

Decision making in diagnostic imaging investigations: a case study of processes and interactions between patients and health care professionals

by

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Declaration

I declare that the thesis, " Decision making in diagnostic imaging investigations: a case study of processes and interactions between patients and health care professionals ", that I hereby submit for the degree PhD in Radiography is my own work and has not previously in its entirety, or in part, been submitted for any degree or examination at this or any other university or academic institution.

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Dedication

This thesis is dedicated to
all the vulnerable patients

In loving memory of my parents, Mr and Mrs P Makanjee,
and my family members whom I have lost in the course of my study:
my brother, Mr Vinod Parbhoodas Makanjee;
my aunt, Mrs Luxmi Lalloo;
my cousin brother, Mr Dharmesh Bhikoobhai Makanjee;
my uncle, Mr B Makanjee.

Summary

The aim of this study was to get an understanding of the various decision-making processes involved in referral for and the choice of the most appropriate diagnostic imaging investigation and how they had a bearing on the interactions between patients and health care professionals. A social constructivist conceptual framework informed the inductive, emerging qualitative research design adopted for this study.

An instrumental case study of one district hospital and its referral links was selected as methodological point of departure. The study consisted of two main phases, the one following on the other. In the first phase, real-life, individual mini-case studies were conducted by “shadowing” 24 patients, from the point of reporting to the hospital up to their discharge from hospital or admission for in-hospital treatment. Data collection methods in this phase not only included entry and exit interviews with patients but also observations at various points of care, and interviews with different health care providers involved with the care of each patient (medical practitioners and specialists, radiologists and radiographers, and nurses). In the second phase, focus group interviews were conducted with the same and other health professionals to triangulate the findings emerging from the shadowing process. The data was analysed inductively around three main units of analysis: the district hospital; patients; and health professionals.

The findings are presented in six chapters, starting with an overview of the health-facility complex in which the district hospital was situated and the various referral pathways for diagnostic imaging investigation that could be followed. This exposition is followed by an exploration of structural and organisational interactions between health care providers from referral for diagnostic imaging, to investigation, interpretation and integration. Interprofessional interactions with regard to diagnostic imaging investigation are discussed, with a special focus on the role of the radiographer as trainer, mediator, gate keeper and gap filler and the differences in interactions inside a radiology department and outside of it. Hierar-

chies, boundaries and task-shifting are also highlighted. Radiographers were found to occupy a tenuous space in decision-making processes and interactions, with their services needed but their profession not appreciated by all cadres of health professionals. Provider-patient interactions are explored in terms of patterns of interaction during the consultation and the diagnostic imaging investigation, as well as in terms of issues of communication, continuity and fragmentation. Patient expectations and experiences are explored from the viewpoint of health providers and of the patients themselves.

The thesis ends with a higher-level reconstruction of the “bigger” picture in which interactions and decision-making processes with regard to diagnostic imaging investigations take place, drawing eclectically on a number of theoretical models and themes from the literature. In order to accommodate the complexities of and all role players involved in diagnostic imaging investigations, it is proposed that the notions of patient-centre care and shared decision making be replaced with a patient-provider-centred approach to care and collective decision making. Collective decision making includes a sequence of discreet decision-making moments and events in which elements of distributed, shared, negotiated and collaborative decision making are found.

Keywords: decision making, diagnostic imaging, radiography, service delivery, patient-centred care

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researcher

Abbreviations and acronyms

ACR	American College of Radiology
ATS	Accident, Trauma and Surgery
CEO	Chief Executive Officer
C/spine	Cervical spine
CT	Computerised tomography
DEATH	Diabetes, epilepsy, asthma, thyroid and hypertension
DH	District hospital
DoH	Department of Health
DRC	Democratic Republic of Congo
ENT	Ear, Nose and Throat (Otolaryngology)
FNA	Fine needle aspiration
GP	General practitioner
HIS	Hospital information system
HPCSA	Health Professions Council of South Africa
ICU	Intensive care unit
ID	Identification
IT	Information technology
IV	Intravenous
Lat	Lateral
MO	Medical officer
MRI	Magnetic resonance imaging
MVA	Motor vehicle accident
PA	Postero-anterior
PHC	Primary health care
RIS	Radiology Information System
RSA	Republic of South Africa
SDM	Shared decision making
TB	Tuberculosis
TH	Tertiary hospital
UK	United Kingdom
US	United States

Reference codes for direct quotations from transcripts

CS	Case study
FG	Focus group
MP	Medical practitioners
MP-PT	Medical Practitioner (Doctor, registrar, consultant) – Patient interaction (Consultation)
NP	Nurses
PCI	Pre-consultation interview (Patient initial interview)
PEI	Post-consultation interview (Patient exit interview)
RAD	Radiographer
RAD-PT	Radiographer – Patient interaction (Radiographic investigation)
RADL	Radiologists
RADL-PT	Radiologist – Patient interaction (Radiological investigation)

Editorial conventions

Verbatim quotations from participants:

- In order to preserve the authentic voices of participants minimum language formatting was done and grammatical and syntax errors were kept

Double quotation marks are used in the following instances:

- Direct quotations from the literature
- Direct quotations from transcripts produced in the study
- Metaphorical use of a word or phrase

Square brackets:

- Explanation of something that may not be clear in a direct quotation
- Enhancing readability of direct quotations of research participants' own words
- First letter of a direct quotation from the literature in square brackets: sentence started with a capital in the original

Italics:

- Verbatim quotations of study transcripts

Acronyms:

- In brackets at the first point where the words it represents appear in each chapter

Chapter 1

Introduction

The study reported in this thesis is about interactions between health care professionals amongst each other and between professionals and patients in decision-making processes around diagnostic imaging investigations. It takes an in-depth look at the interactions between these two groups of role players and the course of processes in coming to “timely, appropriate clinical action” (Pitman et al., 2009: 457).

In this introductory chapter the background to the study and rationale for choosing this topic are provided. The discussion of the aims and the research questions of the study are followed by an overview of the research design. The chapter ends with an orientation to the rest of the chapters in this thesis.

1.1 BACKGROUND

Patient-centred care currently enjoys much interest among health professionals and the general public. This type of care puts the patient as partner and collaborator in the diagnosis and management of his or her own health conditions. According to Elwyn (2005: 287), the concept of patient centeredness was introduced by the South African, JH Levenstein, who published an article in *South African Family Practice* in 1984, entitled “The patient-centred general practice consultation”. A Canadian group that included Ian McWhinney and Moira Stewart further developed the so-called clinical method of patient-centred medicine (Elwyn, 2005: 287). In the medical literature patient-centred care is intricately linked with notions of shared decision making and the patient’s active participation in all processes of the medical encounter, ranging from the provisional diagnosis, to the choice of diagnostic investigations (including diagnostic imaging), to the discussion of provisional findings and the design of a management plan (Frosch and Kaplan, 1999; Godolphin et al., 2001; Jordan et al., 2002: 383; Thiel De Bocanegra and Gany, 2004; Elwyn, 2005; Feldman-Stewart, 2005; Eldh et al., 2006; Kiesler and Auerbach, 2006; Saba et al., 2006; Booth and Manning, 2006; Gravel et al., 2006; Yedidia, 2007; Undeland and Malterud 2008; Suter et al., 2009; Frank et al., 2010; Bleakley, 2011; Etheredge, 2011; Cropley, 2012; Dy and Purnell, 2012). In the doctor-patient consultation there has been a steady shift from paternalism towards a focus on the needs

and the multiple voices of providers and the autonomy of the patient as being at the centre of his or her own care (Elwyn, 2005: 290).

Modern medicine is highly dependent upon high technological scientific equipment and practices (Adams and Smith, 2003: 198). The advances in diagnostic imaging technology with regard to enhanced image quality have opened the door for detecting previously unseen abnormalities of unknown relevance. Digitally acquired images also promote ease of access for the referrer (Davies et al., 2011: 589). According to Webster (2002: 109), imaging from surface anatomy to intra-body physiology enabled the "medical gaze" to move deeper and deeper into body structures. However, technology has professional, social and individual implications, as the availability of the latest diagnostic equipment is like a diagnostic invitation that could lead to the belief in the "gift" of knowing that would enable health care professionals to make an informed decision (Kenen, 1996: 1546). Unfortunately, according to Adams and Smith (2003: 198), "sometimes the patient as a person can be lost from the clinician's gaze" and advancement in patient care is not necessarily guaranteed (Munn and Jordan, 2011: 323).

Another important factor is the potential influence of consumer awareness and demand on the patterns of utilisation of diagnostic imaging. Patients may demand imaging procedures for various reasons: they may have acquired information from the print or electronic media or by word of mouth; or they could believe that they should receive specific imaging services for particular symptoms, based on their past experience. Most patients are not financially liable for imaging services received. If the physician is reluctant to refer them for diagnostic imaging they may interpret it as insensitivity on the part of the physician who withholds procedures that they are entitled to. Furthermore, many patients have little understanding of indications for or benefits of imaging procedures and the cost involved. Radiation doses and their associated risks, and the protection procedures in place are also poorly understood (Hendee et al., 2010: 244; Geneau et al., 2008: 5; Malone et al., 2011: 523; Chun-sing et al., 2012: 268). One of the gaps in our current knowledge on the functioning of the health system is the extent to which patients are aware of their rights regarding participation in the planning of their treatment and diagnosis, including knowledge of radiation risks.

The use of diagnostic medical imaging can be defined as "timely access to and delivery of integrated and appropriate radiological studies and interventions in a safe and responsive facility and a prompt delivery of accurately interpreted reports by capable personnel in an efficient, effective, and sustainable manner" (Pitman et al., 2009: 457). According to Bernardy et al. (2009: 844), the quality of medical care brings value to both patient and provider when medical imaging is justified and is performed correctly. Despite the acknowledgement

in the current literature that health professional-patient interactions and decision-making processes regarding referral, diagnostic imaging investigations, interpretation and communication of outcomes are complex phenomena, research in diagnostic investigations in general has been fragmented (Geneau et al., 2008: 10). These fragmented studies focus on test ordering (Geneau et al., 2008: 8; Whiting et al., 2007), cost (Olivier et al., 2005: S83; Hofmann and Lydsdahl, 2008: 446; Hendee et al., 2010: 240), and over-utilisation of diagnostic services (e.g. as a result of new technology, office-based imaging, physician self-referral, increasing patient demands, altered reimbursement systems, commercial liability, and fear of lawsuits). The current study is an attempt to bridge the gap of fragmentation and to embrace the shift from a technology-centred approach to an integrated patient-centred approach (Ugwu et al., 2009: 1; Halkett, 2011: 55).

1.2 PUBLIC AND RESEARCHER EXPERIENCES OF DIAGNOSTIC IMAGING INVESTIGATIONS

The South African media regularly reports on negative and some positive patient experiences of service delivery by the health care system. Current headlines focus on human and financial resource issues that directly impact on patient treatment; for example, diagnostic imaging accessibility is highly dependent on resources such as equipment maintenance and radiation therapy treatment. From a patient perspective there is lack of confidence and trust in the lower levels of care (e.g. the primary health care clinics), inter alia because a large part of the public is not educated to appreciate the different levels of health care services and the types of services available at each level. The following two examples of media reports illustrate this point. In a report in the *Sunday Times* of 30 May 2010 titled, "Referral at root of health crisis", Ntyintyane addresses the issue of overcrowding in tertiary hospitals, inter alia as a result of professionals' attitudes at the primary health care level. A report by Paul Avis in the *Rapport* newspaper of October 2006, illustrates some of the problems regarding education of patients and the communication of findings involving diagnostic imaging investigations as part of the clinical diagnosis. He relates the story of a patient referred for a chest radiograph with a suspicion of a lung infection. The patient was subsequently referred for a computerised tomography (CT) scan of the chest with a possible mass in the lung and was later referred for a biopsy. During the many contacts the patient had with different health care providers such as the referring doctor, the radiologist and the thoracic surgeon, they appeared very calm and confident. However, throughout the staging of the diagnosis proper communication was absent and their communication styles were reported to have been poor.

As a practicing clinical radiographer, my initial interest in conducting the current study was triggered by observations on the quality of service delivery within the clinical setting as it relates, amongst others, to inadequate equipment maintenance, poorly completed request forms, unwarranted referrals, and inappropriate requests. In addition, patients' poor understanding of the role, purpose and modalities of diagnostic imaging investigations was another reason for conducting the study. According to the Health Professions Council of South Africa (HPCSA, 2008c: 3), patients should be aware of the diagnostic imaging services offered by their local health providers and about the importance of providing accurate and relevant information during a consultation process (e.g. regarding previous diagnostic investigations). Other issues that contributed to the initiation of this study were current debates on the identity of radiographers as autonomous, independent practitioners and on role expansion in the context of shortage of radiological expertise. The initial literature review also revealed discussions on shared decision-making processes that included a variety of health care professions as well as the patient (see Chapter 2). As a result, the researcher entered the field from a multi-role perspective – as an academic, professional radiographer, clinician and service provider.

1.3 PROBLEM STATEMENT AND RESEARCH QUESTION

According to Undeland and Malterud (2002: 145), the term “diagnosis” is derived from the Greek word that means “decision”. Therefore, to diagnose is to make a decision. A patient is often referred for a diagnostic imaging investigation when the referrer seeks a radiological opinion on a clinical diagnosis. The initial literature review and the researcher's own experience highlighted what appears to be fragmented care and a lack of communication between different health care professionals regarding the decisions made during the referral process and determining the most appropriate diagnostic imaging investigation. The only person who is present throughout the entire process is the patient, but it is not known to what extent these processes affect patients' experiences and understandings and what meanings they attach to diagnostic imaging investigations. It was argued that by observing the pathway of the patient from his or her entry into the health care system (i.e. even before consulting the referring medical practitioner) up to the point of diagnosis would enable the researcher to present a holistic account of referral patterns, interactions and decision-making processes as a continuum. Furthermore, it would indicate how these actions influence patients' and health care professionals' expectations, experiences, meanings and understandings of diagnostic imaging investigations in relation to the outcomes and quality of the medical encounter.

1.3.1 Research questions

The main research question in this study was the following:

In the process of decision making on referral for the most appropriate diagnostic imaging investigation, how do the interactions between health care professionals and patients shape their expectations, experiences and understandings of diagnostic imaging investigation and the outcomes thereof?

The main research question was divided into further sub-questions:

1. How do the interactions of health care professionals with patients affect the referral process and decision making regarding the most appropriate investigation in relation to radiological outcomes and to clinical management of the patient?
2. What is the role of the radiographer as “interpreter” of the most appropriate investigation and projections?
3. What is the role of the radiographer as a “mediator” in the patient’s “journey” through the process?
4. How do health care professionals and patients construct meaning, experiences and understandings through the various points of the referral process in determining the most appropriate investigation and the outcomes thereof in relation to the medical encounter?
5. How do patients’ expectations regarding diagnostic imaging investigations affect their construction of meanings, experiences and understandings of their “journey” through the various points in the medical and diagnostic imaging encounter?
6. How could answers to the above questions inform the development of frameworks, models or instruments to illuminate the decision-making process and interactions between patients and health care professionals and to contribute to the improvement in the quality of service delivery?

1.3.2 Research aim and objectives

The main research aim of this study was to get an understanding of the various decision-making processes involved in referral and choice of most appropriate diagnostic imaging investigation, especially as they are experienced in the interactions between patients and health care professionals.

The objectives of this study included the following:

- a. To describe how events and processes in the medical practitioner consultation resulted in the referral for a diagnostic investigation.
- b. To describe how the referral for an investigation was interpreted and how decisions of the most appropriate investigation were made by health professionals at the diagnostic imaging section.
- c. To describe how health professionals interacted during the referral, specifically regarding interpreting the referral and in determining the most appropriate investigation and the outcomes.
- d. To develop an appreciation of the similarities and differences of how patients interacted with medical practitioners, radiologists and radiographers respectively.
- e. To observe and explain the interaction processes between medical practitioners, radiographers and radiologists and how these affected the patients' construction of diagnostic procedures as part of their medical encounter.
- f. To describe patients' experiences and understandings of diagnostic imaging investigation as part of the treatment process and health outcomes and how patients interpreted the mechanisms and patterns of referrals and decision-making of diagnostic imaging investigation processes as part of their medical encounter.
- g. To develop a model(s), framework(s) or instrument(s) to provide a holistic view of how experiences, meanings and understandings are constructed and reconstructed as the patient proceeds through various stages within a structure.

1.4 RESEARCH DESIGN

A qualitative research design was considered to be the most appropriate approach for exploring the various research questions, particularly due to the fragmented nature of studies related to referral decisions and diagnostic imaging investigation processes and procedures, as well as the absence of studies on interprofessional and professional-patient interactions. An instrumental case study of one district hospital and its referral links was selected to advance the aims of the study. The study consisted of two main phases, the one following after the other. In the first phase, 24 patients were followed ("shadowed") from the point of reporting to the hospital up to their discharge or being admitted for in-hospital treatment. Data collection included entry and exit interviews with patients, observations at various points

of care and interviews with different providers involved with the care of each patient. In the second phase, focus group interviews were used to solicit the views of professionals (medical practitioners, family physicians, radiologists, radiology registrars, radiographers and nurses) to triangulate the findings emanating from the shadowing process. A social constructivist conceptual framework underpinned the study (Section 3.1).

1.5. OVERVIEW OF THESIS CHAPTERS

In this chapter an overview of the background to and rationale for this study was outlined. The problem statement, research question, objectives and aims that formed the basis for planning the study were also discussed and a brief summary was given of the research design. Chapter 2 provides a review of a capita selecta from the literature, whereas the research design and methodology are described in Chapter 3. Chapters 4 to 8 pertain to the findings emerging from the study. Chapter 4 describes the research scene by referring to services and administrative processes in terms of a patient's points of contact with the health system, as well as the radiographer's role in diagnostic imaging investigations and interpretation. Chapter 5 explores the systemic and organisational interactions between health care providers. The focus in Chapter 6 shifts to the intra- and interprofessional interactions and relationships between the different health care providers involved in diagnostic imaging services. Chapter 7 unpacks the interactions between health care providers and patients, whereas Chapter 8 contains an in-depth exploration of patient expectations, perceptions and experiences. Chapter 9 discusses the findings in relation to existing literature. It also proposes some frameworks for understanding the diagnostic imaging investigation processes and its impact on decision making. Chapter 10 contains the conclusion and gives recommendations for future research.

In the next chapter a capita selecta of literature pertaining to the focus of this study will be reviewed. The qualitative nature of the study and the complexity of an emergent research design did not allow for an extensive review.

Chapter 2

Capita selecta from the literature

Due to the complexity of the study reported in this thesis, it was not possible to do a comprehensive literature review on all aspects related to diagnostic imaging, including doctor and other health care professional consultations, providers' relationship with patients, and different theoretical approaches. Therefore, two pertinent themes were selected for review from the literature. The first theme is a discussion of the South African health system with a focus on the structural aspects of and human agency in diagnostic imaging services, including references to regulatory statements by government, the professions and a discussion of role players involved. The second theme focuses on micro-level issues related to the individual interactions between health care providers and patients.

In different countries different terminologies are used to refer to a medical practitioner. In most instances in this chapter the term “medical practitioner” is used as is the custom in South Africa. In some instances “physician”, “clinician” or “doctor” is used if it reflects the original meaning of the authors more appropriately.

2.1 DIAGNOSTIC IMAGING AND THE HEALTH SYSTEM

Diagnostic imaging technology services form an important component within the health system in terms of rendering quality professional service to health care service providers and patients benefiting from the referral. Accessibility to these technological services is highly dependent on the level of services provided at the various institutions. The services and its effectiveness are shaped through interactions between provider and patient. At times there are multiple health care providers who either work as individuals or as a group to make decisions regarding intra- and inter-institutional pathways of referral and treatment to be followed for each individual patient. In this section and subsections the provision of diagnostic radiographic services in the South African health system and guidelines for the delivery of diagnostic imaging services is discussed. This is followed by an exposition of the role players in the provision of these services.

2.1.1 The South African health system

The South African health system comprises a public and a private sector. The public sector is divided into a primary (level 1), a secondary (level 2) and a tertiary (level 3) level of care (RSA, 2011: 4-5; Gibson, 2001: 517; Cullinan, 2006: 4; Pfaff and Couper, 2010: 109). There are specific guidelines for referrals between these levels. The private health sector is divided into a large corporate private-for-profit hospital sector, and a smaller and diversified, private-not-for-profit sector (RSA, 2011: 5; Heunis, 2004: 480). Unlike for the public sector, a complete categorisation of all types of private and industry or workplace hospitals is not available in the South African literature.

Clients crossing between the public and private sectors when seeking health care is a common phenomenon. There are several reasons for the dual use of the health system. Patients “shop around” between different providers for different types of services that suit their needs. Public sector use is quite common when seeking treatment for chronic conditions. Furthermore, certain types of services are only accessible during normal working hours and private patients also access certain types of public sector health services after hours (Van Rensburg and Pelser, 2004: 149). According to Palmer et al. (2003: 292-293), this type of fragmented approach impacts on the health system and on patients – financially and clinically – in terms of providing a continuum of optimal quality of care. Although the focus of my study was at a micro-level in the health system (referral, decision making and interaction) of individual patients, it is acknowledged that meso- and macro-level trends influence the individual encounters between patients and health care providers and the outcomes with regard to management, treatment and follow-up (cf. Charles et al., 2006: 263; Van Zyl et al., 2000, cited by Van Rensburg and Pelser, 2004: 150).

In terms of test ordering and procedures a diagnostic imaging investigation referral is regarded as requesting an opinion from a specialist in radiology on detection or exclusion of disease that contributes to management of care, assessment of prognosis, monitoring clinical course and/or screening for at-risk health (European Commission, 2001: 22; Knottnerus et al., 2002: 477). If the user enters the health care system at the lowest level he or she is ensured of an effective and efficient referral pathway facilitated by competent and skilled health care professionals who have a support structure in place to contribute to a smooth transition of care (Van Rensburg and Pelser, 2004: 149).

The national Department of Health recommends that the public level-1, district hospitals should provide diagnostic imaging in the form of plain general radiographic services, fluoroscopic facilities (barium studies) and hysterosalpingograms. The last service is, however, not accessible everywhere. Radiological services at level-2, regional hospitals

include, amongst others, some advanced fluoroscopic investigation services and modalities such as computerised tomographic (CT) scans. At next level of referral, level-3, tertiary institutions provide the whole spectrum of specialised advanced diagnostic imaging facilities that are equivalent to the technologically advanced radiological services of the private sector. With regard to general diagnostic imaging services there is, therefore, an overlap in the provision by the various levels of care in the public sector (DoH, 2002: 15, 16). Upward referral to specialised services in the private sector appears to follow a more structured approach. According to Gibson (2001: 22), who studied the experience of accessibility to health care services of five cases of chronically ill, disadvantaged patients, “[p]rivate patients paid for access to a specialist physician’s opinion and care, as well as to the necessary technology. This enabled the patients to buy not only time, but also possibly chances of life.”

2.1.2 Guidelines for delivery of diagnostic imaging services

Effective control of radiation exposure, inter alia by means of appropriate justification for every exposure, is a basic principle to be followed by all diagnostic imaging services. The American College of Radiology (ACR) proposes that radiation exposure from medical imaging should be regarded as a public health issue (Gray, 2010: 2). In South Africa radiation exposure is the responsibility of the Directorate: Radiation Control in the national Department of Health. It follows the International Commission on Radiological Protection (ICRP) guidelines for human exposure to ionising radiation (ICRP, 2007). In the document, “Strategic Priorities for the National Health System 2004-2009”, the strengthening of radiation control was identified as a strategic priority in the South African health system (RSA, 2004b: 14). There is worldwide concern about the effectiveness of radiation control measures. Increasing budgetary and financial constraints in health care sectors and the growing consumerist movement demanding greater patient-initiated access to medical services are of special concern (Malone et al., 2012: 523).

From a radiation safety perspective there are presently no formal evidence-based guidelines for diagnostic imaging test ordering for medical practitioners in South Africa. From a clinical management perspective there appears to be some evidence of clinical management strategies that include the appropriate imaging modalities. Patricios (2010: 91), for example, refers to cases of concussion in the brain with a possible intracranial lesion(s) where it would be recommended that a patient undergo a CT or magnetic resonance image (MRI) investigation.

From the researcher’s experience radiographers write down the number of projections, the radiation exposure technique information, time and the actual dose on the request form (at

some institutions). However, no records are made available to patients for their information. The question arises about the importance of informing the patient of their actual accumulative dose based on the ethical guidelines that state: “However small the risk, the patient should be informed” (RSA, 2004a: 20; cf. also HPCSA, 2008b: 2; Gray, 2010: 2). Even though patient education on aspects of diagnostic imaging investigations takes place, an effort must be made to include more information on low-dose exposure to radiation (PHC4, 2004: 2; Gray, 2010: 2). According to Gray (2010: 2), providing information to patients about the risks of imaging puts them in a position to be able to make informed decisions about their own care. The inclusion of information on the risk and cost versus benefit of diagnostic imaging investigations may result in a better understanding and/or ability of patients to participate during the consultation and to cooperate during the performance of an investigation. However, the medical community has raised concerns over the creation of unnecessary alarm in patients when disclosing certain information, as their risks to radiation exposure cannot be restricted. This is due to the inherent difficulty of balancing substantial clinical need for such investigations against the likelihood of cancer risks. If strict regulation is not possible as a result of the complexity of imaging decision making, Gray (2010: 3) suggests the patient must rely on the expertise of their physician.

On the disclosure of information and consent for a referral for a diagnostic imaging investigation, the guidelines of the Health Professions Council of South Africa (HPCSA) states: “Where a patient has agreed to be referred for an x-ray, referring practitioners may make relevant information available to diagnostic radiologists” (HPCSA, 2002: 3). This led the researcher to review literature on code of practice, guidelines and scope of practice for medical practitioners, radiologists and radiographers regarding diagnostic imaging investigation processes.

Many of the characteristics of processes of the South African health system that have a direct or indirect bearing on diagnostic imaging investigations are also discussed in the international literature. These include ethical and referral guidelines for health professionals, the role of patients in the decision-making process and treatment, and issues of safety. Studies pertaining specifically to diagnostic imaging were also found, for example, in relation to quality of service delivery (Haddad et. al., 1998: 392; Hahn and Kleinman, 1983: 317; Parasuraman et. al., 1985: 41; Peyrot et al., 1993: 24; Sofaer and Firminger, 2005: 513-520; Holmberg et al., 2010: 16; Malone et al., 2012: 537).

The principles of justification and optimisation that underpin medical practice also form the cornerstones of radiation protection (Malone, 2012: 525). Medical practitioners are expected to employ the most efficient diagnostic strategies to prevent unnecessary referrals for

diagnostic tests that could impact on time and resources (Kravitz and Callahan, 2000: 38). A study by Baker et al. (2006: 5) in the United Kingdom (UK) illustrated that those general practitioners (GPs) who were able to judge the use of x-rays in terms of the value regarding patient management generally did not make unnecessary referrals. Dhingsa et al. (2002: 138) conducted a study to assess GPs' and radiologists' justification with regard to radiation exposure in the UK and concluded that it would be best if guidelines for the justification of a request were devised collaboratively among groups who would use and implement these guidelines. These authors identified that the guidelines of the Royal College of Radiologists (RCR) were not symptom based; therefore, they would not be helpful when it came to the symptoms to warrant an imaging investigation. Whether a request was justified from an individual perspective was dependent on that individual's experience and expectation of the outcomes of an imaging investigation.

The ACR developed and disseminated imaging referral criteria for symptoms associated with specific medical conditions, called "appropriateness criteria" or "appropriate use criteria" (ACR, 2007). These criteria have not been widely adopted by health care facilities and medical providers. Possible reasons for non-adoption are the absence of policies guiding providers in the effective use of patient histories in making imaging decisions and a gap in terms of how information regarding imaging decision making fits into the clinical decision-making process (Gray, 2010: 1).

After exploring clinicians' and non-clinicians' knowledge on radiation in relation to their referral practice in Norway, Borgen et al. (2010: 193-194) concluded that there was a need for information on radiation protection and the effects of radiation. Their study found that physicians used referral guidelines less often than non-physicians and included radiation dose as more important in weighting their decision. The authors conclude that guidelines are considered as a means of supporting referral decisions but also improving referral practices, that is, by changing clinicians' attitudes towards radiation issues. Bairstow et al. (2010: 194, 195) found that non-compliance with diagnostic guidelines according to the use of the so-called Diagnostic Imaging Pathways tool as part of a decision-support system was due to referrers' attempts to subvert procedures. They had provided inaccurate prerequisite information that placed pressure on providers to accept an incomplete or inappropriate request. The authors state that "[i]t is possible that some deviations from recommendations were justifiable in particular circumstances but there is no record of why incomplete or incorrect request forms were accepted" (Bairstow et al., 2010: 198).

From a radiographer's perspective a written request – complemented by obtaining clinical information from patients regarding their condition – is a requirement to justify decisions with

regard to any imaging investigation study. It furthermore prevents errors of misrepresentation or misunderstanding of the patient's clinical history, which may result in incorrect or unnecessary projections. It is also expected of radiographers to report any additional knowledge they acquire about the patient as part of an effective communication channel. This justification process not only prevents errors, but also aids the referring medical practitioner in the management of the patient in terms of diagnosis and treatment (Lam et al., 2004: 133-136; Snaith and Lancaster, 2008: 150). This "gate-keeper" function is sometimes circumvented if providers (including radiographers) collude with referrers in accepting inappropriate examination requests. In the above mentioned study by Bairstow et al. (2010: 195) radiographers were also sometimes found to be coerced into accepting a request with no written record of the reasons for the acceptance of the request.

2.1.2.1 Service delivery

At a macro-level of the health system diagnostic imaging services are categorised as clinical support services grouped together with the laboratory services (DoH, 2002: 31). However, it is not always clear whether the provision of diagnostic imaging services is regarded as an essential frontline service of a health care institution. This uncertainty is illustrated by an example in North West Province in South Africa where a district hospital was relocated due to the rebuilding of the hospital. During the relocation there were no plans in place for routing patients to have access to x-ray services nor was provision made for this in the budget. For emergency x-rays an arrangement was made with a private health facility. Routine x-rays had to be done at a hospital 40 kilometres away. This resulted in patients taking up to two days to access services and return with a radiograph. Besides clinical management being delayed, there were also the financial implications of not having a budget (Pfaff and Couper, 2010: 111).

Diagnostic imaging allows visualisation of the body by obtaining images, thus enabling one to diagnose diseases at earlier stages, while preventing exposure to more invasive but also costly diagnostic investigations (PHC4, 2004: 2). Medical practitioner attitudes can also play a role in how diagnostic imaging services are used. According to Tavakoli et al. (2003: 3, cited by Mung'omba, 2011: 23), up to 50 percent of critical medical decisions are based on x-ray examinations. However, the availability of these measures could also result in the practice of defensive medicine. In such a case, a referral for a diagnostic imaging investigation is done for any of the following reasons: academic reasons; benefit of manufacturers; fear of medico-legal action; lack of knowledge or professional uncertainty about the clinical indications for specific investigations; limited knowledge on ionising radiation; non-use of or non-adherence to referral guidelines (Winkens and Dinant, 2002: 783; Verstappen et al.,

2003: 2411; Espeland and Baerheim, 2003: 6; Gottlieb, 2005: 1399; Dunnick et al., 2005: 402; Schattner, 2006: 273; Phan et al., 2006: 335; Lysdahl and Hofmann, 2009: 1; Mendelson and Murray, 2009: 5; Borgen et al., 2010; Hendee et al., 2010: 244; Chun-sing et al., 2012: 267). Bey er and Diedericks (2010: 22-24) investigated the attitudes of radiographers towards patients in South African regional and district hospitals. They focused on the behavioural aspects of radiographers and communication strategies prior, during and after the investigation. Their results revealed that patients did not always sign the consent form for an examination and a significant number of repeats could not be accounted for.

2.1.2.2 Over-servicing

The HPCSA addresses the general ethical duties of doctors, dentists and medical scientists to patients as follows:

“Always seek to give priority to the investigation and treatment of patients solely on the basis of clinical need, avoid over-servicing. Recommend or refer your patients for necessary investigations and treatment only. Prescribe only treatment, drugs or appliances that serve patients’ needs.” (HPCSA, 2008a: 8)

Hendee et al. (2010: 241) define over-utilisation as, “[a]pplications of imaging procedures where circumstances indicate that they are unlikely to improve patient outcome”.

With the advent of highly specialised technological equipment, the use of diagnostic imaging equipment has become an integral part of health care. Using high technology on a mass scale is, however, regarded as over-servicing, a common problem in modern medicine. Health care providers, including radiographers and radiologists, have the right to not perform (or direct to be performed) any procedure on a patient which is not indicated (HPCSA, 2008a: 8). Etheredge (2011: 12) refers to the tendency to refer patients for scans on a routine basis when not necessarily indicated. The dilemma created for the radiographers is the fear of reporting over-servicing, as they may experience unpleasant treatment from their superiors (including radiologists) who pay their salaries.

Over-servicing and wastefulness also feature in the international literature. There are many reports of growing test ordering in many countries – often blindly, repeatedly and sometimes without examining the patient (Verstappen et al., 2003: 2407; Schattner, 2006: 273). According to Schattner (2006: 273), this undermines the value of clinical skills. Strategies to reduce the ordering of tests have also been tested. For example, a randomised trial conducted to establish the effect of a practice-based strategy on test-ordering performance of Dutch pri-

mary care physicians working according to the national, evidence-based guidelines also found that many tests had been requested unnecessarily (Verstappen et al., 2003: 2408).

According to Hendee et al. (2010: 244), 20 to 50 percent of high-tech imaging procedures in the United States (US) fail to provide information that improves patient welfare. On the other hand, taking these types of results at face value also fails to acknowledge the value of negative imaging studies in influencing decisions about patient treatment and management. Bairstow et al. (2010: 195) state that up to one third of imaging requests are unjustified and most of these requests are inappropriate.

Over-utilisation of diagnostic imaging procedures happens when radiologists take up a consultant role. They do not want to play the gate-keeping role by having to consult with referring physicians on patient details needed to decide on the appropriateness of an examination request. Radiologists often recommend, for a variety of reasons, additional imaging procedures as an adjunct to an interventional procedure (Hendee et al, 2010: 244).

The European Commission (2001: 11) describes the causes of wasteful use of diagnostic imaging by medical practitioners as follows:

“Repeating investigations, which have already been done: e.g. at another hospital, in an outpatient department, or in the accident and emergency department.

Investigations when results are unlikely to affect patient management: because of anticipated positive findings.

Investigating too often: that is before the disease could have progressed or resolved or before the results could influence the treatment.

Doing the wrong investigation: imaging techniques and technology is developing rapidly. It is often helpful to discuss an investigation with a specialist in clinical radiology or nuclear medicine before it is requested.” [Emphasis added]

Inappropriate imaging is a significant problem in the health service sector, with a number of undesirable consequences. Unnecessary radiological reporting is a burden on available human resources to supply the expected services. It further results in inefficient diagnosis, retardation of patient flow and unnecessary expenditure costs (Bairstow et al., 2010: 195; Munn and Jordan, 2011: 323). The long-term risk to cancer due to unnecessary radiation exposure should always be taken into account (Chun-sing et al., 2012: 264). (See also Section 2.1.2.3 below.) Nahmias and Stolberg (2002: 190) state that the goal of diagnostic imaging should not be restricted to providing images of the highest quality and diagnoses of the highest accuracy, but should be extended to include issues such as patient outcomes and societal benefits. The focus should not only be on quality and safety but also on the extent to

which an imaging examination could aid in treatment changes and improved health outcomes, at the same time reducing overall health care expenditure (Hillman et al., 2004: 36).

There are mechanisms available for reducing unnecessary tests and the associated costs. A study by Phan et al. (2006) in Australia used an automated, stratified system known as “Traffic Lights” for justifying imaging requests. A “Red” light signifies that test ordering should be authorised by a consultant, an “Amber” light refers to the need for registrar or consultant authorisation, whereas the “Green” light may also be ordered by medical staff, including interns and residents. This stratified system for requesting imaging could also be integrated with evidence-based medicine protocols to enhance the appropriateness of imaging procedures, the quality and the overall safety in terms of radiation exposure.

According to the literature, patients also contribute to the higher utilisation of services through their insistence on diagnostic imaging investigations to relieve anxieties about their health (Verstappen et al., 2003: 2407; PHC4, 2004: 2; Dunnick et. al., 2005: 402; Demeter et al., 2005: 1175; Schattner, 2006: 273; Larrson et al., 2009: 11; Flynn et al., 2011: 839). The rising demand for these investigations is, amongst other things, due to increased public awareness of the benefits of diagnostic imaging technology and the emphasis on the patient as consumer (Kenen, 1996: 1545; Kravitz and Callahan, 2000: 38; Gray, 2010: 1; Davies et al., 2011: 589). Diagnostic reasoning is, therefore, not merely an analytic process, but often involves an affective component (Patel et al., 2002: 53).

Mung’omba’s (2011) study in rural KwaZulu-Natal in South Africa focused on unwarranted demand for radiological imaging by patients. The aim of his study was to describe socio-demographic factors that may influence patients’ demand for x-ray examinations. Although not many patients were found to have knowledge of x-rays, factors that could influence their demands for x-rays included the following: age; level of education; patients’ perceived benefits of x-rays; other beliefs; lack of public health awareness; and lack of effective communication between patients and health care providers. Mung’omba’s (2011: 117) recommendations include further studies focusing on: knowledge of x-rays by other health care professionals who frequently come into contact with patients; factors that influence the use of x-rays from the doctors’ perspective; and a comparison between urban and rural patients seeking health care services.

2.1.2.3 Radiation risk

Within the South African health system quality is linked to the continuum of care, which depends on the effectiveness of communication between the various parties involved. If a patient’s condition necessitates referral to a better resourced health care institution, a referral

letter acts as permission for the patient to have easy access to further management and treatment by a specialist at a secondary or tertiary level of service (Smith and Khutoane, 2009: 64). The degree of radiation risk depends on the quality of information the receiving doctor gets. Patients also rely on referring doctors to provide information on the management aspect prior to the referral. According to Langalibalele et al. (2011: 483, 486), the wheel sometimes needs to be “reinvented” through trial and error, which could include a re-referral and duplication of diagnostic imaging investigations. This also has an effect on cost and time.

The safety of health workers and patients with regard to radiation is a major concern of any health system (Smith-Bindman et al., 2008: 1491). From a medical practitioner perspective, a referral that entails exposure to radiation should be justified by the fact that the requested imaging examination should have a positive effect on patient management that would outweigh the risk associated with the exposure (Matthews and Brennan, 2008: 350; Weinstein et al., 2005: 14). A recent clinical review of risks of exposure to radiological imaging in the UK describes the “technology creep” as the tendency of using modern technology imaging whilst ignoring conventional imaging investigations (Davies et al., 2011: 589). Iatrogenic radiation exposure is often the result of the lack of knowledge by referring physicians about techniques or alternative procedures known to yield the same or better information, but with less risk to the patient or at a reduced cost (Davies et al., 2011: 589; Hendee et al., 2010: 244). A recent study by Chun-sing et al. (2012) assessed knowledge and practice regarding radiation exposure to imaging examinations in Hong Kong. They found that radiologists (including interns and physicians) understated radiation doses and that some medical practitioners were still not utilising MRI and diagnostic ultrasound as alternate modalities to radiation-related modalities. In this regard the study by Baker et al. (2006: 3) that explored GP variation in referral for x-rays for back pain found that the ideal pathway (e.g. access to MRI) was not always accessible, as GPs experienced difficulties like waiting lists for referral for secondary care.

The above discussion leads to the question of how x-ray examinations should be justified and what happens if they are not. From a radiographer perspective, once an x-ray examination is justified, the principle of optimisation applies. During the examination the margin of good over harm is maximised by attending to all aspects of radiographic technique, to produce images of diagnostic quality at acceptable cost to the individual patient and to society (Winkens and Dinant, 2002: 784; Matthews and Brennan, 2009: 262; Triantopoulou et al., 2005: 306; Malone et al., 2012: 523). There are instances when requests for unjustified examinations may lead to unexpected incidental findings that may change the management of patients (Triantopoulou et al., 2005: 311). This illustrates the complexity of decision making in the case of unjustified requests.

According to Gottlieb (2005: 1399-1400) of the Roswell Park Cancer Institute in Buffalo, New York State, radiologists could play a role in minimising the risk of radiation exposure by assessing the value of imaging in a variety of clinical situations and by monitoring the test ordering patterns and their effects on patient outcomes. This could be of value in facilitating patient care, when weighing up whether to scan or not in terms of potential harm to the patients due to radiation exposure, reactions to intravenous (IV) contrast material, or streamlining the effects of false-positive and false-negative interpretations.

2.1.3 Role players in diagnostic investigations

In the referral system for diagnostic imaging four categories of health care providers play a pivotal role in the process: the referring medical practitioner; the radiologist; the radiographer; and the nurse. Very specific professional roles are expected from each of these partners.

2.1.3.1 Radiologists and referring medical practitioners and specialists

One of the areas of potential conflict regarding the provision of radiographic services relates to the scope of practice of the general medical practitioner and specialists performing radiological tasks. According to HPCSA (2008b:1 5) policy, "Doctors practice in fields in which they have adequate training." Gazelle et al. (2007: 518) refer to GPs in the US with general radiography services on site and who function on a self-referral basis. According to Van Niekerk (2010: 71), the quality of x-rays and ultrasound examinations performed by GPs in South Africa is suboptimal and can lead to misdiagnosis. A study by Nkombua (2008: 65b) on the role of the medical practitioner in an emergency unit at a district hospital in an underserved area in South Africa revealed challenges of practising at this level. The author does not specifically refer to the competencies and skills required for performing and interpreting diagnostic imaging investigations. However, he states that a health provider has to be knowledgeable and skilful in a wide range of disciplines and has to have adequate diagnostic and therapeutic skills, for example in dealing with motor vehicle accident patients.

To ensure effective communication between medical practitioners and radiologists regarding requests for imaging investigations, Triantopoulou et al. (2005: 306) are of the view that it is the referring medical practitioner's responsibility to gather and communicate clinical as well as diagnostic information by means of a request form to the radiologist. This should include data about previous investigation(s) relevant to the requested imaging examination(s). The primary role of the radiologist prior to approving an examination request is to make sure that the information regarding the clinical condition of the patient and the preceding examinations is available in order to be able to make decisions. In the absence of a radiologist the medical practitioner assesses the transmitted information and makes a judgment on the justification

of the requested examination and decisions concerning the patient's radiation exposure from a clinical perspective. According to Chun-sing et al. (2012: 267), the referring doctor is the one who must explain the risks versus benefits regarding the diagnostic examination to the patient.

Lysdahl et al. (2010) investigated radiologists' actions regarding inadequate referrals in Norway. Radiologists preferred to obtain additional information from medical records and the patient instead of from the provider. Individual characteristics of radiologists, the positions they held and their working environment also influenced their approach to accessing additional information, how they responded and what was expected. Although the ideal here would be face-to-face interaction with referring clinicians to facilitate consensus on the most appropriate examination that would also improve patient care, the reality was dictated by the constraints and cautions not to upset interpersonal relations with clinicians.

According to Grant et al. (2009: 2332), there is an under-appreciation of the role of the radiologist by the general public. Ortega and Gracia (2006: 473) refer to the difficulties of relationship building because of the wide gap between patients' beliefs and radiologists' motivation – radiological care is centred on doctors' necessities, not on those of patients. From a radiologist perspective the reasons for this wide gap or fragmented relationships include time constraints, poor doctor-patient relationships, poor working environments mediated by transactional issues, cost constraints and the belief in the radiological report as the main medium of communication to both patients and medical practitioners.

Radiologists and referring medical practitioners ideally act together in the best interest of the patient. Occasionally when the referring medical practitioner is unavailable to communicate a significant finding, the responsibility could then fall on the radiologist or a proxy (Safdar et al., 2011: 854). Even in the absence of communication between the radiologist and patient it is important that the findings are not lost "in ether", as it is a collective responsibility of both radiologist and referring medical practitioner.

Even if the outcomes of a diagnostic investigation are preliminary, a radiologist giving information about these while the patient is at the radiology department, increases patient satisfaction and reassures and prepares the patient for the news regarding prognosis. This consultative role of the radiologist forms a critical part of the interdisciplinary experience (Safdar et al., 2011: 855). Some practicing radiologists and experts have begun to advocate a model in which patients can consult with radiologists after a diagnostic examination; others have begun to send radiological reports directly to patients (Safdar et al., 2011: 856). For the radiologist it enhances the esteem, respect, professional role and identity as valued member of the health team able to assist with the patient's medical needs. This notion of disseminat-

ing the results directly to the patient is further supported by Berlin (2009: 573), who cautions one to handle each case individually on the decision to communicate outcomes of the diagnostic imaging investigation prior to consultation with the referring practitioner. Sasson et al. (2008: 417) further encourage the engagement between the radiologist and the patient, especially with mammography investigations and interventional procedures. Therefore, the radiologist's value is much more than being an isolated practitioner as part of the production chain, but rather being a specialist sharing the responsibility for patients' care with other medical providers (Blackmore, 2007: 218-220).

2.1.3.2 The role of the radiographer

Through the years the roles of radiographers have changed and diversified in response to advances in radiographic technology, skill shortages and changes in a health system. Nowadays one finds a plethora of terminologies to refer to radiographers and other health workers in the field of radiography, for example radiological technologists and radiologist assistants (Ellenbogen, 2008: 4); consultant radiographer (Hogg et al., 2008: 39); medical radiation science (MRS) practitioner (Sim and Radloff, 2009: 204); radiology nurses (Andersson et al., 2007: 402); and mammographer (Moran and Warren-Forward, 2010: 12). In this study the focus was on radiographers who fulfilled the more "traditional" roles of general radiography, fluoroscopy, and mammography.

In South Africa, according to an HPCSA document, "[a] professional shall perform, except in an emergency, only a professional act amongst others for which he or she is adequately educated, trained and sufficiently experienced" (HPCSA, 2006: 12). The ethical rules of conduct for practitioners registered under the Health Professions Act, 1974 outline the professional acts that a radiographer may perform as follows:

"A radiographer –

- (a) shall perform professional acts only at the written request and under the supervision of a practitioner approved by the board of such purpose: Provided that this prohibition shall not apply in respect of –
 - (i) acts pertaining to the profession of radiography determined by the board for such purpose;
 - (ii) a radiographer who complies with the conditions set by the board in this regard and who in the opinion of such board is competent to perform professional acts without supervision at the written request of such practitioner; and

- (iii) a request from such practitioner which in the opinion of the radiographer was based on good and sufficient grounds: Provided that such request was in writing and signed by the person making the request;
- (b) shall consult in regard to any work performed by him or her in his or her profession only with a practitioner approved by the board at whose instance such work was undertaken;
- (c) shall not interpret radiographical investigations, report thereon or furnish information in regard to any work performed by him or her in his or her profession to any person other than a practitioner approved by the board at whose request such work was undertaken; and
- (d) shall not in his or her practice exceed the limits of the category or categories in which he or she is registered.” (RSA, 2006: 61)

A recent publication on the need for radiographer role extension in primary health care re-emphasises the need for recognising image interpretation and providing a report. At the same time it highlights the issue of misinterpretation by newly qualified and inexperienced medical practitioners (Gqweta, 2012: 24). In contrast to the South African situation, where the role of the radiographer is that of an “operator” (RSA, 2010: 10), radiographers in the UK are working at three levels, namely as “referrers”, “practitioners” and “operators” – “One of the examples of advanced ‘radiographer’ competencies was requesting radiological procedures (‘Referrer’) and justifying radiological procedures prior to conducting them (‘Practitioner’)” (Nightingale and Hogg, 2003: 78-79). Radiographers in the UK have been engaging in the interpretation of radiographs since 1982 by applying the pattern recognition criteria and using the “red dot” to indicate possible pathology or abnormality (Rudd, 2003: 9-11). However, they are not allowed to formally report on radiographic images (Hargreaves and Mackay, 2003: 283). Despite this limitation some radiology departments in the UK provide the practitioners with a written opinion of the radiographic appearances. This initiative is strongly supported by the British Society and College of Radiographers (Coleman and Piper, 2009: 197).

Australian and Canadian researchers found the design of ethical commitment standards for radiographers a challenge because of the dominance of medicine, poor professional autonomy, low self-esteem and not being able to take responsibility (Lewis et al., 2008; Sim and Radloff, 2009: 203; Clark, 2010: 264, 265). This corresponds with Etheredge’s (2011: 10) description of the field of radiography as “a complex occupation with a multitude of ethical issues”. Although radiography forms an integral part of the health care process, it does not

allow radiographers much professional autonomy in the working environment. Thus, radiographers have very little leeway when it comes to patient interactions with regard to performing repeat views or extra views, or when patients ask probing questions (Etheredge, 2011: 10).

According to Etheredge (2011: 10-11), radiographers' responsibilities are not clearly defined in the chain of medical treatment. This leads to a paradoxical situation in terms of informed consent, as it is not clear how much information a radiographer can disclose to the patient. On the one hand, the radiographer is obliged to act in accordance with instructions from a radiologist. On the other hand, radiographers in South Africa are legally defined as "health care providers" (Etheredge, 2011: 10), so they are legally responsible for obtaining informed consent from their patients for any procedure that a patient might require.

Snaith (2007: 15-16) reports the following on a pilot study on radiographer-led discharge in an accident and emergency unit in the UK:

"Radiographers have not necessarily been involved in the ongoing care or discharge of patients after radiology, whereas this has become an accepted role for both nurses and allied health professionals (AHPs). This has been further developed with the publication of the 10 key roles for AHPs which include 'to discharge and/or refer patients to other services, working with protocols where appropriate'. ... The agreed parameter for radiographer discharge for this study was normal radiographic examinations of the ankle and the person most able to make a decision being a reporting radiographer. ... This role development has shown that journey times can be significantly reduced, improving patients' experience as well as releasing clinician time to deal with other patients. This has been most apparent in conjunction with 'See and Treat', when a full clinical examination and decisions regarding treatment can be made at the initial consultation."

According to Australian literature, the autonomy of radiographers is stifled by paternalism, subordination and an asymmetrical working relationship between them and medical providers. This leads to radiographers experiencing communication problems not only with radiologists but also with medical practitioners (Lewis et al., 2008: 96). Barley (1986: 87) elaborates on the relations between radiologists and radiographers as a result of the distribution of technical and interpretive knowledge in the x-ray department – radiologists issue orders and offer critiques in imperative sentences; radiographers carry out the orders. Radiologists rarely justify their commands and preferences and authority is centralised, even in mundane matters (Barley, 1986: 87; Murphy, 2006: 173).

One of the neglected areas of the above is the role of the radiographer as the mediator between the medical practitioner, the radiologist and the patient in the process of decision making and recommendation of the most appropriate and/or preferred investigation. This is linked to the advanced radiographer competencies as “practitioner” as identified by Nightingale and Hogg (2003: 78) (cf. also Adams and Smith, 2003: 197-198; Smith, 2006: 52). Supported by the everyday clinical reality, the patient sometimes unpacks in detail his or her experiences of illness regardless of the investigation requested. The radiographer then interprets this information. In the absence of a radiologist, the medical practitioner often seeks an opinion from the radiographer to confirm the most appropriate investigation. The radiographer also plays a role in presenting the images for a radiological report and may even assist the medical practitioner in the radiological interpretations of the images. The radiographer’s interpretive role can then be regarded as part of what a radiologist does in clinical practice (Hardy and Barrett 2004: 657; Nightingale and Hogg, 2003: 78; AIR, 2003, cited by Smith, 2006: 54).

From the discussion above it is clear that in a dynamic workplace a radiographer’s tasks are complex. According to Williams and Berry (2000: 37), the breaking up of the work of the radiographer into separate components – focusing on the operator role only [CRM] – leads to the loss of the complete picture in terms of identity. A multi-faceted approach that includes a change in workplace culture and reconceptualisation of academic programmes with an emphasis on critical reflection may be needed (Sim and Radloff, 2009: 205).

Williams and Berry (2000: 36) describe the role of the radiographer in the UK as “caring for the needs of the patient whilst producing high quality radiographs”. The radiographer, therefore, also has a care role similar to nurses (Niemi and Paasivaara, 2006: 262). Furthermore, Williams and Berry (2000: 36) forecast an expansion of the role of the radiographer to that of being a multi-skilled professional that would require aligning current and anticipated practice (Williams and Berry, 2000: 40). In the UK new roles and responsibilities are also assigned to advanced radiographers. According to Booth and Manning (2006: 277), education in the UK has moved from a medical model of care to a more holistic model that also includes the psychological and social dimensions of health. Williams and Berry (1999: 228; 2000: 37) and Booth and Manning (2006: 277) view this psychosocial aspect as part of radiographers’ interpersonal competencies such as the ability to maintain effective communication with all individuals, including patients, relatives and visitors. The care of the patient relates to a “context of care which meets the needs of the patient through a process of assessment, planning, implementation and evaluation” (Payne, 2001, cited by Booth and Manning, 2006: 277). According to the Culmer model, radiographers constantly observe patients’ condition

and assess their limitations in order to best manage an investigation to achieve optimal quality images with the least pain and discomfort (Culmer, 1997, cited by Smith, 2006: 52).

2.1.3.3 Nurses in radiographic practice

In most radiology departments there are also nurses caring for patients. It was not until the 1970s that nurses were employed specifically in radiology departments. Prior to this a nurse was called from either the emergency or the intensive care unit (ICU) to provide the needed care. Their function is to ensure patient safety, comfort, competence and ethical care in the radiology department (Goodhart and Page, 2007: 36; Brown, 2012: 97). According Hardy and Barret (2004: 658), Freij and colleagues were the first authors to discuss the role of nurses in radiographic interpretation in 1993. Their study was a retrospective one comparing the ability of nurse practitioners and junior casualty doctors to request appropriately and interpret radiographs. The results of this study demonstrated the ability of radiographers to interpret radiographs. Mørk et al. (2008: 17) refer to the everyday life scenario of how these two professions need to cooperate in sharing tasks in order to come to a common outcome of the quality of service expected, without compromising care. According to Donovan and Manning (cited by Snaith and Lancaster, 2008: 151), radiographers' practice is extending to clinical practice assessment by developing skills as "emergency nurse practitioners".

In the subsections above diagnostic imaging services and the roles of various role players have been discussed from a macro- and meso-level perspective. It is, however, also necessary to look at what happens to individual patients during their medical encounter with the health system. This is discussed in the section below, using the patient and decisions affecting the patient as the point of departure.

2.2 PATIENT-CENTEREDNESS AND SHARED DECISION MAKING

The origins of the patient-centred approach and the accompanying notion of shared decision making (SDM) have already been alluded to in Chapter 1. One of the key aspects to collaborative patient-centred care, and specifically to care coordination, is communication between providers, and between providers and patients and their families (Suter et al., 2009: 46). This section reviews literature pertaining to patient experiences of diagnostic investigations and general health care provider-patient interactions as they relate to SDM.

According to Bromley (2012: 1058), patient-centeredness is involved as a technique to acknowledge a patient's intrinsic worth and represents an attempt to address the devaluation of the patient and the attenuation of provider-provider relationships brought about by medical specialisations, bureaucratisation and reliance on technology in the form of diagnostic test

ordering. Attending to the psychosocial and physical needs of a patient enables choice, empowerment and relationship-centred care. The construct of patient-centred care is also used at a macro-level where legislation, rising health care costs and patient consumerism have led to the “erosion of medical authority and trust in the physician” (Greenfield et al., 2012: 1202). The implementation and interpretation of patient-centeredness is, however, complex and highly context dependent (Bromley, 2012:1058; Lorig, 2012: 523).

Just as in the case of patient-centeredness, there are large variations in the interpretation of shared decision making. Jordan et al. (2002: 383) define SDM as a two-way, information-giving process. Although the final decision is made jointly in total agreement between the provider and the patient, it does not always mean that the decision has been shared. According to Kiesler and Auerbach (2006: 320), not all patients necessarily want to be involved in medical decision making and have the right to delegate responsibilities for decisions to their physicians. Pressure to take a more active role may provoke emotional distress in patients with a passive inclination. In this regard Sung et al. (2010: 1073) refer to the construct of control preference as “the degree of control an individual wants to assume when decisions are being made about medical treatment”.

Dy and Purnell (2012: 582) conducted a review on the quality of complex and shared decision making in health care for patients with complex conditions. They identified various key concepts such as: provider competence; trustworthiness and cultural competence; communication with patients and families; information quality; patient/surrogate competence; and roles and involvement. High-quality medical decision making includes differential diagnosis, test ordering and interpretation, prescribing, and skilful delivery of treatments and procedures. However, the measurement of the quality of SDM in the studies these authors reviewed was found to be one-dimensional. The focus was on provider behaviours, using indicators related to the choice of preference-sensitive procedures and weighing the risks and benefits of different treatments, to the exclusion of patients with certain characteristics or risk adjustment for patients with complex illness.

2.2.1 Patient experiences of diagnostic investigations

To enable one to understand the patient's exact expectations in terms of information about diagnostic imaging requires a thorough and comprehensive patient analysis. Many patients express anxiety when undergoing routine tests, especially if there is uncertainty about the future (Olivier et al., 2005: S84; Undeland and Malterud, 2002: 149). According to Brown (1995: 39), at the individual care level the diagnosis could provide personal emotional control for the patient by knowing what is wrong and for medical professionals, control of the

problem itself. Although there are insights from international studies that can be drawn upon, very few studies have been done on patients' feelings and experiences of diagnostic imaging in South Africa. Laidlaw and Henwood (2003: 21) demonstrated by means of a model how information could reduce fear and anxiety and increase quality of experience for patients having MRI (Figure 2-1).

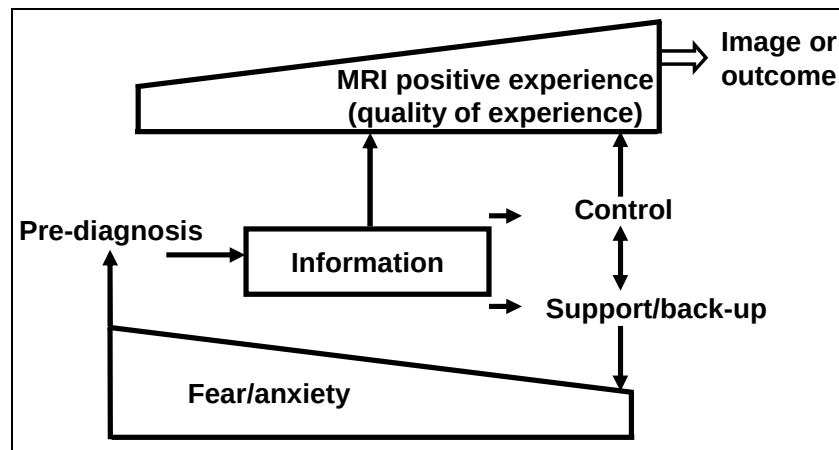


Figure 2-1. Model of MRI experience – overview of findings
(Laidlaw and Henwood, 2003: 21)

Whiting and colleagues' (2007: 988) review of factors influencing test ordering revealed that subjective factors such as the need for reassurance may override the scientific evidence regarding diagnostic accuracy. According to Borgen et al. (2010: 197), there is a strong shared belief among health care providers that patients will be reassured after additional testing. However, a systematic review by Van Ravesteijn et al. (2012: 4) could not confirm this reassuring effect. According to these authors, a test could increase worry that the symptoms are serious. It is more likely that the quality and amount of information provided to patients before test ordering could have a reassuring effect. It depends on how well the diagnostic test matches with disclosed worries and fears of the patient (Van Ravesteijn et al., 2012: 7).

Munn and Jordan (2011: 328) claim that the person who is to undergo a diagnostic imaging investigation is often in a vulnerable state. The role of the radiographer is to produce a high quality image and facilitate patient care throughout the imaging process. High levels of anxiety or claustrophobia may lead to motion artefacts resulting in suboptimal images that may lead to aborting the imaging process. The patient may refuse an investigation as a result, may need sedation, or additional sequences need to be performed. These have

financial implications in terms of human resources and the wear and tear of equipment (Munn and Jordan, 2011: 329). Balaqué and Cedraschi (2006: 510) and Munn and Jordan (2011: 329) advocate for the performance of more qualitative research studies to identifying the causes and ranges of patient emotions and experiences.

Rhodes et al. (1999) explored the meaning of diagnostic tests for patients with chronic back pain in Atlanta, Seattle and Dallas in the US. Participants perceived diagnostic testing on the one hand as “something over which they had little control – as something they actively sought, interpreted, accepted or rejected” (Rhodes et al., 1999: 1194). Then the viewing of the radiographic image was described “as an almost collegial interaction” where the doctor included the patient in a gesture to viewing the “object-body” as it was made “visible” and “external.” The “nothing” found on tests suggested that there was no reason, and no justification, for the pain. Patients’ trust in terms of the value or worth of the test regarding diagnosis led to confusion and disappointment (Rhodes et al., 1999: 1193-1194).

Diagnostic ultrasound as a medical technology is used as a diagnostic procedure, but also operates as a media technology in the case of pregnant patients. Han (2001) provides a brief anthropological interpretation of the ritualised use of diagnostic ultrasound in the monitoring of foetal development and its social and cultural consequences. She draws on the work of Petchesky (1987: 269), who refers to the advent of photographic imagery and the family album as “a magical source of fetishes that can resurrect the dead or preserve lost love”. Ultrasound images have a similar meaning with regard to the unborn. Expectant parents anticipate an ultrasound investigation “with a mixture of anticipation and anxiety” (Han, 2001: 2). During the investigation different types of relationships are evoked and enacted: between “expert” (sonographer) and “patient”, and between “parent” and “child” (Han, 2001: 5).

In a US study on patients’ perceptions of diagnostic tests, Kravitz and Callahan (2000: 41-43) identified three value dimensions to be dealt with from a patient perspective, namely pragmatic, symbolic and biomedical dimensions. From a pragmatic point of view the test aids patients in creating a mental picture that is based on a mechanical model of the disease. From a symbolic dimension,

“... patients often perceived diagnostic interventions and tests to have value that transcended their potential contribution to diagnosis, prognosis, and therapy. ... Diagnostic investigations were seen as a way in which clinicians could demonstrate interest in the patients and their problems, validate their concerns, demonstrate an empathetic connection, establish clinical credibility, provide specific reassurance, and reduce the odds of future chagrin.” (Kravitz and Callahan, 2000: 41)

According to Kravitz (2001: 886), patients are concerned that their symptoms represent a serious illness and if reassurance is offered indifferently (without careful examination and judicious laboratory testing or imaging), it will not be accepted and may have consequences for treatment adherence.

2.2.2 Health care provider-patient interaction and shared decision making

In South Africa not much is known about how patients and health care professionals express and experience their needs for a referral for a diagnostic imaging investigation and how they come to an agreement on the most appropriate investigation of choice based on the informed consent principle. The South African Charter of Patient Rights states that the patient has the right to be informed and to participate in any decisions affecting his or her personal health and treatment outcomes (HPCSA, 2008c: 5). Chapter two of the National Health Act (Act No. 61 of 2003) (RSA, 2004a: 20-21) also states: “Every health care provider must inform a user of – ‘the user’s health status except in circumstances where there is substantial evidence that the disclosure of the user’s health status would be contrary to the best interests of the user; the range of diagnostic procedures and treatment options generally available to the user; the benefits, risks, costs and consequences generally associated with each option; and the user’s right to refuse health services and explain the implications, risks, obligations of such refusal.’” These principles appear to contradict the HPCSA’s (2002: 3) directive that a doctor does not require consent from a patient to do a diagnostic imaging investigation.

2.2.2.1 On being perceptive to patient voices

According to Stacey et al. (2010: 164), to foster patient-centred care health professionals need to be responsive to individual patient preferences, needs and values to reach clinical decisions. Légaré and colleagues’ (2011: 2) systematic review of facilitators and barriers to the implementation of SDM for health care professionals in 18 countries identified patient characteristics, time constraints and the clinical situation as barriers. Then there are issues such as the roles and power in the patient-professional relationship and whether the decision-making process is paternalistic, shared or patient driven (Légaré et al., 2011: 2). An anthropological study by Simon (1999: 157) on the complexities of and power in diagnostics in medical interaction illustrated “how decisions continued to be made behind closed doors without the full participation of those whose lives could be most profoundly affected”. Simon (1999: 157) also argues that among professionals there is a hidden tension between “the ideal, the ‘team’ as a democratic and effective pool of mental resources, and the actual ‘team’ as an assortment of differently perceived professionals”. During an interaction the role

and power of the individuals involved are also influenced by external factors and how the other individual's decision-making role is perceived (Feldman-Stewart et al., 2005: 807).

On the one hand, Malterud and Taksdal (2007: 27) found that in most of the doctor-patient consultations they had observed, the patient's story provided stronger clues for diagnosis than the clinical and diagnostic tests; yet, the patient's voice did not always count. Main et al. (2010: 220) identified the gap that providers fail to obtain patient perceptions on the impact of the problem because they do not check how well the patient understands. Different understandings by providers and/or provider(s) and patient may lead to different actions (Hilligoss, 2011: 88; Feldman-Stewart et al., 2005: 802-803). Kravitz and Callahan (2000: 38) report that patients are able to identify specific interventions they consider necessary. On the other hand, uncritical compliance with patients' requests would be unprofessional and unethical.

According to Gray (2010: 2), there is little in the medical literature that aids in determining how dissemination of imaging referral criteria, called "appropriate criteria" or "appropriate use criteria", fit into the clinical decision, as these criteria are associated with a number of medical conditions. However, a majority of consultations do not deal with diagnostic decision making and clinical reasoning does not always lead to a definite conclusion (Undeland and Malterud, 2002: 145). Undeland and Malterud (2002: 146-147; 2008: 222) further share from their own clinical experiences "when traditional diagnostic processes fail to provide a comprehensible answer to the doctor's questions regarding what is wrong and what can be done." The doctor assumes a provisional standpoint in the decision-making process. Hypotheses, reservations and suppositions are tested through clinical examinations, blood tests, prescriptions and referrals, often without checking whether the patient has the same concern.

From a diagnostic imaging perspective, Dauer et al. (2011) examined the rationale for informed consent and risk communication in the US. According to them, there is lack of communication regarding diagnostic imaging decision making. Due to the lack of awareness of the immediate benefits, the ultimate goals of radiation imaging decision making are sharing knowledge, building trust, and influencing attitudes, beliefs and behaviours of patients fearing the effects of imaging will have on their bodies. According to Malone et al. (2012: 523, 528) and Chun-sing et al. (2012: 267), there is minimal communication by most medical practitioners but no discussion regarding radiation-related matters with their patients when requesting investigations and hardly any patients would ask about these issues. Thus, public awareness of radiation exposure and related risks is poor. This coincides with Gray's (2010: 1) opinion that there must be a shift in society in a direction where radiation exposure is treated from a medical imaging perspective as a public health issue, thereby bringing

patient voices into the decision making. Providing information to patients about the risks of imaging would give patients the ability to make informed decisions about very complex issues in their own care. According to Malone et al. (2012: 528), such decisions would be best facilitated by an open discussion and shared decision making in the case of high-dose procedures. Kaplan and Frosch (2005: 542) are of the view that a detailed discussion of the problem may lengthen the visit and should be avoided. Instead, a strong recommendation for a test or a treatment should rather be made. Thiel De Bocanegra and Gany (2004: SP21) found that impaired communication may result in physicians defensively ordering unnecessary, hazardous, or expensive diagnostic tests, or physicians being less inclined to order needed tests, instead of relying on their clinical expertise to make a decision whether to refer or not.

2.2.2.2 Communication within the ambit of diagnostic imaging

Feldman-Stewart et al.'s (2005: 801) patient-provider communication conceptual framework acknowledges that the dyad is central to the health-care communication process. Greenfield et al. (2012: 1208) further state that this dyadic relationship also includes indicators of the interpersonal relationship in the form of affective dimensions such as trust, loyalty, intimacy and dependency "that are rooted in the physician-patient emotional contract". Patient-provider communication within the health care setting is much more complex and wider than the one-on-one interaction. Key components in patient-professional communication are the environment, the individuals themselves, and interaction regarding their communication goals. Included during this interaction process is the conveying and receiving of messages. Each person's interaction is shaped by his or her own attributes and the communication environment. Of importance is that each time a message is conveyed and received between individuals it may be understood uniquely by each individual (Feldman-Stewart et al. 2005: 802). According to Henderson (2006: 5), the patient's thoughts and experiences regarding their illness are in doubt and appear to be irrelevant because of technology entering the consulting room. This compromises the centrality and importance of the psychosocial aspect by leaving the passive patient to endure invasive, often painful and, at times, aggressive procedures. According to Greenfield et al. (2012: 1208), second-opinion encounters are even more complex, because more than one physician is involved. This results in two patient-provider dyads, but not necessarily a triad – from an interprofessional viewpoint people talk about a sequence of dyadic experiences rather than a concurrent triadic experience.

Adams and Smith (2003: 198) state that "[r]adiographers are in the unique position of mediator interceding between the patient and the potentially threatening health care technology". One of the essential characteristics of a radiographer is having effective communication skills in order to provide patients with the information and support they need. The reality is that

radiographers do not always explain procedures adequately and with sufficient depth, and do not take time to assess patients' verbal and non-verbal cues, and how effectively they are communicating with individual patients. Munn and Jordan (2011: 323) describe the ignorance of the "patient and patient care as a 'hit and run' process, because the patient can sometimes be seen as just a translucent screen upon which the health professional peers to find a diagnostic entity within, and the body is perceived differently by the patient and the practitioner." Halkett et al. (2011: 56) illustrated how they could develop the history-taking skills of radiography students, who are often the first health care worker to see the patient, by using Pendleton's professional-patient consultation framework for consulting patients in general practice. This framework focuses on gathering information on the reason for the visit and formulating an appropriate action for each problem by using time and appropriate resources to achieve a shared understanding and participation of the patient and to address the problem at hand.

According to Munn and Jordan (2011: 329), providing information is not only a support measure but also a form of control. Often, patients may be misinformed prior to the scan, and this may result in misconceptions of the imaging technology. The source of information, whether credible or not, could be relayed or accessed through media, friends or family. However, the information provided should be digestible and clear pertinent to the investigation they are to undergo. According to Eldh et al. (2006: 51), participation not only entails getting information, but also includes the art of transforming information into knowledge in order to be able to use it. For a patient to be responsible and accept responsibility, he or she has to be able to do the following: "conceive and integrate the information into comprehension; interpret the information in terms of his or her own context; and use this information without confusion". Effective communication between health care providers and patients or the general public is hampered by the fact that the terminology related to the quantification of radiation exposure, effective dose and risk is specialised and not suitable for everyday conversations. According to a draft report of an International Atomic Energy Agency (IAEA) consultation, "[t]here is practically no worthwhile nuanced dialogue on balancing benefits and risks with patients, whose perceptions and requirements must surely, on many occasions, contribute to and alter the equation. This situation, inevitably and with time undermines the social acceptability of justification as it is presently practised, and needs to be remedied" (IAEA, 2009: 9).

According to Olivier et al. (2005: S84-S85), radiologists should have the necessary know-how to establish a good patient relationship; that is they should, be able to provide the patient information, be empathetic at the same time, be respectful of their desires and their rights, and be able to listen and provide psychological support. A qualitative study on Positron

Emission Tomography (PET)-CT revealed that although communication efforts made by staff were seen as overwhelmingly positive, the expectation-reality divide can adversely affect patient experience (Nightingale et al., 2012: 252). While health care professionals may have become accustomed to their work, the experience for the patient undergoing a scan for the first time is very different. In time, follow-up patients would become acclimatised to these investigations. Because the scan is such an out-of-the-ordinary, unique experience, one has to undergo a scan examination to truly understand what patients go through (Munn and Jordan, 2011: 329).

2.2.3 Provider-provider interactions

Shared decision making does not only pertain to the interaction between health care providers and patients, but also between various providers. It also relates to decisions promoting effective delivery of accessible, continuous and comprehensive services necessary to provide integrated care (D'Amour et al., 2008: 2). The challenge is the collective undertaking of reaching a shared decision in the context of diagnostic imaging referrals and the integration of these referrals in decision making. The premise is that multiple health providers within the institution and other institutions work synergistically to provide an effective but seamless transition in upholding the continuity of safe practice in terms quality of care service delivered (D'Amour et al., 2008: 2; Longo and Smith, 2011: 345; Suter et al., 2009: 44; Clark, 2010: 268).

There is a great interest to improve patient and health outcomes by building effective health care teams through interprofessional collaboration. Stacey et al. (2010: 164) define interprofessionalism "as a cohesive practice between professionals from different disciplines to provide a well-integrated means of meeting the needs of the people." Key elements of interprofessional, collaborative relationships between two or more health professionals from different disciplines, but with a common goal, are "integrated and cohesive care, symmetry of power, shared knowledge, interactions over time, a common understanding of each other's role, interdependency among health professionals, and a supportive organizational environment" (Stacey et al., 2010: 164). This is in line with Légaré et al.'s (2011: 2) notion of an interprofessional approach to SDM to improve the quality of decision support provided in the health care system in an integrated manner that reflects patient-centred care and improves health. At the same time the gap between professionals from various health disciplines is bridged and patients and their families are included, thereby enhancing the continuity of care across health sectors. In an interdisciplinary team approach different disciplines contribute different knowledge and skills to the decision-making process leading to more feasible and sustainable decisions. From the patients' perspective, an interprofessional approach to SDM

makes it possible for them to participate in decision making, to have their needs met, and to get to agreement in general.

2.3 CHAPTER SUMMARY

The review in this chapter provided an overview of the South African health system in the context of an organisational structural perspective on the mixed referral mechanisms and the emphasis on the distribution of the diagnostic imaging services in the context of the levels of the public and private health sectors. The diagnostic imaging services form an integral part of the quality of the care process within the ambit service provision. Of importance is the utilisation of these services in the context of organisational or structural routines, financial and human resources versus the benefits more than the risks in aiding the diagnostic decision-making process as part of the continuum of the treatment and management plan. This may entail routing the patient's pathway through the health system level(s) by means of interactions and decision-making processes up to the final diagnosis, which includes a treatment and management plan. Often these pathways are unpredictable until the final diagnosis is made.

As the patient is navigated through the system there are points where the patient interacts with other health care providers besides the referring medical practitioner. These providers also play a role and are responsible for aiding in the diagnostic decision making. However, these providers seldom meet at the same point in time due to the labour division and the fact that they are stationed at various service points. Therefore, engagement in the decision-making processes varies, based on the type of discipline and autonomy of the profession. Although decision making is highly dependent on the characteristics of the professional and his or her expertise and skills, it is more so based on the regulation by professional bodies, referral guidelines and institutional routines and structure. From the review it is clear that the decision-making processes from referral to the diagnostic imaging outcomes and their integration into the consultation are not always fixed and predictable. To date, the studies that have been conducted focused mainly on the utilisation of imaging technology from a bio-medical perspective while very little research has been conducted on the social aspect of technology and the lifeworld of the patient. Also, the patient aspects regarding their diagnostic decision-making processes are fragmented by the professional boundaries and communication processes that shape the meaning making, as well as understandings within the bigger picture of the treatment and management plan. Although radiographers and radiologists are part of the health care team members, their roles and responsibilities remain a grey area from the perspective of the dominant medical disciplines and are often perceived as

subordinate disciplines. Even if all role players' roles and responsibilities are clearly understood within the specific discipline, there is a lack of understanding of the roles and responsibilities across other disciplines.

In the literature there is a strong emphasis on the interaction between doctor and patient as the primary inter-actors. Only recently the much broader context has been explored that led to the realisation of the complexity of including the patient in decision making. The recent technological advancements in diagnostic imaging creeping into the consultation also add to the already complex decision-making processes regarding diagnostic imaging investigations.

Chapter 3

Research design and methodology

This chapter discusses the conceptual framework and research design that underpinned the methodological processes and procedures. The rationale for the choice of an instrumental case study design is followed by a discussion on the sampling and recruitment strategies used to identify study participants, which included patients and health care providers. Data collection, storage, management and analysis are explained. The chapter ends with a reflection on the quality of the study and ethical issues that had to be dealt with. In order to design a study, it is also necessary to investigate possible theoretical or conceptual frameworks that could assist in answering the research questions in an appropriate manner. An interpretive paradigm using a social constructivist approach appeared to be a feasible route to investigate for this study.

3.1 A SOCIAL CONSTRUCTIVIST CONCEPTUAL FRAMEWORK

In order to design a study it is necessary to investigate possible theoretical or conceptual frameworks that could assist in answering the research questions in an appropriate manner. When one investigates phenomena like provider-patient interactions and processes of decision making, the traditional positivist paradigm and statistical models of inquiry do not always yield the necessary underlying understanding of issues at hand. An interpretivist paradigm, using a social constructivist approach, appeared to be a feasible route of investigation for exploring the various interactions regarding diagnostic-imaging decision making processes with multiple providers. According to Denzin and Lincoln (2011: 12), the research action is guided by ontological, epistemological and methodological beliefs.

Ontology refers to the science or study of being (Wilson, 2000: 206). The nature of reality can be viewed in different ways. Working within an interpretivist paradigm entails the adoption of a relativist ontological position (Charmaz, 2005: 508-509), which means that reality and what can be known about it is considered to be multiple and socially constructed (Denzin and Lincoln, 2011: 24). According to Ponterotto (2005: 129), these realities are “multiple, apprehendable, and equally valid”. For this study the goal was to understand how

the experiences, understandings and meaning makings of health care providers and patients constructed their realities in different ways during a medical encounter.

Epistemology refers to the branch of philosophy that deals with the varieties, grounds and validity of knowledge; the relationship between the knower and what is known (Wilson, 2000: 206). The epistemological position adopted for my study was subjectivist, as it is based on the assumption of the interaction between knower (research participant) and would-be knower (researcher) and what can be known and how these shape one another. Doing research from a subjectivist epistemological viewpoint can lead to contradictions and challenges if research participants are located in a setting, such as a hospital, where a biomedical viewpoint, based on a positivist epistemology, emphasises that health care professionals “can observe without influencing what is being observed” (Wilson, 2000: 207). For example, the interaction between patient and doctor in a consultation or the interaction between the radiographer and patient mediated through technology in performing a diagnostic imaging investigation has a significant effect on the outcome of the process, event or task at hand.

Research methodology refers to particular strategies or techniques a researcher uses to collect data necessary for developing a theoretical framework or testing a theory (Giacomini, 2010: 145). When using an interpretivist approach, certain methods are more appropriate to align with the ontological and epistemological points of departure described above. This implies that the research is context specific and takes place in a natural setting, using qualitative research methods that are interpretive in nature (Ponterotto, 2005: 128). In Chapter 3 the research methods and the qualitative approach used in this study are explained in detail.

This study is embedded in the notion of the social construction of diagnosis and illness (cf. Brown, 1995: 39) in a patient’s journey through the health system where diagnostic imaging investigations were part of the patient’s dis-ease experience. Although this study observed interactions between individuals, which can also sometimes be associated with symbolic interactionism (Blumer, 1969), the focus was not primarily in the meanings the research participants attached to actions (Bryman, 2004: 339, 544) (i.e. actions around the patient’s journey through the health system), nor was the focus on the construction of medical knowledge where symbolic meanings are shared among a group of professionals (Ng and White, 2005: 219). The emphasis was rather on human agency in people’s exchanges of meaning that can account for the structural action at the meso-level and the individual interpersonal communication at the micro-level. This approach opens the way for the analysis of communication exchanges among participants in the biomedical setting of signs,

symptoms and diagnostics and how people play out their social roles and relate to professional and institutional structures where interaction takes place (Brown, 1995: 34-36). Although this perspective has informed some research conducted in psychiatry, Brown (1995: 39) contends that not much has been done with regard to general trends of diagnostic processes.

Using a constructivist approach enabled the researcher to provide descriptive narratives at a micro-level regarding the diagnostic imaging investigation processes as the patients and health care professionals reconstructed their meanings and understandings at various stages of the process. It also allowed me as a researcher to provide a contextual account of how patients experienced diagnostic imaging investigation processes. Figure 3-1 gives an overview of this study's research process in terms of a social constructivist approach. This further explains the initial proposed conceptual framework for this study as is summarised in Figure 3-2. The conceptualisation of these two diagrams was informed by a variety of literature reviewed on doctor-patient consultation from biomedical, anthropological and social constructivist perspectives, as well as literature on decision-making processes. (See Sections 1.2 and 2.2.)

Although social constructivism is often associated with grounded theory (Denzin and Lincoln, 2011: 24; Charmaz, 2005: 508-510), this study did not follow an original grounded theory approach in the construction of its conceptual framework. It could be argued that the conceptual framework fits in with an "informed grounded theory" approach proposed by Thornberg (2012: 249), in which both the process and the product are thoroughly grounded in data by grounded theory methods while at the same time being informed by existing literature and theoretical frameworks, which, amongst others, have their roots in constructivist grounded theory and theory of pragmatism. According to Ng and White (2005: 219), grounded theory is an appropriate method to study complex relationships, clinical situations and new areas of inquiry or an area not studied before. According to Charmaz (2010: 508), on the applications of grounded theory for social justice studies, "[g]rounded theorists portray their understandings of research participants' actions and meanings, offer abstract interpretations of empirical relationships, and create conditional statements about the implications of their analyses." In terms of my study, grounded theory could offer integrated theoretical statements about the conditions needed for the development, change or continuation of decision making and interactions (Charmaz, 2010: 508).

Figure 3-2 provides an overview of the initial social constructivist perspective used to explore the patient's complex medical encounter with health care professionals. It depicts the two worlds in which this interplay takes place. Health professionals – including medical practitio-

ners, specialists, radiologists, nurses and radiographers – usually approach the encounter from a biomedical perspective with values and beliefs that are abstract, scientific, technological and individualistic. The patient approaches the encounter from his or her own “lived” experience, a lifeworld that is guided by values and beliefs that are natural and social. In this encounter the radiographer and the medical professionals view the patient as a physical body of which parts are diseased, whereas the patient comes to the encounter as a whole embodied person with a problem (Turner, 1992, cited by Brown, 1995: 36; Marcum, 2008: 54). According to Marcum (2004: 315), “[t]his everyday world or life-world is the ground or foundation upon which the meaning of human existence rests.” The body is a lived, experienced, integrated unity that is not readily divisible into a body on the one hand and the mind on the other through which a subject in-habits a lifeworld.

The encounter between health professionals and patients is characterised by transactional processes where participants draw on their understandings, meaning making, values and beliefs emanating from the biomedical and lifeworlds. According to Rosenblatt (1985: 98), transactions refer to “an on-going process in which the elements or parts are seen as aspects or phases of a total [organically-interrelated] situation.” For the purpose of this study

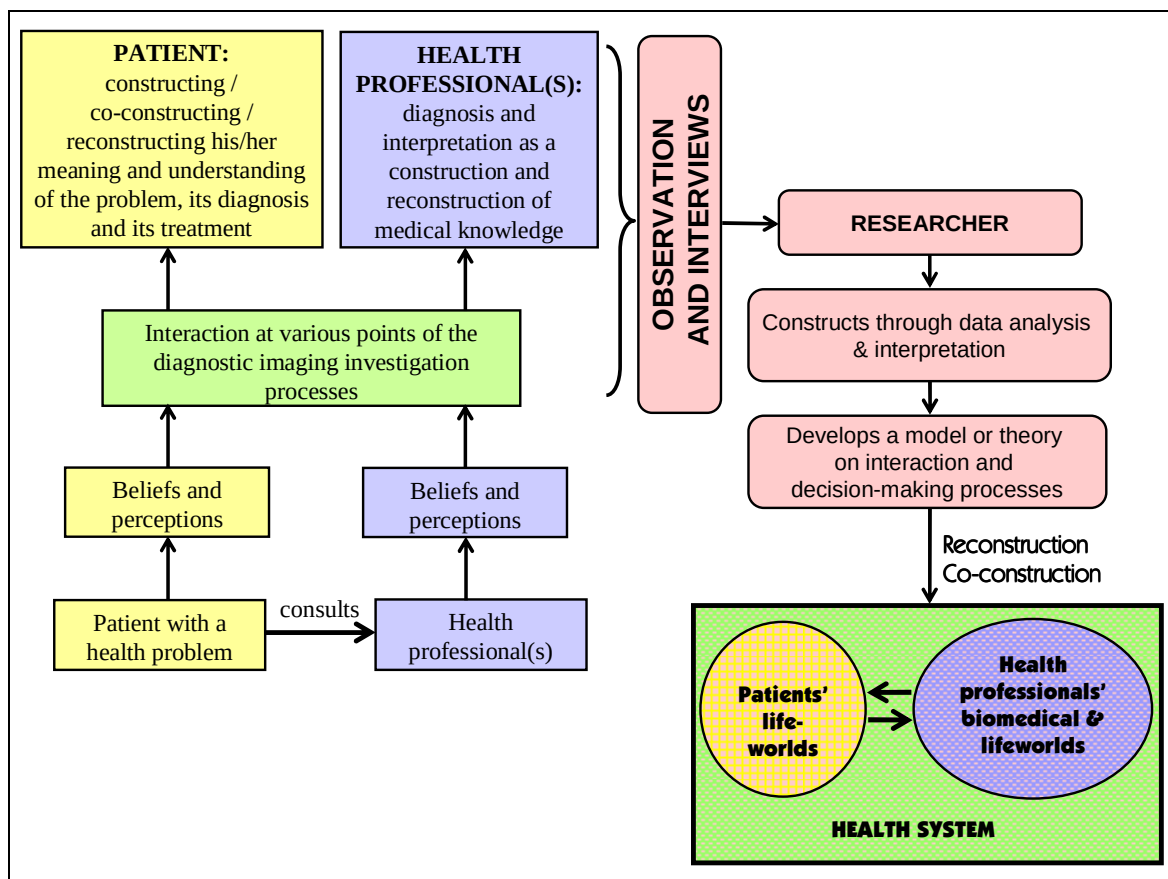


Figure 3-1. A social constructivist perspective on the research process

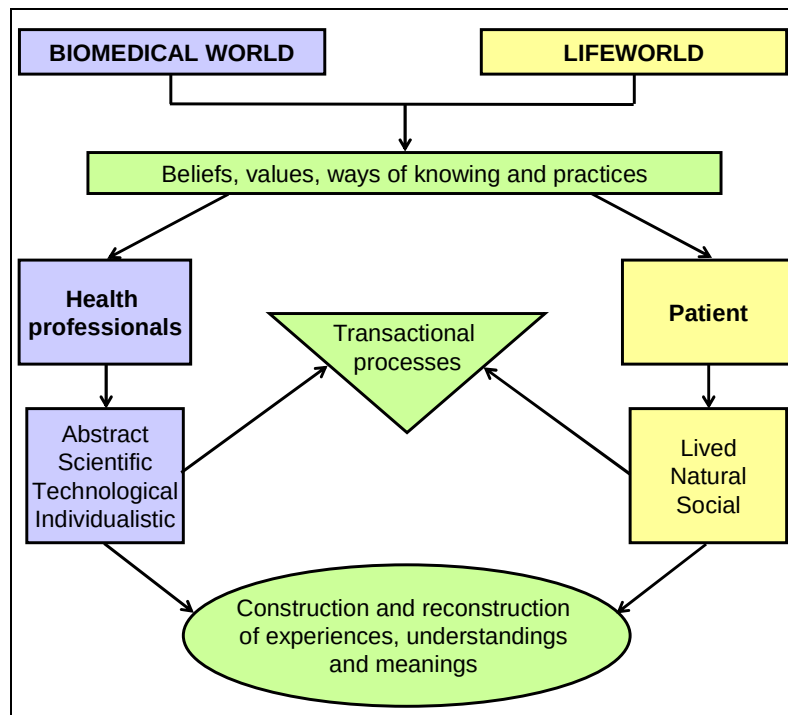


Figure 3-2. The meeting of biomedicine and lifeworld in the health system

Simpson's (2009) description of interactions and transactions was used as a point of departure. According to her, "whereas an inter-action is something that happens between actors who are physically and mentally independent, a trans-action happens across actors who are aspects of a relationally integrated whole; whereas meanings are transmitted between actors in an inter-action, the actors *are* the continuously emerging meaning in a trans-action" (Simpson, 2009: 1334). The interactions between health care providers and patients (who move through different contact points when referred for a diagnostic imaging investigation) could also be considered as a series of dynamic, ongoing transactional processes in which different role players construct and reconstruct their own experiences, understandings and meanings.

3.2 RESEARCH DESIGN

Based on the exploratory nature of the research questions an inductive, emerging qualitative research design was used as the overarching research design. Multiple sources of data collection methods (Babbie and Mouton, 2002: 80; Creswell, 2002: 61) with a small component of quantitative analysis of the documentation was used. Qualitative methods encompass a broad spectrum of empirical procedures designed to describe and interpret the experiences of research participants in a context-specific setting (Pontoretto, 2005: 128;

Tracy, 2010: 839). For this study one health facility was selected as an instrumental case study, which Stake (2000: 437) describes as follows:

"... a particular case is examined mainly to provide insight into an issue or to redraw a generalization. The case is of secondary interest; it plays a supportive role and it facilitates our understanding of something else. The case is still looked at in depth, its contexts scrutinized, its ordinary activities detailed, but all because this helps the researcher to pursue the external interest. The choice of case is made to advance understanding of that other interest."

According to McMillan and Schumacher (2005: 318), exploratory and discovery-oriented research justifies a case study design. Carrona (2010: 74) states that case studies are chosen for the following reasons: uniqueness; typicality; or understanding a historically situated process. Yin (1989: 23) describes a case study as "an empirical inquiry that: investigates a contemporary phenomenon within its real life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used."

3.2.1 Instrumental case: a district hospital with referral links to a tertiary hospital and primary health care clinics

The district hospital, which is the focus of this study, was conveniently linked with a primary health care (PHC) clinic on the same premises and a tertiary hospital on adjacent premises. This offered the researcher the opportunity to also study the referral pathways for diagnostic investigations. The district hospital was somewhat of a "deviant case" or "positive outlier" (Seawright and Gerring, 2008: 302; Caronna, 2010: 74) because of its direct referral to the tertiary hospital for logistical reasons. The instrumental case study approach could be applied because the case was not the primary interest of the study (cf. Stake, 2000: 438).

The original buildings of the study hospital were erected in 1927 and upgraded to an academic and tertiary hospital in the 1940s. Due to the limited space some of the clinical specialties like the orthopaedics and maternity units were located on sites that were 800 to 1000 metres away from the emergency section of the main site. Diagnostic imaging was also subdivided and at some sites only a mobile x-ray service was accessible. This hospital rendered level-1-to-3 comprehensive care services up to 2004. In 2005 this hospital was commissioned as an autonomous, 200-bed, community-based health care service organisation with a 24-hour service. The level-3 comprehensive care services were transferred to a new academic (tertiary) hospital on adjacent premises. The new district hospital's premises are shared with a primary health clinic (PHC) clinic and it remains the referral centre for other

PHC clinics in the catchment area. The hospital also serves as a teaching site affiliated to the local university.

The community at large benefits from the PHC clinic on the premises of the hospital. Clients have direct access to the diagnostic facilities and expert medical opinion at the district and tertiary institutions and also benefit from down referrals. The majority of the patients referred to the district hospital are from public and private primary care facilities or are self-referrals by the most vulnerable sector of the community who do not have any other choice or whose medical aid funds are depleted. (See also Section 4.1.3.)

3.2.2 Structure of the research design

The original study design had four phases. (See Table 3-1.) When a research process is emergent, all steps and phases of a project cannot be tightly prescribed and changes or shifts may occur after entering the data collection phase. Creswell (2007: 39), for instance, mentions that there may be changes in the questions, shifts in the forms of data collection, and modifications in the individuals studied and the sites visited. In my study there was a change in the sequence of the proposed data collection activities and in the groups of participants eventually included.

Table 3-1. Original and emergent study designs

Phase	Original design	Emergent design
Phase I	Shadowing of patients	Shadowing of patients
Phase II	Focus groups: Radiographers	Focus groups: (a) Nurses (b) Radiographers (c) Radiology consultants and registrars (d) Medical practitioners and family medicine consultants
Phase III	Focus groups: (a) Medical practitioners and family medicine consultants (b) Radiology consultants and registrars (c) Nurses	
Phase IV	Same research process at more facilities	Adaptation to include referrals to the tertiary hospital and interviewing health care providers at this hospital

Phase I comprised mini-case case studies in the form of “shadowing” patients in their “journey” through the health system. This enabled the inclusion of the whole process of referring and referrals that could contribute to more appropriate imaging processes (cf. Lysdahl et al., 2010: 1231, 1232). Shadowing entailed that the researcher accompanied the patient partici-

pants through all the processes and procedures from entry into the hospital until the point of exit or admission. Multiple, real-life, individual mini-case studies within the health facility served the pursuit of the external interest to enable the researcher to systematically assemble and analyse detailed, in-depth information on the processes regarding referral and outcomes of diagnostic imaging investigations (Stake, 2000: 437). This phase was executed as planned, with some additional data collection mechanisms built in as a result of the pilot study – nurses were added as informants during shadowing and nurses' notes were also studied.

Originally Phase II was designed for conducting focus group interviews with radiographers and Phase III for focus groups with medical practitioners and family medicine consultants, radiology consultants and registrars, and nurses. In the actual study Phases II and III were conflated and the focus groups for the different health professions took place in a different sequence than originally envisaged. These changes are depicted in Table 3-1.

To be in line with Creswell's (2002: 30) maximal variation sampling theory, the original plan included a fourth phase, namely to adopt a collective case study (Stake, 2000: 437) involving multiple health care facilities (public and private). This phase would be executed should the instrumental case study at the district hospital not yield sufficient data or should there have been another reason for expanding the study to more health care facilities. This was, however, not necessary in the ultimate execution of the study, although the study was extended to the tertiary hospital in patient cases referred from the district to the tertiary hospital.

3.3 SAMPLING AND RECRUITMENT

This study had two main groups of research participants, namely patients and health care providers. This was complemented with an analysis of documentation (e.g. x-ray request forms and patient hospital records).

The study was approved by the Research Ethics Committee of the Faculty of Health Sciences, University of Pretoria (Protocol 170/2008) (Appendix A1). Permission to do the study was sought from the chief executive officer (CEO) of the hospital complex and the nursing director of the PHC clinic on the hospital premises. The pilot process provided an opportunity to gauge the potential influence of the researcher's presence on patient and health care provider behaviour and how to minimise any potential effects thereof. The methodological change to include nurses in the shadowing process was approved as an amendment by the Research Ethics Committee (Appendix A2).

3.3.1 Patients

Convenience or availability sampling (Grinnell, 1997: 244) was used for the actual shadowing of patients. Only patients who fulfilled the inclusion criteria and were willing to sign informed consent (Appendix B) were included as research participants. Inclusion criteria entailed that the participant had to be a mobile or walking day patient, able to give consent and willing to spend an extra half hour after completion of the medical consultation. The following patients were originally excluded from the study: ward patients; patients requiring emergency medical care; female patients who were pregnant and those suspected of being pregnant (due to radiation risk); patients younger than 18 years and older than 65 years; or patients unable to provide consent. Eventually ward patients and patients older than 65 were also included in the study as the anticipated logistical, personal and health constraints turned out to be negligible. During the recruitment process a senior family medicine consultant insisted on the inclusion of patients from the gynaecological ward. This was not feasible due to the distant location of the ward. However, an agreement was reached that gynaecological patients admitted at the Casualties department would be considered for recruitment, specifically those referred for diagnostic ultrasound investigations.

The original rationale for making 65 years the upper age limit for recruitment was based on the assumption that older people might have multiple conditions or may find the shadowing tiring. While recruiting in the female ward of Casualties, an 83 year old patient (Patient 5) expressed interest to participate. To avoid lengthening the time I utilised the waiting time between the feedback on the outcomes of the diagnostic investigation and before discharge. The patient was appreciative of being part of the study because she had *“n warm gevoel, iemand gee om. ... Ek sê baie dankie. Dit was 'n voorreg om jou te leer ken en jou te ontmoet”* [A warm feeling, someone cares. ... I say, thank you very much. It was a privilege to get to know you better and meet you] [CS05:479&488:19&20]. The inclusion of more categories of patient participants benefited the study, as it provided greater diversity of participants. The final sample size was governed by the principle of data saturation (Cheek, 2011: 260). A total of 24 participants were shadowed. The first 20 participants were recruited before their consultation with the medical practitioner. A further four were recruited after the medical practitioner had made the decision to refer them for a diagnostic imaging investigation. (See Section 3.4.1.7.) The purpose of shadowing these four was to confirm data saturation.

3.3.2 Health care providers

Recruitment of health care providers entailed recruitment for two different roles in the study. The first recruitment was for Phase I by obtaining permission to observe consultations with patient participants and to conduct interviews with these providers on their consultations. This was a convenience sample linked to the patients recruited for shadowing. These participants were medical officers, family medicine consultants and registrars, community service doctors, interns, medical students, radiographers and nurses. In the case of patients referred to the tertiary hospital for further management and/or for specialised investigations the majority of provider participants were radiographers and radiology consultants and registrars, with a few consultants and registrars in otolaryngology, neuro-, orthopaedic and general surgery.

The second recruitment involved getting volunteers to participate in focus group interviews in Phases II and III. These participants included nurses, radiographers, medical officers and family medicine consultants, interns and radiology consultants and registrars. Purposive sampling was used to recruit specific persons who were potentially information-rich participants (McMillan & Schumacher, 1993: 378).

Information sessions were held with medical practitioners, nurses, radiographers and radiologists as part of the recruitment process and to seek consent for voluntary participation for both roles. Heads of departments were approached for a suitable time slot, either as part of or just after a departmental meeting. At the information session an overview of the study was given, with special reference to the data collection process, which included recruitment for direct observations of consultations and participation in a focus group and/or individual interview. Practicalities of the shadowing process were also discussed with volunteers. Only health care providers who gave written informed consent were included in the study (Appendices C1 to C4).

3.4 DATA COLLECTION

Data collection for the patient case studies took place between January 2009 and March 2009. The focus group interviews followed after the first phase of data analysis of the patient case studies and were conducted between June 2009 and August 2009. One focus group was conducted in January 2010 to follow up on gaps discovered in the data analysis with regard to radiology consultants and registrars. Table 3-2 gives an overview of the data collection timeline.

Table 3-2. Data collection timeline

Phase	Collection method	2009												2010
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan
I	<i>Shadowing patients</i>													
II & III	<i>Focus groups:</i>													
	Nurses													
	Radiographers													
	Radiology													
	Family medicine													

3.4.1 Phase I: Shadowing the patients

At the start of the study there were some problems of cooperation, with medical practitioners being reluctant to participate. A meeting was called by the chief family medicine specialist of the district hospital to address this and other issues pertaining to the shadowing of patients. During this meeting it was also agreed that the radiology department at the tertiary hospital would provide a radiological report for each patient being shadowed. This agreement was of benefit to me as the researcher, as I was not an expert in radiological interpretation and in the district hospital this role was taken on by the medical practitioner. As such, I would not know if a radiological interpretation had been made correctly, as that was outside my scope of practice. The subsequent data triangulation made possible by this arrangement was most beneficial as it contributed to the reduction of researcher subjectivity during the observation of interpretations.

Upon recruitment of a patient I first introduced myself, explained the purpose of the study and informed the participant on the various stages of data collection that would be involved. I informed participants that this was a research project to observe what happened in a natural setting. The patients who were able to read and write in English provided written consent. For those not fluent in English the process was explained in simple language and interpreters were also used. They provided verbal consent. After verbal or written consent had been obtained, participants provided their contact details, should a follow-up interview be needed for further clarification.

The first patient I shadowed served as the pilot study (Greeff, 2002: 316). At this point I had to establish rapport with staff and patients, become orientated and gain a sense of how many participants could be shadowed or interviewed per day (McMillan and Schumacher, 2005:

322-323). It allowed me to process some ideas and facts whilst collecting data. I also made descriptive notes before I left the site.

After the pilot study the shadowing processes were refined. Figures 3-3 and 3-4 give a graphic presentation of the different data collection points. At least two interviews were held

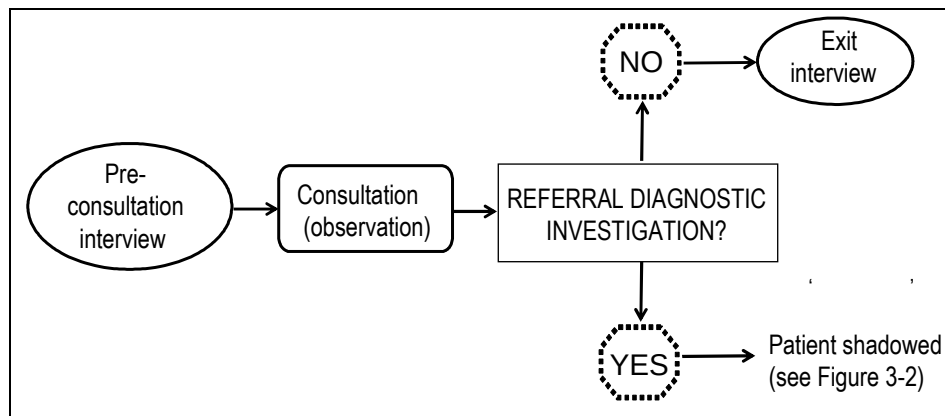


Figure 3-3. Simplified presentation of data collection points in the actual study

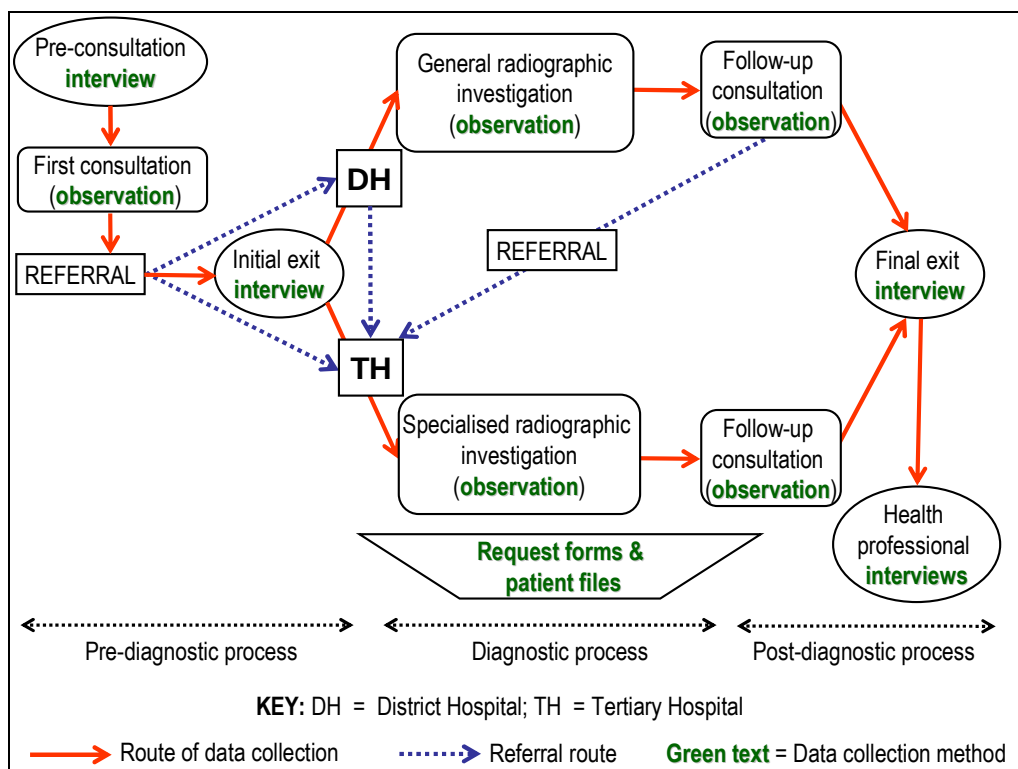


Figure 3-4. Shadowing process of patients referred for diagnostic imaging investigations

with each patient and observations took place at three points, namely at first consultation, at the diagnostic imaging department, and after the diagnostic imaging investigation at the referring medical practitioner's and/or the radiologist's consultation. A digital audio-recorder was used where permission had been granted and I also made field notes of the consultations and the interviews with patient participants. The shadowing process is graphically depicted in Figure 3-4.

Audio-recordings of the interviews and consultations were transcribed after each shadowed case and observations of the processes documented. An inventory of the observations, consultations and interviews was done and if there were gaps in the data collection I followed it up in the next patient participant and in the focus group interviews with health care providers.

3.4.1.1 Pre-consultation or entry interview

The purpose of the semi-structured, pre-consultation interviews with patients was to obtain a sense of their preferences, needs, expectations of services and their insight in and possibility of a diagnostic referral (Yedidia, 2007: 41). Furthermore, a systematic study of patients' met and unmet expectations for diagnostic imaging investigations could contribute to understanding this important aspect of the physician-patient relationship in the context of decision making (Kravitz and Callahan, 2000: 38; Lysdahl and Hofmann, 2009: 1; Balaque and Cedraschi, 2006: 512). The design of this study responded to Murphy's (2001: 193) recommendation for more exploration of the alteration of patient expectations in terms of what imaging could actually do and whether patients' knowledge was correct or misconceived. The interview guide (Appendix E1) included closed and open-ended items, a strategy that allowed me to be consistent (Flick, 2009: 167). According to Kelly (2010: 318), more structured interviews are appropriate where a researcher is comparing across a range of cases. Because the patients' cases had to be compared with each other, the broad interview questions followed a particular sequence, but it also allowed for variations and different ways of probing.

3.4.1.2 Observation of consultations and interactions

In the process of shadowing patients it was important to observe them in their natural health care setting (Lincoln and Guba, 1985: 114). Middleton et al. (2006: 1238) state that a consultation between a medical practitioner and the patient is the core activity of clinical practice. It is based on the assumption that anything that improves the quality of the consultation has the potential to improve all aspects of health care. For this study doctor-patient interaction was used to better understand the referral behaviour of medical practitioners (Verstappen et al., 2003: 2411). Thiel De Bocanegra and Gany (2004: SP21) highlight the issue of impaired

communication between a clinician and patient that could cause physicians to defensively order unnecessary, hazardous, or expensive diagnostic tests, or on the contrary, to not bother to request the required tests. According to Greenfield et al. (2007: 47), observations enable researchers to collect data on a wide range of behaviours, to capture a great variety of interactions, and to openly explore the research topic. Observations of interactions between patients and health care providers enabled me to get a holistic view, which included the context in which specific behaviours occurred.

Direct observations took place at two or three points: during the medical consultation; at the point of the diagnostic investigation; and at the points of discussion of the outcomes of the investigation. If the patient was referred for a diagnostic imaging investigation, a copy was made of the request form. Detailed field notes were made of the observations and recordings of the conversations and interactions between the patient and health care providers using an observation schedule as guideline (Appendices F1 and F2) (Creswell, 2002: 214). This schedule was based on the six interconnecting components of patient centeredness discussed by Stewart et al. (1995, cited by Mead and Bower, 2000: 1087). In the case where a health care provider granted permission, the encounter was also audio-recorded. The role of the researcher was that of a complete observer. This enabled me to better understand and give meaning to certain behaviours, interactions and levels of engagement(s) (Grinnell, 1997: 120), with special emphasis on the patient and health care providers as key informants.

All consultation interviews were observed, except for Patients 4 and 7. For Patient 7 the medical student did not grant permission. In the case of Patient 4 the medical practitioner first did his assessment and then called me and explained to me the ideal and how medical practitioners made their clinical diagnosis. For Patients 12, 14, 18 and 19 the attending medical practitioners did not give permission for consultations to be audio-recorded. Patients who were referred for diagnostic imaging investigations could be observed with permission granted by patients, radiographers and/or radiologists. I was able to make notes of the observations and interactions during the investigation, but audio-recording was not feasible at the point of positioning of the patient. At the diagnostic imaging departments observations were made in an unobtrusive manner of the conversations between the radiographer and/or the radiologist and the patient and the actual investigation.

During the shadowing there were extended waiting times between the different points of referral. This enabled me to also observe non-participant interactions of the patients and health care providers in the natural setting of hospital corridors and waiting rooms.

3.4.1.3 Post-consultation and/or exit interview

At the end of the first consultation an exit interview was conducted with all patient participants. (See Appendix E2 for the interview guide.) For patients not referred for diagnostic imaging it served as a final exit interview. For those referred for diagnostic imaging it served as an initial exit interview followed by a final exit interview at the end. (See Appendix E3 for the final exit interview guide.) All these semi-structured interviews were also audio-recorded. Barry et al. (2000: 1246) claim that the only way to address patient expectations, needs and preferences is by means of a pre- and post-consultation interview. The purpose of the exit interviews was to probe patients' perceptions on the fulfilment of expectations and other understandings of the consultations and of interactions regarding diagnostic imaging investigation as part of the medical encounter. All patient participants were, amongst others, asked whether the researcher's presence was uncomfortable to him or her. Patient 19, for example, framed her answer from a gender viewpoint: *"No, no, I didn't feel uncomfortable; I was just at home because we're all women. If you were a male, I would be uncomfortable"* [CS19:537-539: 20].

The exit interview also enabled me to compare and relate what had been conveyed in the pre-consultation interview to the outcome at the end of the patient's journey. Patient 6, for example, was vocal about her expectations in the pre-consultation interview after the medical students had informed her about a possible referral to a discipline-specific field expert for plastic surgery:

"I expect attention and get help in any way possible, in any way that they can help today. I don't have to wait a day or two. And for them [plastic surgeons], to tell me the possibilities of the wounds that I have. The changes I am going to see and things to explain the pain source of what is being experienced. And then again to tell me I can come for check-ups, just to make follow-ups, not just give medications and that's it." [CS06:37-44:02]

At the exit interview this patient showed realism after the expectations created by the medical students:

"I thought the cut was too deep. I was just prepared to go to the specialist. But on the x-ray it came out that the cut was not so bad. So I had to get stitches, so it was just okay. So everything went very well for me." [CS06:535-539:20]

3.4.1.4 Interviews with health care providers

Interviews were held with medical practitioners, nurses and radiologists/radiology registrars at the end of the shadowing of individual patients in either English or Afrikaans. In the case of radiographers, interviews were held prior to the investigation and at the end of the investigation. If the patient was referred for a specialised investigation the interview with the consultants or registrars was also used to determine the consistency of the request for referral in relation to the radiological outcomes of the diagnostic imaging investigation.

The purpose of these interviews was to clarify aspects of the referral process and interactions with the shadowed patients and their experiences of patient interaction and decision making regarding referrals, investigations and outcomes. Experiences of the system processes and procedures were also probed. The interviews with all provider participants who signed consent were audio-recorded and descriptive notes were made. (See Appendices G1 to G3 for the interview guides).

3.4.1.5 Additional data sources

According to the actor-network theory, non-human agents – such as files, forms and images – are actors that can drive the medical decision-making procedure and that can be analysed in terms of their content, production and function (Frank et al., 2010: 46; Prior, 2010: 428). Three additional data sources were consulted in the shadowing process:

- (1) *Hospital files* were used to obtain data on patients' demographic and socio-cultural status, and medical notes were used to verify the clinical findings. The hospital number was used as a code to identify the patient.
- (2) The *request forms* for diagnostic imaging investigations were not only used to gather data on the clinical history, but also to determine: (a) how they were used as a communication tool between health care providers; (b) whether the investigation requested was justified; and (c) what the relation was between the information on the request form and the interpretation of images in the radiological report.
- (3) Radiographic and the accompanying *radiological reports* in my study were used to: (a) verify interpretational skills, competencies, and integration on an individual basis; (b) get a sense of communication processes between providers regarding diagnostic decision making; and (c) trace the intra- and inter-institutional continuum of communication.

3.4.1.6 Subsequent contact

During the data collection phase patient participants were contacted for further clarification of interview statements to fill in gaps in the collected data. (See also Section 3.4.1.7(c).) A few health care providers were also contacted for the same purpose and were further interrogated in the focus group interviews (Section 3.4.2)

3.4.1.7 Profile of participants in Phase I

(a) Patients

Table 3-3 gives an overview of some characteristics of the 24 recruited patients. Seven patients were male and 17 female; 19 were black and five white. One of the 17 female patients

Table 3-3. Profile of patient participants in Phase I

Case no.	Entry route	Origin of referral	Gender	Age (years)	Admission department	Referral for diagnostic imaging
1	Direct	Self	Male	22	Casualties	√
2	Direct	Self	Female	18	Casualties	
3	Direct	Self	Male	59	Casualties	
4	Direct	Self	Female	19	Casualties	√
5	Direct	Self	Female	83	Casualties	√
6	Direct	Self	Female	24	Casualties	√
7	Direct	Self	Male	56	Casualties	√
8	Referral	Clinic	Female	30	Casualties	√
9	Direct	Self	Female	44	Casualties	
10	Referral	Follow-up	Female	24	Outpatients	√
11	Referral	Clinic	Female	64	Outpatients	
12	Referral	Clinic	Female	44	Outpatients	√
13	Referral	Private	Female	46	Outpatients	√
14	Referral	Casualties	Female	51	Outpatients	√
15	Referral	Private	Female	38	Outpatients	
16	Referral	Clinic	Female	48	Outpatients	√
17	Referral	Private	Male	46	Outpatients	√
18	Referral	Private	Female	24	Outpatients	√
19	Referral	Clinic	Female	58	Outpatients	√
20	Direct	Self	Male	27	Casualties	
21	Direct	Self	Female	39	Casualties	√
22	Direct	Self	Male	19	Casualties	√
23	Direct	Self	Female	24	Casualties	√
24	Direct	Self	Female	52	Casualties	√

was pregnant (Patient 2). Three patients were of foreign origin (1, 2 and 16). Fourteen participants were recruited at Casualties and ten at Outpatients. At Casualties 13 were self-referrals who entered directly, with one referral from a clinic. All participants at Outpatients were referrals – one from Casualties, four from the private sector, and five from clinics. The ages of the patients ranged between 18 and 83 years. All but one participant were able to walk. Patient 5, who was on a trolley, was however able to provide consent.

Of the patients shadowed three were not fluent in English. In the case of Patient 22, a South African, a radiographer who spoke the same language as the patient volunteered to interpret. After being briefed on the nature of the study, the interpreter signed an undertaking to respect the confidentiality of all information revealed (Appendix D). Patient 2 was from the Democratic Republic of Congo (DRC) and spoke Swahili. There was no Swahili interpreter available, but the patient managed to answer most of the questions adequately, except for those relating to medical terms and to expectations regarding a referral. Patient 16 was from Rwandese origin and was on her first contact at Outpatients, accompanied by her daughter who spoke English fluently. However, the attending family medicine physician was fluent in the patient's native language and translated in English throughout the consultation.

Seventeen of the first 20 patients were shadowed from pre-consultation to the point of discharge. Patients 7 and 8 were not shadowed at every point of their journey due to the timing of their admission and/or a referral decision when the researcher was not available. Patient 18 was shadowed up to her follow-up consultation because the decision was a referral for a surgical intervention. Patients 21 to 24 were shadowed from the x-ray department at the district hospital to the point of discharge. At that point data saturation had been reached. Of the first 20 patients, six were not referred for a diagnostic imaging investigation – three at Casualties and three at Outpatients. They were discharged after their consultation.

(b) Health care providers

At the research site staff members on duty were notified in advance on the commencement of the shadowing and interviews with patient participants and recruited health providers. To ensure the data collection activities of patient participants did not interfere with the on-going flow of their medical encounter, arrangements were made with the participating health care providers at the Casualties and the x-ray department to consult patient participants as soon as possible, thus minimising their waiting time, which in turn could be utilised for the exit interviews.

At the district hospital 21 provider participants were observed and/or interviewed during shadowing. They included medical students, medical interns, community service medical officers, junior and senior medical officers, one family medicine registrar and two family medicine consultants. For the patients referred to the tertiary hospital the following five field specialists were observed and/or interviewed: one surgery consultant, two general surgery registrars, one orthopaedics registrar and one otolaryngology registrar. Of the 27 participants in total, 13 were females. The majority of the participants had obtained their first medical degree at the University of Pretoria, followed by four from the University of Limpopo, two from the University of KwaZulu-Natal and one each from the Universities of the Free State, Cape Town and Witwatersrand. The participant profiles are summarised in Table 3-4.

Table 3-4. Profile of the consultants, registrars and medical practitioners providing care during the shadowing process

Participant code	Designation	Gender	Institution of primary qualification	Case no(s)	Hand-over	Referral for diagnostic investigation		Follow-up
						District	Tertiary	
1	MO	Male	Univ Limpopo	1 ^δ		√		
				22	√	√		
				24	√	√		
2	Snr MO [^]	Female	Univ Pretoria	2 ^δ				
				20 ^δ				
3	Snr MO [^]	Female	Univ Limpopo	3 ^δ				
4	Snr MO [^]	Male	Univ Limpopo	4 ^δ		√		
5	MO	Male	Univ Cape Town	5 ^δ		√		
6	Comm serv	Female	Univ Pretoria	6 ^δ		√		
				21		√		
7	Medical student+	Male	Univ Pretoria	7		√	√	
8	Registrar (Neurosurgery)	Male	Univ Pretoria	7		√		
9	Intern	Male	Univ Witwatersrand	8 ^δ	√	√	√	
10	Snr MO	Female	Univ Limpopo	9 ^δ				
11	MO	Female	Univ Pretoria	10 ^δ		√		
				13 ^δ				
12	MO	Female	Univ Pretoria	11 ^δ				

Participant code	Designation	Gender	Institution of primary qualification	Case no(s)	Hand-over	Referral for diagnostic investigation		Follow-up
						District	Tertiary	
13	MO [^]	Female	Univ Pretoria	12 ^δ		√		
				14 ⁺			√	
				18 ⁺			√	
				19 ^δ		√		
14	Consultant (Family medicine)	Female	Univ Pretoria	12 ^δ				√
				17 ⁺			√	
15	Medical intern	Female	Univ Pretoria	13 ^δ			√	
16	Consultant (Professor) [^] (Surgery)	Male	Univ Pretoria	13 ^δ		√		√
17	Registrar [^] (Surgery)	Female	Univ Pretoria	13 ^δ				√
18	Registrar (Surgery)	Male	Univ Pretoria	13 ^δ				
19	Registrar (Family Medicine)	Male	Univ KwaZulu-Natal	15				√
				16 ⁺		√		
20	Consultant (Family Medicine)	Female	US	16 ⁺				√
21	Medical Student	Male	Univ Pretoria	16 ⁺				
22	Medical student	Male	Univ Pretoria	17 ⁺				
23	Registrar (Orthopaedics)	Male	Univ Pretoria	17 ⁺				√
24	Registrar (Otolaryngology)	Male	Univ KwaZulu-Natal	18 ⁺		√		√
25	Intern	Female	Univ Pretoria	22				
26	Intern	Female	Univ Pretoria	23				
27	Intern	Male	Free State Univ	24				
Abbreviations: Comm serv = Community service; MO = medical officer; Snr = Senior; Univ = University (of)								

[^] Declined individual interview but allowed observation during consultation

⁺ Declined observation but allowed interview

^δ Consultations observed from entry to discharge or admission

[×] Consultations observed to outcomes of diagnostic investigation and/or patients who had to come back for follow-up

Of the 27 medical practitioners, registrars and specialists involved in the shadowing of the patients, one registrar and one consultant at the tertiary hospital were not available for individual interviews, but they did allow observation and the audio-recording of consultations. Four medical officers at the district hospital declined individual interviews, but did allow observation and audio-recording of consultations. A fourth medical officer at the district hospital allowed observation of the consultation, but not an audio-recording. The medical student attending to Patient 7 at the district hospital did not want the consultation to be observed or audio-recorded.

The radiographer participants' investigations were observed and interviews were held at the point of and after the investigation. The profiles of these participants are provided in Table 3-5. Fifteen radiographers and two students were involved. Fourteen radiographers consented to observation and an interview. The two students were not observed or interviewed. Patient 8 could not be shadowed for her whole journey because of researcher unavailability during the diagnostic imaging investigation. Her investigation was done by the only male radiographer, who also declined an individual interview afterwards. Nine radiographers from the district hospital and five from the tertiary hospital were observed and interviewed. Five of these had acquired their first qualification from the University of Pretoria, and four from Tshwane University of Technology. Two qualified at Port Elizabeth Technikon (now incorporated in the Nelson Mandela Metropolitan University), one at the University of Johannesburg (Wits Technikon), one at the Central University of Technology and one at the Addington Hospital (now incorporated in Durban University of Technology).

The radiologists' interviews were held immediately after an investigation. Details of these participants are provided in Table 3-6. Fourteen radiology registrars and three consultants agreed to participate, nine females and eight males. Most radiology registrars were graduates of the University of Pretoria. Three had foreign primary qualifications (DRC, Pakistan and Iran) and one had obtained his primary qualification from the University of Limpopo. Two of the three consultants obtained their radiology degree from the University of Limpopo and one from the University of Witwatersrand.

(c) Follow-up contact with patient participants

It was not possible to make telephone contact afterwards with all patient participants. Patient 18, for example, had a broken phone. Patient 23 returned to Casualties the next day because she was still experiencing pain of her leg. I was, however, unable to do a follow-up interview because I was busy shadowing Patient 24. When I tried to call the patient's mobile it was on voicemail. Several text and voice messages yielded no response. Patient 15 declined further participation due to personal reasons.

Table 3-5. Profile of the radiographers providing services during the shadowing process

Participant code	Designation	Gender	Institution of first qualification	Case study no.	District	Tertiary
1	Comm serv	Female	Tshwane Univ Technology	1	√	
				18	√	
2	Comm serv	Female	Univ Johannesburg	4	√	
3	Comm serv	Female	Tshwane Univ Technology	5	√	
4	Snr radiographer	Female	Univ Pretoria	6	√	
				23	√	
5	Snr radiographer	Female	Tshwane Univ Technology	7	√	
				12	√	
6	Snr radiographer (CT)	Female	Univ Pretoria	18		√
7	Snr radiographer [^]	Male	-	8	√	
8	Comm serv	Female	Central Univ Technology	10	√	
				21	√	
				22	√	
9	Snr radiographer	Female	Univ Pretoria	13		√
10	Snr radiographer	Female	Univ Pretoria			
11	Snr radiographer	Female	Durban Univ Technology			
12	Student*	Female	Univ Pretoria	14	√	
13	Snr radiographer	Female	Tshwane Univ Technology	16	√	
14	Snr radiographer	Female	Univ Pretoria	17		√
15	Snr radiographer	Female	Nelson Mandela Metro Univ (PE)	18		√
16	Snr radiographer	Female	Nelson Mandela Metro Univ (PE)	19	√	
17	Student*	Female	Univ Pretoria	24	√	
Abbreviations: Comm serv = Community service; Snr = Senior; CT = Computerised Tomography; Univ = University (of); PE=Port Elizabeth						

* Students not observed or available for individual interviews.

[^] Declined individual interview

Table 3-6. Profile of the radiology participants observed, interviewed or providing a radiological report during the shadowing process

Participant code	Designation	Gender	Institution of primary qualification	Case study number
1	Consultant	Female	DRC (Radiology: Univ Limpopo)	1
2	Registrar	Male	Univ Pretoria	4
				5
3	Registrar	Female	Univ Pretoria	6
4	Registrar	Female	Univ Pretoria	7
5	Registrar	Male	Univ Pretoria	8
6	Registrar	Female	Univ Pretoria	10
7	Consultant	Female	Univ Pakistan (Radiology: Univ Limpopo)	12
8	Registrar	Male	Univ Tehran	13
9	Registrar	Male	Univ Pretoria	
10	Registrar	Male	Univ Pretoria	
11	Professor (Consultant)	Male	Univ Pretoria (Radiology: Wits Univ)	
12	Registrar	Female	Univ Pretoria	14
13	Registrar	Male	Univ Limpopo	16
14	Registrar (Plain films)	Female	Univ Pretoria	19
				18
15	Registrar (CT)	Female	Univ Pretoria	
16	Registrar	Male	Univ Pretoria	22
				23
17	Registrar	Female	Univ Pretoria	24
Abbreviations: CT = Computerised Tomography; DRC = Democratic Republic of Congo; Univ = University (of); Wits = Witwatersrand				

3.4.2 Phases II and III: Focus group interviews

Focus group interviews were held to collect additional data after completion of the shadowing phase of the research to ensure adequate inputs from the health care providers' perspective. Morgan (1997: 6) describes focus groups as a research technique that collects data through group interaction on a topic determined by the researcher, whereas Krueger (1988, cited by Kingry et al., 1990: 124) defines the focus group as "a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment".

The focus group interviews were conducted for the following purposes:

- to obtain health care providers' perspectives on mechanisms of the referral and decision-making processes regarding diagnostic imaging investigations;
- to explore the views of health care providers on patient expectations, experiences and understandings of the diagnostic imaging process and to refine the themes obtained in the first phase of data collection; and
- to clarify and interrogate gaps found during the analysis of individual health care provider interviews in Phase I.

Phases II and III of the proposed research design were conducted simultaneously during the actual study. Focus group interviews were first held with nurses because they were the ones who liaised more directly with the patients and often accompanied them through various points in the system. The first focus group with nurses served as the pilot interview (Greeff, 2002: 316), which allowed the researcher to become familiar with the group interviewing technique and to further refine the interview guide. Subsequently medical practitioners and family medicine consultants, radiology registrars and consultants, and radiographers were targeted. All participants were required to sign an informed consent document (Appendices C1 to C4).

An interview guide with provisional questions was formulated to ensure the smooth management of the interview process (Appendices H1 to H4). The findings from the shadowing of patients informed further refinements. The interview questions were open-ended and I ensured, as far as possible, that at the end of each interview the main topics had all been adequately covered. If not, the topic was covered in more detail in subsequent focus groups. The researcher acted as sole moderator, as difficulties were experienced to recruit a second moderator to assist with the process. However, all interviews were successfully audio-recorded. (See also Section 3.4.3 about further measures to address this limitation.)

After permission was sought to utilise a suitable venue for the various focus group interviews, the relevant heads of departments were informed of the venue and group selection criteria, namely a mixed group regarding gender, senior and junior staff members and some participants who had not taken part in the shadowing. The groups and the list of volunteers were electronically communicated to me and reminders for volunteers were posted on notice boards. Participants were informed of the time, venue and location for the interviews. A week before the actual group session, I contacted the clinical head of the relevant department to remind him or her of the appointment. A day before the group session, a follow-up call was made.

Six to eight potential participants were recruited for each focus group, to ensure that at least four to six would attend. Greeff (2011: 366) recommends an average of four to six participants if they have an intense interest or a great deal to share. The researcher had very little control over how many providers eventually participated in each group. In one interview with medical practitioners (FGMP3) and one with nursing providers (FGNP3) only two participants attended because of staff shortages. However, rich text data was still obtained from groups where there were only two participants. The final number of interviews was determined by the point of data saturation (Cheek, 2011: 260; Greeff 2011: 366). Participants used English or Afrikaans as language of participation, depending on which language they felt more comfortable with.

A total of twelve health care provider focus group interviews were held – three groups with medical practitioners, three with radiographers, two with radiology registrars and four with nurses. This method of triangulation of different groups of health care providers yielded several different types of sources that could provide insights about the same events and relationships (Erlandson et al., 1993: 115).

Regarding sequencing of focus groups I decided to commence with the nurses because they were recruited at a later stage and data from nurses was only available for two of the patient cases. Nurses were also the ones who accompanied patients to their diagnostic investigation. Two nurse focus group interviews were held at the district hospital followed by two focus groups with radiographers and one with radiology registrars at the tertiary hospital. Then, two nurse focus groups were held at the tertiary hospital, followed by three medical practitioner focus groups at the district hospital. Lastly, a radiographer focus group was held at the district hospital and a second focus group with radiology registrars at the tertiary hospital. Detailed information on the composition of the participants in each focus group is provided in Table 3-7 on the next page.

3.4.3 Researcher's notes

Three types of field notes were made during the study. Excerpts from these notes are included in Appendix I.

For the case studies field notes were made *during the shadowing* while waiting for medical practitioners' consultations and before a diagnostic investigation and if it was not feasible, directly after the exit interview with the patient (Babbie and Mouton, 2002: 306).

Table 3-7. Summary of provider participants in focus group interviews

Participants	Focus group code	Invited	Participating	Gender	Ranks	Number also shadowed
Radiographers	FGRAD1 (Tertiary)	6	6	1 Male 5 Female	1 Chief 5 Snr	-
	FGRAD2 (Tertiary)	6	5	5 Female	1 Chief 4 Snr	1
	FGRAD3 (District)	5	4	1 Male 3 Female	2 Snr 2 Jnr	4
Sub total		17	15			5
Medical practitioners	FGMP1 (District)	7	7	1 Male 6 Female	2 Consultants 2 Snr MOs 1 Jnr MO 2 Interns	3
	FGMP2 (District)	5	4	2 Male 2 Female	1 Consultant 3 MOs	-
	FGMP3 (District)	5	2	1 Male 1 Female	1 Snr MO 1 Consultant	-
Subtotal		17	13			3
Radiology registrars	FGRADL1 (Tertiary)	6	4	2 Male 2 Female	2 Jnr registrars 2 Snr registrars	3
	FGRADL2 (Tertiary)	6	4	1 Male 3 Female	3 Jnr registrars 1 Snr registrar	-
Subtotal		12	8			3
Nurses	FGNP1 (District)	6	3	3 Female	2 EN 1 PN	-
	FGNP2 (District)	6	4	4 Female	3 EN 1 PN	-
	FGNP3 (Tertiary)	6	2	2 Female	2 PN	-
	FGNP4 (Tertiary)	8	8	1 Male 7 Female	3 PN 6 EN	-
Subtotal		26	17			0
TOTAL		72	53			11
Abbreviations: Snr = Senior; Jnr = Junior; MO = Medical officer; EN = Enrolled nurse; PN = Professional nurse						

Notes were also made of *observations of interactions* between health care providers. The final time schedules of the focus groups resulted in the unavailability of a second moderator to assist with note taking. Brief notes were made of important points raised during the focus groups and where necessary these were then explored further during the interview. Additional field notes were made at the end of each focus group. As all of these interviews were successfully audio-recorded, the transcripts served as the basis for cross-checking important points.

I also kept a *journal* that included the following: expressions of own experiences, feelings and subjectivity; recordings of incidental insights to inform the data analysis and interpretation; reflections on and justifications for necessary on-the-spot decisions, especially during data collection (McMillan and Schumacher, 2005: 329); and ethical dilemmas and the way they had been resolved at each point.

3.5 DATA STORAGE AND MANAGEMENT

In order to manage the day-to-day data collection activities a field log was created on the interview schedules to chronologically document the dates and times spent at every event at a particular setting and the data collected in the field, including getting access to sites and participants (McMillan and Schumacher, 2005: 329). This information was coordinated with the notes and transcripts so that I could cross-reference and check who the interviewed participants were at a particular setting.

Data was managed and stored according to the guidelines set out by Creswell (2002: 572), De Vos (2005: 337) and Patton (2002: 441). This enabled the establishment of a proper audit trail (Patton, 2002: 93). Two sets of manual files (hard copies) were created for each case study shadowed, which included the transcripts of individual interviews with health care provider participants. Another two sets were made for the focus group interviews with the various health care providers. The first set of files was the master files, while the second set of files – an exact copy of the first set – was used for interpretation and analysis. Each file set contained data for all the patient case studies and transcripts of all focus group interviews. Data sets for each case study received unique codes as outlined in Tables 3-3 to 3-7. For each case study a general code was created (e.g. CS01, CS02, etc.); “CS” refers to case study and “01” to the first case shadowed. This code will be used as reference for the direct quotations in the rest of the thesis. For filing purposes each case received sub-codes referring to different consultations, observations and participants. (See Table 3-8.)

In Phases II and III a set of codes was also generated for the focus groups. (See Table 3-9.) For example, in the case of the code [FGMP1], “FG” refers to the focus group, “MP” to medical practitioners and “1” to the first of focus group.

Data from all interviews, observations, referral documents and field notes was captured on the computer using MS Word (De Vos, 2005: 336; Grinnell, 1997: 120). All audio-recordings were transcribed verbatim. Typing and organising these field notes myself allowed me to get immersed in the data and experience, which generated emergent insights (De Vos, 2005: 337).

Table 3-8. Data-set codes for the case studies

CASE STUDY 1 (CS01)					
Patient interviews		Observations		Provider interviews	
Category	Code	Type	Code	Category	Code
Pre-consultation	PCI:01	Consultation	MP-PT:01	Medical practitioner	MP1I:01
Exit	PEI:01	Diagnostic investigation:		Nurses	NP1I:01
		Radiographer	RAD-PT:01	Radiographer	RAD1I:01
		Radiologist	RADL-PT:01	Radiologist	RADL1I:01

Table 3-9. Data-set codes for the focus group interviews

Focus group interviews	Code
Medical practitioners	FGMP1; FGMP2; etc
Radiographers	FGRAD1; FGRAD2; etc
Radiologists	FGRADL1; FGRADL2; etc
Nurses	FGNP1; FGNP2; etc

An electronic filing system was created using the same approach as the manual filing system. The manual files as well as the hard copies of the electronic files were kept locked in a filing cabinet to which only the researcher and the supervisor had access. Upon completion of the study the data will be stored for 15 years at the Department of Radiography of the University of Pretoria. (See Appendix J.)

3.6 DATA ANALYSIS

Data analysis in a qualitative inquiry is an inseparable, two-fold approach in building a coherent interpretation of the data (De Vos, 2005: 335). It involves data analysis at the research site during data collection and away from the site. According to the literature on qualitative research, the phases of data collection and analysis are interactive research processes occurring in overlapping cycles, which is referred to as a “spiral” analysis (McMillan and Schumacher, 2005: 322; Creswell, 1998: 142-165). In addition, Marshall and Rossman (1999: 152-159) refer to this as integration in a linear form. The process starts from the

“bottom up,” with data being organised systematically from the concrete transcriptions of data recordings to abstract patterns or themes (Creswell, 2007: 38; McMillan and Schumacher, 2005: 322-323). For this reason the phrase “data analysis strategy” was preferred to “data analysis procedures”, as it captures the flexibility of qualitative data analysis (McMillan and Schumacher, 1993: 383).

The above process is also referred to as an inductive data analysis strategy. This is in contrast with the hypothetical-deductive approach of quantitative designs (Patton, 2002: 56). The strategy allowed me to work back and forth between the various phases of the analytical steps in order to establish a set of comprehensive patterns (Creswell, 2007: 38). (See Figure 3-5). In this way important analysis dimensions were thoroughly explored without prior suppositions about what they should look like (Patton, 2002: 57).

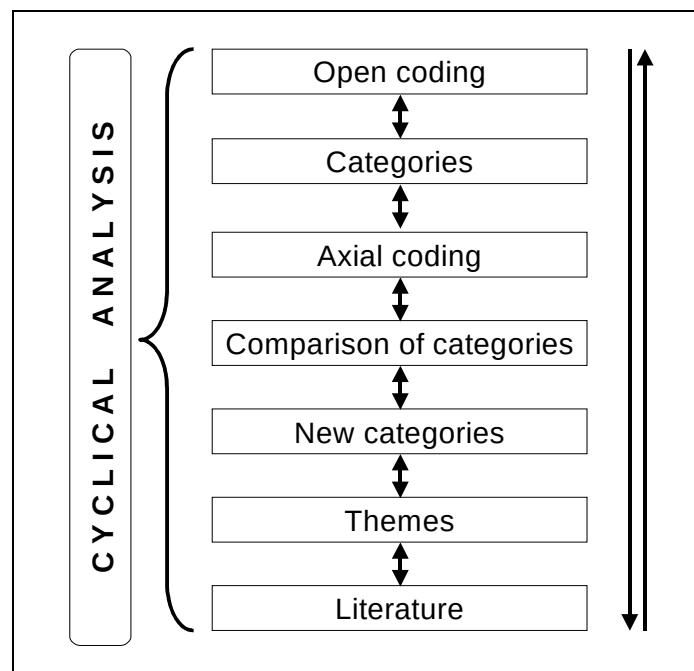


Figure 3-5. The cyclical process of data collection and analysis

It was decided from the outset to not use one of the software packages available for qualitative research. These programmes do not do the data analysis, but merely provide tools for the management of data and for assisting with the data analysis process. The researcher-as-instrument does the actual analysis. Weitzman (2000: 806) also refers to the fact that no computer programme is neutral and that the conceptual assumptions on which a programme is based may shape an analysis.

3.6.1 Phases of data analysis

Table 3-10 provides an overview of the data analysis phases. Regarding the shadowing phase, I started with what is termed microanalysis (Strauss and Corbin, 1998 cited in Patton, 2002: 490). I read and re-read each line of the transcriptions and field notes to start the coding process, often referred to as open coding (De Vos, 2005: 337). For each transcript phrase, ideas and keynotes used by the participants and not the researcher were written in brackets next to the phrases (McMillan and Schumacher, 2005: 365). Also included in the analysis were key words and phrases to identify broad categories. I then returned to the site and continued with data collection, at the same time continuing with the transcriptions and micro-analysis to identify broad categories for each of the cases until no new categories emerged; in other words until saturation was reached. I then re-read my field notes and the transcripts of the interviews. On occasions, I also listened to the recordings of the interviews again to further familiarise myself and immerse myself in the data. This process was repeated for two months after the open coding. Since my analysis was emerging and evolving, I would sometimes see the data in a new light or notice details I had not appreciated whilst the shadowing was in process. At this stage of open coding a peer reviewer scrutinised the coding to advise or confirm the feasibility of the broad categories identified.

Table 3-10. Timeline of the data analysis process

	2009												2010		2011
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb - Dec	Jan-Dec
<i>Shadowing patients</i>															
Data collection															
Data analysis															
<i>Focus groups:</i>															
Data analysis															
Data collection															

As soon as the analysis for the case studies was progressing well, the focus groups interviews with the providers were conducted. The transcript for the first focus group interview was analysed as for the case studies in order to identify broad categories. Thereafter, focus group interviews were held with other provider groups until no new broad categories emerged. Then each case was analysed individually in order to get insight into the specific cases and their context. I then sought similarities and differences between the categories

(axial coding) and sought for deviant categories in both the focus group and case studies data. There were no deviant categories. The peer reviewer then commented on the coding process and categorisations of both the case studies and focus group data (Creswell 2007: 209-210). Where there were disagreements, consensus was reached and amendments were made accordingly.

At the next level of analysis I sought relationships between the categories identified in both the case study and focus group categories to identify new categories and themes (Strauss and Corbin, 1990 cited in Patton, 2002: 490; De Vos, 2005: 343; Patton, 2002: 454). Then the data, themes and patterns were re-examined with a view to generating theoretical concepts that could be checked against existing literature (Patton, 2002: 454, 487).

The process of data analysis described above contributed towards developing a holistic view of how experiences, meanings and understandings were constructed and reconstructed as patients moved through various stages within a structure. The interaction processes between health care providers and between health care providers and patients in determining the most appropriate investigation and the referral pathways and decision-making processes within the system regarding diagnostic imaging investigations were also interrogated and refined.

3.7 QUALITY OF THE STUDY

When it comes to ensuring the quality of a study, quantitative and qualitative researchers do not always use the same terminology to describe the measures to be taken. Positivists use terms such as validity and reliability in quantitative research. In the qualitative literature there are different ways of justifying the rigour of the research. Although the notion of “trustworthiness” is widely used, some authors also divide their quality criteria around the notions of reliability and validity (Creswell, 2007: 202-207). In qualitative research the researcher devises strategies to enhance the reliability and validity of a study and demonstrates the credibility of the research findings by describing the strategies followed to ensure the quality of the study. As there is no uniform way in which authors make the division between techniques to enhance reliability and validity, the exposition that follows is based on McMillan and Schumacher’s (1993; 2005) conceptualisation of these terms.

McMillan and Schumacher (1993: 385) describe reliability in qualitative research, as “the extent to which independent researchers could discover the same phenomena and to which there is agreement on the description of the phenomena between the researcher and

participants”. They make a further division between reliability in design and reliability in data collection.

Validity is described as “the degree to which the explanations of phenomena match the realities of the world” (McMillan and Schumacher, 1993: 391; 2005: 324). A distinction is made between internal validity and external validity (extension of findings).

3.7.1 Reliability in design (dependability)

Although the ideal researcher role is that of an “outsider”, for this study the researcher had different roles in different phases of the data collection. According to Allen (2010: 356), it is very seldom the case that settings are completely familiar or completely strange and the researcher’s insider-outsider status can vary over the period of a project. As I was not part of the district or tertiary hospital setting, I could, from that point of view, be considered an outsider when shadowing the patients. Patients, however, did not always have a clear understanding of my role as researcher. Patient 13, for example asked, “*After you finish your studies, you are going to be my doctor?*” [CS13:2399:87].

Meticulous note keeping and regular consultations with my supervisor and the data-analysis peer reviewer, who were total outsiders, were measures to minimise the threat to validity. The use of “thick” descriptions (Flyvbjerg, 2011: 311) with verbatim accounts in the chapters describing the findings also contributes to minimising the threat. In the focus group interviews the researcher was an insider when viewed from a health professions perspective. On the other hand, my position was one of an outsider when presenting the views of the participants in trying to discover the congruence and incongruence between patient views and what others (the providers) thought their views were.

In this study participants were selected by means of convenience sampling. Patients continued to be recruited until data saturation was reached and no new themes emerged from the shadowing of patients. Validity was enhanced by the inclusion of members of all the groups of provider role players in diagnostic imaging investigations in both phases of the study, namely the shadowing of patients and in the focus groups. The description of the participants in Sections 3.2.1. and 3.4.2. includes a detailed account of the social context in which the data collection took place – a description of the physical, social, interpersonal and functional aspects of the setting. The researcher’s own relationship with other health care providers whom I might have known before the commencement of the study is further discussed in Section 3.7.4.

The data analysis strategies followed are described in detail in Section 3.6, so that sufficient information is available for future researchers wanting to do a similar study. According to McMillan and Schumacher (1993: 288), putting forward the analytical premises, the conceptual framework, “which informed the study and from which findings from previous research was integrated and contrasted”, safeguards against unreliability. The social constructivist framework used in this study is described in Section 3.1. In the final stage of the inductive data analysis I referred back to the literature to compare those findings with the ones emanating from my study (Chapter 9).

3.7.2 Reliability in data collection (dependability)

Data was audio-recorded where permission was obtained. This enabled me to transcribe and store verbatim accounts and authentic narratives for use in the forthcoming chapters. The discussion on the management of data records in Section 3.5 demonstrates the authenticity of the study process (McMillan and Schumacher, 2005: 329). This ensured that the accuracy of the process and the product of the study – this thesis – can be assessed independently (Creswell, 2007: 209).

In this study interviews, observations and documents were used as data collection methods. The data sources included patients and health care providers (radiographers, medical practitioners and family physicians, nurses, radiologists, radiology registrars, other specialists and registrars). This allowed for various types of comparisons and for cross-checking the consistency of information derived at different points and from various participants (Patton 2002: 559), for example between individual patients who were shadowed, between different points in the shadowing process for individual patients and for the patient group as a whole, between patients and the different groups of health care providers, and among the health care provider groups themselves.

Another form of triangulation was the fact that the majority of the health care providers included in the focus group interviews had not been previously involved in the shadowing of patients (Table 3-7). The focus groups, therefore, enabled me to gain more insight into the research setting and the various role players and I could confer and verify my influence on and subjectivity in the research process. This assisted me in seeing the difference between ideal and reality and how I should position myself in the presence of my own subjectivity. (See also Section 3.7.4.) The focus groups were also of benefit to the providers who could ask questions on the research process or the role of the radiographer in general.

3.7.3 Internal validity of the design (credibility)

McMillan and Schumacher (1993: 391) refer to internal validity as “the degree to which the interpretations and concepts have *mutual meanings* between the participants and the researcher”. An important strategy for improving internal validity is a lengthy data collection period. Observations conducted for case studies are shorter-term than those of ethnographies (Caronna, 2010: 74). Although a case study does not involve continuous immersion in a setting or group (Sofaer, 1999: 1110), a period of approximately three months was spent at the research site, shadowing patients at every point of their interaction with health care providers in a natural setting. Therefore, each mini-case could also be considered “lengthy”, compared to other studies where only individual points in a patient’s journey through the health system had been investigated. The time spent at the complex site was furthermore dependent on data saturation.

The use of multi-methods in data collection allowed for triangulation between different data sources (McMillan and Schumacher, 2005: 325). Mead and Bower (2000: 1107) suggest that patients’ perceptions are useful external reality checks on observer-based measures of consultation processes, but what is needed most is triangulation of the three perspectives (i.e. health care provider, patient and observer) rather than affording particular priority to one.

According to Lincoln and Guba (1985: 314), member checking is “the most critical technique for establishing credibility”. Patton (2002: 560) claims that it offers another approach to analytical triangulation. Member checking for the patient participants was done at the exit interviews for patients who had follow-up exit interviews, where their initial expectations and interpretations were re-explored. This enabled me to corroborate whether the researcher’s reconstruction of the experiences could be considered as having “truth value” (Patton 2002: 93). It ensured an agreement between the researcher and participants and enhanced the reliability of the study (McMillan and Schumacher, 1993: 385). The focus groups with health care professionals also served as a form of member checking by clarifying issues and confirming interpretations from the patient case studies.

McMillan and Schumacher (1993: 389; 2005: 325, 332) also refer to the inclusion of verbatim accounts (authentic narratives) and low-inference descriptors (almost literal descriptions and not in abstract language) in the research analysis. The use of the participants’ language and avoiding scientific language was, therefore, another technique that was employed to enhance internal validity of the findings. In the findings described in Chapters 4 to 8, thick descriptions are utilised to illustrate the points made in the participants’ own word and from their own perspective. Where participants used Afrikaans, the original excerpt plus the English translation are quoted for readers to be able to confirm how near the translation is to

original meaning. The majority of participants were not English first-language speakers and the direct quotations were also kept in the South African English lingua franca in order to reflect the authentic cultural use of language to convey meaning and context (Popay and Mallinson, 2010: 302).

Some strategies already described, such as the researcher's reflective journal (Section 3.4.3), ensured disciplined subjectivity (McMillan and Schumacher, 1993: 392) and enhanced reflexivity, which McMillan and Schumacher (2005: 327) call "the rigorous self-scrutiny by the researcher throughout the entire process". (This is further elaborated on in the next section.) At every stage of the data collection and analytical processes field notes and my personal notes were included and assessed by a member of the PhD panel and the supervisor. This process included the consideration of all alternative explanations for interpretations at various points of the research. All these contributed to conformability (De Vos, 2005: 347).

Some authors suggest that the use of multiple researchers in qualitative studies is a way to improve the reliability in data collection (Tracy, 2010: 843). However, as this was a PhD study, the researcher was the only primary researcher. Measures were built into the design to minimise any threat by having regular consultations with the supervisor, a member of the PhD advisory panel and the chief family medicine specialist at the district hospital. They all gave inputs in the process from time to time to ensure that various aspects that might be problematic were sufficiently addressed. Furthermore, the supervisor and a member of the PhD advisory panel also acted as peer debriefers for certain aspects in the discussion phases of the analysis. This is in line with the use of peer review or debriefing as an external check on the research process (Creswell, 2007: 208). The advisory panel member together with the researcher also reviewed a synthesis of all the cases that were shadowed in order to reach consensus on meanings derived from the interview data. This enhanced agreement between the researcher's reconstruction of participants' meaning making and the meanings participants ascribed to their experiences.

3.7.4 Researcher influence on and participant experiences of the research

According to Patton (2002: 546), "[s]ocial constructivists' case studies, findings and reports are explicitly informed by attention to praxis and reflexivity, that is, understanding how one's own experience and background affect what one understands and how one acts in the world, including acts of inquiry." In order for the reader to make a judgment on the credibility of the study, my personal experiences and subjectivities as they manifested during the study need to be stated.

3.7.4.1 Insider and outsider roles

Although the ideal researcher role is that of an outsider, I had different roles in the study. As a clinical radiographer I had worked in the research setting before the conversion of the old academic hospital into a district hospital. However, a lot has changed since I left; therefore, I could be considered an outsider when shadowing the patients. Because of the lack of familiarity with research of this nature at the district setting my role as a researcher was not always clearly understood by all health care provider participants. This was especially so with the senior medical practitioners and nurses at Casualties. An information session had been held with the medical practitioners to get their consent and their input on the process, but also to explain the requirement of minimum interference from me as the researcher. Initially this agreement was not honoured in the actual normal setting; some medical officers at Casualties perceived me as an intruder. At a later stage a medical intern confided in me that this was the first time they were experiencing a data collection strategy of this nature. Not all medical officers were keen on the process. Whilst shadowing the patients, providers often interpreted it as a threat or perceived it as if they were being assessed. According to Patient 17's observation, the medical practitioner was *"not sure what you are doing exactly; so ja, it might frighten him that this guy may report me"* [CS17:1222:55]. These difficulties are an illustration of (unexpected) researcher "influence" when doing real-life case studies.

The case of Patient 1, which served as the pilot, was a steep learning experience that made me feel uncertain. As Patient 1 had to wait for his consultation, I informed him of the delay and asked him if he would like to continue with the research process. He agreed to wait and I then informed the family physician who was supposed to see the patient. I was forced to put the patient's file back into the "new file section" to enable me to recruit another medical officer. I went back to the patient and was reprimanded by the sister in charge of the accident, trauma and surgery (ATS) unit not to remove the patient from the unit, as they were required to do their nursing observations. I then realised that the nurses did not receive the communication about the research as agreed with by the sister in charge. I returned to the unit with the patient and apologised for the inconvenience caused by me. I then decided to wait at the reception desk for a medical practitioner to collect the file and then seek his or her consent. At the x-ray department it was easy to follow through with the planned process for the data collection.

Before shadowing any more patients I arranged an information session for the nurses and thereafter the processes were smoother. The data collection was adapted by making arrangements with the nurse at the reception desk to report the patient recruited for

participation and she would inform the medical practitioner if I was still busy with the patient's pre-consultation interview.

As an outsider I felt less affinity with the medical practitioners and nurses than with the radiographers and radiologists. Throughout the study the former providers did not treat me with a lot of respect, thus further posing a challenge to coordinate the shadowing process without much interference. This amplified the fact that I was an outsider and made it a bit more difficult to negotiate and occupy my space as a researcher and not an outsider. In a few instances medical practitioners also shouted at patients who did not understand medical terms. In another instance the doctor left in the middle of a consultation to talk to one of the nurses. These behaviours made me very uncomfortable.

Provider participants were much more comfortable in their natural setting. Even though I had requested neutral venues to hold interviews, I had very little control over disturbances in these settings and noise when setting up my audio-recorder. In this context I had to work hard to create a rapport and put participants at ease to make them realise that I was doing a research project for a qualification and their identity would not be revealed at any stage of the research process and in publications. I had to politely engage with the staff to enable me to do the research. In this respect reverse power relations came into play and I did not have much choice on interview and consultation venues.

On the other hand, as radiographer I was an insider in the health system, familiar with referrals for diagnostic imaging investigations and, from this point of view, could not be considered as a detached, independent investigator. I had worked with some of the radiographers included in the study before and some had been my students. At the tertiary hospital I felt I was treated as a colleague and with respect as a researcher. This allowed me to settle with ease and helped me to blend in as if I were an insider, despite being an outsider.

3.7.4.2 Minimising researcher / observer effects

The way in which this study has been constructed, especially the observation pathway, may have caused participants to behave in a certain manner, which in turn may have influenced the data collection. To minimise researcher/observer effect the pre-consultation and exit interviews of the first patient were used to get a sense of this potential effect and to take measures to further minimise the effect. Although it was envisaged that the recording equipment could be placed unobtrusively, this was not always possible because I had very little control over the setting. In the patient consultations I sat in the position that was least interfering in the direct interaction between patient and health care provider. The formal interviews that the researcher had with medical practitioners in the course of the shadowing also

assisted in changing arrangements being a potential threat to internal validity in future consultations.

In a subsequent case study I came to the realisation that some of the medical practitioners and nurses expected me to fulfil certain care functions such as discharging a patient or provide feedback on the diagnostic imaging investigation. I reported the matter to my supervisor who advised me on informing health care providers of my role as a researcher not employed by the district hospital and who may not perform care duties.

With the third and fourth patients the medical practitioners first wanted to do an assessment of their patients and then present their findings to me. I realised that I was not going to get sufficient data, which might jeopardise the truthfulness and smooth collection of the data. One medical practitioner even questioned wryly, why I was not shadowing the chief family physician who gave permission for the study to be conducted. Therefore, I requested a meeting with the sister in charge of Casualties and the chief family physician. To overcome the dilemma of non-inclusion of nurses in the study an amendment was sent to the Research Ethics Committee to also include them as participants. The nursing manager also informed me that the staff was not familiar with the methods of data gathering and only knew the survey type technique. The chief family physician also made me aware that, because I was not part of the hospital setting, I was seen as a threat. The outcomes of the second information session convened with the medical practitioners to ease off the tension and to reassure them of the role of the researcher have already been discussed in Section 3.4.1.

3.7.4.3 Dealing with issues of privacy and confidentiality

At the tertiary hospital and at Outpatients at the district hospital I was able to exercise privacy and confidentiality with health care providers by conducting their interviews in the consultation room. The entry interviews with patients at Outpatients posed a challenge because patients would lose their position in the queue. I had to conduct the interviews in the waiting room or corridor and keep to the routine questions pertaining to expectations and previous experiences without in-depth probing. For the exit interviews a private venue was available, which provided the opportunity for asking more confidential and in-depth questions in a safe environment. Only in the case of Patient 13 I could not find a private room and had to conduct the exit interview in the corridor. We could, however, find a space with no other patients close by. Whilst conducting this interview a security officer spotted the audio-recording device and thought the researcher was a media reporter. I was immediately requested to report to the CEO of the hospital. An apology was conveyed for the inconvenience after the CEO had read the letter of permission.

It was also anticipated that individual interviews with health care providers would be conducted in their private offices. This was possible at Outpatients, but at Casualties I held interviews in the common room shared by medical practitioners. There were no sensitive questions and patient particulars were not disclosed.

At the district hospital, in terms of observation of radiographic interpretation by radiographer participants, a venue was identified for confidentiality purposes. However, the suboptimal illumination of the light boxes in that particular venue could have resulted in suboptimal image interpretation and unnecessary radiation risk to the patient. Therefore, the pre- and post-diagnostic investigation interviews with radiographers regarding the request form and radiographic image interpretation, was conducted at the central viewing station. The diagnostic investigation was conducted in the x-ray room where only the radiographer, patient and the researcher were present. When it came to interpretation of the request form and radiographic image interpretation the researcher informed all non-participant staff members ahead of time at every case study shadowed on the importance of confidentiality and privacy of the participants. Non-participant radiographers did perform their interpretational task but used the extreme viewing station away from where the interpretational interviews were conducted. There was no sensitive information discussed during these interviews. The individual interviews with radiographers were conducted in a private venue at the x-ray department.

3.7.4.4 Personal academic challenges

A considerable challenge for me was to constantly set aside my views and opinions of being an academic and practising clinical radiographer. In the individual interviews some of the medical practitioners and radiographers, being mindful of my academic background, tended to provide ideal situation answers instead of describing reality as is. Others again used the research process to voice their frustration of having to wait for blood test results. I also had to consciously set aside my own constructions and interpretations, especially during the observations. I tended to want to correct things that were not according to the required standards. I also found that I became too deeply engrossed in the patients I shadowed when the members of the system and health care providers started failing in service delivery. I had to remind myself of the aims and objectives of the research process and to not interfere with the events that unfolded and the outcomes in terms of the real situation. The only time where I interfered was when a patient was sent for an ultrasound investigation with another patient's file.

There was one medical officer who did not want me to audio-record her consultations and it so happened that three patients were observed with her. She was ashamed to inform me of

her lack of knowledge or skill on interpreting radiographs. I offered her assistance by taking her requested investigations to be reported by a radiologist. Then she would ask me to show on the radiographic image where the pathology was and I gained her trust at the same time. Later she would keep x-rays of even other patients to have them reported.

3.7.5 External validity of the design (transferability)

Although this study did not aim at any generalisation of results as in quantitative studies, I aimed at extending the understandings by means of detailed descriptions that would enable other researchers to understand similar situations and to use the interpretations in further studies. The study could be useful for other similar settings, as the primary study site was a typical metropolitan district hospital. Therefore, the findings of the study are being described in as much detail as possible to promote comparability. The conceptual framework proposed for this study would also be able to be translated to other similar studies. The triangulation proposed for this study also contributes to its usefulness for other settings.

3.8 ETHICAL CONSIDERATIONS

The Research Ethics Committee of the Faculty of Health Sciences, University of Pretoria granted approval for conducting this study. Ethical considerations for this study were taken into account at all the stages of the study and are outlined according to the categorisation of Creswell (2003: 64-67), who distinguishes between ethical issues in data collection and ethical issues in data analysis and interpretation.

The necessary permission was obtained from the authorities governing the health care facilities (e.g. the CEO of the hospitals). All participants received an information leaflet that explained the nature and purpose of the study, the procedures to be followed, the risks and benefits, as well as an assurance of the confidential treatment of all data and the protection of participants' identity. All participation was voluntary and included informed consent.

Some of the challenges with regard to privacy and confidentiality have already been discussed in Section 3.7.4.3. Table 3-11 gives a summary of the extent to which privacy and confidentiality could be maintained in the care of each patient who was shadowed.

There was very little room for privacy and confidentiality of patients regarding the observation of their consultations. Consultations took place where there were several patients and in some instances even the curtains could not be drawn. Providers appeared to be accustomed to this environment. I merely conducted observations in such cases and did not ask participants any questions.

Table 3-11. Case studies: confidentiality and privacy of patient observations and interviews

Confidentiality				Privacy		
Cases	Pre-consultation interview	Consultation	Exit interviews	Pre-consultation interview	Consultation	Exit interviews
1	√	δ	√	√	δ	δ
2	√	√	√	π	π	π
3	√	π	√	√	π	√
4	√	δ	√	√	δ	√
5	√	√	√	π	π	π
6	√	δ	√	√	δ	√
7	δ	δ	δ	δ	δ	δ
8	√	√	√	π	√	π
9	√	√	√	√	π	√
10	√	√	√	√	√	√
11	√	√	√	δ	√	√
12	√	√	√	δ	√	Δ
13	√	√	√	δ	√	√
14	√	√	√	δ	√	δ
15	√	√	√	δ	√	δ
16	√	√	√	δ	√	√
17	√	√	√	√	√	√
18	√	√	√	δ	√	δ
19	√	√	√	δ	√	δ
20	√	√	√	√	√	δ
21	√	Not observed	√	√	Not observed	√
22	√	Not observed	√	√	Not observed	√
23	√	Not observed	√	√	Not observed	√
24	√	Not observed	√	√	Not observed	√
Key: π = Curtains drawn; δ = No curtains; √ = Confidentiality and/or privacy could be maintained						

Various measures were in place to ensure confidentiality and anonymity in the data analysis phase. Individual participants were allocated a code and were not identified by name. Although hospitals and clinics were also anonymised in reporting the findings in this thesis some readers might be able to identify the setting. The safe-keeping of the data has already been discussed in Section 3.5. No major clinical dilemmas emerged in the course of the study. Individual participants sometimes used the researcher to vent their own feelings or prejudices, but this did not have any effect on the course of the study.

3.9 LIMITATIONS OF THE STUDY

This study had a number of limitations, many of them as a result of the qualitative nature of the study, the broad scope of the research and what is required for a doctoral thesis. These limitations are listed according to the limitations of the research design, data collection, data analysis and the research report.

Research design:

- Only one theoretical/conceptual framework was used, namely a constructivist framework to explore, interpret and reconstruct the journey of patients through the health system and diagnostic imaging investigations. The use of other theoretical frameworks derived from, for example, social psychology or organisational theory may also yield useful findings.
- A deviant case was used where referral for certain types of diagnostic imaging was directly from the district to the tertiary hospital (Section 3.2.1). Although this does not matter in an instrumental case study, it may be insightful to conduct a similar study where a regional referral hospital is not close to the district hospital.
- Only a public health care setting was used for the inquiry and a similar inquiry in private health settings may yield findings that could be valuable for comparative purposes.

Data collection:

- The initial difficulties in establishing rapport, especially with the medical officers at the district hospital, may have influenced the quality of the data for some of the patients shadowed. It was, therefore, important to continue shadowing patients until data saturation had been reached.

- There was poor cooperation from staff in accessing medical files. Background information important to the researcher was lost where files went missing. This experience did however give the researcher better insight into the frustrations of medical officers in this regard.
- The length that a recruited patient participant would stay at the hospital was unpredictable as there was no guarantee that a participant would be referred for a diagnostic investigation or would be admitted to the hospital for a longer period of time. In the case of an overnight stay for the patient, it was difficult to set up an individual interview with the attending medical practitioner. When it did happen, their recall of the patient was unsatisfactory because they had seen so many patients.
- The exit interviews were ineffective in instances where patients were rushing to get home or where they were so relieved that their problem had been solved that they showed minimum interest to further engage with the researcher. Follow-up contact with some participants was difficult where cell phones were switched off or not answered or where participants had more than one cell phone. This was particularly difficult during the data analysis phase, hence the attempt to frame the exit interview in such a way as to capture some of the information that could typically be obtained in the member checking phase.

Data analysis:

- The extent and wealth of the data collected was such that the researcher could, proverbially speaking, only scratch the surface for the report in this thesis. Other publications following from this thesis will report on some of the other themes.

Research report:

- This thesis is longer than most theses in the health sciences, especially those using quantitative research methodologies. However, it is within the norms for theses that report narratives, stories and words instead of numbers and statistics, as they need more space to do justice to the reconstruction of the perceptions and experiences of research participants. Furthermore, a lengthy description is needed in order to ensure that future researchers are enabled to do a similar study.

3.10 CHAPTER SUMMARY AND OVERVIEW OF SUBSEQUENT CHAPTERS

In this chapter I have presented a detailed account of the research methodology, the data collection techniques and the management of the data. A detailed description of the opera-

tionalisation of the patient-shadowing phase and the focus group interviews with various providers was provided. The data analysis strategies, validity and reliability of the findings in this study, ethical issues and the limitations were also discussed.

According to Yin (2009: 50), the same case may involve more than one unit of analysis. In this study the three main units of analysis that were used in different ways to construct the findings of this study were: the district hospital together with its linkages to other institutions; patients; and health care providers. In Chapter 4 the focus is more on the health facility complex with the district hospital as main unit of analysis, resulting in the description of the research setting and the referral pathways. Chapter 5 uses a combination of the health facility complex and the providers as units of analysis in describing the systemic interactions between health care providers. Chapter 6 focuses more on the health care providers and their interprofessional interactions as unit of analysis. For constructing Chapter 7 the providers and patients were used as units of analysis to map out the interactions between the two groups, whereas in Chapter 8 the focus shifts to the patients as unit of analysis and their experiences of their encounter with the health system and diagnostic imaging investigations.

The golden thread that runs through all the findings chapters relates to the basic sequence of hospital activities where diagnostic imaging contributes to clinical decision making regarding the final diagnosis and the treatment plan. The three major points are: referral for a diagnostic imaging investigation; the investigation itself; and the interpretation and outcomes of the investigation.

Chapter 4

The research scene

This chapter provides a description of the setting in which the study took place. It sets the scene and provides the backdrop against which the findings in the subsequent chapters should be understood. The first part of the chapter gives an overview of the services and administrative processes as well as routes of access and referral. It also describes the diagnostic imaging services that were available, the systems used for the management of patient information and how referrals from elsewhere were dealt with.

The second part of the chapter describes the patient's journey through the system and the different points of contact with the health care providers, from admission to discharge. These include the initial point of contact, the consultation with the doctor, the different referral pathways for diagnostic services and the use of the request form, the diagnostic imaging procedure itself, the interpretation of the images and lastly, the different exit pathways at the end of the patient's journey.

The third part of the chapter addresses the role of the radiographer in performing technology-mediated tasks to acquire optimal quality images that form an integral part of decision-making processes and procedures regarding the patient's management and treatment.

4.1 SERVICES AND ADMINISTRATIVE PROCESSES

In Section 3.2.1 a brief description of the district hospital setting and its relation to the tertiary hospital has been given. The district hospital plays a pivotal role in supporting primary health care services and serving as the referral gateway to secondary levels of care (De Villiers and De Villiers, 2003: 15; Cullinan, 2006: 13). In order to get a better understanding of the points of interaction between health care providers and patients, this section provides a more detailed description of the hospital structures and services provided.

At the time of the study the district hospital provided services for casualties, diagnostic imaging and outpatients. It had three operational operating theatres and eight wards with a 200-bed capacity. Laboratory services were shared between this hospital and the adjacent tertiary institution. The casualties department (further referred to as "Casualties"), x-ray

department, operating theatre and wards were all housed in one building, with the outpatients department (further referred to as “Outpatients”) located in a separate building. The Administration section of the hospital was in the process of renovation.

Casualties had an emergency section with three subsections – accident, trauma and surgery (ATS). It also had a priority-one facility where critically ill patients were treated. The medical units consisted of male and female wards, a gynaecological ward and a small paediatric unit. A short-stay unit was in place for patients who had to be monitored for a few days prior to admission or who awaited certain types of diagnostic investigation. There was a central waiting area close to the registration area. The triaging of patients was non-operational for most of the study period and only the last three cases in this study were triaged.

Outpatients provided medical, oral hygiene and ophthalmology services on Mondays to Fridays between 07:30 and 16:00. The clinical support service section included radiography, physiotherapy, occupational therapy, pharmaceutical and dietetics services.

The personnel involved in the district hospital services included in this study were medical practitioners, nurses and radiographers. There were 14 permanent medical officers (including session and part-time doctors) and one senior medical officer. As the hospital was a university training centre a rank structure was aligned with the academic structure. Medical officers (MOs) were ranked as grade 1, 2 and 3 specialists, with a principal specialist heading the clinical services. The line manager was a chief specialist attached to the department of family medicine of the university. The hospital also had junior and senior medical interns and five community-service MOs appointed on contract. Nursing staff included nursing assistants, enrolled (staff) nurses, professional nurses, two assistant directors and one nursing manager. A chief radiographer was in charge of the x-ray department, with five senior and five community-service radiographers. Medical, nursing and radiography students also rotated through the various sections of the hospital.

4.1.1 Diagnostic imaging services

The outlay of the x-ray department still bore reminiscences of the facilities required for an academic hospital. It consisted of a reception area, waiting and filing areas, two administrative offices (previously used by radiology consultants), a viewing station, and six x-rooms, of which three were operational. In the fourth x-room one piece of equipment was partially operational for conducting standing x-ray investigations. The daylight chemical processors at the viewing station were in operation. The previous myelography, fluoroscopy and mammography rooms with their condemned equipment, as well as a darkroom and a seminar room of the previous academic structures were not operational.

Radiographic equipment and accessories form an integral part of the radiographer's task performance, and availability and accessibility impact directly on the image capturing, which in turn can influence the quality of the radiographic image. At the time of the study there were plans for upgrading the analogue equipment to computerised digital devices, which materialised after the end of the data analysis phase of this study.

The diagnostic equipment in use at the time of the study appeared to function sub-optimally. This was, for example, observed when Patient 5 had been positioned for a chest x-ray but a malfunction was experienced when the radiographer initiated exposure. The machine had to be switched off and on twice before it could function. The two daylight automatic chemical processing units at the viewing station were also functioning sub-optimally. Films often got stuck during loading and unloading and cassettes jammed in the unit. This impacted on the throughput of the radiographs.

A basic ultrasound service limited to gynaecological and obstetric investigations was rendered at Casualties and at the obstetrics and gynaecology unit. Any other cases eligible for an ultrasound scan had to be referred to the tertiary hospital.

The main focus of this study was diagnostic imaging conducted at the district hospital. However, patients were referred to the tertiary hospital for specialised investigations. At the tertiary hospital diagnostic imaging was the domain of the radiology department. Subdivisions in this department included x-rays, fluoroscopy, mammography, angiography, computerised tomography (CT), diagnostic ultrasound, and magnetic resonance imaging (MRI). Whereas the district hospital was still using analogue technology at the time of the study, the tertiary hospital used digital imaging.

4.1.2 The patient information management system

In this section the registration of patients is described, followed by an exposition of the patient records created at various points in the system. The fragmentation of information systems and the different archiving routes are also discussed.

4.1.2.1 Registration of patients and record keeping

At the district and tertiary hospitals patients were registered and re-registered at different points of their journey through the system. They were processed on a first-come-first-serve basis (cf. Gibson, 2001: 519), with a prioritisation of emergencies, and they had to wait in a queue. After registration the patient returned to the designated section, for example Outpatients or Casualties. At first-time and subsequent registrations, they were required to produce their identity documents, proof of residential address and salary slip, although this

did not always happen. A fee based on income had to be paid for every new or follow-up visit, so a unique identification (ID) code was issued to every patient together with a card for possible follow-up appointments.

At Outpatients at the district hospital it was observed that patients' existing files were retrieved from the main records building after re-registration at follow-up visits. Another system was, however, observed at Casualties, where a new file was opened every time a patient came in with a new complaint, but the old hospital identification code was retained. For example, Patient 5 had a file but it was not retrieved and a new file was opened. In the case of Patient 16, when she was involved in a motor vehicle accident (MVA), her file was not retrieved from Outpatients; a new file was opened. So when Patient 16 came for her follow-up appointment at Outpatients she mentioned her involvement in an MVA, but there were no records of the MVA in her Outpatients file. Her new Casualties file was kept at a separate location at the district hospital because she had been involved in an MVA. For follow-up episodes at Casualties some practitioners kept the patient files. For example, Patient 4's blood results were not available; the patient was discharged and requested to come back the following day for her blood results. The file was kept in the medical practitioner's room. Similarly at the tertiary hospital for Patient 13, when her breast biopsy results were confirmed lost, the doctor kept the patient's file at Surgery Outpatients for the repeat biopsy.

Record keeping forms an integral part of continuity of information necessary for appropriate patient care. In this regard various forms of record keeping were observed. At Casualties a register completed at the nurses' reception desk was used as a mechanism of control and a form of record of the patient throughput. On arrival, the time of arrival, name of patient and main problem was recorded and then again the time of discharge, transfer or admission. Medical officers also signed this register in order to ensure an even work distribution among medical practitioners and as an accountability measure. A piece of paper with a number on was given to each patient to keep track of their turn for their medical consultation.

The registration process followed a slightly different route at Outpatients, where patients were required to produce a referral letter. Access to consultation was by appointment. Upon the initial contact patients reported to the nursing professional on duty to receive a date for their consultation. The patient received a card with the details of the appointment. On the appointment day the patient first reported to the nursing professional in a waiting hall and received a number. They then had to wait for their files to be retrieved or a file was generated. After the consultation the patients reported to the sister on duty in the nurses' observation room for their follow-up appointments.

(a) The centrality of the diagnostic investigation request form

For logistic and medico-legal reasons the conventional analogue x-ray request form with a hospital ID label was still used as a tool of communication with the diagnostic imaging sections in both hospitals. (See Figure 4-1.) At the district hospital the referring medical officer completed a new form in triplicate for each new referral and for each request for an additional investigation. This request form, together with the patient's file, was handed over to the patient to take along to the x-ray department. Here the patient was received by either a radiographer or an administration clerk who proceeded with the registration process, using a register similar to the one used at Casualties. The information recorded in different documents at this point in the patient's journey is summarised in Table 4-1.

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TPH.62D

DEPARTEMENT RADIOLOGIE/DEPARTMENT OF RADIOLOGY MAG SLEGS DEUR GENEESHEER VOLTOOI WORD/MAY ONLY BE COMPLETED BY A DOCTOR						
HOSPITAAL/HOSPITAL			Rô No.:			
PASIËNT/PATIENT:.....			LOPEND WALKING ☐	BED VERVOER BED TRANSPORT ☐	DRAAGBAAR STRETCHER ☐	
HOSP. No.:.....			STOEL CHAIR ☐	DOEN IN SAAL DO IN WARD ☐		
GESLAG/ SEX	OUDERDOM/ AGE	INDELING/ CLASSIFICATION	AFDELING/ WARD	VOORHEEN GERADIOGRAFFER/ PREVIOUSLY RADIOGRAPHED	JA/ YES	NEE/ NO
VORIGE Rô ONDERSOEK MET DATUMS/PREVIOUS Rô EXAMS WITH DATES						
VOLLEDIGE KLINIESE BEVINDINGS EN INDIKASIE VIR AANVRAAG/COMPLETE CLINICAL FINDINGS INDICATIONS FOR REQUEST						
ONDERSOEK AANGEVRA/EXAMINATION REQUESTED						
IN PASIËNT MOONTLIK SWANGER? IS PATIENT POSSIBLY PREGNANT?		JA/ YES	NEE/ NO	DEPARTEMENTSHOOF HEAD OF DEPARTMENT		
VERSLAG/REPORT	JA/ YES	NEE/ NO	PRIVAAT PASIËNT: RADIOLOOG PRIVATE PATIENT: RADIOLOGIST			
VERWYSENDE GENEESHEER (Drukskrif) REFERRING DOCTOR (Please Print)				HANDTEKENING EN DATUM SIGNATURE AND DATE		
KONTAK NOMMER/CONTACT NUMBER				VIR DEPARTEMENT RADIOLOGIE/FOR DEPARTMENT OF RADIOLOGY		
AANKOMS (A) VERTREK (D) VAN PASIËNT ARRIVAL (A) DEPARTURE (D) OF PATIENT			(A) (D)		DATUM VAN ONDERSOEK DATE OF EXAMINATION	
RADIOGRAAF/RADIOGRAPHER			STUDENT: VOLLE NAAM/FULL NAME			
DEURLIGTINGSTYD/SCREEN TIME AANTAL BELIGTINGS/No. OF EXPOSURES			FILMS: GROOTTE EN GETAL/FILMS: SIZE AND NUMBER			
			18 X 24		24 X 30	
			18 X 43		30 X 40	
KONTRAS TOEGEDIEN EN STERKTE/ CONTRAST ADMINISTERED AND STRENGTH			HOEEVEELHEID EN STERKTE/ AMOUNT AND STRENGTH			

Figure 4-1. The request form

Table 4-1. Information on request form and information recorded at the x-ray department at the district hospital

On patient file	On request form (triplicate)	In radiography register (according to date)	On envelope with radiographic films (outside)
• Date of investigation • X-ray number • Type of investigation*	• Hospital ID label (Patient demographic information) • Time of arrival and departure • X-ray number • Initials of radiographer • Number and sizes of films exposed in total • Date of investigation requested and date of investigation done ↓ • 1 copy in patient file • 1 copy in x-ray envelope • 1 copy kept in a file at x-ray department	• Hospital ID label • Time of arrival • X-ray number • Type of investigation* • Department ↓ Information used to: • Keep track of total number of patient visits • Retrieve previous investigations (to monitor number of diagnostic encounters pertaining to radiation exposure per patient)	• Hospital ID label • Referring department • Date of investigation • X-ray number • Type of investigation*

* Including modalities

On the request form there was a section to be completed for the purposes of medico-legal requirements, record keeping, audit and accountability. The radiographer had to approve by signing, indicating the time and date of examination, the number of exposures, the dose if applicable, and size and number of films (including the repeats). There was also a section to be recorded on the request form for information on a fluoroscopic investigation that required contrast medium administration, the type of contrast medium, volume and batch number. Additionally, the dose received was also recorded by writing down the fluoroscopic screening time.

After completion of an investigation, the radiographer put a copy of the request form in the patient's file, another in the envelope that would accompany the patient back to the referring medical officer; and the third copy in a file that remained at the x-ray department. At the district hospital the patient was instructed to return to the medical officer at Casualties or Outpatients with an envelope containing the radiographic images and the file. At the tertiary hospital the patient was instructed to go back to the relevant section and was told the x-rays were on the computer.

4.1.2.2 Information systems

Although the hospitals and clinics involved in this study all had information systems that included the same provincial referral code, there was inter-institutional fragmentation. Every hospital and clinic had its own institutional identification code and a code for each individual patient. The latter codes were only valid for referrals and points of contact within that particular institution. At the district hospital the patient code was attached to the record card of each patient. If the patient visited more than one clinic or hospital he or she would end up having a separate patient record card for each health care facility. Only the laboratories had a central identification system. Fragmentation of patient identification between the various levels of care and different health facilities resulted in a lack of continuity of patient care and information, and patient consultations were conducted from scratch, which in turn impacted on the use of financial and human resources. This is how one medical officer described the situation:

“Or even worse, if you can type in the hospital numbers of any [health facility] and the name can come up, it will save money [and] time, logistically not only here, but [at] any other regional hospital. Here we sometimes work a patient up for HIV and TB. Only three weeks ago he was lying in A [a hospital about 70 km away]. And they did exactly the same things two weeks ago, because he is chronically ill. She [another patient] had pneumonia. She [another patient] was lying in another hospital. No one can follow up cultures which she had in another hospital. So if one implements a central information system you can follow up on the system and see it was positive. Just for the ... [provincial] system it can't be that difficult.” [FGMP1:821-828:30]

An “electronic divide” was observed between the district and tertiary hospitals with regard to the management of patient information. The district hospital's electronic information system (HIS) was limited to capturing patient demographic information for billing purposes and to generate a hospital identification code. There was no radiology information system (RIS). Medical and diagnostic records were paper-based and, for example, included a copy of the diagnostic imaging request form. In contrast, the tertiary hospital's medical records were electronically compiled on the HIS and only a single instead of a triplicate request form accompanied the patient. The RIS was accessible for image interpretation and compiling radiological reports, as well as for administrative and archiving purposes. Referring medical officers, registrars and specialists could access the images and the radiological report. However, according to the radiology registrars and consultants, the electronic medical files of patients were not accessible to them: *“It is unusual for us to have access to the file. I wouldn't mind looking at it, but it would be the exception”* [CS14:541-542:20]. Halkett et al.

(2011: 56) experienced a similar situation in their study aimed at enhancing radiography students' communication skills with patients by introducing them to the importance of history taking.

4.1.2.3 Archiving of records

Just as is the case with information systems, the archiving of records is important for continuity of information and care. Because of the paper-based documentation system at the district hospital, fragmentation and segmentation also characterised the archiving system, with files housed at different locations within the hospital. Trauma and medical files were kept at the main archiving site. Outpatients had their own archives, but at times had files retrieved from the main archive site. According to the administrative staff, the MVA files were archived separately at a secured location due to potential medico-legal investigations and claims. Patient records were archived according to the patient's year and date of birth. This practice posed constraints when it came to retrieving files. One medical officer expressed her frustration that *"you can't use only your date of birth, because one million people share the same date of birth"* [FGMP1:839-840:31].

At Casualties a number of inconsistencies became obvious from observations, as a formal structure for record keeping and retrieval processes was not visible to the researcher. The gaps in the record keeping system from admission to discharge led to a lot of duplication. Every time a patient made contact with the system it was regarded as a new or individual "episode". Patient 16 referred to in Section 4.1.2.1 was, for example, referred to Outpatients from a primary health care clinic for a second opinion. She had her initial consultation and was requested to go for a follow-up appointment at Outpatients. Two days prior to her follow-up appointment she was involved in an MVA, for which a separate file was opened and these records were kept separately. Patients 5 and 7 had had numerous contacts with the system previously but at the time of the study a new contact with new medical records was created. Only after Patient 5 had been discharged and Patient 7 had been transferred to the tertiary hospital were the new medical records added to the old ones.

At Outpatients some mechanisms for systematic archiving were in place. However, from observation it appeared as if losing patient files was a common occurrence, with no track record to fall back on. For example, the files for Patient 8, a regular patient, and Patient 15, who had had a laparoscopy, could not be found. Furthermore, the segmentation of archives impacted on the continuity and quality of care through absent information and the use of resources through the duplication of procedures. In the case of Patient 16, the medical officer taking her for her follow-up appointment was trying to integrate the events of the MVA, but no

records were accessible. For Patient 15, the medical officer attempted to get a full picture of her situation without any previous records – *“So let’s just start up fresh, because we don’t know where that file is gone”* [CS15:220-222:9].

In the absence of an RIS and no connection with the HIS, radiographic images still needed to be printed and archived in envelopes. The most recent x-ray reference number was used for archiving the investigation results and forms. An entry of this information was also made on the cover of the patient’s file, including the date of the examination, investigation and x-ray reference number. As mentioned before, a copy of the request form was also archived with the printed images in an envelope; the other was kept in the patient file and the last copy was archived in a file in the x-ray department. Retrieval of previous investigations was by referring to the last x-ray number recorded on the patient file.

During my study I observed patients’ radiographic image envelopes being stacked at Casualties and the copies of the request forms at the x-ray department for more than one month. For the outsider, there appeared to be no structure in place for the collection of these investigations from Casualties. At the x-ray department archiving did not appear to be a priority, which resulted in breaks in the continuity of care – *“You can never get old x-rays to compare; it’s impossible”* [FGMP1:137:5]. The following quotation of one medical officer’s frustration illustrates how the system’s logistical constraints now shifted to and became the responsibility of the patient: *“I mean, it’s got to a point where I trust the patients to keep their own x-rays and bring them back with you next time”* [FGMP1:135:5].

4.1.3 Referrals from elsewhere

From the information obtained from the doctors and nurses at Casualties, there was a wide spectrum of referrals and no patient was allowed to be turned away. From my own observations the categories of patients requiring services ranged from the simple ambulatory patients with minor ailments to complicated, complex cases. Complicated cases involved patients being referred to and fro between different levels of care. Some had previously been attended to at the tertiary hospital but had to “step down” through the prescribed levels of care.

A specific example was that of Patient 7 with a history of a previous brain injury and an inserted shunt. He had been referred back to a lower care level and had to start his re-entry into the system at Casualties at the district hospital and was then referred back to the tertiary hospital for further management. On admission at the tertiary hospital the patient was reclassified as a trauma patient, based on a previous admission history at their emergency section. There were also patterns of discontinuity of care between the various levels of care,

especially in the case of patients referred from the private sector. For example, Patient 13 was receiving treatment for neurologically related problems at the tertiary hospital. At the time of the study she consulted with her private medical doctor on a breast problem. It seems as if the referring practitioner was referring her to the tertiary level in the public sector once more for the sophisticated treatment and diagnostic work up. But she had to re-enter at Outpatients in the district hospital, following the system's processes. According to the medical officer at the district hospital, she was supposed to have been referred to the tertiary hospital – *"But they didn't send you to GOPD [Gynae Outpatients] ... This is [District] OPD"* [CS13:259:10].

The types of referrals most frequently observed at the district hospital were self-referrals, followed by formal referrals from elsewhere in the health system. Five of the self-referrals in this study were patients' first contact with the system or a first consultation with a medical officer. Self-referrals often included patients from outside the feeder area. Although there was a policy of not turning away patients at the district hospital it seems as if providers wanted to exercise some form of "gate keeping", even for some patients living in the vicinity. During the initial consultation some of the self-referring research participants were reprimanded for visiting the hospital. One medical officer told Patient 3, whose workplace was nearby: *"Then also if you live in B..., you need to use the clinic or the hospital there in your area"* [CS3:172:7]. Patient 14 related, *"Apparently they said, 'You're going to get your medicines at the clinic.' So we still don't know what's going on. We used to have our chemist here. So we don't know if we're going to get our medicine"* [CS14:52-53:2]. This uncertainty upset her – *"I am living here. Where must I run to? I can't go every time into town when I am ill. That's what's worrying me"* [CS14:53-55:2].

Most of the other referrals were upward referrals from private and public primary health care providers. Downward referrals came from the tertiary hospital because of its close proximity, with fewer referrals from regional hospitals. The down referrals were mainly follow-ups or re-directions to be in line with the system's referral process.

4.1.3.1 Reasons for referrals

At Outpatients a variety of reasons for referrals were identified in the course of the study, such as the expectation of getting quality service, the avoidance of delays, the unavailability of resources and services elsewhere, and getting services for back-referral to the private sector. Some patients bypassed the system's lower levels, possibly driven by a number of factors, such as patients' perceptions of superior quality of care and the availability of resources at referral hospitals.

A prominent reason for self-referral was related to the district hospital's reputation and the expectation of getting a quality service in different respects. As the buildings in which the hospital was housed had previously been used as an academic hospital, it was still perceived to render the full spectrum of services that had been available in the past. A medical officer at Outpatients expressed this as follows in an individual interview:

"I usually explain to them this is a district hospital. We have no more facilities, because often patients will come from all parts of the country and they haven't been helped. So we see that quite a lot. They come from all over with the expectations that we are going to solve all their problems." [CS11:606-612:22]

Patient 17 was first treated at a tertiary hospital in another province and was not satisfied. He was then referred from his work for occupational safety reasons. This is what he had to share:

"After I was not satisfied in my mind, I will say, 'No, here I am not getting a good treatment.' Even if I don't have any example. That's why I am saying how it differ – this was good, this was bad. ... This comes to me. Let me check, try this one." [CS17:1368-1374:50]

Patient 18 also came from another province and used a fictitious address. These patients took control and ownership of their health problems and re-routed themselves. The medical officer quoted above referred to the sense of hope that some patients had:

"I know the patient I saw earlier today is actually from another province. She was seen at a provincial hospital where it is a level two hospital, but she wasn't satisfied for some reason and now she has come to [this hospital] and she expects better service to solve the problem that they couldn't solve." [CS11: 609-615:22]

At Casualties Patient 6 came from a suburb close to a regional hospital, but preferred to visit the district hospital. *"The service there, eish. That's why I decided to come here because the service there is no good. They attend to you after hours. So that means I am going to wait there for long time"* [CS06:25-30:2]. Three patients also reported on negative staff attitudes and cultural and linguistic differences. At Outpatients Patient 14 shared her opinion as follows: *"It was Russian doctor [at another hospital], very difficult to communicate with her. I am not the only one complaining about her because she does not understand us"* [CS14:96-108:4].

Another reason for self-referral was the avoidance of delays in care – *“And people use us as a gateway to try and get to the academic [hospital]”* [FGMP1:233-235:9]. Inversely, Patients 18 and 24 referred themselves to the tertiary hospital, but were referred back to the district hospital. This is how one patient explained it to another patient while waiting: *“I first came here [to the tertiary hospital] to open up a file. Then they did not want to help me. I had to first go to the district [hospital] and there they took x-rays, but it did not help at all”* [CS18:779-782:29].

A further reason for referral at Outpatients was a lack of drugs or out-of-stock drugs at the referring centres. While shadowing patients, medical officers also informally mentioned that a request for diagnostic services was a frequent reason for a referral. Most public primary health care (PHC) facilities had no or limited diagnostic services, with a few facilities providing chest radiography. Patient 19, for example, fell and injured her hip and shoulder and was referred to the district hospital because *“at our clinic they don’t do x-rays. They wrote me a letter to come here”* [CS19:11-13:1].

Although some health care centres in the private sector have basic general radiographic services, patients were referred to the district hospital for reasons such as a depleted medical aid, lack of sufficient funds and/or lack of access to sophisticated diagnostic facilities. At Outpatients Patient 15 with a history of chronic lower abdominal pain indicated that she had to come back to the district hospital for the management of her illness because *“the company won’t send me [for private health care] again. That is why I came back where I can afford. I went for two times after the operation”* [CS15:318-320:12]. It also seemed as if patients referred from the private sector had a desire to take the outcomes of their diagnostic investigations back to the primary referrer. A senior medical officer indicated, *“I think they want to take it for a second opinion. They will tell you, ‘We just want the blood results and take all of this to our doctor’”* [FGMP1:755-760:28]. Patient 17 was such a referral with a request for an advanced diagnostic modality investigation (a CT scan of the lumbar spine). In the pre-consultation interview he indicated that *“I took it [my previous radiograph] to my doctor in private”* [CS17:82:3].

The description above illustrates how the administrative system contributed to the fragmentation and discontinuity of the continuum of filtering of information and how this affected the care of the patient. The discontinuity and fragmentation is further discussed in Section 7.3.3. Patient expectations regarding the services at the district hospital were also highlighted. The structural, as well as the system characteristics provide the bases for further understanding

the referral pathways followed by patients through the system and patients' experiences of service delivery and treatment.

4.2 A PATIENT'S JOURNEY THROUGH THE SYSTEM – POINTS OF CONTACT

This section provides a reconstruction of patient participants' journeys through the health system. The points of contact with patients are described, starting with the initial contact, followed by the consultation with a medical practitioner. In some cases there would be a referral for diagnostic imaging investigations. The journey ends with the patient seeing the practitioner again, at which point a decision is made on future action. The route that patients followed through the system is depicted in Figure 4-2.

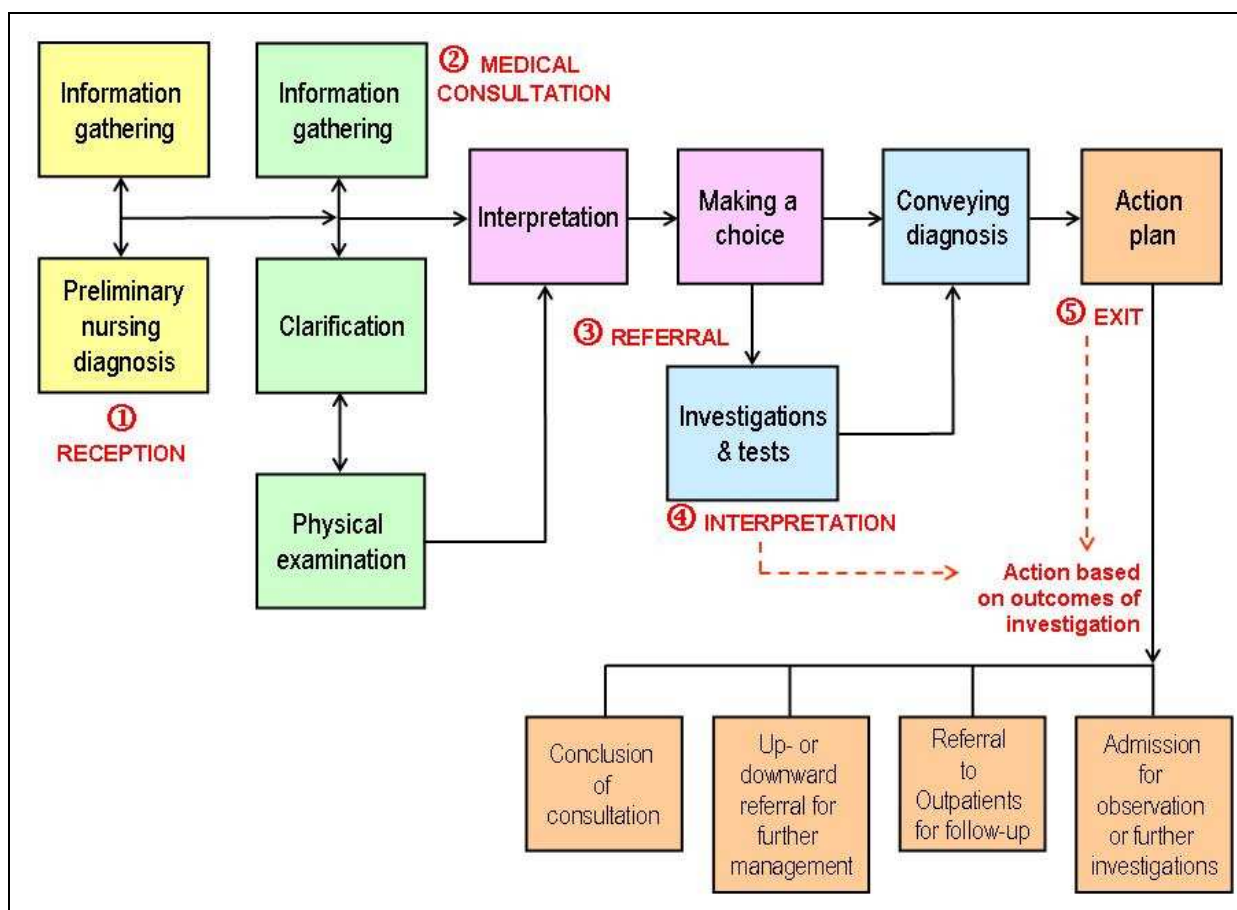


Figure 4-2 Consultation pathways from the initial point of journey to the exit

4.2.1 Initial point of contact with health care providers

The initial point of contact a patient had with providers at the district hospital was at the reception desk of either Outpatients or Casualties. At Outpatients clients reported to the nursing sister in the waiting area on the day of the appointment and received a number. Thereafter they proceeded with registration and were then re-categorised into the group that came solely for medical prescriptions and the group that required a medical opinion. The patient numbers were redistributed accordingly and patients were processed on a first-come-first-served basis.

The process at Casualties was more complicated. Patients were received by a nursing sister at the reception desk manned by two nurses most of the time and occasionally also by a medical officer. At this point a process of gate keeping started and patients were assessed and filtered according to their clinical presentations. The self-referrals were given an opportunity to present their main concern and patients with referral letters handed their letters to the providers for assessment. According to a senior medical officer, ideally the medical officer should, assisted by a professional nurse, use the Cape Triage Score points for making the decision on whether to discharge, refer to Outpatients, down refer and/or admit the patient to Casualties. Patients arriving with an ambulance were granted direct access to the emergency section and were registered after being seen.

The triage was the second filtering process. After data collection I had an informal discussion with the nurses at the Casualties reception desk to better understand the triaging of patients. According to them, patients referred to triage should ideally receive a note with a description of their illness from the nursing reception desk before completing the registration process, where patients also waited in a queue for their assessment. In reality some patients were “referred” to triage in order to streamline admissions. For example, Patient 21 complaining of wrist pain was referred to triage after registration, and then for x-rays and was only thereafter admitted to Casualties. This is how a radiographer expressed his experience in a focus group:

“You see now, they did this triage thing whereby the patient goes there [to triage]. As the patient walks in, they ask where you have pain. ‘No, I have pain here and here and here.’ Okay, x-ray, they’re only going to diagnose the patient after viewing the x-rays.” [FGRAD3: 128-132:5]

After the registration process described in Section 4.2.1.1 the patient handed over the file to the nursing professional at the reception desk in Casualties. Based on the clinical condition

(accident, medical or gynaecological), the patient was directed to the relevant ward. The files were then queued in the “new-files” shelf and were ready for collection.

After registration at Outpatients or Casualties, nursing professionals should ideally interact with the patients to get baseline information. At Outpatients vital signs were taken. At Casualties, once the patient had been admitted, the nurses did observations like taking the patient's history, monitoring vital signs and formulating the nursing diagnosis before x-rays. The patients were then supposed to be monitored until a decision had been made regarding the management and treatment. In reality, this did not always take place. In the case of Patient 8 presenting with swelling in the lower leg and Patient 20 with an injury to the skull there were no nursing observations until after the consultation.

4.2.1.1 The shifting boundaries of gate keeping

The process of referral was accompanied by a filtering process in which boundaries and criteria for gate keeping at the receiving health care facility was continually shifting and re-interpreted, despite the triaging system at Casualties. In reality the interpretation of the first-come-first-served process varied between providers when triaging patients. The system boundaries became quite tight when the system became overloaded, which in turn influenced the re-routing of referrals. When the setting was not overloaded, the boundaries were more relaxed and there appeared to be an ease of access.

The permeability of the boundaries at Casualties appeared to be determined by the discretion of the professional nurse in charge or the medical officer. The gate-keeping function was more obvious when nurses and doctors went to the waiting room and filtered referrals. For example, at least two patients who were not from the feeder area and who should ideally have started at their clinic were allowed access. One had a history of suspected haemorrhoids (Patient 3) and the other, who had a deep laceration of the skull (Patient 6), did not want to go to her feeder area hospital because of perceived poor service delivery.

At Outpatients the system boundaries were fairly tight, as referral to this section from both the district and tertiary hospitals was based on a formal arrangement, with the patient bringing a referral letter and getting an appointment date. A referral letter acted as permission slip to allow the patient easy access to treatment (cf. Smith and Khutoane, 2009: 64). Patient 19 was referred from her clinic for a diagnostic investigation and was denied access the first time because she came on the wrong date. However, on rare occasions provision was made for non-appointment patients at the district hospital, mostly at the discretion of the nurse on duty. From observations in the morning sessions at Outpatients some patients without appointments were put on a standby list.

4.2.2 The doctor-patient consultation – second point of contact

The patient's second point of contact with the health system was with the medical officer. The interaction between the doctor and the patient marks the beginning of a relationship with the system. This section looks at the consultation environment and stages of decision making for referral. The various stages of the consultation process that led to a decision to refer the patient for a diagnostic opinion are discussed in Section 7.1.

4.2.2.1 The consultation environment

At Outpatients, after registration, the patient file was placed at the nursing station according to the first-come-first-serve principle. The patients waited on benches in the corridor with their numbers to indicate the flow of who was to follow next. The medical officer collected the file from the nurse's station and called the patient by name and/or the allocated number. The consultations between MOs and patients took place in individual consultation rooms.

At Casualties the consultation environment was much more complicated. At the reception area most MOs tended to take the upper most file from the new-files shelf. Some rearranged the files and selected patients of their choice, resulting in another form of filtering or gate-keeping. Medical practitioners had to sign a register and record the time of the consultation period. The time a patient was discharged or transferred was also recorded in this register. This procedure was part of the existing control mechanism to monitor the overall patient throughput rate and the throughput rate of patients per individual MO. Not all MOs adhered to these procedures – some took up to three files at a time.

Medical officers approached the consultation in different ways. At Casualties a medical student sometimes attended to the patient before the consultation with the MO. There was usually some form of interaction between patient and medical student regarding the clinical diagnosis. In some cases the medical officer would consult the student's notes to check for a possible (mis)diagnosis, before approaching the patient. Other MOs first consulted the baseline data compiled by the nurses and then approached the patient. Some approached the patients directly.

From observations in the trauma section ambulant patients sat in a room. A consultation took place in the presence of other patients. Patients and providers appeared to be accustomed to this form of consultation environment. Only patients on trolleys were afforded some form of confidentiality and privacy, by drawing the curtain. Health care providers' discussion of other patients with each other in the presence of patients was frequently observed. Whilst waiting for Patient 3 to undress, the medical officer stood by another patient she had attended to

earlier and shared with a nursing professional her views of this patient lying in the same ward, with the intention that the patient should hear:

“Oh, the bladder [problem] is gone now. The mass is gone. I told you [the nurse], it was the bladder and not a mass. He [the patient] doesn’t listen to the doctor. The mass was the bladder.” [CS03:135-137:06]

This patient thought there was something seriously wrong with his bladder and the practitioner was justifying the diagnosis of what was wrong to the nurse in front of the other patients in the ward.

4.2.2.2 Decision-making stages

It emerged from my observations that medical practitioners constructed their understanding of a particular problem or situation and made their decision to refer by means of a step-wise structured approach. The steps in this approach are graphically depicted in Figure 4-3. The main reason for shadowing patients in my study from the district to the tertiary hospital was the possibility of entry for further diagnostic investigation procedures.

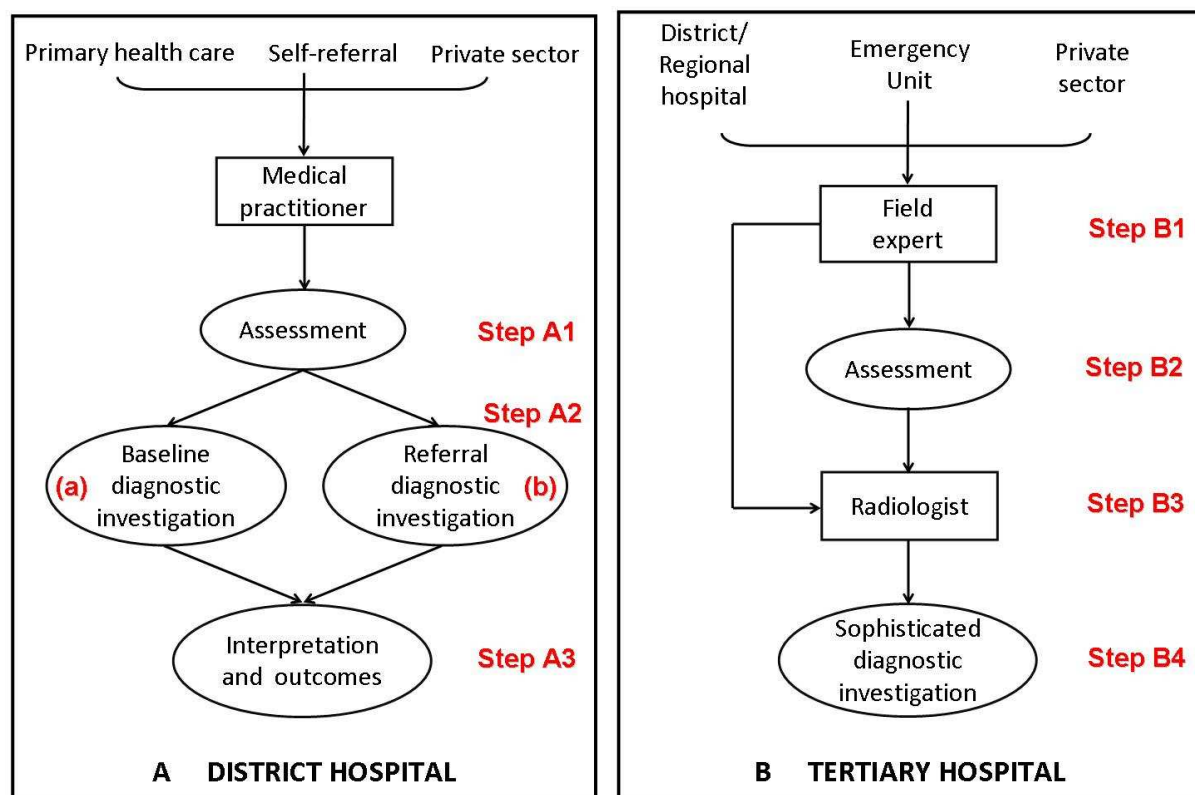


Figure 4-3. Steps in the decision making on referral for diagnostic investigation

A typical example of this step-wise approach was the consultation with Patient 15 who presented with lower abdominal pain, but her file was lost. After the doctor had read the abdominal ultrasound report from the private radiologist and analysed the urine results **[step A1]**, the patient was given a detailed explanation about the various steps, with the justification for each process, before a decision could be made for a possible re-referral for a diagnostic investigation:

*"First step what we do is, [we] did your blood test today **[step A2a]**. You come back for the results in a week's time. Depending on what the blood results say, then we will probably [be] able to book you for another ultrasound **[step A2b]**, whether we see anything different or not; and decide from there what to do **[step A3]**. Okay? ... To know what is exactly happening, you have to do it in a stepwise manner."* [CS15:368-374&380-381:14]

The practitioner also communicated the realities of the system's referral pathway for further management to the patient:

*"No operations can be done here. ... So whatever happens, you will be seen here. Then we will phone the surgeons and ask if they can see you, take over **[step B1]** ... They want all these tests done first. Okay?"* [CS15:390-395:15]

This approach is in line with Whiting et al.'s (2007: 984) view that tests are more commonly used for the following reasons: to rule out a condition; to help the doctor to make a decision about referral; and/or to provide information to the secondary care specialist. Smith (2006: 166), for instance, refers to the use of radiographic investigation in triaging the referral to a secondary care specialist, whereas Gibson (2001: 521) refers to it as the medical legitimisation of the institutionalisation of the patient. Primary care doctors commonly face the decision between ordering a test or adopting a period of "watchful waiting", requesting the patient to return later to follow the development of his or her symptoms (Whiting et al., 2004: 984). This was the case for Patient 16 who had a chronic history of pain in her shoulder: *"So let's then try the brufen and see how you do with it and then review in back about a month and see if it's worse. If it is worse, x-rays will be taken"* [CS16:444-446:16].

A family medicine registrar who had previously worked at Casualties in a regional hospital shared that system's protocol for a field-specific referral:

*"When we screen the patient, we do x-rays **[step A2]** before they go to a specialist department and they can be seen at the specialist department **[step B1]**. Here as well, our job is to make some kind of diagnosis, get answers **[step A3]**. That is, if it is*

the thyroid, then it is our duty to get the ultrasound done of the thyroid to prove what is wrong with the thyroid, enlarged.” [CS15:465-472:18]

Referral pathways did not always follow exactly the same route. This could have been because of the diversity of conditions under investigation. It could also have been due to the absence of more detailed guidelines. (See also Section 5.1.3.) A private practitioner had referred Patient 17 for a possible CT scan of the lumbar spine. After assessment by a medical student [step A1 of Figure 4-3] a senior family physician decided to refer the patient to the tertiary hospital for further management [step B1]. Here the patient was referred for lumbar spine x-rays [step B4] and then assessed by the orthopaedic registrar for interpretation and decision making on the outcomes [step B1]. In other instances patients were first referred for plain diagnostic investigations at the district hospital [step A2b] and re-assessed at the tertiary level by a field expert [step B1], who then made a formal arrangement with the radiologist on an appointment basis [step B3]. This was the case with Patient 7 with the blocked shunt described above, who was ultimately seen by the neurosurgeon at the tertiary hospital.

4.2.3 Referral for diagnostic imaging services – from the second to the third point of contact

The initiation of a referral for a diagnostic imaging service commenced during the doctor-patient consultation. In this section the stages of the referral processes for diagnostic investigations are discussed, including the pathways used by medical practitioners to access services in the district and tertiary hospitals. Attention is also given to decision-making processes accompanying referrals and referral protocols.

At the district setting most cases shadowed were single referrals with a single request, so the referral pathway followed to access services was straightforward and uncomplicated. The single referrals with multiple examination requests at the district hospital were mainly from the accident and trauma sections in Casualties. In the case of extended or multiple requests, additional processes were sometimes involved in the upward referral to the tertiary hospital. These pathways are described below, as well as the various stages and structural processes involved in accessing different modalities and types of investigations, which Campion et al. (2010: 33) refer to as “the social organisation of imaging equipment”.

4.2.3.1 Pathways at the district hospital

The most common and frequent referral at the district hospital was for plain diagnostic investigations where medical practitioners merely completed a request form and sent the patient to the x-ray department. (See Figure 4-4.) The PHC clinic on the hospital site followed the same protocol when referring for plain diagnostic imaging investigations.

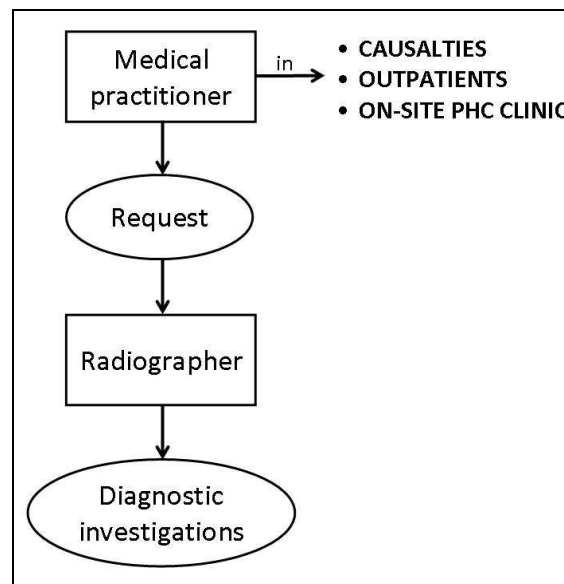


Figure 4-4. Access pathway to plain radiographic investigations from the district hospital or the on-site primary health care clinic

At Outpatients the PHC centres remote from the district hospital followed the formal referral route by means of a referral letter, followed by a formal appointment, registration and then a consultation. The referrals from elsewhere often served a dual role, seeking a medical opinion or review and requesting a diagnostic investigation. Then, according to a medical practitioner, these referrals had to follow the system's pathway – *"You have to manage them like the others"* [FGMP2:533:20] in order *"to assess whether the request is appropriate"* [FGMP2:556:21]. The role of the attending medical practitioner at the district hospital was more of a gate keeper or medium to access diagnostic services. Depending on the outcomes of the consultation a referral was made for a diagnostic investigation. Figure 4-5 gives a graphic depiction of this pathway.

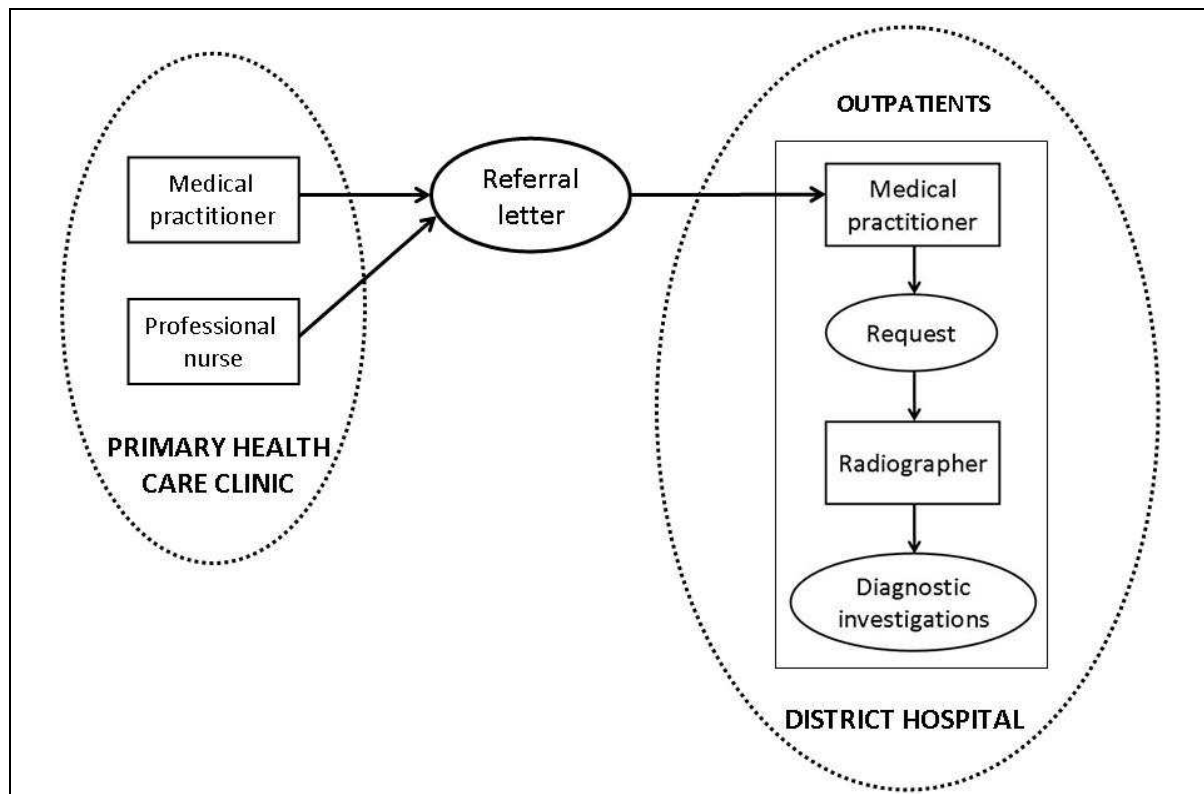


Figure 4-5. Referral for a diagnostic investigation from primary health care clinics to Outpatients at the district hospital

Specific administrative procedures were followed for patients referred directly for advanced radiological investigations. At Casualties, patients who were able to walk to the x-ray department received their file from the nurse at the reception desk. For patients requiring assistance, the file was left on a shelf marked “X-Ray”. The porter collected the file and took the patient to the x-ray department. At Outpatients the medical practitioner handed over the file to the patient, who then proceeded to the x-ray department.

4.2.3.2 Upward referral

The route taken in an upward referral and the way in which access to diagnostic investigations was obtained depended on the situation or the problem the patient presented with. Figure 4-6 gives a graphic depiction of the various referral options for diagnostic investigations at the tertiary hospital. Diagram (a) of the figure demonstrates cases where the diagnostic investigation was done at the district hospital and the images were sent to the radiology department at the tertiary hospital for interpretation. Although this is not a common practice, for the study patients all diagnostic investigations received a radiological report. (See Section 3.4.1.)

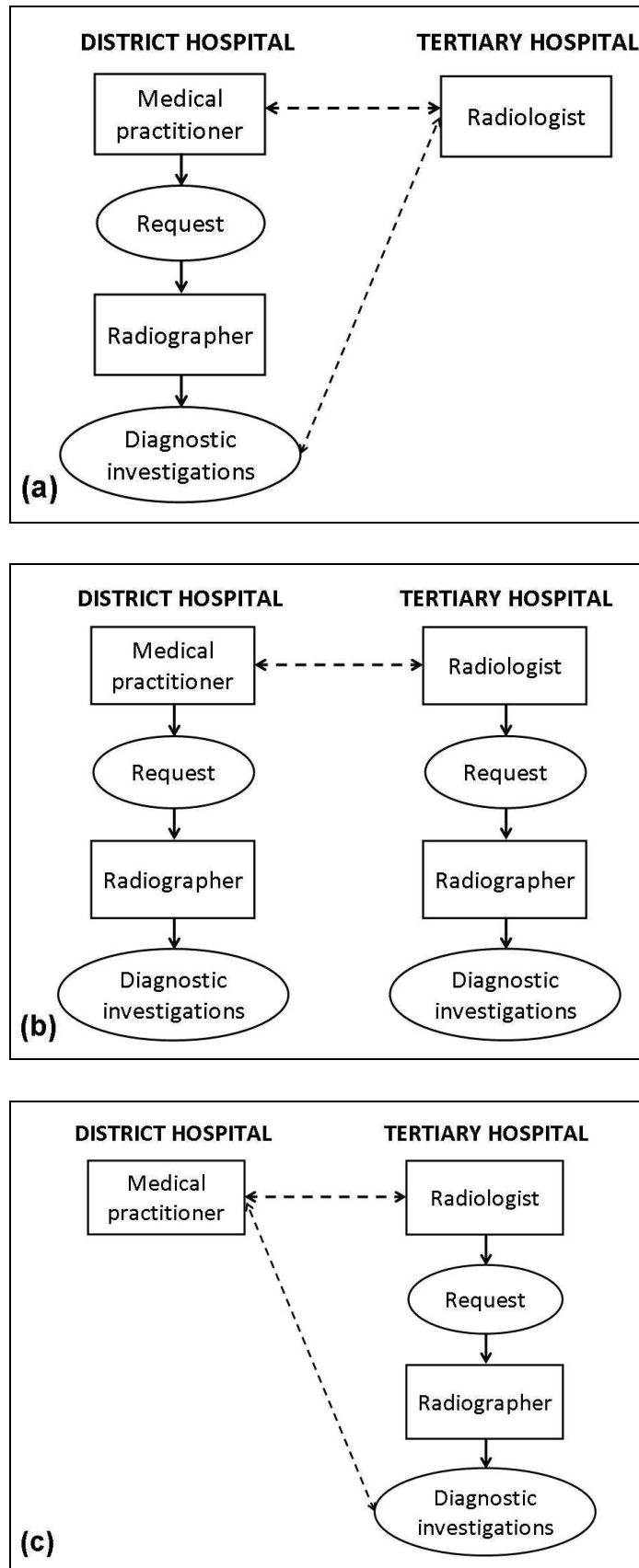


Figure 4-6. Specialised diagnostic referrals directly to the radiology department

Diagram (b) of the figure illustrates cases where diagnostic investigations were performed at both hospitals, with direct contact between the medical practitioner and the radiologist. Sometimes a patient was admitted at the district hospital and first had a general plain x-ray for instance, before being referred to the tertiary hospital for a CT scan or a duplex Doppler investigation for confirmation. Patient 8, with suspected deep vein thrombosis, was such a case in point. She was admitted at the district hospital and referred for a duplex Doppler investigation at the tertiary hospital for confirmation of the provisional diagnosis.

Diagram (c) of Figure 4-6 illustrates direct referrals for specialised modalities and investigations such as fluoroscopy, diagnostic ultrasound and a CT brain scan that could be done through a formal arrangement by the district hospital's medical practitioner with the radiologist or radiographer (e.g. mammography section) at the tertiary hospital. Patient 16 was a case referred for an abdominal sonar at the tertiary hospital.

A direct referral from a medical practitioner to a radiologist was not allowed in all cases and referrals sometimes had to be done via a field expert (specialist) (Figure 4-7). Three district hospital patients in the study (13, 17 and 18) were referred from Outpatients and one from Casualties (7) for an expert opinion at the tertiary hospital first, where they were then referred for diagnostic investigations, followed by further management and care at the tertiary level. At times it appeared as if the role of the field specialist at the tertiary level was more that of a

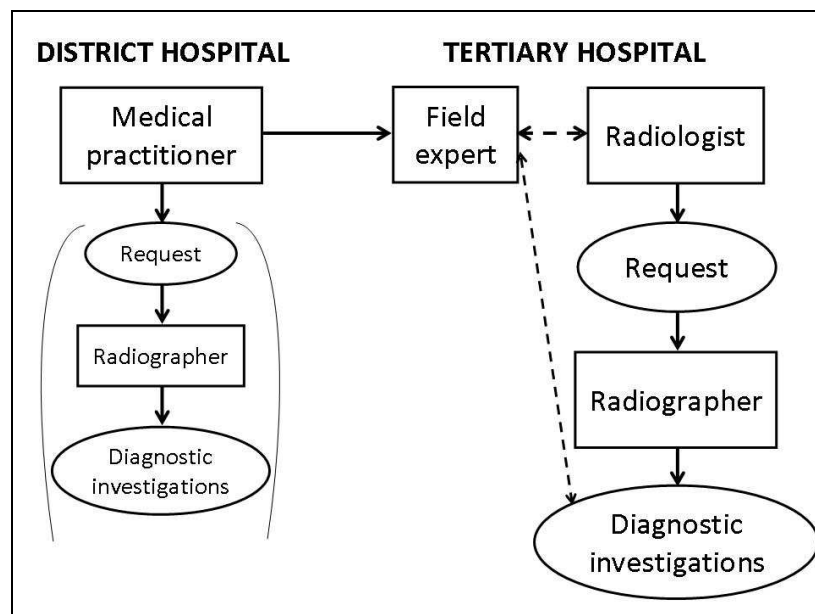


Figure 4-7. Sophisticated specialised diagnostic referrals via the field expert

mediator or gate keeper to authorise the referral to access imaging modalities from the district hospital. A typical example shared by a medical intern was of patients with cervical spine trauma who did not *“have to be seen by the specialist”* [CS24:427:16] before being referred for a CT scan. An orthopaedic surgeon was contacted to authorise the referral for a CT scan based on image interpretational findings. After the field expert had granted access to a radiologist, *“then we [at the district hospital] can phone the radiologist only”* [CS24:430:16]. A radiologist gave a dual-purpose reason for this approach. Firstly, it avoided unnecessary referrals and secondly, there was a logistic necessity for having an accountable person present at the tertiary site in case admission was required after radiological diagnosis. Some of the radiology registrars informally commented that a referral via a field expert was seen as a responsibility-taking mechanism for the patient in transition.

Immaterial of the category of the referral from the district to the tertiary hospital the patient had to be released from the district hospital. A form, “Application for Transfer” (Appendix K), was completed and transport arranged. A professional nurse, a referral letter and/or a request form accompanied the patient. This documentation is important for enabling continuity of quality care. According to Langelibalele et al. (2011: 486), the receiving doctor has to be well informed, otherwise there may be a need to “re-invent the wheel” through trial and error, which has an effect on cost and time.

From Outpatients the documentation accompanying the patient was a referral letter. One of the nurses at Casualties said that patients *“go with their x-rays”* [FGNP2:407:15]. At the tertiary hospital the patient re-registered and received the tertiary-level identification tag. Similar to the situation at the district hospital, each upward referral was regarded as a separate or new episode, despite the referral letter.

The most common systemic dilemma with upward referrals was the ripple effect when the tertiary hospital was under pressure. The reality was *“the time it takes to book the investigations”* [FGMP1:75:03], accompanied by human resource challenges that tended to spill over to the district hospital. One medical practitioner related how the cardiologist *“couldn’t take any more of our patients ... because they’re short of staff”* [FGMP1:99:04& 82:03]. Gibson’s (2001: 525) observations regarding district hospitals referring to regional hospitals also have relevance for reflecting on the implications of this case study, even though the district and tertiary hospitals were located on adjacent premises. He refers to the patient as being shifted to the in-between space to wait for unreliable and time-consuming transport where no therapeutic intervention occurred, the status quo was maintained, and only minimal resources were expended.

4.2.4 The x-ray department – the third point of contact

The referral for a diagnostic imaging investigation resulted in the third point of contact of the patient with health care providers as he or she journeyed through the system. This happened when the medical officer made the choice to refer the patient for a diagnostic imaging investigation. (See Figure 4-2.) Upon arrival at the x-ray department, depending on the availability of the x-room, the patient would sometimes be requested to sit in the cubicle or wait in the wheelchair or on the stretcher in the passage – “Ms, we are just waiting for a room” [CS5:285:12].

This point of contact involved three processes: firstly, information gathering and verification from the request form and the patient; secondly, the diagnostic investigation itself; and lastly, the interpretation of the quality of the investigation by the radiographer. In the process of information gathering and verification the patient was sometimes actively involved when the radiographer sought clarification on matters that were not complete on the request form. A typical example in the case of an incomplete request with no history was cited in one of the radiographer focus groups:

“They will ask for a chest and they will tell you, ‘It’s a rib fracture’. They’re actually looking for bony injuries. They just ask for chest; they don’t write anything. It’s my job to ask the patient what’s wrong. And they [the patients] will tell you, ‘I have a pain here.’ Then, you mos [obviously] know it is rib fracture.” [FGRAD03:26-32:02]

The process of information gathering and interpretation is described in more detail in Section 4.3. During the investigation itself patient cooperation was important to take projections that would result in images of adequate quality. Patient 17 required an open mouth projection, amongst other projections, of his cervical spine. This is how the radiographer interacted:

Observation	Interaction
Radiographer explains.	<i>“Okay, this one is a bit strange, because I ask you to open your mouth so that we can see the first vertebra. ... But I will tell you when.”</i>
Radiographer positions patient.	<i>“Just want to feel the back of your head.”</i>
Radiographer goes ahead and feels.	<i>“Keep your head like this and open your mouth.”</i>
Patient opens mouth. The radiographer appraises.	<i>“That’s it, perfect. Just hold it like that for me.”</i>
Radiographer stands back to go and	<i>“Say aaahh for me.”</i>

Observation

Interaction

expose and instructs.

Whilst patient is making the sound he moves the head and stops whilst the radiographer exposes.

"Okay, you can relax".

Patient closes mouth and radiographer views the image, is not satisfied and decides to do another one.

"I just want to get a better one. "

[CS17:792-808:29]

After completion of investigations patients were informed that the examination was complete or that a projection needed to be repeated (e.g. Patient 17). They were then left in the x-room or requested to go to the waiting room while the radiographer processed and interpreted the images. After completion of the image interpretation, and if the images had been acceptable, the patient was referred back to Casualties, Outpatients or the ward.

4.2.5 End of the patient's journey

The various options regarding the way a patient's journey ended are summarised in Figure 4-2. They included the following:

- (1) The consultation was concluded by the medical officer giving a debriefing of the clinical picture, sometimes followed by what had been diagnosed and an outline of the management strategy. Most doctors had a tendency to provide the information to the patient in a single approach. This is how the medical officer communicated with Patient 9:

"When I listen to your chest, it is clear. All over there are no signs of fluid or bleeding into the lungs when I palpate and I feel. But I can see there is a bruise where the stone hit you. So I am going to give you something for pain, send you with some medication home." [CS09:135-140:5]

Patients were sometimes warned upfront on what to expect, followed by a statement of reassurance – *"It is going to take some time, because it is a bony area and there are no fractures that I am worried about"* [CS09:140-143:5].

- (2) There was a downward or upward referral for further management, which would entail further points of contact for some patients' journey. Patients 7, 13, 17 and 18 were referred to the tertiary hospital for further management. In the case of Patient 8 the medical officer communicated to the patient the possible outcomes based on a

physiological test – *“It’s maybe cellulites”* [CS08:207:08]. This was followed by a vague interpretation of the clinical findings and single-benefit justification – *“I just did the test for the clot to see that the vein is not blocked and that test shows that it is not”* [CS08:208:08]. This was not in line with the clinical findings of a suspected deep vein thrombosis. The medical practitioner chose to do another test and based on that, it could implicate a referral upward for a diagnostic test or downward referral to the clinic:

“It is not deep vein thrombosis, so the other medical officer is just going [to] come, measure here [around the calf] and if it is bigger than two centimetres different, then we’re going to arrange for the Doppler anyway. So they [the radiologist] must see you. If it is not, then you have to follow it up with the clinic.” [CS08:210-214:33]

- (3) There was a referral to Outpatients. Patient 10, for example, was referred for follow-up after having been diagnosed with a fracture.
- (4) Patients were admitted for further observations or management before and or after a diagnostic investigation. Patient 8 described above was, for example, admitted for observation at the district hospital whilst awaiting her Doppler investigation.

4.2.6 Boundaries and interprofessional interactions affecting the patient’s journey

From observations there seemed to be two boundaries that impacted on the patient’s journey through the health system: professional boundaries embedded within the system and operational boundaries between the different levels of care. The professional boundaries were governed by the scope of practice of the various professional groupings, which tended to overlap with the system boundaries at the various levels of care. At the district setting the medical practitioner’s professional boundary at the request phase included plain radiographic investigations and stretched to referrals for specialised investigations such as fluoroscopic and diagnostic ultrasound investigations and CT brain scans, for which access would be granted via a formal arrangement with the radiologist. A further discussion on the permeability of professional boundaries is presented in Section 5.2.1.

System and operational boundaries are set by the “rules” and guidelines that govern the operation of the health system. The flexible interpretation of these boundaries results in the permeability or relaxation of boundaries. The system boundaries became more relaxed when the patient’s problem or situation was perceived as serious, even in the case of a normal radiograph. One example was the immediate access to the tertiary hospital for Patient 7

when a possible blocked shunt was identified from a normal abdominal image. On the other hand, system boundaries became tighter when it came to orthopaedic-related cases, especially when there were protocols involved regarding specific types of injuries. Delayed access to diagnostic investigations was observed in the case of Patient 8 with suspected deep vein thrombosis. The patient had to wait for a week in the medical ward at the district hospital before access could be granted for the referred diagnostic investigation.

A common experience of all providers was the financial boundaries and constraints, as a medical student remarked: *“There is no budget. So no need for special investigations right now. That also needs to be taken into account”* [CS07:185-190:8]. This corresponds with Gibson’s (2001: 519) description of “first layered approach of access to health services” aimed at cost-effectiveness and rational usage of available resources. Furthermore, inter-professional relations and interactions between providers were dependent on the characteristics, skill and competency level of individual providers, as well as the negotiated processes taking place within the framework of the institutional rules and regulations.

4.3 THE RADIOGRAPHER’S ROLE IN DIAGNOSTIC IMAGING INVESTIGATIONS AND INTERPRETATION

In the process of this study some insights came to the fore during the shadowing that could make the decision-making processes of radiographers more visible. The information in this section and subsections will also be helpful to understand the interactions between various professionals described in Chapter 5.

The diagnostic imaging investigation phase started with the interpretation of the request form, where the radiographer made the choice to accept or reject the request if needed or to modify it and continue with the investigation. The quality of the task to be performed was assessed against the quality of the request and whether the referring medical officer’s question was answered. For example, if the medical practitioner queries a fracture, ideally the radiographer must do the projections that will aid the doctor in answering whether there is pathology or not.

The approach prior to conducting an investigation varied between radiographers. Some radiographers collected the request form and proceeded to a work bench at the viewing station. Others scanned the request form at the reception desk, called for the patient and proceeded with the investigation. Interactions with patients at this stage are discussed in more detail in Section 7.2.1.

4.3.1 Information gathering and verification

Information gathering was initiated by the radiographer's interpretation of the request form. At this point of interpretation and confirmation regarding the request, the patient sometimes moved to and fro between providers in a virtual manner. Figure 4-8 gives a graphic depiction of movements and options. Step 1 in the diagram deals with the interpretation of the request form. An integral part of radiographer and radiologist task performance is to interpret the quality of communication (information provided) for the requested investigation itself and the interpretation thereof. A frequent challenge was to *"make out that word"* [CS4:187:7] – *"Sometimes you can't even read the handwriting"* [FGRAD1:139:5]. The radiographers tended to focus intensely on the history – *"History, I checked. It is chest pain, two days"* [CS4:186:7]. Another common challenge for both radiographers and radiologists was incomplete request forms. The quality of the request form as tool of communication is further discussed in Section 5.1.1.

After checking the patient history radiographers proceeded to draw a correlation between the request format and the history provided. At this point [step 2] the radiographer made a choice to accept, reject or modify the request. Information verification [step 3a] is an integral part in the planning of an investigation. At the same time it aids the radiographer in determining the number and type of projections (Larsson et al., 2009: 15). The value of medical records in planning the task at hand is access to patients' *"previous x-rays and it kind of like guides you on what you can do some times"* [CS06:414:15]. For example, in the case of follow-up x-rays, the investigation may be modified:

"[When] you do a forearm or something, you include both joints. But if you have previous x-rays then you don't have to include both joints, but only that part or even if it is not really pathology". [CS06:415-417:15]

Information verification also assists with establishing the exposure technique factors to determine the quality of the image. For instance, in the case of pathology, sometimes the exposure technique needs to be adapted. Then in the case of follow-up investigations it is important to maintain the standard of the quality of the image produced to compare with previous radiographs. This is governed, amongst other factors (e.g. the focus to film distance and positioning of the patient), by the exposure technique over which the radiographer has most control (Lam et al., 2004: 134; Moskowitz, 2010: 08). Precautionary measures have a positive outcome on the possible risk of exposing the patient unnecessarily to radiation. (See also Sections 5.1.2 and 5.1.3.) Patient 10 had a fracture of the 5th metatarsal of the foot that required follow-up radiographs to see if the fracture had healed. The radiographer saw the

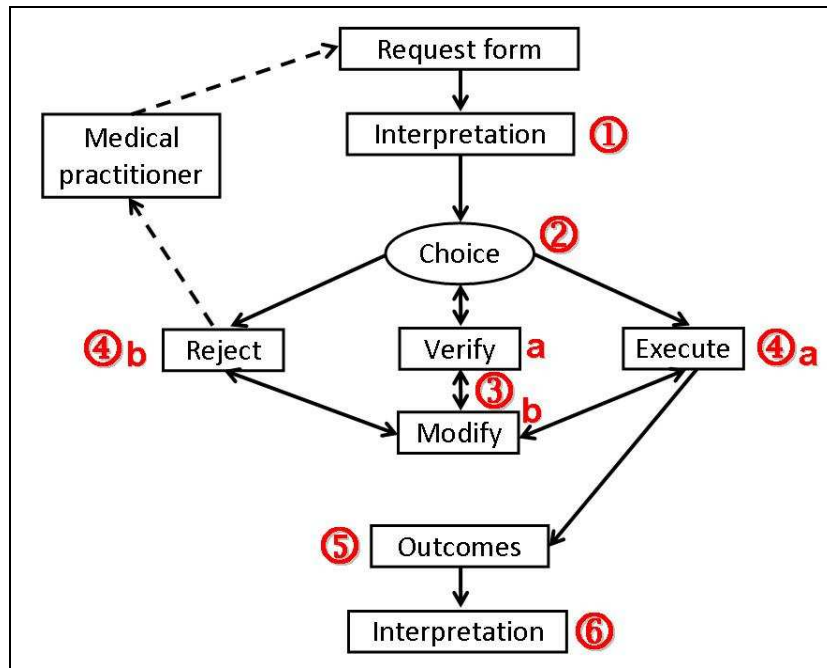


Figure 4-8. Processes involved in choice on task requested

follow-up radiographs after the investigation had been completed. Whilst viewing the previous radiographs, she commented that the previous image “shows it [the fracture] nice, but the quality of this [new] one is not good; it is a little bit light” [CS10:412-413:16].

The radiographer, therefore, verifies the information on the request form to come to a decision [step 3a in Figure 4-8], either by accepting it as is [step 3a] or by modifying it [step 3b]. If the request is accepted in its original form or when modified by the radiographer, the required projection(s) is/are executed [step 4a]. If the request is rejected [step 4b], often as a result of an incomplete request form, the request form is returned to the medical practitioner.

In the case of the patients accompanied to the x-ray department in this study the radiographers could most of the time resolve a non-correlation or a discrepancy on the request form by asking the patient and/or reading the medical records. This entailed the modification process depicted in Figure 4-8 as step 3b. Patient 5 was such a case, where the radiographer interpreted the history on the request form as “she has a cough and with white sputum ... Okay, so they need a chest x-ray” [CS05:249&251-255:11]. The decision was to accept the request and proceed with the investigation [step 4a].

Should verification from the request form or patient information fail, the choice at the district hospital was to verify with the medical officer. At the tertiary hospital the radiographer verified most often with the radiologist, the emergency medical officer or another specialist [step 3a].

According to Dhingsa et al. (2002: 136), radiologists or radiographers can seek additional information from the patients themselves or by contacting the general practitioner.

4.3.2 Diagnostic investigation

In the x-ray room the manner in which a radiographer approached the investigation depended a lot on the type of request and the patient status. Ideally the verification and confirmation of information regarding the history and correlation should be done prior to commencing a diagnostic investigation (Matthews and Brennan, 2008: 353; Dhingsa et al., 2002: 136). Most radiographers' decisions were based on the primary source of information, namely the request form. Radiographers and radiologists tended to trust the request and not to seek further verification. The most important secondary source of information was the patient. The information received was then interpreted and integrated with the required technique, which also depended on the skill or expertise of the radiographer to perform the task accurately. These task performance stages are graphically depicted in Figure 4-9.

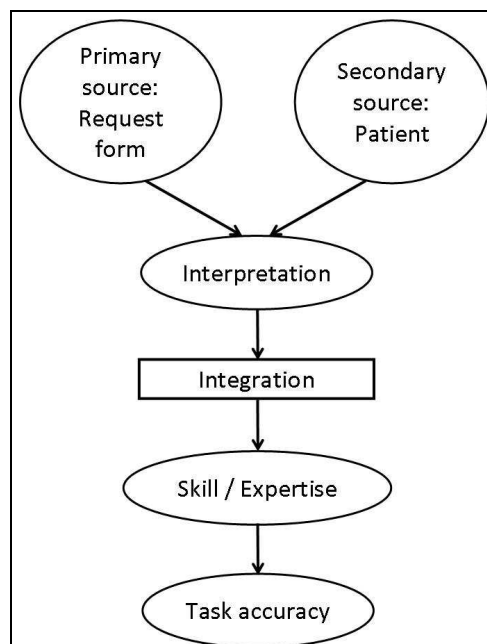


Figure 4-9. Task performance stages

Some radiographers prepared the equipment in the room prior to the patient entering, whilst others did so afterwards. The radiographers appeared to be highly task focused. There was little evidence of reassuring or orientating the patient on what to expect. This is further discussed in Section 7.2.2.

It was observed that radiographers manipulated the equipment to the selected field of interest by means of a collimation device that incorporated the direction of the central ray. Some radiographers provided additional protection devices for the patient. The radiographer would then go to the control panel, manipulate the pre-set exposure, if necessary, and expose. After an exposure the patient was asked to relax. The radiographer continued with positioning, manipulation and exposure until all the required projections were completed.

4.3.3 Diagnostic image interpretation

According to Matthews and Brennan (2008: 353), for plain film radiography the radiographer interprets the clinical information (on the request form) and seeks for further information from the patient or the referring prescriber if necessary. If the examination is justified, he or she decides which projections to perform and evaluates the resultant images, before releasing the patient from the imaging department. Ideally, image interpretation begins with the radiographer, then the radiologist, and lastly, the referring practitioner.

At the district hospital the interpretations of the radiographic images were conducted mainly at two points. The first point of interpretation took place at the x-ray department where the radiographers made an interpretation regarding the completeness of the projections requested or required and the quality of the images. The second phase was the interpretation of the x-rays by the medical officer at Casualties, Outpatients or in the wards. Their diagnostic image interpretation was an integral part of diagnosis, decision making, the plan of action and the management of the patient. A further interpretation took place if a patient had been referred to the tertiary hospital for specialist care or a special radiological investigation.

After completion of an investigation the radiographic images were processed with an analogue system at the district hospital and with a digital system at the tertiary hospital. Generally, part of the interpretational task involved interpreting the image(s) acquired from the projection(s) by confirming and integrating the information provided on the request form. Then a choice was made to conclude the task or to include an additional projection(s) to demonstrate the pathology better. The images were the outcomes as depicted as step 5 in Figure 4-8. The interpretation, which comprises the evaluation or assessment for image quality is step 6. Figure 4-10 gives a more detailed exposition of steps 5 and 6, and the way in which these outcomes were assessed until completion of the task.

Part of quality control is determining whether a **radiographic image is of optimal quality**. The film critique method is applied for thorough evaluation of the image, which forms an integral part of the decision-making process of whether the image is of optimal or suboptimal

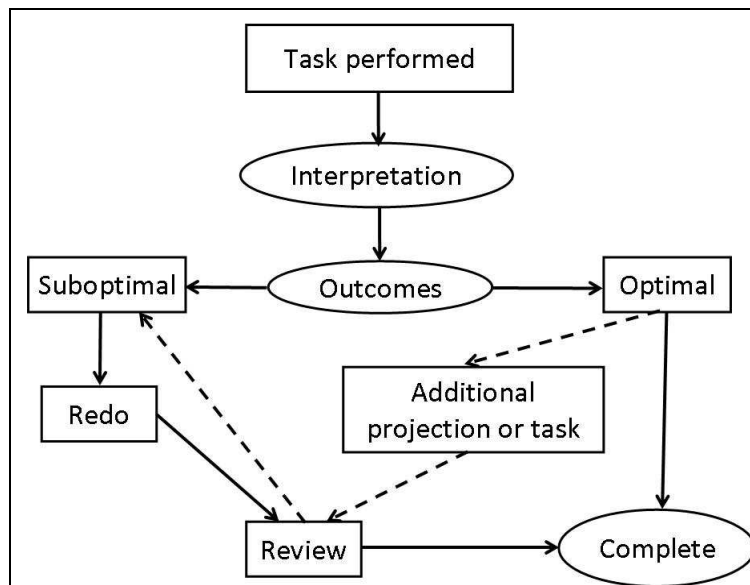


Figure 4-10. Quality control in radiographer interpretation

quality. The radiographer has to plan the imaging investigation in order to minimise the radiation exposure of the patient, while at the same time optimising the quality of the radiographic image. Part of obtaining an optimal quality radiograph is the exposure technique (Carlton and Adler, 2013: 465). From my observations it appeared as if decisions in determining an optimal exposure technique posed a challenge to most radiographers. At the time of the study there was little evidence of an established quality control programme, except for the analysis of reject films. Departmental protocols on the different types of examinations were also not observed. Due to the lack of structural guidelines, radiographers appeared to rely on their previous learning or work experiences to perform their task. One community-service radiographer for whom it was her first experience in a public setting stated the following when probed on her decision on the number projections to make in the case of Patient 4: *“As routine, we always had done PA [postero-anterior view] and lateral”* [CS04:189-190:7].

Two examples of image quality control in the interpretation process are provided here. Patient 6 was referred for skull radiographs as a result of multiple deep wound lacerations. The radiographer’s plan of action was to first do the *“standard projections ... Depending what I see on the PA and the lateral, you can decide to do additional views for the doctor”* [CS06:332:12]. After the interpretation a decision was made not to do an additional projection. Patient 4 was referred for chest radiographs due to hypochondrial pain. The routine projections PA and Lat(eral) were performed. The PA projection was suboptimal and the radiographer concluded, *“The patient is very rotated. I confirm she is not straight. I think I*

will have to go do this one again" [CS04:289-290:11]. The decision in this case was for the radiographs to be repeated.

Quality control also includes the **completeness of the task performed** with regard to the number (at least two projections at right angles) and additional projections needed to adequately demonstrate the pathology or a fracture (Lam et al., 2004: 133-134). A typical example of this was found for Patient 13 who had undergone a mammography investigation. The mammography projections were six in total in accordance with protocol at the tertiary hospital. It is compulsory to do comparison projections for interpretational purposes in order to pick up pathology (Setz-Pels et al., 2011: 358). In the focus groups radiographers also related how their own experience, often based on past evidence, influenced their decision to take additional projections. One such case mentioned was prior experience with high impact on the ankles that leads to a skilled decision to do an additional projection even before an interpretation is made – *"Let's just do a x-ray higher up"* [FGRAD3:271:11], because *"there is a fracture; ... most of the times that happens"* [FGRAD3:271:11].

If a radiologist was involved in an investigation, his or her role in terms of outcomes and interpretation was to compile *"accurate reports"* [FGRADL1:84:03], which is very much dependent on the appropriateness of the diagnostic investigation requested. The completeness of the information (inputs) required by the radiologist depended on the quality of the request form completion, the patient and the accuracy of task performed by the radiographer or radiologist. The adequacy or inadequacy of the inputs determined outcomes. (See Figure 4-11.)

Ideally the primary task of the radiographer is to interpret and make a judgment on the quality of the radiographic images for quality control purposes (Figure 4-10) (Hargreaves and Mackay, 2003: 284). My study confirmed that radiographers were the first to get a glimpse, *"the first to see the scans being done"* [CS18:2238:81]. With an analogue system the radiographer is supposed to mark any abnormal patterns observed on the image with a "red dot" to draw attention to the problem for the referring medical officer in the district hospital.

In the case studies several inconsistencies were observed. Some radiographers did not indicate the date of the examination on the request form and no one indicated the repeat radiographs or the size of films used. None of the patients in the study required contrast medium investigations.

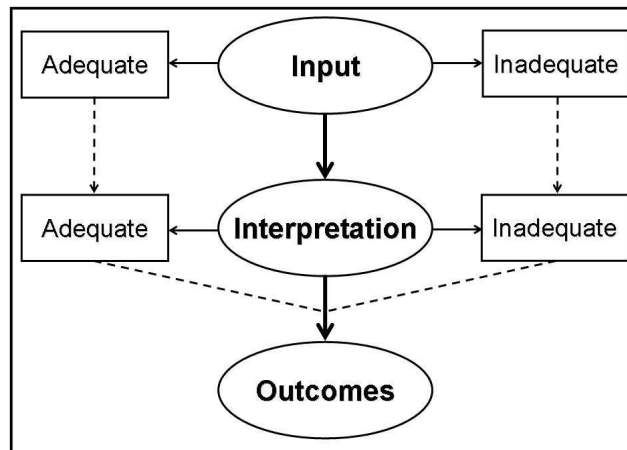


Figure 4-11. Representation of the effect of the quality of the request on the outcomes

4.4 CHAPTER SUMMARY

This chapter gave the description of the research scene. In addition to describing the physical hospital settings, a description was also given of the different points of contact of the patient with health care providers in the system and the procedures prescribed and processes taking place at each point. The discussion of the radiographer's role in the decision-making process was to provide the reader further insight. The information provided in this chapter sets the scene for the chapters to follow. The focus of the next chapter will be on the structural and organisational interactions between health care providers and how these could influence patient outcomes. Then there is a chapter on interprofessional interactions, followed by a chapter on the interactions between health care providers and patients. Finally, there will be a chapter describing patient perceptions and experiences of their journey through the health system.

Chapter 5

Structural and organisational interactions between health care providers

This chapter provides an in-depth view of the interactions between health care providers and their experience thereof at the various points in the patient's journey. It sets the scene with regard to the quality of the formal communications and interactions between health care professionals required by the health system in terms of coordinated patient care. The previous chapter provided the background to the possible routes of a patient's journey through the health system and the pathways of referral and interactions between different levels of care. This chapter is devoted to what we call "structural and organisational interactions", relating to interactions of health care providers with each other at the different points of contact with the patient.

In the previous chapter the vehicles of interaction between the different service points, such as request forms and other documentation, have already been described. This chapter pertains mainly to findings related to the quality of formal interactions between different points, from referral to investigation, to interpretation, outcomes and action. The focus in this chapter is on interactions according to "rules" of the system as expressed in protocols, transferred by word of mouth and through apprenticeship, or implicitly embedded in the organisational culture. From the observations it appeared as if many decisions were made according to institutional conventions that had, over time, been transferred verbally from experienced professionals to novices.

The request form was the main communication tool used throughout the system for diagnostic services. The justification for a referral was very much dependent on the quality of communication of the request (cf. Lam, et al. 2004: 133). The interpretation of this communiqué formed the basis of the patterns of interactions that emerged, not only between providers, but also between providers and patients. These interactions were either prior to, during or after an investigation. The request form also provided the basis for the radiographer and the radiologist to optimally perform their task. The interpretation and the quality of the task performed (the value or the worth) were judged in terms of benefit to both the referrer and the patient. Gaps in any of the above could impact on the quality of service delivered.

5.1 REFERRAL

A referral means seeking an opinion or a service required to enable a diagnosis. Coyle et al. (2011: 846) define a referral as the verbal or written direction of a patient to another service for treatment, aid, information or decision. Secondary care or indirect referrals – including referral for a diagnostic imaging investigation – take place when a patient needing the investigation does not have direct access to it. As has already been discussed in Chapter 4, a referral for a diagnostic imaging service had to be accompanied by a completed request document. In this section the vehicles of systemic communication such as the request form, as well as the reasons for referrals for diagnostic imaging, re-referrals and over-requesting are explored. All of these had a bearing on the quality of the investigation, interpretation, processing of information and the ultimate decision making with regard to diagnosis and management plan.

According to the literature, the referring doctor has the responsibility for the collection of all diagnostic information that justifies the requested radiological (radiography) examination, including information about previous exposures. The radiologist or radiographer can only justify an exposure if sufficient relevant clinical information is provided on the request form (Dhingsa et al., 2002:138; Triantopoulou et al., 2005: 306). An important observation I made at the initial consultation between patient and medical practitioner was the absence of written formal system protocols related to the way in which diagnostic imaging investigation referrals should be done, similar to the guidelines for Australia and Europe discussed in Section 2.1.2. There was also uncertainty regarding the types of conditions that may be referred to the tertiary hospital, especially when it came to cervical trauma patients. According to one of the medical practitioners, she was not sure as to *“what you’re allowed to and what you’re not allowed to refer”* [FGMP2:332:12]. Most of the referring practitioners were also sometimes faced with the uncertainty of which field expert or specialist should accept a patient – *“Should it be a cardiothoracic? Is it an internal medicinal case? They fight”* [FGMP3:420:15]. Croskerry (2005: R6) refers to this phenomenon as “a gradient of decision-making that parallels the degree of uncertainty associated with the wide variety of patient conditions”, as well as to the challenge of the uncertainty about the diagnosis and the inability to stage the disease and make a choice on treatment and management.

Radiologists and registrars confirmed the absence of such guidelines in informal conversations. This had a bearing on the quality of the request for diagnostic imaging investigations or examinations as was particularly evident in the request form. This often resulted in an over-requesting of imaging investigations and/or examinations and in re-referrals. Medical practi-

tioners also expressed the need for guidelines on what to look for if they had requested a specific investigation:

“But that is how we’re supposed to be working, with guidance on how to work. If I ask for sinuses, this is what I look for on sinuses. A protocol on chest, if I do a chest, this is what I look for. Otherwise at the end of the day it becomes a waste. You over-investigate; you don’t know what you are looking for.” [FGMP2:627-632:23]

Khan et al. (1998: 3) go a step further and state that in order to select imaging tests judiciously, the clinician must understand what each test can do and be fully knowledgeable about the limitations, also with regard to the available techniques. Malone et al. (2012: 535) also refer to the use of referral guidelines or appropriateness criteria as a good practice in the process of justification. A golden thread running through all the discussions with health professionals on referrals and requests for diagnostic imaging investigations and that will be referred to in the sections below, was the issue of radiation risks versus the benefits of an investigation.

5.1.1 The request form as medium of communication

As mentioned in Section 4.2.1.1(c), from a logistical system point of view, the request form was part of the patient records and an important component in the continuum and availability of patient information. According to Khan et al. (1998: 3), detailed case notes and a well-conceived, ordered list of differential diagnoses are the absolute minimum to include in any imaging request in order to ensure that the selected imaging is warranted and to improve the accuracy of reporting. In this study the completion of a request form entailed providing administrative and background information, as well as the investigations requested. (See Figure 4-1.) Administrative information included putting on the hospital identity tag, referring unit (Casualties or theatre), and method of transport (stretcher or wheelchair). On the request form there was also a section to be completed by the medical practitioner to indicate if the patient had had previous investigations. The background information entailed the patient’s history, detailed clinical information and diagnosis where possible (i.e. the real or suspected problem) that needed confirmation or verification. Then there was the actual request that indicated the modality (general or specialised), the body area of concern, the required projections and, where applicable, whether contrast medium was indicated. Medical practitioners were also required to provide details of the head of department, sign the form and provide their own contact details. A space was also provided for requesting a radiologist report. The provincial hospital request form did not make provision for date of the last menstrual period (LMP). If contrast medium administration was indicated, then the medical

practitioner had to acquire written consent from the patient or a legal guardian. The completed consent form accompanied the request form, should the patient be referred for diagnostic investigations.

5.1.1.1 Uses of the request form

Irrespective of the type of investigation and/or modality required, a formal request had to be made by completing a request form in triplicate.

One medical practitioner felt the request form *“plays a role research wise”* in that it could be used to estimate patterns of referrals and investigations and the use of resources – *“the budget to spare for certain investigations which are commonly done”*. He also suggested it to be a tool for monitoring the incidence and progress of pathology – *“increase in people who are interested in pathology; you can come up with a very good study. So in a month’s time you can see how many patients present with a particular type of pathology”*. At a strategic level, information on the utilisation of diagnostic investigations with regard to *“which departments are dependent on imaging”* was also perceived as useful. This data could be further refined to field-specific utilisation of diagnostic facilities, for instance *“the orthopaedics, they depend a lot on x-rays and neurosurgery depends a lot on CT scans”* [CS07:1228-1234:45].

In this study various communication pathways were observed for requesting a diagnostic investigation. The request form played a central role in all aspects of the systemic interaction processes. This was especially the case at the district hospital. Medical practitioners could communicate verbally to nurses at Casualties regarding other forms of investigations, but communication with radiographers was mainly through the request form, with rare telephone contact. The fact that the x-ray department was quite a distance away from Casualties posed an additional barrier to interprofessional communication between the medical practitioners and radiographers.

The request form served as the primary medium of communication (cf, Dhingra et al., 2002: 138) in the case of plain x-rays and certain specialised radiographic investigations such as fluoroscopic investigations. A decision by the radiographer to contact the referring practitioner would only be necessary if, for instance, there had been a discrepancy or non-correlation between the information on the request form and the information provided by the patient. (See also Figure 4-8.)

Access to specialised investigations such as angiography, magnetic resonance imaging (MRI) and computerised tomography (CT) scan investigations required a formal telephone

arrangement by the referring medical officer via a field specialist at the tertiary hospital for permission to make direct contact with a radiology registrar. (See also Section 4.2.3.2.) In such cases the request form was a secondary medium of communication.

From the viewpoint of a radiographer's scope of practice the request form served as a form of authorisation to perform an investigation – *"We're not allowed doing it [x-ray investigation] without x-ray forms"* [FGRAD2:435:16]. Radiographers would, therefore, refuse to do an investigation without a request form, because the information in the form served as medico-legal evidence. What became obvious in this study was the importance of the request form as a communication tool that was used more so by radiographers and medical practitioners than radiologists to convey messages to one another. Section 5.1.1.2 below gives a detailed account on the quality of request forms and how it affected radiographers' decision making.

Radiographers used the request forms to relay messages to the referring practitioner regarding incomplete forms. A medical intern shared an example of rejection of a referral by radiographers because of missing clinical information: *"They wanted clinical information. The one time I forgot to, they actually sent the patient back"* [FGMP1:336:13]. Radiographers also used the request form to relay messages about the decisions taken on multiple examinations requested, *"for like c/spine [cervical spine], left arm, right foot"* [FGMP1:340-342:15]. According to the same doctor, radiographers would *"come up and send you a note: 'So many x-rays not necessary.' And they only did the c/spine"* [FGMP1:342-345:15].

At both the district and tertiary hospitals professional undergraduate, postgraduate and intern training was taking place on an on-going basis and medical practitioners and students-in-training rotated and were reassigned at short intervals to various divisions within a particular institution or within a specific section of a department. Radiographers at the tertiary hospital claimed they had to continuously re-orientate the "newcomers" to the protocols, as no one else appeared to have orientated them on the process and procedures of requesting investigation(s). At the commencement of each new rotation of medical practitioners, radiographers found themselves explaining and informing the new group:

"What you need from them in order to get the whole process of the protocol in your department correct; get them in a rhythm, so that things can run smoothly. Otherwise there is confusion and I think some people have a misguided idea." [FGRAD2:48-53:05]

Although radiographers were mindful about the practitioners' multiple responsibilities some were quite vocal about the challenges imposed on them to get cooperation on the procedures to be followed:

"I think that it is already difficult for us to deal with the four or five doctors rotating every four weeks or every six weeks [or every] month within the orthopaedic firms. It's just like trying to get them into the rhythm. ... If you request the patient's x-rays from Casualty, you have to leave the form with the patient, you have to order the porters. Just to get that little nitty-gritty, little things into their heads on top of everything else that they have to [do] is difficult." [FGRAD2:1235-1245:45]

One radiographer also justified the approach radiographers were forced to use, *"because it's not like you're working in a team. Sometimes, ja, but most time, we just read the history and read what they're asking us to do"* [CS13:1063-1065:53].

5.1.1.2 Challenges of poor information

The above discussion referred to factors that influenced the quality of the request form. Although the completeness of this form was perceived to be essential – *"it is useless if they are not correctly filled"* [FGMP1:233:45] – a number of quality issues were identified that mainly related to absence of request forms, incompleteness, mismatches and discrepancies.

(a) Missing information

The amount of information on most request forms ranged from information on only the patient's hospital ID label to a mere request for an investigation such as a chest x-ray with or without some form of justification (history) for a request. Other missing pieces of information were the contact details of practitioners and the pregnancy status of the patient. A radiographer at the tertiary hospital recalled the following experience while on night duty:

"I came in at seven and neonatal ... ICU [intensive care unit] phoned. So I went up; it's very urgent. I must come for three babies. Normally they put their x-ray forms on the incubator light. So I get there. I see the three forms hanging. Nothing is filled in, no stickers.

So I went to the nurse. I am like, 'Is this the babies for x-rays?' She said, 'Yes'.

'The forms are not filled in, with no stickers. Isn't there a doctor here that can just fill in the forms? You say the x-rays is urgent.'

She said, 'No, the doctor just left.' I am like, 'Can you give me the hash [speed-dial number] and I will phone the doctor?'

No, she doesn't know who the doctor is. So I'm like, 'Okay, I am going down to level 4 again and if the doctor comes, fills in the x-ray form, I will come back.'

So I told the person in charge [at radiography] what happened and she is like, 'No it's fine; it is very busy'. When we just got back, I told her we did not do it because there was no x-rays forms. We're not allowed to do it without x-ray forms and she is like, 'No, it's fine'.

And then the doctor phoned and he was very rude to us. Why didn't we take the x-ray blah, blah, blah and the person in charge told him there was no x-ray form filled in. 'No one knew about the x-rays; there was no hash to call you or anything.'

So he is like, 'Ja, are you going to do the x-rays?'

So the person is like, 'Yes, fill in the x-ray forms, then we will do the neonatal x-rays.' ... and they just expect you to come, even if the form is not filled in.

And numerous times I went to a ward, there was no clinical history and then they give the answer, 'Why must we fill in the clinical history?'" [FGRAD2:420-444:16]

The minimal information radiographers routinely receive about their patients prior to taking a radiographic image has also been a finding in a study by Halkett et al. (2011: 56).

Although most medical practitioners in the cases that were shadowed signed the request form and included their contact details, radiologists and radiographers participating in the focus groups related experiences of missing details. They shared their frustration of not always being able to contact the referring medical practitioners when additional information was required about the patient – *"When it comes to referring doctors, [they] sometimes don't give enough details about themselves"* [FGRADL1:23:02]. This information became relevant especially when there were *"pending cases like a real emergency; we [radiologists] need to phone them back"* [FGRADL1:31:02]. Radiographers at the tertiary hospital also related on how they sometimes had to walk around to track the doctor down, especially on night duty: *"You have to go all the way to Casualties, look for the doctors. Sometimes you can't even read the handwriting who they are"* [FGRAD1:138:05]. At the district hospital a medical practitioner expressed her dilemma when she had tried to contact a radiographer: *"Their signature is on the x-ray form, but I can never read. I can never contact whoever I want to and that makes it difficult in a sense in this setting"* [FGMP3:152-154:06] (cf. also Dhingsa, 2002: 138).

The case of Patient 18 who was referred to the tertiary hospital for a CT scan of the sinuses clearly demonstrated the importance of contact details. The radiology registrar did not have any hash number of the referring otolaryngology registrar nor was any telephone extension provided on the request form. In this case confirmation was needed on whether a contrast medium had to be administered, as the radiology registrar was not sure if the referring doctor

suspected a tumour – *“I just wanted to make sure if there is a call for contrast and usually they don’t suspect a tumour, it is a polyp, because you want to differentiate between cancer, infection and the whole benign thing”* [CS18:1962:71]. This registrar was overcautious in the absence of sufficient information, an approach expressed by many study participants. Furthermore, the scan was supposed to have included the neck. Only the patient picked up that the neck scan had not been done.

(b) Poor and vague information

The information provided on the request form formed an important component in the justification of the request for a diagnostic investigation. From the radiologists’ and radiographers’ point of view this aided them in performing their task accurately. Poor and vague information often resulted in seeking justification, as this radiologist did: *“There must be a reason why they ask for the right elbow”* [CS22:384-390:15]. According to one senior family medicine consultant, ideally *“if you are worried about a peptic ulcer that is perforated, you need to write ‘query peptic ulcer perforation’”* [FGMP3:618-620:23]. This kind of input would enable the radiographer *“to make a decision about all the views, all the different positions”* [FGMP3:620-622:23].

Besides challenges on deciding on the projections to be done, radiographers also experienced challenges from a medico-legal perspective with an incomplete or absent history, as was the case with requests for routine chest x-rays in the intensive care unit. Radiographers were willing to do the x-rays – *“I know it’s routine, but it is still necessary for me to have the patient’s history before I do a x-ray of the patient because of the medico-legal implications”* [FGRAD1:94-97:4]. A radiologist also shared her concerns about justifications for those investigations:

“The problem is also when it comes to ICU patients, you find that the patient is done on a daily basis. Sometimes it is necessary; sometimes it tends not to be necessary. For instance, that a patient is intubated and the form comes the following day to say patient [is] post intubation, which was done the previous day, the same kind. So if they want something new, at least give us the proper history to say we found that clinically the patient has aspirated. So we want to determine now the level of the lungs, not just ‘intubated’.” [FGRADL1:186-196:7-8]

The need expressed by the radiologist in the excerpt above resonates with Croskerry’s (2005: R6) notion of situational awareness – knowing what has gone before, what is happening now, and anticipating what is coming now.

Besides the contact details, in terms of history both radiologists and radiographers experienced the following:

"Often we don't get a good history from the referring clinicians. Sometimes the history is not appropriate or it doesn't help us [radiologists] to come to a specific diagnosis. A lot of things are left out; often biochemical results are left out; things that we think are important. Sometimes they don't understand what we need and vice versa."
[FGRADL1:9-16:01]

Patient 22, for example, presented with an elbow injury. Whilst interpreting the radiographs, this is what the radiology registrar commented on the clinical information on the request form:

"The clinical, there is not much detail about it, whether he's got pain. The range of movement, it didn't state the range of movement or pain on turning the arm on rotation. So you know, that's not very specific." [CS22:384-389:15]

Vague clinical information posed constraints in the task performance of radiographers and radiologists. On interpretation of the cervical spine radiographs of Patient 16, a junior radiology registrar remarked:

"A history of MVA [motor vehicle accident]; so I am not sure whether this was screening x-rays or the patient had pain in the neck; whether the patient is unconscious or conscious, any history of clinical fall-out. Honestly, there is a lot of discrepancies in the referral." [CS16:1546-1550:56]

(c) Wrong information

Apart from the vague histories radiographers also cited the challenges experienced in terms of wrong information on the request form. Radiographers are required to verify the request, assess the situation in terms of the body part to be examined and make a judgment to do the projection required to demonstrate the affected part correctly. In a focus group a radiographer cited a case where *"the doctor requested for the left femur"*, but when she verified the side of pain with the patient, the patient allegedly indicated that *"the pain was on the right side"* [FGRAD3:81-84:03]. Another radiographer shared her dilemma about a requested investigation for *"facial bones"* that did not correlate with the patient's history of feeling *"a little bit sick"*. The radiographer went to the referring practitioner for verification and confirmation, whose response was: *"But now, what's the difference?" She asked me, 'What's the difference between facial bones and sinuses?'"* [FGRAD3:343-344:14].

Although radiographers are required to verify and assess each situation, they still need accurate information. One radiographer at the district hospital shared examples of calcaneus fractures and how the poor quality information on history could affect the integration into the bigger picture:

“Because sometimes the doctor will ask for an ankle, for example, it happens quite a lot here [at the district hospital] and then they don’t write anything. But if they wrote that the patient jump from a high building, then you know, okay, you just look into a calcaneus fracture. Lots of times that it has happened already that there was a calcaneus fracture, then you know as person that, okay, a high impact from that you jump from a high building or whatever. I have to do an extra view to show that to the doctor. Sometimes they don’t ask for that. So it’s important for us to know what is.”
[FGRAD3:16-32:02]

Wrong information also pertained to the investigation requested being the wrong investigation. This mismatch is further discussed in Section 5.2.2.

(d) Pregnant patients

One particular item on the request form that is important for women of child bearing age is the pregnancy status of the patient. In a focus group one of the senior family medicine consultants confessed:

“We even forget to ask them if they are pregnant a lot. I had a situation where the patient was sent back [by the radiographer] – ‘Doctor, the patient is six weeks pregnant. Can we still do the x-rays?’ ‘Sorry for that. I didn’t ask them [the patient].”
[FGMP3:800-803:29]

Another viewpoint was raised by another medical practitioner:

“Yes, you have to try and send them and then you have to cancel them and then you have to make them sign. It does happen and then the patient signs, unless, but with children I don’t know what the radiographers do?” [FGMP2:130-132:05]

According to the radiographers, it seemed as if medical practitioners were not prepared to take the responsibility of the risk involved in referring pregnant patients. They would rather have the radiographer make the decision and be held accountable, so that their good relation with the patient could be upheld. Radiographers at the district hospital had the following to say about protecting themselves when a pregnant woman was referred for diagnostic investigation:

"The pregnant females, we have between ourselves, make notes on the job cards [request form] too and let the patient sign next to it just to cover ourselves. We tell them about the complications and this can happen, what are the risk factors. What the doctor is going to view in this whole thing. Then we just let them sign ... also so that the doctor can see it." [FGRAD3:261-268:27]

A radiographer also related an incident of a pregnant patient referred for radiographs of her arm, where she contacted the referring practitioner:

"I'm like, 'I have a patient here. She is pregnant'.

He says, 'Oh really?'

[I go] like, 'Yes, didn't you fill in the form?'

'No, my assistant did it.'" [FGRAD2:855-860:31]

5.1.1.3 Reasons for the poor quality of information

In focus groups and individual interviews with medical practitioners at the district hospital the issue of incomplete information and a justification for a request was raised. One reason given was: *"One wants to write in detail, but because of time constraints, but one can understand the frustration on the other side"* [CS24:398-400:15]. Another practitioner said, *"There is a little bit, the space is not that much for us people who've got a huge handwriting"* [FGMP2:308-309:12].

Radiographers also came to the defence of the medical practitioners by stating that incomplete forms were not intentional – *"They feel they've got so many people to worry about, so much on their minds"* [FGRAD1:745:27]. Other reasons related to the medical practitioners' undergraduate training, because not all junior practitioners had insight in the purpose and relevance of information provided in the request form and the impact it had on the task performance of the radiographer as such.

According to a junior medical intern, providing a clinical history was a mere logistic exercise. From her experience at the tertiary hospital, *"every time you fill a request form, you just provide a clinical history, just in the habit of doing so. I don't know exactly"* [CS06:295:11]. This observation was confirmed in the focus groups with radiographers and radiologists – *"The history is inadequate, because the doctor who is referring or requesting the examination also not sure, does not have a clue what they're looking for"* [FGRADL1:66-70:03].

On the other hand, completing a request form properly was considered with high regard if *"a radiologist will look at the x-rays as well"* [FGMP3:612-613:22]. A senior family medicine

consultant admitted to this tendency and cited examples of inadequate histories in the cases of ankle fractures or peptic ulcers:

"I think the communication line is sometimes the problem. I don't think it will, but the request can give you a better indication what you really need. So I am wrong, I have used MVA and x-ray right ankle, but I think that's it. They don't need more, because I need to know if there is a ankle injury or ankle fracture. Don't worry about the rest. Like sometimes this case about the peptic ulcer I think it gives you a better idea. There's other examples, I can't think now, but there is lots of them." [FGMP3:614-623:23]

Apart from an incomplete history on the request from, radiologists also referred to a lack of skill and insight on *"particular views and formats to request"* [FGRADL1:157-158:06]. They saw one of the reasons for this gap that, *"it's [not] covered very much [at] the undergraduate level"* [FGRADL1:159-161:06] of medical training.

In addition to the absence of written protocols to guide junior doctors on referral (discussed in Section 5.1), it appeared as if there were no formal structures in place at the district hospital to orientate new medical interns on available and accessible categories of diagnostic imaging services. This reflected on the use of the request form and radiographic modalities requested. In the case of Patient 8, the intern commented as follows: *"I have to speak to one of the senior doctors [to find out] if we are capable of doing it here. I don't know if these doctors can"* [CS08:240-245:9]. A family medicine consultant trained abroad shared her views regarding her confidence to refer for diagnostic investigations at the district setting:

"Here it is as if I am sent into some deep dark hole, no idea what happens. ... I am very hesitant to send [patients] because I don't really know how much information you really need in order to help radiographers make their own sort of decisions." [CS16:593&596-598:22]

According to a neurosurgery registrar at the tertiary hospital,

"It get easier with time. Before as a medical officer you struggle to find your feet. You don't know what is really expected of you. You over-diagnose and tend to over-treat patients and [with] investigations you tend to go beyond the line. When you become registrar, you become more aware and you order appropriate investigations at the right time." [CS07:1260-1265:46]

The literature also refers to the way in which experienced clinicians perform better than novices in the face of uncertainty and are able to judge the value of x-rays based on their

knowledge (Espeland and Baerheim, 2003: 5; Baker, Lecouturier and Bond, 2005: 5; Croskerry, 2005: R2).

Radiologists, their registrars and radiographers reacted in different ways to the poor quality of request forms. Some seemed to be so accustomed to the system's processes and requests that they accepted request forms on face value and performed the requested procedures. Patient 8 is a good example of this practice. She was referred for a chest radiograph but with an identification and history of another patient. The incorrect identification was not picked up by the radiographer or the radiology registrar, and the researcher had to bring it to the attention of the registrar. In this study radiographers often accepted and trusted the request and performed the task(s) without questioning the quality of the completeness of the request. When Patient 1 was shadowed, the radiographer had this to say: *"I do not sometimes check for the patient what is going on"* [CS01:408:16]. My impression was that radiographers did the examinations any way because it was expected of them to do so.

Radiographers were frequently faced with system pressures, as medical students and nurses also requested investigations and filled out request forms. The radiographers indicated that if they had to send every patient back to the referring medical practitioner as a result of incomplete request forms the backlog would be too much. The complexity of the radiographer's decision making for accuracy of task performed is further explained in Section 5.2.2 below. Sometimes radiographers at the tertiary hospital would seek support from the radiologist in their effort to figure out what the referring doctor was looking for. Most times the radiologist would ask the radiographer to ask the patient for supplementary information. At the district hospital radiographers resorted to a form of triangulation by comparing information from different sources, namely the request form, the medical practitioner, the patient and/or the patient's records.

5.1.2 Over-requesting

Another important theme related to the quality of requests was over-requesting of diagnostic investigations. The *"head-to-toe"* [FGRAD3:65:03] investigations were an easy way to diagnose and to act, especially at Casualties in the district hospital. In one of the focus groups a senior family medicine consultant confirmed: *"I mean quick fix, sometimes I know of to convince the patients. I mean, let's rather do the x-ray; it's easier to do it than not to do it. That's also not right"* [FGMP2: 712-716:26].

X-rays may be requested for a number of different reasons. Confirmation of normality is often important in general practice to exclude or confirm a diagnosis. In this situation a negative result may be as important as a positive one (Durham and Mcleod, 1999: 212). On the other

hand, in this study quick-fix approaches and head-to-toe investigations were an easy way to diagnose and served as a form of reassurance that it was the right thing to do, a phenomenon that has also been reported in the international literature (Espeland and Baerheim, 2003: 5). Some medical practitioners lacked confidence; others were overcautious and afraid of missing something – *“You can sometimes miss stuff”* [CS24:279:11]. So for the practitioners it was seen as a benefit that would outweigh the risk – some went to the extent of requesting an investigation any way just to make sure. It was almost as if they did not trust their own judgment and relied on or preferred technological procedures to determine or confirm what they thought the solution to the problem was. The medical practitioner attending to Patient 1 told the researcher the following:

“So I am just going to send him for x-rays. ... and [I am] going to give him some analgesics, some medication. Check if there is any type of a fracture. When I feel his arm, it feels like a soft tissue injury. I just want to make sure there is no fracture.”
[CS01:141-148:26]

Winkens and Dinant (2002: 785) are of the opinion that requesting a diagnostic investigation is because of fear of missing an important diagnosis, a feeling of insecurity or a desire for opinions to be backed up by a positive test result.

Then there were also instances where a referral for a diagnostic imaging investigation was made without any physical examination – *“Like most of the cases, like emergency situations, doctors don’t even examine patients, they just send the patients to x-rays, so we can do all their clinical examination for them with the x-rays”* [FGRAD2:230-235:09]. This appeared to be occurring where protocols were verbally communicated to novice medical practitioners and/or where they did not exist in writing. (See Sections 5.1 and 5.1.1.1.) Despite budgetary constraints there was still a relative ease of access to plain diagnostic investigations.

While I was shadowing one of the patients at the district hospital, I observed the medical practitioner consulting with three patients at the same time. He asked each patient, *“Where is the pain?”* The patients gestured where the pain was and they were all sent for diagnostic imaging investigations straight away. A radiographer commented on this practice: *“The doctor just come and asks the patient: ‘Where is the pain?’ ‘I’ve got a headache.’ ‘You’ve got a headache – skull x-rays’”* [FGRAD3:110-120:8]. According to the radiographers at the district hospital, nursing professionals also decided on requests for x-rays:

“Especially some of the patients will tell you, ‘I haven’t even seen the doctor. The sister was attending to me, asking me what’s wrong. And then I end up being at x-

rays'. ... That's true. ... And then they ask us, 'Are we going to see a doctor?' I'm like, 'I don't know'." [FGRAD3:224-229:09]

Over-requesting was also common when there was a potential for referral from the district to the tertiary hospital, especially in the case of MVAs, even when multiple investigations were not clinically indicated. A senior family medicine consultant remarked the following in this regard:

"So maybe we do need some standard protocols of minimum standards for c/spine, this, the minimum views that we must do for [a] poly trauma patient. You must do c/spine, chest and ... But we haven't been told that; but it doesn't always work but I suppose. ... But in a serious poly trauma, what do they say? Hip, chest and ... pelvis, chest and c/spine, hips AP [antero-posterior] and c/spine lateral. You can do anything that you can in my opinion." [FGMP2:274-279:10]

According to Mendelson and Murray (2007: 5), the old paradigm of history taking, physical examination and provisional clinical diagnosis is being replaced by imaging investigations. Geneau et al. (2008: 7) refer to time management and patient overflow associated with less communication between patient and physician, which leads to medical uncertainty, and ultimately more referrals for investigations.

When it came to higher levels of care, the use of multiple investigations could be justified as a primary exclusion tool. Rigid protocols do not make provision for each individual case and may even lead to the delay of the patient's transition from the district to the tertiary hospital.

"I had a patient who had a bilateral calcaneus fracture [because he jumped out of the second storey window]. I referred him to ... [the tertiary] hospital and the orthopaedic surgeon did not want to accept him, unless we cleared his knees, back and hips. So I had to send him back to x-rays. It's probably screening, because clinically there was nothing wrong with him, but the doctor did not want to accept him. So the radiographer phoned me and said, 'There is nothing wrong with his' [knees, back and hips] and I understand that. But from my point of view, [I] have to refer him, because I am in charge of his treatment until he gets there [to the tertiary hospital]. I understand it's about x-rays and I understand that clinically it was not indicated. But with history of jumping out of the window, that is what they clear. They clear that calcaneus, ankles, knees, the back and the hips. I understand it makes it difficult for them [radiographers]. But they must understand from my point of view. I can't do anything else with the patient until they can help me out with the x-rays. We had a little bit of [a] tiff about why I wanted it and to say, that, ja, they can do it there [at the tertiary hospital]."

I agree with that, but still the specialist will not accept without the x- rays and that makes it difficult.” [FGMP3:286-310:11]

Whiting et al. (2007: 984) refer to the use of tests for triaging to determine whether to refer a patient for further testing. If initial tests suggest the possibility of a particular condition, more costly or invasive tests may be ordered for confirmation on the basis of the possible differential diagnoses. According to Pitman et al. (2009: 457), a failure of timely, appropriate clinical action following the test result can render the value of the entire process useless.

The differences in training of medical practitioners was another reason for the tendency to over-request. This links up with the discussion on the poor quality of requests due to perceived insufficient undergraduate training (Section 5.1.1.3). According to a senior family medicine consultant,

“If you expect something, always include the joint above and the joint below. That’s why they maybe do that, so maybe from that it’s not really a screening tool, it’s just to be complete. Because somebody have told them, a professor has told them, ‘If you’re worried about something, that’s the one way’. But again screening, in the same sense that they are taught by people in emergency medicine: if you’ve got a patient with a motor vehicle accident, you need to do a skull, a neck, and a chest- pelvis.” [FGMP3: 708-718:26]

Radiographers also commented on the risks following some of these multiple requests and were sometimes accused of not doing their job optimally. This is further discussed in Section 5.2.

In addition to being trained to request for multiple investigations, even in the absence of a clinical indication, some medical interns were trained to always request for comparative extremity investigations. On adults, *“we like to see two joints on two limbs”* [CS24:262:10]. The present system was perceived as limited due to budgetary constraints because radiographers tended to *“only do the affected limb”* [CS24:265:10]. This led to uncertainty with regard to accessibility of comparative projections and using the additional view(s) as a visual interpretation aid – *“So at times you’re scared to x-ray; it might be excessive. Here you want to keep it down”* [CS24:262-268:10].

Radiographers were also frustrated by the tendency to over-request.

“I am really disappointed at the kind of doctors that we have in this institution [the district hospital], even some of the so-called head doctors, senior doctors. I am particularly disappointed in them. You find that you’re running the most expensive

department. You see, in the institute we're trying to reduce the waste. We are trying to reduce the unnecessary radiation to the patient, but they don't do their part." [FGRAD3:110-118:05]

Radiographers were furthermore concerned with the attitude of medical practitioners with regard to the potential risk of radiation with over-requesting.

"They will request, over-request examinations. They keep sending their patients for x-rays because it [the radiation risk] doesn't bug them. ... Because they themselves will not be exposed to radiation for the patient" [FGRAD1:424:16] – "It is for themselves, not for their patients" [FGRAD1:422:16].

5.1.3 Re-referrals

Re-referrals can have different meanings in different sections of the health system. For this study the term was interpreted from a diagnostic imaging perspective. Re-referrals can entail any of the following: a re-request of the same examination, with or without additional projections; or a request for a totally new examination, either at the district or the tertiary hospital. Some re-referrals are justified and others not. A variety of reasons for re-referrals were observed in this study. They could be classified as three overlapping themes on quality issues related to technology, people and the health system. People issues relate to the motivation of referrers (medical practitioners, nurses, medical students).

5.1.3.1 The re-referrers in the eyes of the radiographers

In the previous section on over-requesting reference was made to medical practitioners requesting investigations (and re-requesting investigations) just to make sure. Categories that emerged in this theme relate to the re-referrers' uncertainty on what to look for or lack of confidence in own clinical interpretation skills. This also relates to inadequate training in requesting and image interpretation skills that could lead to re-referrals – *"I haven't worked for a long time and I don't think I have the experience, but I have the need to know more about radiology. I am really not comfortable looking at any x-ray"* [FGMP1:1335:39].

The radiographers were very vocal in the focus groups on what they perceived to be the inadequate skills of some medical practitioners with regard to requesting investigations, together with the completeness of request forms. (See also Section 5.1.1.2.) One radiographer described the multiple facets of requesting at the tertiary hospital as follows:

"So you phone them, 'Doctor, there was a x-ray done three o'clock. Why do you want another x-ray at 4 o'clock again?' If they don't write why they want it, we can't sniff

out. ... And we don't have time phoning [for] each doctor's form and following up what we should do. And if we send the patient back because maybe why he didn't refresh his [computer] system, so he didn't see the previous x-rays. Then he phones us in a terrible mood. Why didn't we do the next x-ray he asked for? And then he didn't write his hash. So we couldn't communicate with them back to ask." [FGRAD2:392-410:15]

The ability of some medical practitioners to determine the order in which diagnostic imaging modalities should be requested also came under scrutiny. In a radiographer focus group one example cited for the tertiary hospital was about an uncooperative patient who first had a CT scan investigation before being referred for a plain radiographic examination instead of the other way around. The radiographer declined the investigation and got a very hostile reaction.

"One of the doctors at Casualties, he wanted cervical spine and he wanted obliques of the cervical spine. In Casualty he wanted a pelvis to the big toe. We did the best that we could. We got a AP and a lateral, just, and we did the pelvis and the AP of the foot and then we realised that he had to be scanned for his head and his neck. So we go back to the [x-ray] department, it's like two o'clock in the morning. We said, 'We're not going to do anything more. This is it'. Because they have got the scan; they have the pelvis; they have got the foot, that's it. So we go back to the department.

Two minutes later the doctor phones, has this huge fit over the phone. Like, 'Why didn't you do the obliques? Why didn't you do this?' We said, 'Because it is not necessary. You have got the scan. We did the AP and the lateral on a patient that is not cooperative, not sedated. He doesn't have a collar on, nothing like that. We did the best we could. I don't think the rest is necessary.' Few minutes later he storms into the department and he was yelling like, 'Who the hell do you think you are to tell me how to do my job? And if my registrar wants to see this, you will do this!'" [FGRAD2:1345-1368:53]

The radiographers at both the district and tertiary hospitals were of the view that there could be sub-optimal care where practitioners lacked the knowledge on the most appropriate imaging modality of choice and sensitivity towards radiation risk, to assist them in making the diagnosis. There was an expectation that a diagnostic image would reveal the diagnosis.

"And I just wanted to say that patients get sent here, ten o'clock, eleven o'clock and they had x-rays already but the doctor says, they can't put a diagnosis on the x-ray because it is inadequate. ... And that means we just expose the patient over and over again and it's unnecessary, because maybe that x-rays is sufficient enough. But

according to them, I don't know what their mentality is. So we're sitting there, so they will give us work, but not even. It's more workload on us, but also more exposure to the patient and they don't realise that." [FGRAD2:590-595:22]

Although a re-referral for a new investigation could be justified for investigating or confirming suspected pathology, unnecessary re-referrals also occurred in this regard. A classical example was Patient 7 who was referred for chest radiographs at the district hospital with a history of right hypochondriac pain on the request form. No mention was made of speculation of gall stones. Upon telephone contact the patient informed the researcher about the possible gall stones that the medical student had informed him about. However, the radiographer did chest and abdominal radiographs after the patient had queried what examination had been requested by the medical student in training. The patient took it upon himself to explain to the radiographer where the pain was. Upon interpretation of the unrequested abdominal radiograph the referring medical student and a senior medical officer came to a diagnosis of a possible blocked shunt. The patient was then referred to the tertiary hospital for further management where a decision was taken to refer for a brain CT and, thereafter an ultrasound investigation and another abdominal radiograph. The attending radiology registrar was unaware of the existence of the first set of chest and abdominal radiographs.

"Initially, based on my first conversation I had with the neurosurgeon there was no mention made of the abdominal symptoms. The neurosurgeon say the patient was presenting with some nausea and vomiting and he was worried as it is due to secondary raised intracranial pressure from a shunt being blocked. And I think that is what the patient was referred to him for and the only way to exclude that is by CT brain. And there is not another investigation to exclude that, so that was appropriate. And following with a ultrasound is a cost effective way of investigation. So that was appropriate as well, to do the ultrasound. I saw later on that there was a abdominal x-ray also performed. But [I] think that was after my shift, which was also appropriate. The imaging investigation that can be used is a CT abdomen and a pelvis. It is little bit more cost cumbersome if the ultrasound examination was inconclusive. We would have gone to do a CT to see what [the] real cause of the pain was." [CS07:810-825:30]

According to radiographers, lack of proper communication between medical practitioners at the handover of shifts also led to re-referrals, especially at the tertiary hospital.

"I remember the other time I had a patient that was done previously. So he came round about at eleven and they still want a pelvis, which was done at night. So I am

like, 'I didn't know the patient had x-rays already'. They just wrote querying fracture of the pelvis. So I put the patient on the bed.

And like the patient asked, 'What are you going to do now?'

Like, 'I am going to do a pelvis'.

He is like, 'No, they did that earlier on. Now I am not having another x-ray done.'

I am like, 'Okay, I don't know. Let me just call the doctor and find out.' I phone the doctor.

The doctor is like, 'No, I didn't see the x-ray. The x-ray is not done' and stuff like that. And when I went back to the patient to explain, 'The doctor didn't know you had a x-ray done.'

Ja, you see, that's the thing you see. The one was working during the night, went home. Now [there] is another one. Now they're not communicating at all. So if the patient didn't understand, like I could have radiated the patient again, just because he knows I just had that." [FGRAD2:748-763:27]

5.1.3.2 People and technology

The interplay between human error and challenges of technology also led to re-referrals. A digital imaging system was in place at the tertiary hospital. However, medical practitioners were sometimes unable to determine whether any diagnostic investigations had already been done on the patients, as they had forgotten to use the refresher button on the computer. Examples were shared in the focus group interviews of a medical practitioner referring a patient back to radiology because the radiographs had allegedly not been done.

People and technology also interacted strongly when it came to issues of quality diagnostic images. Different professions had different backgrounds in the interpretation of images and there were mutual accusations of incompetence. In the focus groups, medical practitioners at the district hospital articulated their perceptions on radiographers' task performance and the consequences of turning the patient into a messenger.

"Here it is a lot to do with the sending back and forth of patients to the radiographers. Because they're not doing the right views. So we're shunting the patients. Writing long stories on the forms ... which is a little argument going on." [FGMP1:295-302:11]

A medical officer reported sifting through and selecting the good from the bad: *"I sort out the bad x-rays, x-ray incompetent, [and] do another x-ray. And not all x-rays are good, because they know you're going to send the patient back again" [FGMP1:418-420:15].*

Patient 24 had her radiographs taken and was referred back to Casualties. The intern who took over the case from the medical officer – who had to go to theatre – viewed a set of radiographs. The patient was re-referred to the x-ray department because, according to the intern, the examination was incomplete. The request form stated the following:

“Patient involved MVA – tib[ia] / fib[ula] bilateral pain swelling. Patient handed over to me – last x-ray = only one joint view. Not comfortable sending patient home without seeing distal tib/fib views. Any queries feel free to contact me.” [CS24:125-129:05]

The attending senior radiographer discovered the radiographs of other projections in the envelope, which the intern did not see. The radiographer then said:

“Ja, the doctor wants us to redo the lower part but we have x-rayed the lower part; it's inside the envelope. The doctor didn't open the envelope. The doctor never checked why to see what is in there. ...Yes, I phoned him, I told him, 'Next time, open the envelope as wide as you can because there are so many different sizes of films.' He just took out the long ones, then the small one[s] are right inside.” [CS24:139-147:05-06]

Then the senior radiographer requested a junior radiographer to go with the patient back to Casualties. At Casualties the medical intern apologised and was now asking the radiographer about another request. The intern's comment after the interaction was as follows:

“Oh well, that's just because she's moaned before that I do too many x-rays. So I was just clearing with her. So that she is not going to moan and send the patient back. But the patients, we get a lot of MVAs and then it's pretty severe trauma. So we want to do x-rays, but budget constraints and time constraints. So now it's going to take about two hours to do all the x-rays, so that what I was just clearing with her.” [CS24:3170-324:12]

After the doctor's feedback, this is what the junior radiographer had to say: *“He must come to me, I will teach him if he does not know”* [CS24:169-170:05].

One of the district hospital medical officers judged radiographers' interpretational skills on one individual radiographer's decision making regarding the quality of radiographic images:

“There is the one guy who works here, you can't trust his x-rays because he does not even look at his x-rays. And what if he was the guy who has to make the diagnosis? So it is a very individual [thing] and he has to put the stickers [red dots] on and he will put stickers everywhere, that's worse.” [FGMP1:1122-1126:41]

In the shadowing of patients it was also observed that some radiographers were not very competent in judging the quality of images. Examples are provided in Section 5.2.3.

It could be argued that the digital system in the tertiary hospital discouraged the use of images produced by the traditional analogue system. One radiographer at the tertiary hospital did not view all the images acquired by the analogue system to be useless:

"It's not bad. Sometimes we get a little bit of a shock from R [another district hospital] or wherever the patient comes from. It's, I can't say that every time we look at [the x-rays] it's bad. So I don't think we can say that it is fine. It's, we're used to the digital quality, which is quite nice and all the x-rays are, we can see the skin and the bone and all the different densities. With conventional it is sometimes not like that, but it's still not unacceptable". [CS13:1245-1250:45]

The radiographer further elaborated on a mechanism to overcome the preference for digitally acquired images, namely to upload the images of acceptable quality, so that the patient would benefit by not being exposed unnecessarily to an extra radiation dose.

"If the x-rays were done at [the district hospital], we don't do it again. It's already done. If they want us to put it on the system, we can and digitise on Monday morning. We don't do the x-rays again because it's not on our system, because it is not good for the patient. It is not necessary for that little baby to have another chest. You can digitise it Monday morning and that happens a lot." [CS13:1118-1123:45]

In a medical practitioner focus group the decision on whether to first refer patients for plain x-ray investigations at the district hospital before referral to a higher level of care was discussed. According to one practitioner, the issue was that certain specialties required of them to do the plain investigation before accepting a referred patient. (See Section 5.1.2 on over-requesting). For him the situation of the patient mattered most and should be weighed up against time constraints and the radiation risk.

"On the other side [at the tertiary hospital], most of the time they repeat. When we work there it's because of poor quality of whatever. They insist they want it on a computer system. If the surgeon is prepared to take the patient without x-rays, I will send the patient. It is very much quicker than sending someone in excruciating pain to our radiology [radiography] department, then wait for it [the x-rays] come back and then arrange a transfer. It takes just too long, I think." [FGMP2: 46-54:02]

One of the radiology registrars also raised concerns about the frequency of referrals for CT brain scans for patients with neurological symptoms. Another registrar defended the situation by saying it was a catch 22 situation when it came to weighing up risks versus benefits.

“As clinicians we should do that, always watch that the radiation dose is not too high. But there are patients in this hospital that get brain scans every two or three days, because we need it. I mean, you worry because there are reports coming out from the UK [United Kingdom] where just one brain scan in the child can predispose that child to blood cancer or neuro-cancer. Overseas [they] are moving another way, but with us here it is still very [high]. One should have as an additive thing on the PACS [picture archiving and communication system] or something, I don’t know. ... I think it’s difficult for the physician. It’s like you have a patient; [you’re] responsible for trying to get that patient well. And you need the information by exposing the patient to radiation. It’s a catch 22 situation; you need to do potential harm to your patient to help get them better.” [FGRADL1:770-793:29]

From the data it was unclear to what extent the existence of two different systems of acquiring images in the two hospitals impacted on re-referrals due to poor quality radiographic images. In this study a justification for repeating an investigation was rather based on a practice of anatomic re-investigation for all patients referred from elsewhere, including from the district hospital, even before the advent of a digital system at the tertiary hospital. A consideration of radiation risk was a lesser priority.

5.1.3.3 People and the health system

The third theme regarding re-referrals relates to the health system and the interplay between system protocols and hospital system factors. Professional participants particularly highlighted the question of the validity of investigations from other institutions, possible changes in the clinical condition of the patient that would justify the duplication of a diagnostic work-up and a re-referral for diagnostic investigations. Two medical practitioners discussed this issue in one of the focus groups at the district hospital and concluded that one of the major stumbling blocks was the absence of protocols. The first practitioner felt the reality was the inaccessibility of images done at other institutions.

“I don’t know what the chances are of getting the special investigations here from [another tertiary hospital]. You cannot hope that it will show. So if clinically indicated you have to do it again. What else will you do if the patient has the x-rays that wouldn’t help you?” [FGMP2:596-600:22]

The second practitioner felt the documentation, medical records and reports of the CT scan may help, but only *“if you got the CT scan report and everything”* [FGMP2:604:22]. Practitioner one on the other hand, justified the need to repeat anyway:

“Ja, then you don’t. But if they bring the x-rays every time, even then, if it is old and it is not clinically representative or the clinical conditions have changed, you have to do it again. That is not duplication, but you’re re-evaluating.” [FGMP2:608-612:23]

The debate then went on about the validity of information versus trust – what you see on the paper and whether there is a signature and qualification.

“Well, isn’t it valid if the signature of the doctor is there with his qualifications and everything? You suppose, depending on how long ago these investigations have been done and the clinical feature of the patient as in now.” [FGMP2:614-617:23]

But the reality, according to another practitioner, is the following:

“If you question the validity, but you don’t, then it’s fine. But of course a lot of investigations are over-done because of uncertainty. If you are uncertain then you will do everything, hoping [to] show that those things will come back positively. I mean, that is, we need a protocol; that is where I get the nick name of Doctor Protocol. But that is how we’re supposed to be working with guidance on how to work.” [FGMP2:619-627:23]

This confirms Hendee et al.’s (2010: 244) contention that a definitive diagnosis of a patient’s condition is sometimes challenging and may require additional, unrewarding imaging examinations in an attempt to improve the certainty of the diagnosis.

Besides the duplication of diagnostic work-ups, there was also the issue of accessibility to previous diagnostic investigations done within the same institution. One medical officer’s frustration has already been quoted in Section 4.1.2.3:

“Getting the old x-rays, the old investigations, I mean, it’s got to a point where I trust the patients to keep their own x-rays and bring them back with you next time. Otherwise you can never get old x-rays to compare, it’s impossible.” [FGMP1:133-138:05]

According to Langelibalele et al. (2011: 483), patients rely on referring doctors to provide information on the management aspect prior to the referral. Lack of records in this regard could lead to a re-referral for duplication of diagnostic imaging investigations at the receiving health care institution.

The issue of multiple referrals with a single extended request seemed to be a frequent occurrence. From the above discussion it emerged that re-referrals of patients were quite a complex issue. The system structures, together with people's attitudes and behaviour, played a significant role in the decision making of the to- and fro-movement of the patient through the system. From the provider's side it related to the issue of trust and the impact of trust or distrust on the communication between the various role players within the system. This seemed to result in interprofessional conflict regarding accuracy and trust on the quality of tasks performed by radiographers.

5.1.4 Conclusion on referrals

From a referral perspective of a diagnostic imaging investigation at the juncture of the doctor-patient consultation on the one hand and then the expected service required from the radiographers and radiologists to perform their task effectively, the request form was the central point where information was integrated. Various types of decisions were made between the various professions. There appears to be a direct relation between the quality of the request form completion and the extent of over-requesting and re-referrals. The quality of the information on the request form determined the radiographers' approach to performing their tasks in view of the expected answer to the patients' problem or situation. The quality of the radiographers' task performance again impacted on the doctor-patient consultation and the decision-making processes regarding the diagnostic outcomes. A further analysis is given in Sections 6.2.2, 7.1 and 7.2 on the relations and interactions between the various providers and patients.

5.2 INVESTIGATIONS

A poor quality request form had an influence on the quality of an investigation. Radiographers and radiologists were unsure if they had answered the medical practitioner's concern or what he or she had been looking for. From the diagnostic imaging perspective this often resulted in the medical provider's scrutiny at the point of referral, which could undermine the integrity of the radiographers and radiologists. From a medical practitioner's point of view there were questions regarding the competency and professionalism of radiographers and radiologists in terms of the quality of the investigation performed. This may have had an impact on the medical provider's management strategy and the desired patient care outcomes.

The main themes around systemic interactions at the point of diagnostic imaging investigations emerging from this study were: issues related to access to investigations; complexities

of investigations, especially from a radiographer's perspective of the quality control of images; and the absence of written guidelines and protocols for examinations.

5.2.1 Access to imaging investigations

Getting access to certain modalities of imaging followed a different pathway in the public sector than in the private sector. In the public sector access to some imaging modalities used in specialised investigations entailed building up evidence through a graded referral from the most basic to the most sophisticated modalities based on clinical decision making. In most instances a referral was also required to move from one level of care to the next, depending on the availability of specialists and technologies (cf. Geneau et al., 2008: 2, 6). This is in contrast to the private sector where financial incentives for the provider via payments by medical aids provide much easier access to a range of modalities (Gibson, 2001: 522).

At the district hospital the perceived *"bureaucratic system"* [CS11:588-594:22] of the tertiary hospital posed more of an obstacle in the decision-making process on referrals to a higher level of care and accessibility to a quality radiological expert opinion. District hospital medical practitioners also felt that medical officers at the tertiary hospital had easier access to specialised expert opinion and modalities compared to what they had. This is how one medical officer saw the situation:

"It looks like a mass on the x-ray. They won't allow us to do a lung scan for those patients. They will say, you have to treat the patients with antibiotics first for six weeks and repeat that. Then I had cases like that after six weeks, the patient is seen by another doctor. After four months the mass [is] actually bigger." [CS11:578-583:21]

The reality at the tertiary hospital was that access to certain modalities was also restricted in terms of a step-by-step process prescribed by the system. This process did not necessarily correspond with the ideal of making an accurate diagnosis by means of direct access to the modality most appropriate to provide an answer. An orthopaedic registrar had the following to share in the case of Patient 17:

"You're wondering, why we are not doing a CT scan. Ag, you know, CT scan and MRIs are specialised treatments. It's quite expensive. I think a CT scan is what, seven, six thousand rand there [in the private sector]; MRIs are around 10, if I'm not mistaken, those expensive things. Our protocol is to start off with basic examinations. If we get something and we are stuck, you feel you want to get further investigations, then we do the next step. But in his case I do not feel it's necessary, indicated to do a CT scan. It's not going to show me anything more. If anything in private, I would have

liked to do an MRI on this guy, just to visualise the nerve roots and the spinal canal stenosis and prolapse of the disc. It would have been perfect from [a] private specialist; I would do that for him. I could give him a clear answer. Unfortunately in this case we cannot do it with all our patients. So we follow him up, if he still has these pains and symptoms, he is going to go to the Spinal Outpatients, where the spinal consultants are and they will send him for MRI. The thing is, you do MRI if you want to plan surgery. So we, I do MRI now. Basically I am telling myself, I want to operate this guy and in private [it] is as easy, as quick thing, you know. You go for the top, the apex investigation, in private, because the medical aid pays it. So unfortunately [with] the government, our hands are a bit tight.” [CS17:1171-1199:43]

The approach explained in the excerpt above relates to Khan et al.’s (1998: 3) view that the more expensive tests are not necessarily the most appropriate for a given clinical situation.

A typical example of accessibility was the mammography investigation. At the district hospital medical officers were unable to refer directly as their counterparts did in the private sector. They had to go through the system’s prescribed step-by-step process – *“It’s just not straight mammogram. It is first a physical examination, fine needle aspiration, a biopsy and then a mammogram”* [FGMP2:544-548:26].

At the district hospital the boundaries of the step-by-step process seemed to become blurred in some instances, with accessibility based on who knew whom and who was working when and where at the tertiary hospital. One family medicine physician shared her success in accessing the relevant specialised modalities:

“Well, [what] I have done many times is I walk with the x-rays to the radiology department at [the tertiary hospital]. On the fourth floor there is Doctor N, very friendly. She looked at my x-rays and once or twice, did CT scans on my patients. There are other doctors as well; that really helps us.” [FGMP1:545-546:09]

On the other hand, there were also medical officers who did not manage to get access to expert radiological opinion, let alone a specialised modality. Although it may be an isolated incident, a senior medical officer had the following to say about an unpleasant encounter with radiology at the tertiary hospital:

“If you have a difficulty with a x-ray, see something you’re not comfortable with, so you send it [for a radiologist’s report]. There you get a message that, ‘If you want a radiologist, employ one yourself. We are not here to report x-rays for you’.” [FGMP1: 235-240:01]

5.2.2 The complexity of a radiographic investigation

The point of departure for an investigation is the quality of the information on the request form. Often there was a **mismatch between the investigation requested and the intended investigation**. As a result an incorrect investigation was conducted or in some instances the correct investigation was conducted. These types of mishaps led to compromising the quality of diagnostic services. One professional nurse shared the following:

"Because sometimes they want an abdominal x-rays, they write abdominal sonar. And the forms comes and the clerks [receive the forms], the patient goes for a sonar and then to the [referring] doctor. The doctor says, 'No, I wanted abdominal x-rays. Go there to x-rays'." [FGNP4:828-831:30]

Radiographers shared similar experiences where mistakes had happened repeatedly and were rectified – *"How many times the patient comes to complain about the right side, the doctor request[s] the left"* [FGRAD3:148-149:06]. One medical practitioner even admitted in a focus group: *"And then you send the patient with left foot and he comes with right foot"* [FGMP1:345-346:13].

Radiographers also rectified the incomplete investigations sent with patients referred from elsewhere, for example an incomplete set of cervical projections accompanying the incoming patient. According to one radiographer the medical providers,

"... send their [patients'] old x-rays with to us. They say, 'Inappropriate. You can't see anything.' Then we ask them for the x-rays. We look at it and say, 'Okay, we'll probably include a open mouth or something'." [FGRAD1:163-171:1-2]

Risking the patient to unnecessary radiation during an examination also depended on the examinations requested and what the patient had to say. This often resulted in discrepancies as to what body part or joint to include where applicable and what not to include when conducting the actual investigation. So the decision was to do only what was necessary, as this radiographer demonstrated:

"The patient explains to you, 'I bumped my knee on the chair', or something and then the doctor has requested for pelvis, femur, knee, hip. Whereas the patient has just bumped the knee. And then we do the knee and don't do all the unnecessary things." [FGRAD3:69-73:03]

Some medical practitioners saw this kind of behaviour as non-compliant – *“They just do what they think is necessary and I mean if that is the case then they mustn’t ask us to write what we want. They must just do what they think we want”* [FGMP1:364-366:18].

A further aspect of the complexity of an investigation relates to the **interplay between the technical aspect, the actual image production, and the completeness of the investigation** that the radiographer was responsible for. Radiologists and medical practitioners admitted that the radiographers were more experienced in terms of the technical aspects. One medical officer, with an appreciation for this complexity, shared her experience in a rural setting where she had to perform her own radiographic investigations:

“I spent two years there, so I did a few [radiographic investigations], mostly for trauma patients, but that was quite challenging. So I think the people here complain too easily. There is a lot more modalities [meaning the equipment] than I am used to, but that was a while ago. ... Yes definitely, it’s not as easy to take [the radiograph]. I had the basic tables [exposure technique chart], how far the distance, the seconds of the machine. Most of the times you can barely see the limbs, so it is quite difficult.” [CS11:650-660:24]

At the tertiary hospital radiographers experienced more support from the radiologists and registrars in the decision making on the task at hand when there was uncertainty about an investigation or projection. They would often say, *“Doctor, we’re not sure about this. Can you just look at the shoulder. Do you think we need another view?”* [FGRADL1:458-461:17].

Radiographers felt that doctors and nurses at the district hospital were not familiar enough with the complexity of a diagnostic investigation and the sometimes very challenging situations under which they had to produce images. They requested more mindfulness in this regard when referring patients for investigations. According to one of the radiographers, the general perception at the district hospital was the following:

“I think the nurses, the doctors, everyone that sends or refer patients, in their minds they think we just put the patient next to the bucky, push the button, the picture is there. They don’t think that sometimes you are faced with challenges and it is sometimes hard when you do a particular patient. That is why they don’t understand why we prefer them to physically examine the patient and specifically request for what you think is necessary.” [FGRAD3:500-505:21]

The complexity of the radiographer’s task further related to the **nature of the patient’s condition**. Radiographers often experienced difficulty in acquiring the desired projection if the patient was either uncooperative or immobile. The investigation was measured against

the time consumed and the worth in terms of anticipated normal versus abnormal findings. According to one radiographer,

“Sometimes you get a drunk patient and then [the doctor] has ridiculous request. And then you think, ‘How am I going to get a certain position on this particular patient?’ Only to find that there is absolutely nothing wrong with the patient. You stand almost an hour doing one patient, doing unnecessary views.” [FGRAD3:507-511:21]

Besides lack of cooperation from patients there were also the cases of immobile patients referred for a single examination like a chest x-ray or for multiple examinations like the whole spine and shoulder projections. The challenge then was to obtain a projection that required body part manipulation. At the district hospital, in the absence of field-expert support, the medical practitioner had to make a decision to “clear” the spine, to enable the radiographer to manipulate the body part for the required position.

“With some, it’s just impossible to get it [the desired projection]. For example, if the patient comes for a whole spine x-rays on the stretcher, straight to x-rays and now they ask for whole spine. I can do that, but then they ask for a lateral shoulder. You have to turn the patient. Then you end up not doing those x-rays. You send it back. Then doctor will ask you, she asked for a lateral shoulder, why didn’t you do that. Then you must explain to the doctor that you first must clear the c/spine before we can turn the patient to do a lateral. ‘Oh, I didn’t think about that.’ Then you end up, how does this happen? How does the doctor not think about it?” [FGRAD3:525-535:22]

At the district hospital where there was no radiologist available medical practitioners played the gate-keeping role with regard to the quality of an investigation. This entailed the accuracy of the investigation (including the technical quality of the images) and the completeness of task required. The lack of trust in the radiographer’s abilities stems from experiences of individual medical providers with one or two radiographers: *“It was individual thing and time of the day. You know if this radiographer is working, the x-rays are going to be bad. You’ll never get what you want” [FGMP3:409-410:15].*

The patient’s physical condition and capacity to cooperate in the examination must be assessed and any shortcomings must be communicated to others in the health care team (Egan and Baird, 2003: 13). Most medical practitioners also felt radiographers did not communicate the challenges they had experienced with specific investigations – *“They don’t say*

patient was difficult to do or not cooperating. They just give you the x-rays. So you don't know if there was a problem or not [FGMP1:356-358:13]. This is how a senior family medicine consultant saw the complementary role of the radiographer with regard to imaging investigations:

"In the private setting where there is a radiologist they need to be involved. So if the radiographer is unhappy about something or they see something they can consult with the radiologist. ... The role of the radiographer for me is, yes, they must do their work and take the views and things that you request. But if they've got a query and sometimes from their experience, know something will work better, then I think they must consult with doctor." [FGMP3:71-75:03]

"They must go to the doctor if they've got a problem to get the patient in a specific position view whatever. They need to consult with the doctor and say, 'Doctor, I have taken this one or two x-rays. I can't get the patient to stand up. Are you happy with x-ray? Or do I need to go on?' And that's the relationship." [FGMP3:602-607:22]

These difficulties often led to misconceptions and frictions between these provider groups – with a clear dominance of the medical profession – rather than to focus on the actual intent of wanting to act in the interest of the patient. In one of the focus groups a radiographer related a case where a specialised projection had been omitted from a requested investigation because of perceived potential harm. The doctor referred the patient back, but the radiographer still refused to do the projection to prevent potential harm (which could have been overcome by equipment manipulation to angle the direction of the x-ray beam).

"I refuse to do the patient. The doctor sends the patient for a c/spine. I did the lateral, I did the swimmers, I did the AP. I tried to do the open mouth without me manipulating the patient's neck, because there was a 'query neck fracture'.

I send the patient back and the doctor phoned me and said, 'I have requested this and this. You did not do the open mouth'.

Then I explained to the doctor, 'You query a fracture within neck, that is why I tried to do the best that I could in trying to get the open mouth and send the patient back so that you can clear the neck fracture.' Then you send the patient back.

Then I said, 'Did you clear?' and the doctor said, 'No, I want that particular view'.

And then I said, 'Hell no, I am not going to do that view.'

Then they send for the head of the [doctor's] department and then the head came and then ... I explained to the doctor and the doctor asked me, 'If you don't want to

do it, what then?' I said, 'You're the doctor, you must figure it out. I am not going to tell you that neck is a fracture. I am not going to play around with the patient's head because something can happen to the patient.'

And then he said, 'What do you think is the next step?'

So the doctor didn't know, so I said, 'Don't you think a CT scan is advisable?'

He said, 'No, that you have to arrange and do all of that.' Then: 'That's not my problem anymore, I did my part. You queried a fracture. I am not going to manipulate the head [of the patient].' And they told the head I refused.

I told the head, 'These are the reasons why I refused'. The head said, 'You know what, you are actually right. I don't know what the fuss was about from the doctor'."
[FGRAD3:538-562:22]

A radiographer working at the tertiary hospital cited an example of how an orthopaedic registrar had initiated a referral for a diagnostic investigation – a request for chest radiographs without providing a history or justification. This nearly resulted in exposure to physical harm when student radiographers had attempted to lift the patient for a supine chest radiographic projection in order to insert an image receptor device (digital detector).

"We had a patient a month ago from the ward, one of the orthopaedic wards, for a pre-op chest x-ray, but all it said for the clinical history is that it's a pre-op. And we know that they send all their patients for pre-op chest x-rays. It's something that we do every day. ... We pushed the patient in one of the bigger rooms so that we can do the patient with a mobile because he said that he can't stand and I am standing there and looking at the patient. I don't see any casts; I don't see any traction; I don't see any anything that indicates that there is an extremity fracture. And then the students are already standing there holding the patients arms. They want to lift up so that we can put the cassette in. And then I said, 'Guys, just hold on a second.'

And I check the x-ray form and I phone the doctor. It was one of the interns that we had problems with before because she is a little bit deurmekaar [confused] most of the time and I said to her, 'Listen Doctor, so and so is here for a pre-op chest x-ray. I just want to find out from you what is wrong with him? Before we lift him up, to do the x-rays.'

'Oh no, he has got an unstable fracture of T4.'

And I lost it. I yelled at her over the phone, 'How can you do this? We almost paralysed this patient, because you did not fill in your x-ray form correctly.'

'Oh sorry, I forgot.'

So we have a lot of stuff like that to deal with every day. Because it is an academic hospital, and the professors and the registrars don't always give them adequate education on how to fill in an x-ray form correctly and what has to be on it, and specific things that we need to know. And then the x-ray forms come here, and we have to try and guess what's wrong and try and not to injure the patient further by doing something that we're not supposed to do because of his injuries. So we have a really ... big problem at this hospital of x-ray forms not being filled out correctly." [FGRAD2:457-495:17]

In other instances it was the dilemma created by a missing specialised projection(s) of an investigation like the cervical spine – *"The radiographer did not do the swimmer's view until you ask for that"* [FGMP2:335:12].

"Yes, then you know, special views that you don't do normally. For a suspected acetabula fracture, things that are maybe not so obvious that are important, so that we have ... complete investigations. So that we can make an adequate decision if you do not do an open mouth, you can't really comment on the c/spine." [FGMP2:285-288:12]

The examples above reflect on the gaps in the competencies of a few individual radiographers with whom the medical practitioners experienced problems. In the case of sub-optimally performed tasks – *"because they're not doing the right views"* [FGMP1:297:11] – medical practitioners had to accept and rely on their clinical judgment. *"So that is why we need that to determine clinically whether there is a fracture or not; that is some of the problems we experience here regarding the x-rays"* [FGMP1:304-309:11]. Incidences such as these devaluated the role of technology in making a diagnosis.

One consequence of the dilemma that both the referring practitioners or specialists had was lack of the understanding of the complexity of the radiographer's task and the importance of weighing up risks to unnecessary exposure. Radiographers specifically mentioned perceptions in the case of multiple requests by medical practitioners – *"To do x-rays was [for them like] a walk in the park"* [FGRAD3:516:20]. Then there were also challenging projections that may result in exposing the patient to additional radiation – *"Some positions are not easy to get. You had to try it two to three times more to get the correct position"* [FGRAD3:518-520:22].

"They will request for unnecessary x-ray on that particular patient and me as a radiographer, when the patient comes here, you get a request from head-to-toe request."

They expect us to be just button pushers and you must radiograph from head to toe.”
[FGRAD3:63-65:03]

After the initial data collection a radiology registrar told me that, based on clinical demand, this type of approach opened up the boundaries to over-requesting and increased the chances of risking the patient to additional radiation exposure. This statement concurs with Lysdahl and Hofmann’s (2009: 8) report that expanded medical possibilities and supply and demand of services are the most important causes for an increased volume in investigations.

5.2.3 Quality of images

Another factor in the complexity of the radiographer’s task is producing optimal quality radiographic images. Smith (2006: 161) contends that a sub-optimal quality radiograph may compromise the doctor’s ability to see a radiological sign of an abnormality. When reading the images radiographers must decide whether image criteria for the relevant examination have been fulfilled. In this regard Larsson et al. (2009: 15) refer to differences between the routine actor and the more reflective actor. Examples emanating from my study relate to vigilance before, during and after an investigation. Aspects mentioned pertinently were artefacts influencing the image quality and radiographers not always being vigilant about the quality of images they produced.

With regard to the avoidance of superimposition of artefacts medical practitioners commented that *“sometimes we see patients with necklaces, with accessories, bra straps and that. ... Often the pathology is just behind that”* [FGMP1:565-569:21]. Patient 23, who had been in an MVA, was referred for cervical, knee and hip radiographs. The radiographers made no effort to remove glass pieces, to exclude artefacts on the radiographs or write an explanatory note to the referring doctor. The radiology registrar then commented, *“The quality of the x-rays, I can’t really complain of, just that we would have liked to know where the superficial foreign bodies are”* [CS23:395-397:15].

At the district hospital medical practitioners also commented on other inconsistencies in image evaluation quality control.

“They must be told to remove all the jewellery, the belts, et cetera, so that we don’t need to send them back to repeat the x-ray. And that it is not overexposed and it’s not underexposed, that it is the right view and the elbow is not cut out of it. ... Then you get the top of the chest on a x-ray and then the bottom of the x-ray on another plate.”
[FGMP1:904-911:33]

"I think sometimes the radiographers don't check the x-rays they have taken. You get very poor exposure, annotation and rotation. ... Sometimes it's a normal patient; it shouldn't be problem and they [were] clearly not checking." [FGMP1:353-361:12]

From the observations most radiographers were accustomed to the quality control aspect of image interpretation. So the tendency was to glance at their images, with the main focus on the technical factors such as density and contrast. However, with the patients who were shadowed, some radiographers did not annotate their images whether the projection was done supine or erect. For example, with regard to quality checking, Patient 8's radiograph was a poor inspiratory chest radiograph. It could have been that some radiographers were not skilled to identify an optimal radiograph in terms of anatomical orientation and superimposition. Patient 12 was referred for sinus radiographs. The projection to demonstrate the maxillary sinuses was not optimal because the petrous bone was overlying the maxillary sinuses.

5.2.4 Guidelines

One important explanation for problems of optimal service delivery and proper communication was the lack of standardisation and absence of written guidelines and protocols, which has already been mentioned in Section 5.1.1.1 with regard to referrals. This provides an important explanation for the problems experienced in terms of professional service delivery regarding various aspects of diagnostic imaging investigation-related matters. The matter was further complicated by budgetary constraints in the public sector and referring medical practitioners' lack of understanding of the reasons for requesting specific investigations, in other words *"what to look for"* [FGRAD2:157:06]. In some instances there was a mismatch between the referring medical practitioner's and specialist's perceptions of what a complete task would be versus the radiographer interpretation of what they were allowed to do within the system's constraints. For example, the verbal guidelines on cost saving the radiographers had received did not require a lateral chest x-ray for every patient and in the case of extremities nor did it require an image of the joint above and the joint below for every affected joint.

Although members of the other professions were aware of the restrictions regarding the choice of modalities they seemed to be uninformed about the minimal projections necessary in specific cases. This is how medical practitioners expressed their frustrations (and ignorance):

“The result and I mean, if I had a rand for every lateral chest x-ray when I have requested it, I request it on almost every patient, a PA and lateral x-ray and you never get a lateral. ... They just do what they think is necessary.” [FGMP1:362-366:13]

“And also for orthopaedics, you were taught that two joints, two sides, two views, but you never get [that]. It's like one x-ray sometimes. ... You are supposed to get the joint above and the joint below.” [FGMP1:375-380:14]

“I don't know if it is to cut down costs or save time or I don't really know. It's not proper what you're supposed to be doing. ... I think it is also the personality of the country or whoever or wherever you work, does the minimum necessary from there and they will get away with that minimum, so [I] will just do that.” [FGMP1:384-382:14]

Some radiographers shared their willingness to fill the gap to ensure the quality of the task at hand is not compromised, provided they had sufficient information, especially on the request form. This would enable them to integrate the provided information in the performance of a complete task. Examples of missing, vague or wrong information on the request form have already been discussed in Sections 5.1.1.1 and 5.1.1.2.

From a system's and health care provider's perspective the quality of services required depends not only on the guidelines and protocols but also on an understanding of what is expected of each other in terms of the roles and responsibilities. In this regard the mechanism of communication used by these professionals becomes an essential component in providing a professional service.

5.3 INTERPRETATION AND INTEGRATION

Various professionals had a role to play, individually and/or in collaboration with one another, during decision making that was based on image interpretation. Image interpretation entails a process of integrating information derived from request forms, patient records or patients themselves with the diagnostic images in order to build a complete picture or story of patients' problems and possible diagnosis and management solutions (Hilligoss, 2011: 179). Contributions from different groups of professionals in interpreting radiographic images varied between the district and tertiary hospital. Professionals also had different perceptions of each other's scope of practice and competence in image interpretation.

5.3.1 Access to the services of radiologists

Interactions between radiologists and medical practitioners from both district and tertiary hospitals revolved around access to the service of radiologists other than for a radiological report. Radiologists defined their professional role as providing a radiological report limited to providing “*narrow differential diagnosis or definite differential diagnosis or diagnoses*” [FGRADL1:94:09]. The dilemma they faced regarding interpretation was an inadequate history on the request form (cf. also Dhingsa, 2002: 138). This often resulted in a report covering all the basics of the investigation, as well as what they saw on the images. Whether this approach benefited the medical practitioner in the integration of the information into the bigger picture remained unanswered.

“So you’re covering more than what you’re supposed to, just to cover ... all your basis. Sometimes it can lead to unnecessary or wrong investigation or minimal investigations. Maybe we’re not catching the right thing or maybe we need to focus our investigations to what the clinicians want. So we don’t know what they want, so basically we cover everything.” [FGRADL1:115-133:05]

In some instances medical practitioners then experienced a radiological report as being inconclusive. According to one practitioner at the district hospital the nature of a report had an impact on the decision whether to refer the patient to a higher level of care or not – “*Ja, but the thing is ... [the radiologists] do not just say, ‘This is what I see’*” [FGMP2:329:12]. According to a radiology registrar, medical practitioners had different expectations – “*Things that we think are important, sometimes they [the medical practitioners] don’t understand what we need, and vice versa*” [FGRADL1:15-16:01].

For the district hospital the need for interpretational expertise after hours was also highlighted.

“So ja, it does, but the main problem, this thing of reporting, to have a radiologist especially after hours. Like when you have a patient with cervical fracture, you did the x-rays. But you could not really see the fracture. But he is still complaining of pain and there is some neurological deficit. Then there is where you cannot see anything.” [FGMP2:316-320:12]

This problem is also echoed in Khan et al.’s (1998 2) observation that with regard to sports injuries it was a major problem when clinicians relied heavily on less sensitive imaging methods such as plain radiography.

Medical practitioners at the district hospital were not aware that radiologists were not always available after hours at the tertiary hospital either. This is where radiographers or medical colleagues were used to fill the interpretation gaps:

"During night shift the radiologist is always busy. ... So some of the doctors come around and ask us [the radiographers], can we just have a look with us to see if we missed anything on the x-rays. ... That is where we will sit and say there is a fracture. ... So most of the time they didn't even realise there is a fracture or dislocation or anything like that." [FGRAD2:1139-1145:41]

"We work as a team. If I cannot see, I ask Doctor W, 'Can you look with me? Can you see something?' Then if you know there might be a fracture, but please confirm with me if there is any fracture. You ask everyone if you cannot see." [FGMP2:487-491:18]

At the district hospital, in the absence of a radiological service, the interpretational boundaries became diffused because there were no clear guidelines as to the gate-keeping roles of the various providers in terms of image quality judgment and interpretation. As medical practitioners did not understand the scope of the radiographer's practice, there were sometimes interpersonal difficulties with radiographers. Medical practitioners also had a wide range of expectations with regard to the radiographer's interpretation role. Some acknowledged the complementary roles of the two professions – *"So I think between the doctor and the radiographer there should be complementary service"* [FGMP2:252:10]. Others felt that, *"it is really not the job of the radiographer to interpret x-rays, because we all have been taught to do that"* [FGMP2:357:13]. So the doctors tended to rely on shared opinions in case of uncertainty – *"If you are not sure, there is always more than one person in Casualties. So we all sit around the box and everybody has a look and everybody has an input"* [FGMP2:204-208:08]. This practice relates to what Geneau and colleagues (2008: 5) refer to as "the tacit influence of peer-to-peer interactions" in gaining knowledge. Powell and Davies (2012: 807) refer to the significant impact of professional identities and boundaries on how individuals work with colleagues from the same and other professions and the care that patients receive.

Medical practitioners were not always aware of the image interpretational skills they were lacking and in most case only relied on their own judgement. For example, during the shadowing process Patient 1 was referred for radiographs of the humerus, elbow and forearm. The radiographer performed a complete investigation by doing the antero-posterior and lateral projections (two views at right angles). The medical practitioner did not seem to have an adequate understanding of the rationale for doing the two projections and interpreted

them as being the same – “*They did them double; they did two of them, but anyway*” [CS01:182:07].

In the focus groups both family medicine consultants and radiographers referred to fractures and pathology that were sometimes missed.

“But we had an incident, the patient was discharged and I think the fracture was missed. I think she came back, I think it was in triage and the ankle was quite swollen. I said, ‘Let’s just repeat it and compare with the old x-rays’. It was not an obvious fracture but there was a fracture and so we managed to see it again. Those incidents do happen. It was missed in Casualty. It was probably missed because of pressure that, [but] we do ask to follow up within two days and usually we pick it up quickly.” [FGMP2:456-462:17]

“In my previous hospital we had an incident where the patient came in. He had a pneumothorax and the doctor did not see it. He sent the patient out and the radiographer who did the [x-rays], when he knocked off, he saw the patient outside waiting for his transport. He asked him like, ‘What are you doing here?’ ‘No, I am going home, why?’ ‘Did the doctor saw your x-rays?’ ‘Yes, but she said there is nothing on the x-rays.’ Then he took the patient into the Casualties. He showed the doctor, ‘Look this is the pneumothorax. This patient really needs [treatment]’. And the doctor actually did. He was not rude. He did explain to the patient, he is sorry and that.” [FGRAD1:880-890:33]

Radiographers felt not all medical practitioners had a clear understanding of the projections they requested or additional projections required to make a proper diagnosis. This was considered particularly important at the district hospital in the absence of radiological support on site. An example cited in a radiographer focus group is the following:

“Some of them don’t even know what is it they are requesting because, yes, I had a doctor requesting Judet views. I can’t remember what I asked. She asked me, ‘What is Judet views?’ I am like, ‘You requested them. So why you’re requesting something you don’t even know?’ What is she going to look for if she request Judet views? What’s she going to look for on the x-rays? So some of them don’t have much experience in x-ray stuff.” [FGRAD1:925-935:34]

In addition, radiographers felt medical practitioners lacked even basic skills such as placing radiographs on the light box according to the correct anatomical orientation. One radiographer related the following incident in the operating theatre:

“There was this time I was in theatre. The doctor could not put up an x-ray correctly of the knee. Everything was upside down. Even the orthopod was complaining, ‘You see, these are the kind of doctors we are having’. Now the anatomy was upside down, but if you come as radiographer, you say, ‘You know, Doctor, this is how you’re supposed to put up the x-rays’, they take offence.” [FGRAD3:294-298:02]

5.3.2 Who is responsible for interpreting pathology?

The biggest area of difficulties with the role of the radiographer was with regard to the identification of possible pathology and the use of the red dot system – *“On the part of radiographers, is there an obligation to write, to indicate with an arrow if they see anything obvious, or not really?” [FGMP2:342:13]. “You are the medical practitioner. You are the one who ordered the x-rays. So you are the one looking for the pathology” [FGMP2:471-472:18].*

Radiographers are trained to apply their theoretical knowledge of image quality evaluation and interpretation in practice. (See Section 5.2.3.) Although the role of radiographers in filling the gap in the interpretation of image quality was acknowledged, in reality there was no space for them to formally share theoretical knowledge in this domain. The assumption was that medical skills were based on scientific learning, whilst radiographers acquired their skills based on practice only. Radiologists, senior registrars, as well some medical practitioners considered themselves superior and regarded radiographers’ knowledge and competence as inferior.

Medical officers felt the radiographers’ scope of practice was *“limited”* [FGMP3:25:01] when it came to interpretation of the images and lacked the competency on decision making for additional projections. As such, medical officers were redefining the professional boundary of the radiographer. According to one of the family medicine consultants, they expected the radiographer to seek permission and be accountable to the medical officer in the absence of a radiologist when it came to decisions about additional projections:

“The radiographer has got ... a limited role in the sense you get a request. They must basically, there is nobody else that they sort of consult, to say... ‘I have got this request. Tell me exactly, must I do more views of this or what?’ So they can’t really decide on their own sense of additional views unless they consult with the doctor, me as the medical doctor.” [FGMP3:24-30:2]

The radiologists felt radiographers had some insight in interpretation but this was purely acquired from experiential exposure.

“Because they do image production, they get to see a lot of abnormalities, but they do not have the clinical understanding of what it actually means. ... But some of them from all their years of experience and interest they will be able to interpret them and write something, but I think they will still need some support and training; that is if they saw something interesting.” [FGRADL2:65-68:3]

In one of the focus groups a medical practitioner sarcastically commented, *“And then you get some people, who will put a sticker [red dot] on the x-ray to show you the fracture. I mean, that’s great, but they shouldn’t rub it in” [FGMP1:404-405:15]*. One doctor at the district hospital was positive about the gap-filling role of the radiographer – *“But they often help us when they put red stickers on the x-rays, if they see fractures and stuff like that as well. So it helps us a lot” [CS24:323-324:12]*. Some practitioners also expressed their support for the role expansion of the radiographer to provide a report, which, according to one medical officer, would benefit the medical practitioner to integrate the information.

“I don’t think it is a bad idea on the report to say, it is this [and] this, and then the radiologist gives his interpretation – you have this complete view. We’re not competing here from the radiographer’s view, this is this from the radiologist view, this is this so definitely if the radiographer is trained to see the pattern recognition then [that is] what the radiographer reports. It’s once more just two heads [are] better than one. You look at what the radiologist saw and yes, this pattern is important or not important and you can put the things together.” [FGMP1:1104-1114:40]

Radiographers also reported on the supportive role they played in image interpretation.

“I feel our role in pattern recognition is very good because we can assist such doctors and we have doctors in our [tertiary] hospital who did come to us in Casualties. They come to us if they see something and they did come and say, ‘Come help me, I am new here. Come and help how to evaluate this x-ray.’ And you would stand there, help him.” [FGRAD1:880-894:33]

With the change-over from the analogue to digital system the red dot system may disappear and could also in future pose new challenges to radiographers at the district hospital with regard to their support in image interpretation. This was demonstrated by the comment of one medical practitioner: *“We all have been taught to do that [to interpret x-rays] and the whole effect is that we also one day come on the medical [digital] system and they don’t put all of that [red dot]. It’s not like we’re really relying on them” [FGMP2:360-368:14]*.

At the level of the tertiary hospital radiographers felt they could make a valuable contribution to the development of medical interns.

"Most of the doctors in Casualty don't always see where something is. But we work with it every day. So we can quickly see something wrong because our eyes are trained. But the only difference is our eyes are more trained to see x-rays than they are. Because they only do orthopaedics or whatever in certain months only, so some of the house doctors, especially for orthopaedic patients that come in, and you tell, 'Oh, this is a patient with a scaphoid fracture?' Then like, 'Oh, was that a scaphoid fracture with the wrist fracture?' Then they miss that tiny thing, but a big problem regarding the treatment. So I think for some of us we are bit it seems, something wrong, not always knowing, but we can clearly see this is not normal." [FGRAD2: 1115-1125:41]

At the tertiary hospital the radiographer's interpretational role was also evident in some types of investigations where they had to be vigilant in picking up fractures on the screen in order to prevent further harm or risk to the patient. One radiographer gave the example of a patient referred from elsewhere for a CT scan of the brain. In such a case the protocol was to also do a CT scan of the cervical spine.

"We were very busy and there was a patient referred from another hospital with cervical spine and a brain scan and the moment I start to scan his brain, his brain looked fine. The moment I started scanning his c/spine, he had a C1 big fracture, and the scan wasn't even done yet. I got the radiologist to look at the scan. Immediately, she got to the phone to speak to the doctor who this patient was referred to. And get them to come ... to the scan to put on a hard collar on the patient." [CS18:2263-2270:82]

Just as in the case with referrals (Section 5.1.1.3), medical interns often lacked confidence in interpreting diagnostic images and tended to seek reassurance from the radiographers in this regard. The following is an example that demonstrates the gate-keeping and gap-filling roles of the radiographers that could contribute to the benefit of all parties:

"I also had one of the orthopaedic house doctors that came to me that [had] actually seen the patient, but [asked] for a second set of x-rays because she couldn't tell the wrist was broken or not and I checked the x-rays that were taken at another hospital. So I put them up on the light box and it was a complete, the radius and ulna and it was displaced. I said to her, 'How can you not see this is fractured?' I had to explain to her that you have to look at cortical outline; you have to look at the trabecula pattern. I had to explain to her because she didn't get any education on that during their medical training. They don't get taught this, just a few small basics. They're just taught to look at the x-rays and make a diagnosis, but they don't know what they're

looking at. So we have to [do] a lot of education with regards to that as well, like trying to help out. This is what you have to look for and especially for the medical students, because they're not qualified yet. So we have to do a lot. ... As well guys coming in and saying, listen, their registrars ask them to look at the x-ray. They're afraid they're going to miss something. Can you please go through it with them and see what we see and we have to do that quite a lot." [FGRAD2:1149-1165:42]

Medical practitioners' ignorance of radiographer capability of image interpretation often led to distrust. However, some medical practitioners did acknowledge their lack of interpretation skills. This is illustrated by the following example on a decision to print digital radiographs for the medical providers:

"Because we are printing fracture x-rays at level four [at the tertiary hospital], a doctor came and she fought with me. She said, 'That is fracture on that patient' and I told her, 'That is not a fracture.' But because she is the doctor, she wants to be right. She said, 'Okay'. Then I printed the x-rays and then she went and showed it to the registrar. But she was nice. She came back to me and apologised. She told me, 'You were right, there was no fracture'." [FGRAD1:960-967:35]

5.3.3 Interpretational skills of medical interns

A strong theme that emerged from the study was the need expressed by medical interns for more exposure to radiographic image interpretation during their training. Although they do learn through experiential exposure, they would prefer to have more expert guidance. Radiologists and registrars also confirmed the lack of interpretational skills of medical practitioners.

"I had Casualty officers ask me, they say, 'I looked at this chest x-ray and I don't think there is anything wrong. Just have a look and make sure'. They were trauma patients and in both cases there were pneumothorasis. There was a c/spine fracture. They [the practitioners] said, 'Ag, everything is fine'. Then on x-rays you could see the fracture and then we [at radiology] scanned and there was a fracture." [FGRADL1:335-341:13]

"What I find in medical school nobody ever properly teach you everything. So they just expect you to be in third year, and you to read the x-rays. They expect you to read a CT. But nobody ever walks you through the process of being able to do it. Once you are a doctor, you have to know it and then teach it to other people. So it's quite challenging. And also the nitty gritty of the x-rays I never thought it was so. ...

But once you get comfortable with it, when you have done it a thousand times, it becomes second nature.” [FGMP1:08-16:01]

In a South African study by Nyangairi et al. (2010: 468) final-year medical students also expressed a need for improving their x-ray interpretation skills.

During undergraduate medical training the focus regarding quality of images was *“on spot pathology or the abnormality, not really on how to get a good quality image or what is a good quality film density and contrast”* [FGRADL2:97-99:3]. According to the radiology registrars, they developed their skill when they started at radiology. They felt their lack of expertise in assessing the technical image quality often resulted in fear of missing some pathology that may have been there.

“[As a] clinician now you see this x-ray. You don’t know whether it is good quality x-ray. Or like if it is a chest x-ray, at what level are you supposed to see this and that. And sometimes if the picture is overexposed, you might miss some pathology. You don’t know it was there. You can see an artefact and report it as an abnormality. You don’t know it is an artefact at pre-graduate before you start working here.” [FGRADL2:102-107:4]

A specific example was given in relation to skills development in detecting various abnormal patterns indicating specific pathology. Only then one realised how much pathology could have been missed or misdiagnosed if one was not skilled enough to pick it up:

“As a clinician you see patchy grain, things you think it’s a bronchopneumonia. But actually some will show you, ‘No, can you see this little lesion here? It looks like it is bronchiectasis.’ It is like, where? But as you see more radiographs, then you actually [see] more detail, because we actually see more pathology now than what we used to see before.” [FGRADL2:117-122:4]

A further challenge was the issue of differentiating between normal and abnormal variants. The mastery of this skill was acquired through experiential learning. A junior radiology registrar commented as follows:

“I think the other experience now, there are actually more normal variants that I was aware of than previously. Previously, it was only pathology or it was normal and most of them showed pathology because I was not aware of this normal variants. It is like you see more and more of this quality images and it is that standard kind of finding.” [FGRADL1:123-126:5]

The view above corresponds with Smith's (2006: 161) finding that doctors lacking experience in interpreting radiographs could misinterpret a significant abnormality as a normal variant or incorrectly diagnose a normal variant as pathological.

Senior medical officers echoed the sentiment of interns expecting too much to be done for them by other people instead of taking initiative to develop the necessary interpretational skills. In addition, there was the issue of interns and junior practitioners not getting the opportunity to develop their interpretational skills if radiological reports were always available – *“We [interns] always ask the senior person because we’re not sure, but it would be nice if we had a report as well”* [FGMP1:311-314:12]. This is how one senior medical officer addressed interns participating in the same focus group:

“You are so wet behind your ears. You have oceans [of gaps in your interpretation skills]. ... You depend on everybody that is more senior to you to hold your hand and that is fair. ... We all were interns. You always depend on someone else’s opinion. You very seldom have your own opinion. It’s only with experience and doing things over and over again [that you] get that confidence. ... You learn, you agree with me on that? ... Similarly with x-rays, if you get x-rays that is reported, you never look at the x-rays because you have trust in so and so, he’s got ten years of experience. ... I am an intern; you don’t even know what an x-ray looks like anymore. Now it gives you a false sense of knowledge because you believe that doctor. That day that doctor got sick, he didn’t read the x-rays properly. You never took out the x-ray because [you] read his report; you missed the pleural effusion.” [FGMP1:1260-1284:46-47]

Khan et al. (1998: 3) also refer to the expectation that the clinician should not just read the radiological report, but ought to be able to interpret the films.

Some of the other senior family medicine physicians were more cautious in terms of what a medical student should know and be able to do when he or she graduates: the imaging interpretation skill required was limited to the confirmation of pathology. A senior family medicine consultant felt the interpretational role or skill required from the medical practitioner was not the traditional holistic systematic interpretation approach, that is to interpret in detail in the way it was done by the radiologists, and to a lesser extent by radiographers. The interpretational skill required was narrowed down to the practitioner’s judgment of what is wrong based on clinical assessment and to aid practitioners to make a diagnosis.

“I think that the training of medical doctors in interpreting x-rays, I think it’s happening in each block or whatever they are doing. So if you go to surgery you have surgical discussions on surgical x-rays and if you go to internal medicine and paediatrics and

there will be somehow, we will discuss x-rays, but I don't think there is a specific block or specific time when they say this one week or two weeks or a month in radiology we learn or teach you how to interpret. And I think maybe that is something that needs to be addressed from our side, from the university side and from the training, where there is a place for basic interpretation, because, ja, that's the one thing.

My second thing is, I think any medical doctor who qualifies should be able to do the basic interpretation of x-rays; that means a chest, abdomen, limbs fractures and things like cervical spine and so on. I don't expect anybody else to interpret out of that range. If you really have got a case that need for the radiologist, then you need to have a system where you can. But in a emergency situation, twelve o' clock at night, you must just make the decision. Yes or no, yes there is air under the diaphragm, [or] no. And I think and that is all what we need from a intern or a medical officer on that level. You don't need to discuss all the final detail of this, this and that and so on, or put up the x-ray, this is a pneumonia. Yes okay, I can see there is something wrong. But to have all the finer detail of each line and even that is not the role of the basic x-ray. ... As I said, to pick up the red flags or the emergency things in my opinion."
[FGMP3:332-361:12-13]

Medical practitioners also had specific views on the type of experience in interpretive skills that interns acquired at the tertiary system, which explains the lamentation of the senior medical officer quoted before that students only relied on the radiological report.

"They are actually [at the] academic hospital ... and they come for rotation here [at the district hospital]. So they are so used to the system there, where each x-ray or I think so, most x-rays are interpreted by the radiologists. It goes through the system and then [you] just get the [report]. I have seen in the past that they don't get to look at the x-ray. They only look at the report for x-rays of minor things. That they just go on the system and print out the report and there is the report and they don't look at x-ray and that is wrong." [FGMP3:368-378:14]

The views of family medicine practitioners were opposite to that of an otolaryngology registrar who had worked in an emergency section previously. This registrar felt a practitioner needed to be vigilant or needed the skill to pick up the "*small things*" [CS18:1068:69]. The justification for finer interpretive skills was to provide optimal care to be able to refer the patient to a higher level of care according to the structural procedures and processes. The registrar gave a specific example in the case of a fractured skull and the importance of detecting it on an x-ray:

“Ja, you see, there’s more demand in Casualty regarding x-rays. Because you’re the first contact doctor. You need to have a very beady eye with regard to this small things. You need to pick up instantaneously. Second, because you have to refer thereafter, you know, like medial skull fracture. You need to pick it up all the time. You can’t send the patient home with fatalities. ... I suppose in that environment you need to be quite clued up with regard to reading x-rays without being reported or picking up little things you know on x-rays. ... In a way, well, our interpretation is very limited. Basically we look for what we want to see. And other than what we want to see, any other abnormalities we don’t really pick it up. ... Because, you know, we’re homing on our region or what we want to see and then if there is some other pathology, we may ourselves not pick it up. Unless it ... is blatant, so you can see it. Something like a small, like a hair-line fracture or something like that we’re not very competent in picking things up like that.” [CS18:1066-1094:39-40]

Practitioners at the district hospital felt skills acquired by experiential exposure could result in risk-taking behaviour. Because of the advancement in terms of technology one may not be aware of repeated misinterpretation, which may in turn impact on the health outcomes of patients. One practitioner shared her views on the experiential approach and some of its shortcomings that did not make her feel comfortable:

“You cannot read the x-ray and everything yourself, because even with years and years of experience you might have seen the same thing over and over again. But you’re not up to date with the latest information. You might be redoing the same mistake ... because someone [who] has told you, ‘The doctor that taught me x-rays when I was an intern in Casualties’, might have really not known what she was doing. ... She doesn’t get come-backs, so when I do it I do it in the same way and that might be the wrong way that has been perpetuated and that is where I get that sense of false security in my heart.” [FGMP1:1327-1308:48]

Misreading of radiographs has been shown to be the most common type of clinical error (Smith et al., 2009: 1). According to Hardy and Barrett (2004: 657), a referral for a diagnostic investigation stems from a clinical examination, based on the clinical signs and symptoms. The provisional diagnosis can be confirmed or refuted depending on the clinician’s ability to interpret the radiograph. Therefore, in all circumstances the decision to do a radiographic investigation should be influenced by the ability to interpret the resultant image (Smith, 2006: 161). Khan and others (1998: 3) are of the view that it is the responsibility of the treating clinician to determine whether the anatomic anomaly revealed by an imaging study is related to the patient’s symptoms. According to Pusic et al. (2012: 290), this could be due to the fact

that in clinical practice “to recognise pathology in a ‘sea of normals’” is quite difficult and “[t]he prevalence of pathology can contribute to a ‘context or prevalence bias’ in decision making”.

5.4 PERCEIVED BENEFITS OF THE STUDY FOR HEALTH CARE PROVIDERS

In the focus groups health care providers were also asked about their perceptions as to whether this study had any benefits to them. The views and opinions elicited about the research process provoked mixed reactions. Although the researcher felt at ease in the interaction with radiographers, some of them viewed this study as an assessment and confessed during the focus groups that they had been quite tense – *“Well, it was very intimidating; I tried to be at my peak, but I would have done it anyway”* [FGRAD1:1172:43]. I also observed that many of the radiographers took a subservient position and saw me as the expert doing a research project. I was able to enlist their trust by communicating individually about the study aims and objectives. The focus groups, according to radiographers, benefited them because, *“we could hear other people’s opinion ... that others feel the same”* [FGRAD1:1175-6:43].

A radiology registrar expressed the benefit of the study as follows:

“It will be very interesting to be in your shoes and just follow the patient through and see what actually goes on, i.e. what different people say and explain to the patient through the diagnostic chain. Sure it’s interesting. I think patients here are getting different information as they go through the clerks, the nurses, the doctors who see them, porters, radiographers [and] radiologists who see them. Down the chain again I wouldn’t be surprised if they’re confused again.” [FGRADL1:1079-1085:39]

Although medical officers at the district hospital sought the opinion of radiologists on a regular basis, the shadowing of patients also appeared to have had benefits for some radiologists.

“I think it was very informative. I could get other information from you that I didn’t actually know. For instance, there was one clinician that referred a patient for the sinuses and did not know how to interpret sinus x-rays, which I did not actually understand, because now you give me a better insight as to what is happening on the other side.” [FGRADL1:1075-1079:39]

The main benefit for nurses was the fact that they could ask questions about radiation safety matters on which they needed information to answer patients’ questions: *“Maybe they [radiographers] can give us a course for two days or three days, because it is not helpful for*

the patient if he asks, 'What's this? What's this? What are they going to do?'" [FGNP2:412-413:15].

Some medical practitioners indicated that the focus groups had provided them with a better understanding of the interpretational role of the radiographer. The importance of a completed request form for the radiographer was also an eye-opener for some. One consultant admitted that *"if you give them [radiographers] a better clinical picture, what you are looking for, then they will know better what to do"* [FGMP3:620-623:23]. Despite the initial difficulties to get buy-in from all health care providers to participate in the research, their views shifted in the course of the study. This shift was more visible in some of the reactions of members of the different health professions.

5.5 CHAPTER SUMMARY

In the discussion above the various professional roles were explored from a systems perspective with regard to referral, the request for diagnostic investigations, the quality of such investigations and the interpretation thereof. The quality of information provided on the request form triggered interactions between the various role-players to fill in the gaps. Then there was also the decision on the quality of the task performed that could influence the quality of a referring medical practitioner's decision making and could impact on the treatment plan for the patient and ultimately on the quality of service rendered. Lack of competence on the side of both radiographers and medical practitioners led to inappropriate referrals and re-requests. Despite the potential risks to patients, reliance on the power of technology appears to have been trusted most, at the expense of practitioners having faith in their own clinical judgement. The gate-keeping role of the radiographer was, therefore, misunderstood and seen as undermining the integrity of the referring practitioner.

Where this chapter focused on systemic interaction, the next chapter addresses the patterns of interactions between providers from the referral to the outcomes of the management strategies in terms of decision-making strategies and the relations with members of other professions.

Chapter 6

Professional interactions between and experiences of health care providers

When a patient is referred for a diagnostic investigation various role players interact with the patient and with each other. These interactions take place for different reasons and are accompanied by various interpretations and ways of integrating information received at the point of referral, during the consultation, and through the request form. The outcomes of these interactions are dependent on who is interacting with whom at a particular point in time. Boon et al. (2009: 715) refer to the appreciation of the complexity of the multiple dimensions underlying the interplay between patient's illness and disease because human health requires the involvement of persons with diverse expertise collaborating in multidisciplinary teams to provide the best patient care.

In the analysis of professional interactions, with a prominent focus on radiographers' interactions with other professionals, two distinct themes emerged: relationships and interactions inside the radiology department at the tertiary hospital; and relationships and interactions outside the radiology department at the district hospital without its own radiological services or at other points in the tertiary hospital (e.g. intensive care or theatre) or between the district and tertiary hospitals. Interactions of the radiographers in the district hospital setting were mainly with patients and then with the medical practitioners. At the tertiary hospital, in addition to the normal interactions with patients, radiographers interacted more frequently with medical officers and even more so with radiology registrars and radiologists. The latter interactions can be explained by the greater proximity between the radiography and radiology professions. In the tertiary hospital relationships and interactions of members of different specialties with radiologists, radiographers and medical practitioners also manifested certain characteristics. In both the district and tertiary hospital settings radiographers played the role of a supporter of medical students in training, medical interns and junior medical practitioners and acted as gap filler for junior radiology registrars with regard to skills development in equipment operation and radiographic interpretations. According to Matthews and Brennan (2008: 353), the radiographer's implicit role is justified at all levels, but most particularly in situations where they act as the professional interface between the prescribing doctor, the patient and the practitioner doctor.

6.1 INSIDE THE RADIOLOGY TERRITORY

The key role players inside the radiology department were radiologists, registrars, radiographers and nurses. Radiologists and registrars were generally appreciative of the work done by radiographers. Radiographers adopted an approach of willingness and were obliged to perform their tasks as required. In interactions between junior registrars and radiographers the latter had been leading figures in investigations and interpretations and as the registrars became more experienced, roles were reversed. The lack of clarity regarding the roles and responsibilities of nurses often led to friction with radiologists and radiographers.

6.1.1 Radiologists on the role of radiographers

From a systems perspective, the role of the radiographer did not seem to have been well defined nor understood by the various professions. Radiologists and their registrars agreed that the role and value of the radiographer and the boundaries within which they operated were difficult to understand outside of radiology.

“Well, it’s difficult to say. We are on the inside; we are not on the outside. But I think it’s easy for other specialties and other departments to miss the value of a radiographer. They don’t really understand the work they do. So I think it’s not easy for them to see how valuable they are.” [FGRADL1:432-437:16]

According to the radiologists and registrars, they only came to understand the professional scope of practice of radiographers once they had entered the radiology discipline, especially the radiographer’s role in the technical aspects of image formation and processing.

“Without radiographers there is no radiology. ... I have got a limited understanding of exposures and mAs [milli-ampere seconds] and kVs [kilovoltages], how to position and what to do when. Often they say to me, ‘Let’s try it this way.’ Or if we’re screening something and something it’s not just working, ‘Okay, I have seen this before. Let’s try this or that’. So for me, ... there is no way I can manage without them.” [FGRADL1:415-425:15]

The above remark is in line with Mørk et al.’s (2008: 17) illustration on how radiographers and radiologists cooperated in defining novel ways of sharing tasks – during screening procedures in conventional radiology examination rooms the radiographer took care of the positioning of the patient, whilst the radiologist manipulated the equipment. According to Johansen and Brodersen (2011: 329), the working relationship between radiographers and radiologists is important for the success of skill mix.

Radiology registrars and radiologists were also appreciative of the mediating role of radiographers with the patients.

"I think they also sometimes come between patients and us. Sometimes we tell the radiographer or discuss with the radiographer. They are the ones who actually go out and talk to the patients afterwards, especially when it comes to after the procedure and we left and so on. So they're quite important in that come-between or mediator's role." [FGRADL1:406-410:15]

This is how one of the radiographers saw their mediating role:

"But if there is just this general feeling of mind your business and I mind my business, then it can affect the patient in some way and at some point. I think that the radiologist, they're not here for the patient. They're here to look at the scan that you put here for them and they need to write the report. That is their input to this patient." [CS18:2339-2340:85]

6.1.2 "Two heads are better than one"

Radiologists sometimes claimed that radiographers were equal partners and that there were two-way communications between them. However, these interactions were limited to mediating with patients or about patients, investigations or discussing the image quality.

"If they're not sure, they can ask. And [if] we're not sure, we can ask them. We can ask them extra views. Anything that they did special, was there any limitations of the study or anything like that." [CS08:710-713:26]

"They often say, 'Doctor, we're not sure about this. Can you just look at the shoulder? Do you think we need another view?'" [FGRADL1:458-461:17]

"I see something bothering me, which might not necessarily be something. I get someone's attention immediately and ask them to please look. Something you can just mention it to the radiologist and then he will look at it and further investigate. I think as well, two heads is better than one, if you see." [FGRAD2:175-180:7]

Although radiology registrars expressed this reciprocal relation and communication, radiographers were respectful and very careful not to cross the professional boundary. They expressed their approach as follows:

"Well, that part ... I wouldn't want to invade someone's space by telling them this and this is wrong here. But I would rather look at the scan. As it is, I am the first one to see the scans [after they have] been done. When I pick something up, I would get the

doctor's attention right there and then to ask them, 'Do you think there is something in here that needs further investigation to?'" [CS18:2251-2261:82]

"I think if you really see something obvious on the x-rays that is not mentioned on the clinical history ..., that maybe the referring clinician has missed, that you have an obligation to go and point this out to the radiologist. So that they don't miss it on their own, which I am not saying. But if you see something, you have to say, 'I see this', ... especially in case where you have got battered baby and stuff like that. If you know what to look for, you can maybe go to the radiologist while the child is in the room, so that there may be further x-rays taken or they can evaluate the situation from there. ... But I think if you see something, you have an obligation to do it. I mean, we get taught anatomy and pathology, so we are forced to see certain things. You can study further if you want, ... but we are taught to see different things. I think if you see something, you should have the courage or the freedom of speech to go ahead and say it." [FGRAD2:145-175:06-07]

At other times there was one-way communication where a radiographer could, for example, be asked technical questions such as, *"Were there any limitations or anything like that?" [CS08:712:26]. "Sometimes they ask me, 'Why is it rotated?' Then I would say, 'Because the patient is disabled, that is the best I could get'. They never ask anything about the patients, or how the examination went" [CS13:1176-1179:43].*

There was also occasional interaction between radiographers and the field experts from the orthopaedics and neurosurgery departments at the interventional radiology, computerised tomography (CT) and magnetic resonance investigations (MRI) sections. These interactions were, however, limited to logistical issues such as directing the expert to the radiologist or registrar for bookings. Between the various sections of radiology the administrative role of the radiographer varied. Whereas radiographers did all the bookings at the mammography section, the radiologist or registrar was responsible for bookings at the CT section. In some sections the radiographer's role was simply to prioritise patients and manage the through-flow of patients according to the management requirements of the department. Radiologists praised the efficiency of the radiographers in this regard and relied on their judgment of the patient's condition because of their closer proximity to the patient.

"Most of the time, [with] the prioritisation they're good. They will let you know, 'This is a more urgent patient. Try to handle that first.' Then the flow of the daily duties, they run quite smoothly because they are interacting with the patients. They are the ones who can see the patients are sequencing forward." [FGRADL1:480-485:18]

Despite the communication opportunities, the radiology department was still characterised by hierarchical relationships. The only section where the radiographer was acknowledged as an equal partner was in the mammography section. The radiographer played an integral role in the decision making regarding the projection (positioning of the breast) in relation to the site of entry of the biopsy needle. Radiologists admitted relying on the radiographer's skill in this regard, *"because they have got more experience than what I have"* [CS13:3501:127], according to a radiology registrar.

6.1.3 Role reversals

Most radiologists and registrars felt that despite the professional hierarchies, relations with radiographers were relaxed and conducive to an equal partner relation – *"We are professional, but in terms of like you're the boss and we are not the boss, it is very informal, very relaxed"* [CS18:714-715:26]. In contrast, some radiographers felt that their relationship with radiologists was one of convenience. An interesting picture of role reversals between radiographers and junior radiologists emerged during the study.

"When the radiologists start [as registrars], they've got a misinterpretation about us. As they start working with us, they start realising different things and start treating us better ... They try to be nice, even if they don't understand what we are doing." [FGRAD1:515-520:19]

Radiographers were willing to assist or support the new radiology registrars with orientation in protocols relating to procedures and processes regarding certain investigations. This moral obligation and willingness to provide support enabled the registrars to perform their radiological interpretation task optimally. One senior CT scan radiographer shared her experience from the scan section:

"Well, that situation you mostly find when you're on call. ... It is just you and the radiologist [registrar]. So, if there is a situation that one of the doctors comes from somewhere and asks for a scan, and it's a new radiologist [registrar] who doesn't know what is being expected. You the older [senior] radiographer that's been working here before this radiologist [registrar], you tend to go about the scan the way you know best. And if you pick up something, you would suggest to the radiologist [registrar], not tell him, but make a suggestion, 'You know what, this, that and the other [is what] this patient might need.' For example, the doctor wouldn't know that if a trauma patient, the patient would need a brain and a c/spine [cervical spine]. Because you're the radiographer working here for long, he accepted [it] as a brain, but there is a history of trauma here. 'You know, I think we need to do the c/spine.' Do the c/spine. If

there is anything, okay, we have done the c/spine. If there is nothing, okay, we've done the c/spine because it's protocol. But it's not everyone that knows the protocol. ... Some of the radiologists [registrars] would come and ask you for your opinion as to, 'This patient now is with this history, what do you think we need to do?' Then you would say, 'I think we need to do this or that'. So there is communication. I think the most important part ... that situation you would mostly find one-on-one radiologist-to-radiographer on-call basis." [CS18:2305-2320:84]

Larsson et al. (2009: 15) also refer to the occasional event of radiographers having a superior level of competence in the analysis of images compared to the junior radiologist, in which case the radiographer needs to be flexible, not following the normal roles or the rules of the environment.

The appreciation for radiographers seemed to last until the radiology registrars mastered the relevant skills and considered themselves experts with superior skills. This is what one of the registrars shared about his experience in sonography:

"I am busy with my second month. The radiographers, their knowledge with that [sonography] is tremendous. They really help us a lot with basics, things of how to do a abdominal sonar, how to get pathology, what to look for and what is normal and what is abnormal. Their knowledge at this stage is much superior than mine when coming to sonar. Whilst radiographers are that experienced, with radiology registrars you also have the advantage of the theoretical knowledge. With time when they pick up on the technical skills sometimes there is a tension that builds up I sense between you and the radiographer, because now I want to have things done this way. And the radiographer does not really understand because she has been training you to do this and you want to take over. But from the beginning they are very supportive. ... But with time we find our feet, take up the reigns, be in charge of the situation and be the one that makes the interpretation of the pathology that you find. The challenge was to find the pathology with the technical skills. But once the pathology is found, we are the one who wants to interpret it." [FGRADL2:140-147:5-6]

Radiographers also experienced tension with regard to expectations from radiology registrars. When registrars started a new rotation their task performance could be affected. The example below illustrates the issue of the scope of practice with regard to putting up an intravenous drip for the administration of contrast medium:

"The radiologists [registrars], I think, depend on who it is that you work with here. Unfortunately they rotate. So ... some of them can make your life difficult in terms of you

cannot put up a drip, that is their role. We cannot inject hand contrast, that's their role. So, if they are busy, and you have to wait and then, a little bit of tension build up, because you have this list [of other patients] to go through. Eventually someone will come and crap on your head, 'Why isn't the list getting done?' But they don't know that ... from the patient [has] been registered to coming here, there is so many hold-ups, you know. When it gets to their part, then it's just like, you have to wait for me. I am busy, you-just-have-to-wait-for-me situation. Then others, you know, you ask them [even] if what they're busy with, [they] come and so you can carry on with your work. So ... it's, who you get to be with, on this specific day [that] influences your role." [CS18:2218-2232:81]

6.1.4 Radiographers and nurses

Another area of conflict was interactions with nurses, who were an integral part of the support team of the radiology department. The nurses felt they were doing much more than just the care of the patient and that they made an effort to assist where possible. They felt part of the team – *"It's not a question of we have to be asked. We are there. You see, we're always there to help. Especially when you see a patient coming in from ICU [intensive care unit], you know you have to be there"* [FGNP4:711-713:26].

Confusion and friction resulted from differences in expectations of the scope of the nurses' responsibilities. This pertained specifically to patient preparation for ultrasound investigations, their role in fluoroscopic procedures and the choice of contrast medium. Requests for ultrasound investigations of the abdomen and pelvis were generally of a poor quality. Nurses were expected to make a judgment whether a patient required a full bladder and also to ensure that the bladder was filled. Often the request would be for an abdomen ultrasound. However, after verification with the radiologists, it was actually for a pelvis or lower abdominal ultrasound investigation. Then these patients had to wait until their bladders were full. In a focus group one of the nurses shared her own experience as a patient in this regard:

"I came for a sonar. And I waited for an hour. My name was called to go inside for the examination. The doctor asked if I have been given water to drink. And I said, 'No'. I had to go out and be given water to drink and wait another hour." [FGNP4:504-506:19]

Some radiographers preferred the nurse to be present with fluoroscopic procedures, regardless of whether a specific task would be allocated or required of them. Some nurses were concerned about the radiation risk if their role was purely that of a bystander during a procedure.

"I think sometimes we are getting exposed to radiation unnecessarily. ... The patient is for the swallow. What is the duty of the nurse inside the screening room? Because the contrast, the radiographer is mixing it and the radiologist is giving it by mouth. Why do they want the nurse to be exposed to radiation? There it's questionable. Some of them, sometimes they do not call you because they know you are not needed there. You see tomorrow, if you are not there, then there is a complaint again. I feel that we are exposed unnecessarily." [FGNP4:748-758:28]

Some radiographers expected nurses to know which contrast medium to select and to draw it up for administration. According to one nurse, she would first consult with the radiologist on the type of contrast medium to be administered before drawing it up. However, this often resulted in the incorrect choice, with the nurse being accused of wasting contrast medium.

"Op level 6, die radiografiste dink die nurses is hulle bediendes. So ons nurses, dit is nie my werk om met kontras te werk nie. Maar hier moet ek kontras optrek. Ek was ge-report omdat hulle sê ek besluit watse kontras. Ek vat die vorm na die dokter toe om te vra, 'Watse kontras moet gebruik word?' Sy was nie daar toe ek by die dokter was. Dan haal sy dit alles uit en dan report sy ek waste kontras wat moet gegee word. En hier op level ses, die radiografiste ken nie hulle werk nie, glad nie. Hulle ken nie hulle werk, die meerderheid. So ek wil weet: Wie se werk is dit om die kontras [op te trek], is dit die nurses of die radiografiste?"

[On level 6 the radiographers think the nurses are their servants. So us nurses, it is not my job to work with contrast (medium). But here I must draw up contrast. I was reported because they say I decide which contrast. I take the form to the doctor to ask, 'Which contrast must be used?' She was not there when I was with the doctor. Then she takes it all out and then reports I waste the contrast that must be given. And here on level six, the radiographers don't know their work, not at all. They don't know their work, the majority. So I want to know: Whose job is it to [draw] contrast, the nurses' or the radiographers'?] [FGNP4:424-431:16]

Norris and Melby (2006: 259) also noted conflict between nurses and other professionals in their study on nursing practitioners challenging existing boundaries of emergency nurses in the United Kingdom.

6.2 OUTSIDE THE RADIOLOGY TERRITORY

Despite the varying roles expected of the radiographer within the radiology department of the tertiary hospital, there was some common understanding of the supportive and complemen-

tary role of radiographers. Outside the radiology territory the relationship between the members of the different professions became more complex with multiple role players involved. A lot of the interactions were determined by hierarchies within the system and the way in which professional boundaries were defined within this context. Members of the medical profession occupied the highest position in the hierarchy. The radiographers were the least powerful at the bottom of the ladder. Because of the system pressures a lot of task shifting took place, which sometimes coincided with the development of further skills for some health care providers.

6.2.1 Hierarchies and boundaries within the medical domain

Hierarchies between different categories of medical providers were also observed in the district as well as the tertiary hospital. Specialists, excluding radiologists, enjoyed the most power. Radiologists categorised themselves as faceless people whose clinical skills remained unrecognised and who operated behind the scenes in service of other specialties and general practice. Many specialists and medical practitioners saw the role of the radiologist as a service provider in a *"black and white"* interpretation business.

"Why do people become a radiologist? Do they become it because they are not in the consultation business, because they don't want to consult the patients? And they become a technician, yes or no. Or they're people who are sort of clinical radiologists like they do intervention type, where they actually do something, so that's a different story. I think the interpretation type of business is actually again, it's almost like going away from ... a clinical way to a black-and-white picture thing." [FGMP3:461-467:17]

6.2.1.1 "Missing that link" – on having radiologists at the district hospital

Sections 5.2.1 and 6.2.1.1 1 have already alluded to the availability and access to radiology services and the constraints experienced by medical practitioners at the district hospital. These practitioners accepted this non-availability of not having a full-time radiological service on site at level-one institutions. Also, the practitioners had varied opinions on the usefulness of having radiologists at this hospital.

"You won't have a radiologist [in] most of the government setting hospitals, which are district setting hospitals. Or even sometimes secondary setting hospitals haven't got a radiologist full time on duty, maybe a visiting radiologist, or a session radiologist. So you can't just call out a radiologist every time in the middle of the night to come and interpret and even in private hospitals, I've seen that as well. They will take the x-rays and it will go back to the Casualty officer and they will say, okay, they will send the

radiographs back because the radiologist will report it the next morning". [FGRADL1: 382-389:14]

The lack of immediate access to radiological services led to certain attitudes and perceptions amongst certain practitioners. Medical practitioners had to walk across to the tertiary hospital if a radiological interpretation was required. Although this accessibility was appreciated and utilised, there were mixed reactions regarding the practicality thereof, *"because I am not leaving; I am the only doctor in ward 7. There is resuscitation and I am busy and [while] carrying x-rays around to other hospitals, someone dies in that ward because of negligence"* [FGMP1: 256-261:10].

"At ... night you need a x-ray to be read. You need to fill in a transport form. By the time it gets to the radiologist [and] she finds the time because she is probably busy with the spoed [emergency] CT or spoed sonar or something. To read the x-ray, the actual report to send it back, nothing less than two to three hours." [FGMP1:277-282:11]

The absence of a radiologist was experienced as a missing link in the aid to medical practitioners in diagnosis and referral decisions. The current practice was for the medical officer at the district hospital to make a diagnosis before referring it to a higher level of care.

"Here as well our job is to make some kind of diagnosis. Get an answer, that is, if it is the thyroid, then it is our duty to get the ultrasound done of the thyroid to prove what is wrong with the thyroid. [Is it] enlarged? And then make an appropriate referral to the surgical department to say, 'Listen, here we have done an ultrasound; we've done a thyroid function [test]. It shows for further management.'" [CS15:467-470:17-18]

The predominant constraint experienced by most practitioners in the absence of a radiological expert opinion was with cervical spine examinations. A decision needed to be taken in the case of severe spine tenderness, as one was not able to diagnose on an x-ray because of uncertainty as to what to look for. If support for an expert opinion from an orthopaedic surgeon was sought, there were additional difficulties, as the surgeons did not want to clinically assess the patient. One had to have a CT scan because they seemed to disregard plain cervical x-rays.

"Where you've got doubts, then you do get worried, especially when very tender. Especially when you see the x-ray and you are not sure and you have to phone the orthopaedic doctor, they give you a lot of problems. You have to do CT on patients, sometimes unnecessarily, because the orthopaedics, they don't want to see the

patients without a CT scan of the neck. So because they don't evaluate x-rays per se, so you have to do a lot of unnecessary CTs just to be cautious." [CS24:300-310:12]

Medical officers felt radiologists could fill the gap by authorising and give directions on which field specialist to consult.

"It will help to facilitate the transfer to the ... [tertiary] hospital. In a sense if you said, 'This is suspicious of malignancy in the lung.' Now to get a CT scan, you either have to walk with x-rays. And you have to explain some of your cases to radiologist or you can refer via a specialist. And then they wait long. In that sense if we can show it to the radiologist like once a week, twice a month or something that can help us to facilitate to organise a CT scan. I can understand they want us to refer via a specialist. It's difficult to see, should [it] be a cardiothoracic, is [it] a internal medicine case. They fight between them as to who has to accept the patient." [FGMP3:412-424:18]

Furthermore, there was a constant fluctuation of provider responsibility and taking of ownership of the patient in instances where decisions were taken by medical practitioners.

"The tertiary level has a problem. They don't really understand that we are district-level hospital. We don't have radiologists reporting on our x- rays. So if I say this [the diagnosis], they are really supposed to accept the patient." [FGMP2:336-340:13]

Medical practitioners were very vocal about the professional struggles between radiologists and other field specialists, as they often found themselves caught up in the cross-fire of the battle.

"It's, what's the words? It is politics. What's the word I am looking for? Internal politics. I had a similar story on a Friday. I had a young lady that needed a heart sonar. I phoned the cardiologist and she says, 'Phone the radiologist'. And I went from here to there and here to there. Then later I said, 'The two of you sort it out, between the two of you and then get back to me'. Then they got back to me. He says, 'You phone' and she says, 'You phone him'. Then I said, 'You'll sort it out. Here are each other's hash numbers.'" [FGMP3:103-108:04]

"But I don't clearly understand the motivation for it [accepting referrals from the district hospital]. Because if it's to cut down on patient numbers, it's a bit stupid, because those patients are going [to] come to them anyway. They just come to them at a later stage. Like I had patients in Outpatients; they refused to take the patients. But then they say, 'You have to ... go via the department.' So you phone the [radiology] registrar, and you say, 'I have got a patient with chronic liver disease'. You need a

sonar whatever, whatever. He is like, 'Book the sonar.' And you phone the other doctor and you discuss with the doctor. And you call the doctor and then they take down the details. And I mean, all I have done is tell another doctor, 'That's fine, do it'. I mean, it's pointless ... in the end it's the patient that is going to be delayed and suffer." [FGMP1:121-132:05]

Medical practitioners found themselves in the role of mediators and negotiators. In this regard Suter et al. (2009: 46) are of the view that negotiation is useful to overcome differences in viewpoints arising from different professional cultures or other influences.

There were mixed responses to a question on the usefulness of an expert radiological opinion at the district hospital level. There was some support for the radiological opinion – *"You're reading the report, you notice things, you learn. So it's not like I saw ... this hole the whole time, so I thought it was that previously. But after you get a professional opinion, then you start to spot things"* [FGMP1:1221-1224:45]. Other practitioners tended to be selective in the use of information from the radiological report. The tendency was to distinguish between the relevant and non-relevant information and then integrate: *"You look at what the radiologist saw and yes, this pattern is important or not important, and you can put the things together"* [FGMP1:1115-117:41].

"Or it was just a person not doing his job optimally, because I know they have a way that they usually report. So probably he is lazy. He will not use the format. He needs to type in every single patchy [finding], so that was probably one of your individuals that was not using the correct procedure. But if you insist, there is a procedure. I have seen quite a few, if you look on your system and speaking to your patient. ... If you get a substandard report and you get hundreds of reports to the standard, you can phone him and say, 'Why didn't you comment on these? I see this report is not so informative as it should be.' That is how one deals with [it] in a very professional manner." [FGMP1:1210-1230:45]

In reaction to demands for a full-time radiologist at the district hospital and difficulties of having immediate access to radiological service, senior medical officers felt that a regular visit by a radiologist for a discussion should suffice.

[Participant 1:]

"Getting a person to come and do reporting of our x-rays, we discussed it with our management. Is it really worthwhile getting a person to come in once a week, twice a week, or whatever to come and report here? At that stage we decided that for our

hospital we can use that money, that post, for something that we've got shortage in other areas."

[Participant 2:]

"If we can get somebody to come once a week or whatever and coming to attend clinical discussions ... We put up the x-rays. Half an hour, an hour and we discuss x-rays. That will then benefit more to doctors and that part of training, it's sort of in-service training that helps a lot." [FGMP3:396-408:15]

Khan et al. (1998: 3) reiterate that advances in diagnostic imaging do not replace the need for clinical interpretation and also suggest that clinicians and imaging specialists should schedule weekly case meetings to facilitate communication.

From the radiographers' perspective the hierarchical status of professionals could have an influence on gate keeping and decision making. Radiographers at the district hospital felt there was a need for a radiologist to be the mediator between them and the medical practitioners in order to promote accountability and leaving them with the power to take certain decisions. This could result in better relations between radiographers and medical providers, as radiologists were fellow-medical practitioners and superior in terms of their specialty.

"When there is radiologists in an institute they will say, 'Do this' and they will go and tell them, 'Why this and why are you asking for things that is not related to the case?' They can sort out the problems. But now we're missing that link, between the doctors and us. So we end up fighting with the doctors, and the doctors fighting with us. Because we are missing the link. They will respect each other because they come from the same background. They can see that you specialise, they will listen to you. They can listen to each other better than us." [FGRAD3:315-327:15]

In some instances medical practitioners could perform some ultrasound diagnostic investigations but in the context of patient referral for specialised investigation challenges remained, as professional hierarchy also came into play. In the case of cardiac sonars, for example, subject-specific expertise and skills are needed.

"Especially the cardiac sonars, because Dr M [a family physician] got training on abdominal and so forth, but he can't do cardiac sonar. So now if you want a cardiac sonar you have to phone the [cardiology] registrar on call. He says, we can't book cardiac sonars or do everything now." [FGMP1:89-90:4]

Where medical practitioners had expanded their professional skills they were often unable to apply these skills or perform their task adequately because of lack of direct access to tech-

nologically-mediated expertise to provide “the best possible care that a district hospital can give them” [FGMP1:216-217:8]. A senior medical practitioner commented as follows on her own professional development:

“I am doing my masters in [family] medicine and now we are doing a course in sonography as part of the masters, where you learn to put a CVP [central venous pressure] under sonography. So that’s it. Every emergency unit should have a sonographer and a radiologist. But there is where the health system is failing the doctors, because it’s holding us back with our own training and moving forward [and] failing the patients, because they’re not getting adequate care.” [FGMP1:205-215:8]

6.2.1.2 “Turf wars” at the tertiary hospital

Internal politics and the claiming of boundaries also played a role in the way in which radiologists and other specialists interacted at the tertiary hospital. This revolved around two main aspects, the completeness of request forms received from certain specialists and the territory of who should do breast biopsies.

Specialists other than radiologists seemed to dominate the medical domain. Radiologists had a great respect for these clinical discipline-specific experts, because their knowledge of interpretation was based on experiential integration and insight on the continuity of care.

“I think as far as the referrals and requests go, what we get, reflects the level of the referring doctor. For example, sometimes a consultant will order an x-ray. The consultants know what they want to see. They don’t need our report, especially the orthopaedic cases. So they will just write, ‘Previous fracture, x-ray ankle’. There is no other history of the operation because they know how operations are done. They’re going to look at the films themselves. They know sometimes the history is inadequate. The referring doctor is a specialist, he knows what he wants.” [FGRADL1:41-54:02]

On the other hand, boundaries became tighter when radiologists felt these discipline-specific experts were attempting to interpret images that were out of their expert fields. The radiologists would then re-claim ownership of the interpretational territory.

“Obviously we’re dealing with other specialties and like I said previously, I don’t feel offended that orthopaedic surgeon who’s been specialising in orthopaedic surgery for so many years doesn’t necessarily look at my report. He can see exactly, see what’s going on and he knows what he is going to do for his patient. And then the same goes for a neurosurgeon. The neurosurgeon looks at just as many CT brains as we

do. And I think our [role] becomes important, especially when that boundary gets crossed. Especially, for example, when a orthopaedic surgeon now has a patient with a bone tumor and she needs to see whether there are lung metastases. Now she does not look at a lot of chest x-rays. Now that is where our role comes in and that's where orthopaedics comes to us and say, 'This is the problem: We can see the bone tumor'. But they don't know with lungs. We can help them with the lungs, and we help them with the brain. And the same goes for the neurosurgeons. If they've got a poly trauma patient they're fine at looking at the CT of the brain but they don't always look at our reports. But, for example, their patients are going to be on ventilators, they're going to have problem issues with the lungs, with the abdomen, orthopaedics, and that's when they come in and ask us for our support." [FGRADL1:215-246:8-9]

There were furthermore cases where radiologists and specialists worked together to come to a conclusion on diagnosis and treatment.

"I think when it comes to follow-up patients, that is where the orthopods have intervened and the neurosurgeons have intervened. They know what they have done and often that bit of information help us in our reports as well. If we can actually come to a conclusion together, so I think sometimes that helps as well." [FGRADL1:270-277:10]

Turf wars broke out where there appeared to be an overlap in scope of practice between radiologists and specialists and where both performed certain procedures. Surgeons and radiologists, for example, had issues around whose territory it was to do breast biopsies and about the accuracy of the biopsies. This was discussed aptly by the radiology registrar attending to Patient 13:

"Yes, they do see, it is still old school in medicine. There is always the turf wars, what's your, what's mine. So I am not going to lie to you because there is money in that. Surgeons sometimes feel if they could feel the lump, they're going to biopsy it. They're going to try and biopsy it. And our feeling is, don't. There is a mammogram and a stereo-tactic biopsy is far more efficient, far more sensitive. We're going to see the micro-calcification; we know where to go in. He might feel a lump, it is a fibro adenoma and next to it is cancer. What do you biopsy the fibro adenoma? You miss the cancer. He might lose, or if she is intelligent enough and got the resources [and] comes back on time to SOPD [surgical outpatient department] [for an] appointment. And say, 'There is something wrong with you and come back whenever.' And [they] may have lost out." [CS13:3517-3530:127-128]

This territorial confusion was illustrated in the case of Patient 13. The surgeon explained to the patient the need for a mammogram in order to make a decision whether a biopsy was necessary or not.

“Biopsy is recommended [according to the referral note]. The problem is if I don’t have a picture of a mammogram, then where are you going to do that biopsy? Because this lump has now disappeared, so it’s probably part of fibro adenosis. So, we want to see you after this x-ray that they take. Then you must bring all this with. So we don’t lose track of what is going on.” [CS13:689-694:25]

When the patient and I arrived at the radiology department, the radiology registrar made a decision to also perform a biopsy of the breast and explained as follows:

“For the right breast, no fault. The left, there is small part of the caliceal, is a breast cellular. They [radiographers, radiologists and nurses] do the biopsy, evaluate the reason for calcification. I think you’re booked for 8th April, then biopsy for the left side.” [CS13:1445-1448:53]

According to Mørk et al. (2008: 14), “shared practice by its very nature creates boundaries”, and experiences may be modified and extended in the light of experiences in their discipline fields. These authors also refer to the fact that boundary blurring between practices of radiologists and surgeons necessarily evokes conflicts and that each group wants to claim ownership to the treatment and to the eligible patients. Powell and Davies (2012: 808) describe professional territory as “the differences in professional identities and core beliefs” and the significant impact of professional identities and boundaries on how individual health care providers from the same or different profession work with each other – something that has implications for the care that patients receive. They also refer to the radiology profession seeking to lay claim to particular fields of knowledge and to assert their jurisdiction over particular tasks. In a study by Johansen and Brodersen (2011: 326) the fear of losing demarcations with regard to resources and organisational quality was also a concern between medical specialist professionals and radiographers where tasks were taken over or shared.

6.2.2 The radiographer’s professional space – *“There is a battle between everyone in this hospital”*

Radiographers faced different challenges in performing their tasks effectively outside the radiology department – *“But outside of the department, no I think it would not work well to work outside with the same people”* [FGRAD1:595-596:22]. Outside the radiology territory

radiographers' task performance was complex and complicated. It was dependent on team effort and cooperation with other professionals.

"I have mixed emotions. ... Sometimes we fit in everywhere and everybody is happy. You're working with the nurse, the doctor, everybody is having a great day. And sometimes there is just one person in the chain that totally takes all that away, that doesn't know what to do or why you want to do it the way you want to, or even if you explain to them. I don't say doctors, I don't want to say doctors, [I am] speaking of everybody that doesn't know, whatever. ... In my opinion sometimes, yes, everybody works well, sometimes, no. Then there's only one person that, it's a new doctor that is rotating somewhere, or a new nurse that is rotating in that ward. It depends on the situation." [FGRAD2:210-226:08-09]

6.2.2.1 Perceived hierarchies, power relations and disrespect

According to Hilligoss (2011: 38), existing personal relationships, differing levels of experience, formal power structures and hierarchies have numerous effects on quality of care or services. In my study, radiographers felt doctors and nurses did not understand their roles and responsibilities – *"They don't understand the profession and how much we know, and what everything entails and why we do certain things"* [FGRAD1:288-289:11], which often resulted in feelings like the following:

"I am part of it, but I don't feel part of it. Especially when you are in theatre, you are part of the team. But somehow you are not part of the conversation. ... You just stand there in your little corner." [FGRAD2:357-368:14]

Lack of information and understanding of professional roles and responsibilities, meaningful communication and relationships are also reported in the literature (Suter et al., 2009: 44; Adams and Smith, 2003: 197). According to Mørk et al. (2008: 17), the radiographer's role in theatre is confined to a particular task of taking images, but usually there is no direct cooperation between, for example, operation nurses and radiographers.

On the other hand, nurses felt radiographers were, *"part of the team. Because without them we cannot see where is the infection in the lungs, if the bone is broken"* [FGNP1:79-80:03]. A professional's position in the hierarchical structure within the system was perceived by radiographers as the number of years a person had studied:

"They [medical practitioners] just think that we did a three years course. I actually studied for seven years for all these things. So they think they know better. Because

they have more background than us ... that is true. But at the end of the day, you [the medical practitioners] make idiotic mistakes.” [FGRAD3:328-331:14-15]

The power of relations in the hierarchies left very little space for radiographers to participate in decision-making processes dominated by the medical profession. Medical practitioners saw the completion of the request form as a medium of instruction to perform a job. A senior family medicine consultant said:

“If I am requesting a specific thing for my specific reason, I don’t think you [radiographers] are in a position to query. My requesting may be unreasonable, but still, if I, on my clinical decision making, want a specific view or specific x-ray, I don’t think they can refuse. So that is my feeling; that is my biggest thing.” [FGMP3:43-49:02]

Lewis et al. (2008: 96) refer to unethical situations relating to the justification of radiographic examinations and radiographers’ feelings of uncertainty with regard to their legal and moral responsibilities.

The medical practitioner-patient interaction was the primary relationship in the system. Other providers – the radiologists and radiographers – were perceived as intruders in this relationship. A senior family medicine consultant gave a specific example of how patients were used as a vehicle to pass on distorted messages if referrals had not been justified:

“Where people are not informed properly, again that’s the relation between the doctor and the patient. That’s almost like a triangle between the doctor, the patient, and then the radiographer. ... In research terms, we talk about the confounding factors. So it could be that [in the] relationship the radiographer actually somehow are involved, that they’re involved in the process to the benefit of the patient or sometimes not to the benefit [of the patient]. You don’t make the wrong comment about something. They jeopardise the relationship between the doctor. If they, let’s say for example, I see the patient; I send him for x-ray. The radiographer takes my request form and while she is busy with the patient, she will make the comment like, ‘Why did the doctor want this x-ray?’ Then the patient comes back to you, ‘Doctor they say you are sending me unnecessary for the x-ray’. Maybe there is a little bit friction. So I don’t think the radiographer is really in the position to always comment or make a decision about the request of the doctor.” [FGMP3:547-562:20-21]

Incompleteness of the request form was sometimes accompanied by some abuse of power by medical practitioners. When radiographers attempted to mediate and fill the gap by seeking clarity on the request, *“when you even call the doctor sometimes, they are very rude. They just tell you, ‘Just do the x-rays’” [FGRAD1:182-184:7]*. A radiographer recalled an

incident at the tertiary hospital where she was requested to do, amongst other examinations, the cervical spine that included specialised projections in the emergency unit. She decided not to continue with those projections because the patient already had a CT cervical scan. (See also Section 5.1.3.1.) The reactive response from the referring practitioner was:

“Who the hell do you think you are to tell me how to do my job? If my registrar wants to see this, you will do this.’ ... She sat there looking at him. Whilst explaining what’s going on, the louder he yelled and she told him, ‘Listen here, there is nothing wrong with my ears. You can speak normally’.” [FGRAD2:1365-1370:50]

Radiographers also experienced disrespectful treatment by medical practitioners with regard to services expected to be rendered after hours. Below are typical examples of the hierarchical role of the medical providers, who disregarded the protocols for radiography theatre services in the tertiary hospital after hours:

“They just think if they phone for a x-ray, you must come now. Doesn’t matter what you’re doing, especially on night duty. ...

So I went there and the doctor is like, ‘Why did you take so long?’

I told him, ‘Doctor please, okay Doctor, I just came from floor six.’

But he says, ‘But aren’t you six?’

I told him, ‘No, we are three, for the whole hospital and the other one that is in charge can’t leave the department, so it’s very, it’s actually just two of us doing mobiles the whole night.’

And I mean the whole hospital and ... they can’t understand. That they can’t expect us to be there, when they phone, I think that is very bad.” [FGRAD2:357-368:14]

“The other night, I must be at the urology theatre at seven. We have got notice in the department that says, ‘There is not a x-ray radiographer available for ... urology theatre or gastro after half past three.’ ... So they know that. Then they phone us seven o’clock in the evening. They need someone to come to the urology theatre now.

When you get there, you try and explain to them, ‘Listen, I will not be able to sit here the whole time, because we are understaffed. ... They need me downstairs.’

The doctor said to me, ‘I don’t care if you’re understaffed. If I tell you to sit here, you will sit here.’” [FGRAD2:357-368:14]

Yielder and Davis (2009: 348) refer to radiographers’ feelings of inferiority and subservience towards radiologists and medical practitioners in general. They also reported feelings of being intimidated, under-appreciated, worthless and subordinate – “Just the Radiographer”.

6.2.2.2 “It is always better in a team set-up” – *interaction and communication with radiographers*

Various claims with regard to interactions between radiographers and other health care providers were made during focus group and individual interviews. One radiographer at the tertiary hospital said:

“Yes, lot of interaction between us and the doctors. It’s not always just positive. It’s sometimes just a question, just to make sure that we understand correctly. Sometimes, ‘This and this is broken very badly. Just go and check it as soon as you can, please!’ But some of the times it is also to make sure what is going on.” [CS13:1086-1092:40]

A radiographer gave an illustration how two-way open communication could be effective:

“The doctor came and said, ‘This is a fracture.’ But it’s a growth plate and I mean we know it and they don’t even know it. I mean, they can just come and ask us or even come and ask the radiologist just to check for them.” [FGRAD1:947-951:35]

Medical practitioners at the district hospital conceded that they had minimal interaction with radiographers and the relation between these two professions was an indirect one that differed from the close proximity of radiographers with radiologists at the tertiary hospital.

“The only time you react to them [the radiographers] is when they’re doing a bedside unit. If you’re sending the patient to the x-ray, you don’t interact with them. But if they’re coming through to you ... they come and they take the x-rays. They go and they leave; we don’t see them again. I am sure if there was an instance where they come back with the x-ray maybe ... but there is no interaction.” [CS18:1139-1145:42]

One of the medical officers at the district hospital was also of the opinion that “*two heads are better than one*” [FGMP1:1111:411] when it came to interpretation. Another senior medical officer felt it was important to interact with radiographers:

“It is necessary; there are times when the doctors are not perfect in everything. There are times when you got an x-ray. You are not sure what you’re seeing on that. Sometimes you need two brains to find out what you see. I think also open communication between two ends, because you are helping sorting out the patients. It is always better in a team set-up.” [CS09:204-217:08]

Kelly et al. (2012: 91) suggest that the accuracy of diagnostic decisions can be improved through collaboration between radiographers and junior doctors. This would have the potential to contribute positively to patient outcome.

6.2.2.3 Nurses and uncooperative patients

An interesting comment made by one of the radiographers related to how nurses perceived them – *“The nurses think we are zero. As well they think we don’t know anything about our job. They know better than us”* [FGRAD1:324-325:12]. Nurses, on the other hand, felt they were willing to cooperate with the radiographers – *“We are not usually involved. All we do is hold patients if they are restless and if the patient is not restless we usually wait outside”* [FGNP1:4-8:01]. They also felt they would be more willing to cooperate if they knew what was expected of them.

“But again, it goes about the communication. If we have to lift the patient we have to assist each other. The radiographer wants to do like this and the nurses must do this. We want to, we must assist each other, so that we reach a conclusion.” [FGNP2:301-305:11]

According to Mørk et al. (2008: 17), the primary concern of the nurse is the care of the patient and that matters need to be diplomatically resolved if roles and responsibilities are not clearly defined.

At the tertiary hospital the relations of radiographers with nursing staff differed from ward to ward.

“I just feel the ICU sisters in our hospital are fairly okay, especially [those in wards] X and Y. They usually, they will help you. But the other wards, the sisters will just, if you walk in with the machine, it’s like exploding and then everybody is gone.” [FGRAD1:345-352:13]

Radiographers felt that nurses took charge and often made erroneous judgment calls on the best practices to be implemented to achieve an optimal quality examination, which often resulted in a downplay of each other’s professions. An illustration of this was particularly visible when a radiographer was relating about an immobile patient and she was expected to do the x-rays with the patient seated.

“I went to do a patient in ICU. The ICU patient is intubated. ... He doesn’t even understand what’s going on with him. She told me I must do the patient seated. I was alone there with the mobile.

I say, ‘How am I going to do that? Will you hold the patient for me and the cassette?’

She is like, ‘No’.

But I must do that patient seated. I'm like, she's telling me that when you do a patient erect, the views are better.

I said, 'I know. But in this case I am not going to do the patient seated. That's why supine.'

She is telling me, no, but she has twenty years' experience.

I am like, 'Do you have twenty years' experience as a nurse or as a radiographer?'

So they also think like we don't know what we are doing. I feel that they feel we're just like dumb, we don't know, have a clue what we are doing. They know better than us."

[FGRAD1:327-339:13]

Radiographers also accused nurses of undermining their competence in performing their task. In some situations radiographers were left on their own to do their job and even if a call was made for assistance the response was very poor. This impacted on the radiographer's task at hand and often resulted in sub-optimal care of the patient.

"The detectors are very heavy and you have to lift up the patient. You have to put in [the detector]. Nobody wants to help you.

I was asking the sister, 'Come and help me'.

She told me, 'The patient can sit up on his own'.

So I asked him four times, 'Please sit up, please sit up'.

I asked him, he said, he can't sit up on his own. Now, I can't lift him and put in the cassette. ... So I went to fetch her [the nurse]. ... She was just like holding his arm.

I told her, 'If you don't wanna do your work, then rather leave. Because I don't think it's fair towards the patient or me'.

She does not want to help me. And then I told her, 'I asked the patient to sit up for me. He said, he can't.'

And then she said, 'Ja, you don't know how to do your job. Then you must leave'."

[FGRAD1:360-371:14]

Nurses' refusal to assist the radiographer sometimes necessitated the medical practitioner to intervene by instructing the nurse to assist.

"Radiographers go up to the wards to do the mobiles. When they come, especially in the ICU unit, the sisters don't want to help the radiographers to support them to help lift the patient ... because they can't handle the patient alone. So the sisters, they're

just refusing to help the radiographers. ... And then the doctor starts fighting, 'Why is this x-rays not done?' ... When the doctor ... talks to the sisters, then they will do something about it." [FGNP4:228-240:09]

The lack of cooperation between radiographers and nurses could, amongst others, have been caused by the minimal interaction between the two groups. Also, according to a nurse, there was not much interaction between them and the radiographers – *"We don't talk too much. We just come here. They're sending us with request forms. They say, 'Go this way. You sit outside'"* [FGNP1:55-56: 03]. For the nurses who did accompany their patients to the x-ray department at the district hospital it was nothing out of the ordinary, because for them, *"it's normal because you have been used to it"* [FGNP1:59:03]. According to a nurse at the district hospital, the radiographers *"come in with their machines. They do the patient and we wear those aprons and then we assist them. Thereafter, it is amen"* [FGNP2:155-160:06]. Nurses were not at ease with the protective clothing provided because of the lack of understanding on radiation safety. *"We just wear them. They don't tell us why. There is no interaction. They just tell you, 'Do this, do that'"* [FGNP2:261-262:10].

Radiographers in turn could not understand and were quite judgmental about the nurses' lack of support in terms of restraining a patient or helping the radiographer to hold the cassette and blamed it on misconceptions of the radiographer's scope of practice.

"The fact that we're not allowed to hold patients doing a examination, the sisters has a big problem with that. They don't want to hold the cassette. Why must we reside from radiation and why not them? They don't realise all we're receiving all day long is radiation. So again I think they're very misinformed about the profession. I don't think they want to know much about it either." [FGRAD1:379-384:14]

6.2.2.4 Radiographers' perceived isolation and alienation in the absence of support

Radiographers experienced a sense of isolation – similar to that which Mørk et al. (2008: 15) found in their study – because of the disrespect shown by other professions operating outside the radiology department. Their role was constantly downplayed and mocked – *"They asked in theatre, 'Is that what you're getting paid for?'"* [FGRAD2:546:20]. Radiographers perceived these kinds of behaviours as a barrier to building interprofessional trust and relationships that are necessary for optimum patient care.

"I mean, if they wanna do it, they can do it. But I don't know how they're going to push the button, look and screen and look and draw and everything, so I don't know. Some of the doctors really think we are dumb here. ... I think that they do appreciate, but

somehow they don't manage to say that. ... When we're not there, they miss us, but when we're there, they do not appreciate us." [FGRAD1:545-561:21]

Most radiographers perceived their role as one of insignificant and low professional worth. This low self-worth feeling made them feel unappreciated within the health care system. As professionals they were seeking acceptance or belonging. This is how one of many radiographers expressed this longing for recognition:

"I think sometimes people look at us, especially the doctors look at us as people who really don't have anything in between the brain, you know the ears. And sends patients here and when we ask questions, is like, they become this aggressive. 'How do you dare ask me, who's been studying for twelve years?' These type of questions. 'Are you, do you know what is it? Do you have more knowledge than me?'

Certainly, I have more knowledge when it comes to the radiation, when it comes to the contrast. And then when you tell them, 'Please this patient is telling me that there is a suspicion of allergy, or suspicion of pregnancy and because I am going to be held legally responsible if anything should happen to this patient, I need to know these answers and she can't tell me. You're unfortunately the referring doctor.' So who else do I ask?

So I think, there is a battle of not even between the radiographer and the doctor, but there is a battle between everyone in this hospital, the nurse, the radiologist, the referring doctor, the radiographer. ... To me it's like, the doctor thinks he knows it all. I don't argue with the fact that he knows more than me. But allow me to practice what I know. Don't undermine that. Fine, you know more than me, you have done much more than me. But I have been trained to do this. I think I am allowed to ask these questions and get answers. Not treated like a person that, what do they call us? Druk knoppies [push buttons] or knoppiepoppies [button dolls] or button pushers or whatever." [CS18: 2160-2185:58]

However, radiographers sometimes also received little or no support from senior radiographers and radiologists when the quality of the investigation was under scrutiny. So even within the radiology territory they sometimes felt they were on their own.

"Also in ICU sometimes you get sisters that, say cassettes that is not deep enough in, and they say, 'No it's fine'. They only want to see where the tube is. They don't think you have to get all the costophrenic angles on. They don't see it has to be optimum. They just want to see where it goes. They say, 'That's why the doctor requested the film', but they don't want us to lift again a bit deeper or make the bed flat

and all that, but just get everything perfect. They just want to quickly do it to see if everything is fine. We have to do everything perfect because here [in the department] nobody else knows what happened there [in the wards]. They [radiologist or senior radiographer] just say, 'Your x-ray is not right, the projection'. And you're struggling to get help." [FGRAD1:385-400:15]

6.2.3 Boundaries and task shifting

During the study many observations were made with regard to practices related to informal task shifting. Task shifting in this instance refers to asking someone from another profession to do the task for you or someone does it because there are insufficient resources or supervision or someone thinks it is perceived as a collegial favour.

The role reversals and informal task shifting with regard to diagnostic imaging investigation could be viewed as an expansion and contraction of professional boundaries. In Section 6.2.1.2 mention has already been made of a type of task shifting between radiologists and specialists. Radiologists relinquished their responsibilities with regard to interpreting the request form and writing the report by allowing specialists to take ownership and control from referral to interpreting their own images.

Two other forms of task shifting were also observed. Firstly, medical practitioners and specialists allowed nurses and medical students to do their referrals for diagnostic imaging investigations independently. Secondly, some radiologists also expected radiographers to do specialised investigations before studying the request form. In a focus group reference was also made of instances where the radiographer had to interpret x-rays in the absence of a radiologist. Table 6-1 gives a summary of these forms of task shifting.

Table 6-1. Informal task shifting from the medical domain to nursing and radiography

Category	Radiographers	Nurses	Medical students
Referral	-	√	√
Investigation	√	-	-
Interpretation	√	-	-

6.2.3.1 Who may refer and who not?

Ideally only qualified medical practitioners are allowed to refer patients and request for diagnostic investigations, “because it says so on the x-ray request form.” [FGRAD1:108:04] At both tertiary and district hospitals task shifting occurred between professions when making referrals. At the tertiary hospital, nurses at the orthopaedics department were allowed to refer and request an investigation because of shortage of consultants and registrars to cover the patient load. This is what a radiology registrar had to say about this situation:

“Well, technically she [nurse] is not allowed to request the examination. It should be the qualified doctor that requests the examination. We are aware that sometimes sisters do fill in the forms and then get doctors to sign. We’re not aware because the form comes with a doctor’s name and a signature, a hash number. Sometimes it’s clear from the history that is given the doctors did not fill out the form. The question is what to do about it? On the one hand is, for example, in orthopaedic clinics where they’re very, very busy, at the outpatients clinic. There are 101 patients that need to be seen; they all need x-rays. And the doctors are busy doing ward rounds and theatre, and patients are lined up. And to streamline things the sisters do fill out the form with very limited history. And in terms of getting the clinic running and getting things on the roll, yes, it’s good thing. The bad thing is they’re not supposed to do it and patients sometimes get sent for investigations that are inadequate or are not required.” [FGRADL1:959-973:35]

Nurses felt that because they were working in a team and the medical providers were not always there they had a role to play in referrals.

“Yes we do [request] in most cases because sometimes the doctors are not always there in the ward; they come in the morning. They do quickly the rounds, thereafter we do admissions and they just request. ... Most of them don’t sign it. We just write the doctor’s hash numbers there, we just write there [the doctor’s name], hash number, but the signature I put my own signature there. ... We feel, because we are working as a team, we have to help each other because it’s a team working.” [FGNP3:436-454:15-16]

One of the consequences of task shifting was the impact on professional relations between providers. A typical example was given by the radiology registrars at the tertiary hospital to illustrate the communication constraint they faced when nurses were sent to do the bookings.

“And also that nurses are sent to make booking for the VCU [voiding cysto urethrogram]. The problem comes when you want to find out more detail about the patient’s information. Has the patient been operated on? Why do you think he has got posterior urethral valve stricture? ... Then ask them to ask the doctor to phone you. Then [it] becomes another bad kind of blood between the two of you, when it is not supposed to be like that in the first place. The reason why you want those answers is because you want to understand what you need to do for the patient. Yes, it’s been a little bit of a dilemma.” [FGRADL1:980-984:36]

Similarly medical students were sent to make bookings for specific investigations. The ideal is that *“under normal circumstances, we would have said, ‘No’.*” However, according to a radiology registrar in the case of *“a particularly good student who knew exactly what she was talking about”,* the referral contributed to skills development and empowerment. In that case the student was reminded of the system rules: *“You are not allowed to request. Please tell your registrar that, but we’re going to book it. Because you clearly know what you’re talking about, so that’s fine this time”* [FGRADL1:1008-1014:37].

Ideally, it was the family medicine consultants’ responsibility to mentor the medical students at the district hospital.

“I have seen many patients sent for x-rays, head to toe that is unnecessary. And sometimes we mistake, we have got medical students, final [year] students. And then they present, and the way they present you don’t really examine. But it sound like this patient really has [something or a problem]. You find that the request is already done and you sign it. ... but when you go and check the patient quickly then you find that there is no need for any x-ray. But you know how sensitive the students are. Your knee is painful and your ankle is painful, so that is when you should really be worried when a request is called ‘pelvis, knees’.” [FGMP2:652-657:24]

Role reversals and informal task shifting also posed significant challenges to radiographers with regard to task performance. Immaterial of whether investigations were justified, whether request forms were complete or whether the correct investigation was requested, radiographers were expected to perform the investigations. One such example was Patient 17 with a complaint of back pain and a feeling of discomfort in the fingers. The nursing professional requested a hand radiograph that was not justified. The radiographer proceeded with the investigation, thus risking the patient to unnecessary radiation. The radiographers indicated that they had complained from time to time about the nurses referring when the system came under pressure, but that nothing had been done – *“It is not right for the nurses to fill in the*

form and sometimes they fill in the form and not even ask for the right examination” [FGRAD1:105-111:5].

6.2.3.2 Radiographers taking over radiologist and medical practitioner tasks

Radiographers did not only experience challenges with referrals but also with investigations when the radiology registrars wanted them to perform tasks without first looking at the request form. One radiographer shared her experience in this regard where she had stuck to the correct practice, preventing the patient from being exposed to unnecessary risk.

“The patient was sent for a rapid barium swallow with the third year students ... and like, ‘Okay, so you know the history of the patient?’ They don’t know. So I phoned my doctor, the radiologist [who said], ‘You just do the rapid barium swallow without me and then I will see the x-rays on the computer.’

I’m like, oh is that so? I am like, I am not going to give the patient the contrast. So I took my patient to the room and I did a control chest x-ray. ... When I checked the x-rays, the patient had a lot of surgical emphysema.

So I’m like, ‘Do you guys [medical students] think I should carry on and give the contrast?’ ... They’re, ‘Ja, ja’, they said, ‘You must give the patient contrast. We want to see the oesophagus and stuff like that.’

Then I went and called [the radiologist] and he came. And he is, ‘Oh shit’. Then he took the patient for a CT scan of the chest ... ‘So you see now, you told me I must just give the patient contrast’.” [FGRAD2:1295-1310:47-48]

The role expansion was further acknowledged and praised by a radiology registrar when she was a medical officer elsewhere. A specific example of a radiographer performing the task of a radiologist was cited. The medical officer acknowledged the lack of her own skill and expertise on radiology-related investigations and interpretation thereof at that time. This is similar to the missing link of radiological expert services at the district hospital. According to her, the quality of professional service in conducting the specialised procedure maintained the continuity of care and not sending the patient to and fro between institutions.

“When I worked in the rural hospital in Province C, we didn’t do anything beyond plain films and she [the chief radiographer] used to do rapid swallows [fluoroscopic investigation]. I [then a medical officer] used to look [at] them and I didn’t know what I was looking at. ... We had a big HIV clinic and a lot of ... oesophagitis and she used to do a lot of swallows and she used to report it. That is very helpful because we don’t

have to refer our patients to a urban hospital for their barium study. We could do it at the hospital.” [FGRADL2:110-116:4]

6.2.3.3 “A big secret” – Who should communicate the outcomes of an investigation?

The standard requirement for communication of the outcomes of an investigation is that it should be done by the referring practitioner or specialist. Medical practitioners and radiologists were very clear in the focus groups about their role in the communication of outcomes. Although it could not always strictly be considered task shifting, fragmented communication of outcomes by different health care providers, were also observed in this study. In the focus group with radiologists they tended to set their boundaries firmly and provided sufficient justification for sticking to it, but in reality it was different.

Radiologists felt it was unfair to make the communication outcomes their responsibility, because their radiological findings may be inconclusive and vague due to the broad spectrum of possible diagnoses.

“Having an inadequate history and inadequate request and not having doctor’s contact number, so to make that our role to discuss what we saw on a x-ray to the patient is inappropriate. Because we don’t have all that information, and a lot of the times what we see on a x-ray, we have to give a differential diagnosis for which ranges from general cancer to a minor infection. So although it’s sometimes, it’s of benefit for showing the x-rays to patients, I think it’s better that the referring clinician treating the patient be the one to discuss those findings.” [RADL1:658-:668:24]

According to Triantopoloulou et al. (2005: 306), a radiologist should – before accepting an examination request – be aware of the clinical condition of the patient and the preceding examinations, in order to be able to make appropriate decisions. In my study radiologists did not have the full picture of the interactions that had taken place prior to the referral. They were respectful of the doctor-patient relationship and did not want to be seen as the confounders, which could often result in conflict.

“It’s also difficult because you don’t know what your referring clinician has told the patient before they sent the patient to you. So sometimes you prefer to have the referring clinician read the report, you know, before you give the information to the patient. Because it’s a very general source of problems and conflict between the patients and the referring clinician.” [RADL1:534-540:37]

On the whole medical practitioners felt very strongly about the issue of ownership and control of the final diagnosis – *“The final diagnosis I think that is the role of the clinician”*

[FGMP3:478:18]. *“So let the family physician give him the bad news, because he is trained for that”* [FGMP1:1051-1052:38]. In another focus group a medical provider justified why the medical officer and not the radiologist should do the communication, by delineating the professional boundary of the radiologist as being focused on the investigation only.

“As the family physicians we have the bigger picture – the blood results, the urine results. We can put the picture together. Not just isolating and treating just per investigation. We spend time with the patient. We have a patient relationship. So it’s not fair for the investigator to explain the results.” [FGMP1:1056-1061:39]

“Say, for instance, I told the patient, he’s got pneumonia. I send him for chest x-ray and I thought it’s pneumonia, but for the radiologist to say a possible malignant mass. It’s just going to confuse the patient”. [FGMP3:498-500:18]

Although there were strong views on the communication boundaries between medical practitioners and radiologists, some medical providers at the district hospital did not mind if the radiologist communicated outcomes to the patient.

“You see from our point of view, I mean, if we tell the patient the results or the radiologist does it, [it] doesn’t really make a difference. That’s fine, provided we have the report. I mean from the patient’s point of view, it’s really poor that the radiologist can’t be bothered to tell what’s wrong with him.” [FGMP1:1038-1042:38]

Safdar et al. (2011: 856) are of the view that some radiologists are simply uncomfortable taking on responsibilities of direct patient communication that were not in the past considered a part of their roles.

One medical practitioner defined the role of the radiologist in terms of interaction to be confined to technological interpretation-related matters, *“to get a better picture, better view, [or] another, that is fine ... that small interaction”* [FGMP3:470:17]. The radiologist could also *“have a discussion with the patient as to interpret the x-rays better. Then tell them [patients] according to this x-ray, ‘See this, this and this’; ... give the report and ‘Go back to your attending doctor’”* [FGMP3: 204-210:8].

Other practitioners felt radiologists gave preference to their professional domain of *“prioritising the x-rays and not the patient. It’s like the x-rays is what they’re there to do and the patients just pull the vehicle for the x-ray”* [FGMP1:1010-1011:37]. This was further justified by stating, *“I mean, they’re, doctors first and radiologists second, that patient is their responsibility surely”* [FGMP1:1015-1016:37]. According to Olivier et al. (2005: S84), the radiologist must have the necessary know-how and ability to establish an attentive relationship

with a patient – providing patients with clinical competence, empathy and respect of their desires and their rights.

During the shadowing process it was observed that some radiologists did communicate outcomes to patients. In the case of Patient 7 the radiology registrar reported to the researcher what he had told the patient:

“I said to him that there was a single stone and he was asking me the diagnostic reason for his pain. And I told him the gall bladder wall isn’t thickened. So the gall bladder wall does not show signs of inflammation yet, but as it worsens, it moves; it can cause an intermittent obstruction.” [CS07:790-795:29]

Medical practitioners in the focus groups were also probed on the scope of practice of the radiographers’ interpretation skill and communicating of the outcomes – *“If a patient has a ankle fracture, are you people [radiographers] allowed to tell the patient, ‘You have a fracture’?”* [FGMP1: 980-981:36]. Practitioners felt radiographers did have the skill and expertise but that the professional boundary should be respected: *“Really, I feel you work with it daily for many, many years, surely you immediately see the fracture. Now you have to say, ‘Ask your doctor’”* [FGMP1:1003-1005:37]. It also appeared as if some practitioners felt that radiographers had a role in communication with the patient in the case of suspected fractures.

“If a patient comes in with a suspected fracture, I don’t know because even the radiographers don’t say anything. They just send back the patients. They might tell the patient that the doctor will have a look and explain you better.” [FGMP2:294-299]

Although radiographers felt it was appropriate not to cross the professional boundary because it was not their scope of practice, not saying anything might clash with their moral obligation. They were aware that *“it might not be right.”* But one radiographer felt she was *“not lying, I am telling the truth”* [FGRAD2:787:29]. Therefore, they would occasionally warn the patient with the intention of not wanting to cause further harm to the affected body part in the transition from diagnostic investigation back to the medical provider – *“Sometimes, in certain cases, especially elbow and ankle fractures, if you see quite an obvious maleollar fracture or supra condylar, I ask the patient, ‘Just be careful for your elbow. Keep it in this position till you get to the doctor’”* [FGRAD2:913-915:33]. So if there was an obvious fracture it would be morally honest if the patient could benefit: *“If the patient ask you, ‘Is there something wrong?’”*. If the patient was also aware of the fracture, *“I just say, ‘Yes there is something wrong. Your bone is broken’”* [FGRAD1:784:29]. One radiographer also described

her method of shared, interpretive decision making in the case of anxious patients needing to come to terms with what has happened:

"I had one or two patients who were really distressed. [The patient asked,] 'Is my arm broken or isn't it broken?' And then I actually took them to the monitor and showed them the x-ray and ask them if they can see something. They would say, 'Is it broken there?' Then I would say, 'Yes, so be careful with your arm.' ... I think if it helps the patient then to get some clarity ... just to help him to know, okay, my worst fears have been confirmed, it is broken, just relax and deal with it." [FGRAD2:905-910:33]

Olivier et al. (2005: S84) see radiographers as often being in the forefront where patients want to know from them what is wrong. They emphasise the importance of finding the appropriate words that will keep them within their professional boundary. If the radiographer is not in a position to disclose results to patients it does not afford radiographers much professional autonomy in their working environment, according to Etheredge (2011: 10).

Most professionals agreed that ideally the medical practitioner should be the person to convey the outcomes of a diagnostic investigation to the patient. In reality the messages were brief and only the most essential information was relayed. Sometimes the responsibility for communicating the outcomes to patients was shifted to nurses. Sometimes no information was filtered through, as described by this medical practitioner:

"I have seen patients. They have been through the whole system and they come back and you ask them.

'Yes, they took x-rays. I had a accident and this and what was wrong. No, they never told me what was wrong with it.'

'Have you got a fracture?'

'No, I don't know. They never told me'.

So there are cases where it happens like that, where people are not informed properly". [FGMP3:542-546:20]

In summary, between the providers there was an assumption that the information would filter through to the patient and in the process the patient might have lost out.

"So, actually in terms of x-rays or scans, our department is lacking if that's the perception of patients [to be informed on the radiological outcomes]. Because at the moment we just do the report and we tell them, 'Don't worry, it's on the system. The doctor will check it up. So just go see the doctor.' That means they don't know. They

don't see the report, they don't see the x-rays, they don't see anything. It's like a big secret. Take the x-rays, put it into an envelope and you stick a letter on the [envelope], 'Confidential', do not open or whatever. And they think they're not allowed to open it. Obviously then it's like they don't know what's in there. And they take it to the doctor. And it's stressful for them. So I think that is somewhere we're lacking in the system. Our system is like that. So how we are going to overcome that?"
[FGRADL1:624-642:23-24]

6.3 CHAPTER SUMMARY

In this chapter the variety of perceptions on the roles and responsibilities of the various professions and what was expected of their members were discussed. Task performance-related issues were governed by the scope of practice and the system expectations. At the district hospital the professional and system boundaries dictated whom and what was allowed to be referred. This was further complicated by the absence of a radiologist at the district level. However, at the tertiary level it was more the issue of territorial boundaries amongst discipline-based field experts regarding interpretation of images. Therefore, the interprofessional interactions and relations between the various members were rather dominated by the professional hierarchical structures and individual characteristics of these professionals. This often resulted in boundary shifting.

The ability of the radiographers and their scope of practice were frequently under scrutiny throughout by the other professions. Where a radiographer had gone the proverbial "extra mile", it was sometimes temporarily praised and appreciated. However, radiographers felt that these efforts went unnoticed in the bigger scheme of things. Radiographers' self-esteem was largely diminished, as they were being perceived as not having much between their two ears. They felt themselves relegated to button pushers and tended to adhere to the boundaries set by the hierarchies of other professions within the system. The literature also discusses how Australian radiographers, in attempting to set a standard of ethical commitment, are hindered by the dominance of medicine and poor professional autonomy (Lewis et al., 2008: 91; Clark, 2010: 264).

In this chapter relationships between health professionals were described. In the next chapter the interactions and relationships between various health care professionals and patients will be explored.

Chapter 7

Provider-patient interactions

In the previous chapter the roles and responsibilities and patterns of interactions of various professions were explored with an in-depth focus on the role of the radiographer. During the systematic interaction processes professional boundaries were continuously shifted to make space or accommodate the issues of referrals, requests, interpretations and integration of information around the decision making processes regarding the diagnosis and management strategy. This chapter explores the interactions between patients and health care providers, the quality of which is at the core of patient-centred care (Jayadevappa and Chattré, 2011: 20). A gap identified in the review of the literature is the role of diagnostic imaging technology in the mediation of overall patient-centred care. The first section of the chapter focuses on the various stages of the doctor-patient consultation, from information gathering to plan of action in terms of levels of engagement between medical practitioners and patients and decision-making processes and procedures regarding patient diagnosis and referrals to a higher level of care. The second section further addresses the patterns of interactions between radiographers and, where applicable, radiologists with patients at the diagnostic imaging section between the points of entry to and exit from this department. The third section deals with issues between patients and providers, such as the choice and use of language, medical terminology and priority information on the risks and benefits of imaging investigations and the outcomes thereof. The chapter ends with a discussion on continuity and fragmentation in the availability of patient information at the various points of the patient's journey through the system and how this could affect treatment and management outcomes.

7.1 THE CONSULTATION: PATTERNS OF INTERACTION BETWEEN MEDICAL PRACTITIONERS AND PATIENTS

Medical consultations of patients at the district hospital generally followed a structured sequence of interactions, starting with an initial stage of information gathering, interspersed with clarification and interpretation. After the physical examination, there was an interpretation stage based on the information provided and the findings of the physical examination in general. This was followed by making a choice, depending on the problem the patient pre-

sented with. The choice could be a referral for a diagnostic test and/or upward or downward transfer, admission or discharge. The sequences of activities are depicted in Figure 4-2 in Chapter 4.

7.1.1 Information gathering in the opening stage

The opening of the initial interaction formed the first part of the information gathering stage. According to Undeland and Malterud (2008: 224), the initial diagnostic interaction revolves around how medical practitioners involve their patients when collecting information. In this stage two main patterns of interaction were observed in the shadowed patient cases that placed the patients in different position vis-à-vis the doctor – encounters in which the patient provided little detail and encounters in which the patient had a large presence in terms of being able to provide information.

The initial interaction was opened by the doctor who took control of the process. Opening statements varied between doctors. Very few introduced themselves to the patient. In the case of Patient 5, the doctor said, *“I am doctor N and how do you say your surname?”* [CS05:69:04]. There were no fixed patterns of approach. Depending on the situation, for example Patient 8, the medical intern at Casualties opened with a closed-ended question, *“What is your age?”* [CS08:93:03]. For Patient 12 at Outpatients there was also a closed question as introduction: *“It’s your first time coming here?”* [CS12:181:07], followed by further probing on the request letter. The same medical officer asked Patient 14 an open-ended question: *“How are you today?”* [CS14:259:10]. Patient 11 was greeted with *“What can I help you with today?”* [CS11:257:09]. Others focused on the concern: *“What happened?”* [CS01:95:04].

Patient responses also varied. The level of “intensity” of the responses appeared to depend on the patient’s level of familiarity with the health system and to some extent on patient personalities. This is schematically depicted in Figure 7-1. Very few participants in the study had had multiple encounters with the health system before. Patient 12, being more familiar with the system, took the opportunity to provide detailed information on her chronic sinusitis (diagram (a) of Figure 7-1):

“It’s ten years [that I have this condition], and plus minus three years [ago] I stopped [going for follow-up], because it was too far for me to come to the clinic. They tested my blood, gave me medication and told me it will be better, that they can’t do the operation. They gave me some injection, I can’t remember.” [CS12:185-200:08]

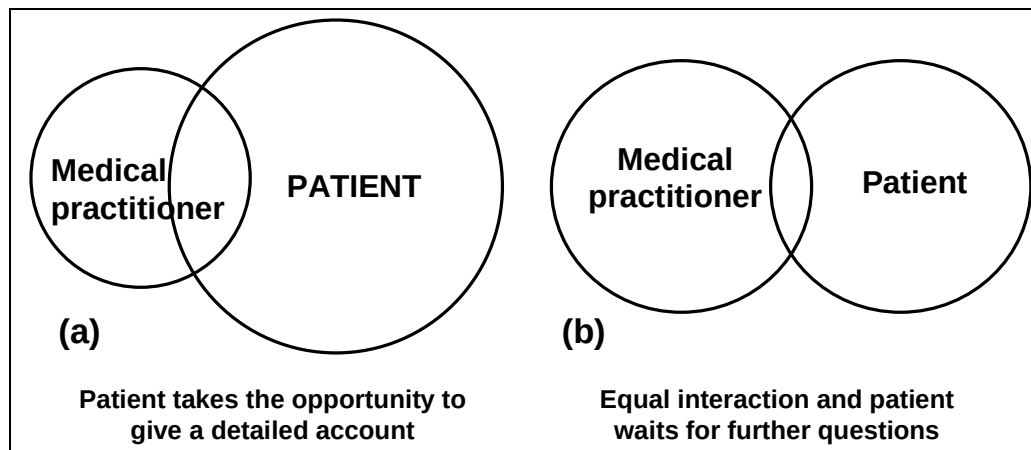


Figure 7-1. Patient presence in the interaction in the information-gathering phase

Patients who were not familiar with the system or those who had had very few encounters seemed to be more “economical” in their responses to questions. On the question by the medical officer about what had happened, Patient 6, for example, only replied, “*I was mugged this morning*” [CS06:135-145:05]. This is presented in diagram (b) of Figure 7-1 with the two consultation partners depicted in equal size circles. Based on the information gathered, the medical officer continued the process by probing for clarification and interpretation.

According to Lam et al. (2004: 134), effective methods of clinical history taking include the use of open-ended and closed-ended questions, probing questions, facilitation of discussion, and silence to allow time for the patient to think about the question.

7.1.2 Clarification

In the clarification stage the interaction was dominated by a question-answer format with the medical officer in control, as is graphically depicted in Figure 7-2. The medical officer navigated the interaction by picking up the cues and exploring further on the problem, situation, event and/or what the patient was experiencing (cf. also Alfuth and Barnard, 2000: 272). Patient 5, for example, complained of “*coughing with phlegm*”. The officer picked up this cue and explored further: “*it comes out*”, “*the colour*”, “*the duration*”, “*whether it is getting worse*” and “*when you’re coughing, do you feel chest pain as well?*” [CS05:84-95:04].

A common pattern observed at this stage of interaction was the DEATH (diabetes, epilepsy, asthma, thyroid and hypertension) sequence of questions, regardless of the problem or situation at hand. Some officers probed for each item separately and others merely queued

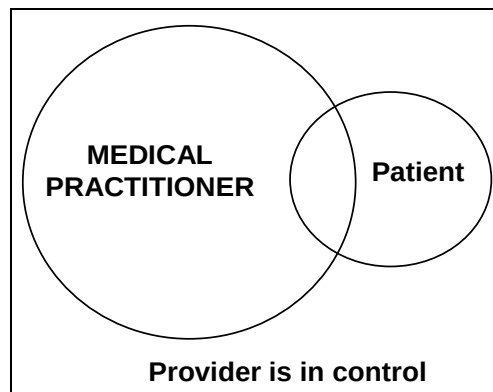


Figure 7-2. Interaction in the clarification phase

them in one sentence as a procedural exercise: *“Do you have any diabetes, epilepsy, TB, high blood?”* The intense question-answer phase was followed by the physical assessment, which was focused on the main concern at hand. This was achieved through bodily manipulations and these manipulations were then accompanied by verbal interaction with the patient. These were then interpreted to aid in formulating a (provisional) clinical diagnosis. Patient 16 was experiencing shoulder pain and the family physician sought clarification during the physical assessment: *“The pain is just in the one spot? Raise your arm for me”* [CS16:399-400:15], to which the patient responded by cooperating with the instructions. [CS03:108-109:04].

For some patients further assessments included the use of instrumentation like a stethoscope and at other times a tuning fork to assess the patient's hearing ability. Throughout this stage the focus was on exploring what the patient was experiencing and gathering further information or confirming what was told earlier by the patient by means of physical assessment. This enabled a more in-depth understanding of the problem (cf. Alfuth and Barnard, 2000: 272).

Pain was a common expression used by both patients and providers at this stage of the consultation. Patients used pain to describe the seriousness of their problem or trying to get the attention of the providers. Providers used pain to navigate through the inner body to pick up clues for the clinical diagnosis. During the physical examination one medical intern was probing for malfunction of the leg by repeating the question of pain experienced: *“Is not painful? You can still walk and move your foot easily?”* He then reconfirmed: *“So it's just swelling”* [CS08:129:08]. The information reflected back to the patient was to assess and better understand what factors were impinging specific to the problem at hand (cf. Alfuth and Barnard, 2000: 272). According to Hendee et al. (2010: 244), physicians should ideally

encourage patients to describe their previous imaging examinations to help eliminate the duplication of imaging studies.

7.1.3 Interpretation

The information-gathering and clarification phases were followed by an interpretation phase based on the findings from the information gathering and the outcomes of the physical assessment. Medical officers sometimes shared the interpretation with the patient, but often not. In most instances a degree of uncertainty or speculation on the side of the medical officer was also communicated – *“It seems to me more of a gastritis food poisoning”* [CS07:182:07], or *“I think you have a lung infection”* [CS05:164:07].

7.1.4 Making a choice

The stage of making a choice was the transition between the clinical diagnosis and proceeding with the plan of action. Three types of interactions were identified: the medical provider made the decision or choice of treatment on his or her own; the medical provider consulted with colleagues before making a decision; or the patient was also involved in the decision. This is graphically depicted in Figure 7-3.

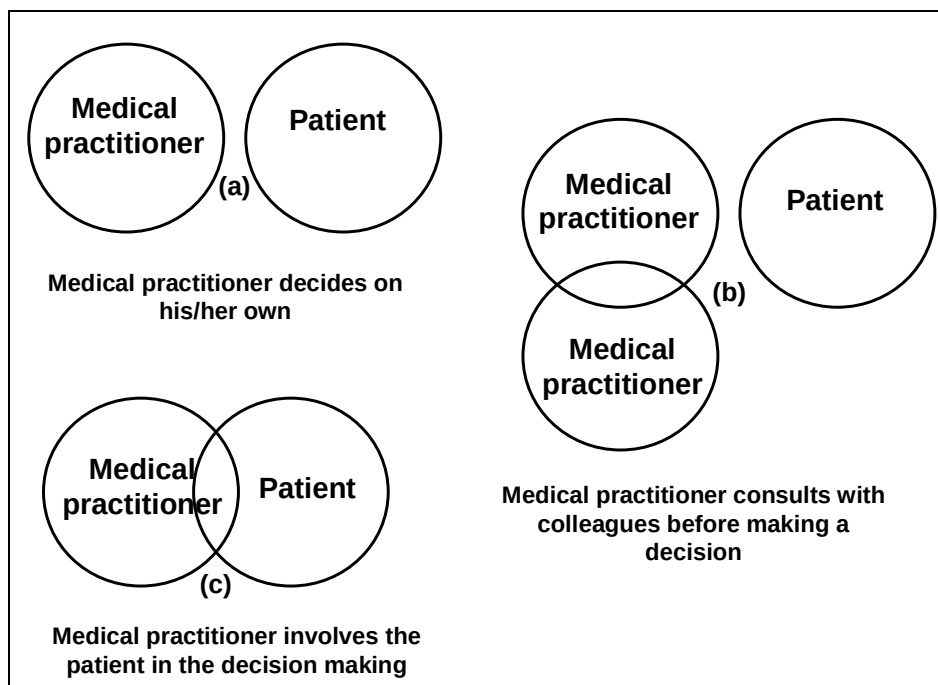


Figure 7-3. Interaction patterns in the choice-making phase

In the case of Patient 7, who was diagnosed with gastritis, the medical student felt the patient's condition did not *"deserve any investigations"* [CS07:183:07]. The patient asked the medical student, *"What is wrong with me?"* [CS07:280-281:11]. The student was honest about his lack of expertise and informed the patient that *"he is going to consult with his seniors"* [CS07:284- 285:11]. With Patients 7, 16 and 17 the medical student and junior medical officers had *"to consult with senior medical officers and get their opinion"* [CS07:184-185:7] before making a decision on a referral. This option is depicted in diagram (b) of Figure 7-3. Other medical providers again did baseline physiological tests and/or referred the patient for a diagnostic investigation(s). During this phase of the consultation the majority of medical providers communicated their choice to the patient, inter alia whether to send them for diagnostic imaging or not. The most common pattern of interaction was that of diagram (a) in Figure 7-3. This is further discussed in Section 7.1.4.1 below.

Technology was sometimes the determining factor in the choice between the discharge or admission of a patient – *"So you are going to wait for all the tests before you can go home, but depending on the [outcome of the] test"* [CS05:167-168:07]. A sense of realism was also conveyed in terms of the possible plan of action at this stage of the consultation: *"We will discharge if the infection is not so severe. We will give you medication. But if it is severe, we are going to keep you here for a day"* [CS05:169:07].

Contrast medium is often indicated, amongst others, to outline an organ or a tumour. Patients are required to consent prior to administration of contrast medium. According to radiographers and nursing professionals, there appeared to be some confusion in this regard. There was also lack of understanding because even patients with allergies were made to sign consent and sent for investigations.

"They make the patient sign not knowing what they're signing for ... it is a bit difficult. ... Is like for the past week ... the patient has signed a consent but he is allergic to iodine." [FGNP4:68-70:3]

Another instance mentioned in a focus group with nurses was that of a mother of a 12-year-old child who had been made to sign consent without any explanation. Upon verification by the nurse it was discovered that *"the mum didn't have any idea. They didn't ask anything. The patient is just going there for CT [computerised tomography] scan."* [FGNP4:78-80:3]

7.1.4.1 A choice for referral for a diagnostic imaging investigation

In my study the plan of action and management strategy sometimes preceded the conveyance of the outcomes of the diagnostic investigation. This corresponds with Price's

(2000: 1042) observation that any part of the decision making process that leads to an improved outcome can be considered as part of the outcome of a diagnostic test. The question is whether the referral for a diagnostic investigation served more the purpose of confirming the preliminary diagnosis in cases like these. Many times the results of the interpretation of the diagnostic investigation were not fed back into the feedback or management plan communicated to the patient. Patient 1 was a typical example of *“just to make sure”* [CS01:147: 06]. When I saw the patient after the consultation during which the medical officer had interpreted the x-rays, the nurse had already been instructed to put on a sling for the patient's arm. The patient had received the prescription card for the medication and was ready to be discharged. Similarly, Patient 6 had to ask the nurse to make sure there was no fracture before she continued with the suturing of the laceration on the skull – *“So I asked her to please check and that is when she called the doctor”* [CS06:551-552:20].

My observations in the consultation stage indicate that the ownership of the referral decision was with the medical officer, a decision that was mostly non-negotiable and without the patient being part of the process. Patients were not provided an opportunity or space for raising questions or queries or for voicing their approval or disagreement regarding the referral. After the physical examination, Patient 5 was told, *“I am going to take some blood and chest x-ray to see the extent of the infection”* [CS05:164-166:07]. Some patients were aware of an incorrect or unnecessary referral, such as Patient 18 who was referred for sinus radiographs of her recurrent polyps. She used her previous experience of a CT scan of the sinuses to get the medical officer's attention, as she was not familiar with a referral for x-rays for her condition. She tried to get some clarity on the referral for sinus x-rays by asking: *“So must I go for a CAT scan?”* [CS18:214:08]. The medical officer perceived this as an unrealistic request because there was no such modality available at the district hospital. The patient then made a second attempt to share her previous experience of the investigation: *“There, at the previous institution, they put the fluid also. It's not the same?”* [CS18:214:8]. The response of the medical officer was defensive and did not provide a direct answer: *“We don't do CAT scans here”* [CS18:215:8]. The doctor went ahead with the referral for x-rays. (See also Section 8.2.3.1.)

Patients appeared to take a neutral stance in most instances and agreed with the providers on the decisions. One nursing professional commented in one of the focus groups about her experience when she had previously accompanied her child to the hospital:

“We believe that there is no fracture, but if the other one say, ‘Let's take the x-rays’, then you also agree. [If] you don't, you are just [saying] you agree with everything.”
[FGNP3: 380-382:14]

Medical practitioners were of the view that patients preferred the *“private hospital for the x-rays”* [FGMP1:740:27]. According to a senior medical officer, *“you know patients are given that chance to decide in private. When coming to government they also expect that the patients are given that chance to decide”* [FGMP1: 741-745:27]. Radiologists were of the view that *“patients gave the autonomy to the doctors”* [FGRADL1:678:25] to make a decision on the referral. They also felt patients had a tendency to *“draw the barrier and you say you’re not crossing that line”* [FGRADL1:680:25], because they were not aware of their rights – *“You don’t think you can and you just don’t do it. You just leave everything to somebody else”* [FGRADL1:683-684:25]. More patient views and reactions are discussed in Chapter 8, especially in Sections 8.2.3 and 8.2.4.

The degree of interaction in terms of referral for a diagnostic imaging investigation varied between medical officers and patients. In most instances the interaction was limited to the *“why”* of the referral, but not a discussion on risks and benefits or what could be expected of the investigation itself. Some patients were merely told they were going to be *“sent for x-rays”* [CS01:132:05]. The communication strategies were, therefore, mostly instructional and to the point, without any explanation or dialogue. Patient 6 with skull lacerations, for example, was just told: *“I am just going to cover it up and going to send you for x-rays”* [CS06:191:7].

Other times some medical providers did tell the patient of a referral to x-rays but there was a tendency to download information on patients. Information on the management of the condition, mostly in medical jargon, was queued. Embedded in this information was the choice of referral for diagnostic investigation. A typical example was Patient 8 with a history of swelling of the calf:

“We are going to do your vitals. At the moment your main problem is the swelling of your leg, but it is only on one side. So it is not the heart or the kidneys, it is mainly like a clot. They call it a deep vein thrombosis. So there is some blood test I am going to do. So we’re going to find out [if] what we can do [is] an ultrasound.” [CS08:185-190:4]

In addition to the way in which patient choice was managed and perceived at the point of referral, medical practitioners also tended not to provide information to patients who were new to a specific investigation. For example, in the case of Patient 8 referred to above, the medical officer informed her that she was going to be referred for an ultrasound, but did not ask her if she understood what an ultrasound investigation was. According to the nurses, the reality at Casualties was that *“the doctors don’t get a chance to explain everything to the patient, what’s the procedure wah wah”* [FGNP2:43-45:2]. Patient 9, with a knee injury, was referred from a primary health care clinic for an x-ray at the district hospital. Apparently the

interaction with the doctor at the clinic about the referral was also very brief – *“She didn’t explain much, because there is nothing she can do”* [CS19:60-64:3].

According to the radiologists, the clinicians were supposed to communicate to the patient *“from A to Z”* [FGRADL1:692:25]. Most radiographers and radiologists also indicated the primary source of the relation or interaction was initiated at the consultation – *“It starts with the clinicians and how patients interact with their clinicians”* [FGRADL1:690:25].

Senior medical officers during the focus group interviews insisted that they made an effort to inform patients about their justification for a referral. One family medicine physician gave the following example:

“Then an indication for an x-ray, you say if it’s a child, ‘Mummy, I am going to send your child for an x-ray because of infection in the lung’ or ‘I think there is something wrong in the lung’. Then she will ask, ‘Doctor, what do you mean?’” [FGMP2:108-112:04]

According to some family physicians, some patients arrived with an expectation to be sent directly for a diagnostic imaging investigation when the referring centre had promised them a referral for such an investigation elsewhere. This was then perceived as a dilemma; some practitioners felt they deserved an investigation, because an expectation had been created and it could affect the relationship if the patient was denied of a referral for the investigation.

“If somebody else has seen the patient and then now it must go through another person. They [the patients] have already got this expectation. They will send me for x-rays. And then if I say, ‘I am not going to take the x-rays’, then it causes a friction. So sometimes I just do the x-rays.” [FGMP3:641-645:23]

Then there were also situations where there was a written request for a referral for a diagnostic imaging investigation:

“The patient will be referred with a letter and this is the problem – the doctor who is referring suggest[s] that you do a mammogram. That is quite a difficult situation. You have to explain to the patient, I have to first take the history, examine you and see if you really need this mammogram because I cannot just send you for a mammogram after examining you. It’s quite difficult to explain because she believes her doctor sent her especially for a mammogram and we end up fighting with the patients.” [FGMP2:522-534:19]

7.1.5 Conveying the message on the outcomes

The next phase of the consultation was the feedback phase of conveying a message regarding the outcomes of the physical examination and/or the test(s) and/or diagnostic investigation(s). The viewpoints of health professionals on who should convey the outcomes of the investigation to the patient have already been discussed in Section 6.2.3.3. According to the medical officers, it was *“the duty of the attending physician to put everything together, tell the patient the whole story, the whole picture”* and to make a commitment to *“say that I can see something abnormal”* [FGMP1:1092-3:40]. A radiology registrar gave the following view of the way patient involvement should be approached:

“That’s if the patient wants to see the investigation or the films then and they should have the right to ask. The referring clinician has to have a look at the films as well and I think it’s at that point that the patient should be shown the images. If they want to ask the clinician that they want to. At the end of the day, that is the doctor that is going to be treating them, not us.” [FGRADL1:643-646:23-24]

From my observations, patients mostly appeared to be unfamiliar with the system's processes and procedures, especially when it came to communication of outcomes of diagnostic referrals. A referral for a diagnostic investigation was probably perceived as a handover of further management because of a gap in communication. Nobody explained to the patient whose responsibility it was. So patients often expected their outcomes of diagnostic investigation to be communicated by the radiologist.

Figure 7-4 gives a graphic depiction of the ways in which x-rays were integrated in conveying the message on outcomes. In most cases the medical practitioner followed the route depicted in diagram (a) of the figure and interpreted the image without involving the patient. At the district hospital in the case studies observed at Casualties there was a tendency to interpret radiographs in isolation and not with the patients. Patients did not seem to have much opportunity to be part of the decision-making process, although most patients seemed to show some interest or desire to view their radiographs. According to the nurses, patients sometimes took it upon themselves to interpret their radiographs or constructed their own meaning and understanding of what was happening. Patient 21, for example, was curious to see her wrist-fracture x-rays, based on her previous experience of being shown on the x-rays what the problem was. As the patient took the x-rays out to view, the medical practitioner quickly took the x-rays and envelope from the patient and said, *“This is mine”* [CS21:195:08].

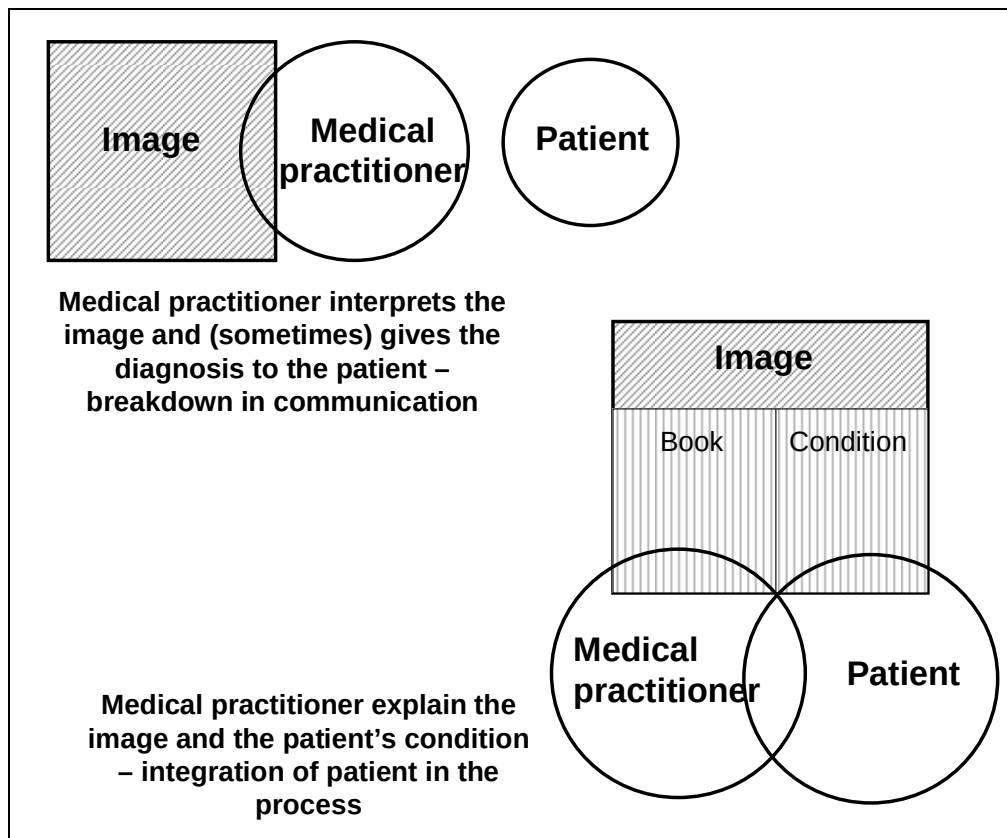


Figure 7-4. Interaction patterns in conveying the message

According to professional nurses at the tertiary hospital wards, there was no transparency in the wards. The medical providers came and checked the x-rays on an image display screen and had a discussion amongst themselves about the management strategy without the patient being part of the process.

"The doctors come here. ... They check on the machine and on that light [viewing box] and then they discuss that among themselves. The x-ray and what they are going to do ... but the patient, they don't know. They don't go to the patient and tell them that". [FGNP3:65-5:03]

The role of the patient was that of a mere bystander in the decisions made about the situation. One of the nurses stated, *"They just tell that you have a broken jaw, something of your face is broken and you are going for an operation. It's all what they tell the patient"* [FGNP3:79:03]. The *"big secret"* that one radiologist referred to has been already been alluded to in Section 6.2.3.3.

A similar experience at a primary health care clinic was shared by Patient 8: *"The doctors they were so many, they were discussing. Then the other one call me and tell me that [I have*

TB]" [CS08:855-857:31]. Other patients felt that it was a single-sided benefit for the medical officers to see what is wrong: *"I think it could have only benefited the doctors because it showed them exactly what is wrong"* [CS11:61-62:3].

Sometimes a diagnosis was given to the patient afterwards. Only two patients in this study got the *"whole story"* from the doctor. The interaction between Patient 12 and the medical practitioner was a demonstration of diagram (b) of Figure 7-4. The medical officer integrated the radiographic image as a tool and also used a textbook to explain the source of the sinusitis problem (cf. also Jayadevappa and Chattrre, 2011: 18). (See also Section 8.2.3.3.)

Patients received information on the outcomes of the investigations and the plan of action in most of the consultations. As already discussed in Section 6.2.3.3, in some instances the medical provider requested the nursing professionals to communicate the outcomes and discharge the patient (Patients 1, 6, 10 and 20). Patient 20, for example, required some documentation from the hospital because of a history of assault. After examining the patient, the medical officer asked the sister to explain the outcomes to the patient. The nurse came to the unit and told the other nurses, *"Why doesn't she do it herself? Why do I have to tell the patient?"* [CS20:126:05].

7.1.6 Plan of action

The consultation normally ended with a plan of action formulated on the basis of interpretation of the clinical findings and/or the diagnostic investigations, where applicable. The decisions appeared to have been communicated to most patients as a one-way information process. (See Figure 7-5.) Patient 17 made an attempt to raise another concern: *"There are other things sometimes. I fail to sleep on my back; it's like it does not allow me"* [CS17:1126:41]. The practitioner did not respond and ended the consultation abruptly.

7.1.6.1 Referral to the tertiary hospital

The options at the end of the patient's journey through the system that are part of the plan of action have already been described in Section 4.2.5. Four of the patients in the study were referred to the tertiary hospital for further radiological investigations – one was referred directly for diagnostic ultrasound investigation and three were referred via a medical specialist for either a general or specialised investigation. Most interactions in the tertiary hospital took place at the point of referral for diagnostic imaging (with radiologists, registrars and radiographers) or with the specialist (e.g. the surgeon).

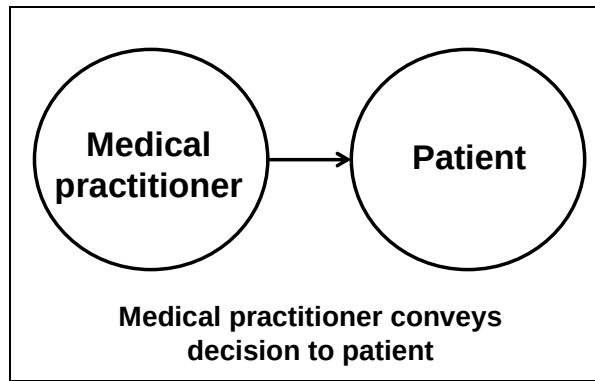


Figure 7-5. Pattern of interaction on outcomes and action plan

Patient 13 was one of the three patients who had a consultation with a specialist before referral for a diagnostic investigation. She was seen by a specialist at Surgery Outpatients. This consultation resembled diagram (c) of Figure 7-3 where the patient felt informed about the situation – *“understand what is going on”* [CS13:727-730:27] – and felt involved in the decision making. The specialist was honest about the challenge and according to the patient said, *“He cannot do anything without any x-ray. I had to make the x-ray first. ... and it is then he knows what to do next”* [CS13:730-732:27]. In contrast, at the radiology department the interaction resembled diagram (a) of Figure 7-3. As already quoted in Section 6.2.1.2, Patient 13 was just told by the radiology registrar about her booking for breast a biopsy: *“They do the biopsy and evaluate the reason for calcification. I think you’re booked for 8th April; then biopsy on the left side ... Are you happy?”* [CS13:1446-1448 & 1450:53]. The patient was still trying to come to terms with the announcement of the referral – *“Uhuh,..”* – but the registrar briefly reassured her, *“No, don’t worry; just relax”* [CS13:1451:53]. He then immediately took back control of the arrangements and preparation on what to expect: *“We will arrange it for you. You are coming here to the other room. You lie on a specific bed. Do biopsy. Give you some local anaesthesia. Give less pain for you and do the biopsy”* [CS13:1452-1453:53]. This interaction resembled Figure 7-5.

7.2 PATTERNS OF INTERACTION DURING DIAGNOSTIC INVESTIGATION

The patterns of interaction at the diagnostic imaging section and during diagnostic investigations were substantially dependent on the quality of information in the request form, the type of investigation required and the equipment. During these interactions the radiographer engaged with the patient to verify the request, inform the patient on what to expect during an investigation and communicate on the orientation of the body part during an investigation. The communication strategies of the radiographer and, where applicable, the radiologists

were, unlike that in the medical consultation, focused on obtaining patient cooperation to achieve optimal quality images.

7.2.1 Information gathering and verification

Patients arrived for diagnostic investigations with different levels of preparedness. This sometimes posed a dilemma to radiographers on how to fill in the communication gap – *“It’s difficult for us sometimes to try and figure out what we’re allowed to say”* [FGRAD2:14:1]. Radiographers only had a fragmented “peep” and were not informed of the full picture – *“You know [a] little bit about what’s going on”* [FGRAD2:15:1]. A typical experience of breakdown in communication or patients not understanding the purpose of their referral was shared by a radiographer during one of the focus group interviews. A patient had been referred for a barium enema investigation, but had not received an explanation on the nature and purpose of such an investigation. After hearing the radiographer’s explanation on what the examination entailed the patient declined the investigation. The radiographer tried to mediate and suggest options like having a scope or scan. In response the patients preferred to go back to her doctor and verify her options. (See also Section 8.2.1.)

“I had this experience where this patient came in for a enema. ‘Did they explain to you?’ Then she said, no, she doesn’t want it; is there any alternatives. And then I said, ‘Maybe you could get a scope or a scan’. Then she wanted to go back to the doctor to get another second whatever investigation. She refused the enema because she didn’t understand what she made that appointment [for] and everything. But she didn’t want to, because she didn’t want, in any case because she did not know what she was going for.” [FGRAD1:660-666:24-25]

Three distinct patterns of interaction between radiographers and patients were observed during the shadowing of patients in this study. Figure 7-6 gives a graphic depiction of the interactions: (a) no interaction; (b) download of information on the patient; and (c) equal exchanges between radiographer and the patient.

Most cases in this study followed the pattern of diagram (a), as radiographers trusted the information on the request form and immediately commenced with the investigation. Patient 24 described her diagnostic interaction as follows:

“I just give her [the radiographer] the paper the doctor give me. She took the paper. She took me next door [to the x-ray room]. She took the x-ray and after that she said I must sit on the bench. She come, she give me the x-rays. Going back to the nurses to give it there.” [CS24:60-64:3]

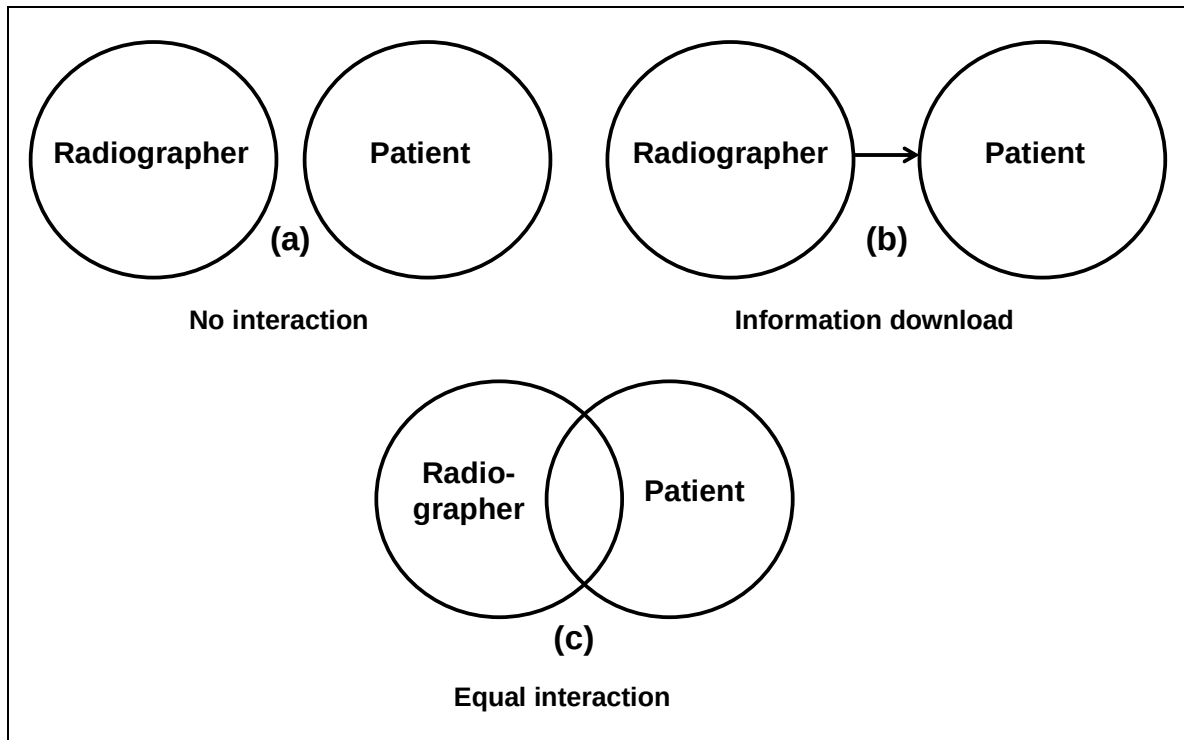


Figure 7-6. Patterns of interaction during information gathering and verification

During the shadowing process of Patient 1, one radiographer admitted that *"sometimes I do not check ... [with] the patient what's going on"* [CS01:405-411:15].

Others followed the pattern of diagram (b) in Figure 7-6, collecting the patient and instructing him or her to wait or put on a gown in the change room and wait. In the case of Patient 18, for whom a sinus radiograph had been requested, the radiographer explained to her the value of a plain radiograph and then continued with the investigation.

During the focus groups with radiographers, they did, however, refer to the pattern of interaction depicted in diagram (c) of Figure 7-6, where information gathering and verification took place.

"When they [medical practitioners] refer the patients and asking for certain x-rays, then we eventually ask the patient also what ... the problem is. Where do the patient have pain or what caused [it] or whatever. So we can just make sure what images we need to take". [FGRAD3:13:01]

Then there was also Patient 7 who was referred for a chest radiograph and sought reassurance from the radiographer. The patient took the initiative and asked the radiographer, *"Are you going to do the x-rays of my tummy?"* [CS07:1039:38]. The radiographer commented in the interview with the researcher, *"He had pains and he showed me"* [CS07:1040:38]. She

used this information to verify the information on the request form – *“I read the history again and it made sense”* [CS07:1041:38]. She took a decision to benefit both the patient and the referrer by doing both the chest (the requested investigation) and abdominal radiograph without knowledge of the shunt: *“I did both of them at the same time, without realising that there was a shunt. So to my surprise, I see there was a shunt all the way down”* [CS07:1043-1044:38].

In other instances this interaction in seeking verification from the patient sometimes took place just before commencing a projection or whilst positioning for a certain projection, like in the case of Patient 1. The radiographer started the positioning for the projection and confirmed by asking the patient, *“It’s the right side [arm], okay? What happened?”* [CS01:310:12]. The patient confirmed it was the right arm and told the radiographer what had happened. The radiographer then verified with the patient to enable her to include the fragment that is of interest when taking the projection: *“Exactly what is sore? The elbow, wrist or whatever”* [CS01:312:12]. According to the radiographer, he said the elbow. This information was then used to obtain the appropriate anatomical structures to be included in the projections. For Patient 1 the radiographer included *“all the x-rays, including the elbow, because that was the main problem”* [CS01:397:15].

Radiographers also indicated how these interactions revealed instances of over-requesting:

“As they come in we say, ‘What happened to you?’ The patient explains to you, ‘I bumped my knee on the chair or something’. Then the doctor has requested for pelvis, femur, knee and hip.” [FGRAD3:68-71:03]

Murphy (2001: 193) acknowledges that it is important for medical practitioners, radiographers and radiologists to be task orientated at times, but that it is equally important to keep the patient informed of what is happening and take a patient’s construction of the understanding of this event into account.

7.2.2 Preparation for the investigation

Ideally, the radiographer should inform the patient before the investigation starts on what to expect. Radiographers, however, felt medical officers *“don’t give the patient enough information”* [FGRAD2:7:1] on why they had been referred. During the focus group interviews there was an appeal by nurses for radiographers to be more patient orientated than task orientated and perhaps to take time to create a conducive environment: *“To reassure the patient. Do you know why you are here? Do you know what is expected? Once more just to make them feel better”* [FGNP2:452-455:17].

In Section 5.1.1.2(d) the misconceptions about the roles and responsibilities in terms of pregnant patients have been discussed, where medical providers were reported to feel an effort should be made to refer the pregnant patient for the diagnostic imaging investigation and to hold the radiographer accountable for the decision whether to proceed with the investigation or not. According to radiographers and medical practitioners, the patient then had to consent to the decision not to proceed with the diagnostic investigation. Patients are not knowledgeable about the risk of diagnostic imaging for their unborn children. Patient 4, for example, only became aware of it while waiting for her x-rays when she observed the warning sign on pregnancy in the waiting room. According to her interpretation, there was a risk of a possible infection to her unborn child and one should inform the radiographers immediately, *“because they did not want you to infect the baby. I notice the sign if you are pregnant you must respond to them quickly”* [CS04:375-376:14].

Communication to prepare the patient for the investigation was not only absent in some consultations between medical officers and patients, but also in the interaction between radiographers and patients. A typical example was Patient 24 with a leg injury, who was told the following: *“The doctor just look at my foot [leg] and he say, ‘I must go to the x-ray and bring it again back’”* [CS24:26-27:01]. One radiographer was of the opinion that because they were accustomed to the system’s technological procedures they took it for granted that patients would also be familiar with these – *“So once the modality becomes old, then the explanation wears off and that is why maybe radiographers are not explaining general radiography to the patients”* [CS18:2079: 79].

One radiology registrar said, *“In general radiography, the radiologist does not explain the chest x-rays and all the details to the patient presuming that the patient knows about it”* [CS12:940-943:34]. Most patients seemed to be more knowledgeable on the value of a referral for a diagnostic imaging investigation – *“if they want to look inside maybe”* [CS09:39:02] – but much less on the risks.

On her first visit for the biopsy Patient 13 did not get any explanation on what to expect and did not even meet the radiology registrar. On her second visit the radiologist informed her. This is how she described this encounter:

“Today I saw the doctor; [he] was very generous to me. He is very nice to me than the first one. I know the doctor who did this biopsy today. He explain everything to me what he is going to do; what is going to happen and how I am going to feel. The first one did not say anything to me.” [CS13:4035-4040:146]

Radiographers were observed orientating the patients in the form of a brief task-focused download as depicted in diagram (b) of Figure 7-6. One nurse practitioner felt that patients should be orientated for routine mammogram: *"She [the radiographer] must put herself that maybe this one she does not understand that mammogram."* [FGNP2:492:18]. The radiographer *"must tell the patient what is expected of her and what is going to be done"* [FGNP2:498:18] and should provide a more detailed explanation, for example, *"We have to do like step by step"* [FGNP2:499:18].

7.2.3 The investigation itself

Interaction during an investigation was partially dominated by the task at hand, the manipulation of the equipment and instrumentation used. It was also dependent *"on the type of investigation"* [CS07:845:31], as well as the modality. For example, in the case of Patient 4 the radiographer doing the investigation said: *"I am going to position your chest. And ask you, take a deep breath in and then hold your breath. And turn to the side. Take your x-rays"* [CS04:240-242:09]. The radiographer was essentially providing cues of information and instructions in preparation for the chest radiograph with a view of getting physical cooperation in terms of orientating the body part for a specific projection or projections. Very seldom was there an initial step-by-step explanation to the patient of what to expect.

For the investigations done at the tertiary hospital a variety of interactions with the radiologists and their registrars was observed, with the two main patterns of interaction depicted in Figure 7-7. Diagram (a) depicts a relationship mediated by technology, sometimes with the interaction of a radiographer playing a mediating role with patients. Diagram (b) depicts a situation that includes the patient throughout the process.

Radiographers felt that radiologists did not show that much interest in either patients or radiographers when it came to plain radiographic investigations. *"They never ask anything about the patients or how the examination went"* [CS13:1179:49]. A radiologist confirmed this non-relationship: *"We don't have much contact with the patient on sort of day-to-day running of plain x-rays to see the patient"* [FGRADL1:491:18].

"During x-ray investigations there would be interaction if there is something I need to clarify with the patient, so I [radiologist] would go and ask the patient him/herself or if there is a finding on the x-ray that I cannot make sense of. For example, I see some sort of surgical clips and the history doesn't say anything about the surgery, then I would go and ask the patient." [CS07:847-852:32]

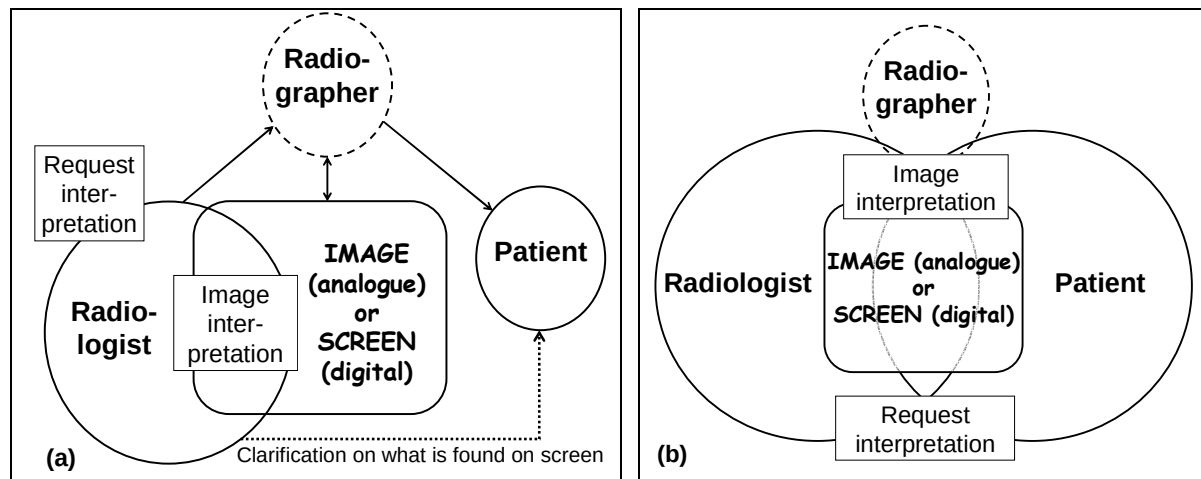


Figure 7-7. Patterns of interaction between radiologist and patient during a diagnostic imaging investigation

With regard to sophisticated investigation radiologists claimed in the focus groups to have an interactive relation with patients:

“CT scan, we don’t have much to do with the patient. It’s only if we put up the drip ... The only time we really have to do with the patient is when we’re doing angiography or screening cases and sonar.” [FGRADL1:491-496:18]

However, it appears as if interactions between radiologist and patient were often largely determined by personal characteristics. The radiology registrar dealing with Patient 7 commented, *“If it is an investigation like an ultrasound or a screening procedure there is usually a lot of interaction throughout the study before and after”* [CS07:845-847:31].

With regard to the patients shadowed, there was mostly only a little interaction between the patient and the radiologist or registrar. Patient 18, for example, was informed by the radiographer after the CT scan of her sinuses that a radiologist needed to interpret her scan and that a decision needed to be taken to administer a contrast medium if necessary. Patient 16 was referred for diagnostic ultrasound and this is how her daughter described the impersonal, task-driven interaction:

“They just gave her the water; she must drink six glasses of water. ... So she drank the six glasses of water. ... They didn’t explain anything to her. They just laid her down, the nurses. ... After the ultrasound they told her to leave the room.” [CS16:68-72:3]

Patient 8 was a typical case of a patient becoming an object. The radiology registrar performed an ultrasound investigation and looked on the screen without explaining anything to the patient. The patient could communicate well and was literate, but this was her first

encounter with a diagnostic investigation. It became a very impersonal experience with minimum interaction. At the radiology department the nurse escorted Patient 8 to the investigation room and instructed her to lie down. The registrar put the gel on the leg and started the scanning process. At the same time he viewed the images on the monitor, which was not visible to the patient. Occasionally the patient was instructed to elevate the leg while the radiology registrar continued with the task. The patient's experience of this encounter is described in Section 8.2.2.1.

The case of Patient 7, with a history of hypochondriac pain, provides an illustration of diagram (b) of Figure 7-7. There were interactions between the radiology registrar and patient throughout his ultrasound investigation. This description by the registrar has also been quoted in Section 6.2.3.3:

"I described to him what I saw. I did see a single gall stone in his gall bladder. While I was doing this [repositioning him] I said to him that there was a single stone and he was asking me the diagnostic reason for his pain. I told him, 'The gall bladder wall isn't thickened, so the gall bladder wall does not show signs of inflammation yet. But as it worsens, it moves; it can cause an intermittent obstruction'. And he confirmed his pain and that was sort of intermittent and that was sort [of] the end of our contact session." [CS07:786-795:29-30]

In conclusion, interactions between radiographers, radiologists and patients were characterised by different levels of engagement that were, to a certain extent, dependent on individuals and their styles of communication. During the information gathering and verification phase the interactions were absent in some instances and brief in others. During the diagnostic investigation radiographers mostly interacted in a short, abrupt, "staccato" mode. The radiologists' interactions ranged from absent to "staccato" to a full explanation. According to the radiologists, they were more interactive but were selective with whom they interacted with. A radiology registrar shared her preference:

"Personally I feel to have well-informed patient is a better situation than having a patient not knowing what is going on. Unfortunately in our situation there is situation of big communication barrier often with patients that makes it difficult sometimes to communicate exactly what is wrong without there being confusion in the patient's mind." [CS07:894-899:33]

The above excerpt describes a very similar approach to that found in the doctor-patient consultations. The nature of the interactions also appeared to have been based on

radiologists' and radiographers' perceptions of patients' ability to communicate without confirming the real situation. From the patients' perspective technology probably forced them into a submissive role. Murphy (2006: 171) is of the view that, from a postmodern perspective, both radiographers and radiologists were short of seeing their role as the social actors "bridging the divide between technology and human healthcare".

7.3 ISSUES OF COMMUNICATION

As the patient journeyed through the organisation, the types of interactions varied according to the stages of solving the problem and the outcomes related to the problem. One of the essential tools in an interaction process is communication. The type of information shared among health care providers and between health care providers and patients forms an important component in building relations and trust within the health system. In this section the various aspects of the how and what of communication between health care provider and patient will be dealt with, in order to establish how this influenced the meaning and understanding of the referral choices for the diagnostic investigation and the outcomes thereof. In addition, the subsections will address the availability of language(s) of communication and coping mechanisms used to overcome language barriers, and communication about risks and benefits, outcome plan and plan of action. This section is concluded with a discussion on continuity and fragmentation.

7.3.1 Issues of language and understanding

When information is passed on, account should be taken of an individual's language preferences and level of literacy (Etheredge, 2011: 11), including the ability to negotiate and coordinate care (Suter et al, 2009: 45). Throughout my observations most of the patients did not offer detailed information of their condition if not probed in depth. (See Section 7.1 and subsections.) It could, however, not be established how much of this "reserved" interaction was due to cultural and contextual issues and how much language of communication was a problem. Provider participants in my study did refer to the issue of language and understanding.

7.3.1.1 "Language is a problem"

Radiographers at the tertiary hospital admitted "*language is a problem, the language plays a role. The patient does not understand everything that you are saying*" [FGRAD2:100-101:4]. They also felt the patient would feel more comfortable if communicated to in their language of preference.

“A number of us here in this room can’t speak Sotho or Zulu or Tswana to explain to the patient in their language what is going to happen. ... If the patient does not understand exactly what you are saying, there might also be queries.” [FGRAD2:102-107:4]

During the shadowing of patients the issue of language seemed to be of least priority during the doctor-patient consultation process. I encountered only one foreign family physician at the district hospital who shared the following regarding her language-barrier challenges:

“So I think one of the things that I found here was things get lost in translation, I mean, because I always speak English. So even with the Sotho- and Zulu-speaking patients sometimes you find they speak Afrikaans. I don’t speak Afrikaans, though it becomes a bit of a problem. But I mean, so far, I have been able to manage, you know. But I worry sometimes, that maybe I ask a question they don’t quite get the proper clinical picture. And maybe when I give the information, they don’t quite understand everything that I am saying. So I think it creates a bit of a problem for me.” [CS16:516-526:19]

Very seldom did patients alert the medical provider early in the consultation about a language barrier. Only Patient 16 said, *“Yes, my English is not ...”* [CS16:829:30]. The medical student immediately appraised the situation and created a conducive environment by telling her, *“It’s hundred percent, don’t worry”* [CS16:830:30]. Jayadevappa and Chattrre (2011: 20) state that one way of potentially solving language discordance problems and reducing disparities in care is to provide language interpreters.

7.3.1.2 When there was a need for language interpretation

In the shadowed cases, most patients were able to communicate in English and were literate. There were only four who needed interpretational assistance. Three were foreign nationals. Patient 1 was literate and could speak, read and write English, whereas Patients 2 and 16 were illiterate and could hardly speak, read or write the language. Patient 20 was a South African with the same difficulties.

At the district hospital one of the medical officers attending to Patient 2 made no effort to get a language interpreter when the patient struggled to answer her overloaded questions:

“When was your last menstruation? When is your last menstruation date? When did you see your menstruation last time? When, which month did you see your last menstruation? When you’re bleeding?” [CS02:132-136:05]

The patient's response was just staring at the medical officer, trying to understand. She showed the doctor the bruised arm and replied, *"I don't know"* [CS02:136:05]. The medical officer then moved on and made a judgement: *"No, you count menstruation, which the last month you count from June, July, August"* [CS02:140-141:05]. There was a sense of powerlessness and patient carried on staring at the doctor.

During her first visit Patient 16 had a foreign family physician who could speak her native language. She could, therefore, engage fully with her. The family physician, for example, asked the patient, *"So what do you think could be causing the pain?"* [CS16:424-426:16] and the patient could participate by saying, *"I don't know"* [CS16:428:16].

Nurses at the radiology department of the tertiary hospital felt that radiographers and radiologists seemed not to make an effort to ask patients about their ability to communicate in a specific language, especially in the case of African patients. This phenomenon was also observed throughout the shadowing of the patients. According to the nurses, radiographers and radiologists would automatically seek interpretational support:

"Most of them, if they see the black people, they just see that maybe she does not know anything, any language. They will call you even if you are nowhere, 'Hey, you, will you please come and interpret?' And then I told them, 'Just first ask the patient, can you talk English or Afrikaans?'" [FGNP4:445-453:17]

7.3.1.3 Pitching the communication at the right level

In order for the patient to understand what is going on requires an interaction pitched at a level where the patient could engage effectively (cf. Henderson, 2006: 5).

The issue of conveying too much information for a patient to digest has already been referred to in Section 7.1.4.1. Patients were not only expected to keep up with the pace of communication, but language barriers also posed a challenge to providing patients with sufficient information.

"If dialect is not a problem, I like discussing with the patient what I saw what I think is wrong. But like I say, either the patients are sometimes confused or can't understand or communicate." [CS07:899-902:33]

Some patients would just accept what the medical provider had told them. Others made an effort to seek some clarification or confirmation of what had been said. Most times not all of what was told was picked up or understood. Patient 3 was a typical example where the medical officer told him about receiving some medication, *"I will give the stool softeners to*

make the kaka come out, all right?" [CS03:166:07]. The patient did not understand or comprehend what the medical officer said. The patient's concern was that he did not get the medication as promised – *"They don't give me nothing [anything]"* [CS03:186:08].

In addition to patients not understanding the language spoken, there was also a challenge regarding the "lay" translation of medical terms. A consultant acknowledged this gap by posing the following communication scenario: *"Then you say, you've got an infection. How do you explain an infection to a lay person?"* [FGMP2:99:4]. One nursing professional also confirmed the comprehension challenge from the perspective of the patient: *"Some of our black people don't understand what the doctor is saying. Then it is very much difficult to tell the patient that you've got high blood, you see"* [FGNP4:270-275:10].

According to Van Ravesteijn et al. (2012: 4), to bridge this gap is to use comprehensive language and modify some of the terminology through using metaphors. One of the radiographers shared her approach on the use of terminology with children:

"I always tell them I am going to take a photo, smile for me and then they're happy. They don't understand we're taking x-rays, because they're scared; they think you're going to inject a needle or something like that. So communication is very important to explain that. But you get adults as well, then you also tell, you're taking a picture of your leg to see what's wrong." [FGRAD1:625-633:23]

Nurses in the radiology department at the tertiary hospital felt that not pitching the interaction with the patients at the right level created a barrier and made patients scared to ask questions.

"The doctors sometimes they will come with the x-rays in front of the patient. They talk among themselves as a team. They don't explain to the patient. This is your x-rays, 'This is what we found, see this and this, this is happening to you'. So, if the doctor can talk to the patients and come to the level of the patient that will help, because patients are afraid of asking the doctors." [FGNP4:306-315:12]

7.3.1.4 Attitudes towards language affect a patient's dignity

Nursing professionals at the tertiary hospital's radiology department had a close affiliation with the patients and felt radiologists and radiographers were often judgmental. Episodes of treating patients as if they were inferior language wise often undermined the patient's dignity.

"I also had an experience one day with a patient with whom the doctors were communicating to in improper Afrikaans. Until I intervene and told the doctor, 'You can talk to him in English; that is a principal of a school'." [FGNP4:535-540:20]

7.3.2 Communicating benefits of diagnostic imaging and radiation risks

According Malone et al. (2012: 529), in communication events frequently little or no mention is made of radiation risk. These situations are complicated by the complex and specialised nature of the units used to quantify radiation exposure, which is not conducive to effective communication with the public and even with health professionals.

"I think it is a good theory [patient having a small card with a record of their radiation doses] but I think the difficulty will come in implementing and get[ting] the patient up to a level of understanding where he understands that I have been exposed to this many rads of radiation whichever measurements you want to use and I can take only a certain amount more. I think you have to educate the patient to such a level that they understand risk versus benefit; I don't know how you're going to implement it." [FGRADL1:800-808:29]

Throughout the shadowing of patients the interaction between all health care providers and patients regarding communication about risks and benefits was very poor. At the doctor-patient consultations there was no communiqué, except for asking the patient whether she was pregnant. In one of the focus groups a senior medical officer admitted there was a gap – *"That is where the doctors are lacking a lot. Because we don't talk to the patients about it, the risk and it is dangerous and things like that"* [FGMP1:791-792:29]. Some medical officers felt patients were knowledgeable and had insight on plain diagnostic investigations. One medical officer expressed it as follows:

"I never sort of discuss the benefits as such. It's for me logical that the benefit is that we will see that there is a fracture. I understand it might be beneficial to tell them. I just feel that in a setting like that they already know why I am sending them." [FGMP3:822-828: 30]

The reality is that this is not one of their priorities during a consultation – *"and then we even forget to ask them if they are pregnant"* [FGMP3:798-800:29]. However, radiologists and their registrars had an expectation that it was the attending medical officers' responsibility to communicate risks and benefits.

"When they discuss with the patient, 'This is the situation; these are the options that you have and these are the disadvantages of all the options that you have, including

radiation'. And they should, you know, weigh their advantages over disadvantages. And when they come here, they are knowledgeable and quite understanding." [FGRADL1:818-820:30].

Malone et al. (2012: 529) state that patients have the right to know of the radiation risk and it is the duty of physicians to inform them. This contributes to empowering patients to make informed decisions about their treatment. In the case of high-dose procedures, open discussion and shared decision making would facilitate the process.

Although radiographers and radiologists often blamed the medical officers that *"they don't inform the patients what they're going to do and who's going to do it"* [FGRAD1:680:25], it was also the radiographer's and radiologist's primary responsibility to inform the patient on risks and benefits. With reference to Section 5.1.1.2(d) radiographers played the key role by making the effort to establish the pregnancy status of the patients. For the patients shadowed there was very little interaction between radiographers and patients regarding radiation risks. The only communication in this regard was with female patients about their pregnancy.

The minimal communication regarding radiation risk was more evident in the ward rather than at the diagnostic imaging sections. In the wards other patients were simply asked to vacate the ward. It was also found that nurses and patients were not knowledgeable on the radiation risks. For instance, when I asked Patient 18 about the radiation harm, she had the following response:

"Ek weet nie. As hulle x-strale neem, dan sê hulle ons moet uitgaan. Die strale, ek weet nie of dit beskadig nie; ek weet nie hoe, of dit iets doen nie. Kyk, hulle sê vir jou jy moet agter hulle staan so ... so die x-strale jou nie beskadig nie, dis al. Maar meeste van die mense bly hier binne; hulle gaan nie uit nie as hulle x-strale neem, ... Hulle sê net dit is die strale."

[I don't know. When they take x-rays, then they say we must go out. The rays, I don't know if they harm; I don't know how, if it does anything. See, they say you must stand behind them like this ... so the x-rays don't harm you, that's all. But most people stay here inside [the room]; they don't leave when they take the x-rays. ... They just say it is the rays]. [CS18:3223-3235:117]

Patient 18 was of the opinion that student radiographers should not work unsupervised because they were repeating, as they did not know what they were doing.

"Maar hierdie studente, ek dink hulle moet soos iemand het wat professional is wat saam met hulle kom. Want hulle is student, nou staan hulle en x-strale neem. And it's

like the one is trying to help the other one, but not one has a clue on what to do. So hulle neem x-strale oor en oor en oor. Maar nie een van hulle weet wat die colourness has to be. Hulle staan en 6.3. Hulle sê, hulle is eerste jaar, hulle kom volgens die jare. Maar hulle moet iemand professional het wat by wees om te sê, hoe is die prosedure en wat, wat, wat.”

[But these students, I think like they must have someone who is professional that comes with them. Because they're students and now they stand here and take the x-rays. And it's like the one trying to help the other one, but not one has a clue on what to do. So they take x-rays over and over and over. But not one of them knows what the colourness has to be. They stand and 6.3. They say, they're first years, they come according to their years. But they must have someone professional to be present to say what is the procedure and what, what, what.] [CS18:3201-3212:116]

According to a nursing professional, patients were requested to move away just before exposing a patient in the ward, with no explanation by the radiographer. One of the other patients was curious about the reason for the request to move away when the radiographer was about to expose and the nurse could not provide a full explanation.

“The radiographer told us to move away, even the other patients. So after the radiographer has gone out, the guy asked me, ‘Why are they sending us away?’ I didn’t know what to tell him. For us women I know why because of the eggs if you are pregnant or not, but I didn’t know what to explain to the guy.” [FGNP2:277-283:11]

7.3.3 Continuity and fragmentation

A theme that emerged from the analysis of the primary data in this study was the discontinuity and fragmentation of information filtering through at various points. One of the roles and responsibilities of medical practitioners was the issue of building a sound relation with the patient. To maintain this relation sometimes resulted in risk-taking behaviours by referring or re-referring patients, hoping to build a sound relation. This often resulted in interprofessional conflict such as who communicated what to the patient, which often led to patients being confused or trying to figure out what was happening as they journeyed through the system.

7.3.3.1 Roles and responsibilities: continuity as part of building a relation

At the district hospital Casualties and Outpatients it was observed that each medical provider took the file on top for a consultation. (See Section 4.1.2.1.) This was the beginning of the fragmentation of a patient's care. According a senior family medicine physician at Outpa-

tients who had previously worked in the institution when it was still an academic hospital, this led to the waste of time and resources, repetition of procedures and the inability to build a relationship with a patient.

"I can tell you what I have been doing. I have been at this hospital for 22 years. It work[ed] consistent with five doctors, each doctor having their own patients and it worked like that all the time. Suddenly we're a district hospital now. ... I am not happy with it. Sixty files are put on a heap and each doctor only takes the top one and you know about that. So each doctor take the top file. I feel it takes some time to get to gel with the patient, so it's at times quicker and easier to see the patient who already knows you. So I have tried to talk about it, but they do not listen to me about it. I feel I am in a dark box. I feel like that because we have the old system, when you come the morning waiting for this doctor; it is more cost effective. These days, so each doctor has a file, but it takes a longer time. They don't want to listen to me, so I have given up, so I have to do as they say." [CS12:634-646:23]

"If I do see a patient I give the patient lots of emotional support. I talk to them and I let them talk to me. Do you know, the old people, they want to tell you so many things. It's not like the young ones taking all the bloods and it's all normal; there is no difference whether this is high or low. So I feel if you know the doctor, the patient will say [to] that doctor today, I have got this problem or this problem at home. I can't sleep or my heart is worse or my gout is worse. And then it is very quick, you don't have to go through the whole system because you know. But now each doctor takes a new history and a new examination. And all these bloods and few x-rays, the assessment, and unfortunately we have to refer the patients down to the clinics. I know that they will not get all their medication, I tell them, 'If you can't get your course of medication, I can't do nothing about that'." [CS12:679-694:25]

Regarding quality of care, it is important that the continuum of care is maintained. Often, a patient's condition necessitates referral to a better resourced health care institution for further management (Smith and Khutoane, 2009: 64). Lack of records in this regard could lead to a re-referral for duplication of diagnostic imaging investigations at the receiving health care institution (Langalibalele et al., 2011: 483). (See Section 5.1.3.3.)

Apart from the patients' files and records that had gone missing, the issue of starting from scratch became obvious when shadowed patients were referred from one level of care to the next and/or referred for a specialised procedure opinion. Patient 15, for instance, was allowed to consult at Outpatients at the district hospital with a radiological report from a private radiological practice. According to her, the medical aid was exhausted and she had

lower abdominal pain, a possible gall bladder stone and umbilical discharge. She was treated previously at this hospital for umbilical discharge, but her file was lost. The attending family medicine registrar had to start from scratch and there was some confusion with the family medicine registrar on where the patient had the laparoscopy.

Doctor: *"The only thing I am concerned about [is] that you're going to too many different places. Normally when you have a problem, it is better to be constant, okay? Because if you go to too many doctors, they will tell you all different things. You have been to private for one laparoscopy; you have been to the doctor in Lynnwood who has done this operation."*

Patient: *The laparoscopy, it was done here.*

Doctor: *You understand now, you've done an operation five months ago at L. Have you ever gone back to the doctor to find out about you having pain in the abdomen.*

Patient: *No, the company won't send me again. That is why I came back, where I can afford. I went for two times after the operation."* [CS15:292-320:11-12]

Because of the discontinuity of care the registrar decided as follows:

"The first thing we have to do [to] find out what's going on, is to do some blood tests. Okay, the blood test I am talking about is a liver function test. Normally with gall stones, normally you find that pre hepatic or a hepatic cause of the symptoms. And we have look from the blood test, what it is, okay? What's causing the problem? You had a ultrasound done already, which is fine. They said, there is a lesion in the liver as well, okay? So we have to figure out, what is this lesion that you have in the liver, okay? First step what we do is [we] did your blood test today and you come back for the results in a week's time. Depending on what the blood result say then we will probably able to book you for another ultrasound whether we see anything different or not and decide from there what to do, okay? ... But we can't just open your abdomen every time for all the different things, because it has been done twice. And it hasn't brought you any relief. To know what is exactly happening, you have to do it in a stepwise manner and do it properly this time." [CS15:360-382:14]

Another starting-from-scratch example was Patient 18 who was referred from the district to the tertiary hospital for further management. The otolaryngology registrar justified his starting afresh, as his endeavour to be thorough required the skill or expertise regarding field-specific labelling of what was wrong, like the end diagnosis that was often omitted by the referring medical practitioners.

"For me it's maybe different. ... I always like to start from scratch because I feel there is certain things the doctors omit. And if you're not ENT [ear, nose and throat] related you will not ask, you know. Like you see for example, here [referring to the notes] this doctor says on the consultation note. Where is the one you had [the doctor's referral letter]? You had one like this. So [if] you go according to this, you see some of them don't know the difference between a polyp and turbinate. Most of the doctors sometimes, they see a turbinate, they refer to it as a polyp. So, me myself, now, I don't go according to the referral note. I am not being bad but ... because at the end of the day ENT, I feel, is a very specialised field. And I feel also the training that you go through is two weeks as a general practitioner. In two weeks you can't know everything as like the general surgeons do. That is why I feel most of the doctors especially the community service doctors, you know just starting off as a medical officer, they don't have the experience to identify certain structures. And we get lots of patients referred to here as a nasal polyp and it is just a turbinate. You see, [they] can't make the difference. So that is why I feel I rather start from scratch, find out everything. To me if it is polyp, then the question that I ask, I have to go to allergies, to blocked nose, runny nose, sneezing. The ordinary doctor would not ask those things and for me to come to my end-stage diagnosis to see if the polyp is allergy related or if it is related via aspirin or you know that kind of thing. You know, trying to find the cause of it." [CS18:1720-1729:63]

The gap in communication regarding protocols and accuracy of what diagnostic tests one could do or not, to diagnose a malignancy in the breast also resulted in fragmentation, leading to frustration for the radiology consultant and registrars. In the case of Patient 13, the radiology consultant expressed this as follows:

"You don't know where and now they're sticking needles, now we don't know where, how deep. You get a result back that says nothing. Now you must decide, 'Do I go on that fine needle or do I discard everything?' This what we normally do; we discard as if she had nothing and we start from basics, get a mammogram, sonar and on that we decide if we need a biopsy." [CS13:1352-1358:49]

When Patient 13's biopsy got lost due to the rotation of the medical providers, the attending radiology registrar expressed his approach and the importance of continuity when conducting these biopsies.

"My opinion ... I don't have a problem with it [do the repeat biopsy]. I know I got briefed on the background ... she was done by colleagues. So I trust what goes on, you know what I mean and she [the radiographer] knows. She has been continuous with the patient, so she knows. ... I do what I need to do. I need to [do] a biopsy on this woman."

I need a representative sample. I always make sure that I get a representative sample and I am going to use the same approach that I use for the other ladies. I am going to pick my areas as if she was a fresh patient. I pick my areas about the same way.” [CS13:3474-3485:126]

After discovering that her breast biopsy was missing, Patient 13 explained the problem as follows:

“That’s the problem. Because if I was going to see the doctor ... that the first doctor she [he] saw me, then maybe he [consultant] will know what happen. Because the one I am seeing here today, she just ask me question, if I was seen [by] the same doctor I used to see. Then he will know what to do and he will know why am I here today. Changing of the doctors is where the problem started.” [CS13:3099-3104:112]

Patient 17 shared his experiences of the intolerance from medical officers resulting from the lack of continuity. He made an effort to know whether they were going to operate but there were no complete answers. There was no continuity in the communication chain because of having different providers each time – between referral and after the investigation, the district to the tertiary hospital. Patient 17 was first seen by a medical student, then by a professional nurse and then by an orthopaedic registrar. This made him uncertain as to what he should do, to whom he should direct what questions or whether he should get an opinion or expert advice, because he was then referred to a spine specialist for further management.

7.3.3.2 Dilution of relations

In Section 6.2.3.3 the issue of health care providers taking ownership of communicating outcomes and diagnosis has already been discussed. From observed cases at Casualties, it seemed as if the interprofessional boundaries became more permeable and relations diluted when it came to informing the patient on the outcomes of the diagnostic investigation or even the clinical findings. In the case of Patients 1, 6, 10 and 20 the medical practitioners did not discuss the outcomes with the patients. Nursing professionals had received communication regarding the treatment plan, but not on the outcomes of the x-ray investigations. According to the medical officer’s notes, Patient 10 had a *“little crack on the fourth metatarsal”*. Patient 10 related how the nursing professional *“put the slab on”* [CS10:63:3] and the medical intern just came *“to check after the nurse put the back slab on”* [CS10:65:03]. The patient did not receive any communication about the outcomes – *“They didn’t explain anything before and even after. The x-rays they didn’t tell me anything. I just had to find out for myself”* [CS10:42-46:3]. In one of the focus groups a nursing professional also related another patient’s experience at a community clinic: *“I [the other patient] went to the clinic and they have done*

the x-ray to me. So I was waiting for the results.’ Yes, unfortunately they don’t tell the results” [FGNP3:315-317:12].

As already mentioned in Section 7.3.3, information provided to the patient on risks versus benefits of diagnostic imaging was sometimes minimal to none, in both the doctor-patient consultation and at the x-ray department. This could be because of shifts in roles and responsibilities amongst professionals and lack of clarity on exactly who must communicate what information. According to a medical practitioner, ideally *“the clinician who saw the patient”* [FGMP3:479:18] is the responsible person – *“If you request the thing, you are actually responsible”* [FGMP3:481:18]. The reality was that *“in our setting it doesn’t always happen”* [FGMP3:483:18]. A specific example was given during the shadowing of patients by a senior family medicine physician – *“The person who does the HIV test and somebody else gives the information. It creates you don’t know what the other person said to him”* [FGMP3:484-486:18]. The practices discussed above created gaps and posed a constraint on the through-flow of information. System constraints like those already mentioned are related to the division of responsibilities between different medical officers and also contributed to difficulties in building relationships and to the inability to provide a continuity of care.

7.4 CHAPTER SUMMARY

The patterns of interaction between professionals and patients were very dependent on the environment created by the professionals. During the different stages of the consultation the role of the patient as an active participant was diminished to one of a passive recipient of care. In the transition from referral to the actual diagnostic investigation the communication gap increased because the focus was now more on getting the task done. The inability of bridging these communication gaps was possibly due to the management of the provision of care, system pressures, workload and the commitment of some individual providers. At the diagnostic imaging section the patient appeared to have experienced a loss of control, as the roles and responsibilities of who should communicate what had not been explained to him or her. The communication of the outcomes of an investigation became even more fragmented, but patients seemed to be willing to go with the flow of the system processes. This aspect will be explored in Chapter 8.

Chapter 8

The patient

This chapter outlines patients' expectations, perceptions and experiences of their journey through the health care system. Firstly, an overview is given of health care providers' perceptions of patients. This provides some insight into patient management strategies used by providers for referral and explaining the value of an investigation and the outcomes thereof. This is followed by a section based on patients' narratives of their own expectations of their roles and responsibilities when decisions were made regarding their referral, a diagnostic investigation and further care. Central to the construction of perceptions, meaning and understandings is the information that was communicated between patients and providers. The second part is concluded by a discussion of the role and power of technology that makes a visual impact in pursuit of seeking a solution to the problem, but provides an inadequate space for the patient to experience a relationship with providers during the various stages of decision making.

8.1 PROVIDER PERCEPTIONS OF PATIENT EXPECTATIONS

In Chapter 7 the various degrees and levels of interactive engagement between providers and patients at the different contact points were explored (Sections 7.1 and 7.2). In this section the focus is on provider perceptions, how they saw and dealt with patient expectations, experiences and perceptions of investigations and outcomes. Providers' views and treatment of the so-called "*demand*" [FGMP1:697:25] the patient makes are discussed. The measures they took to prevent come-backs when there was a form of patient dissatisfaction, if a demand for a referral for a diagnostic investigation had not been met, are also explored.

A neurosurgery registrar at the tertiary hospital described the categories of characteristics of patients as follows:

"There are two groups of patients. There are those who accept whatever the doctor says. They have come here for diagnosis. And those who made up their mind, they're coming to confirm their suspicion. Those are the patients that will demand diagnostic

investigations even if they don't need it. They demand and these are from the good socio-economic status, the ones that are educated." [CS07:1255-1260:46]

Medical practitioners and radiologists felt patients did not want to take interest or responsibility when they came to the hospital. A family medicine consultant who had trained in the United States had the following to share from her brief experience in the clinical setting:

"I mean here [at the district hospital] at the end of the day you do make the decision. But the point is you've taken the time to make the patient feel like you are part of the decision. Whether they have to make the decision, it is immaterial. There is the sense of empowerment. But on the other hand, there are the group of patients who want you to make all the decisions and they don't want to be involved. But for me it is important to give them an opportunity. That is why I ask them also, what they think may be the problem." [CS16:550-560:21]

According to the nurses, patients' interests regarding a desire for information varied, but most patients seemed to be complacent with the system's procedures and processes.

"Some do ask, some don't, but not all of them. ... There are those that need x-rays or those that don't. ... And then there are those that don't even care, as long as they got their medication." [FGNP2:95:04]

Alternatively it could also be that patients were still trying to come to terms with the role of the diagnostic investigation in terms of their treatment and management strategy.

"Sometimes you will be asked that 'I have been taken for x-rays. I didn't understand what was that for [at] that moment. We didn't know, what was the x-rays?' At the end of that you will reassure the necessity of that x-rays so that you can be ... how can I put it, to reassure." [FGNP2: 320-332:12]

On the other hand, nurses experienced more interest from patients admitted to the ward who were curious to know the outcomes of their diagnostic investigation – *"Some of them don't even ask. They just take the envelope, open it and start looking like this and they want you to start explaining to them"* [FGNP2: 103-107:04].

8.1.1 "The placebo effect" of technology

Various providers had the perception that patients saw the referral for a diagnostic imaging investigation as a curative measure to the extent of a total healing of their illnesses – *"It's like a treatment they're going through"* [FGRAD2:826:30]. Perceptions like these led to the use of technology as a placebo for the so-called demanding patients to pacify the desire for a

referral and at the same time as an incentive to prevent come-backs, instead of trying to convince patients on clinical grounds why a referral for a diagnostic imaging investigation was not necessary.

Regarding the patient perception of the possibility of missing their illness or diagnosis a medical officer justified the thought process of the patient in terms of what was told to the patient at the first point of contact. The patient constructed his or her illness or what was wrong with him or her in terms of the symptoms experienced.

"I think the problem is that the patient sometimes has funny ideas about what is wrong with them. ... For instance, if the patient experiences a cough for a long time or for a week it might just be a cold but might think it's cancer. It's something that's ungrounded. It's something that the doctor thinks up at that stage. So for them not to be sent for x-rays it's ... they don't understand it because we are going to miss their possible cancer. That's what makes it difficult for patients." [FGMP3:115-125:05]

Another explanation for false patient expectations of an x-ray could be ignorance and interpreting a referral as a routine procedure by observing the behaviour of health care providers. According to a nurse working in Casualties at the district hospital, the desire or demand could be created by patients observing other patients referred for diagnostic investigations:

"Especially in Casualties there are this motor vehicle accident patients. ... Even if the doctor didn't order, they say, 'Uhuh, why the doctor didn't tell me to go for x-rays? Because I have got an injury, maybe there is a fracture.'" [FGNP2:88-89:4]

This was illustrated through an observation while Patient 6 was waiting for her consultation at Casualties. A medical officer walked in and attended to three patients involved in motor vehicle accidents. These patients were mobile, but injured. After a brief interview the medical officer referred all three for diagnostic investigations. This incident is also discussed in Section 5.1.2 in terms of over-requesting.

Furthermore, medical providers felt patients were of the opinion that medical practitioners are able to identify the source of the problem or the problem itself through x-rays – *"Ja, and they think we can see everything on x-ray"* [FGMP3:881:32]. Another medical officer told a story of a family member who had died in a private hospital of a heart-related problem. According to her, the family had had the expectation that the doctor should have been able to visually reveal the source of the problem via technology: *"They did the x-ray and they never see the heart attack"* [FGMP1: 608:22].

Patient 17 was expecting an investigation of a scan and a decision on a surgical intervention for his lower back pain. An orthopaedic registrar at the tertiary hospital provided an example of the placebo effect on the patient's management, of which the scan is part of the treatment strategy regarding his non-symptomatic lower back pain:

"Our policy is we first do that lower back pain. Unfortunately like headaches sometimes, it's very non-specific. And a lot of times they cannot cure it for you. You must realise that if I scan her [the researcher] and if I scan you [the patient] that there is a chance that 50/50 to pick up something abnormal with you and 50/50 to pick up abnormal with her, even if she doesn't complain of pain. And if I go operate both of you, the chances is that she might develop something and you might improve, vice versa. So the problem with back pain is there is the placebo effect. I can give you not even medication and anything, any SmartiesTM or anything and tell you it is medication and the studies have shown that 40% of people will improve even on SmartiesTM. So you just show a very non-specific back pain." [CS17:1104-1116:40]

A nurse shared her experiences of the placebo effect when working in the community:

"And with the community, I think they are like, if one will say I am going to the clinic I must come for a x-ray. They do have the belief that it's happening, the progress of their treatment you see. You will see that you find that they are so happy. I went to the clinic and they have done the x-ray to me, so I am waiting for the results. Yes, unfortunately they don't tell the results. The only results they tell the patient is when they do it for the TB screening; is when they tell them that, 'You have TB and you need to take the treatment'. But with the other things, they don't explain. Maar [But] most of the community, I see I have those they feel that something is happening. ... It's like the other patient last I was at the clinic, we were doing the primary health care. So most of the patients you need to check them from top to bottom. And then some of them will tell us, 'Since ever I came in this clinic you are the first person to check me like this' without prescribing the medication for them. They feel like you are healed. So, it's like they feel today I was checked thoroughly. Even with a mere urine analysis they become so happy. But if maybe you just ask what is the problem. 'I have got headache so, so, so', and you write whatever you write. Sometimes they don't feel like they must come back again. Because they will tell that the doctor doesn't even check you. He just give you the Panado and now he has, we even completed the Panado. The medication that they gave is little. But if you check them thoroughly, even with the x-ray, they feel that something is happening." [FGNP3:311-350:12]

This is how a senior family medicine consultant described and illustrated, by means of an example, the perceptions formed of an uninformed patient regarding an expectation of a referral:

“Some people have got the wrong sort of expectations that, ‘The x-rays are going to change my life now forever. After this x-ray, everything will be sorted out.’ And that is the wrong impression ... a lot of patients has this magical thing. ... A lot of patients will not be informed about it. They don’t really know how the process works. The one thing that I can think about that I can share, maybe I have heard about specific but a long time ago. A doctor in the peripheral place, where sort of in the rural practice and they use the x-rays really for the wrong reasons. So the patient will come to them, the patient will have whatever symptoms, then he will tell the patient, ‘I think you have a snake in your body’. And then they will say, ‘Okay, we will take a x-ray because x-ray is the magical thing’. And they go and stand in front of the machine, but it’s not a real machine. They got an old x-ray, they come back to put that, but is actually a barium swallow. They say, ‘Look there is a snake. Okay, this injection, this treatment, this whatever’. And then they say, ‘Come back after a week and we will take another x-ray’. [They] take a normal x-ray and show them the normal x-ray. The snake is gone so and the patient is better. So you can, but that is totally the wrong thing but you can have magical power if you really think about it. Because if people really think that way then it can be magical and people really think x-rays is sometimes going to cure them. ‘This is my last resort. If I take an x-ray, everything is going to be cleared up.’”
[FGMP3:815-821:30 & 840-858:31]

Murphy (2001: 200) states that myths that confuse patients and “blur the boundaries between facts and fiction” are widely disseminated as a result of patients’ previous encounters with imaging examinations. During a focus group interview a medical officer described the challenge for providers in that they perceived that patients may have felt they deserved an investigation:

“Sometimes with trauma you feel you don’t need an x-ray. But then the patient feels that they need an x-ray. Sometimes it becomes a bit tricky. They will come back the next day. X-ray wasn’t done, so they’re angry. So they feel that they deserve one, although it’s not indicated for.” [FGMP2:213-215:8]

According to Geneau et al. (2008: 5), patient demands influence physicians’ behaviour. Espeland and Baerheim (2003: 4) found that medical practitioners complied with strong wishes from patients in cases where the clinical indication for radiographic investigation was in doubt, little else could be done, the consultation was difficult, or time was scarce. Most

medical officers in my study felt that they would refer patients for a diagnostic investigation out of moral obligation. This created a false sense hope that something could and had been done. A choice was made to refer the patient without the knowledge of what the patient's desires were in terms of monetary incentives. According to a senior consultant, the challenge was the following:

"If clinically it looks like a fracture I can accept that but screening with an x-ray is not acceptable even if you really want to move your queue. You know the ones who come to Casualty with taxi MVA and there is many of them and when I ask, 'Stand on one leg; stand on the other leg', very quickly to see if they have fractures or not and another thing is the diplomacy. How do you convince a patient not to do the x-ray if they feel they need an x-ray? Because some of them claimed from the road accident funds [RAF]. Sending them for an x-ray, make them feel they have been helped. They deserve some money from the RAF." [FGMP2:686-695:25]

8.1.1.1 Dealing with the "demanding" patient – technology as a pacifier

The types of misconceptions of passive demands or expectations may have been created as a result of the "quick fix" approach discussed in Section 5.1.2 – *"I mean, let's rather do the x-ray, it's easier to do it"* [FGMP2:708:26]. Khan et al. (1998:1) blame physicians for contributing to the idea that an accurate diagnosis is only possible with the aid of an image.

In my study the issue of trust also emerged, namely for medical practitioners to convince patients that their illness had been diagnosed and not missed on the basis of their clinical expertise. This created mistrust or lack of confidence in a clinical assessment, allowing the power of technology to dominate by providing visual evidence of a normal outcome.

"I found that quite often the patient comes with something. And now the doctor says, 'It's not broken'. And anybody can see it's not broken. And the patient will never be convinced before the x-ray [is done] that it is normal. So what I do, [with] the x-rays explaining to the patient how it fits in, that there is no swelling of the arm, or neck clinically. There was no swelling and on the x-rays there is no swelling. So that means it correlates clinically. There is no fracture at all. That then convinces the patient." [FGMP1:650-660:24]

The above view corresponds with Balaqué and Cedraschi's (2006: 511) contention that "[p]atients tend to consider technological investigations as more trustworthy than the clinical examination."

In the private sector medical practitioners were reported to also give in to patients' demands for a diagnostic imaging investigation request to avoid friction. The patients had more confidence in the diagnostic investigation despite the risk:

"Even though I explain the risks, radiation and the cost, if they see it's swollen, they want x-rays. People told them, so that's what they want. So you've got two options – you fight with them or just comply and write out a request form and send them. Sometimes the easiest way is just to comply, even if you know you're not going to show anything. It will set their minds at ease and not create too much trouble for yourself. That is true." [CS08:740-750:27]

This is how a senior family physician described his attempts to engage with the patient to enhance understanding that a referral was not a curative process:

"The expectations of the patients sometimes is wrong. They come from somewhere. They come for a x-ray because they think the x-ray is going to cure everything. Or, ja, my typical thing is x-rays doesn't cure, x-rays just help us to make a [diagnosis]. So that a patient comes in and I see the patient. And I then tell the patient, this is a clinical [problem] and there is no indication for a x-ray. And the patient asks, 'Why can't you send me for a x-ray?' I say, 'No x-ray, is not going to make me change my decision and is not going to take away the pain'. And the patients sometimes understand that. But a lot of patients think there is something very special about an x-ray and maybe sometimes it just give them that, what is the right word? Satisfaction. The satisfaction that if I had a x-ray, then I actually know that there's [nothing wrong]. But I think there is no clinical ground, sometime if you decide what you want to do and the patient must understand that." [FGMP3:97-112:04]

In one of the focus groups a medical intern expressed the view that one should be honest and make an attempt to convince a patient:

"The other night I was called out after twelve. It was foreigners from up the north. It was a seven -year old and the brother, he is insisting that. The little girl is fine and the vitals are all fine. And he is insisting, she has chest pain and she is screaming and crying when moving her chest. But as soon as she came to Casualty it all stopped. There is something wrong. I brought her to OPD [Outpatients department]. They did sputum, they're dealing with it. But he is completely upset. I listen to her to see if there is absolutely no reason to do chest x-rays or anything. So I spend some time with the little girl, who was quite fussy. When communicating and translating, ten minutes down the line it comes out that her little cousin hit her on the chest. And that

is why she was crying and screaming. And the brother refused to listen to anything. He is convinced she required the x-rays. I said, 'No, I am not doing it'. You can see there is a social problem here. So people do in OPD takes time to explain to the demand, change their mind set on investigations [that] aren't the answer." [FGMP1: 681-698:25]

A senior medical officer felt that that kind of time was not available at Casualties:

"I think in the OPD setting you have the time to explain that. But in the Casualty setting you don't have the time, where every minute counts, when you're seeing 150 to 160 patients a day. That time, the five or ten minutes in the Casualty department is very valuable time." [FGMP1: 673-676:25]

Matters could furthermore become complicated as a result of perceived or created expectations of a referral for an x-ray by the referring centre.

"But if a patient come with an expectation it makes it difficult. Because if you don't do it, then they're going to come back. To triage next week, come back to Outpatients [and] a month later because they still want their chest x-ray. Because the clinic said they must get a chest x-ray because they've got blood pressure. You know it happens; it makes it difficult. In that sense sometimes I do use it as screening but minimally. ... It's only to almost, to help the patient to understand to go back to his clinic, so that he doesn't come back. Because if patients do not understand, they come back over and over again, because they still think at the back of their minds that there is a cancer." [FGMP3:558-673:24-25]

This type of behaviour could create a misconception of the purpose of the referral and at the same time taking advantage of the patient's vulnerability. This is how one medical practitioner described the situation:

"But then they still go away thinking, that lousy doctor did not send them for x-rays. And then they come the next time, they say the doctor did not send them for x-rays. ... Doctors are not doctors until they have done x-rays, give an injection. ... That is exactly and, yes, the injection, ja, ... and a big fat packet of medicine and then they feel good. Basically is the same as others, you think the patient is fine, but they think you actually look into their problems when you have a x-ray. ... It is actually psychological that you do something even if it's not 100% indicated. ... The patient feels you're doing something because the patient is worried. To prevent more visits." [FGMP1:613-640:22-24]

In other instances a referral was not so much done as a result of patient demand, but to avoid conflict between providers at various referral points.

“Some patients are sent from the clinics for unnecessary x-rays because they want to screen. But then again, if somebody else has seen the patient and then now it must go through another person. Before we can do that again for the patient they have already got this expectation, they [will] send me for x-rays. And then if I say, I am not going to take the x-rays, then it causes a friction. So sometimes I just do the x-rays whatever.” [FGMP3:636-645:23]

8.1.2 The submissive, “scared”, uncertain patient

Providers felt that patients adopted a submissive role because of inadequate communication with and orientation of patients not familiar with the referral processes and procedures, including what to expect of a diagnostic investigation. Patients were perceived as being disorientated at times, with some confusion during the transition from referral to the actual investigation. In one of the radiographer focus groups it was mentioned that referring medical practitioners do not always prepare their patients sufficiently for a referral, a sentiment also echoed by radiologists and nurses at the tertiary hospital.

“Sometimes the doctors don’t go give the patient enough information. By the time they get to x-rays they’re not exactly sure, even why they are here or what the doctor wants to see or what he thinks is wrong.” [FGRAD2:10-12:01]

During shadowing and in the focus groups medical practitioners acknowledged the gap in communication – *“We also don’t explain to them or we never tell them, it’s not therapeutic, it’s limited and things like that”* [FGMP1:617-618:23]. In one of the nurse focus groups the following view of patient preparation for x-rays was highlighted:

“It is like a command, which [is] like, [the] doctor said, ‘You must go to x-rays’. Then you [the nurse] just give the patient [the request form] if he is able to walk or call the porter to collect the patient and bring the patient back. And those that can’t, they [the radiographers] come and do the x-ray.” [FGNP3: 84-88:04]

Most of the times patients would opt to ask questions to and seek answers from nurses, for example on the question: *“Why are we going to x-rays?”* [FGNP1:43:02]. They would sometimes also share their interpretation of what an investigation might be like or provide feedback on their experience:

“Ja, sometimes, they do [share their fears and uncertainties], some of them. Some don’t even know what x-ray [is]. They ask you, ‘What is x-ray? What are we going to

do there? Is there any big machines? Am I going to feel the pain when they're going to do this?' And then I try to explain to them because I saw some chest x-rays being done before. I will tell her that you are going to stand there and they have got a big light and a big machine and they are going to take a photo of you. But this photo [is] taken of your inside, not your outside appearance. But then they [the patient] become better. But in the ward, because they don't know, they have got the fear of maybe I am lying to them, like they are going to feel the pain. And when they come back, I ask, 'How was it?' They say, 'Eish, I am better now because I thought you were lying. It wasn't that difficult.'" [FGNP2:15-31:1-2]

Nurses, who frequently accompanied patients, experienced the uncertainty of patients who were not familiar with the term x-rays and did not have insight in what a diagnostic investigation entailed. Patients' questions often tended to draw correlations with procedures or interventions with which they were more familiar and which could lead them to expect the worst.

"I think they are afraid of the word x-rays, because when you bring the patient here [to the x-ray department], they ask you, 'What are they going to do with me? What is wrong? Are they going to operate?'" [FGNP1:96-99:04]

This was accompanied by a sense of expectation of a physical experience or a change regarding their physical status. This could be because the notion of x-rays is an abstract concept and difficult to understand.

"They are anxious when they go there. They just get this big machine and light and after that they say, 'Sit there outside'. And they will ask, 'Why I was there, because nothing happened to me?'" [FGNP1:108-112:5]

Radiographers also felt that patients adopted a pattern of compliance, especially at the point of contact where the radiographic investigation was done, because of uncertainty of what to expect and the anxiety caused by uncertainty. Therefore, patients often shared a sense of relief after the investigation, frequently using an expression like *"I feel much better now"* [FGNP2:30:02]. Providers often constructed patients' expression of relief from anxiety as a misconception of feeling better as part of a healing process.

"Some patients really, they don't understand [what] x-rays is all about. Because the patient comes in and you ask him, if he can stand. He say, 'No, I can't stand'. And you go to the room and then the patient stand[s] up, you do the PA [postero-anterior projection], you do the lateral. And so, 'I feel much better now'. So he doesn't even know what the x-ray is all about. He just think we've done this big thing on him, now

he is feeling lighter than before or I am feeling much better now.” [FGRAD2:806-814:30]

According to a medical officer, *“A lot of times they go for x-rays from Casualty. They come back. They say they’re feeling much better, but they haven’t received their analgesia, but the x-rays did help them”* [FGMP3:882-888:32]. Patients normally did not question the medical provider on the outcomes of an investigation because they were, according to nurses, *“scared to ask the doctor”* [FGNP4:315:12]. Edwards and Sines (2007: 2451) concluded in their study on nurses’ initial assessment in triage that patients were “passive within the decision-making process, merely acting as an unreliable, and sometimes reluctant, repository of information”.

8.2 PATIENT EXPECTATIONS AND EXPERIENCES

In this section the expectations and experiences of patients with regard to referral, investigations and outcomes are discussed. The focus is on the reconstruction of the meaning making and understandings of patients and how they shaped their role within the system, including their relationship with the providers and the system’s processes and procedures. Furthermore, the expected roles and responsibilities of the patient in terms of being informed and knowledgeable on various aspects of processes and procedures of a diagnostic investigation are explored, as well as the interactive space provided for patients’ voices to be heard. Lastly the patient in relation to technology is discussed.

8.2.1 Prior knowledge and misconceptions of radiographic diagnostic investigations and expectations

According to medical practitioners, patients had an unreasonable expectation and demand for diagnostic imaging referral. My findings on patient expectations of referral for diagnostic investigations in the pre-consultation interviews, as well as during the consultations, did not correspond with this. Of the 20 patients with a pre-consultation interview only Patient 7, with a history of acute right hypochondriac pain and with several previous contacts with the health system, explicitly expressed a need for x-ray referral: *“Well, just take x-rays of my [pointing towards the abdomen]. Give me some pain killers. Show what’s up and what is going on. If they have to operate, they must just operate”* [CS07:37-38:2]. Patients were not very vocal about their expectations and expressed their desires in more general terms – *“I want them to help me”* [CS04:34:02]. They also accepted diagnostic imaging referrals because of lack of insight – *“I don’t know more about x-ray”* [CS16:1468:53] – and tended to be compliant: *“If they [doctors] say for a x-ray, I know I must go”* [CS16:1468:53]. Others (e.g. Patients 3 and

6) wished for a thorough work-up. On probing, Patient 6, who had deep lacerations of the skull and had previously been seen by medical students, responded as follows:

"Well, some of the tests, I really don't know about them. But the card I am going to go for x-rays, see specialist for scar on the face, a plastic surgeon. I am not sure if they're going to go through with that. I just don't expect an x-ray, [but] I expect more than just a x-ray." [CS06:52-56:02-03]

Generally patients tended to leave decisions to the expert's discretion. According to Patient 12 with a history of chronic sinusitis, there was *"no need to ask questions"* when it came to referrals because of the faith or trust in the experts.

"Because when they examined me, they could see. They told me exactly, they must send me for an x-ray because they can see what is wrong. ... I don't know [what to expect] because normally the doctor is the person that works with the type of patients. So the doctor will send you for x-rays." [CS12:100-102 & 115-116:05]

The patients I shadowed very rarely shared any of the desires mentioned above or a preference for referral during the consultation.

Uninformed patients and those unfamiliar with diagnostic investigations often associated an investigation with an invasive intervention. This is in line with the perceptions expressed by the health care providers. Patient 6, for example, had had a previous chest x-ray at a very young age when she had anticipated pain, but now *"it is what I expected, it was not painful"* [CS06:478:18]. When probed on harm caused by exposure to radiation most patients felt x-rays were not harmful, neither was it perceived as a painful procedure. Only Patient 7 shared some other insights relating to the risk of radiation exposure:

"No, you don't have x-rays too often, maybe once every six years. You don't have it a lot. X-rays are harmful because they're radioactive. But cell phones are just as harmful. The radiologist [radiographer] gets behind the screens and you just push the button." [CS07:360-365:14]

Patient 16 shared how members of the community perceived radiation risk or harm: *"Say, if you go in the x-ray too much, your age get [less]. I don't know if it is true. It decreases the number of years of your life, I don't know if it is true"* [CS16:162-163:06].

Provider perceptions of patient expectations of a diagnostic imaging investigation, when referred from elsewhere, was not evident in my study. For example, Patient 13 was informed at the clinic that no diagnostic imaging service was available at the clinic or that there was no access to sophisticated modalities. In the pre-consultation interview, Patient 13 shared what

had been communicated to her at the point of referral: *“They are going to scan my left breast, so that they can see any problem, because he [the doctor] doesn’t have any scanning. He feels something inside of my breast”* [CS13:42-43:2]. This information was not shared during the consultation with the attending medical intern. Although Patient 13 was possibly expecting a scan, a fine needle aspiration (FNA) was performed on the affected breast in order to adhere to the system’s protocol. With limited knowledge of different imaging modalities, Patient 13 perceived the FNA as superior to the scan and even confused an FNA with drawing blood: *“They didn’t scan; I don’t feel very bad, because they took my bloods to make sure. But I think the blood is better than the scan because the blood give all the results”* [CS13:505-510:19].

The provider misconception of the disinterested or confused patient could have been created because of a number of reasons. One is the language barrier that has already been discussed in Section 7.3.1. Another was the absence of communication by providers to the patient on what to expect at the point of the diagnostic imaging investigation (Sections 7.1.4.1 and 7.2.1). During a focus group interview a radiographer shared her experience of a patient who had not received an explanation on the nature and purpose of a barium enema investigation (also discussed in Section 7.2.1). When the patient was informed what the investigation entailed, she declined the investigation. The radiographer tried to mediate and suggest options like having a scope or a scan. In response, the patients preferred to go back to her medical provider and verify her options.

“I had this experience where this patient came in for a enema. ‘Did they explain to you?’ Then she said, no, she doesn’t want it; is there any alternatives. And then I said, ‘Maybe you could get a scope or a scan’. Then she wanted to go back to the doctor to get another second whatever investigation. She refused the enema because she didn’t understand what she made that appointment [for] and everything. But she didn’t want to, because she didn’t want, in any case because she did not know what she was going for.” [FGRAD1:660-666:24-25]

8.2.2 Effect of communication of information to patients

In Section 7.3 issues of lack of communication between health care provider and patient have already been addressed. In this subsection the focus will be on how it influenced patients’ understanding of what was happening or going to happen.

8.2.2.1 Referral – not told what to expect of an investigation

Shadowed patients with previous experiences of diagnostic investigations could recall in the pre-consultation interview the interpretation of their images with their practitioners. Patient 21

had had a chest x-ray in another province when having double pneumonia and the medical provider had shown it to her on the x-rays – *“Ek het een x-straal gehad en dit was vir my bors. Ek het dubbel longontsteking gehad. Ja, hulle het my gewys; hulle het so kringetjies getrek waar die fout is.”* [I had one x-ray and it was for my chest. I had double pneumonia. Yes, they showed me; they drew small circles where the problem is] [CS21:77-78:03].

Patient 13 was well informed regarding her referral for a mammogram by the specialist at Surgery Outpatients. The consultant was honest with her on the challenge he faced. After her consultation the patient felt confident and in control of what was happening.

“Today I’ve seen the professor, the one who give all the situation. Because he said he cannot do anything without any x-ray. I had to make the x-ray first and it is then he knows what to do next.” [CS13:727-732:27]

Doctors’ sharing of selective information about a patient’s disease or illness before referral could also lead to disappointment and possible mistrust. Patient 8 reported as follows on the information provided by a private medical practitioner on referral to a public primary health care clinic on a previous occasion:

“When I got sick ... last year the doctor, private doctor didn’t tell me maybe it was the TB [tuberculosis] or something. He just said it was ... some sore. What do you call this sore? ... Ja, he didn’t say, it was TB. But they only found out it was TB when I am doing the x-rays. That is why I am saying that x-rays are good.” [CS08:850-854:30-31]

Patient 8 presented with a swelling of the calf when she admitted to Casualties at the district hospital. As part of the consultation the medical intern clinically assessed her chest, was satisfied with the progress made with the TB medication, and felt it was unnecessary to refer the patient for a follow-up chest radiograph. He did not communicate the outcome of the clinical findings to the patient. After admission at the district hospital, Patient 8 readdressed her concern about the chest pain experienced with another medical officer. Follow-up chest radiographs were done, but the outcomes were not communicated to her either. So the patient’s concern was not addressed by providing her with adequate information on clinical and diagnostic findings.

This occasion was also Patient 8’s first experience of a referral for an ultrasound investigation. The amount of information overload on her, including the referral for an ultrasound, was converted into fear of an operation: *“I don’t want to lose my leg”* [CS08:346:13]. After the information overload, the medical intern did give the patient the opportunity to ask questions,

which the patient declined. The mismatch between what was anticipated and the actual experience was confirmed after the ultrasound investigation:

"It was the first time doing that thing. I think I was confused at first, but I know that when you are, they are speaking about a sonar, what it is? Ja. ... they put something and the gel and they rub it in my leg. So that they can see what it was inside my leg. So I didn't see it actually." [CS08:804-805 &810-814:29].

8.2.2.2 The investigation

(a) What am I here for?

Patients' uncertainty and anxiety during the referral phase of their journey through the health system and what to expect of a diagnostic investigation have already been discussed in Section 8.2.1 above. This uncertainty and anxiety continued to be reflected in the interactions at the diagnostic imaging section. This is how one radiographer described their experiences with patient uncertainty:

"I think we play a role in not just the general feeling of a patient towards what he is coming here for. Because if you get someone that would just tell the next person, come and lie down here; just put him through there, you can see there is some panic. But it's not always that people would have that understanding unless you've been there where the patient is, like I was a patient myself. I had to go for abdominal and chest x-rays. But because I am a radiographer I knew what was expected of me. But because the radiographer that time told me, not knowing that I was a radiographer, she just saw me as a patient. She explained to me, that is what she wants me to do. This is what I am here for. It somehow makes you feel a bit more at ease, you know.

So I think the radiographer's role towards a patient especially should be more involved. They should always see themselves in the patient's shoes, the role of the patient and always try and see what that patient is going through to make the experience more inviting. Because if a patient had a bad experience then he would always have the fear of coming back, especially if the patient has been at the MRI [magnetic resonance imaging]. They come here, you open that doors for them and it seems like they wanna run away, don't want to go through the tunnel again. Then you take them there; you show them that the machine open on both ends, the gantry; you put them on the bed; you slide them through, you know, before the scan started, you slide them through and bring them back – this is what's going to happen.

So once the modality becomes old, then the explanation wears and that is why maybe radiographers are not explaining general radiography to the patients and always explain what might happen, especially in a situation like with this patient [18]. I didn't just put her on and said to her we're going to scan and that's it ... I said to her, we're going to scan her and take her off, and bring her back if the doctor feels that we need to give her contrast. And then she will have to get a drip and then injected with the iodine and then [a re-scan]. So she knows what is expected of her." [CS18:2094-2118:76-77]

(b) An impersonal environment – *"This cold room"*

What was interesting in this study was that the nurses participating in the focus groups were often more vocal about their negative emotional experiences of a diagnostic imaging investigation as patients themselves or when accompanying a relative as a patient. The role of the radiographer came under scrutiny a lot. One nurse described how the radiographer interacted with her during the investigation to get cooperation in order to perform her task, where she was expected to play a dual role of emotionally and physically supporting the child:

"It was fearsome when they give you the lead apron. They put your child there. But and in the meantime I was supposed to hold the child because it was cryful. I was supposed to help, holding her, so she can be settled. But with the apron that they gave, I was thought it was a dangerous [thing]." [FGNP3:400-405:03]

Another nurse also shared her experience of her child's investigation:

"Seeing the big machine, I know it's scary, because I took my daughter once a few months back. Everything so nice here, but the minute we got into the x-ray room, so we saw these big machines, so she started to cry. Even me, I did not really prepare for this psychologically, because she is three years old. Everything is okay until we got to this cold room. No, it was cold. There was no talking. She [the radiographer] said, 'Come in'; 'Okay, hold her arm'; and that was it. So okay ... I don't know how to express myself but I felt neglected. You are not important. Just do this, that's all. They don't care. They just have to do their job. I won't say neglected that is a very strong word. When you are called in, you would expect them to [say], 'Mummy, we are now going to'; a little bit of explanation of what's going to happen. But they just say, 'Put the baby there; pull the arm', whatever and that was it. After the [investigation] they could have made my child feel a little okay. ... I know I was anxious but ... I felt that 'Mummy is nice, but this other person is also nice'. You know, when you work with

kids ... that voice of yours. But there was nothing. 'Okay, we're finished. Okay go. Bye'." [FGNP2:455-460, 467-468 & 475-488:17-18]

The impersonal environment at a private practice was also described by a nurse who had undergone a mammogram investigation:

"Private sectors are worse out there. I once attended the private hospital to do a mammogram. I was just called, Xhosa just, come in. And she start. But first she must put herself, that maybe this one she does not understand that mammogram. I had to explain everything. Not to just get in, do this, thwah thwah. It's like as if you are in a hurry. Just give me few minutes. At the end I tell myself that she was in a hurry because she wanted to complete her tea or breakfast. ... They must tell the patient what is expected of her and what is going to be done rather than being harsh like that. We have to do like step by step, not just do like this, be like this. And it was not my first time to do this because I usually do it once a year. But if somebody does not know what it is going to be, you will land up not doing the procedure again. And it is her health to do that. It's high time that they explain everything to the patient we are here under stressful but somewhere, somewhere the patient must understand what is going to be done, ubuntu."* [FGNP2:491-505:18-19]

In contrast, most patients shadowed judged their experiences of diagnostic investigations on the interpersonal interaction and behaviour of radiographers. These patients also appraised them: *"They were good. I observed how their attitude was and how they handled me"* [CS05:452:18]. This is what Patient 17 had to say:

"They [the radiographers] used to talk to me ... talk nice to me, treat me and explain to me that they are going to do the x-ray. What I am going to do while they will be doing x-ray. There is no any way they were just saying, 'Turn like this; turn like this'. ... They used to come nicely to me and say, 'We want to take it from this position, want to take it sleeping on your back.' Just like that." [CS17:1440-1446:52]

- (c) Patient understanding of an investigation and the experiences of an investigation itself – the case of Patient 13

Similar to the first experience of Patient 8 to a diagnostic ultrasound investigation discussed in Section 8.2.2.1, it was also Patient 13's first exposure to both modalities of a mammogram

* *Ubuntu* is a people-centred approach to life that acknowledges the other person as the human race. It cherishes characteristics such as being caring, humble, thoughtful, considerate, understanding, wise, generous, hospitable, socially mature, socially sensitive, virtuous and blessed (Teffo, 1998: 4; Le Roux, 2000: 43).

and then a diagnostic ultrasound investigation. This is how she initially expressed herself on both these investigations:

"It was not too real like the other one [fine needle aspiration]. ... It was unusual and interesting. ... The people were very nice to me. They didn't be harsh to me. They were not funny. They were the nicest people. ... They did tell me everything. I didn't have any question." [CS13:1644&1653-55:60]

Although the mammogram was also an unusual experience, Patient 13 was able to describe it as a fragmented body part (object) capturing. Then there appeared to be a gap regarding the abstract concept of the actual capturing of the image: *"They just put in the [breast]. Where you are, they put the machine there. They just send it to the photo to come, there photo of x-ray"* [CS13: 4091-4093:148].

For a mammogram the patient faces the machine and is able to see the procedure. From my observations it was unlikely that Patients 8 and 13 could see the screen during their ultrasound investigations and they were not communicated to on the observations on the screen.

"I didn't see; it was interesting. ... Because I didn't hear any sound. It just they smear with gel and moving that it was something unordinary to me. ... I know they were busy searching the problem, yes." [CS13:1681&1686:61]

Further, misconceptions around what an investigation entailed and the actual experience of such an investigation or procedure could negatively impact on the trust and relations between providers and patients. Patient 13 was informed after her ultrasound investigation that she had to undergo a breast biopsy, after which the radiographer took her to the biopsy room and explained the procedure to her. According to what she understood and could recall, the radiographers and nurses were to do an invasive procedure:

"They did show me only the bed where I am going to be laying. They are going to inject me with a needle and cut me. I am not sure because of, I am not sure [how] they were going to do that." [CS13:2292-2295:83]

When I probed the patient on her expectations of a biopsy, the response was: *"I will see when I get there"* [CS13:1683:61]. On the day of the biopsy Patient 13 was anxious, because of the selective information received and some interactions that took place between the providers during the biopsy, which led to feelings of uncertainty about the procedure itself and mistrust of the providers, almost a form disappointment.

"I was feeling scared but not so. ... I was thinking how are they going to do this thing. They say they are going to cut a piece of meat. It's where my imagination started to

make me scared because I thought they were going just to cut me like that. ... I think it was going to be worse. ... They told me that they are going to inject me with a needle and they are going to cut me. I am not sure because of I was not sure they were going to do that. Maybe they were make me not to be scared. ... How I feel is I was not expecting it to be like this. It horrified me. ... They are going to cut a piece. ... I didn't even see the doctor that was doing the biopsy. I saw only sister or nurses. ... Maybe is, they are, that I must not see the doctor I thought so. I must not know who the doctor he is. ... They [the FNA, mammogram, ultrasound and biopsy] are all different. But today I was so horrified really. ... They must explain to the patient, the doctor who is going to do this kind of a thing. Because I didn't know I was going to be done by the doctor. I thought those nurses are going to do it. Maybe it should have made me more better if they could have tell me that I was going to be done by the doctor. If somebody asks me who the doctor did this to me, then I had to tell them. But now I don't know who the doctor is. ... Maybe is going to come the final decision is where I am going to know where am I standing. ... I don't know maybe you can tell me the time I was with you. Do you see any complicated thing or you won't know nothing or they are still waiting for results? But if they are talking knowing they are numbers, maybe talk the numbers, do you think there is anything wrong? [CS13: 2281-2354:83-85]

Patient 13 is a typical example of Murphy's (2001: 200) illustration of how the interpretation of informal interaction before an investigation can lead to very believable ideas about the technology itself that serve as the patient's self-preparation for the investigation. If no other information is received, the stories and analogies that patients choose become the expectation.

Patient 13 experienced a form of disrespect about the discussions held by providers and the students during her biopsy. She also felt a form of tension and discomfort.

"I, it's not well, not good, because of they make doctor not to concentrate in whatever he is doing. ... I was no interest to them. But I did hear the doctor asking them they must say something, because I was concentrating on my breast." [CS13:4104-4108: 149]

Patient 13 was also not sure what the students' exact role was:

"No, they [students] didn't ask me; they just come in. I don't know who are they and where they come from and what they are for. I don't feel very good, because I don't

know why they are here. If they were learner, or to get something, to get the results of understanding. They should have asked me first.” [CS13:4118-4123:149]

In line with the discussion in Section 8.1.2, Patient 13 confirmed her anxiety and suggested that in order to reduce anxiety at the time of referral health professionals must provide support by informing the people on what was going to happen.

“They can then come and tell you when you’re going to the mammogram. They should have; they should counsel people so that the people cannot be scared. People can understand what is going [to happen] because it is good to be counselled. Because of sometimes ... because I was looking for somebody to talk to me about this [biopsy], telling me is not so bad. I think ... they must counsel people.” [CS13:4679-4685:170]

According to Patient 13 the ideal would be to reassure the filtering of accurate information in order to eliminate any misconceptions regarding the biopsy.

“What is going to take on [to happen in the biopsy], ja, that is from there. Because when you enter there you see something new that you’ve never seen before, you see. So from that moment they take everything where they can start talking to you, telling you how it’s going to be and you must not think this and do this.” [CS13:4713-4715:171]

A nurse shared a similar experience with an abdominal ultrasound investigation. From her observation she felt the radiologist was not sure what he was seeing on the screen.

“I just want to share a personal experience I went to the sonar department for a abdominal sonar. The doctor would do the sonar. I could see he wasn’t sure what he was seeing on the screen. He went out; he came with the other doctor. Now while I was lying on the bed the one doctor was this side, the other doctor was this side. And now they are doing the scan. And I was on duty that day and the doctor said, ‘Oh, that’s cancer’. I almost died on that table that day. I mean, really, I almost had a heart attack. Just so blunt – it’s cancer. I mean, that is not the way to do it. ... Even if it was cancer, he should have discussed it. And then come and tell me in a proper way. I was so shocked that day, nè [you see]?” [FGNP4:460-470:10]

8.2.2.3 Outcomes

With reference to Section 7.1.4, medical officers often communicated with patients in cues and with an overload of information regarding the referral, plan of action and a management strategy. Most patients felt confused and/or disorientated when there was improper commu-

nication or when they had had a high expectation that technology would detect their problem. Patients frequently expected communication about their outcomes at the referral site: *“I would have liked to know whilst I was at x-ray department”* [CS10:55:03]. According to a family member, Patient 16 felt emotionally unstable and disappointed after her ultrasound investigation outcomes had not been communicated to her immediately after the investigation. The family member said that by withholding the information of the outcomes of the investigation, at that point, led to further confusion regarding her experiencing persistent symptoms.

“She was more confused. They didn’t explain to her, whether the problem was found or not found. It was shocking because she still felt the pain. But the report said, ‘There is nothing wrong’. Ja, so it is sort of confusing, kind of sad.” [CS16:90-96:4]

Patient 6 was probed on the benefit of an x-ray investigation. She further shared her desire of integration of the interpretation of the image and for instance the role of the diagnostic picture to illustrate where the fragment fits in the treatment or management process. She also had no insight on the interpretational aspects of the providers’ role.

“Because I don’t know how they read them, I would really not know. ... Yes, I would have liked them to show me, to say, ‘If you see this and that picture, it means you have to take this’ [medication]. I can take, even if I don’t understand.” [CS06:96-104:04]

A few patients in this study got the *“whole story”* from either their medical practitioner or another attending medical provider (Section 7.1.5). Sinusitis Patient 12, with several previous encounters with the system was one of the few cases who, despite being dealt with by different medical providers, benefited from adequate information when a family medicine consultant attending to her on the follow-up consultation was able to put the pieces together, integrated the radiographic image as a tool and also used a textbook to explain the source of the problem. This gave Patient 12 a sense of control and understanding over what was happening:

“It was really a benefit to me because even on the x-rays the doctor showed me. I like also the fact that the doctor show me even in the book also how the whole thing started and it help me as well. So I think the x-rays is a very good thing and what I like from that I just know that, I have sinus. Before when I go to the doctor then they check. ... They say my sinusses is blocked inside. So it’s the first time that I experience that they show me at the x-rays. How even my eyes, I didn’t know that the x-rays will take it out as well. As it’s part of the sinus, the infection of the eye. I know

now the whole, whole story of the problem that I have. And then for that I know I will be more careful. For sometimes you know you mustn't be in the place where people smoke, but still you are there. So now I know exactly that I must really strictly avoid those type of things. ... The doctor that helped me now really, I mean, really it was a blessing. Just something that I wanted and I am very glad she was very, very helpful. That is how it must go. The doctor must explain to you the cause of the sickness and show how the parts what happen and what happen." [CS12:771-805:28-29]

According to Borgen et al. (2010: 197), "normal findings will reassure the patient" and treatment, such as that experienced by Patient 12, will give patients the feeling of being taken seriously.

Patient 17, on the other hand, was subjected to an intolerant orthopaedic registrar and a lack of continuity of information and care due to being seen by a different medical provider each time. After an explanation by the orthopaedic registrar, he was convinced about the condition of his spine. Further, the patient had made an effort to know whether they were going to operate, but there were no complete answers. The lack of continuity in the communication chain made Patient 17 uncertain as to whom he should ask what questions or how to get an opinion or expert advice. There also appeared to be no room provided for discussing his concerns.

"Ja, good enough. I did ask the questions and wherever I am not sure, I do repeat until they give me good explanation. But he [orthopaedic registrar] is very fast. It is that I don't know. I was supposed to ask the same doctor, is it good for me to take [scan]. At the end they say [they're] going to operate me. Would it be a good thing? ... Well, I don't know whether it's, after he explained, he convinced me to understand. But ... firstly I couldn't even ask it [about the operation]. As I was saying he was very fast to me. I couldn't even ask him the reason then, because actually the x-ray I did see the last time, so now I wanted to see something different from the x-ray. So I couldn't see it. So I need some results about it. So the way he explained to me that he has to firstly go through those things, first try this, and try this. So I don't know whether he is busy because he say that one [MRI] is more expensive. I don't know, but I think when if I carry on with the treatment, it doesn't help so much, I will ask him why how difficult I was supposed to pay and if it is myself how much. How I am going to pay? Is it cash? Should I make it as a instalment? See those things." [CS17:1456-1462:53 & 1480-1492:54]

The breakdown in communication between providers regarding referrals has already been discussed in Section 6.2.3. The discussion in this section is on the effect this breakdown had

on the conceptualisation of the outcomes status and how this created a source of conflict. Patient 18's son was admitted to the ward with a fractured femur. There was no communication between the two attending medical practitioners in terms of the interpretation of the femur x-rays. The mother had difficulty expressing herself on the issue and saw the source of confusion as the x-rays:

"Want die x-strale, ek weet nie, want hulle het my twee dae terug gesê my kind se been groei nie. Die x-strale wys hy groei glad nie, die dokter [medical officer X] wat vir my gesê het. En toe nou gister, toe sê hulle, nee, maar die been groei. Now how do you explain that? The one day they tell you that there is no difference. He's been lying here for one month. And the next day the doctor [registrar Y] says the bone is all right; it is starting to grow. As die been nie reg is, het hulle nie die traksie afgehaal nie. ... Ek weet nie, want die ander dokter [Y] weet, maar X het eers na die tyd gekom. So die ander dokter [Y] wat bietjie hoër as X is, ek dink sy is 'n spesialis. Sy is besig om te leer vir orthopaedic. Toe sê hy [spesialis Z] hulle het mooi na die x-strale gekyk.

Ek dink daardie dokter [spesialis Z] het na die x-strale gekyk want sy [kliniese assistent Y] het hulle gebel en gesê hulle moet na die x-strale kyk en dan sal sy terugkom na my toe. Toe sê hy [Z] vir my die been is besig om te groei, bone formation, maar nie heeltemal soos hy moet wees 100%. So, hoe het hulle dit gesien as daardie dokter X gesê het die been groei nie? Jy sien, dit voel, ja jy sien, ek weet nie wat het daar gebeur nie. Want die een dokter sê so en die ander een sê so. So jy is so confused en hulle het vir my gesê hulle gaan die penne insit, daardie dokter [X]. Maar toe sê sy [Y], they don't do it because he [the child] is too small. So x-strale is tricky ding. Want van voor af kan hy vir jou so lyk en actually is dit iets anders. Ek weet nie of dit verduidelik nie. My kop is so deurmekaar."

[Because the x-rays, I don't know, because they told me two days ago my child's bone is not growing. The x-rays show it's not growing at all, this doctor [medical officer X] who has told me so. And now yesterday they told me, no, but the bone is growing. Now how do you explain that? The one day they tell you there is no difference. He's been lying here for one month. And the next day the doctor [registrar Y] says the bone is all right; it is starting to grow. If the bone was not right, they would not have taken off the traction. ... I don't know, because the other doctor [Y] knows, X only came afterwards. So the other doctor [Y] who is higher than X, I think she is a specialist. She is learning for orthopaedics. Then he [specialist Z] told me they looked at the x-rays well.

I think that doctor [specialist Z] had looked at the x-rays, because she [registrar Y] phoned them and told them to look at the x-rays and then she will come back to me. Then he [Z] told me the bone is busy growing, bone formation, but not quite as it should be 100%. So how did they see it if that doctor X had said the bone is not growing? You see, it feels, yes you see, I don't know what has happened there. Because the one doctor says this and the other says that. So you are so confused and they told me they were going to put rods in, that doctor [X]. But then she [Y] said, they don't do it because he [the child] is too small. So x-rays are a tricky thing. Because from the front it can look to you like this and actually it is something else. I don't know if that explains it. My head is so confused.] [CS18:3303-3340:121]

Confusion such as the above could create mistrust and some patients sought confirmation after they had been informed (e.g. Patients 13 and 19). Patient 22 was seen by a medical officer who informed him that, *"I had a look at his x-rays. There is no fractures, so we going to let you go home all right"* [CS22:179:07]. After the doctor had left it appeared as if the patient was either seeking reassurance or did not understand what he had been told. So the patient asked me, *"So there is no problem here?"* [CS22:182: 07]

Contrary to providers' perception that patients saw the outcomes of a diagnostic investigation as the outcomes of a treatment, patients rather perceived the interpretation of an image as a tool to enhance treatment adherence. Patient 12 shared her experience of a chest x-ray – *"white lungs"* as the patient recalls. She then integrated it with the management strategy prescribed by the attending medical practitioner: *"The doctor showed me my x-rays and she showed me the cause and everything, also then she gave me stronger medicine"* [CS12:255-258:10]. Therefore, the system had some form of empowerment effect through informing the patient.

There were some valid reasons for the come-backs, amongst others *"the fracture was missed on the x-ray by everyone"* [FGMP2:475:17]. Patient 23 who sustained an injury from a MVA and was referred for an x-ray investigation came back the next day because she was still experiencing pain in the hip and femur from the MVA.

8.2.3 Desire versus demand – giving the health care provider "a chance"

Most of the shadowed patients appeared to be submissive when in contact with health care providers. They only voiced their desires, opinions or frustrations with me as researcher when they were not satisfied with the course of events. Patients were generally not aware of their rights. However, they referred to the consequences of taking a matter further, such as intimidation or other negative implications. Some patients were demanding but were respect-

ful of the system's processes and procedures and gave in to the choices made by the various providers. At times some patients did, however, take charge of their situation as they journeyed through the system and at other times there were also those who would seek another institution should they not be satisfied.

Other than Patient 7 the rest of the patients demonstrated an attitude and behaviour that demonstrated tolerance, giving the provider the benefit of the doubt or space and trust to make the appropriate choice. Patient 9 had his first encounter with the hospital with a rib injury. The medical officer informed him that there was no need for a diagnostic imaging referral. He accepted the doctor's decision and demonstrated confidence and faith in the medical officer: *"Well, actually not so bad. I can trust her, the way she explained"* [CS09:262:10]. Similarly Patient 17, with chronic back pain and several previous encounters with the public and the private health sector, was referred for a computerised tomography (CT) scan of the lumbar spine – *"I am still saying sometimes, it is their procedure, all those sort of things, but expecting they will send me today to the scan. But I am saying, let me give them a chance"* [CS17:341-343:13].

Provider perceptions that a diagnostic imaging investigation had to be done in order to convince patients with evidence from a diagnostic investigation could not be confirmed. Often patients rather took a neutral stance and were willing to take the risk, leaving it to the experts to take responsibility and make the choice. During one of the focus group interviews a nurse shared her personal approach when she brought her daughter to Outpatients for a possible fracture of the forearm:

"I felt, let's give them a chance to decide. Because we believe what they are saying, hakere [isn't it like] if this one says there is no fracture without even checking the x-ray. Because he's a doctor, we believe that there is no fracture. But if the other one say, let's take the x-rays, [and] then you also agree. You don't, you are just, you agree with everything. But your main objective is you want your child to be healed." [FGNP3:377-385:14]

Some of the frustrations experienced by patients also seemed to result from logistical processes such as re-registration and waiting again in a queue to receive their results. Waiting times for the feedback from medical practitioners on outcomes of radiographic investigations ranged from between one hour, three days and up to two weeks. Patients were mostly tolerant, as they had the expectation that their problem would be solved. Patient 12, for example, did not mind waiting for three days for her outcomes of the sinus radiographs:

"For me, I didn't care if [it] take three days, as long as the problem is solved. I know what is wrong with me or they can help me. So the time, Friday to Monday does not matter for me. It was the actual problem that I had; I wanted it to be solved. Even in two, three days, as long as I am satisfied with everything." [CS12:820-824:30]

A South African study by Gibson (2001:515-532) confirms the dominance of institutional culture of the patients expected to behave like "good" patients and passively accept services and attention allocated to them.

Other patients had an expectation to be attended to immediately – *"Because I thought today I was going to be the first one to be attended, because I am not here for check-up or it is for the result"* [CS13:3084:112]. But then Patient 13 was informed about the lost biopsy results; the surgery registrar told her that she would look into the matter and she made the booking for a second biopsy. When I called the patient to find out whether the doctor had called, she said, *"Maybe she [registrar] forget. Let's give her a chance"* [CS13:3394:123].

Inconsistencies were also observed in the registration process. The day Patient 18 had to come to ENT (Ear, Nose and Throat) Outpatients for the outcomes of her CT investigation, she had to wait for four hours at registration. On this day all first-time registrations were checked for proof of residential status, income status and identity documents. First-time patients whom I shadowed were also treated differently. Patient 17 was accepted for the medical consultation but was informed by the sister in charge to provide proof of income status or else he would be billed according to private tariffs. On the other hand, Patients 8 and 13 were allowed to register with proof of identity only. Patient identities also got mixed up sometimes. Whilst waiting for the results of the ultrasound investigation, Patient 8 realised her papers were mixed up – *"When I read, I saw the name, the things are not mine. The information was not mine. Then I called that guy, showed him"* [CS08:884:42].

Patients also appeared to be unfamiliar with their rights or the complaint procedures of the system, despite the many posters on the patient bill of rights and the *Batho Pele* (patient rights) principles in both the district and tertiary hospitals. It appeared as if patients would only utilise these channels with regard to quality of services (e.g. long waiting times and not being helped). A nurse working in Casualties expressed herself about patients as follows:

"They know too much, because most of the time we are working in Casualty. If you doesn't want to help or maybe you're delay[ed] or you are on tea, they will react quickly. They just ask you, 'Where is the office of management?'" [FGNP4:323-328:12]

At the tertiary hospital there were patient satisfaction questionnaires and complaint forms. Patients were aware of these but were reluctant to complain because of fear of intimidation from providers regarding their treatment. Whilst waiting for Patient 18's follow-up consultation, another patient shared her concerns with me, as she thought I was an official from the health division. According to her, the referring medical provider had sent her to the Otolaryngology department for a possible CT scan. After several consultations with the registrar there was no progress regarding her treatment and she had not had a CT scan. I advised her to discuss it with the doctor or complete a questionnaire. Her response was that she was afraid to do so because the situation with the doctors might become worse and they would not treat her properly.

Patient 13, whose biopsy results were lost, started out quite confident about seeking legal advice, because she felt that the system may be failing the community at large.

"I will take the action or whatever, will take the further step. I speak to my family and the man that I am living with. Because even this person, who was calling me, is still at school doing law, he is the one who told me, 'No, this is wrong'. You can't just do something like is called negligence. So you had to take further step. People they are going to be suffering because the way they [hospital personnel] are treating people and the way they are handling things." [CS13:4209-4214:28]

When she was questioned after her second biopsy about taking this matter up, she felt intimidated that the professionals could withhold treatment or do something to her because it was not the first time that they had lost patients' biopsies:

"But today I don't know, but the person who was calling me is the, I did look for a lawyer to deal with this matter. So the person who was calling me now is the person who found me the lawyer. So in fact he want to meet me and talk to me. I don't know how maybe he can do something further because they did do this to me. They won't do this [lose the biopsy results] to other[s] because they have already done this to me. I was afraid of, if I take this matter further before they do this [biopsy], then they can do something. So now they did it [the biopsy]. So I will see, because you did hear that one there, the fat one [radiographer] saying, 'It's not the first time, this one is the second time [losing biopsy].' ... I think she is lying." [CS13:4183-4188:151]

8.2.3.1 A case study of Patient 18

A few patients seemed to be in control of their situation and very aware of what was happening. Patient 18 went to the tertiary hospital first to seek access and was referred back to the district hospital. At her initial consultation at the district hospital she was referred for sinuses

x-rays. (See also Section 7.1.4.1). She was expecting a referral for a CT scan and took the matter up with the medical officer: “*So I must go for a CAT scan?*” [CS18:213:08]. The practitioner responded with, “*I wish*” [CS18:213:08]. The patient probed further: “*At ... [Hospital X] they put the fluid also, it's not the same?*” [CS18:216:08]. The medical officer simply said, “*We don't do CAT scans here*” [CS18:218:08]. The patient went quiet and accepted the decision. At the x-ray department she shared her dissatisfaction with the radiographer when the latter asked her if she knew the reason for the referral.

“Ek weet nie hoekom nie. Ek het gegaan vir 'n CAT scan laas. So ek weet nie of die x-strale iets gaan help nie. Want die ding sit in my [neus]; hy moet geopereer word. Dit is presies wat ek vir haar gesê het.”

[I don't know why I went for a scan last time. So I don't know if these x-rays are going to help in any way. Because this thing sits in my [nose]; it must be operated. That is exactly what I told her.] [CS18:294-296:11]

So the radiographer told Patient 18, “*Dit is hier by jou neus, so ek weet nie. In elk geval, ek is nou by jou*” [It's here by your nose, so I don't know. Anyway, I am with you now] [CS18: 298-300:11]. The radiographer decided to do the x-rays in any case, but limited projections to nasal bone instead of paranasal sinuses – “*There is nothing wrong with the sinuses, the nose is the problem. You can see the nose nicely on the OM [occipito-mental] sinuses, so why must I do all the sinus projections*” [CS18:310-313:12]. The patient accepted the radiographer's decision and returned to the medical officer. The doctor then informed Patient 18 about the ENT Outpatients for securing and seeking advice on the medication. The patient sought clarity on the possibility of an operation – “*They are going to reconstruct my face?*” [CS18:454:17] and further informed the doctor about her drug allergy – “*But I am allergic for voltarin*” [CS18:472:18].

At the tertiary hospital ENT Outpatients, before the consultation, the patient shared the following with me:

“Ek gaan hom smeeek vir 'n scan as hulle nie besig is nie en die datum vir die operasie, dat ek bietjie vroeër kan kom. Jy sien Ouma kom Woensdag kuier vir 'n paar dae en die week na die einde van die maand, na die sewende, dan kom my ma se vriendin kuier. So ek probeer dat hulle my kan inkry want my ma is mos dood en my man gaan nou môre terug werk toe. Dan is my [skoon]ma alleen met die kinders by die huis. Sodat daardie tyd wat ek geopereer word, is daar iemand wat by die huis help, want sy is alleen met die kinders. Want sy het ook daardie voet; sy kan nie op haar voet loop. So ek begin gewoonlik as ek by die ENT en dan na twee weke moet ek weer terugkom

vir die scan. Daarom, twee weke wag vir die scan, ek weet nie hoe besig is dit hierso nie en eers twee weke daarna kom ek vir die operasie. So dis nog 'n hele maand."

[I am going to plead for a scan if they are not busy and the date of the operation that I can come a bit earlier. You see, Granny comes on Wednesday to visit for a few days and the week after the end of the month, after the seventh, then my mother's friend is coming to visit. So I am trying so they can fit me in, because my mother is dead and my husband now goes back to work tomorrow. Then my mother[-in-law] is alone with the children at home. So that that time when I am operated on, there is someone at home to help, because she is alone with the children. Because she also has that foot; she can't walk on her foot. So I usually start at ENT and then after two weeks I must come back for the scan. Therefore, waiting two weeks for the scan. I don't know how busy it is here and only two weeks thereafter I come for the operation. So it's still a whole month.] [CS18:966-977:34-35]

However, the patient was not able to negotiate her request for a rescheduled timeline during her consultation. She accepted the appointment date available for a scan. After the completion of the scan, she shared her frustrations regarding the referral with me:

"Ek het nie eers geweet die dokter moes daar gewees het nie. Dit was so, hoe kan ek sê, hulle het gejaag, soos 'n rush. Hulle het jou net ingesit en weer uitgevat, so dit was nie eintlik. Hulle het nie eens die scan van daardie [nek], maar dit was sy fout; hy het mos nie gevra vir daardie. As ek nou gaan, gaan ek vir hom sê hy moet asseblief hierdie ding maak. ... Dan gaan hy [my] seker daardie dag terugstuur, so die operasie gaan ook dan wag. As ek daar kom, gaan hy seker vir my datums gee vir 'n scan en dan. Of miskien eers die operasie doen and afterwards gaan hy 'n scan doen van die ding ... miskien as ek hierso lê."

[I didn't even know the doctor had to be there. It was so, how can I say, they rushed, like a rush. They just put you in and took you out, so it wasn't actually. They don't even have the scan of that [neck], but it was his fault; he did not ask for that. If I go now, I am going to tell him they must let them make this thing. ... Then he is probably going to send [me] back that day, so the operation will then also wait. When I get there he is probably going to give me dates for a scan and then. Or maybe first do the operation and afterwards he will do a scan of the thing ... maybe while I'm lying here.] [CS18:3416-3425:124]

At the follow-up consultation Patient 18 took responsibility about her concern about the incomplete investigation of neck scan with the referring registrar. The patient started off by

seeking clarity from the registrar by establishing if there is a relation between the lump on the neck and the sinuses:

Observation	Interaction
Patient:	<i>"But this side hasn't got anything to do with the thing like this [the lump on the neck]."</i>
The registrar looks at the lump.	<i>"Oh ja, this round thing. Now let's see, wait."</i>
After re-assessing patient's neck registrar re-views the scan images.	<i>"Ja, they haven't done the neck I just want to see have they gone."</i>
Patient:	<i>"The CT scan, but not sure this thing they mention in the neck, but I am not sure of the CT scan."</i>
Registrar admits:	<i>"I don't know if they went that far [to neck]."</i>
Patient:	<i>"No, they just went up to here."</i>
Registrar confirms:	<i>"No, they didn't do the slices of that."</i>

[CS18:2806-29:102-103]

The patient constructed her understanding of the shortcoming with the duration of the investigation of her previous CT scan with the present experience of a short span of the investigation: *"Ja, it is very quick, in and out. And the last time when I went for scans, the first operation, it took a little while"* [CS18:2831-2832:103].

Patients' degree of interaction was influenced by individual characteristics of the patient. Patient 18 acted with confidence: *"I speak very openly with the doctor. You know, I ask him questions directly and I am honest. If I don't like something, I tell him I don't like it"* [CS18:3476-3479:126].

Others, like Patient 18, also took charge of their situation when they were not satisfied with the treatment they got at a particular hospital (e.g. Patient 17). They tended to rely on emotional judgment and took it upon themselves to seek an answer or solution from another hospital. They manipulated their referral either through their private medical provider or like in the case of Patient 17, who was referred from his work to the district hospital after having been treated at another public tertiary hospital:

"After I was not satisfied my mind concept. It will say, no here I am not getting a good treatment. Even if I don't have any example that why I am saying, how I differ, this was good, this was bad. This comes to me, let me check, try this one." [CS17:1372-1374:50]

According to Patient 17, he was reassured that the condition of his back had not changed since his previous x-ray investigation:

“Ja, the thing which I am crying about, is it getting worse? They compared those two x-ray[s], it must be some three months back and the other one is now that they will compare. The way I see those x-rays, I am satisfied they are still showing the same.”
[CS17:1416-1420:51-52]

8.2.4 “Us” and “them” – the space for patient voices

In Sections 7.1 and 7.2 the discussion focused on the various levels of engagement between providers and patients. In this subsection the emphasis shifts specifically to the space provided for patient voices at various points of contacts within the system. A few examples from the case studies will be used to illustrate how patients, even if they were engaged in an interactive process, could still experience a sense of isolation or feel like a mere bystander when discussions were being held about them and not with them.

Some of the provider perceptions mentioned in Section 8.1.1 regarding the so-called disinterested patient, may have been based on a misunderstanding of patients' intentions. During the shadowing of patients it appeared as if there were opportunities for patients to raise questions of concerns, but that this seemed to be suppressed by the approach of medical professionals using nurses as mediators with the patients.

“The doctors do not give us the chance to talk to them. They are already on the move. ... To ask the questions. ... But you see, you don't know the doctor. ... It is difficult to ask questions in the room because the doctor and the nurse are talking the whole time. ... When you have a question, the sister will say, but the doctor said this, this and that, so one looks at the situation before you can ask questions.” [CS13: 2376-2378:86 & 2735-2740:99]

Most consultations were observed to follow the pattern described above. This is how Patient 17 described his experience with the orthopaedic registrar at the tertiary hospital:

“The doctors don't talk to you so much ... but sometimes the doctor is to me, it was a harsh somebody ... because ... patient, so shhhht [noise for keeping quiet]. So I cannot say, he was not bad, but he was faster. It might frighten me sometimes if I don't know my story. Somehow they are made, I keep quiet about it. Not talking about it. Sometimes even before you give him the answer, he already answer it for you. Ja, you know, when he gets one word [cue from the patient], then he knows this word goes with those words, something like that.” [CS17:1448-1453:53]

Patient 16 who had accompanied a family member for lumbar spine x-rays at a tertiary hospital in another province described this experience with radiographers: *“No, they [the radiographers] did not tell her anything. They take your body and they do it and then send you away with the report”* [CS16:75-78:3]. Patient 24, who had been referred for bilateral lower leg x-rays, shared about her diagnostic experience:

“I just give her [radiographer] the paper the doctor gives me. She took the paper. She took me next door. She took the x-ray. After that she said, I must sit on the bench. She come, she give me the x-rays.” [CS24:60-64:3]

Along the same lines a professional nurse described her experience in one of the focus groups: *“Patients are treated like items, not like human beings you, just another label lying there.”* [FGNP4: 474:18]

The other area of “us” and “them” relate to patients’ perceptions of professionals’ protecting each other. In the case of Patient 13’s first biopsy results that had gone missing, the patient commented on the behaviour of radiographers and radiologists as follows:

“Today I feel they were trying to be more nice to me because they did saw that they did the wrong thing. So they comfort me. They did saw that, what happened, it was not right. Maybe they don’t know, maybe I will take the action or whatever. [I] will take the further step but they try to be nice to me and there were lot of people in my biopsy and they were doing talking.” [CS13:4100:148]

Patient 13 also expressed her dissatisfaction about providers’ defensive behaviour during the execution of the second biopsy.

“The doctors and the two sisters were the ones who were busy with this thing [the biopsy]. I did ask her, every time you do something, you don’t put them in the [digital] system. ... What I am not sure, why they didn’t put the whole thing in the system because they would already know what this thing was for. They should have entered that and know this and this and took it from the system. The assistant says is like they don’t put everything in the system. The sister, so she complained, that why are you [the researcher] here always. I did tell her, you know, that one [is] just somebody from research and I allow her. She didn’t come here by herself, I did allow her. So don’t put things into her, take her out of there. But the problem is here the way things go wrong, I did told her. Maybe she was protecting those people she knew what happened. The way she speak to me as if she is protecting them.” [CS13:4152-4171:152-153]

A further point where patient voices seemed to get lost in the system was where different medical practitioners were involved in the referral for a diagnostic investigation and the interpretation of the results. Patient 24 had already had a diagnostic investigation and was re-referred for additional projections because, according to the medical intern, it was an incomplete investigation. In reality the intern did not check the envelope carefully enough to find the rest of the images. The patient was re-referred back to Casualties and the radiographer clarified the issue with the intern about the perceived incomplete investigation. The patient at this point became confused, because the reason for her re-referral and her role of messenger between the x-ray department and Casualties had not been explained to her. This is what the patient had to say while waiting at the x-ray department: *"The doctor does not see the x-ray. I am still waiting there [at Casualties]"* [CS24:33:2]. When probed further if the doctor had shown her the x-rays her answer was: *"No, I am still sitting there to see the doctor"* [CS 24:84:3]. The patient seemed to be aware that she had no fractures and felt the referral was a mistake. *"I have not broken, maybe there is a mistake, I don't know"* [CS24:95-96:4].

8.2.4.1 "So nice to talk to someone" – patients finding a voice in the study

My oscillation between being both an insider and an outsider resulted in me being like a bridge between the patients, as outsiders, and the inside of the system. This also had a bearing on my influence as the researcher and it is acknowledged that my presence may have contributed to positive patient experiences. However, this is something that cannot be measured objectively. (See Section 3.7.4.) Most patients shared their experiences with openness when probed about their encounters and other experiences that were not related to this study or research questions posed. One example was Patient 14, who required a radiological report as requested by the doctor and I agreed to get the report. The patient's response was the following:

"The report you will get for us, I assume you're going to give her the copy. Do you need my hospital card number?... I think they should give for a patient like me [a] note to put on my hospital card, so when I get here they know exactly what the doctors asked for to get done, but [I] presume soon it will be solved once the lung test get done. I am happy, I just want to say thank you for helping us through this process." [CS14:491-492&519-522:18-19]

At the exit interview Patient 18 had the following to share with me about her journey:

"Dis interessant, dis lekker om iemand te hê wat saam met jou loop, want jy het meer ervaring as ek en jy het baie meer knowledge. Jy weet, [dis] so lekker om met iemand

te praat wat meer weet soos, veral jy wat nou by x-strale en nou wat gebeur. Dit help om daaroor te praat.”

[It is interesting, it is nice to have someone to walk with you, because you have more experience than I have and you have much. You know, it is so nice to talk to someone who knows more, like especially you now at x-rays and what is happening now. It helps to talk about it.] [CS18:3264-3267:118]

A few patients also expressed their appreciation for the research and the influence of the researcher in facilitating examination and treatment.

“But thanks, you were there, sometimes you stop something. It can be very snappy now because you were there he tries to be at least patient, so that you must not see his cruelty if he is cruel.” [CS17:1516:55]

“If you were not with me, they would not help like they do as in now. Because other people get in, they do not help them. If you are not with me, they would not say the doctor would be with you in a second. But the doctor was there even when they saw you.” [CS04:400-404:15]

On recruitment, patients were not always aware that I was a radiographer, but they did show interest in my research. My study appeared to give them a sense of hope regarding their overall care and support. Patient 19, for example, arrived at Outpatients on the day before her scheduled date, which I was not aware of. When she was informed to go home and come back on the scheduled date she expressed her willingness to participate and requested that I wait for her the next day.

“You’re so good as a researcher. You came to show me the pharmacy. You came running after me. And that is a good thing that you’ve done. Your research was not so difficult as I thought it would be, you see. You too, you are a good researcher. You see with patience, with love and perseverance again.” [CS19:533-536:20]

The majority of participants wished me luck and blessed me during the exit interview. Patient 13, who did not know my profession, said: *“After you finish your studies, you are going to be my doctor”* [CS13: 2399:88].

8.2.5 The perception of the power of technology

Patients acknowledged the power of technology to enable a visualisation of their inner body parts. They felt a referral for a diagnostic investigation was, therefore, recommendable as the technology could accurately reveal the status of the inner body – *“It helps, because now I*

know how my lungs are" [CS08:41:02]. Patient 8 confirmed this faith in technology to detect physical problems: *"If they put me in the sonar or x-rays, they are going to find out what is the problem and give me a good medicine"* [CS08:833:30]. Patient 12 thought investigations *"are not harmful; they are helping to know how you are inside"* [CS12:54:02]. For Patient 19 the investigation gave a form of reassurance to know the status of her knee and shoulder after a fall – *"It help me because it brought some relief. It was better to know your situation, the x-rays really helped me"* [CS 19:94-95:04]. It was also seen as a source of getting an insight or better understanding for the patient as well as the medical officer – *"Because most of the time you don't know from the outside if your arm is broken. Even the doctor won't know from the outside"* [CS12:85-90:4]. Sections 7.1.5 and 8.2.2.3 have already discussed the importance of information integration. Some patients also used their investigation outcomes as an educational tool and felt empowered to be part of the progress regarding their treatment and being able to observe the status of the affected body part. Patient 4, for example, shared a previous experience of the benefit of seeing the healing of her fractured feet after an operation. She had gone for two-weekly check-ups at the private sector, where she had been reassured by a medical provider *"that my feet were okay"*. She could integrate the information on the radiographic images – *"They show me how is my leg; my bones were right"* [CS04:69-70:3].

Patients also appeared to benefit from communication at their own level in constructing and understanding what was wrong. Patient 17 drew analogies from his life world regarding his back problem based on information provided by a previous practitioner.

"They were saying it seems they were saying the fuse between my spine. ... They were saying as if there is a something like a sponge. When a person is getting old no longer functioning properly, so I must go for a operation." [CS17:30 & 69-72:02-03]

Patient 17 had not gone for the operation, *"because I was afraid. But now it is becoming worse, so I have to do that"* [CS17:86-87:04]. Therefore, he used his acquired knowledge and integrated it with previous information. He could now associate his bodily experiences with his working conditions:

"Ja, the very same thing I was explained the last time by another doctor [at the previous hospital]. That what is happening between those bones of the spinal cord. Yes, there is some shoes or fuse, so when times go on according to our age, I think, so they have some effect that is no longer doing the right job. ... But so I was satisfied [with the present outcomes], but what I see and what I think I have to check the work [I do]. The way I will be even [doing the work or looking after myself], that one I will do the exer-

cise. I have to follow, I think, that is the main stuff I have to follow [change or adapt my work and everything else like exercise].” [CS17:1352-1355:49]

A referral for a diagnostic investigation could serve as a verification tool. According to Patient 17, if there was speculation of a problem, the x-rays would reveal. The patient was relieved and convinced when outcomes were communicated to him:

“X-ray is where they can show me all. If sometimes the problem I was thinking that one of the bones can be broken, they told me that ... the bone is not broken. Then I am satisfied the way they are saying, is muscle, it must be effect from my muscle.” [CS17:1293-1295:47]

Patients furthermore constructed the role of technology in diagnostic imaging investigations in different ways. Information from the community or from their own experiences contributed to these constructions, in which, inter alia, the physical environment was viewed as an out-of-the-ordinary experience.

When asked what the community knew about x-rays, Patient 17 indicated that the community perceived the diagnostic investigation environment as negative and threatening – *“If you are going into x-ray, they have somewhere in their mind that you may get shocked or what or get injured” [CS17:1315-1319:48]*. But he confirmed that he would inform the community about his current experience:

“The x-ray room is the normal room. There will be some machine ... there. The one who takes every photo from your body is not something that is danger. So to me it is a nice place and the people also they were very friendly to me.” [CS17:1315-1319:48]

Also as already discussed in Section 8.1.1 Patient 8’s experience of the ability of the doctor to see the clinically diagnosed deep vein thrombosis, by means of an ultrasound investigation at the tertiary level, was going to be shared with others in the community about the doctors who were visually able to detect the problem: *“I am going to tell them that they must go to the doctor, they can see” [CS08:808:29]*.

In the absence of sufficient communication, according to the nurses, patients *“become anxious, you wonder is the light going to hurt” [FGNP2:117:5]*. In this case the light was associated with an invasive instrument. Similarly patients often asked questions in anticipation of possible physical pain such as if they are *“going to feel the pain? Is it going to hurt a lot?” [FGNP2: 461-462:17]*

Patient 6 recalled an x-ray procedure from her childhood experience as follows: *"You stand somewhere in front and there is a light that comes and take whatever part that it must take. ...Ja, but there is nothing there"* [CS06:70-73:3].

8.2.6 Techno-psychosocial experiences

Patients who were shadowed expressed a variety of feelings and emotions in their journey through the health system. There were not only moments of uncertainty, negativity, and anxiety, but also a sense of hope and then relief and even optimism after learning the outcomes of their investigation. While waiting for the investigation of a deep vein thrombosis diagnosis, Patient 8 expressed worry about her children:

"I am just waiting for good results. I don't want to lose my leg. I am a domestic worker, a single parent with two children, 19 and 14 years of age. I have not arranged with anyone to look after them and am already two days away from work. I do piece job and do ironing." [CS08:349-354:13]

Delays in the communication of outcomes caused anxiety and worry for some patients. Patient 12 felt anxious when the results of her diagnostic investigation of the sinuses were not available immediately:

"It's about Friday, so maybe the doctor didn't or we didn't understand each other very well. She asked me questions and I answer and it's like she didn't see the seriousness that I am going through. I can't say I wasn't happy, but I wanted to see after the x-rays how it goes like. Today is Monday, but unfortunately she wasn't here today." [CS12:793-795:29]

Patient 13 experienced disappointment when her breast biopsy results had gone *"missing in action"* [CS13:2954:107]. She felt powerless but at the same time hopeful:

"I don't know. I am shocked, because I don't know what to tell you, because we don't have the results. We are just here for nothing. I don't know. How can my result be missing and they have to book for me another one. No, it's not right. I am surprised, I am so surprised. Let's wait for the call, then hear from them, then we'll take it from there." [CS13:3065-3072]

Despite conflicting messages from community members, this patient returned for the second biopsy, justifying that she did it for her health.

"Because I did think that I must not come here anymore. But I ... thought that if there is something wrong with my breast, what am I going to do and where am I going to go if I didn't come." [CS13:4028-4030:146]

After her repeat biopsy the patient shared further her sense of isolation from the community as a result of her repeated delays with the health system with regard to her breast problem, but at the same time referred to her spiritual faith and family support. She remained optimistic throughout her journey, but feeling lost at times as she delved deeper into the system's diagnostic processes. A sense of relief after the feedback on the outcomes of the biopsy reassured the patient regarding the uncertainty experienced of a possible diagnosis of breast cancer. Then lastly, there was the regaining of trust and getting rid of any doubt.

"But when they did do the results, I put my everything on them, so that they can come in really the way that I want. I was so worried really but today at the end, I am very happy because the result is out. From my side I say everything is done. I won't have anything, I am healed. There is nothing on my breast. I don't want to put that thing on my mind thinking that maybe after six months something will be developing. I take everything out of my mind. I am all right, there is no problem.

I was with my family, we were just chanting, chanting, we are believers. So my sister, the one knowing her, is that she has the growth, then I am having the problem of the breast and my brother he has already had the operation for men's cancer what what. ... So only my sister, the big one, she's right. So she prayed for all of us. She said, we must start believing knowing that everything is free for our lives. Now the miracle, He [God] is there for us; really ... I was not enjoying anything, but I just ignored it. I don't want to put the things on my mind. I just take things the way they carry on with. It is my first time carrying this problem in my mind. The people that I go with them, they know me, they say, ... 'We don't know you like this. What's happening to you now?' And I won't tell everybody what is my problem, you see. Maybe I am growing, I am taking things the way they came, you see. I know what was the problem. Even this morning they tell me that my pressure is so high. I think of now, because of the blood pressure, now they are going to admit me to the hospital for this blood pressure. No, it can't be now, I know it is going to be where it must be. Really, once you think of cancer, you're dying and knowing in your family there is this problem, you see.

I really did not understand. I did not know what to do. I did tell people. The other people tell me, 'Do this'. The other people they say, 'This is the sign that you don't have those things; just forget even if I were you.' I will not do another biopsy because there is nothing like that." [CS13:4635-4650:169]

8.3 SUMMARY OF INTERACTIONS BETWEEN HEALTH CARE PROVIDERS AND PATIENTS

The various providers' perceptions as well as the patient perspectives shaping their understandings, meaning making and experiences provided an insight into the context of the various stages of decision-making processes and procedures when it came to diagnostic imaging investigations. The expectations of patients regarding their referral and their experience of the investigation and outcomes itself provided a better understanding of the phrase, "*I feel better now*". In the absence of communication between providers and patients, patients filled gaps in the construction of their experience and understanding of the referral and investigation process by relying on past experiences and/or community perceptions. Although not much space was provided for their voices to be heard, they adopted an accommodating approach of waiting patiently and remaining hopeful until receiving news on the outcomes of their diagnostic imaging investigation. They derived their coping mechanisms from family and community support and their faith.

Chapters 4 to 8 presented the findings from the study on the decision-making processes and interactions between patients and providers in the journey through the system, using various avenues to access diagnostic imaging services in order to strategise their management and treatment decisions. These processes involved interactions between different health care providers at various stages of the decision-making processes, which depended on the organisational, institutional, professional guidelines and interprofessional relationships as the journey was mapped or routed. In the next chapter the findings will be discussed in relation to the existing body of literature pertaining to decision making, unpacking the notions of "bio-techno-psychosocial" and distributed networks of interactions and decision-making processes.

Chapter 9

Building a picture within the bigger picture

Hilligoss (2011: 28) recommends that caring for an individual patient requires a holistic understanding that is greater than the sum of its parts, to what medical practitioners referred to as “*the big picture*”. According to Geneau et al. (2008: 9) and Whiting et al. (2007: 982), various factors – individual, organisational and environmental – make up a complex, dynamic whole, comprising of workplace practices that Patel et al. (2002: 69) conceptualise as networks of people, tools, organisational routines, documents, and so forth, with the aim of delivering patient care. One avenue for a holistic approach from a systems perspective is the integration of effective patient health outcomes and cost-effective comprehensive care by means of an integrative, collaborative care approach comprising of interdisciplinary health care teams (Boon et al., 2009: 715). Journeying with patients in the district hospital complex and visiting selected points within this system enabled the researcher to gather fragments and pieces of information supported by various forms of evidence. This evidence was based on observations, interactions, text, images and image data that enabled the building of a picture of decision-making in diagnostic imaging investigation interactions and processes within the bigger picture of the clinical, medical and institutional decision-making processes and procedures. The building blocks for making a decision on the most appropriate investigation of choice with minimal risk and optimal benefit in terms of management and treatment strategies are highly dependent on the organisational structure, its institutional members, the quality of the referral, the investigation itself and the outcomes thereof (Chapters 4 and 5). The process evolves as the events unfold, based on the actions that are taken. Furthermore, the process is highly dependent on who is communicating with whom in that particular institution or with a referral institution and what is communicated with whom (Chapters 5 to 7). The processes and interactions are also more dependent on what patients present with and how patients present their condition (Chapters 7 and 8).

Insights from various theoretical models and themes, especially from those within the interpretive paradigm, were applied eclectically in the reconstruction of the bigger picture from the findings reported in Chapters 4 to 8. In this chapter the findings of my study will, amongst others, be interpreted from a systems perspective for understanding the complexity of interactions, and the interconnectedness between various processes, structures of

communication and providers within the system itself. The interdependence of the agents or actors providing care related to diagnostic imaging investigations will also be explained in terms of professional boundaries and identities. The complexity of interactions will be depicted as a network of interactions in which transactions in the biomedical, technological and psychosocial worlds take place through collaboration, cooperation, coordination and alignment of decision-making processes and through cyclical processes of transformation of professional information. The chapter ends with a framework for collective decision making.

The purpose of this chapter is not to focus on specific opportunities for improvement such as clinical practice, poor communication and systemic failure related diagnostic imaging. It is rather to provide a theoretical framework to act as the point of departure in interrogating opportunities to further explore opportunities for improvement in decision making, procedural routines, communication at various levels and service points within the health system.

9.1 COMPLEXITY AND INTERCONNECTIVITY IN THE HEALTH SYSTEM

In my study the complexity of the health system and the hierarchical interconnectivity between different levels of the system (cf. Weiner, 2004: 281) were evident throughout the referral process for diagnostic imaging investigations (Section 4.2.3). Patel et al. (2002: 69) refer to a hospital as an indivisible unit of analysis with a high degree of specialisation and diversity among agents or actors, components (including technology) and feedback loops. My study described how different professions interacted with and depended on each other at various points of contact of the patient with the complex health system (Sections 6.1.2 and 6.2.2.2).

To describe the flow of processes and the network of relations and interactions between the role-players involved in referrals for diagnostic imaging investigations (Chapter 5), interpretations of images, communication of results and management plans and the interconnectivity between health care professionals, a model was firstly developed to capture the big picture applicable at any hospital or health centre providing diagnostic imaging services (Figure 9-1). The model was adapted from Yabroff's (2008: S7) health services research framework for evaluating cancer screening. At the macro-level it contextualises the connectivity of the health system and its providers with the patient and his or her community regarding decision-making processes in diagnostic imaging. Central to this network of interconnectivities is the history presented by patients, which revolves around who interacts with whom through interpretation. The common goal shared by all health providers is to deliver quality service and care to the patient (Feldman-Stewart et al., 2005: 804).

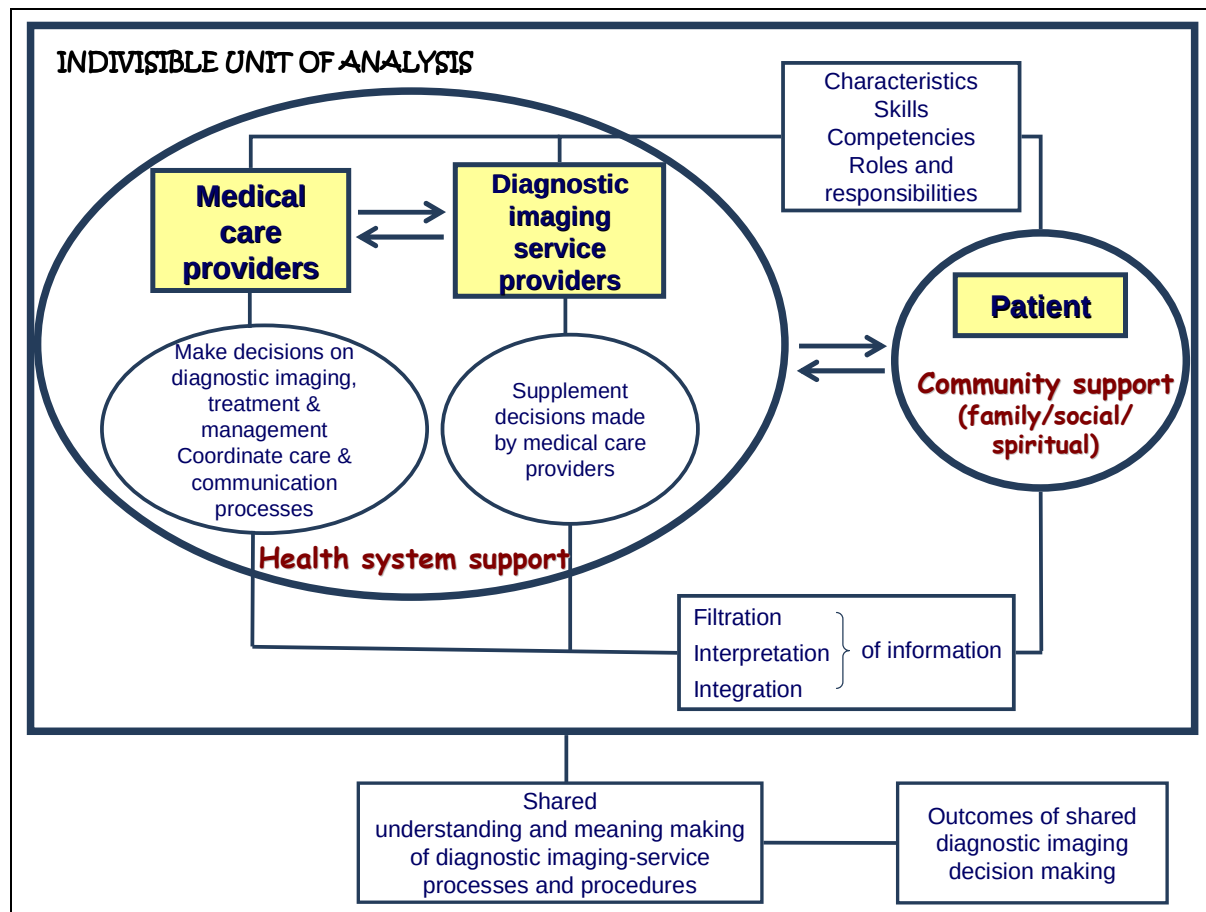


Figure 9-1. Macro-level contextualisation of interactions and decision-making processes regarding diagnostic imaging investigations

These interactions and decision-making processes can also occur at the micro-level between individual health care providers and between providers and patients. Feldman-Stewart et al.'s (2005: 803) conceptual framework for patient-professional communication in the cancer context and Jordan et al.'s (2002: 383) framework on stages in both concordance and shared decision-making consultations in cancer were adapted to understand diagnostic-imaging interactions and decision-making processes between provider and patient at the micro-level.

Figure 9-1 depicts the various role-players routinely interacting in decision making at the macro-level. According to Hilligoss (2011: 15), routines are highly subject to context and need to be adapted as context and situations change. However, the quality of routine actions should continue to enable continued efficiency and optimal outcomes in novel circumstances. In Section 5.2.1 the illustration of the routine actions and unintended effects on the patient for accessing mammography has been described. My study furthermore illustrated how routine actions could be adopted to provide some spinal patients immediate access to advanced imaging modalities (Section 5.1). The way in which routine actions are adapted or not

adapted plays a role in how varying mixes of interrelated goals are communicated in order to achieve optimal outcomes (cf. Hilligoss, 2011: 26). The referral and the imaging investigation itself falls “in the middle of the continuum” (Boon et al., 2009: 716) of the patient’s journey towards solving his or her problems with a diagnosis and treatment plan.

Within the confines of the district hospital, medical care providers (medical practitioners and family physicians) and radiographers providing diagnostic imaging as a support service are the main team members in diagnostic imaging routines (Sections 2.1.3 and 4.1). These two professions interact with each other, often in a transactional manner (Sections 3.1, 6.2.2.2 and 9.3). Figure 9-2 extends the graphic representation of the health provider interactions between different levels of care within the public health system (Section 4.2.3). This enables one to better understand the rigidity of “ceremonial” (Staniland, 2010: 258) processes within which health care providers find themselves – the unwritten, prescribed ways of behaviour that shape decision-making interactions within the systemic pathways that providers need to

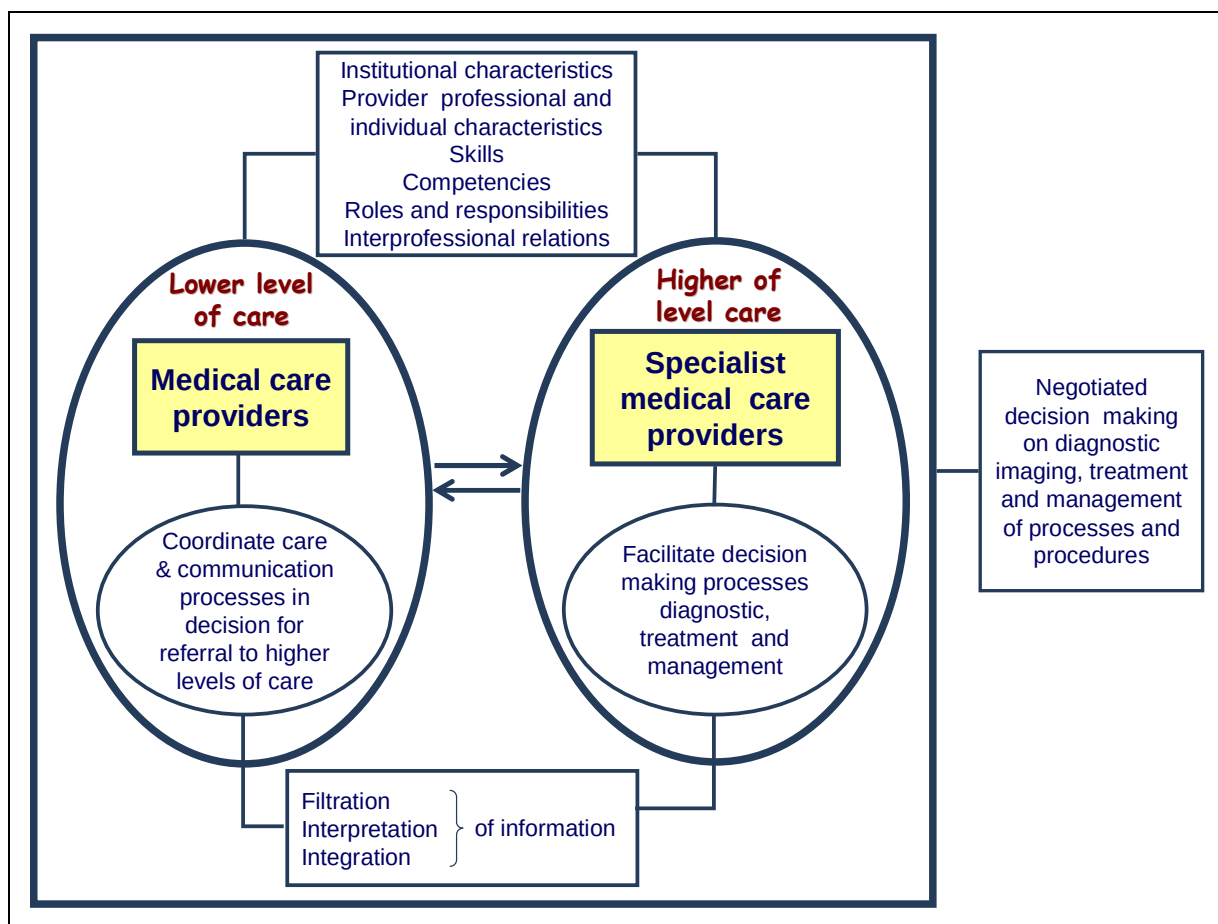


Figure 9-2. Interactions between higher and lower levels of care with regard to decisions related to diagnostic imaging investigations

adhere to within the public sector (Figure 4-2 and Section 4.2.3). In my study the interactions between health care providers (specifically medical practitioners and family physicians) at the district hospital (the left part of Figure 9-1) also included medical specialists (including radiologists) at a higher level of care. In my study it related to the interactions with the tertiary hospital, but the principles, also with regard to decision-making, would be the same for interactions between district and regional hospitals.

The health system role players also interact with patients (Figure 9-1) who enter the health system, bringing with them a community system of support. All these interactions take place at a micro-level, at each point of contact a patient has in his or her journey through the system. However, these interactions are very brief encounters with different health care providers. The diagnostic decision-making process could be regarded as being layered or interwoven within the hierarchical structures of the institution from primary to secondary or tertiary levels of care (Sections 2.1 and 4.2). According to Gibson (2001: 522), patients become arranged into hierarchies as they wait and seek access to technology. Diagnoses of increasing severity determine the passage of some patients deeper into the health care system.

Each set of role players and each individual bring with them individual characteristics, skills, competencies, roles and responsibilities (Section 6.2.3). According to Webster (2002: 109), the medical gaze transcends not only at an individual level but also at a public, collective level of the regulation bodies. For instance, most health care providers belong to a central professional regulatory body such as the Health Professions Council of South Africa (HPCSA) or the South African Nursing Council (SANC), but they are also governed by their professional code of conduct and the institutional code of practice.

According to Espeland and Baerheim (2003: 2), medical practitioners have certain characteristics related to experience and practice type or location, which in the case of my study related to post level, designation and allocation to Casualties or Outpatients (Section 3.4.1.7). The medical practitioner's main responsibility is to coordinate the care of patients and to lead the patients' management and treatment processes and procedures. The role of other providers like radiographers, radiologists and nurses is secondary in these processes and procedures. Their main function is to aid the medical practitioner in the diagnostic decision making by rendering a professional service of high quality (e.g. by means of diagnostic imaging investigations and radiological reports).

At the district hospital the medical practitioner is the coordinator of the referral processes (Coyle et al., 2011: 846) (Figure 9-2). One of the most important skills or characteristics of a medical practitioner referring a patient for a diagnostic imaging investigation is having knowl-

edge on the most appropriate investigation to assist in making a decision (Sections 5.2 and 5.2.4). In order to make a diagnostic decision one must be able to make a judgment on the quality of the image, to interpret the image correctly and to integrate the findings of the radiological report into the bigger clinical picture (Figure 4-10 and Section 5.3).

One of the most important competencies required of health care professionals is the ability to use and transform information approaches in order to come to a diagnosis and formulate a treatment plan. (See also Sections 5.9.4 and 9.4.) Whereas medical care providers are responsible for making decisions on diagnostic imaging, treatment and management for co-ordinating the care and communication processes, the role of radiographers and radiologists is to supplement the medical providers' task with high quality radiographic images and radiological reports, with nurses supporting their task performance. The quality of the diagnostic imaging investigation is dependent on the radiographer's ability to make a judgment on the investigation itself, which is dependent on the quality of information on the request form, the cooperation of the patient, and the imaging technology (Sections 4.3, 5.1.1 and 5.1.2). The radiologist is dependent on the quality of information on the request form (provided by the medical practitioner) and of the investigation, including the quality of the images (provided by the radiographer) to enable integration (expertise) and to make an interpretational judgment on the diagnosis or differential diagnosis (Yedidia, 2007: 47).

Patients also have specific roles and responsibilities within the health system: to provide accurate information about their illness and/or concerns or previous medical encounters; to take interest in their health and well-being; to inform providers of their expectations in terms of outcomes; and to keep previous discharge records (Alfuth and Barnard, 2000: 269). Patients generally play a relatively passive role in this relationship (Sections 7.1, 7.2, 8.2.1 and 8.2.3). They also rely on health professionals to effectively communicate with them, particularly before a diagnosis, when there is uncertainty and fear regarding the symptoms they experience. According to Adams and Smith (2003: 198), patients' experiences of their illness can extend beyond the boundaries and settings of formal diagnosis and treatment – in other words, illness experience in the wider context of, for example, quality of life (Halkett et al., 2011). In the absence of support, patients rely on their family and community for support (Sections 4.2 and 8.1).

The various role-players discussed above find themselves situated in networks of interactions that are, amongst others, shaped by specific interactive processes needed for making decisions. The next section in the chapter will focus on the networks of interactions, followed by an exposition of processes of interactions in decision making.

9.2 NETWORKS OF INTERACTIONS

The inherent complexity of the interactions between the various role players in the event of a diagnostic imaging investigation can be portrayed in various ways. Glucksmann (2005: 19), for example, refers to the many sides of a prism that slices reality in different components. Figure 9-3, called a biotechno-psychosocial model of interactions, is my reconstruction of the interdependent intersections of various “worlds” or social systems as they relate to interactions between role-players. Biomedicine and the lifeworlds of the patients and providers were incorporated into the original conceptual framework in Chapter 3 (Figure 3-2). The findings from my study highlighted two more “worlds”, namely the world of technology and the social organisation of health and community systems. The intersections between these four “worlds” are labelled with combinations such as the bio-psychosocial, techno-biomedical, psychosocial, techno-social, et cetera.

The bio-psychosocial approach is probably the most common lens currently used in health professions education. This entails an acknowledgement of the situation-specific encounter between individual patients and health care providers where patient needs and desires come

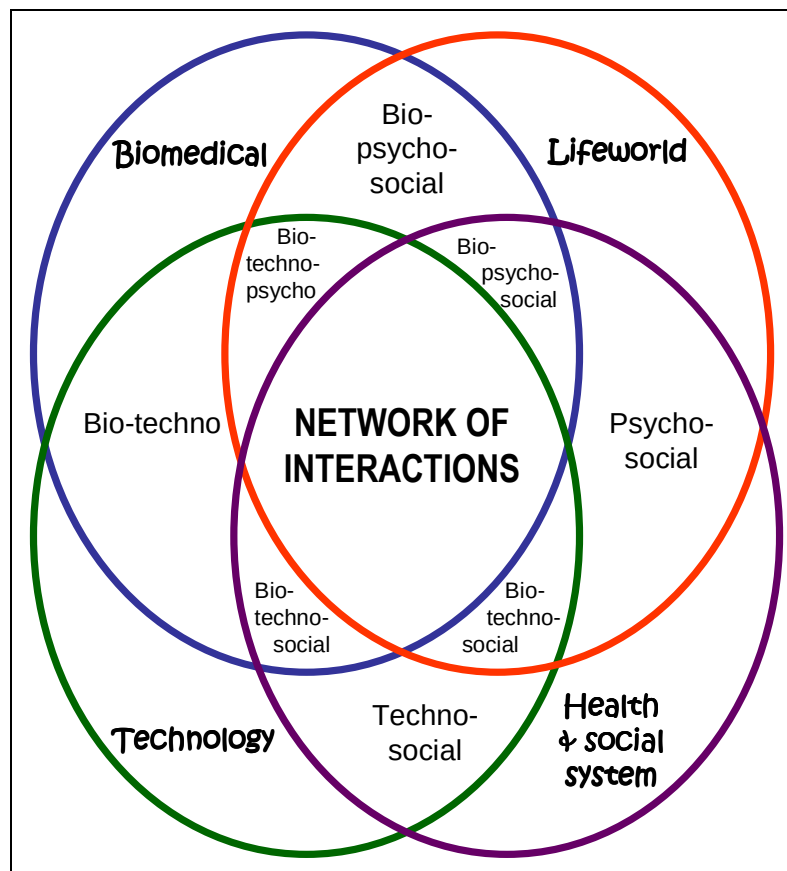


Figure 9-3. The biotechno-psychosocial network of interactions

to the forefront instead of anatomy and physiology (cf. Alfuth and Barnard, 2000: 261). Alfuth and Barnard (2000: 261) are of the view that biomedical and psychosocial worlds cannot be treated as isolated components. The authors refer to the different languages and cultures of these worlds – different ways of knowing [CRM] – that both contribute to the establishment of overall care of the patients, inter alia with regard to efficient use of resources, the quality of services, and provider and patient satisfaction. These authors refer to the predictability existing in the biomedical world with its focus on anatomy and physiology with a view to diagnose and institute effective treatment to bring the human body back to its “normal state”. This is in contrast with the greater unpredictability and complexity inherent in the psychosocial nature where cognition, emotion and behaviour function more at a normative level needed for adaptability and flexibility. The model presented in Figure 9-3 represents an attempt to interpret the bio-psychosocial interactions within “a bigger picture” that portrays the non-static nature of health care provision with ever changing and emerging ways of treatment and health management interaction with recent technological evidence (Suter et al., 2009: 45). There is also a growing body of knowledge on the interpretation of biotechno interactions in the ambit of medical techno-science; for example, relations between the analogue and digital technological worlds of communication and interactive processes, and the fusion between diagnostic and therapeutic work (cf. Mørk et al., 2008: 15; Nancarrow and Borthwick, 2005: 897; Suter et al., 2009: 44). Mol and Elsmann (1996: 611, 628) illustrated the complex biotechno-psychosocial world in which patients and health care professionals function. They stated that diagnostic imaging procedures or interventions, for instance, draw the following together: the system; diverse but interconnected communities of practice; the patient; technology; drugs; interventions; and many other elements. All of them are interconnected and interrelated, “yet each irreducible to the other.”

With regard to diagnostic imaging, Murphy (2006: 170-172) distinguishes between “hard technology” (equipment) designed to diagnose and treat disease and “soft technology” that includes the social interactions of radiographers with patients and other health care professionals. The radiographer acts as an interface between the patient and biomedical health, technology and humane health care. This is what Timmermans and Berg (2003: 103) refer to as “technology-in-practice”. According to Moreira and Rapley (2010: 666), “the coordinating power of health technologies is concerned with how technologies can bring together or break apart the pragmatic worlds we as social actors navigate in our everyday lives” (Chapters 5 and 6; Sections 7.1 and 7.2). Reeves and Decker (2012: 80-82) refer to the “technology-human dualism” with which the profession of radiography is faced because of the short encounter and once-off interactions with patients discourage emotional investment.

Some of these combined terminologies referred to above are well described in the literature, whereas others need further exploration in future in terms of the feasibility of their application and their relations to quality of patient care, patient and provider satisfaction and/or efficient use of resources (cf. Alfuth and Barnard, 2000: 271). The ever-shifting boundaries between different worlds in which health care providers and patients are situated and the interconnectedness between role players also have particular implications for the formation of professional boundaries and identities, which will be discussed in the section below.

9.2.1 Professional boundaries, identities and interconnectedness

Multiple boundaries between and within professions dominate patient care in a hospital environment (Powell and Davies, 2012: 808), while at the same time there is a need for collaboration across these boundaries to maintain and improve quality and safety of patient care (Smith et al., 2009: 7). Professional and interprofessional practices are often clustered around communities of practice that form part of the network of boundary-crossing interactions (cf. Bresnen and Harty, 2010: 549). In my study the health providers often needed information from other providers (Section 5.1.1). They sought the opinion or guidance from peers, intra- or inter-professionally, or from experts in the field, which also entailed intra- or inter-institutional interactions to access services (Sections 4.2.3, 5.2 and 5.3). This inherent complexity of human health requires the involvement of individuals with disparate expertise to provide effective service (Adams and Smith, 2003: 197).

From an organisational perspective, health professional roles are grounded in interactions that occur not only during their task performance but also with other support service members or family members. Therefore, they are also intimately bound to a matrix of social relations (cf. Barley, 1990: 68). In my study service interactions also included non-medical health providers such as radiographers and nursing professionals. To some extent radiographers had to rely on the quality of information on the request form and on equipment characteristics for the quality of image information. Both the medical practitioner and radiologist were dependent on the quality of the information produced by the task performed by the radiographer (Section 5.2.3). Then each of these participants relied on each other's skills and competencies to make diagnostic imaging decisions. In Figures 9-1 and 9-2 some of these boundaries are depicted, namely between medical care providers and the support professions and between general practitioners (GPs) (including family physicians) and medical specialists respectively. Figure 9-3 also tries to represent some of the elements of the social organisation in which interactions and decision making may take place. The inter-relatedness of the work roles are partially defined by the tasks that people perform, which subsumes an individual's use of technology and, hence, his or her skills and how these are

transformed into social processes (Barley, 1990: 69). A more in-depth investigation into the conceptualisation of boundary work within diagnostic imaging investigations is, however, still needed.

Professional and interprofessional identities, defining values and beliefs that guide professionals' thinking, actions and interactions with the patient (Niemi and Paasivaara, 2006: 259), also permeate the social organisation of a health system (cf. Bleakley, 2011: 1171). Professional identity is often associated with the demarcation of tasks and professional responsibilities related to the different ways of knowing of different professions (cf. Alfuth and Barnard, 2000: 261; Johansen and Brodersen, 2011: 330). The interrelatedness, integration and synergy created through interprofessional interaction are often dependent on reciprocal respect and the existence of hierarchies (Alfuth and Barnard, 2000: 261; Bleakley, 2011: 1171). Hierarchical thinking on a continuum of autocratic to democratic ideals (Bleakley, 2011: 1171) can be considered an "attitude" that underpins the demarcation of professional boundaries. The way in which interconnectivity and professional boundaries play themselves out in a hospital setting has a profound effect on the work culture and the quality of services delivered in terms of the ability to perform tasks or components of tasks optimally through appropriate collaborative efforts (cf. Alfuth and Barnard, 2000: 261; Johansen and Brodersen, 2011: 330; Suter et al., 2009: 45). Smith et al. (2009: 7) express the need for collaboration across interprofessional boundaries to ensure the maintenance and improvement of quality and safety (Section 6.2).

In my study discipline-specific boundaries sometimes came under pressure as a result of human resource-related issues (Sections 4.2.1.1, 4.2.7, 6.2.2 and 6.2.3). Workforce flexibility and the blurring of interprofessional role boundaries were observed but it was not clear if these vertical and horizontal substitutions were endorsed by a higher professional body or health authority. Nor was it clear if the demarcation was based on a mutually agreed transfer of tasks, or whether the flexibility of task allocation and performance was due to skill shortage. The tertiary hospital "*turf wars*" identified in my study correspond with Nancarrow and Borthwick's (2005: 909-911) description of a "passive jurisdictional dispute between occupations of similar status and power for control over similar areas of expertise". In the absence of role clarity and where professional power is at play professionals from subordinate health care disciplines feel themselves being treated as "*insignificant*", mostly getting a raw deal, for example radiologists and specialists vis-à-vis medical practitioners and medical professionals vis-à-vis radiographers (cf. Nancarrow and Borthwick, 2005: 909-911).

9.3 PROCESSES OF INTERACTIONS AND DECISION MAKING

Sections 9.1 and 9.2 focused primarily on the interrelatedness and interdependencies between different health care professionals and the interprofessional nature of diagnostic imaging investigation. This section focuses on the processes of interaction and decision making. The main actors in these processes are the health professionals with a biomedical background and patients with their lifeworld experiences – traditionally they are referred to as a dyad (Frank et al., 2010: 48) (Figure 3-2). According to Baron (1985: 608), there is a drive towards reuniting science with life and to “explore the relationship between the abstract world of the sciences and the concrete world of human experience”. Based on the findings of my study and a further review of the literature pertaining to text and technology and actor-network theory, a new framework with three groups of actors is proposed. Figure 9-4 gives a graphic construction of meanings as ascribed to processes related to diagnostic imaging investigations and of understandings of interactions and decision-making processes in this regard. In addition to the biomedical world of health professionals and lifeworlds of patients, a technological world is added that is constituted by second-order actors that require human

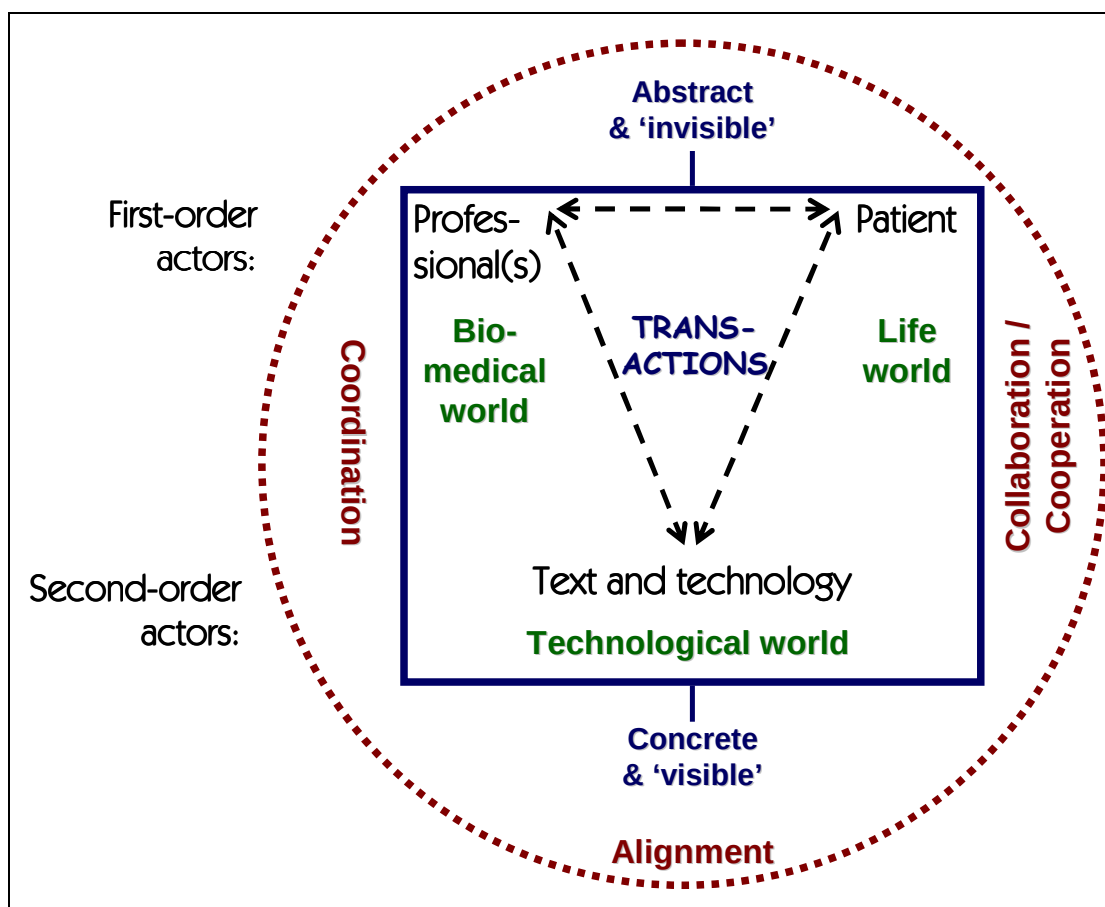


Figure 9-4. A triangular model of transactions

activation (Frank et al., 2010: 46) in the social organisation of health and community systems (Figure 9-1). Second-order actors include text (e.g. the request form, the screen, equipment, radiographic images, radiological reports and medical files) and technology. Olivier et al. (2005: S85) refer to the “patient-doctor-screen triangular relationship” that is sometimes formed during a diagnostic imaging investigation and/or a consultation (Figures 7-4 and 7-7; Section 7.1.5). Wilson (2000: 207) describes the entrance of technology such as an image on a screen as an opportunity of a triad on interaction in a consultation. According to Rhodes et al. (1999: 1195), technological data lead to an intersection where the doctor includes the patient “in a gesture in which they stand side by side on the same side of the window at the ‘object’ body made visible”. Imaging technologies and data mediate the coming together of the biomedical and lifeworld through “examining the transparent body ‘abstractly”.

This expanded interpretation accounts for changes and future changes in the interaction between health care providers. This also takes into account the increasing disintegration of the dyad metaphor (health professional-patient) as a result of broader economic, institutional, social and political currents invading the clinical encounter (Greenfield et al., 2012: 1208). My study also demonstrated how text and technology (e.g. the radiological information system) enabled interactions between people, processes and technologies that spanned over time and across different locations (Section 4.1.2). In the transactions and processes in a patient’s journey through the health system multiple realities were therefore made visible through the notions of technology, the biomedical world of providers, and the lifeworlds of providers and patients. In instances of uncertainty of providers and/or the patient, the visual image provided a neutral platform for constructing understandings, making meaning and affirming different ways of knowing the problem or situation at hand, and planning. (See, for example, Section 7.1.4.) The emphasis was on the context of the information and how the message was filtered through.

9.3.1 Text and technology as second-order actors

The new conceptual framework proposed in Figure 9-4 fits well with the current social constructivist thinking with regard to science and technology (cf. Timmermans and Berg, 2003: 104). According to Price (2000: 1042), “[h]ealth technology encompasses drugs, devices, and procedures together with organisational and support systems”. In my study technology included a variety of equipment and devices used for diagnostic imaging investigations, radiographic film, contrast media and information technology (IT) equipment and software. According to Barley (1986: 81), technology triggers social dynamics and “technologies exist as objects of action, one cannot understand technology’s implications for structuring without exploring how it is incorporated in daily practice by its members”. Technology is

also considered to play a mediating and transforming role in decision-making processes, rather than merely enhancing or supporting decisions (Timmermans and Berg, 2003: 104; Patel et al., 2002: 68).

Frank et al. (2010: 40) view patient-healer interactions to be organised and mediated by specific texts. According to MacPherson and McKie (2010: 427), medical records mediate social relationships of all kinds, also how patients are structured and accessed (including radiological reports and records of radiographic investigations) (Sections 5.1.3.2 and 5.1.3.3). From an organisational perspective texts connect what health professionals and patients know with broader administrative and managerial regimes, determining what does and what does not get acted upon and how actions proceed (Frank et al., 2010: 40). The need to coordinate care is often determined by busy schedules and different working shifts (cf. Alfuth and Barnard, 2000: 266). In the case of a referral, text provides accessibility to diagnostic investigations and the request form as text actor is the primary method of communication.

9.3.2 Transactions in processes around diagnostic imaging investigations

To include the world of technology and text as a separate entity and not as embedded in the biomedical world opens up interpretation possibilities in terms of independent interactions and transactional processes between the patient and text and technology, without the direct presence of health care professionals. According to Timmermans (2010: 37), “medical legitimisation of patienthood is not always required” as a result of the proliferation of Internet-facilitated self-diagnosis and direct access to self-medication and certain technologies online. Included in this trend is a strong drive for patients to have open access to their medical information.

The triadic interactions between the three types of actors (professionals or providers, patients, and text and technology) and the worlds they represent take on the form of a continuum of transactions leading to interim and final decisions. For example, referral for a diagnostic imaging investigation is an interim transaction in order to assist with coming to a final decision on diagnosis and treatment. These transactions take place in a context where texts and images, as products of technology, are not always concrete and visible. The observations in my study concur with Frank et al.'s (2010: 38) statement: “Some of these texts are clearly visible to both patient and healer, other texts are visible to one but invisible to the other, and some texts may be invisible to both.” Examples of how radiographic images were made visible for some of the shadowed patients and remained invisible to others are found in Section 7.1.5.

The biomedical world is circumscribed by evolving knowledge domains that are shared among providers but that also complement each other in different professions. Providers interact with each other – with technology as a facilitator of these processes and transactions – but very often they do not interact with the patient where decisions are taken to refer or to interpret images (Sections 4.2.7 and 5.3.1). In order to understand the transactions between technology, biomedical and lifeworld in the process from referral to investigation to diagnostic imaging outcome, three constructs are used to illuminate these transactions: collaboration/cooperation; coordination; and alignment. These constructs feature in the interactions between technology and provider, provider and provider, and patient and provider and are also requirements for making a contribution to decision-making processes. There are different understandings of the concepts coordination, collaboration/cooperation and alignment, which can be constructed at both an organisational and an individual level. An exposition of how these should be understood in the light of my research findings is given below. (See also Section 9.5.)

9.3.2.1 Collaboration / Cooperation

Joss (2010: 163) describes collaboration as an art rather than a science – “At its core it’s all about managing relationships”. According to Petri (2010: 74), collaboration within the nursing context is defined as “providers who are cooperatively working together by sharing responsibility and making decisions and carrying out plans for patient care” in order for the multidisciplinary team to achieve a common purpose such as a decision on the diagnosis and treatment management plan (Coyle et al., 2011: 846). McNamara (2012: 391) describes cooperation as the interpersonal relations of being able to get along with each other to achieve a common goal. For my study, collaboration is viewed as a multidimensional construct that enables the conceptualisation of interprofessional decision-making, interactions and the synergistic sequencing of interactions between connected and unconnected professionals and patients at each point of contact. All are moving towards the common goal of establishing a diagnosis and treatment plan. Each situation varied and therefore the pathway to diagnosis and treatment and who would be part of the team were unpredictable (Manser, 2009: 143). Team membership among providers was constantly changing with clusters of the same providers working together for short periods of times, adapting to different professional cultures. (See, for example, Section 6.2.2.2.)

With regard to diagnostic imaging, sequential interdependencies therefore occur when separate providers are responsible for the different processes and procedures, from the point of referral to the final diagnostic outcomes (Bunger, 2010: 403). The patient is the only constant factor in this sequence. According to Ohlinger et al. (2003: 472), the principal

elements that support dependable delivery and outcomes of care are teamwork and collaboration – “working together in a cooperative and coordinated way in the interest of a common cause”. The sharing of responsibility implies that all of the disciplines involved cooperate in the process and have accountability for the outcomes (Petri, 2010:76). Collaboration between health professionals by means of text and technology results in a collective action integrating the care provided to individual patients (cf. Oandason et al., 2006, cited in Boon et al., 2009: 716). The active ingredients in this synergy are coordination and alignment of quality of service delivery in the continuum of care, enabled through communication and shared knowledge and skills in a spirit of harmony, respect and trust (Way et al., 2000; 4; Suter et al., 2009: 46; Boon et al., 2009: 716). According to Suter et al. (2009: 46) and Smith (2006: 70), collaboration and coordination are bound together by trust between team members.

9.3.2.2 Coordination

According to the Oxford dictionary, to coordinate is to “bring (parts, movements, etc.) into proper relation, cause to function together or in proper order” (Sykes, 1987: 20). While definitions of coordination vary across disciplines, the construct is often defined as “a process of managing interdependencies; where agencies engage in a process of exchanging needed resources, and adjust in response to one another to accomplish shared tasks or goals” (Bunger, 2010: 403). Communication is the key to the coordination of care in a collaborative way in order to make efficient use of resources and organise the components of care appropriately (Suter et al., 2009: 46). With regard to care involving diagnostic imaging investigations coordination not only refers to the efficient use of resources, but also to the interprofessional and intra- and inter-hospital coordination of tasks, activities and services to be provided for individual patients (Section 4.2). This coordination should contribute to a smooth through-flow and a seamless delivery of quality services, sequenced or coordinated at each point of clinical service and care that a patient encounters (cf. Oandason et al., 2006, cited in Boon et al., 2010: 716). This requires the careful mapping of intra- and/or inter-hospital referral and reporting pathways (Section 4.2.3).

9.3.2.3 Alignment

Alignment is a pivotal construct in intra-organisational interconnectivity. It is also an important concept in understanding the requirements of successful interprofessional interactions and the inclusion of the patient in the bigger picture of diagnostic imaging investigations. According to the 2003 Baldrige National Quality Program for development of potentially better practices for neonatal intensive care units in the United States, alignment is one of the elements of a culture of organisational collaboration. It is defined as “consistency of plans,

processes, information, resource decisions, actions, results, and analysis to support key organization-wide goals” (Lukas et al., 2007: 316). In order for alignment to be effective, a shared understanding of purposes and goals is required, as well as the deployment of resources. Organisational goals are thus supported by appropriate behaviours, operations and processes, because all role-players understand their roles and what is expected of them.

Requests and referrals for diagnostic imaging investigations should also be aligned according to organisational policies, rules and regulations. The routes of referral of patients are aligned with the type(s) of service required to avoid re-routing in the processes around their diagnostic and treatment management. Protocols to be followed should be in place to avoid over- or under-servicing (Section 4.2.1). Providers receiving patients at a particular department or level of care must also be aligned according to institutional rules in order to ensure that the patient is received by the right department or firm according to his or her disease profile and that s/he is protected against “*turf wars*”.(Section 6.2.1.2).

From a provider’s perspective an aspect of effective collaboration is the alignment of care competencies, skills and expectations regarding diagnostic imaging investigations and interpretations (Suter et al., 2009: 48; Norris and Melby, 2006: 259; Kelly et al., 2012: 94). The jargon used by different professions should be aligned towards a common understanding of the type of services or care requested in order to promote a positive outcome.

In the radiology-radiographic field, radiologists and radiographers have different but strongly interrelated ways of performing their diagnostic imaging tasks to the extent that they form a synergetic association. Generally, their respective ways of knowing are accepted as equally valid but as different points on the same continuum (Alfuth and Barnard, 2000: 261). Different ways of knowing in different speciality fields also lead to varying approaches to image interpretation between radiologists and referring practitioners. Radiologists construct a holistic interpretation by taking into account all the information provided by other professionals and by the performance of their own radiological procedures. Medical practitioners have a narrow approach, using a clinical base to interpret the image (Section 5.3.3). This misalignment could result in misinterpretation and/or over- and/or under-diagnosis. Therefore, interprofessional involvement, effective communication, tolerance, trust and cooperation between providers collectively making an input into an image interpretation could result in an integrated shared approach (Boon et al., 2009: 714; Jolley et al., 2008: 154) (Section 6.2.2.2).

The patient as the only constant in the diagnostic imaging process also needs to be factored in any alignment. Feldman-Stewart et al. (2005: 803) and Halkett et al. (2011: 55) refer to the alignment of goals that takes into consideration a patient’s expectations and preferences.

This entails adequate information on decision-making activities and actions through interactive communication in order to enhance both medical and lay understanding (Balaqué and Cedraschi, 2006: 510). Rhodes et al. (1999: 1193) illustrate the point of how this congruency or alignment in understanding offers concreteness but also demonstrates alignment with reality. The authors use a description by Romanyshyn (1989: 128) of the body, a concrete visible image (the object), as “the body which is ‘filled’ with organs that can be made visible in the same way that a landscape is visible through a window”. The patient experiencing the symptom from the “inside” has the task of seeing an image of the “inside” of his/her own body.

9.3.2.4 Summary

In this section the network of interactions has been explored in terms of interactional and transactional processes to illustrate the interconnectivity, interdependencies and interrelatedness of the various worlds and how understanding and meaning making regarding diagnostic imaging investigations are constructed. Specific emphasis has been placed on the social context of text and technology as mediators of the abstract and concrete nature of diagnostic decision-making processes in terms of the dis-eased. The next section will focus on professional actions related to the collection and use of information.

9.4 CYCLICAL PROCESSES: PROFESSIONAL TRANSFORMATION OF INFORMATION

The findings of my study illustrate the linear process of a patient’s journey through the health system, particularly where diagnostic imaging investigations are involved (Section 4.2). In this linear movement through the various points of contact (Figure 4-2), social interactions take place and decisions are made between providers (Chapters 5 and 6) and patients (Sections 7.1 and 7.2) in a sequence of “assessment-treatment-expected outcome” (Alfuth and Barnard, 2000: 271). Embedded in this network of interactions (Section 9.2) and transactional processes (Section 9.3) is a complex set of cyclical processes of communication between different providers and between providers and patient that enables the use of assessment, information and knowledge transfer and the transformation of information in order to come to some interpretation (diagnosis) of a patient’s condition. According to Suter et al. (2009: 45), communication encompasses the ability to negotiate, resolve conflict, and coordinate care through the use of appropriate language (Sections 4.2.7, 6.1 and 6.2). Prior (2010: 425) describe the mediation of care coordination and communication processes as being primarily through text and clinical decision making supported by diagnostic imaging data (Section 5.3).

Figure 9-5 depicts the role of information and interpretation in diagnostic imaging decision making. For each point of contact four interrelating activities with the focus on information take place: information gathering; information verification; information processing; and information exchange (Sections 4.3.1 and 7.1). All these activities also play a role in the final transformation of information, i.e. integration and interpretation (Section 5.3) needed for completing the assessment-treatment-expected outcome sequence described by Alfuth and Barnard (2000: 271). This is a continuous cyclical circular process that plays itself out throughout the patient's journey.

The decision-making and diagnosis process is also characterised by information and knowledge inputs and outputs that contribute to an awareness of the bigger picture and which Wilson (2000: 207) and Whiting et al. (2007: 984) consider as a basis for decision-making processes that could lead to improved operational, economic or clinical benefit (Price, 2000: 1042). According to Paul and Reddy (2008: 322), interpretation draws on mediation tools and embedded contexts such as work practices, cultures, organisation structures and interpersonal relations (Section 5.2).

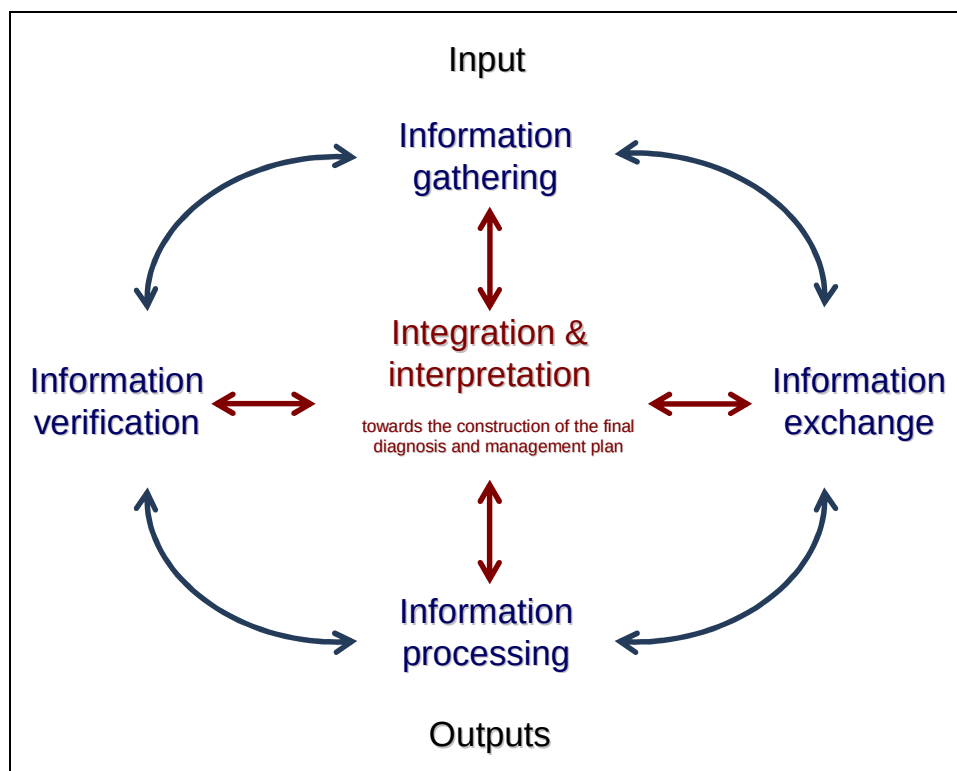


Figure 9-5. The role of information and interpretation in diagnostic imaging decision making

In order to construct and reconstruct a diagnosis and management plan to improve patient outcomes, information in the form of empirical evidence – the “right” piece of information – needs to be gathered during a medical consultation and by means of diagnostic tests (cf. Everitt, 2011: 26-27; Tatsioni et al., 2005: 1048). According to Everitt (2011: 26-27), pivotal questions are: “what information to gather; which diagnostic test to perform; how to interpret and integrate this information to draw diagnostic conclusions.”

In my study it was found that the quality of information is highly dependent on the nature and quality of provider-patient (Section 4.2.2), and provider-provider interactions (Section 2.2.3; Chapters 5 and 6) mediated through documentation (text) and technology (Sections 5.1 and 5.2). The practice of information exchange is an important aspect where information gathering, processing and verification are concerned, especially where technological information has to be transformed into a biomedical language that forms part of the cultural practices of medical practitioners. (See, for example, Section 5.3.2.)

According to Eisenberg et al. (2005: 400), professionals play a critical role in the filtering of cues, deciding which cues to process, ignore or bracket (Paul and Reddy, 2008: 326-327), translate into a list of actions, or integrate into the final diagnosis. Data and information are therefore filtered (Hilligoss, 2011: 179) in a sequence of transactions (Section 9.3.2) through diverse sources (providers and patients) in an effort to make sense of how to interpret (Hilligoss, 2011: 180), integrate and transform (Boon et al., 2009: 716) information in a meaningfully connected and coherent manner (Hilligoss, 2011: 28). (See also Figures 9-1 and 9-2.)

In this filtering process, texts often mediate interaction, including what is known and what counts as knowable. According to Frank et al. (2010: 40), there is a social organisation of knowledge that mediates professional views and responses to patient care. In the case of referral for a diagnostic imaging investigation, the social organisation of knowledge is manifested in activities that take place over periods of time and place and therefore comprise of multiple actions performed by different actors (cf. Paul and Reddy, 2008: 328). In my study the medical practitioner was the principal active information “processor” relaying information. Other providers, including radiographers and radiologists, were receivers and transformers of this information. They could therefore be considered as secondary active processors of information and they also subsequently did something with and “to” the patient other than relaying information, by participating in the physical or imaging examination and, where appropriate, pointing out potential treatment options. If information is not contextualised accurately there may be a loss of information, misconceptions and miscommunication, which could delay diagnosis and treatment (Eisenberg et al., 2005: 410; Hilligoss, 2011: 122).

Viewing a referral as a one-way transmission of information does not, according to Hilligoss (2011: 15), do justice to the complex cognitive, social process and the recipients. According to Frank et al. (2010: 37), what happens during the interactions is substantially affected by what happens outside the interactions. In my study the diverse provider-provider (Section 2.2.3) and provider-patient intersections (Sections 7.1 and 7.2) lent themselves to difficulty in knowing and making sense of the diverse voices – which voices affected each other, how well the patient's voice was heard and how the patient made sense of the provider voices (cf. Frank et al., 2010: 40, 49). At any point in this circular process of information transformation, the patient and health professionals have to understand what is happening. For the patient this would entail a congruence of lifeworld (everyday) and medico-scientific knowledge (Henderson, 2006: 6) and would provide space to reflect on understanding, experiences and meaning making (Malterud and Taksdal, 2007: 32; Cropley, 2012: 334). For professionals there is a need to engage in collaborative sense making during their information-seeking activities, which entails that information has to be distributed equally among group members based on their specific roles. Thus, different group members could access different pieces of information contributing towards an integrated whole of the particular situation at hand (cf. Paul and Reddy, 2008: 326). This leads to the question of how information is transformed and mediated in order to come to decisions on a patient's condition and how to act on this condition. In other words: How do the voices come together and how are they transformed by means of interpretation into an integrated whole that determines the diagnosis and treatment plan that is eventually accepted by the patient?

9.5 TOWARDS A FRAMEWORK OF COLLECTIVE DECISION MAKING IN A COMPLEX ENVIRONMENT

The biomedical model has evolved from the traditional mechanistic view of the human body to one encompassing a bio-psychosocial approach as a result of a greater understanding of the interrelationship between health, illness and disease (Weiner, 2004: 281; Elwyn, 2005: 288). There has been a shift of focus from health care provider to patient in an effort to appreciate the complexity of the multiple dimensions underlying a patient's illness and disease; hence the current emphasis is on patient-centred care. (See also Sections 1.1 and 2.2.) At the core of any decision making where diagnostic imaging is involved is the patient whose problem needs to be solved. Despite the overwhelming focus on patient centeredness, there is also a need to focus on what providers bring or can bring to a situation. Despite the biomedical approach in their professional work, providers are also embedded in their own lifeworlds that are accompanied by certain needs and expectations. Providers' own disposition and experiences, also their experience of job satisfaction, come into play in all decision

making. As a result of my study, I prefer a bigger focus on the provider integrated into a patient-centred approach and, in the case of diagnostic imaging, to rather refer to a collective approach that consists of a multitude of decision-making events. It is, therefore, important to have an understanding of roles and responsibilities, of strengths in terms of interdependencies and interrelations between the components of tasks performed and of the complexities of the interactions involved as decision making takes shape towards a (differential) diagnosis. An overview of this perspective is graphically presented in Figure 9-6.

Decision making entails decision about several things needed for an ultimate diagnosis and treatment plan. These decisions are not always clinical and diagnostic in nature but much broader and can be related to health system issues, technology and a patient's individual situation. All of these form part of collective decision making. In Figure 9-6 collective decision making is described as comprising of transient (Reeves and Decker, 2012: 81), flexible and fluid (Alfuth and Barnard, 2000: 270) processes in an environment or context fragmented by different points of service provision and different providers providing different services. In my

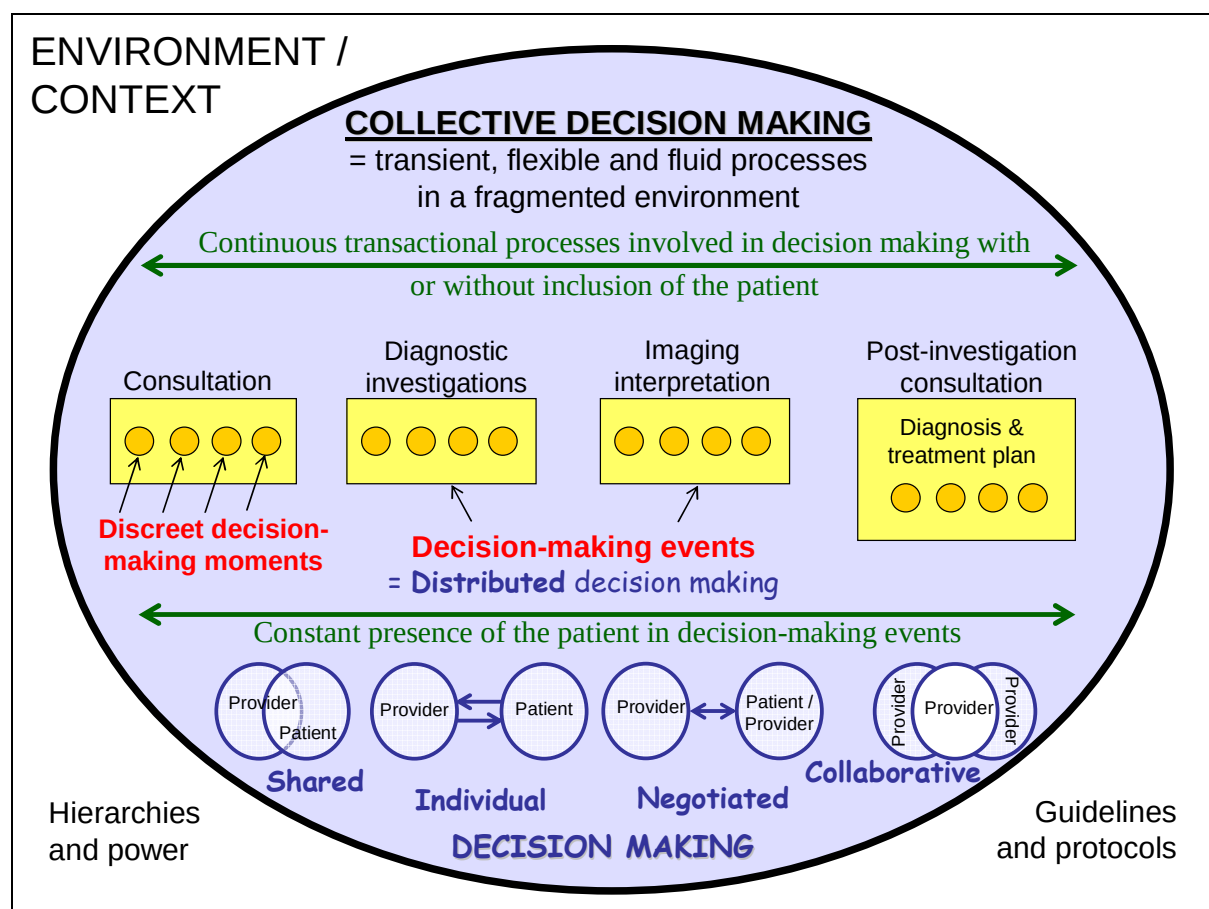


Figure 9-6. Integration of a provider- and patient-centred approach in a framework of collective decision making

study hierarchy and power, as well as the absence of clinical guidelines and/or protocols with regard to diagnostic imaging, was also part of the context (Sections 5.1, 5.2 and 6.2.2.1). In order to come to an ultimate diagnosis and treatment plan transactional processes between health care providers take place continually with or without inclusion of the patient (Sections 7.1 and 7.2), despite the fact that the patient is the only constant presence in the decision-making events.

The patient's journey is characterised by discreet decision-making moments (cf. Dy and Purnell, 2012: 586) taking place sequentially and/or simultaneously. Each point of contact between the patient and the health system could also be considered as a decision-making event consisting of a series of discreet decision-making moments. The findings of my study revealed five different types of decision-making processes: distributed, shared, negotiated, collaborative, and individual.

Distributed decision making functions at a different level than the other four types of decision making. It is used as a term to describe the temporality of decisions taken to ultimately come to a diagnosis and treatment plan. The distributed network of service providers and the distributed interactions between health care providers and between providers and patient result in a sequence of decisions distributed throughout the patient's journey through the system. Patel et al. (2002: 75) refer to it as "distributed partnership". According to Suter et al. (2009: 45), decisions in everyday situations are embedded in a broader context. They are part of a decision-action cycle that does not merely rely on single judgements but are affected by monitoring and feedback. Because of distributed services the notion of interprofessional team-based, patient-centred decision making often does not apply or is not appropriate (Bleakley, 2000: 71). Patel et al. (2000: 69) refer to distributed diagnostic imaging services involving the "management of streams of information and ... communication and coordination among individuals and from data sources", in order to come to shared understandings. Without a mutual understanding, meaningful communication and relationships, including those with patients, can be more difficult to develop (Suter et al., 2009: 44). The interdependency at different levels and stages of decision making and the diversity of providers involved in the fragments of decisions, contribute towards compiling the bigger picture. "Even if a single individual ultimately decides on a course of action others are critically involved in the process" (Patel et al., 2002: 55).

Collaborative and negotiated decision making is more associated with interprovider and interprofessional decision making within an organisation. Often involved at organisational level are characteristics related to power and hierarchies and the presence or absence of guidelines and/or protocols for regulating decisions with regard to diagnostic imaging refer-

rals and interpretation. According to Smith (2006: 148), the balance of hierarchical power (roles and responsibilities) between the various role-players has to be clearly defined. (See also Section 2.1.3.)

Collaborative decision making is frequently connected to the notion of teamwork where health care providers communicate and cooperate inter- and intra-professionally to align and coordinate investigations and treatment or to interpret, for example, diagnostic images. A study by Kelly et al. (2012: 94) emphasises the importance of collaboration using a team-centred approach at an organisational level to enhance patient care by means of accurate diagnostic decision making.

In my study the lack of communication between different providers appeared to have provided limited opportunities for collaborative decision making in many cases. In the focus groups providers shared more examples of collaborative decision making – junior registrars and radiographers collaborating on image interpretation (Section 6.1.1); medical practitioners sharing their views on the interpretation of the x-ray (Section 5.3.1); medical students and interns seeking advice from their colleagues (Section 5.3.3). There are also activities in diagnostic imaging where collaborative decision making is assumed but where my study did not find much evidence, for example nurses and radiographers collaborating in deciding on the positioning of the patient (Section 6.2.2.1).

Negotiated decision making processes are especially visible where one type of provider or profession needs the services or expertise of another or where external artefacts such as diagnostic imaging equipment or computers transform cognition in a significant way (cf. Wilson, 2000: 207). This kind of decision making is rarely based on team work as it is the outcome of a temporary interaction with other health care providers. Bleakley (2011: 71) refers to “teeming”, “negotiated knotworking” and “collaborative intentionality” to describe the transience of these relationships. Where diagnostic imaging investigations are at stake, negotiated decision making often takes places at discreet moments in the unfolding of decision-making events. Roles and responsibilities may become diluted or blurred at these moments of harmony when a joint approach is needed.

Providers also have to negotiate with patients at various points of contact before coming to a final decision. This can happen where more than one treatment or investigation option is available or where a patient needs more time to give permission for an investigation or treatment (Section 8.2.3.1). According to Wilson (2000: 207), behavioural outcomes – following certain decisions that have been made [CRM] – are constructed from negotiations. Patient-centred care recognises the asymmetries in the status of providers and patients that should be resolved by involving individuals to cooperate, collaborate and coordinate through

negotiations rather than following the prescribed rules of behaviour (Kroenke, 1998: 191; Thiel De Bocangera and Gany, 2004: SP22; Yedidia, 2007: 41).

Individual and shared decision making could be considered as two sides of the same coin and is mostly prevalent in doctor-patient consultations. In my study there were very few shared decisions where doctor and patient came to an agreement (Section 2.2) – patients “agreed” or tended to go with the flow in most cases in a submissive, silent fashion. Most decisions were made by an individual based on information shared by the other partner(s) in the particular situation. For example, the patient “decided” which information to divulge to the medical practitioner. This information was integrated with other information that the practitioner derived from a physical examination or diagnostic test(s). The medical practitioner ultimately decided on the diagnosis and provided information to the patient on possible treatment plans. In a patient-centred approach the patient “decides” to accept the plan or negotiate for an adapted or adjusted version of the plan. Where options are available patients most often let the doctor decide (Section 8.2.3) on the choice or option, except where financial implications are at stake (Section 8.1.1.2). According to Booth (2008: 329), the impression is created that the patient is included in a decision when communication is used to achieve patient adherence: “Although these types of messages are often associated with psychological ‘game’ playing, ... the fact that radiographers are consciously choosing one style of communicating over another suggests they are more likely to be ‘manoeuvres’.” The ‘manoeuvring’ of styles of interactions do not appear to be overtly controlling, which enables some form of patient participation.

In all forms of decision making certain principles came to the fore. In interprofessional patient care providers need to have a shared understanding of information and results and optimal decision making. Dignity, respect, collegial relationships, trust, accountability, professional autonomy and in-depth knowledge and evidence of their professional competencies are required. This does not necessarily suggest a democratic decision-making process with all parties having an equal voice (Patel et al., 2002: 69). Patients need the space to make sense of coming to terms with what is happening at the various points of contact in the health system, so that they are ready to share their story where needed and come to an understanding of the implication of their condition or situation (cf. Undeland and Malterud, 2008: 226). The bottom line remains humane and effective communication in a transactional decision-making environment.

9.6 CHAPTER SUMMARY

In this chapter findings from the previous chapters were integrated with insights from the literature in order to position diagnostic imaging in the broader framework of health care. This led to a holistic conceptualisation of interactions and decision-making processes in diagnostic imaging investigations, starting from the institutional system level moving towards interactions where decision making by individuals is at play. Figure 9-7 on the next page brings together the individual conceptualisations presented in this chapter.

I argue that a biotechno-psychosocial network of interactions demonstrates the interrelatedness and interdependencies of the biomedical, technological and lifeworlds of patients and health professionals, as first-order actors, and how second-order actors such as text and technology shape and are shaped by the decision making. Collective decision making is a cyclical, transactional process in which information is disseminated or taken apart, reconstructed, co-constructed and transformed in order to reach the end goal of solving a patient's problem through a (differential) diagnosis and treatment plan.

The usefulness of the theoretical framework that I propose needs further investigation. The final chapter will provide some pointers and possible activities in the ambit of quality improvement and research.

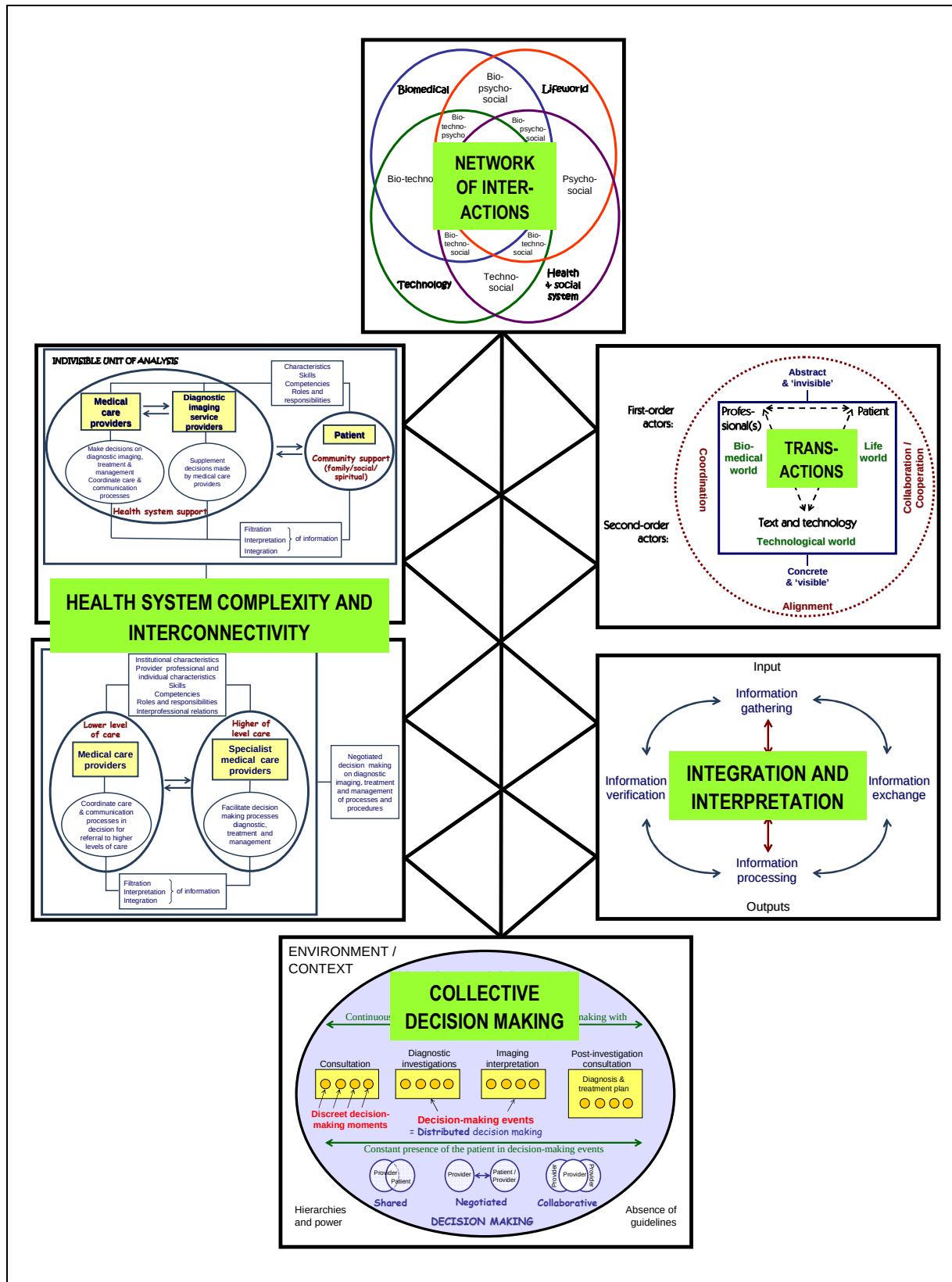


Figure 9-7. Summary of the conceptualisation of interactions and decision-making processes

Chapter 10

Conclusions and recommendations

In this final chapter, I reflect, review, and synthesise my contribution to a transdisciplinary field of study where radiographers meet with other health professions and patients around the activities, processes and decision-making events of diagnostic imaging investigations. I did not only study the journeys of patients referred for diagnostic imaging; my study was also a journey in itself, starting off on a trajectory of patient-centred care and shared decision making and ending with new perspectives on patient-provider-centred care and collective decision making. It is important to also reflect on the extent to which the findings of my study answered the research questions, on the contribution of my study to knowledge in the field of diagnostic radiography, and on the areas in which further research may be needed.

10.1 ANSWERING THE RESEARCH QUESTION

In the process of decision making on referral for the most appropriate diagnostic imaging investigation, how do the interactions between health care professionals and patients shape their expectations, experiences and understandings of diagnostic imaging investigation and the outcomes thereof?

The study is underpinned by a social constructivist conceptual framework that sets the parameters for the study design and the interpretation of the data. The interpretation of the findings culminates in Chapter 9 in the presentation of a holistic, higher-level framework for interpreting structural actions, decision-making processes and interactions between patients and health care professionals, stretching beyond the individual to the institutional culture of the health system and even into larger organisational and social contexts.

Through this qualitative inquiry the complexity of health care provision is demonstrated, especially how diagnostic imaging investigation decisions and the interactions in this process occur within and through the context of a complex and dynamic health care environment that involves disparate and fragmented components of services and outcomes. The use and integration of text and technology in the midst of these complex processes is a prime focal point. My study also highlights the “soft” technology (Murphy, 2006: 170) that is highly dependent

on the lifeworlds of individual actors (health care professionals and patients) that shape their behaviours, interactions and decisions and the ability of these actors to adapt to the complex health care environment dominated by a biomedical world.

The constructivist approach enables the construction, deconstruction or reconstruction of actors' understanding and meaning making that shape experiences, styles of interactions and types of decisions taken. Temporality is highlighted as discreet, sequential moments of decision making due to the inherent brief contact events in diagnostic imaging procedures between actors, with or without a relationship with each other. Thus, only the patient is in the loop throughout the journey towards the ultimate diagnosis and treatment, but he or she is not an active participant at all points of the journey. This necessitates a provider-patient-centred approach that emphasises human agency and mutual dependency of both groups of actors on each other in order to build a bigger picture of a patient's condition (diagnosis) and to come to a mutually acceptable management and treatment plan.

10.1.1 Meeting the research objectives

Table 10-1 gives an overview of where and how the research objectives, based on the sub-questions derived from the main research question, have been achieved in this thesis.

Although the framework for this study was decision making, interactions and processes, the themes expanded into various decision-making dimensions and diversities of interactions as they emerged from the data analysis. This resulted in the birth of Chapter 4, which provides an overview of the research setting at the macro-, institutional level. Themes in the subsequent chapters explored issues at the meso- and micro-level, ending with a theoretical framework in Chapter 9.

From an organisational perspective the level of diagnostic imaging services is intrinsically linked to the various levels of care provision, thus the structure and function of the institution forms the backdrop against which all diagnostic imaging services are shaped. The journey of the patient through the system takes him or her from being referred from the initial consultation to the diagnostic imaging section – the “breaking point” for the patient between the known and the unknown and unfamiliar – and then back to the medical practitioner for the final interpretation of the results and the planning of treatment and follow-up. A patient's accessibility to care and/or services is captured at the first point of interaction with providers, where the patient is subjected to a gate-keeping and ceremonial process in acquiring an identity in the health system, which is tagged to all records and which forms the footprint between the various points of intra- and inter-institutional contact (Chapter 4). The process is

Table 10-1. Research objectives and sub-questions

Sub-question	Objective	Chapter(s) and section(s)
1. How do the interactions of health care professionals with patients affect the referral process and decision making regarding the most appropriate investigation in relation to radiological outcomes and to clinical management of the patient?	a. To describe how events and processes in the medical practitioner consultation resulted in the referral for a diagnostic investigation.	<i>Chapter 4:</i> Sections 4.1.1.3; 4.2.1- 4.2.2
	b. To describe how the referral for an investigation was interpreted and how decisions of the most appropriate investigation were made by health professionals at the diagnostic imaging section.	<i>Chapter 4:</i> Sections 4.2.2.2; 4.2.4 <i>Chapter 5:</i> Sections 5.1.1.2- 5.1.1.3; 5.1.2 <i>Chapter 6:</i> Sections 6.1- 6.2
	c. To describe how health professionals interacted during the referral, specifically regarding interpreting the referral and in determining the most appropriate investigation and the outcomes.	<i>Chapter 4:</i> Section 4.3 <i>Chapter 5:</i> Sections 5.1-5.2
4. How do health care professionals and patients construct meaning, experiences and understandings through the various points of the referral process in determining the most appropriate investigation and the outcomes thereof in relation to the medical encounter?	d. To develop an appreciation of the similarities and differences of how patients interacted with medical practitioners, radiologists and radiographers respectively.	<i>Chapter 4:</i> Section 4.3.1 <i>Chapter 7:</i> Sections 7.1-7.3
	e. To observe and explain the interaction processes between medical practitioners, radiographers and radiologists and how these affected the patients' construction of diagnostic procedures as part of their medical encounter.	<i>Chapter 7:</i> Sections 7.1-7.3 <i>Chapter 8:</i> Section 8.1-8.2
5. How do patients' expectations regarding diagnostic imaging investigations affect their construction of meanings, experiences and understandings of their "journey" through the various points in the medical and diagnostic imaging encounter?	f. To describe patients' experiences and understandings of diagnostic imaging investigation as part of the treatment process and health outcomes and how patients interpreted the mechanisms and patterns of referrals and decision-making of diagnostic imaging investigation processes as part of their medical encounter.	<i>Chapter 8:</i> Section 8.3
6. How could answers to the above questions inform the development of frameworks, models or instruments to illuminate the decision-making process and interactions between patients and health care professionals and to contribute to the improvement in the quality of service delivery?	g. To develop a model(s), framework(s) or instrument(s) to provide a holistic view of how experiences, meanings and understandings are constructed and reconstructed as the patient proceeds through various stages within a structure.	<i>Chapter 9</i>

sometimes staggered as providers struggle for access to sophisticated imaging services in the context of system and institutional processes and structural procedures. Chapter 5 provides the platform to illustrate how various role players interact and act out their roles and responsibilities and how this can impact on the referral for and outcomes of a diagnostic imaging investigation. One of the eye-catching themes is the hidden complexity of an imaging investigation and how this impacts on image quality and the interpretational dilemma between providers.

The dominance of text and technological voices among providers are revealed in Chapter 6, where the subservient, bottom-of-the-ladder, button-pushing role of the radiographer in the context of hierarchies, boundaries and power relations within the medical domain is highlighted. The autonomy of radiographers as independent decision makers and interpreters of information is constantly under scrutiny, with erratic acknowledgement of their roles as: trainer of students, junior doctors and registrars; mediator between medical providers and patients; gate keeper against wrong investigations and unnecessary radiation exposure; and of gap filler in many areas of their work.

The focus in Chapter 7 is on the interactions between health care professionals and patients, with patients often being passive bystanders observing provider discussions and decisions. These interactions are socially constructed and the “outcomes are determined by the way in which the participants create, elicit, interpret and negotiate the meaning of the presenting problem” (Edwards and Sines, 2007: 2451). Chapter 8 focuses on the patient as subject and object, surrounded by transactions and information transformations that shape the meaning they give to and the understanding they construct around diagnostic imaging investigations in the context of their lifeworld and own situatedness. The framework provided in Chapter 9 leads to the change of approach from a patient-centred to a patient-provider-centred approach to care, and from a shared to a collective approach to decision making in the realm of diagnostic imaging.

10.2 CONTRIBUTION TO KNOWLEDGE AND RECOMMENDATIONS FOR FURTHER RESEARCH

Although this study has, proverbially speaking, only scratched the surface with regard to decision making and interactions where diagnostic imaging investigations are involved, it has made some theoretical and research methodological contributions and has provided insights into organisational and institutional aspects of the health system and the role of radiography.

10.2.1 Theoretical contribution

The theoretical contribution of this study is found in the illustration on how a constructivist conceptual framework could be used for studying interactions and decision-making processes in a setting where a biomedical worldview is predominant. The constructivist framework enabled me to explore the voices of all the connected and unconnected role players. It also assisted me in getting to grips with the interrelatedness and interdependencies in the transactions that take place and networks of interactions that exist between the biomedical world, the world of text and technology, and the lifeworlds of patients and health professionals. This study provides an insight into the practicalities and realities around diagnostic imaging investigations as part of the bigger picture of the patient-centred approach that stems from the typical dyadic relation between medical practitioner and patient. The framework enabled me to reveal the shortcomings of only looking at a patient-centred approach in the realm of diagnostic imaging investigations, without taking provider perspectives into account. The observation of the major role of text and technology led to the recommendation of looking at a patient-provider-centred approach.

While this study had a social constructivist point of departure, many other theories from the interpretivist paradigm could also be used to explore the interactions and decision-making processes that take place in patients' journeys through the health system. Theoretical frameworks that come to mind are critical theory, symbolic interactionism, role conflict theory, social worlds theory, actor-network theory, boundary-work theory, and identity theory. Nursing models of care could also be used to unpack shared understandings regarding diagnostic imaging investigation processes and procedures.

10.2.2 Research design and methodology

The research design of shadowing patients within an instrumental case study, is also a new approach within qualitative radiography research. My study enabled each point in the patient's journey to have equal emphasis and could also provide better insights into contextual and organisational issues such as intra- and inter-institutional structures, culture and climate. Shadowing patients gave a lateral and horizontal "bird's eye view" of the complexity of diagnostic imaging decision making, cutting across disciplines and institutions, but also hierarchically within disciplines and institutions.

Lessons learned from this study could provide valuable input for the design of similar studies in other settings or for mixed-methods studies with similar aims as mine. Even though the case selected for my study was somewhat "deviant" (Section 3.2.1), the case study approach was valuable for highlighting the blurred boundaries and relationships between the three

main units of analysis – the district hospital and its linkages, patients, and health care providers. Case studies in the public sector, where the referral pathways are via the regional hospital, and case studies in the private sector could expand the insights generated in this study and complement the findings.

This study is one of the first to draw on practice-led or performative research strategies (Haseman, 2006: 7) to understand the role of the researcher in radiography, using a social science approach in a field that has been dominated by a biomedical approach. In Section 3.7.4 I described my own ambiguous position as a researcher, as being both inside and outside the diagnostic imaging field, in a somewhat intermediary role. According to Morris and Schneider (2010: 83), “no account of techno-science can be innocent, but is a socially located enactment or performance of techno-scientific knowledge or practice that performs particular kind of work related to making sense of a given situation”. This kind of mindfulness of the situatedness of the researcher should be promoted in future qualitative studies in radiography.

10.2.3 Approaching the health system

The approach used in this study enabled a better understanding of people's construction of multiple realities at diverse, distributed points in the health system and of the interconnected- and interrelatedness of the health-system components, from macro- to micro-level and between different health professions. This study also enabled dissection of the role of conventional diagnostic radiography in the current runaway of advanced technology for sophisticated imaging modalities. The role of conventional radiography needs to be re-explored in low- and middle-income countries and within the health system at the level of primary health care centres and district hospitals. The use of radiologists in these settings is another area for exploration.

The position and complexity of diagnostic imaging investigations were also brought to the fore in this study. The need for appropriate patient record systems, preferably electronic, was identified. Triantopoulou et al. (2005: 310) and Malone et al. (2011: 529), for example, indicate that the radiologic information system (RIS) and picture archiving and communication system (PACS) could positively influence communication between radiologists and clinicians. Training needs of medical students and interns have been discussed with regard to the following: use of terminology; understanding the role of the request form and how to complete it appropriately; knowledge of how to and what investigation to request; and how to interpret the resultant images. Caveats resulting from the absence of guidelines or protocols were also highlighted.

An organisational perspective could be used as point of departure to further investigate structural components and processes stemming from policy making and organisational and professional protocols and guidelines. More ethnographic studies, where patients and providers come together in a diagnostic imaging investigation setting, could also reveal other aspects related to the health system and its organisation (Ng and White, 2005: 220). A bigger sample of role players to also include health care administrators and university academics who provide formal health professional education is a further research possibility to consider.

The health system is a social organisation in itself. Power relations between medical providers and non-medical providers and between providers and patients were visible throughout the study. The expression “*knoppiepoppie*” (literally: “button doll”), used by medical providers to refer to radiographers, illustrates these power relations very aptly, where “knoppie” translates into an object and “poppie” translates into a derogatory view of female radiographers. Bringing about social change where these types of symbolic meaning are transformed is indeed challenging. Although not investigated in depth, issues of gender and race surfaced from time to time at the periphery between professionals but also between patients and providers. This is also an area for further research. Another area for research involving social change relates to the question of what could be done to make better the patients’ world in terms of their experiences of diagnostic imaging investigations (cf. Plummer and Young, 2009: 308).

10.2.4 In the ambit of radiography

With regard to the field of radiography my study enabled the construction of a holistic picture regarding diagnostic decision-making processes, both from the provider and patient perspective. It placed specific emphasis on the two ends of the continuum, namely the doctor-patient consultation prior to the imaging investigation and the outcomes and diagnosis post the investigation.

This study provided further insights, in the words of Munn and Jordan (2011: 323): “as to how to best tailor communication to different types of patients and how to best address potential power inequalities between practitioner and patient regarding medical decision making and participation in care.” These authors’ systematic review of qualitative research regarding patient experiences of high-technology medical imaging found that patient and patient care could often be ignored or overlooked, as radiographers and medical providers mainly directed their focus towards technology and not towards the patient.

From a radiography and radiology perspective, the emphasis of research is very much on specialised procedures. By re-visiting general radiography as focal point, referral pathways

and the way in which interactions and transactions take place could be uncovered. This study also provided a platform for the voice of the radiographer and other non-medical providers to be heard in a context where almost everything is mediated through text and technology. The future radiographer is a core member in medical and radiation professional bodies where the autonomy of the profession is recognised and respected.

Using qualitative and/or quantitative methodologies can also be useful for quality improvement purposes and for a systematic examination of patient and provider roles in a health care institution. Other priorities are measuring patient satisfaction with regard to diagnostic imaging investigations and doing research on how diagnostic imaging technologies shape and are shaped by communities in society at large (cf. Webster, 2002: 109). (See also Figure 9-1.)

10.3 RESEARCHER'S FINAL REFLECTION

This study was my journey through the health system as researcher and professional radiographer. As I navigated my way through the labyrinth of the system I came to empathise with patients and radiographers. I also learned to be realistic and not to take predictability for granted – no shoe fits all and flexibility and adaptability should be the motto at the different points of interaction in the diagnostic imaging investigation process. The image enjoyed the centre of attention and resulted in all actors being “on the same side of the fence” for a particular moment in time. At times, medical providers were “sitting on the fence”, swaying to and fro due to uncertainty. And then there were the moments of great divide when particular situations had to be faced. The operator’s face behind the image was mostly opaque, often regarded as the face of a manipulator who would derail other professionals’ autonomy or take others out of their comfort zone. Patients were left on their own and kept in suspense most of the time. Despite their awareness of systemic weaknesses and failures, they “pardoned” the system and its actors and in the end emerged satisfied by the decisions taken on their behalf.

Radiographers were valued as experts in capturing an image – for them the impossible is possible. They were the most wanted, but at the same time they were (ab)used. This was especially so in the eyes of the beholders with supreme power and at times in the eyes of the disciples and ardent servants who worship the beholders. Radiographers were always judged on their behaviour, their whereabouts and how they conducted their work to the satisfaction of the beholders and their servants. Although categorised as people with nothing between the ears, they were the instruments that enabled others to make sense of a patient’s condition. Radiographers were the pillars and the diagnostic imaging technology

was the bridge. At any one time this bridge has to be crossed to achieve the goal of finding a solution to the problem.

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APPENDIX A1

RESEARCH ETHICS COMMITTEE APPROVAL ORIGINAL PROTOCOL

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies
 with ICH-GCP guidelines and has US Federal wide Assurance
 FWA 00002567, Approved dd 22 May 2002 and Expires 24 Jan 2009
 IRB 0000 2235 10RG0001762 Approved dd Jan 2006 and Expires 13 Aug 2011



*Members attended the meeting.

Date: 22/09/2008

PROTOCOL NO.	170/2008
OLD TITLE	Decision making in diagnostic imaging investigations: a case study of processes and interactions between patients and health care professionals
INVESTIGATOR	Principle Investigator: Ms CR Makanjee makanjeeecr@tut.ac.za
SUBINVESTIGATOR	None
SUPERVISOR	Dr A P Bergh anne-marie.bergh@up.ac.za
DEPARTMENT	Dept: Biomedical Sciences, Radiography Division, Tshwane University of Technology Cell: 084 449 1591
STUDY DEGREE	PhD (Diagnostic radiography)
SPONSOR	None
MEETING DATE OF THIS STUDY	17/09/2008

This Protocol and Informed Consent and all the attachments have been considered by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria on 17/09/2008 and found to be acceptable.

*Dr A Nienaber Prof V.O.L. Karusseit Prof M Kruger Dr N K Likibi *Dr T S Marcus *Mrs M C Nzeku *Snr Sr J. Phatoli *Dr L Schoeman *Dr R Sommers *Mr Y Sikweyiya *Prof TJP Swart *Dr A P van Der Walt *Prof C W van Staden	(female) BA (Hons) (Wits); LLB; LLM (UP); Dipl.Datametrics (UNISA) MBChB; MFGP (SA); MMed (Chir); FCS (SA): Surgeon (female) MB.ChB. (Pta); MMed. Pead. (Pret); PhD. (Leuven) MB.BCh; Med. Adviser (Gauteng Dept.of Health) (female) BSc (LSE), PhD (University of Lodz, Poland) (female) BSc (NUL); MSc Biochem (UCL, UK) (female) BCur (Eet.A) BTec (Oncology Nursing Science) Snr Nursing-Sister (female) BP harm, BA Hons (PSy), PhD (female) MBChB; MMed (Int); MPhar.Med; MPH; Master Level Fellowship in Research Ethics; BSC (Health Promotion) Postgraduate Dip in Health Promotion BChD, MSc (Odont), MChD (Oral Path), PGCHE BChD, DGA (Pret) Director: Clinical Services of the Pretoria Academic Hospital MBChB; MMed (Psych); MD; FCPsych; FTCL; UPLM, Dept of Psychiatry



Dr R Sommers; MBChB; MMed (Int); MPhar.Med.
 SECRETARIAT of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Pretoria Academic Hospital

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APPENDIX A2

RESEARCH ETHICS COMMITTEE APPROVAL AMENDMENT



Faculty of Health Sciences Research Ethics Committee
Fakulteit Gesondheidswetenskappe Navorsingsetiekkomitee

DATE: 13/07/2009

Ms C R Makanjee

RE.: Amendment 1 ~ 170/2008: Include Nursing Professionals & Informed Consent

Herewith acknowledgement that the above Amendment 1 has been **received and tabled** on 27/04/2009, and found to be acceptable by the Faculty of Health Sciences Research Ethics Committee.

With regards



DR R SOMMERS; MBChB; MMed (Int); MPharMed.

Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

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makanjee\WRITINGS 2012\Appendices\APPENDIX B4 Amendment form to include nurses.doc

APPENDIX B

INFORMATION LEAFLET AND INFORMED CONSENT – PATIENTS

TITLE OF STUDY

Decision making in diagnostic imaging investigations: A case study of processes and interactions between patients and health care professionals

Dear Patient,

INTRODUCTION

My name is Chandra Makanjee. I invite you to participate in a research study. This information leaflet will help you decide if you want to participate. Before you agree to take part you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask me.

AIM OF THE STUDY

The aim of this study is to find out what happens when a patient is referred for x-rays and other radiological investigations. You as a patient are a very important source of information, as you are the only person who is there right through the process.

PROCEDURES TO BE FOLLOWED

This study may involve an interview before or after you visit your doctor. I will ask you questions about yourself, the reason for your visit, and what you expect or expected of your consultation with the doctor.

Then you will be involved in one of the following processes:

- If I interview you before you see the doctor, I will accompany you to the doctor and observe the consultation. Should you be referred for an x-ray investigation at this hospital or another I will accompany you to the x-ray department and observe your consultation with the radiographer and or the radiologist. After your x-ray investigation I will accompany you back to the doctor and observe that consultation as well. After your consultation I will ask you some questions on how you experienced your visit to the doctor and the diagnostic investigation. Our interviews will be tape-recorded. The consultations will also be tape-recorded with the permission of the doctor, radiographer or radiologist. The x-ray investigation will be video-recorded if the radiographer gives permission.

- If I interview you after you have seen the doctor, I will accompany you to the x-ray department and observe your consultation with the radiographer and or the radiologist. After your x-ray investigation I will accompany you back to the doctor and observe that consultation as well. After your consultation I will ask you some questions on how you experienced your visit to the doctor and the diagnostic investigation. Our interviews will be tape-recorded. The consultations will also be tape-recorded with the permission of the doctor, radiographer or radiologist. The x-ray investigation will be video-recorded if the radiographer gives permission.

I will also look at your file to find out what notes have been made on your condition.

RISK AND DISCOMFORT INVOLVED

There are no risks involved, as this study does not interfere with the doctor's diagnosis or the treatment that you will receive. However, it is important that you let me know of any previous x-ray examinations or scans you had, what their results were and if you are pregnant or planning for a family. Some of the questions I am going to ask may make you feel uncomfortable, but you need not answer them if you don't want to. Although the interviews may take about one hour of your time, your waiting time between the consultations will be reduced.

POSSIBLE BENEFITS OF THIS STUDY

Although you will not benefit directly from the study, the results of the study will enable us to better measure the quality of the service in radiological examinations at the hospital in future.

WHAT ARE YOUR RIGHTS AS A PARTICIPANT IN THIS STUDY?

Your participation in this study is entirely voluntary. You can refuse to participate or stop at any time during the interview without giving any reason. Your withdrawal will not affect you or your treatment in any way. Your honest and open answer response to questions will help us to gather trustworthy information. However, if you feel uncomfortable with any of the questions we ask, you don't need to answer and don't need to give a reason.

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This study has received written approval from the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria (protocol number: 170/2008). A copy of the approval letter is available if you wish to have one. The study has also been structured in accordance with the Declaration of Helsinki (last update: October 2000), which gives guidelines for doctors doing research with people. I can give you a copy if you wish to review it.

INFORMATION AND CONTACT PERSONS

The contact person for this study is Miss CR Makanjee. If you have any questions about the study please contact me at cell: 084 449 1591.

Alternatively you can contact my supervisor, Dr Anne-Marie Bergh at 083 438 5209 or the Research Ethics Committee at (012) 354 1330.

COMPENSATION

Your participation is voluntary. No compensation will be given for your participation.

CONFIDENTIALITY

All information you give will be kept strictly confidential. Once we have analysed the information no one will be able to identify you. Research reports and articles in scientific journals will not include any information, which may identify you.

INFORMED CONSENT

- I confirm that the person asking my consent to take part in this study has told me about the nature, process, risks, discomforts and benefits of the study on patient experiences of diagnostic imaging investigations (protocol number: 170/2008).
- I have received, read and understood the above written information (Information Leaflet and Informed Consent) regarding the study.
- I am aware that the results of the study, including personal details, will be anonymously processed into research reports.
- I am participating voluntarily.
- I have had time to ask questions and have no objection to participate in the interview.
- I understand that there is no penalty should I wish to stop my participation and my withdrawal will not affect me in any way.
- I will receive a signed copy of this informed consent agreement.

I give permission for the interviews and consultations to be audio-taped (please tick on the appropriate line): ☐ YES ☐ NO ☐ NOT APPLICABLE

I give permission for the x-ray investigation to be video-taped (please tick on the appropriate line): ☐ YES ☐ NO ☐ NOT APPLICABLE

By providing my telephone numbers I give permission that I may be contacted for further information if necessary:

Telephone: Cell number:

I would like to receive a report of the study after it has been completed: ___YES ___NO

If "YES", please provide a postal or e-mail address:

.....
.....

Participant's name

(Please print)

Participant's signature Date

Investigator's name

(Please print)

Investigator's signature Date

Witness's name

(Please print)

Witness's signature Date

VERBAL INFORMED CONSENT

- I, the undersigned, have read and have fully explained to the participant the contents of the information leaflet, which explains the nature, process, risks, discomforts and benefits of the study on patient experiences of diagnostic imaging investigations (protocol number: 170/2008) to the participant whom I have asked to participate in the study.
- The participant indicates that he/she understands that the results of the study will be anonymously processed into a research report.
- The participant indicates that he/she has had time to ask questions and has no objection to participate in the interview.
- He/she understands that there is no penalty should he/she wish to discontinue with the study and his/her withdrawal will not affect him/her in any way.

The participant gave permission for the interviews and consultations to be audio-taped:

___YES ___NO ___NOT APPLICABLE

The participant gave permission for the x-ray investigation to be videotaped:

___YES ___NO ___NOT APPLICABLE

The participant provided his/her telephone numbers voluntarily in case the investigator wants to contact him/her for further information if necessary:

Telephone: Cell number:

The participant indicated that he/she would like to receive a report of the study after it has been completed: ___YES ___NO

If "YES", postal or e-mail address:

.....
.....

Participant's name
(Please print)

Person seeking consent
(Please print)

Signature Date

Witness's name
(Please print)

Signature Date

APPENDIX C1

INFORMATION LEAFLET AND INFORMED CONSENT – MEDICAL PRACTITIONERS

TITLE OF STUDY

Decision making in diagnostic imaging investigations: A case study of processes and interactions between patients and health care professionals

Dear Colleague

INTRODUCTION

We invite you to participate in a research study. This information leaflet will help you decide if you want to participate. Before you agree to take part you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the investigator, Miss Chandra Makanjee.

AIM OF THE STUDY

The aim of this study is to gain an understanding of the ways in which healthcare professionals and patients experience and understand the referral mechanisms and decision-making processes regarding diagnostic imaging investigations. You as a frontline service provider and a member of a specific profession working in a hospital are a very important source of information on mechanisms of referrals, decision-making processes, experiences and perceptions not only of patients' but also of other health care professionals' understanding of diagnostic investigations as part of their medical encounter in rendering a quality service.

EXPLANATION OF PROCEDURES TO BE FOLLOWED

This study involves the 'shadowing' of patients from their initial consultation through any diagnostic imaging investigations that might be requested, up to the exit consultation with the medical practitioner. Other health professionals involved in the process will also give written consent for participation in this study.

Apart from getting some personal information from you I am requesting one or both of the following from you:

- Observation of your interactions with study participants during consultations and an interview with you at the end of the 'shadowing' process.

- Participation in a focus group interview. (An invitation with the date, time and venue will be forwarded to you well in advance.)

Your consultations with the study patients and the interviews will be audio-recorded with your permission. Patients may apply for access to the consultation recordings in terms of the Promotion to Access to Information Act (2002).

RISK AND DISCOMFORT INVOLVED

There are no risks involved, as this study does not interfere with your diagnosis or the treatment you will provide. You may feel uncomfortable by the researcher's presence during consultation and some of the questions posed during the informal discussions may also cause discomfort. However you need not answer them if you don't want to.

POSSIBLE BENEFITS OF THIS STUDY

Although you will not benefit directly from the study, the results of the study will enable us to better measure the quality of the service in radiological examinations at the hospital in future.

WHAT ARE MY RIGHTS AS A PARTICIPANT IN THIS STUDY?

Your participation in this study is entirely voluntary. You can refuse to participate or stop at any time without stating any reason. Your withdrawal will not affect you or providing you with a diagnosis and treatment in any way.

HAS THE TRIAL RECEIVED ETHICAL APPROVAL?

This study has received written approval from the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria (protocol number: 170/2008). A copy of the approval letter is available if you wish to have one. The study has also been structured in accordance with the Declaration of Helsinki (last update: October 2000), which deals with the recommendations guiding doctors in biomedical research involving human/subjects. The investigator can provide you with a copy, should you wish to review it.

INFORMATION AND CONTACT PERSONS

The contact person for this study is Miss CR Makanjee. If you have any questions about the study please contact me at 084 449 1591.

Alternatively you can contact my supervisor, Dr Anne-Marie Bergh at 083 438 5209 or the Research Ethics Committee of the University of Pretoria at (012) 354 1330.

COMPENSATION

Your participation is voluntary. No compensation will be given for your participation.

CONFIDENTIALITY

All information you give will be kept strictly confidential. Once we have analysed the information no one will be able to identify you. Research reports and articles in scientific journals will not include any information, which may identify you.

INFORMED CONSENT

- I confirm that the person asking my consent to take part in this study has told me about the nature, process, risks, discomforts and benefits of the study on patient experiences of diagnostic imaging investigations (protocol number: 170/2008).
- I have received, read and understood the above written information (Information Leaflet and Informed Consent) regarding the study.
- I am aware that the results of the study, including personal details, will be anonymously processed into research reports.
- I am participating voluntarily
- I have had time to ask questions and have no objection to participate in the interview.
- I understand that there is no penalty should I wish to stop my participation and my withdrawal will not affect me in any way.
- I will receive a signed copy of this informed consent agreement.

I give permission for the interviews and consultations to be audio-taped (please tick on the appropriate line): ☐ YES ☐ NO ☐ NOT APPLICABLE

Participant's name
(Please print)

Participant's signature Date

Investigator's name
(Please print)

Investigator's signature Date

Witness's name
(Please print)

Witness's signature Date

Telephone numbers in case the investigator needs to contact you:

Telephone: Cell number:

Language of preference for communication: ___English ___ Afrikaans

I would like to receive a copy of the final report (please tick on the appropriate line):

___YES ___NO

Postal and or e-mail address:

.....
.....

Number of years of work experience:

Qualification	Institution	Year

APPENDIX C2

INFORMATION LEAFLET AND INFORMED CONSENT – RADIOGRAPHERS

TITLE OF STUDY

Decision making in diagnostic imaging investigations: A case study of processes and interactions between patients and health care professionals

Dear Colleague

INTRODUCTION

We invite you to participate in a research study. This information leaflet will help you decide if you want to participate. Before you agree to take part you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the investigator, Miss Chandra Makanjee.

AIM OF THE STUDY

The aim of this study is to gain an understanding of the ways in which healthcare professionals and patients experience and understand the referral mechanisms and decision-making processes regarding diagnostic imaging investigations. You as a frontline service provider and a member of a specific profession working in a hospital are a very important source of information on mechanisms of referrals, decision-making processes, experiences and perceptions not only patients' but also other health care professionals' understanding of diagnostic investigations as part of their medical encounter in rendering a quality service.

EXPLANATION OF PROCEDURES TO BE FOLLOWED

This study involves the 'shadowing' of patients from their initial consultation through any diagnostic imaging investigations that might be requested, up to the exit consultation with the medical practitioner. Other health professionals involved in the process will also give written consent for participation in this study.

Apart from getting some personal information from you I am requesting one or both of the following from you:

- Observation of your interactions with study participants during consultations and an interview with you at the end of the 'shadowing' process.
- Participation in a focus group interview. (An invitation with the date, time and venue will be forwarded to you well in advance.)

Your consultations with the patients and the interviews will be audio-recorded and diagnostic imaging investigation video-recorded with your permission. Patients may apply for access to the consultation recordings in terms of the Promotion to Access to Information Act (2002).

RISK AND DISCOMFORT INVOLVED

There are no risks involved, as this study does not interfere with your diagnosis or the treatment you will provide. You may feel uncomfortable by the researcher's presence during consultation and some of the questions posed during the informal discussions may also cause discomfort. However you need not answer them if you don't want to.

POSSIBLE BENEFITS OF THIS STUDY

Although you will not benefit directly from the study, the results of the study will enable us to better measure the quality of the service regarding diagnostic imaging investigations at the hospital in future.

WHAT ARE MY RIGHTS AS A PARTICIPANT IN THIS STUDY?

Your participation in this study is entirely voluntary. You can refuse to participate or stop at any time without stating any reason. Your withdrawal will not affect you or providing you with a diagnosis and treatment in any way.

HAS THE TRIAL RECEIVED ETHICAL APPROVAL?

This study has received written approval from the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria (protocol number: 170/2008). A copy of the approval letter is available if you wish to have one. The study has also been structured in accordance with the Declaration of Helsinki (last update: October 2000), which deals with the recommendations guiding doctors in biomedical research involving human/subjects. The investigator can provide you with a copy, should you wish to review it.

INFORMATION AND CONTACT PERSONS

The contact person for this study is Miss CR Makanjee. If you have any questions about the study please contact me at 084 449 1591.

Alternatively you can contact my supervisor, Dr Anne-Marie Bergh at 083 438 5209 or the Research Ethics Committee of the University of Pretoria at (012) 354 1330.

COMPENSATION

Your participation is voluntary. No compensation will be given for your participation.

CONFIDENTIALITY

All information you give will be kept strictly confidential. Once we have analysed the information no one will be able to identify you. Research reports and articles in scientific journals will not include any information, which may identify you.

INFORMED CONSENT

- I confirm that the person asking my consent to take part in this study has told me about the nature, process, risks, discomforts and benefits of the study on patient experiences of diagnostic imaging investigations (protocol number: 170/2008).
- I have received, read and understood the above written information (Information Leaflet and Informed Consent) regarding the study.
- I am aware that the results of the study, including personal details, will be anonymously processed into research reports.
- I am participating voluntarily
- I have had time to ask questions and have no objection to participate in the interview.
- I understand that there is no penalty should I wish to stop my participation and my withdrawal will not affect me in any way.
- I will receive a signed copy of this informed consent agreement.

I give permission for the interviews and consultations to be audio-taped (please tick on the appropriate line): ☐ YES ☐ NO ☐ NOT APPLICABLE

I give permission for the diagnostic imaging investigation to be videotaped (please tick on the appropriate line): ☐ YES ☐ NO ☐ NOT APPLICABLE

Participant's name
(Please print)
Participant's signature Date

Investigator's name
(Please print)

Investigator's signature Date

Witness's name
(Please print)

Witness's signature Date

Telephone numbers in case the investigator needs to contact you:

Telephone: Cell number:

Language of preference for communication: ___English ___ Afrikaans

I would like to receive a copy of the final report (please tick on the appropriate line):

___YES ___NO

Postal and or e-mail address:

.....
.....

Number of years of work experience:

Qualification	Institution	Year

APPENDIX C3

INFORMATION LEAFLET AND INFORMED CONSENT – RADIOLOGISTS AND RADIOLOGY REGISTRARS

TITLE OF STUDY

Decision making in diagnostic imaging investigations: A case study of processes and interactions between patients and health care professionals

Dear Colleague

INTRODUCTION

We invite you to participate in a research study. This information leaflet will help you decide if you want to participate. Before you agree to take part you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the investigator, Miss Chandra Makanjee.

AIM OF THE STUDY

The aim of this study is to gain an understanding of the ways in which healthcare professionals and patients experience and understand the referral mechanisms and decision-making processes regarding diagnostic imaging investigations. You as a frontline service provider and a member of a specific profession working in a hospital are a very important source of information on mechanisms of referrals, decision-making processes, experiences and perceptions not only patients' but also other health care professionals' understanding of diagnostic investigations as part of their medical encounter in rendering a quality service.

EXPLANATION OF PROCEDURES TO BE FOLLOWED

This study involves the 'shadowing' of patients from their initial consultation through any diagnostic imaging investigations that might be requested, up to the exit consultation with the medical practitioner. Other health professionals involved in the process will also give written consent for participation in this study.

Apart from getting some personal information from you I am requesting one or both of the following from you:

- Observation of your interactions with study participants during consultations and an interview with you at the end of the 'shadowing' process.

- Participation in a focus group interview. (An invitation with the date, time and venue will be forwarded to you well in advance).

Your consultations with the patients and interviews will be audio-recorded with your permission. Patients may apply for access to the consultation recordings in terms of the Promotion to Access to Information Act (2002).

RISK AND DISCOMFORT INVOLVED

There are no risks involved, as this study does not interfere with your diagnosis or the treatment you will provide. You may feel uncomfortable by the researcher's presence during consultation and some of the questions posed during the informal discussions may also cause discomfort. However you need not answer them if you don't want to.

POSSIBLE BENEFITS OF THIS STUDY

Although you will not benefit directly from the study, the results of the study will enable us to better measure the quality of the service in radiological examinations at the hospital in future.

WHAT ARE MY RIGHTS AS A PARTICIPANT IN THIS STUDY?

Your participation in this study is entirely voluntary. You can refuse to participate or stop at any time without stating any reason. Your withdrawal will not affect you or providing you with a diagnosis and treatment in any way.

HAS THE TRIAL RECEIVED ETHICAL APPROVAL?

This study has received written approval from the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria (protocol number: 170/2008). A copy of the approval letter is available if you wish to have one. The study has also been structured in accordance with the Declaration of Helsinki (last update: October 2000), which deals with the recommendations guiding doctors in biomedical research involving human/subjects. The investigator can provide you with a copy, should you wish to review it.

INFORMATION AND CONTACT PERSONS

The contact person for this study is Miss CR Makanjee. If you have any questions about the study please contact me at 084 449 1591.

Alternatively you can contact my supervisor, Dr Anne-Marie Bergh at 083 438 5209 or the Research Ethics Committee of the University of Pretoria at (012) 354 1330.

COMPENSATION

Your participation is voluntary. No compensation will be given for your participation.

CONFIDENTIALITY

All information you give will be kept strictly confidential. Once we have analysed the information no one will be able to identify you. Research reports and articles in scientific journals will not include any information, which may identify you.

INFORMED CONSENT

- I confirm that the person asking my consent to take part in this study has told me about the nature, process, risks, discomforts and benefits of the study on patient experiences of diagnostic imaging investigations (protocol number: 170/2008).
- I have received, read and understood the above written information (Information Leaflet and Informed Consent) regarding the study.
- I am aware that the results of the study, including personal details, will be anonymously processed into research reports.
- I am participating voluntarily
- I have had time to ask questions and have no objection to participate in the interview.
- I understand that there is no penalty should I wish to stop my participation and my withdrawal will not affect me in any way.
- I will receive a signed copy of this informed consent agreement.

I give permission for consultations to be (please tick on the appropriate line):

Audio-taped ☐ YES ☐ NO ☐ NOT APPLICABLE

I give permission for the individual / focus group interview to be (please tick on appropriate line):

Audio-taped ☐ YES ☐ NO ☐ NOT APPLICABLE

Participant's name
(Please print)

Participant's signature Date

Investigator's name
(Please print)

Investigator's signature Date

Witness's name

(Please print)

Witness's signature Date

Telephone numbers in case the investigator needs to contact you:

Telephone: Cell number:

Language of preference for communication: ___English ___ Afrikaans

I would like to receive a copy of the final report (please tick on the appropriate line):

___YES ___NO

Postal and or e-mail address:

.....

.....

Number of years of work experience:

Qualification	Institution	Year

APPENDIX C4

INFORMATION LEAFLET AND INFORMED CONSENT – NURSING PROFESSIONALS

TITLE OF STUDY

Decision making in diagnostic imaging investigations: A case study of processes and interactions between patients and health care professionals

Dear Colleague

INTRODUCTION

We invite you to participate in a research study. This information leaflet will help you decide if you want to participate. Before you agree to take part you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the investigator, Miss Chandra Makanjee.

AIM OF THE STUDY

The aim of this study is to gain an understanding of the ways in which healthcare professionals and patients experience and understand the referral mechanisms and decision-making processes regarding diagnostic imaging investigations. You as a frontline service provider and a member of a specific profession working in a hospital are a very important source of information on mechanisms of referrals, decision-making processes, experiences and perceptions not only of patients' but also of other health care professionals' understanding of diagnostic investigations as part of their medical encounter in rendering a quality service.

EXPLANATION OF PROCEDURES TO BE FOLLOWED

This study involves the 'shadowing' of patients from their initial consultation through any diagnostic imaging investigations that might be requested, up to the exit consultation with the medical practitioner. Other health professionals involved in the process have given written consent for participation in this study.

Apart from getting some personal information from you I am requesting one or both of the following from you:

- A short interview with you at the end of the 'shadowing' process.

- Participation in a focus group interview. (An invitation with the date, time and venue will be forwarded to you well in advance.)

Your interviews will be audio-recorded with your permission.

RISK AND DISCOMFORT INVOLVED

There are no risks involved, as this study does not interfere with your observation and nursing procedures you will conduct. You may feel uncomfortable by the researcher's presence during consultation and some of the questions posed during the informal discussions may also cause discomfort. You are obliged not to answer questions if you don't want to.

POSSIBLE BENEFITS OF THIS STUDY

Although you will not benefit directly from the study, the results of the study will enable us to better measure the quality of the service in radiological examinations at the hospital in future.

WHAT ARE MY RIGHTS AS A PARTICIPANT IN THIS STUDY?

Your participation in this study is entirely voluntary. You can refuse to participate or stop at any time without stating any reason. Your withdrawal will not affect you in anyway.

HAS THE TRIAL RECEIVED ETHICAL APPROVAL?

This study has received written approval from the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria (protocol number: 170/2008). A copy of the approval letter is available if you wish to have one. The study has also been structured in accordance with the Declaration of Helsinki (last update: October 2000), which deals with the recommendations guiding doctors in biomedical research involving human/subjects. The investigator can provide you with a copy, should you wish to review it.

INFORMATION AND CONTACT PERSONS

The contact person for this study is Miss CR Makanjee. If you have any questions about the study please contact me at 084 449 1591.

Alternatively you can contact my supervisor, Dr Anne-Marie Bergh at 083 438 5209 or the Research Ethics Committee of the University of Pretoria at (012) 354 1330.

COMPENSATION

Your participation is voluntary. No compensation will be given for your participation.

CONFIDENTIALITY

All information you give will be kept strictly confidential. Once we have analysed the information no one will be able to identify you. Research reports and articles in scientific journals will not include any information, which may identify you.

INFORMED CONSENT

- I confirm that the person asking my consent to take part in this study has told me about the nature, process, risks, discomforts and benefits of the study on patient experiences of diagnostic imaging investigations (protocol number: 170/2008).
- I have received, read and understood the above written information (Information Leaflet and Informed Consent) regarding the study.
- I am aware that the results of the study, including personal details, will be anonymously processed into research reports.
- I am participating voluntarily.
- I have had time to ask questions and have no objection to participate in the interview.
- I understand that there is no penalty should I wish to stop my participation and my withdrawal will not affect me in any way.
- I will receive a signed copy of this informed consent agreement.

I give permission for the interviews and consultations to be audio-taped (please tick on the appropriate line): ☐ YES ☐ NO ☐ NOT APPLICABLE

Participant's name
(Please print)

Participant's signature Date

Investigator's name
(Please print)

Investigator's signature Date

Witness's name
(Please print)

Witness's signature Date

Telephone numbers in case the investigator needs to contact you:

Telephone: Cell number:

Language of preference for communication: ___English ___ Afrikaans

I would like to receive a copy of the final report (please tick on the appropriate line):

___YES ___NO

Postal and or e-mail address:

.....
.....

Number of years of work experience:

Qualification	Institution	Year

APPENDIX D

UNDERTAKING OF CONFIDENTIALITY – INTERPRETER / TRANSLATOR

TITLE OF STUDY: Decision making in diagnostic imaging investigations: A case study of processes and interactions between patients and health care professionals

I, ..., hereby undertake to keep confidential and not to divulge any information pertaining to data collected for the above study to any person. I will only discuss information about this study with the researcher herself. I also undertake to keep confidential all sensitive information regarding the research process.

Name of interpreter / translator:

(Please print)

Signature Date.....

Witness's name

(Please print)

Witness's signature Date.....

APPENDIX E1

PATIENT PRE-CONSULTATION INTERVIEW GUIDE

Participant file no. Research code:

Date: Time:

Name of the institution:

Department: Section:

Place of interview:

Reminders:

- Check if the audio-recording device is working.
- Thank the participant for agreeing to participate
- Explain information leaflet
- Get consent
- SWITCH RECORDING EQUIPMENT "ON"

Icebreaker:

Tell me a little about yourself.

[If problem for consulting doctor is not mentioned, steer conversation in that direction]

Possible questions if the issues are not flowing directly from the icebreaker:

So what is the reason for visiting the doctor / coming to Outpatients?

[Also check if patient has had the same problem before and what the outcomes were]

Do you think he/she will send you for tests?

[Probe what tests if not specific enough]

Do you think he/she will send you for x-rays?

Reminders:

- Thank participant
- Switch off audio-/video-recorder
- Note length of interview: minutes

APPENDIX E2

PATIENT POST-CONSULTATION (INITIAL) INTERVIEW GUIDE

Participant file no. Research code:

Date: Time:

Name of the institution:

Department: Section:

Place of interview:

Reminders:

- Check if the audio-recording device is working.
- Thank the participant for agreeing to participate
- Explain information leaflet
- Get consent
- SWITCH RECORDING EQUIPMENT "ON"

Icebreaker:

Tell me the reason for your visiting the doctor/coming to Outpatients?

[Also check if patient has had the same problem before and what the outcomes were, with the emphasis on previous diagnostic imaging investigations].

Possible questions if the issues are not flowing directly from the icebreaker:

What did you expect the doctor would do for you when you came this morning?

How did you find your experience with the doctor?

[If, interaction pertaining explanation and process of decision-making not brought about then steer conversation in that direction].

What explanation did the doctor give about the procedure you are about to have?

How do you think this procedure will help you?

Were you able to ask the doctor any questions regarding this investigation?

Reminders:

- Thank participant
- Switch off audio-recorder
- Note length of interview: minutes

Reflective notes:

APPENDIX E3

PATIENT EXIT INTERVIEW GUIDE

Participant file no. Research code:

Date: Time:

Name of the institution:

Department: Section:

Place of interview:

Reminders:

- Check if the audio-recording device is working.
- SWITCH RECORDING EQUIPMENT "ON"

For patients referred for diagnostic imaging investigations:

How did you find your experience today?

Probe according to patient expectations mentioned in the pre-consultation or initial interview.
If necessary, also probe for degree of interaction, perceptions and understanding of the medical encounter.

If not mentioned specifically:

- How did you find your experience at x-rays?
- How did you find your consultation(s) with the doctor(s)?

How satisfied are you with your treatment today?

For patients not referred for diagnostic imaging investigations:

How did you find the consultation?

Probe according to patient expectations mentioned in the pre-consultation or initial interview.

Reminders:

- Thank participant
- Switch off audio-recorder
- Note length of interview: minutes

Reflective notes:

APPENDIX F1

MEDICAL PRACTITIONER-PATIENT OBSERVATION SCHEDULE

Participant file no. Research code:

Date: Time:

Name of the institution:

Department: Section:

Place of observation:

Reminders:

- Check if the audio-recording device is working.
- SWITCH RECORDING EQUIPMENT "ON"

DESCRIPTIVE NOTES

Pre-diagnostic investigation:

1. Practitioner introduces him/herself. Yes___ / No___

Further observation:

Patient response:

2. Doctor asks questions about reason for the visit. Yes___ / No___

Further observation:

Patient response:

3. Doctor confirms reason for visit. Yes___ / No___

Further observation:

Patient response:

4. Doctor probes for what the patient is experiencing. Yes___ / No___

Further observation:

Patient response:

5. Practitioner's responses to the history presented:

Further observation:

Patient response:

6. Doctor seeks together with the patient for common interpretation. Yes___ / No___

Further observation:

Patient response:

7. Doctor explains to patient the plan of action. Yes___ / No___

Further observation:

Patient response:

8. Doctor and patient come to an agreement regarding plan of action. Yes___ / No___

Further observation

Patient response

Post -diagnostic investigation:

9. Doctor interprets images with patient. Yes___ / No___

Further observation:

Patient response:

10. Doctor interprets the radiological report with patient? Yes___ / No___

Further observation:

Patient response:

11. Doctor explains of what benefit the investigation was in the further management of patient. Yes___ / No___

Further observation:

Patient response:

Other observations:

Reminders:

- Thank participants
- Switch off audio-recorder
- Note length of consultation / observation: minutes

Reflective notes:

APPENDIX F2

RADIOGRAPHER/ RADIOLOGY PATIENT OBSERVATION SCHEDULE

Participant file no. Research code:

Date: Time:

Name of the institution:

Department: Section:

Place of observation:

Reminders:

- Check if the audio- and or video-recording device is working.
- SWITCH RECORDING EQUIPMENT "ON"

DESCRIPTIVE NOTES

Pre-diagnostic investigation:

1. Radiographer introduces him/herself. Yes___ / No___

Further observation:

Patient response:

2. Radiographer asks questions such as reason for investigation. Yes___ / No___

Further observation:

Patient response:

3. Radiographer confirms clinical history with patient. Yes___ / No___

Further observation:

Patient response:

4. Radiographer confirms investigation requested on request form. Yes___ / No___

Further observation:

Patient response:

Radiographer's response:

5. Radiographer seeks together with the patient for an agreement. Yes___ / No___

Further observation:

Patient response:

6. Radiographer explains the procedure to patient. Yes__ / No__

Further observation:

Radiographer's explanation:

Patient response:

7. Radiographer and patient come to an agreement on plan of action? Yes__ / No__

Further observation:

Patient response:

8. Communication strategy and interaction processes during the actual investigation.

Further observation:

Radiographer's instructions:

Patient responses:

Post-diagnostic investigation:

9. Communication of radiographer with patient.

Further observation:

Radiographer's instructions:

Patient responses:

10. Radiographer evaluation of the radiographs.

11. Radiographer handing over images for radiological report.

Further observation:

Radiographer's interaction with radiologist:

12. Radiographer handing over report to patient.

Further observation:

Radiographer's interaction with patient:

Other observations:

Reminders:

- Thank participants
- Switch off audio-recorder
- Note length of consultation / observation: minutes

Reflective notes:

APPENDIX G1

MEDICAL PRACTITIONER INTERVIEW GUIDE (INDIVIDUAL INTERVIEWS)

Interview number: Research code:

Date: Time:

Place of interview:

Number of participant:

Reminders:

- Check if the audio-recording device is working.
- Thank participant for agreeing to participate
- Explain information leaflet
- Get consent
- SWITCH RECORDING EQUIPMENT "ON"

Icebreaker:

1. What is your experience with patients referred for diagnostic imaging investigations?

Possible questions if the issues are not flowing directly from the icebreaker:

2. What was your experience with this particular patient regarding referring for an investigation? [Probe for mechanism of referral process, patient's interaction, demands, expectations, attitudes, views, etc]
3. How did the patient react when he/she heard that he/she has been referred for a diagnostic investigation? [Encourage participant/s to share specific experiences that could be enlightening with regard to the interaction during the referral for an investigation].
4. In what way did the radiographer and or radiologist assist you in the referral process? [Probing for interaction and decision making in requesting the most appropriate investigation].
5. How did the outcomes of this investigation affect the clinical management of the patient?
6. How did this patient react when he/she heard the outcomes of the radiological diagnosis? [Encourage participant to share specific experiences that could be enlightening with regard to the construction of diagnosis].

Reminders:

- Thank participants
- Switch off audio-recorder
- Note length of interview: minutes

Reflective notes:

APPENDIX G2

RADIOLOGIST AND RADIOLOGY REGISTRAR INTERVIEW GUIDE (INDIVIDUAL INTERVIEWS)

Interview number: Research code:

Date: Time:

Place of interview:

Number of participant:

Reminders:

- Check if the audio-recording device is working.
- Thank participant for agreeing to participate
- Explain information leaflet
- Get consent
- SWITCH RECORDING EQUIPMENT "ON"

Icebreaker:

1. What was your experience with this particular patient been referred for an investigation?
[Probe for mechanism of referral process, patient's interaction, demands, expectations, attitudes, views, etc].

Possible questions if the issues are not flowing directly from the icebreaker:

2. How did this patient react when he/she heard the outcomes of the radiological diagnosis?
[Encourage participant to share specific experiences that could be enlightening with regard to the construction of diagnosis].
3. What criteria did you use in making a decision on the most appropriate investigation?
[Probing for the clinical indications for the investigation requested and interaction with referring practitioner].
4. How does the outcomes of this radiological investigation influence the medical practitioners' management of the patient? [Probing benefit of the radiological investigations].
5. What was the role of the radiographer regarding this investigation?[Probing interaction regarding decision making].

Reminders:

- Thank participants
- Switch off audio-recorder
- Note length of interview: minutes

Reflective notes:

APPENDIX G3

NURSE INTERVIEW GUIDE (INDIVIDUAL INTERVIEWS)

Interview number: Research code:

Date: Time:

Place of interview:

Number of participant:

Reminders:

- Check if the audio-recording device is working.
- Thank participant for agreeing to participate
- Explain information leaflet
- Get consent
- SWITCH RECORDING EQUIPMENT "ON"

Icebreaker:

1. What is your experience with patients referred for diagnostic imaging investigations?

Possible questions if the issues are not flowing directly from the icebreaker:

2. What was your experience with this particular patient regarding referring for an investigation? [Probe for mechanism of referral process, patient's interaction, demands, expectations, attitudes, views, etc)
6. How do the patient react when he/she heard that he/she has been referred for a diagnostic investigation? [Encourage participant/s to share specific experiences that could be enlightening with regard to the interaction during the referral for an investigation].
4. In what way did the medical practitioner, radiographer and/or radiologist assist in the referral process? [Probing for interaction and decision making in requesting the most appropriate investigation].
5. How did the outcomes of this investigation affect the clinical and nursing management of the patient?
6. How did this patient react when he/she heard the outcomes of the radiological diagnosis? [Encourage participant to share specific experiences that could be enlightening with regard to the construction of diagnosis].

Reminders:

- Thank participants
- Switch off audio-recorder
- Note length of interview: minutes

Reflective notes:

APPENDIX H1

RADIOGRAPHER INTERVIEW GUIDE (FOCUS GROUP INTERVIEWS)

Please note: This guide will be further refined based on the outcomes of the analysis of the 'shadowing' of the patients.

Group number: Research code:

Date: Time:

Place of interview:

Number of participants:

Participant seating arrangements (drawing):

1st Moderator: 2nd Moderator:

Reminders:

- Check if the audio-recording device is working.
- Thank participant/s for agreeing to participate
- Explain information leaflet
- Get consent
- SWITCH RECORDING EQUIPMENT "ON"

Icebreaker:

1. What is your experience regarding referrals for diagnostic imaging investigations? [Probe for mechanisms of referral patterns and interaction processes].

Possible questions if the issues are not flowing directly from the icebreaker:

2. How does a referring practitioner's request for a diagnostic imaging investigation affect your decision-making process? [Probe for justification of investigation on request form, interaction between referring practitioner and or the radiologist].
3. How does the doctor-patient interaction regarding diagnostic imaging investigation affect your decision- making process?
4. What is the role of the radiographer in the decision-making processes regarding the most appropriate investigation of choice?[Probe for investigation not justified and what action is taken, e.g. consult with radiologist, etc].
5. What is your experience with patients referred for diagnostic imaging investigations?
6. What meanings do patients in your experience attach to their encounter with diagnostic imaging investigations? [Also probe for demands, expectations, attitudes, views, etc]

7. How does the doctor-patient consultation affect the patient's experience and understanding of diagnostic imaging investigations?
8. What do you think are patients' understandings of the mechanisms of the referral process?
9. How do radiographers influence patients' experiences and understandings of diagnostic imaging investigations as part of their medical encounter?

Reminders:

- Thank participants
- Switch off audio-recorder
- Note length of interview: minutes

Reflective notes:

APPENDIX H2

MEDICAL PRACTITIONER INTERVIEW GUIDE (FOCUS GROUP INTERVIEWS)

Please note: This guide will be further refined based on the outcomes of the analysis of the 'shadowing' of the patients. It could also include a short presentation of the main findings for comments by the interviewee(s).

Interview number: Research code:

Date: Time:

Place of interview:

Number of participants:

Participant seating arrangements (drawing):

1st Moderator: 2nd Moderator:

Reminders:

- Check if the audio-recording device is working.
- Thank participant/s for agreeing to participate
- Explain information leaflet
- Get consent
- SWITCH RECORDING EQUIPMENT "ON"

Icebreaker:

1. Tell me a little about the work you do and how you are involved with diagnostic imaging investigations.

Possible questions if the issues are not flowing directly from the icebreaker:

2. What is your experience with patients referred for diagnostic imaging investigations?

If necessary, probe for:

- mechanism of referral process
- patient's understandings and meanings of the encounter (also demands, expectations, attitudes, views, etc)

3. How do patients react when they hear the diagnosis?
[Encourage participant/s to share specific experiences that could be enlightening with regard to the construction of diagnosis]

Reminders:

- Thank participants
- Switch off audio-recorder
- Note length of interview: minutes

Reflective notes:

APPENDIX H3

RADIOLOGIST AND RADIOLOGY REGISTRAR INTERVIEW GUIDE (FOCUS GROUP INTERVIEWS)

Please note: This guide will be further refined based on the outcomes of the analysis of the 'shadowing' of the patients.

Interview number: Research code:

Date: Time:

Place of interview:

Number of participants:

Participant seating arrangements (drawing):

1st Moderator: 2nd Moderator:

Reminders:

- Check if the audio-recording device is working.
- Thank participant/s for agreeing to participate
- Explain information leaflet
- Get consent
- SWITCH RECORDING EQUIPMENT "ON"

Icebreaker:

1. What is your experience with patients referred for diagnostic imaging investigations?

Using a presentation to facilitate the discussion:

2. Give a short presentation of the main findings from emanating from the analysis of 'shadowing' the patients.
3. What are your comments of the above interpretation? (Further probes will be developed from the main issues in the findings.)
4. How would you say your radiological interpretation influence patients' experiences and understandings regarding diagnostic imaging investigations as part of their medical encounter?

Reminders:

- Thank participants
- Switch off audio-recorder
- Note length of interview: minutes

Reflective notes:

APPENDIX H4

NURSES INTERVIEW GUIDE (FOCUS GROUP INTERVIEWS)

Please note: This guide will be further refined based on the outcomes of the analysis of the 'shadowing' of the patients. It could also include a short presentation of the main findings for comments by the interviewee(s).

Interview number: Research code:

Date: Time:

Place of interview:

Number of participants:

Participant seating arrangements (drawing):

1st Moderator: 2nd Moderator:

Reminders:

- Check if the audio-recording device is working.
- Thank participant/s for agreeing to participate
- Explain information leaflet
- Get consent
- SWITCH RECORDING EQUIPMENT "ON"

Icebreaker:

1. Tell me a little about the work you do and how you are involved with diagnostic imaging investigations.

Possible questions if the issues are not flowing directly from the icebreaker:

2. What is your experience with patients referred for diagnostic imaging investigations?

If necessary, probe for:

- mechanism of referral process
- patient's understandings and meanings of the encounter (also demands, expectations, attitudes, views, etc)

3. How do patients react when they hear the diagnosis?
[Encourage participant/s to share specific experiences that could be enlightening with regard to the construction of diagnosis]

Reminders:

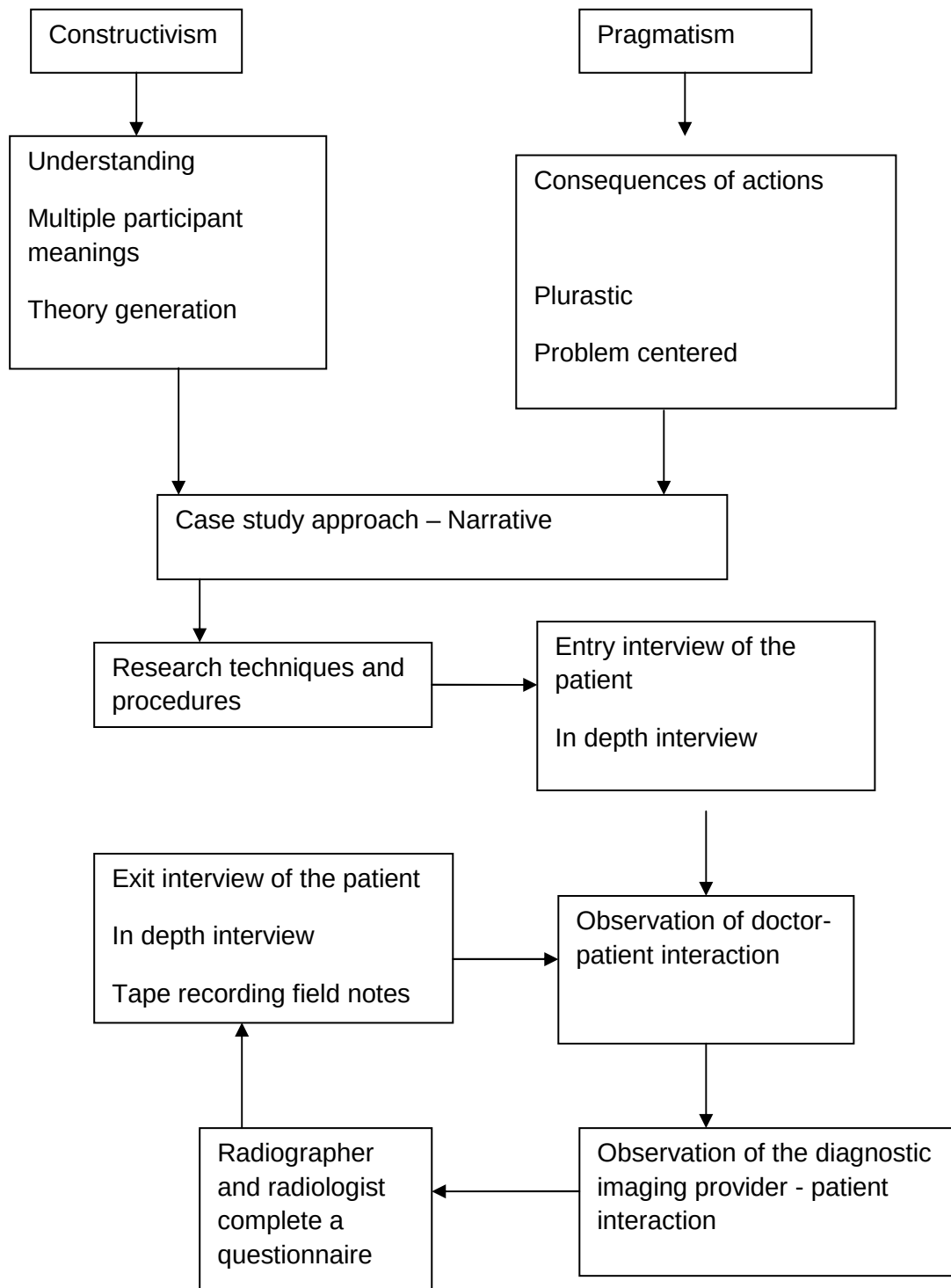
- Thank participants
- Switch off audio-recorder
- Note length of interview: minutes

Reflective notes:

APPENDIX I

EXCERPTS FROM FIELD NOTES AND THE REFLECTIVE JOURNAL

02/07/2008 Conceptual framework for research design



20 May 2010 – 30 August 2010 Data collection and literature review

I retrieve a Thesis titled:

Factors that influence General Practitioner Diagnostic Decision Making and a comparison with other stakeholders

Author: Callaghan KSN.

This study investigated factors that potentially bias diagnostic decision-making by general practitioners and the subjective value placed on these factors by different stakeholders. In their conclusion the findings favours the social constructivist model - “disease” versus “illness” ...

Possible interview question

Role of clinical info for radiologist and radiographer

Danger in interpreting tests, medical practitioner must take two independent decisions

- Test positive or negative
- Does the person have the disease

“If decisions are not made independently then bias can affect the accuracy of the test” (Callaghan KSN, 2006: 21). ...

Question: In my study should I not have the x-rays interpreted by the practitioner and then by the radiologist?

On case study no 1 – The general practitioner requested a right humerus, elbow, forearm and wrist. The general practitioner put up the right AP forearm and lateral humerus and then the lat forearm and AP humerus radiographs on the light box. He said that the radiographer did double x-rays and went on to explain that both joints must be included and the mid humerus that is where the white part is, that's where the patient is most painful. Then I asked him what does he mean by double projections and he pointed to the lat humerus and AP forearm and said that is all I wanted. I then explained to him the reason for the AP and Lateral projections.

The radiographer put the AP and Lat humerus together on the light box and the AP and Lat Forearm together. According to the radiographer the elbow was the most painful and the radiographer when radiographing the patient included the elbow joint on all projections.

The radiologist put the radiographs up on the light boxes the same as the radiographer. The radiologists' interpretation was a holistic approach after interpreting the request form she said that the doctor requested the whole right upper limb and the shoulder was not properly projected it is important that the radiographer does the shoulder projections. She then went sequentially to interpret the humerus then the elbow and then the forearm.

Cultural and socio-economic factors should be taking into account (Callaghan KSN, 2006: 30).

Assumed benefit of team decision-making - ... more informed choice than by single person (Callaghan KSN, 2006:31).

Question: In your opinion how can this be applied?

What implication will this have on the accuracy of diagnosis that is by shared diagnostic information?

Very little in medical literature on relationship duration of consultation and accuracy of diagnosis (Callaghan KSN, 2006:43).

"Gaming the system" and "falsification" of medical information ...influences diagnostic decision making (Callaghan KSN, 2006: 45)

HISTORY

history given by patient

the history written by the doctor does not correspond

history given by the doctor to justify an investigation

A diagnosis can bring a variety of benefits -

Cash payments

Access to health care (Callaghan KSN, 2006: 45)

Exaggerated history presented by patients

Practitioners give less weight to history provided by patients that is not objectively verifiable

When in doubt, diagnose illness - better to have a false alarm than a miss

Uncertainty (Callaghan KSN, 2006: 46)

Question: How does marketing influence diagnosis

Do you as practitioner get asked questions on a disease or illness and the diagnostic imaging procedure?

...

Patient is sent numerous times to the x-ray dept

How do I address this?

...

2010/09/30 Researcher bias and the theme trust during shadowing

...

Question

Do explanation tasks settle patient and physicians' views of medical facts and treatment?

Evaluating the role of explanation

...

Question

For this study diagnostic patient expectations before and after an investigation

Effects of framing

How is information presented regarding diagnostic imaging investigation?

According to Schwab (2008: 1866) information must be presented in a loss or gain frame. There is no neutral frame.

Physician decision-making

The effectiveness of holding physicians financially accountable for patient outcomes or for particular...

Justification for records – clinical history

Arkes and Hakness (1980: 574) address the possibility of mis-diagnosis when they recommend that experts like physicians note a diagnosis and all the symptoms observed that led to this diagnosis. Keeping these records avoids distortion of the symptoms presented through memory and also provides an easy reminder of the facts of a case, which may prove useful to combine with other feedback.

28 Jan 2011 – Individual case – common categories

Patient desires/ UNEXPRESSED expectations from the system

C03: 10-39, p3 [Patient with haemorrhoids]

...

My view:

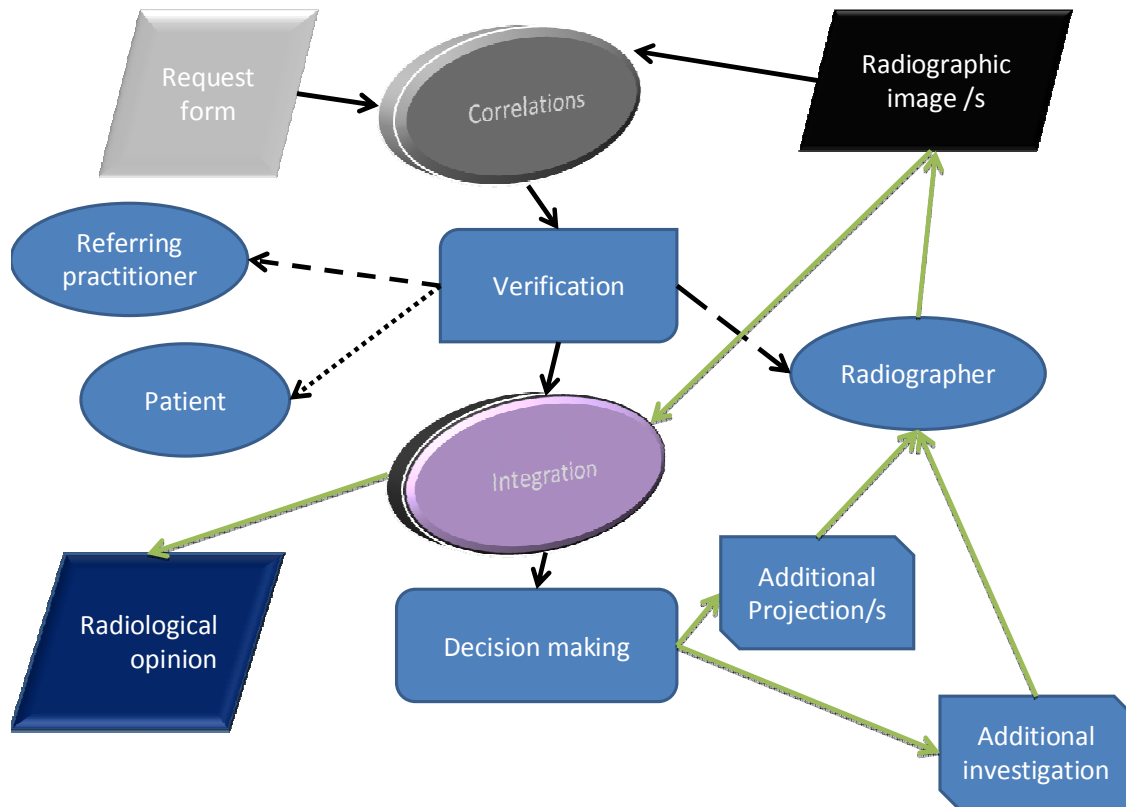
The patient expects a holistic approach by check everything. Regarding the condition “piles” the patient has decided to reject the condition. Does not want to even know about it because it may have caused the patient some bad experience as if the piles did something to the patient. Maybe indirect way of expecting the experts to take it away. (C03:24,31-34p3). There maybe some confusion regarding the labelling of “piles” and confused it his prostate problem

Supportive role of the researcher or mixing it with the MP:

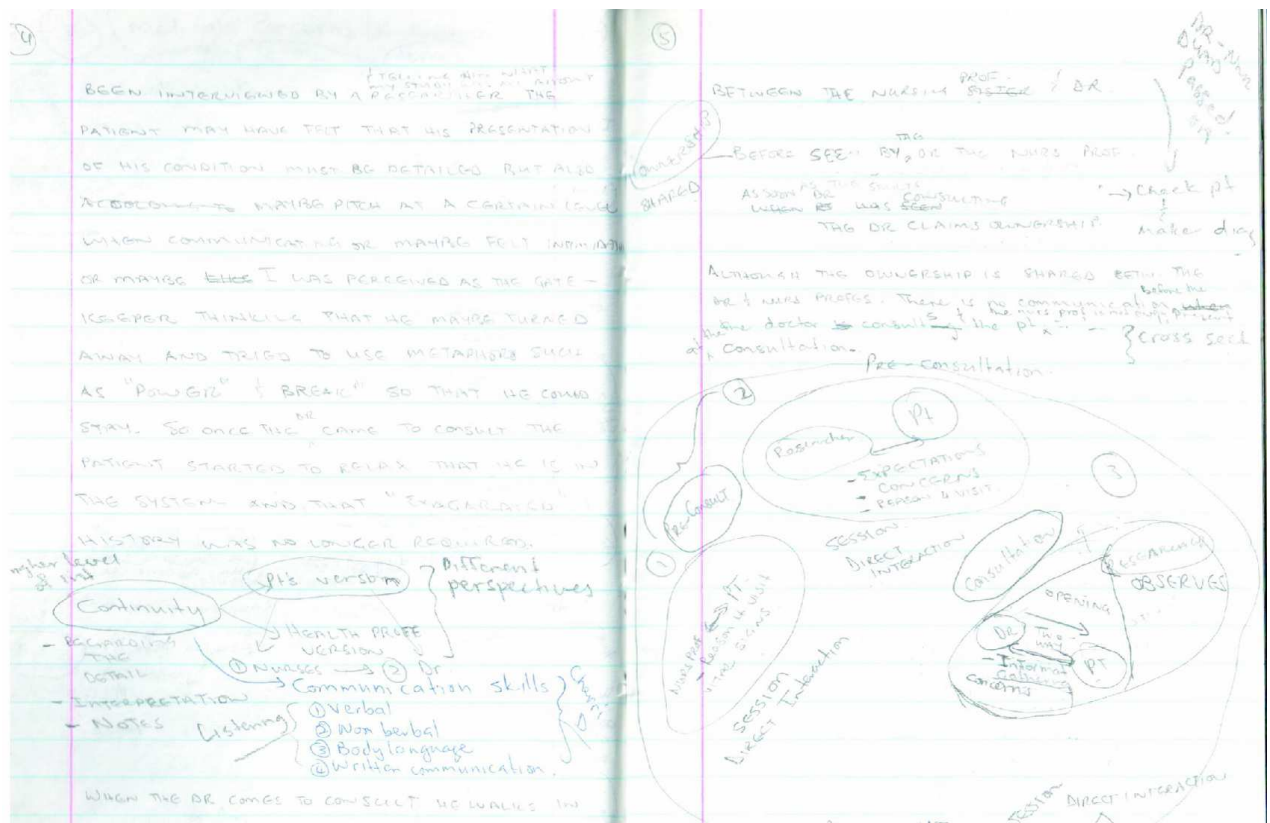
The patient saw the role of the researcher as a supportive role where the patient could confide about his sexual problem as this aspect was not told to the medical students and the nursing staff.

...

April 2010

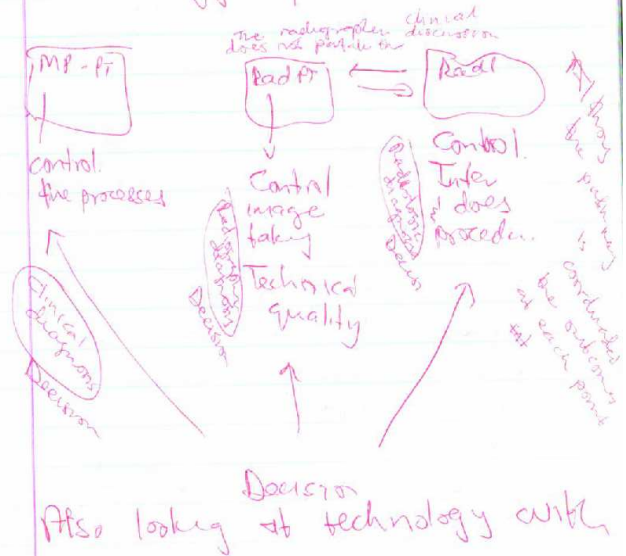


2010/11

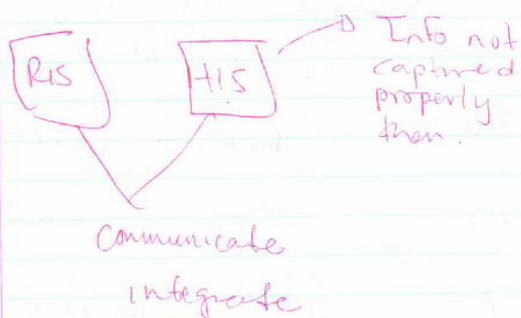


As the chain of events that unfold determines the referral pathway and the points & interactions. Each provider is governed by their professional rules and have competence in their field of expertise although the common goal is care & quality service delivery they have to make a decision sometimes which is contrary to the requested investigation so the decision making power is distributed to the extent that an additional project may be requested or done by a specialist, or radiographer may do it although not requested by or her judgment or the radiologist may request an additional project.

So the decision making is not central as in the consultation or a triage but rather a distribute network decision making power and integrated into the bigger picture



digital imaging is the distribution of networks and each communication point there is an independent operation

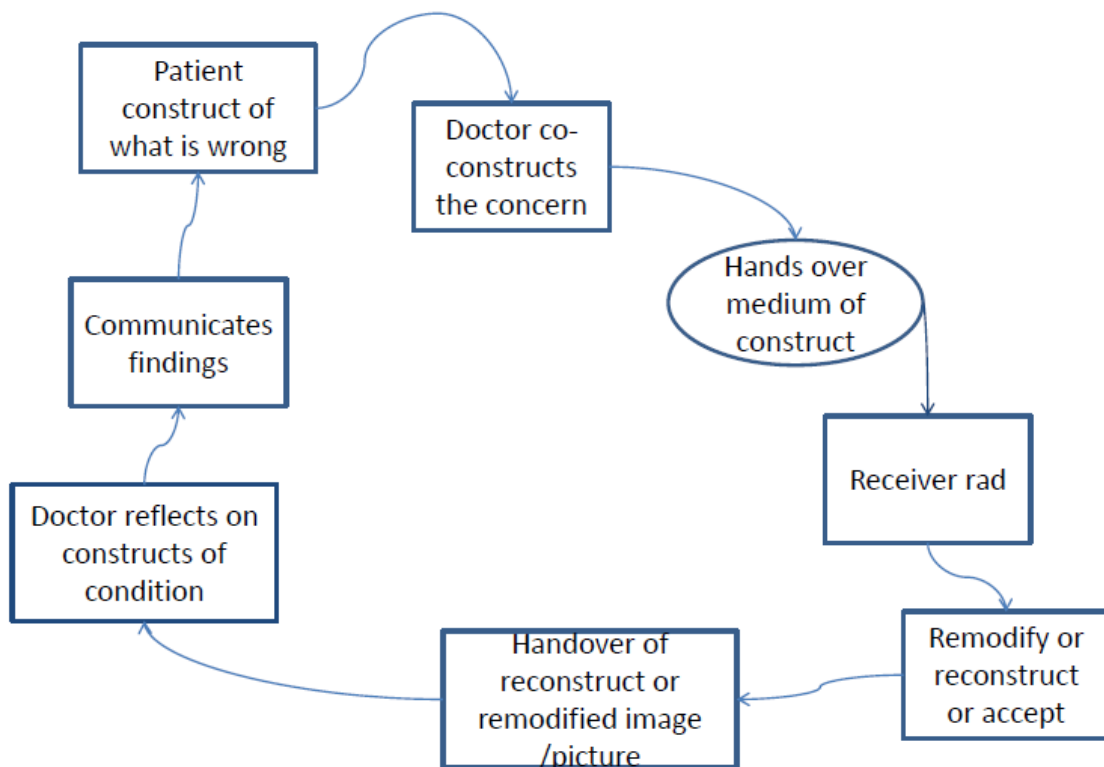


Then also there are those where the decision is provider centered ^{or} patient centered or technology centered so in the case of a typical

~~distributed and independent is when there is no obvious reason but just to make sure then the de~~

There is no centrality so the records cannot be transferred

October 2012



20 February 2013

Radiographer's role

A need for radiography professional awareness campaign

A need identified for education on radiation safety

A need for quality control

A need for multidisciplinary team effort

Role expansion:

A need for interpretational skills

Perceived role of the radiographer: communicating of the outcomes: a need

Patients desire to be part of the process

The need for the human resource to be addressed

The need for guidelines regarding the referral as well as the we do need some standard protocols

APPENDIX J

DATA STORAGE FORMS

Protocol No. _____

Principal Investigator Declaration for the storage of research data and/or documents

I, the Principal Investigator, **Chandra Rekha MAKANJEE** of the following study, titled

Decision making in diagnostic imaging investigations: A case study of processes and interactions between patients and health care professionals

will be storing all the research data and/or documents referring to the above mentioned trial/study at the following address: Department of Radiography Sciences, Faculty of Health Science, University of Pretoria, Level F5, Bridge E, Pretoria Academic Hospital.

I understand that the storage for the abovementioned data and/or documents must be maintained for a minimum of 15 years from the commencement of this trial/study.

START DATE OF STUDY: 01 November 2008

END DATE OF STUDY: 31 December 2010

UNTIL WHICH YEAR WILL DATA WILL BE STORED: 2025

Name: Chandra Rekha MAKANJEE

Signature:  _____

Date: 18 August 2008

Protocol No. _____

Supervisor's Declaration for the storage of research data and/or documents

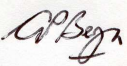
I, the Supervisor, **Dr AP BERGH**, for **Chandra Rekha MAKANJEE** for the study, titled

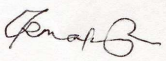
Decision making in diagnostic imaging investigations: A case study of processes and interactions between patients and health care professionals

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START DATE OF STUDY: **01 November 2008**
 END DATE OF STUDY: **31 December 2010**
 UNTIL WHICH YEAR WILL DATA WILL BE STORED: **2025**

Name of Supervisor	Signature	Date
Dr AP Bergh		18 August 2008

Name of Student(s)	Signature	Date
Ms CR Makanjee		18 August 2008

APPENDIX K

APPLICATION FOR TRANSFER

GPS: 02/03

TPH 94 (a) (81/511202)

PROVINCIAL GOVERNMENT • PROVINSIALE REGERING HEALTH • GESONDHEID

Hospital
Hospitaal

To: THE SUPERINTENDENT
Aan: DIE SUPERINTENDENT

Hospital
Hospitaal

APPLICATION FOR TRANSFER OF A PATIENT AANSOEK OM OORPLASING VAN 'N PASIËNT

Name _____ Hospital No. _____
 Naam _____ Hospitaal Nr. _____ Dr. _____
 Residential Address _____
 Woonadres _____

Age _____ Sex _____
 Ouderdom _____ Geslag _____

The above patient is AN EMERGENCY / A NON-EMERGENCY.
 Die bogenoemde pasiënt is 'N NOODGEVAL / NIE 'N NOODGEVAL NIE.

* State here/Vul hier in:
 Train/Trein
 Ambulance/Ambulans
 Private Transport
 Privaat vervoer

And is transferred to you by*
 En word na u oorgeplaad per*

(If by ambulance state reason)
 (Indien per ambulans meld rede)

Transfer was arranged in consultation with
 Oorplasing was gereël in oorlegpleging met

DIAGNOSIS
 DIAGNOSE

Clinical history and results of special investigations, X-rays, etc., already done:
 Kliniese geskiedenis en resultate van spesiale ondersoeke, X-strale, ens., reeds gedoen:

Reason for transfer (Investigation and/or Treatment):
 Rede vir oorplasing (Ondersoek en/of Behandeling):

Date
 Datum

Superintendent

REPORT (To be returned to original hospital) VERSLAG (Terug aan oorspronklike hospitaal)

Name _____ Hospital No. _____
 Naam _____ Hospitaal Nr. _____ Dr. _____

Government Printing Works (012) 354-4550

N.B: This form, in duplicate, to accompany the patient, third copy to be retained.
 Hierdie vorm, in duplo, moet die pasiënt vergesel en derde afskrif moet gehou word.