

# **Process Analysis and Inventory Classification at Garden City Clinic Operating Theatre**

by

**LOUISE ENGELBRECHT**

**25063295**

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*Executive Summary*

This document deals with the assessment of Garden City Clinic operating theatres' stock room and procedures which are followed in order to determine the causes of stock being lost. The project is divided into two sections. The first section deals with the stock room itself. Concepts of inventory, inventory management and control are roughly explained in Chapter 1. An overview on related literature concerning different classification techniques is also addressed. The aim of this section is to use ABC classification technique to identify items that account for a large portion of the total value but a small percentage of the total volume of items which are held in the stock room. The objective is to monitor and control these items with appropriate practices. Different types of monitoring technology are explained in the literature review. After the items are identified, an analysis of the classification is done which provides one with an idea of what the savings would be once these items are monitored and controlled.

The second section investigates the procedures which are followed within the operating theatre. The aim of the section is to identify activities and areas of leakages in the system which contributes to the loss of stock the operating theatre is currently experiencing. The approach used to accomplish this aim involves that one first need to understand the environment and the procedures which are followed in the operating theatre. Thus, a process map was created which shows the general line of procedures which are followed from the point of preparation for a surgical procedure to the end where the patient is in the recovery room in the operating theatre.

Background on process maps are provided in chapter one and two as well an explanation on how to read process maps which is discussed in the methodology (Chapter 3). Once basic understanding of the processes which are followed in theatre is obtained, the observation of different surgical procedures follow. The observations focus more on the activities concerning mainly the procedures which are followed by the nurses. These procedures are important since nurses work with the drugs, equipment and supplies (items) and the charging of the items to the patients. These are the main areas which can lead to the loss of stock. The observations were constructed using IDEF 3 tools. Therefore, to reach the objective of section two it is necessary to analyze the process models against formal procedure documents. A Blue print was constructed by taking activities from the formal procedure documents which can lead to the loss of stock. The analysis of the section deals with comparing the maps, models and documents against one another and interviewing nurses, staff and doctors to help identify and understand where and why stock is being lost.

Losses are divided into three sections namely 'nursing errors', 'stocked opened' and 'other reasons'. An indication of the 'Nursing Error' savings is proved by monitoring the classified items in the stock room for Garden City Clinic. The losses occurring from 'stock opened' are not included in the scope of this project, however recommendations are made. Lastly, the project identifies areas and activities which lead to the loss of stock. By implementing recommended changes a decrease in losses will occur for 'Other Reasons'. Therefore, the application of process analysis and inventory classification leads to an overall decrease of losses.

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## CHAPTER 1

### GARDEN CITY CLINIC OPERATING THEATRE

#### **1.1) Introduction**

Inventory Management and Control is a common field in Industrial Engineering. Many companies experience problems in this area. The same applies for Process Management and Improvement.

Garden City Clinic is experiencing a problem regarding the inventory management, control and procedures occurring in the operating theatre. Relevant concepts and definitions are introduced and explained with the purpose of understanding the problem and an attempt to address the problem in terms of Industrial Engineering principles and techniques.

#### **1.2) Background**

The project investigates two areas of operations in Garden City Clinic operating theatre. The first section concerns inventory in the operating theatre stock room. In this section, the background, concepts and the role of inventory is examined. The second section deals with the processes and procedures followed by staff, doctors and nurses throughout a surgical case. Processes and process models are briefly explained. This section is important as a lot of stock losses can occur from the breach of existing procedures or an active lack of such.

### 1.2.1) Inventory

---

Waters (1992:4) provides the following definition for inventory and stock: ‘Inventory is a list of all the items held in stock. Stock consists of all the goods and materials stored by an organization. It is a supply of items which is kept for future use.’

Before the eighteen hundreds it was considered a sign of wealth to possess a lot of inventory. The reason for this trend could be explained by the fact that communication was unreliable and difficult. The acquisition of the stock could also take long periods of time. Having a lot of inventory in the stock room ensures the availability of a required product but does require an extensive cash investment in the products and the storage space.

In the eighteenth and nineteenth century the forecasting, quality and reliability for products became more specialized. Reducing the amount of inventory a company carried became more popular. Inventory management was therefore required. Technology is the main provider to adequate management of inventory in modern companies. This helps companies to control, monitor and analyze their inventory.

Burt, John (1992) explains that Inventory control is the implementation of management's inventory policies in a manner that assures that the goals of inventory management are met.

The goal of inventory control is to assure that the optimum levels of inventories are available and that there are minimal stockouts (i.e. running out of stock). It also includes that inventory is maintained in a safe and secure place where it is accessible to the personnel.

### 1.2.2) Processes

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#### Processes

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The American Heritage Dictionary defines a process as a series of actions, changes, or functions bringing about a result.

Deming (1982) stated that the first step in gaining control over an organization is to know and understand the basic processes. This can be done through process mapping.



Process mapping refers to the exact activities which take place in an organization, the person responsible for the activity and what the activity requires to be completed. Flowcharts can be the first step towards creating process maps. The Britannica Concise Encyclopaedia (2006) defines a Flowchart as a graphical representation of a process, such as a manufacturing operation or a computer operation, indicating the various steps taken as the product moves along the production line or the problem moves through the computer.

Typical Flowcharts consist of a set of symbols representing the various functions. The sequence of these functions and how they are related to other functions are illustrated by means of linking arrows between the functions. Flow charts can be constructed in different levels of detail. A flowchart can represent an overview of an entire system to a detailed representation of a process within a larger system.

### Process Models

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The term Process Model can be used in different contexts. For the purpose of this project, process models are defined as:

models which are constructed through the observation of different surgical procedures. These models display how work was actually done during surgical procedures.

### **1.3) An Overview of the Current Situation in the Operating Theatre**

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A patient enters the operating theatre with a 'charge sheet'. The charge sheet is completed during the operation and in the recovery room, stating all the medicine and equipment used on the patient. The patient is then charged for the used items listed on the charge sheet.

Procedures of obtaining stock from the stock room simply work on the principle: take what you need and remember to charge the patient for what has been used. Any stock not used must be returned.

## **1.4) Project Aim**

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The aim of the project is to reduce the loss of approximately fifty thousand rand each month occurring in the operating theatre of Garden City Clinic Hospital. This will be done by designing a new or improved system where safe guarding against all leakages is of utmost importance.

## **1.5) Project Scope**

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The project is limited to the operating theatre of Garden City Clinic Hospital. The operating theatre includes the stock room in the operating theatre. The pharmacy of Garden City is not included in the scope of this project. The project is concerned with the control of the stock leaving the stock room for the use in an operation and the procedures and processes followed in the operating theatre.

## **1.6) Overview of the Project Chapters**

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- The goal of chapter one is to provide the reader with an overview of important concepts in order to understand the following chapters.
- A literature study is done in chapter two with the objective to provide the engineer with the knowledge of different approaches applicable.
- Chapter three explains the methodology which will be followed. The objective of chapter three is to classify the stock into groups and to create process maps of the current situation. Analysis of the current situation follows where process leakages and areas of improvement are identified. This is done with the help of creating process models.
- Chapter four includes the findings and results of the methodology which was followed.
- Conclusions and recommendations are made in chapter five with the objective to provide an overall view of the project that was conducted in the operating theatre of Garden City Clinic.

## CHAPTER 2

### Literature Review

To solve the problems Garden City Clinic are experiencing and to achieve the aim of the project, a clear understanding of the relevant concepts need to be formed. Literature Review is essential to provide the engineer with the knowledge of different approaches which have been used and applied in the past. This includes the investigation of solutions that have been developed in other industries facing similar problems and has been proved beneficial. The review is divided into two sections. A study on Inventory was undertaken followed by a study of the Process Flow and Improvement in the Operating Theatre.

### *Inventory*

The objective of inventory management is to make appropriate decisions regarding the level of inventory. Any inventory system must specify when an order is to be placed and how many units to order. In practice there are a lot items involved and it is therefore not practical to model and control each item with equal attention. Classification of inventory is thus necessary.

Inventory plays a crucial role in the stock room of the operating theatre and contributes to the loss Garden City is currently experiencing. Investigation of Classification of inventory follows.

#### **2.1.) Classification of Inventory**

The Barron's Business Dictionary defines Classification as follows:

1. Classes or grades by which jobs are evaluated.
2. Any method of categorizing business activities and products.

Classification of Stock is done in order to determine a specific group of drugs which need to be monitored and controlled by technology. Different Classification methods of inventory are described below.

### *2.1.1) ABC Classification*

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ABC Classification is based on the Pareto Principle. The Pareto Principle is also known as the '80-20 Rule'. Pareto separates the 'trivial many' from the 'vital few'. The Principle states that 20% of the causes are responsible for 80% of the effects.

The most frequently used inventory classification system is the ABC classification system. The limitation to this system is however the fact that it can only consider one criterion. The criterion is usually the annual costs to purchase an item. The ABC classification divides the inventory into three groups based on the annual cost of purchased items. The three groups used in the ABC analysis are usually as follows:

**A items:** (High Value items) approximately 15 to 20 percent of the items that account for 75 to 80 percent of the total annual inventory value.

**B items:** (Medium Value items) approximately 30 to 40 percent of the items that account for 15 percent of the total annual inventory value.

**C items:** (Low Value items) approximately 40 to 50 percent of the items that account for 10 to 15 percent of the total annual inventory value.

There may however be other criteria which are considered important to managers by which the inventory can be ranked:

Vollman et al. in Mare(2007) lists the following attributes by which items can be ranked:

- Annual Rand volume of the transaction
- Unit Cost
- Lead time
- Storage Requirement for an item
- Cost of Stock out
- Engineering design Volatility

- Criticality
- Substitutability

In many instances more than one criterion becomes important to classify items of inventory. In such instances multi-criteria classification is needed.

### *2.1.2) Multi Criteria Inventory Classification methods:*

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#### **MASTA Approach**

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Multi attribute Classification models are able to manage multiple criteria and factors, sometimes conflicting with each other. One such approach is the multi attribute spare tree analysis (MASTA) that has been put forward by Braglia et al (2004).

The MASTA approach answers the following questions:

- Which parts to stock
- How many units to stock

By following the drug classification structure of MASTA the following steps are necessary:

The first step concerns the criticality analysis based on logic trees. Each drug is checked to identify its criticality. The criticality of each drug can be described as, critical, important or desirable. Each drug must also be attributed.

The second step will determine the inventory and stock strategy for each drug in order to optimize the hospitals inventory. The advice of experts (doctors and pharmacists) is essential in order to assign the correct characteristics and attributes to the drugs.

## Multi Attribute ABC Classification Methods

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There are different approaches to classify inventory when more than one criterion is used. These approaches are described below.

- Analytical Hierarchy Process (AHP) can be used for ABC Classification. This was introduced by Saaty (1980). The advantage of this method is that it can integrate many criteria and it is easy to use in large accounting and measurement systems. On the other hand, there is a great amount of subjectivity involved in pairwise comparisons of the criteria.
- Guvenir and Erel (1998) introduced an algorithm to classify inventory. This is known as an Artificial intelligence method and used for multi criterion inventory classification. Artificial neural network is another artificial intelligence based technique which can be used to classify inventory.
- Ernst and Cohen (1990) presented a methodology based on statistical clustering. The main advantage of this approach is that it can accommodate large combinations of attributes. However, this approach requires substantial data, the use of factor analysis, and a clustering procedure. This may be impractical in typical stockroom environments.
- Multi Criteria ABC Classification:  
Flores & Whybark (1986) have proposed a matrix-based methodology. A joint criterion matrix is developed in the case of two criteria. The approach begins with selecting another criterion in addition to the cost criterion. The second step requires the stock keeping units to be classified into three groups according to the level of importance A, B, C. The model then re-classifies the stock keeping units into smaller groups i.e. AA, BB, CC which represents the three inventory control groups. This joint criterion matrix is shown in figure 2.1.

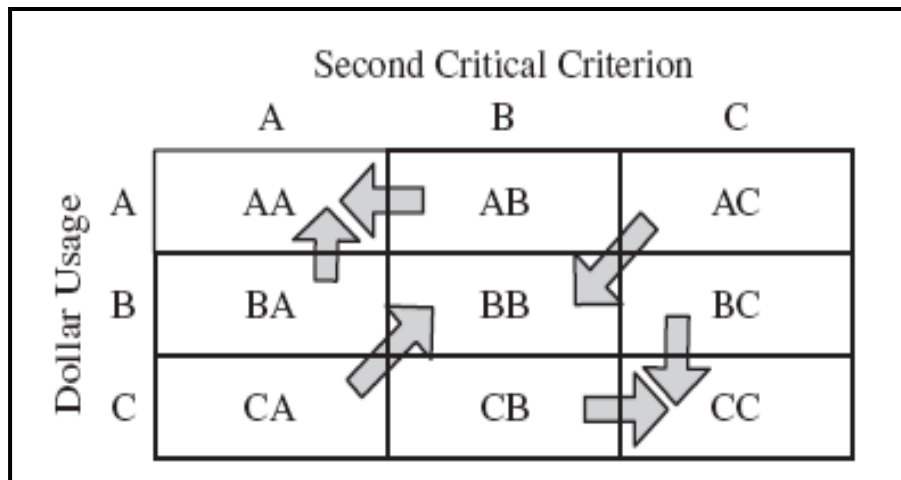


Figure 2.1: Joint Matrix for two Criterion

The Flores and Whybark methodology considers two criteria and is a simple and efficient method which can be applied and used to classify stock.

## 2.2) Technologies

The purpose of the classification technique is to identify the inventory (drugs) which contributes mostly to the loss incurred each month. The aim is to monitor these drugs by implementing new technologies. This will reduce the amount of errors occurring in the control of such drugs in the system. Different monitoring technologies are investigated below.

### 2.2.1) Radio Frequency Identification

Radio frequency identification is a method which can store and retrieve data using devices called RFID tags. RFID tags can be an adhesive sticker which is attached onto a product. They are made of an antenna connected to an electric chip. The chips transform energy of radio frequencies from an RFID receiver or transceiver. It responds by sending back information they contain. Finally a computer with RFID application is required which processes the data it sends.

The identification by radio frequencies (RFID) can be applied to a hospital to transform the hospital into a smart hospital. This can benefit hospital performance by creating a system which optimizes business processes, reduces errors, increase patient safety and enhances the quality in services.

Characteristics of RFID tags:

- Possible to scan tags in motion
- The tags do not need to be in sight of the RFID reader since radio waves can pass through most solid objects.

Patrik and Dominique (2006) conducted a study on building a smart hospital with RFID technology. They included several applications of RFID and how it can enhance a medical facility. These are listed below:

- Medical equipment must be tagged
- The doctors, nurses and staff wear a ‘smart badge’ storing their employee ID number.
- On arrival, each patient receives a wristband with an embedded RFID tag storing a unique identifier and information about the patient (picture, patient code...)
- All patients’ medical histories and other important documents are tagged with self adhesive RFID labels containing a unique number.
- Blister packs and other drugs; packages all contain RFID labels.
- Bags of blood are attached with a self adhesive RFID label holding a unique identifier, the hospital tracking number and some important information of the contained type of blood.
- RFID readers can be placed in strategic places in the hospital:
- RFID gates are placed at entrances and exits of the hospital
- Each operating theatre contains at least one RFID reader
- RFID readers are placed in important galleries and offices
- The doctors, nurses and staff each have a handheld equipped with a RFID reader and possibly with a wireless connection to the web



RFID is the best suited for tracking equipment. It enables automated and fast tracking of equipment, medicines, patients and documents. It can also be used to avoid theft. Many other applications of RFID can be used in a hospital. RFID technology is however a particularly expensive technology to implement.

### *2.2.2) Bar Coding*

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The Small business Encyclopedia (2002) defines Bar Coding as follows:

Bar coding is an automatic identification technology that allows data to be collected rapidly and accurately from all aspects of a company's operations, including manufacturing, inspection, transportation, and inventory elements.

Bar coding can provide inventory control, inventory management, route accounting, etc. It is convenient, quick and accurate data entry method.

There are different types of bar coding technology. Wireless technology has become popular in bar coding and operates in real time. Batch reporting is another common option but does not operate in real time.

Wireless Bar coding:

Wireless Bar coding is real time technology. Data can be tracked by employees using handheld devices such as scanners. The handheld devices can receive information and record updates continuously. The data is transmitted directly to the company's information systems and is therefore updated instantaneously.

Batch Reporting:

Batch reporting is less expensive than wireless bar coding and does not operate in real time. Data is collected over a day and then at the end of the day recorded onto the system.

Figure 2.2 is an example of an upcoming barcode process in the health care environment:

It is designed to address medication administration errors. As seen from the figure the technology consists of hardware, software and includes bar coding printing systems for patients' wristbands and for the use of medication and administration. Portable barcode scanners are interfaced with computers near patient beds, pharmacy, other important databases and administration.

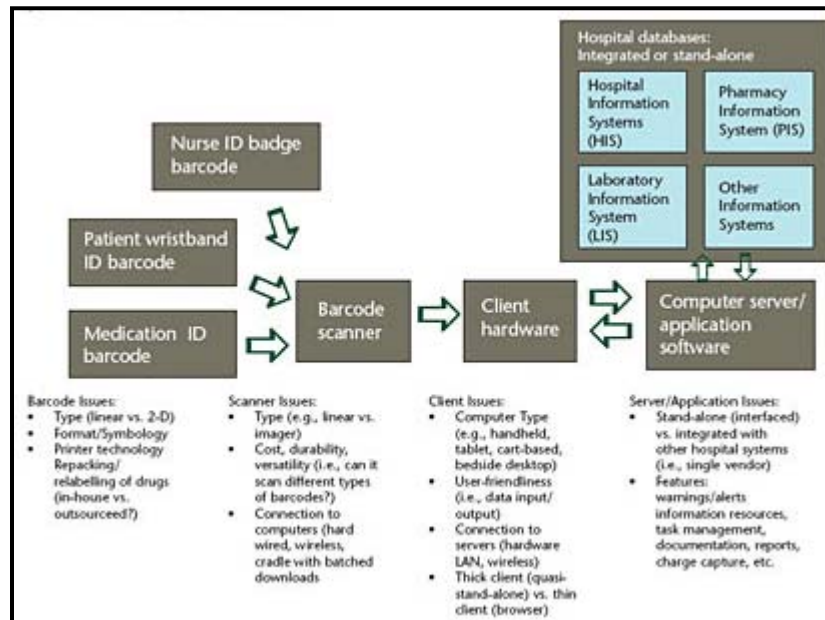


Figure 2.2: Bar Coding Process in the Health Care Environment

The process starts with nurses scanning in their ID bar code, the patients' wristband barcode and the current barcodes of the medication packages.

There are three types of barcodes: Linear (one dimensional), two dimensional or composite (combined 1D and 2D).

Linear barcodes are the standard barcodes. They include 10-digit National Drug Code (NDC) number that identifies the manufacturer, product, and package size. Alternatively the two dimensional bar code can contain a lot more information. Figure 2.3 shows the different types of bar codes.

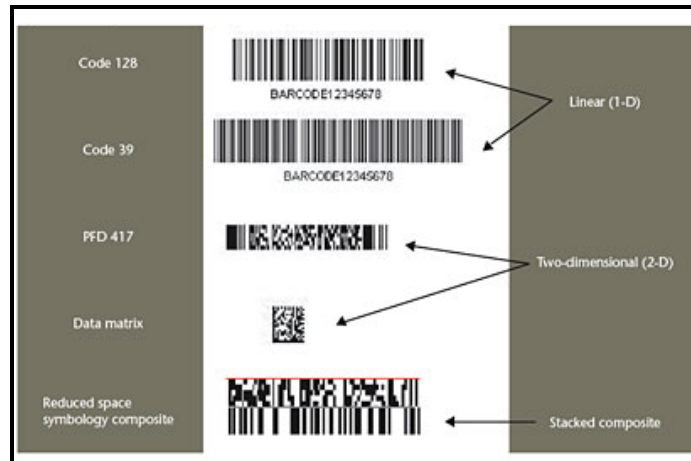


Figure 2.3) Bar Code Types

Considering that ABC Classification will be used, the number of products identified will be approximately twenty percent of the total of products in the stock room. For this reason the most suitable tracking and monitoring device would be a Bar Coding System.

## Process Flow and Improvement

Davenport (1958) defines a process as “a specific ordering of work activities across time and place, with a beginning, an end, and clearly identified inputs and outputs: a structure of action”

A better understanding of an organization depends on the understanding of the activities, procedures and processes currently adopted by the organization.

This is done through Process Mapping and is explained in section 2.3. Once process maps have been created for a system it is required to analyze the processes and identify areas of improvement and leakages in the current system. This is done through process modeling which is explained in section 2.4.

### 2.3) Process Mapping

American Heritage Dictionary defines Business Process Mapping as follow: The activities involved in defining exactly what a business entity does, who is responsible, to what standard a process should be completed and how the success of a business process can be determined

Process Mapping may be used in a variety of performance improvement applications. Process mapping involves a set of maps that can show customer supplier relations, functions, steps and tasks. Therefore, process maps show how work is currently being done throughout the organization.

## **2.4) Process Models**

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As already defined in Chapter one, process models are defined to be models which are constructed through the observation of different surgical procedures. These models display how work was actually done during surgical procedures.

Process models can help the analyst to identify data sets, formalize workflows and define mandatory steps and user needs. The objective is to define a process model which outlines a process in terms of roles, activities, documentation, objectives and indicators.

This can be done through:

- Observation and interviewing
- Facilitated group decision making
- Performance analysis

The goals of a process model according to Rolland, C. (June 1993) should be

- Descriptive
  - Track what actually happens during a process.
  - Takes the point of view of an external observer who looks at the way a process has been performed and determines the improvements that have to be made to make it perform more effectively or efficiently.
- Prescriptive
  - Defines the desired processes and how they should/could/might be performed.
  - Lays down rules, guidelines, and behavior patterns which, if followed, would lead to the desired process performance. They can range from strict enforcement to flexible guidance.
- Explanatory
  - Provides explanations about the rationale of processes.

- Explore and evaluate the several possible courses of action based on rational arguments.
- Establish an explicit link between processes and the requirements that the model needs to fulfill.

These models are used in the analysis phase where leakages in the current procedures are identified as well as areas of improvement.

Thus, through process analysis, the current processes in Garden City operating theatre will be identified, analyzed and the existing processes will be improved to meet the new goals and objectives. Process models are therefore roughly anticipated models which will be used to design the final re-designed processes.

## CHAPTER 3

### Methodology

The methodology consists of two sections. It starts with explaining the steps which will be followed to classify the inventory in operating theatre stock room. The second section describes the steps which will be taken regarding the process flow and improvement of procedures which are followed in the operating theatre.

#### 3.1) Inventory Classification

The figure below illustrates the necessary steps to be taken for classifying the drugs/equipment (items) in the operating theatre stock room.

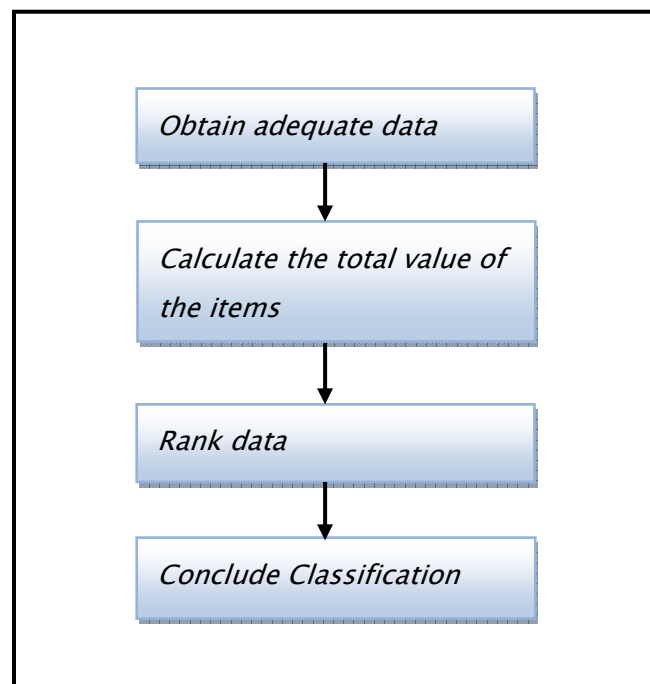


Figure 3.1) ABC Classification

The items in the stock room are classified according to the ABC classification principle. Data need to be obtained where each item and its related unit cost are listed. There is a pre-determined quantity (safety stock) to be held in theatre for each item. The items which are used during a day are recorded onto the system by the night staff. This process automatically goes through to the pharmacy and these items are then usually replaced the following morning. Classification is therefore done on the pre-determined quantity of each item which should be held in theatre.

Once the correct data is obtained, the total value for each item is calculated [item cost multiplied by the quantity]. The results are then ranked in a decreasing order according to the total value of the items and are placed into three categories which are often called ABC Codes. The weights assigned to these categories may differ, but for the purpose of this project the following will be used:

‘A Class’ - this category will typically contain items that account for 80% of the total value in the stock room.

‘B Class’ – items will account 10% of the total value.

‘C Class’ – items will account the remaining 10% of the total value.

By using the ABC classification technique items are identified to which attention must be drawn to monitor these items more effectively. These items are represented by the ‘A Class’ category.

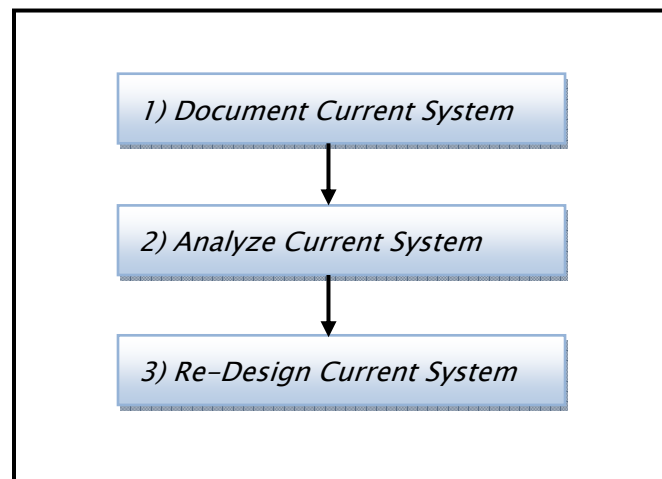
### **3.2) Process Flow and Improvement**

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The aim of this section is to follow a methodology which will result in a new re-designed system placing focus on aligning the new systems’ processes and procedures with the operating theatre’s policy, standards and procedure documents. Minimizing the loss of stock in the operating theatre is of utmost importance (as discussed in chapter 1).

The section below describes the steps to be taken to identify flaws, areas of leakages and inconsistencies in the current systems’ processes and procedures. It also includes identification of current procedures which are worthwhile to carry over into the new designed system. Interaction with nurses, staff and doctors forms a great part of the methodology and will contribute to the design of the new system.

The figure below illustrates the actions which are taken to develop a new proposed design:



*Figure 3.2) Process Flow and Improvement Methodology*

### **Document the Current System**

As stated previously in the document, the first step in gaining control over an organisation is to know and understand the basic processes and procedures. This can be done through process mapping. Through observation, enquiring and speaking to people in the system an idea of how the system works can be developed. It is important to check with the head matron of the operating theatre to ensure that your external understanding of the processes and procedures are correct.

A Process Map is created to understand the system and environment under investigation. It graphically shows how things/activities are performed throughout the system. The process map is created using the Knowledge Based Systems Inc. (KBSI) which is a provider of IDEF tools.

The IDEF Process Mapping methodology facilitates process understanding, analysis and improvement of the processes. The map can be used to describe what a process does, what controls it and by what means the activities are performed. It also indicates what the outcomes of the processes are. This is illustrated in figure 3.3.



Interpretation of a box:

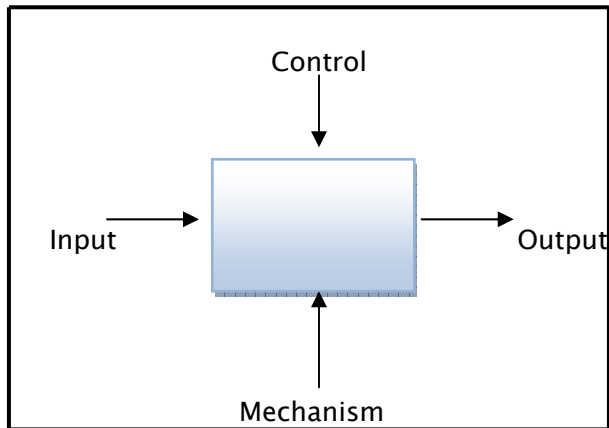


Figure 3.3) IDEF Box

**How to read the process map:**

The process map is made up of a collection of diagrams arranged in a hierarchical manner (top down approach). The IDEF process map consists of hierarchical series of diagrams which shows different levels of detail describing the process in the operating theatre. This is illustrated in Figure 3.4 below.

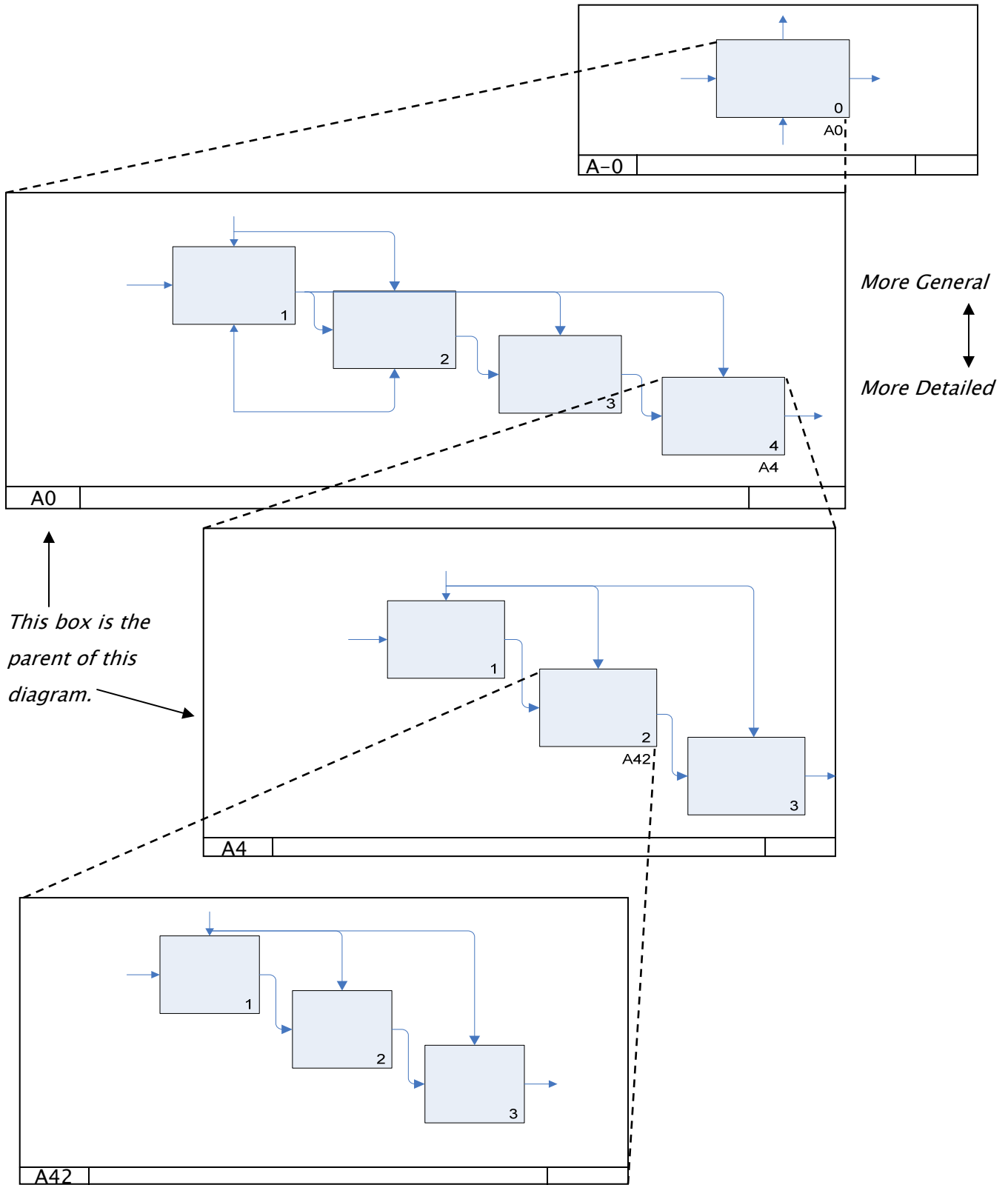


Figure 3.4) Process Activity Graphic Representation

**Analyze the Current System**

Desirable information is needed to analyze the current system for a successful analysis of the operating theatre, as stated below:

- 1.) A general perception and understanding of the processes and procedures followed in the operating theatre. This is documented in the IDEF 0 process map. Refer to Appendix A.
- 2.) Information regarding the operating theatre policy, standards and procedures. A blue print of a circulating person (Nurse) in theatre is constructed. This is done according to Netcare procedure documents. Refer to appendix B.
- 3.) The observation of different scenarios of processes and procedures followed during surgical procedures. An example of a process model is attached in Appendix C.

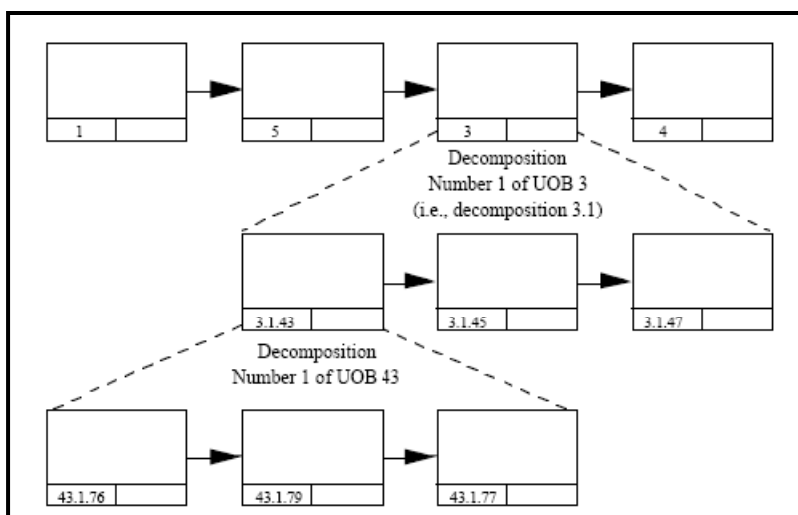
It is therefore necessary to elaborate on the observations of surgical procedures.

Surgical procedures are observed from the point where preparation is done for the operation up to the point where the patient is in the recovery room after the operation. IDEF3 process models are created for these observations. The observations are seen as models to create analysis data.

Different diagrams with multiple viewpoints of processes are captured and recorded.

**How to read process models:**

The basic flow of the process model is similar to that of the IDEF 0 process maps. Figure 3.5 illustrates a graphical representation of process models.



*Figure 3.5) Process Model Graphic Representation*

Process models are more complicated than process maps. It is therefore necessary to understand the different symbols which can be used in process models. This is shown in figure 3.6. Processes or units of behavior (UOB) describe the general flow of the processes. The junctions specify the logic of the process flow, while the referents allows one to add additional detail to an individual process, links, junctions or process flow.

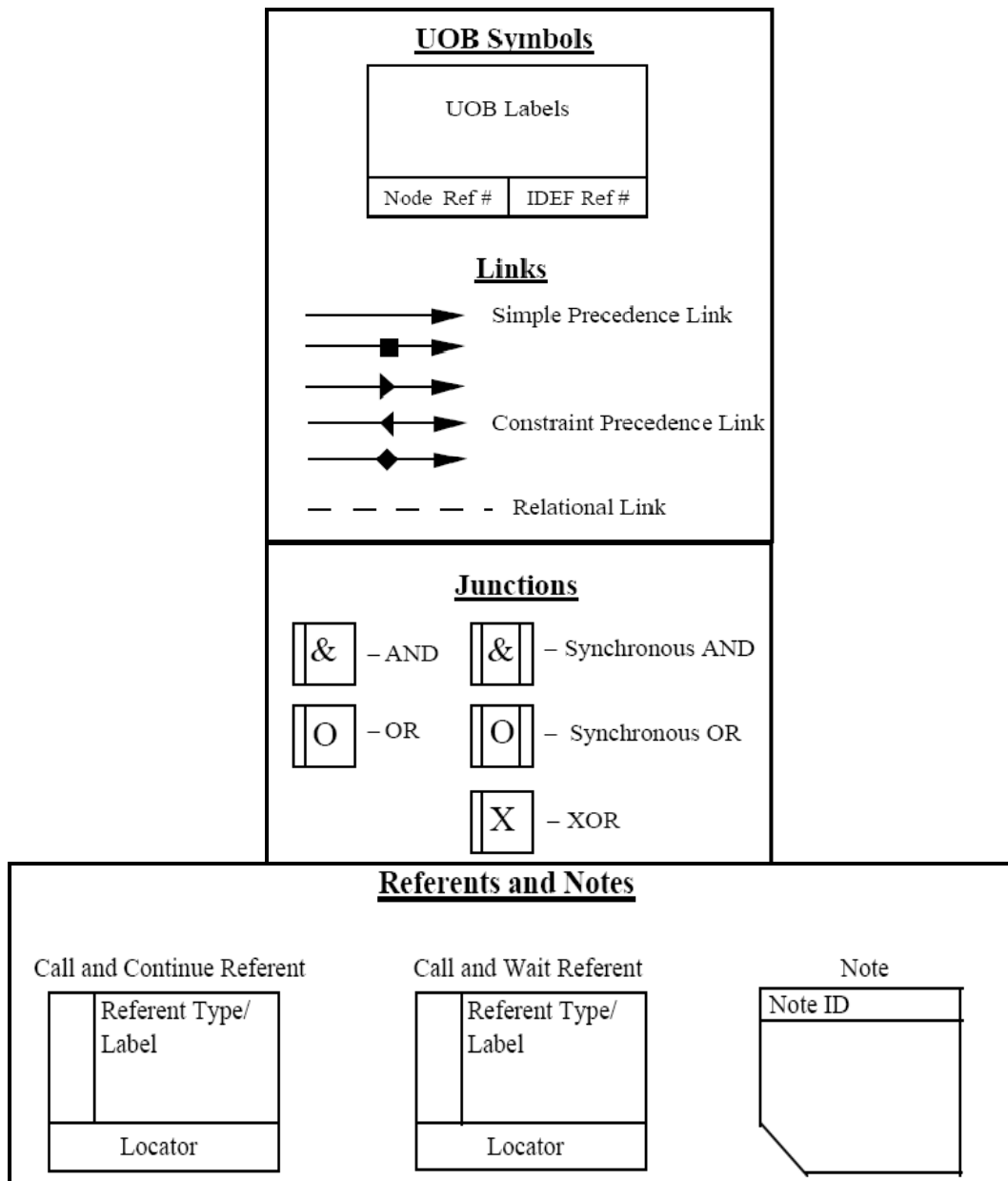


Figure 3.6) Process Model Symbols

The goal of the analysis is to compare the different documents against one another and use valuable information and findings to design the new proposed system.

This includes:

- To determine how well the current system is helping to meet the objective of reducing the inventory loss and identifying problems in the current processes and procedures
- To identify which of the current activities and features should be carried over to the new proposed system design
- To study the procedure and policy documents. This will help identify flaws in the current system and even statements in the documents itself can also be questioned.

Figure 3.7 shows how the analysis is conducted.

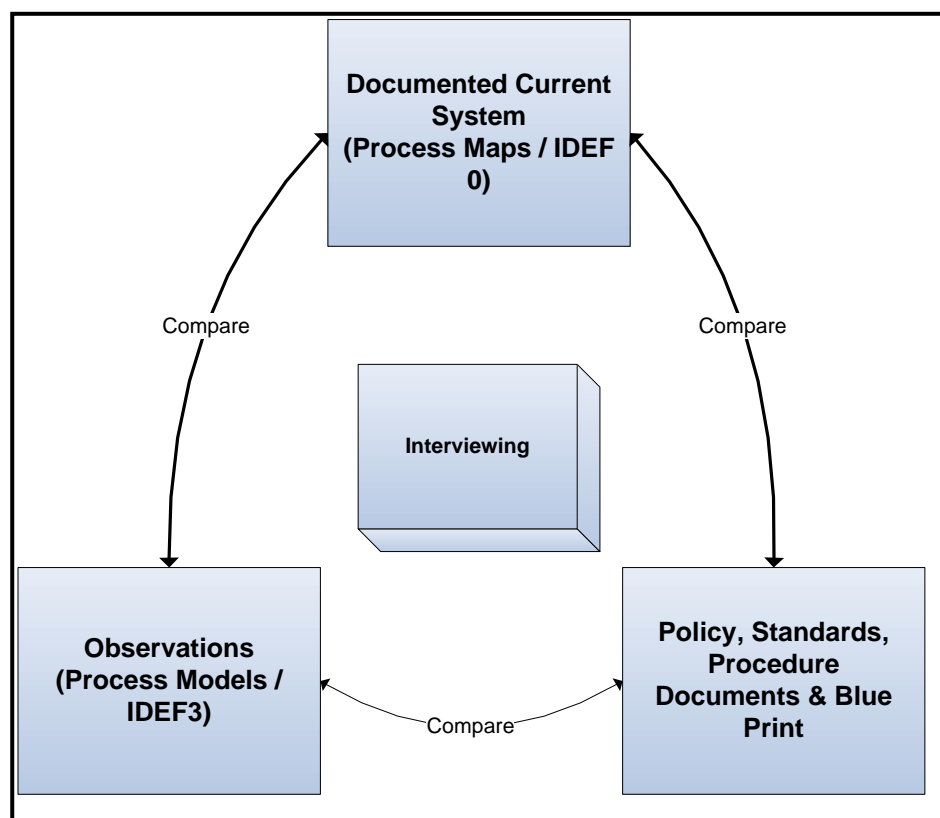


Figure 3.7) Analysis of the System

The following can be asked when comparing the different documents against one another:

- 1.) Which activities from the process models do not correspond to the general activities on the current system's process maps?
- 2.) Which activities, from both the process maps and models, do not obey the operating theatre policies, standards and procedure documents?
- 3.) Which activities obey the policies, standard and procedure documents?

The following must also be done:

- Identify from the process models, the activities which occur to be unique or out of line to any of the normal activities on the process maps.
- Identify activities which have to do with the charging of items which can contribute to the loss of stock.

Another information gathering technique which is used to analyze the system is through conducting interviews. Interviewing people in the system gives a better grasp of problems which occur in the system. Strengths and weaknesses of the current system are also more easily addressed and visible. Interviewing helps with the specification of the requirements for the new proposed system.

Once the comparisons are done, interviewing can be used (where applicable) to answer the following questions:

- 1.) Why is the activity done the way it is?
- 2.) Why did they not obey what is stated in the policy, standards and procedure documents?
- 3.) How would they prefer doing a certain activity and why?
- 4.) Do you have any recommendations to what must be included into the proposed design and why?
- 5.) Do you know of any other procedure which you would want to change, and why?

The following four steps will conclude the analysis:

- 1.) Determine which steps of the current system is unnecessary
- 2.) Determine information requirements not adequately served by the current system
- 3.) Identify major performance problems related to the loss of stock
- 4.) Determine which parts of the current system may be retained in the new proposed system

The goal therefore is to design an optimal proposed system where attention is focused on important decisions to be made while masking irrelevant information and unneeded complexity.

## CHAPTER 4

### Findings and Results

Chapter four provides feedback of the methodology which was followed. It begins with the findings and results obtained from the classification of stock where after the current system and the analysis of the current system are explained.

#### 4.1) Classification of stock

A list of drugs/equipment (items) used in the classification process is attached to Appendix E. Classifying the stock resulted into an ‘A Class’ category which account for a large portion of the overall value in the stock room but a small percentage of the overall volume in the stock room. The ‘A Class’ category is represented by the items which are colour coded in Appendix E. [Note: the data used for the classification is somewhat different of that which appears on the charge sheet. The reasons are that full names, different sizes and dosages are listed in Appendix E. On the charge sheet simplified/shorter item names are used. The charge sheet does not distinguish between all sizes and dosages available and does not include all the items which can be obtained from the stock room. The items not listed on the charge sheet are normally hand written onto the charge sheet or a bar code is attached to the item.

Various items listed in Appendix E appear with a *Quantity* of zero. These items are not held in stock in the operating theatre and are ordered when needed. This makes no difference to the classification process since these items do not contribute any value in the stock room.]



What will the effect be on the *Theatre Stock Losses* if the ‘A class’ category items of the classification are to be monitored and controlled?

The graph below indicates the total losses per month which occurred in the operating theatre stock room for October 2007 until September 2008.

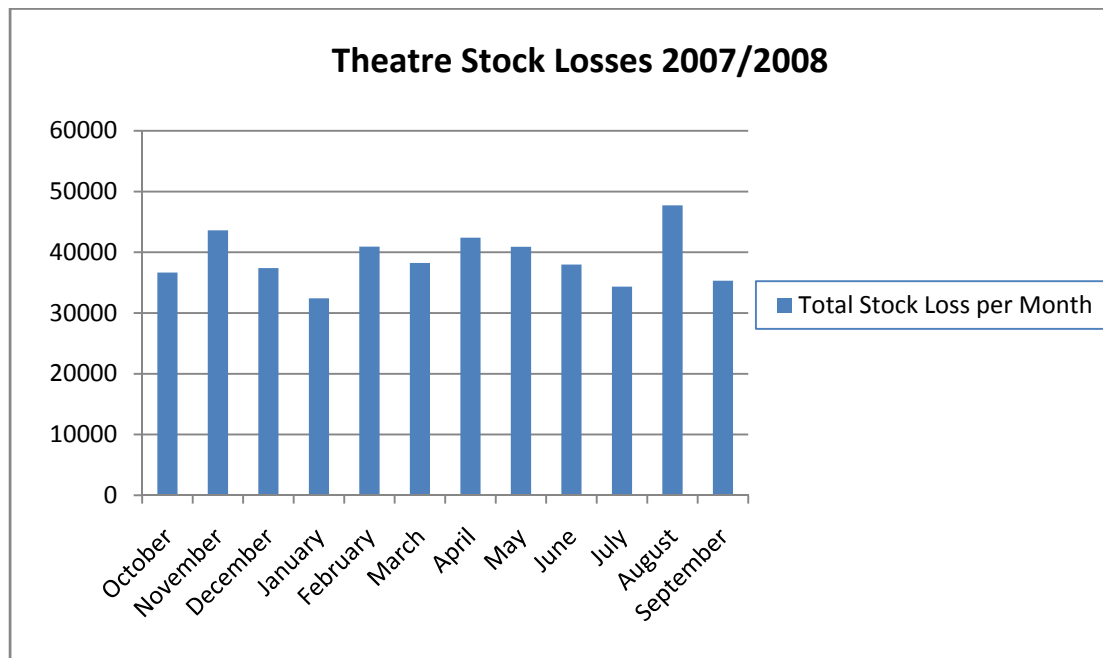


Figure 4.1) Theatre Stock Losses 2007/2008

The losses for each month are divided into three parts namely ‘Nursing Errors’, ‘Stock Opened’ and ‘Other Reasons’. Refer to figure 4.2 below. It is clear that ‘Nursing Errors’ contribute the largest portion of the losses experienced each month.

‘Stock Opened’ refer to sterile items which were opened but not used during that specific surgical procedure. Once sterile items are opened they have to be used in the current surgical procedure. ‘Stock Opened’ can never be used since they are non-sterile and is therefore thrown away. It is apparent that these items contribute the least value to the losses each month.

‘Other Reasons’ involves stock being lost where no explanation or data could be given to where these items might have gone lost.

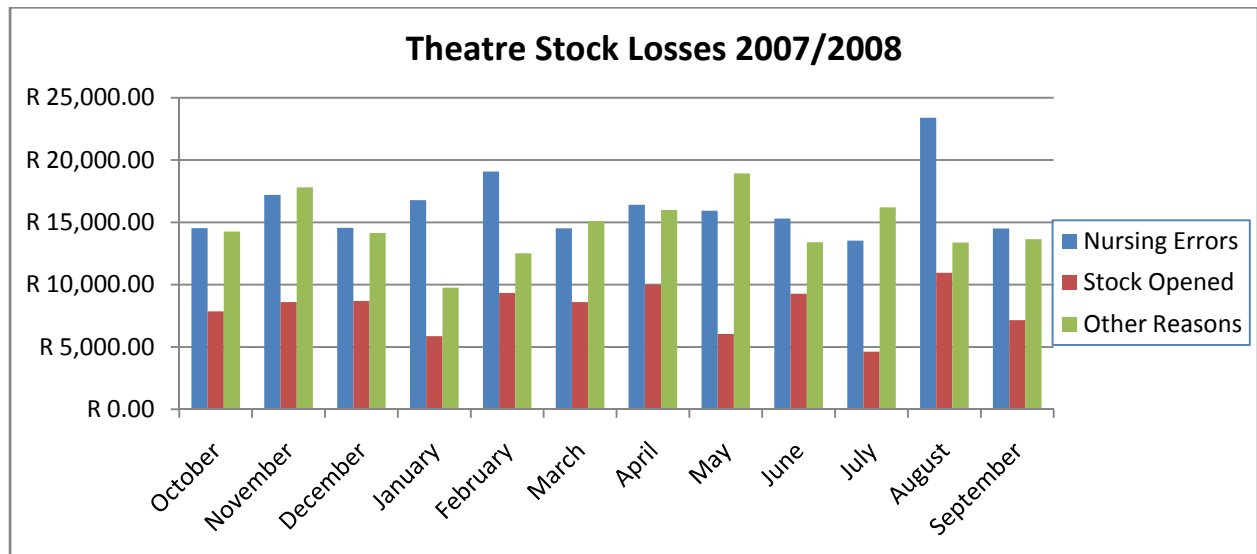
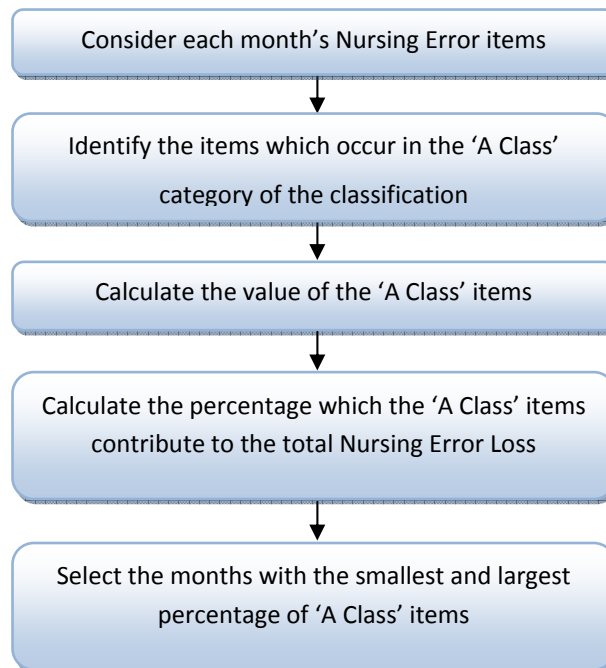


Figure 4.2) Theatre Stock Losses 2007/2008 divided into parts

Data was obtained of the items which occurred as Nursing Error losses. Analysis follows which focuses on the effect it would have if the ‘A Class’ items are monitored.

Analysis of the Nursing Errors:

The following steps are used to identify the two cases on which the analysis will be based.



## Case 1

The table below show the losses which occurred as a result of ‘Nursing Errors’ for February. The *least* ‘A Class’ losses occur in February.

Table 4.1) Nursing Errors for February

February Nursing Errors	Quantity	Unit Cost	Loss
Anexate AMP 0.5MG	6	R 181.33	R 1,087.98
Aterax AMP 100MG	2	R 61.90	R 123.80
Augmentin 1.2mg vial	18	R 267.31	R 4,811.58
Baxter Continu Flo	45	R 35.77	R 1,609.65
Cath Nelaton RED 6FG	3	R 2.20	R 6.60
Cath Wishard PVC Cath 50cm*5FR	1	R 24.04	R 24.04
Cath Yankauer C STD Bulb Tip	1	R 4.24	R 4.24
Coban Bandage 100mm*4.5m	3	R 34.70	R 104.10
Continue flow solution	1	R 5.50	R 5.50
Dextrose Fresenius 50%	20	R 118.86	R 2,377.20
Gauze Paraffin 100*400mm	24	R 35.00	R 840.00
Isoptin AMP 5mg	5	R 96.84	R 484.20
Kefzol Vial 500MG	9	R 270.54	R 2,434.86
Konakion MM AMPS 2MG	6	R 83.79	R 502.74
Osmitirol	1	R 12.22	R 12.22
P.O.P. Bandage 50mm*3.5M	13	R 97.08	R 1,262.04
Ribbon Gauze 12*10mm	1	R 83.11	R 83.11
Ringers	8	R 253.23	R 2,025.84
Scotchcast one step splint 100*750mm	2	R 94.79	R 189.58
Sodium Chloride 0.9% for irrigation 1l	1	R 8.09	R 8.09
Sodium Chloride 1L	2	R 11.99	R 23.98
Solution Admin Set PAED Y 60DR/ML	3	R 4.12	R 12.36
Swab Alcohol	33	R 18.56	R 612.48
Tegaserm Island Dress	3	R 5.71	R 17.13
Voltaren AMP 75MG	10	R 34.37	R 343.70
Zinacef inj 1.5G	1	R 67.23	R 67.23
<b>Total Losses</b>			<b>R 19,074.25</b>
‘A Class’ Losses	R 7,479.25	39.21%	

The items highlighted in *Blue* are items which occur in the ‘A Class’ category of the classification. If these items were monitored the loss would have decreased by R 7,479.25. The ‘A Class’ items contribute 39.21% of the total ‘Nursing Error’ loss for February.

**Case 2**

The table below show the losses which occurred as a result of ‘Nursing Errors’ for August. August had the *most* ‘A Class’ losses which contributes to the total month’s ‘Nursing Error’ losses.

*Table 4.2) Nursing Errors for August*

<b>August</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Loss</b>
Abdominal Large	3	R 636.71	R 1,910.13
Augmentin 1.2MG VIAL	8	R 267.31	R 2,138.48
Baxter Continu flo	34	R 35.77	R 1,216.18
Blood admin set 10DR/ML	7	R 7.22	R 50.54
Cath Foley 10FG	1	R 9.00	R 9.00
Cleansing swabs	13	R 335.78	R 4,365.14
CLEXANE 40MG	2	R 547.11	R 1,094.22
Continue flow solution	17	R 5.50	R 93.50
Cyklokapron 0.1g/mg	1	R 218.84	R 218.84
Cystoset irrigation set	30	R 3.81	R 114.30
Diprivan 20ML 1% AMP	1	R 135.19	R 135.19
Gauze Swabs X-Ray	1	R 536.89	R 536.89
Gynopsa Slab 75mm	2	R 190.94	R 381.88
Irrigation Water IL AFB7114	6	R 7.17	R 43.02
Isoptin AMP 5mg	3	R 96.84	R 290.52
Naropin 2mg/10ml	11	R 138.99	R 1,528.89
Neuro Suction Catheter rigid	3	R 10.54	R 31.62
P.O.P. Bandage 50mm*3.5M	5	R 97.08	R 485.40
Phenylephrine 10mg 1ml AMP	2	R 399.58	R 799.16
Rapifen 0.5mg 2ml AMP	9	R 210.78	R 1,897.02
Ringers 1L	7	R 253.23	R 1,772.61
Sanitary Towel DR Whites	4	R 632.98	R 2,531.92
Sufental 2ml AMP	3	R 169.00	R 507.00
Syntocinon 5lu 1ml AMP	2	R 261.69	R 523.38
Tracrium 2.5ml AMP	1	R 279.92	R 279.92
Zofran 4mg 2ml AMP	2	R 217.98	R 435.96
<b>Total Losses</b>			<b>R 23,390.71</b>
A Class' Losses	R 20,005.43	85.53%	

The items highlighted in *Blue* are items which occur in the ‘A Class’ category of the classification. If these items were monitored the loss would have decreased by R 20,005.43.

The ‘A Class’ items contribute 85.53% of the total Nursing Error loss for August.

A year's data was used to identify the two cases. It can be concluded that Case 1 can be seen as a 'Worst Case Scenario'. If each month's Nursing Errors are reduced by 39.21% theatre will save **R 76,764.30** per annum. (See graph below)

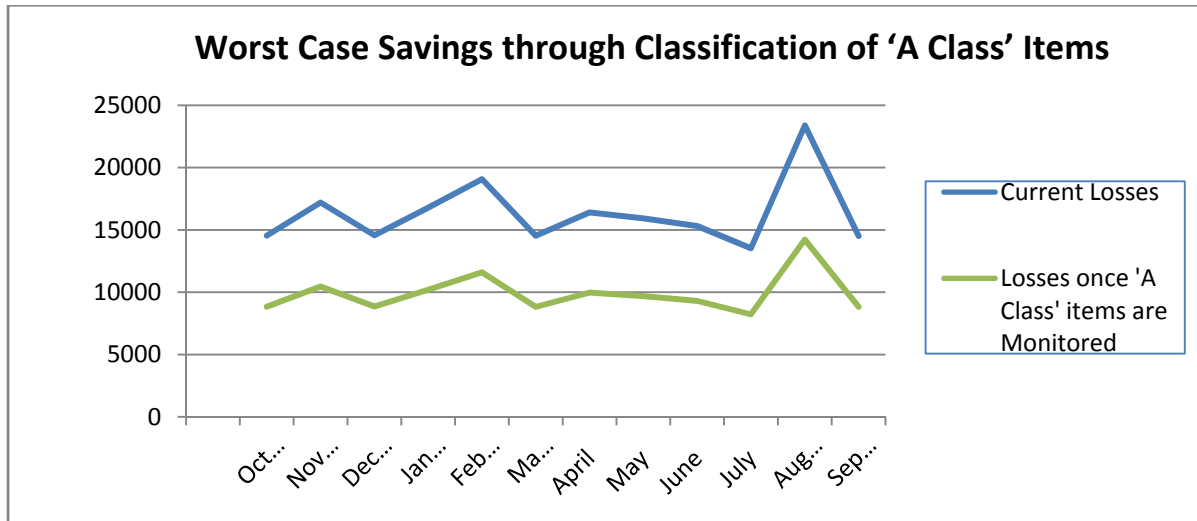


Figure 4.3) Worst Case Scenario

Case 2 can be seen as the 'Best Case Scenario'. If each month's Nursing Errors are reduced by 85.53% theatre will save **R 167,448.36** per annum. (See graph below)

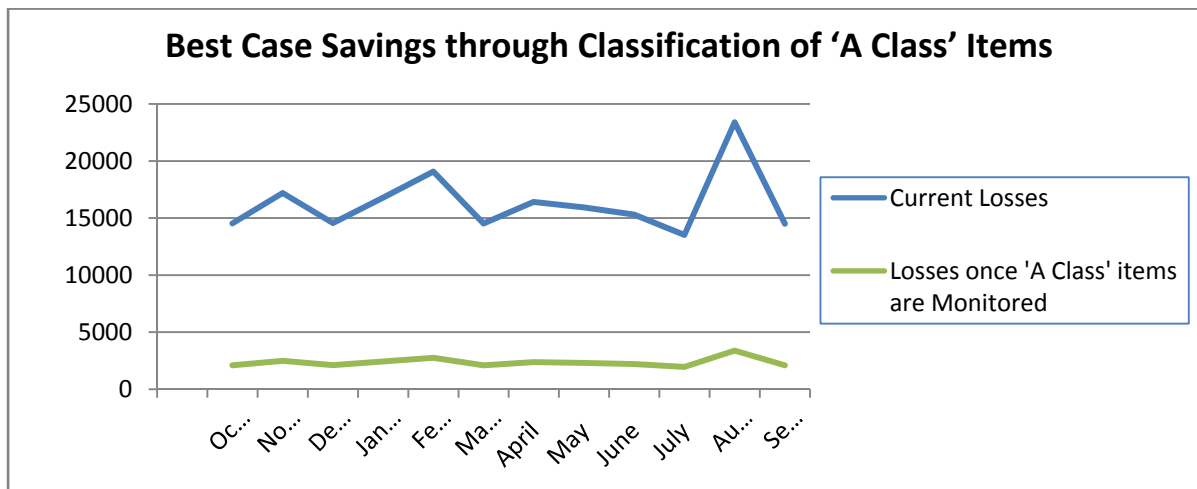


Figure 4.4) Best Case Scenario

Therefore, by monitoring the 'A Class' category items theatre will save between **R 76,764.30** and **R 167,448.36** per annum on 'Nursing Error'. [Note that 'Stock Opened' and 'Other Reasons' are also areas where losses occur]

## **4.2) Documenting the Current System**

By documenting the current system and its procedures, and obtaining information and knowledge of how the system operates, the following was noticed:

### *Preparation of theatre:*

Pre-packed items and instruments are often not complete and adequate for the operations which need to be done. Additional or extra items are then fetched from the stock room. In addition, all items included in these packages are not necessarily used on the patient unless it was needed. The biggest fault noticed in these procedures involves the nurse responsible for completing the charge sheet. It is often assumed that items in the pre-packed packages will be used on a patient. The patient is then charged for something that was not actually used during the operation. Additional or extra items required for an operation is often fetched from the stock room. There is no control over who enters the stock room and what was taken from the stock room. This results in minimal control over stock and therefore allows stock to become lost.

### *Charge Sheets:*

The procedure regarding charging patients for items used during an operation allow for many mistakes to occur. The two main concerns where loss of stock can occur is the charge sheet itself and the lack of knowledge and information conveyed through to the nurses. The charge sheet can easily be filled in incorrectly. Reasons for this can include the lack of standardization.

The charge sheet allows the following to occur, which justifies the lack of standardization:

- Various items are ticked off directly onto the charge sheet.
- Various items are tagged with bar codes. These bar codes are to be attached onto the bar coding control form. However, it has been noticed that some items appear on the charge sheet as well as tagged with bar codes.
- Several names of items do not appear on the charge sheet. Some of them do not even have bar code stickers. In these cases, nurses are expected to write down the bar code number and the name of the item onto the charge sheet.

The importance of knowledge and information communicated effectively through to the nurses can be justified by the following:

- Accurate charging of drugs:  
As seen on the charge sheet, attached to Appendix D, there are several items which are colour coded. Most of these items look exactly the same but appear in different colours and have different costs. It has been noticed that several nurses do not think that there is a price difference for the different coloured items. This results into patients being charged for incorrect colour coded items.
- New items are often introduced, but the charge sheet remains unchanged. There is no specific and effective way of communicating to the nurses the information regarding new items, whether the patient should be charged for that item and in which way these items are to be charged.
- The following notice was placed outside the recovery room regarding the charging of certain items: The Argon Laser does not appear on the charge sheet. If nurses are aware of this notice, they will have to memorize or check the code at the entrance of the recovery room before writing it onto the charge sheet. The effectiveness of this notice is doubtful.

**Argon Laser – Eyes**

CPT code = 66A21

BHF code = 8238 and 3201

**4 Types of syringes:**

1.) Luer Lock

2.) Catheter Tip

3.) Perfusor

4.) Luer Slip

1 & 2 appear on the present charge sheet

Write 3 & 4 onto the charge sheet if items are used

**Laryngeal Masks to be charged as follows:**

Classic = C

Proseal = P

Reinforced = R

Unique = U

[Sizes also to be recorded]

This results into a system which is far too complicated and requires a complex diversity of actions to be taken in order to charge a patient correctly.

### **4.3) Analysis of the Current System**

---

Analysis of the current system was conducted according to figure 3.5 and resulted into the following:

The blue print (see Appendix B) was constructed by referring to Netcare Procedure Documents. It focuses mainly on important procedures which can contribute to the loss of stock. The blue print does not specify exact actions to be taken when charging a patient for items used during an operation. It does however specify that records (the charge sheets) are to be completed post-operatively. In all cases of the process models, records were completed intra-operatively as well as minor additions which were made post-operatively.

Reasons given why documentation is mainly completed intra-operatively and not post-operatively according to nurses include:

- Completing records intra-operatively enables more accurate completion since items which are used can be charged to the patient immediately. Completing records post-operatively requires knowledge of all the items used during the operation and nurses cannot be expected to memorize everything which was used.
- Theatre is disorganized after operations. This makes it difficult to complete records accurately.
- Charge sheets cannot be completed post-operatively since nurses need to attend to the doctors' needs.
- Nurses are pressurized to clean the theatre and prepare for the next operation in line. The time theatre is not utilized is extremely costly and doctors want to start the next operation as soon as possible for them to remain on schedule.



Activities were taken from the process models (see an example in Appendix C) which do not appear on the blue print. The activities are briefly addressed in the *Scenarios* below explaining why these actions may lead to stock being lost.

- Paste bar code onto bar code form
- Write item name and code onto the charge sheet
- Get additional drugs on window shelf
- Paste bar codes onto T-shirt
- Place items' wrapping into plastic bag

**Scenario 1:**

During surgical procedures it was noticed that anesthetists used extra drugs on patients while the nurses were pre-occupied with their personal activities i.e. cellular phones. Since the anesthetist was concentrating on the patients' health, the information that extra drugs were being used was not given through to the nurses. This resulted in the patients not being charged for drugs which were used during the operation.

**Scenario 2:**

It was noticed that highly valuable drugs were lying scattered around on top of a shelf. There is no provision made to place these drugs into a container or clearly marked area.

**Scenario 3:**

During surgical procedures, as items were opened the bar coding stickers were placed onto nurses' T-shirts intending to paste it onto the bar coding form at a later stage. Some packages contain two or more of the same drug, but only one will be used during the current operation. These packages come with the same amount of bar code stickers as the number of drugs in that package. The nurses therefore need to remember to paste the correct amount of bar codes onto the bar coding form as well as keeping the other bar codes and items for the following surgical procedure (if there are any). There is also the possibility of the bar codes falling of the nurse's shirt.

These scenarios come across as immaterial and small, but can contribute a lot to the loss experienced in theatre.

Lastly, the blue print specifies a number of actions to be taken regarding items named ‘Swabs’. According to the blue print, swab control, the discarding and recording of swabs is essential. This is mainly done intra-operatively. ‘Swabs’ are mostly used during every surgical procedure. When comparing the blue print to the process models, the activities specified in the blue print did not appear on the process models. This means that none of the blue print ‘swab’ procedures (which nurses are trained to do) were followed during surgical procedures.

What procedures are currently being followed regarding ‘swabs’?

- The scrub nurse conveys information about the swabs used through to the nurses. The nurses charge the patient with the information obtained from the scrub nurse.

Why are the blue print swab activities not being done?

- The scrub nurse is pre-occupied with the surgical procedure and cannot attend the nurse when counting the swabs and making sure the swabs are discarded and recorded
- Nurses are often pre-occupied with other activities
- The current way of charging swabs to patients is the easiest way for everybody

It is evident in the classification that ‘swabs’ are responsible for a large classification value in the stock room. Different ‘swabs’ with different prices fall under the ‘A Class’ items. It is also noticed that swabs frequently occurred as ‘Nursing Errors’ in the data obtained.

Considering the above, it makes sense that there are prescribed activities in the blue print which states procedure regarding swab control and documentation. This is however a problem area since these activities is not being done.

To conclude the analysis, it is apparent that many different procedures (as seen from the above) can be taken in theatre and that there is no single enforced procedure which is followed. The main reasons include the lack of information conveyed through to nurses, the charge sheet and the inadequate resources available for nurses to charge the patients correctly.

[It was confirmed by the Head Matron that theatre’s policy documents were not available. Therefore policy documents were not considered in this project.]

## CHAPTER 5

### Recommendations and Conclusion

#### 5.1) Classification of Stock

The classification resulted into the identification of certain items in the stock room which needs to be monitored more effectively. These items are presented by the colour coding in the table attached to Appendix E and are referred to as ‘A Class’ items.

Firstly, a bar coding system is recommended to monitor these items. This will result in control over the items which contribute the most value in the stock room but will however require a new member of staff to control these items from leaving the stock room. By only considering the Nursing Errors which occur each month, Garden City Clinic theatre can save between **R76,764.30** and **R167, 448.36** per annum.

Losses of ‘Stock Opened’ was not addressed and do not fall into the scope of the project. It is however recommended that the packaging of sterile items must be changed. Packages which contain more than one sterile item should be changed to packaging where each sterile item is packaged separately. Packaging costs’ will not exceed more than approximately 4% of the items’ cost and will reduce the losses of ‘Stocked Opened’ since many sterile items are currently packaged together.

#### 5.2) Documented Current System

It is clear that many errors can occur when completing the charge sheet. It is therefore necessary to simplify the charge sheet as stated below. A standard procedure need to put in place regarding nurses filling in the charge sheet. The procedure must be strictly followed, simple and easy, and must include procedures which need to be followed in cases of emergencies.

The following changes could be made to simplify the charging procedure:

- Charge sheets include all items in stock
- Charge sheets are continuously updated and re-printed for any new items which are introduced. This will eliminate activities such as bar coding stickers and having to write certain items onto the charge sheet. It also covers information conveyed through to nurses. If new items are introduced and the name of that item does not appear on the charge sheet, the nurse knows that the patient is not charged for that item. Notices put outside the recovery room will not be necessary.

### **5.3) Analysis of the Current System**

---

The analysis, done by comparing the different documents against one another, enabled the identification of major problem areas in theatre. A main area concerns the Netcare procedure documents (these documents are used for the training of nurses). If nurses are trained in the correct way and understand the environment they work in, the system as a whole will be improved. The following changes could be made which will result in an improved system where the loss of stock will be minimized:

- Change the Netcare procedure documents:  
Procedure regarding the charging of the stock to the patient should be specific and strict. This should be done intra-operatively and must consider cases of emergencies. It must be strictly enforced and should not allow any leeway or alternative routes to be followed.
- Staff should be well aware of rules and regulations
- To enforce correct procedure a strict penalty system can be introduced. This can be based on a point system, warning system etc.
- Appoint one member of staff to handle *only* the charging of items to the patients.
- The swab control and documentation activities need to be changed in a way which allow correct information to be given through to the nurses followed by accurately completing documentation in a orderly manner

As noticed from the process models a main reason why certain activities go against formal procedure (blue print), is due to the lack of adequate resources and allocated space for the nurses to charge the patients.

The following recommendations are made:

- Facilitate the nurse responsible for the charge sheet with an allocated space where only he/she operates. This would be best if it were nearest to the Anesthetists' drug trolley since these drugs also need to be charged.
- Anesthetist trolleys contain highly valuable drugs. These trolleys need to be upgraded with specific demarcated safe areas for drugs.

The recommended changes of the analysis will result in a further decrease of losses. It is believed that the 'Unknown Reasons' losses will be reduced if the recommended changes stated above is implemented.

To conclude, it is clear that there is great room for improvement and alterations which could be made in order to minimize the losses which the operating theatre is currently experiencing. If the 'A Class' items of the classification are controlled and strict procedures (as stated above) are implemented in theatre, the operating theatre will reduce their current losses drastically.

As seen from the analysis of the classification, Garden City Clinic theatre can reduce 'Nursing Errors' by at least 39.21% up to 85.53% resulting in a reduction of up to R167, 448.36 per annum. The 'Nursing Errors' only account for 41.83% of the total losses experienced in 2007/2008. Data were not obtained for 'stock opened' since it is not covered in the scope of the project, although recommendations on packaging were made. By implementing recommended changes a decrease in losses will occur for 'Other Reasons'. Therefore, the application of process analysis and inventory classification leads to an overall decrease of losses.

Due to a time constraint the re-design of new procedures could not be executed.

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*Glossary*

- **IDEF** Acronym for Integration Definition. Also used to refer to a family of mutually-supportive methods for enterprise integration, including in particular IDEFØ, IDEF1, IDEF1X, IDEF3, IDEF4, and IDEF5.
- **IDEF3** Integration Definition (IDEF) method for Process Description Capture
- **IDEFØ** Integration Definition (IDEF) method for Function Modeling
- **Junction** An element of the IDEF3 Schematic Language providing a mechanism to graphically display logical branching.
- **Link** A syntactic element of the IDEF3 Schematic Language used to connect other IDEF3 syntactic elements. Links denote significant relationships among UOBs, Object States, and Objects. Examples of the types of relations that can be highlighted by IDEF3 links include temporal, logical, causal, natural, and conventional.
- **Note box** A syntactic element of the IDEF3 Schematic Language that may be used to emphasize the participation of particular objects or relations associated with the IDEF3 element to which it is attached, to tie in specific examples of referenced data or objects (e.g., screen layouts), to highlight special constraint sets associated with a given elaboration, and so forth.
- **Referent** A syntactic element of the IDEF3 Schematic Language used to refer to a UOB scenario or Transition Schematic
- **Unit of Behavior (UOB)** A term used in IDEF3 to describe types of “happenings.” Concepts such as function, process, scenario, activity, operation, decision, action, event, procedure, and so forth each represent “happenings” involving some circumscribed behavior. The term UOB is used to encapsulate concepts such as these.



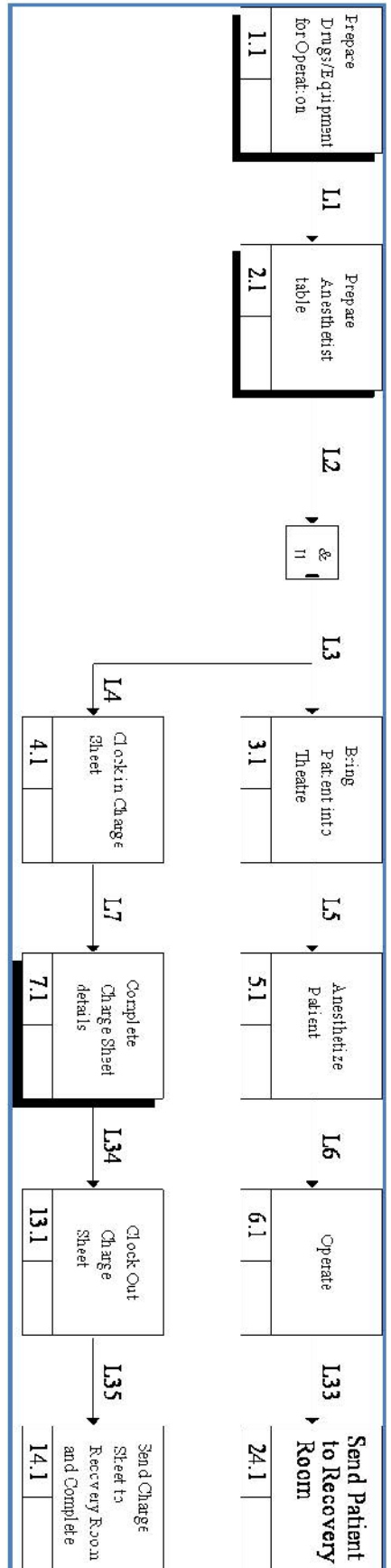
*Appendix A - Process Map*

Open out the process map (IDEF0) of the operating theatre on the next page.

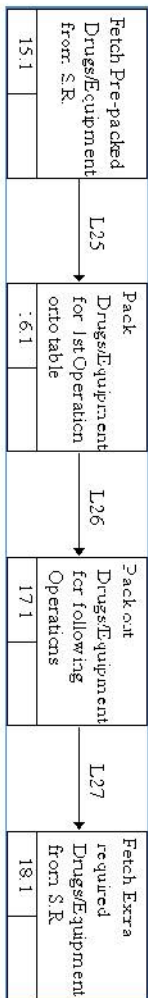
*Appendix B – Blue Print*

Open out the blue print on the next page. It displays the procedures of a ‘circulating person’ (nurse) during a surgical procedure.

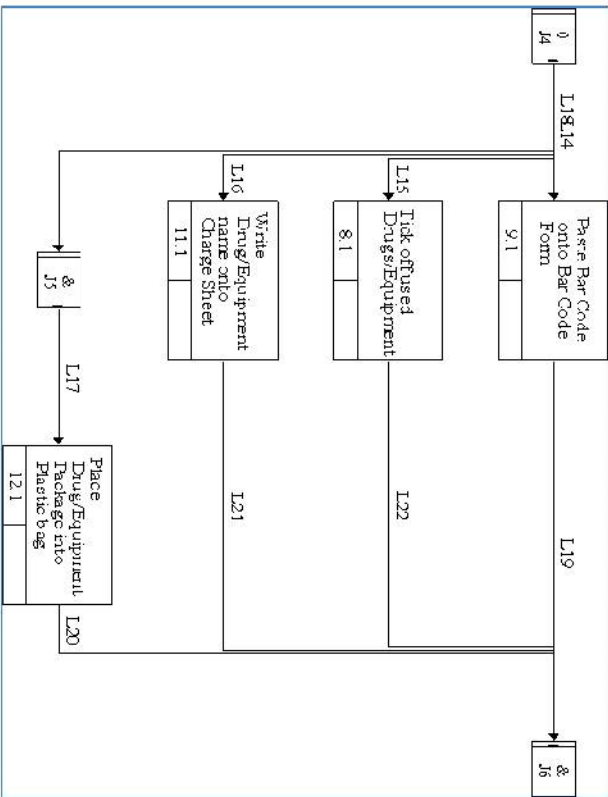
## Appendix C - an Example of a Process Model



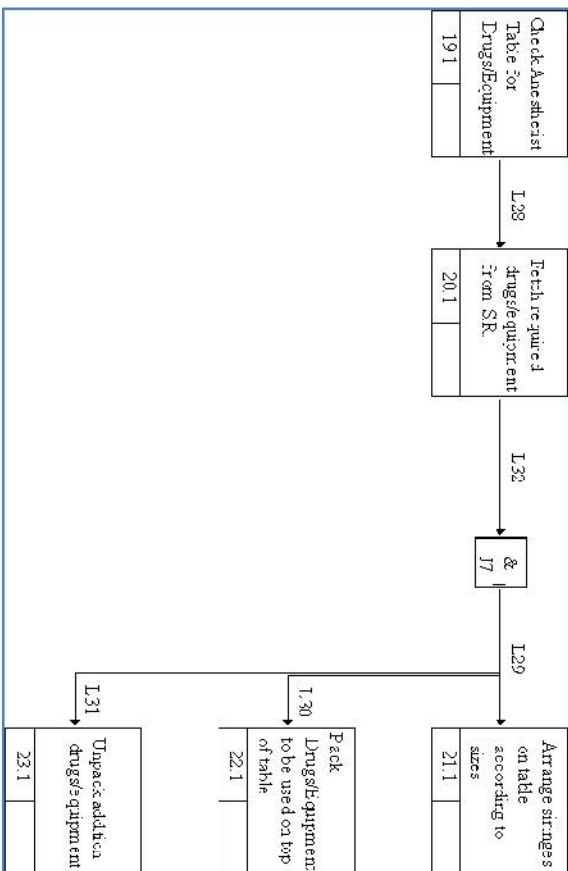
Decomposition of activity 1.1



Decomposition of activity 7.1



Decomposition of activity 2.1





*Appendix D - Charge Sheet*

**Appendix E- ABC Classification**

‘A Class’ items are represented by the highlighted section in the table below.

<b>Name</b>	<b>Quantity</b>	<b>Standard price</b>	<b>Value</b>
GAUZE SWAB 100*100*12PLY PLAIN N/ST 5'S	800	R 740.56	R 592,448.00
GAUZE SWAB 100*100*12PLY PLAIN ST 5'S	548	R 506.01	R 277,293.48
ROCEPHIN VIAL 1G	31	R 6,535.10	R 202,588.10
NORCURON AMP 4MG	58	R 1,981.54	R 114,929.32
SUGICAL CODMAN PATTIE X-RAY 3*3*10	42	R 1,917.80	R 80,547.60
DISSECTING SWABS	46	R 1,623.19	R 74,666.74
ABDOMINAL SWAB 170*200*6PLY STER 5'S	118	R 631.66	R 74,535.88
SINUS DRESSING FOAM C LATEX FREE COVER	25	R 2,254.01	R 56,350.25
GAUZE SWABS XRAY STER	103	R 536.89	R 55,299.67
SUGICAL CODMAN PATTIE X-RAY .25*.25*10	22	R 2,223.77	R 48,922.94
SPINAL PLUG 100*900*16PLY*5	33	R 1,395.46	R 46,050.18
ZOFRAN AMPS 4MG 2ML	170	R 217.98	R 37,056.60
SUGICAL CODMAN PATTIE X-RAY 0.5*1*10	32	R 1,149.74	R 36,791.68
MACAINE PLAIN AMP 0.5% 10ML	118	R 297.75	R 35,134.50
WATER FOR INJECTION 10ML	351	R 94.68	R 33,232.68
RINGER LACTATE 1L	126	R 253.23	R 31,906.98
ESMERON 50MG	34	R 936.76	R 31,849.84
NEURO SURGICAL PATTIES13*38MM	27	R 1,148.00	R 30,996.00
DECASONE AMP 4MG	103	R 280.85	R 28,927.55
MACAINE C ADRENALINE AMP 20ML	45	R 637.76	R 28,699.20
SUGICAL CODMAN PATTIE X-RAY .5*.5*10	28	R 1,000.65	R 28,018.20
ABDOMINAL SWAB 370*450*6PLY STER 5'S	44	R 636.71	R 28,015.24
SUGICAL CODMAN PATTIE X-RAY 1*3*10	21	R 1,333.31	R 27,999.51
NEURO SURGICAL PATTIES13*51MM	22	R 1,220.30	R 26,846.60
XYLOTOX 2% E80 C ADRENALINE 1.8ML	76	R 342.54	R 26,033.04
SWAB TONSIL	25	R 1,010.05	R 25,251.25
KYTRIL AMP 1MG	85	R 292.65	R 24,875.25
XYLOTOX 2% SE PLAIN AMP 1.8ML	66	R 347.49	R 22,934.34
PHENYLEPHRINE HCL AMP 10MG	57	R 399.58	R 22,776.06
WATER FOR IRRIGATION 1L BOTTEL NON CHARGEABLE	94	R 7.17	R 37,560.52
AUGMENTIN IV VIALS 1.2G	84	R 267.31	R 22,454.04
RAYZON 40MG	89	R 242.51	R 21,583.39
RAPIFEN AMP 0.5MG	101	R 210.78	R 21,288.78
PERFALGAN 1 GRAM VIAL	47	R 452.85	R 21,283.95
COTTON WOOL BALLS 1G STERILE 5'S	12	R 1,656.80	R 19,881.60
MEROCEL BARON SINUS PACK	9	R 2,118.76	R 19,068.84
ULTIVA 2MG INJ 5ML	24	R 733.30	R 17,599.20
HYALASE 15001U AMPS	9	R 1,920.00	R 17,280.00
VELBAND STERILE ORTH BANDAGE 150MM*3M	30	R 527.84	R 15,835.20
CREPE BANDAGE 150MM*4.5M STERILE	33	R 461.01	R 15,213.33
SUFENTAL AMP 2ML	87	R 169.00	R 14,703.00

400 PLUS POST-OP K6 W/STRING	14	R 1,046.68	R 14,653.52
SANITARY TOWEL DR WHITES STERILE	23	R 632.98	R 14,558.54
SWAB CLEANSING	43	R 335.78	R 14,438.54
SUBLIMAZE AMP 2ML	88	R 158.43	R 13,941.84
TAMPON EXTERNAL NASAL	52	R 267.23	R 13,895.96
STOCKINETTE	4	R 3,199.89	R 12,799.56
TELFA DRESSING STER	12	R 1,062.91	R 12,754.92
PACK THEATRE BASIC PARKLANDS	23	R 552.93	R 12,717.39
DIPRIVAN 1% AMP 20ML	92	R 135.19	R 12,437.48
PRECEDEX VIAL 2ML	5	R 2,474.54	R 12,372.70
SYNTOCINON AMP 10IU/ML 1ML	39	R 313.81	R 12,238.59
MIVACHRON AMP 2MG	42	R 288.12	R 12,101.04
SWAB ALCOHOL	640	R 18.56	R 11,878.40
EYE PAD GOLD CROSS STERILE	27	R 439.38	R 11,863.26
TRACRIUM AMPS 2.5ML	42	R 279.92	R 11,756.64
4000 PLUS 8CM W/STRING	18	R 625.35	R 11,256.30
CATH THERMACHOICE	2	R 5,562.88	R 11,125.76
RIBBON GAUZE PLAIN STERILE 12MM*1.5M	9	R 1,232.33	R 11,090.97
DANTRIUM IV VIAL 20MG	9	R 1,216.25	R 10,946.25
CYKLOKAPRON 500MG/5ML	49	R 218.84	R 10,723.16
TORA-DOL AMP 30MG	109	R 96.81	R 10,552.29
CATH MAHURKAR DUAL LUMEN KIT	2	R 5,123.02	R 10,246.04
EPHEDRINE SULPHATE AMP 50MG	51	R 195.09	R 9,949.59
SODIUM CHLORIDE AMP 0.9% 10ML	39	R 254.45	R 9,923.55
4000 PLUS ANATOMICAL 8CM W/STRING	13	R 762.84	R 9,916.92
P.O.P. SLAB 150MM*750MM GYPSONA	51	R 190.94	R 9,737.94
VELBAND STERILE ORTH BANDAGE 100MM*3M	29	R 328.97	R 9,540.13
PACK CYSTOSCOPY NETCARE	33	R 282.10	R 9,309.30
ZAMANON AMPS 12.5MG	14	R 658.97	R 9,225.58
STOCKINETTE PHIL-NETTE 150MM	26	R 305.75	R 7,949.50
PACK BASIC NO 2	20	R 389.68	R 7,793.60
CELESTONE SOLUSPAN AMP 6MG	39	R 194.49	R 7,585.11
MEROSAL NASAL PACK	5	R 1,506.91	R 7,534.55
SYNTOCINON AMP 51U/ML 1ML	28	R 261.69	R 7,327.32
HYPOTEN POWER FOR INJECTION	10	R 722.97	R 7,229.70
CREPE BANDAGE 100MM*4.5M STERILE	20	R 360.71	R 7,214.20
400PLUS THIN PACK ANATOMICAL	9	R 790.48	R 7,114.32
KYTRIL IV AMP 3MG	12	R 555.52	R 6,666.24
CRIXIVAN CAPS 400MG	18	R 370.23	R 6,664.14
MACAINE SPINAL AMP C DEXTROSE	21	R 314.54	R 6,605.34
PACK CEASAR	9	R 719.66	R 6,476.94
HYPNOMIDATE AMP 2MG	17	R 376.54	R 6,401.18
CREPE BANDAGE 50MM*4.5MM STERILE	20	R 318.27	R 6,365.40
RIBBON GAUZE PLAIN STERILE 25MM*1.5M	5	R 1,258.30	R 6,291.50
4000 PLUS 4.5CM W/STRING	12	R 518.15	R 6,217.80
4000 PLUS ANATOMICAL AIRWAYS W/STRING	6	R 1,035.02	R 6,210.12
HEPRIN FRESENIUS 1ML AMP	73	R 84.28	R 6,152.44
CATH MICROSENSOR VENT KIT C TRANSDUCER	1	R 6,149.14	R 6,149.14

NALOXONE 0.4MG	57	R 106.72	R 6,083.04
DORMICUM AMP 15MG	4	R 1,500.50	R 6,002.00
P.O.P. SLAB 75MM*750MM GYPSONA	49	R 120.86	R 5,922.14
KEFZOL VIAL 1G	12	R 474.93	R 5,699.16
CREPE BANDAGE 75MM*4.5MM STERILE	17	R 333.71	R 5,673.07
CATH TRIPLE LUMEN	7	R 803.25	R 5,622.75
MACAINE SPINAL AMP 0.5% 4ML	18	R 309.57	R 5,572.26
NAROPIN 2MG	40	R 138.99	R 5,559.60
NIMBEX AMPS 10ML	9	R 606.22	R 5,455.98
CELESTONE AMP 4MG	21	R 256.90	R 5,394.90
PACK BASIC NO 1	11	R 465.80	R 5,123.80
SUFENTA AMP 10ML	6	R 845.01	R 5,070.06
SURTURE STRIP PLUS 6MM*76MM	12	R 419.42	R 5,033.04
ROBINUL AMP 0.2MG 1ML	49	R 96.51	R 4,728.99
STOCKINETTE PHIL-NETTE 50MM	26	R 179.42	R 4,664.92
NEOSTIGMINE FRESENIUS 2.5MG	88	R 50.60	R 4,452.80
CATH HICKMAN 9*90CM DUAL LUMEN	2	R 2,141.17	R 4,282.34
CYCLIMORPH AMPS 10MG	26	R 161.56	R 4,200.56
CHIROCANE 7.5MG	9	R 463.10	R 4,167.90
VELBAND STERILE ORTH BANDAGE 50MM*3M	15	R 274.49	R 4,117.35
ANEASTHETIC THROAT SWAB 75*60CM	78	R 51.50	R 4,017.00
CLOXACILLIN 500MG	8	R 501.25	R 4,010.00
PETHIDINE FRESENIUS HCL AMPS 100MG	71	R 56.28	R 3,995.88
GENTAMYCIN FRESENIUS 80 MG	28	R 139.49	R 3,905.72
MRI HARD BASE PORT	1	R 3,826.07	R 3,826.07
SOLU-CORTEF AMP 100MG 2ML	29	R 130.54	R 3,785.66
TENCKHOFF 1 CUFF 47CM	3	R 1,237.29	R 3,711.87
TRIVEX TUBING	2	R 1,852.46	R 3,704.92
CORDARONE X AMPS 150MG	6	R 604.34	R 3,626.04
VAGINAL PLUS	7	R 517.89	R 3,625.23
CATH FOLEY BIOCAT 2W 2OP EYES 10ML*18F	23	R 153.43	R 3,528.89
AUGMENTIN IV VIAL 0.6G	22	R 154.64	R 3,402.08
RIBBON GAUZE 25*10MM	28	R 120.03	R 3,360.84
ADRENALINE FRESEN 1MG	139	R 24.06	R 3,344.34
LIGNOCAINE 2% 5ML AMP	92	R 36.10	R 3,321.20
ULTIVA 1MG INJ 3ML	9	R 366.34	R 3,297.06
AUTO TRANSFUSION KIT 745C/125	2	R 1,644.96	R 3,289.92
P.O.P. BANDAGE 100MM*3.5M GYPSONA S	21	R 154.78	R 3,250.38
AMIKACIN FRESENIUS 500MG/2ML	8	R 390.56	R 3,124.48
SUXAMETHONIUM CHLORIDE AMP 50MG	55	R 55.82	R 3,070.10
AMIKACIN 1000MG/4ML	5	R 609.95	R 3,049.75
BLURHEX 1ML AMPS	4	R 752.08	R 3,008.32
CATH URETRIC OLIVE TIP CURVED CHO5	14	R 206.92	R 2,896.88
INADINE DRESSING 5CM*5CM STERILE	5	R 567.10	R 2,835.50
NIMBIX AMPS 5ML	8	R 352.89	R 2,823.12
SOTACOR 40MG/4ML	7	R 401.62	R 2,811.34
SODIUM CHORIDE 0.9% FOR IRRIGATION 1L BOTTLE	62	R 8.09	R 24,900.44
CATH HAEMATURIA 3-WAY C/TIP 20FR	10	R 278.93	R 2,789.30

ZENAPAX VIALS	1	R 2,704.95	R 2,704.95
TAMPON NASAL IVALON 4000 PLUS	2	R 1,312.75	R 2,625.50
RIBBON GAUZE 12*10MM	31	R 83.11	R 2,576.41
INTERCEED ABSORB ADH BARRIER	2	R 1,269.98	R 2,539.96
NAROPIN 10MG	15	R 164.45	R 2,466.75
OPSITE MEMBRANE 450MM*550MM	4	R 593.07	R 2,372.28
NAROPIN 7.5 MG	17	R 136.53	R 2,321.01
CATH ACCUFLO DISTAL CATH BA36L	1	R 2,311.55	R 2,311.55
URETERAL CATH DISP CONE TIP	12	R 189.69	R 2,276.28
CHIROCAINE 5MG/ML 10ML AMPS	6	R 374.56	R 2,247.36
PAVULON AMP 2MG	4	R 553.21	R 2,212.84
PETHIDINE FRESENIUS HCL AMPS 50MG	78	R 28.14	R 2,194.92
BUSCOPAN AMP 1ML	45	R 48.68	R 2,190.60
CATH STAMEY URETERAL OPEN TIP	6	R 365.00	R 2,190.00
SYNOMETRINE AMP 1ML	8	R 270.83	R 2,166.64
CATH BRONCHOCATH CATH LEFT 37CH	3	R 713.16	R 2,139.48
AMIKACIN 250MG/2ML	8	R 265.95	R 2,127.60
VELBAND STERILE ORTH BANDAGE 75MM*3M	7	R 302.12	R 2,114.84
INAPSIN AMP 2ML	13	R 162.23	R 2,108.99
ZINACEF INJ 1.5G	31	R 67.23	R 2,084.13
CATH NEPHROMAX KIT	1	R 2,072.00	R 2,072.00
TARGOCID INJ 400MG	2	R 1,017.26	R 2,034.52
MORPHINE FRESENIUS 10MG	57	R 35.66	R 2,032.62
ZAMANON AMPS 100MG	2	R 1,006.25	R 2,012.50
TRAMAL AMPS 100MG	25	R 80.32	R 2,008.00
4000 PLUS 4.5CM AIRWAYS	3	R 669.16	R 2,007.48
NIMBIX AMPS 2.5ML	10	R 200.51	R 2,005.10
CATH DOUBLE LUMEN 7FR 20CM	3	R 667.01	R 2,001.03
ROBINUL AMP 0.2MG 2ML	22	R 90.42	R 1,989.24
BAXTER PCA INFUSION 5ML PER HOUR	9	R 219.90	R 1,979.10
CATH HAEMATURIA 3-WAY W/TIP 22FR	7	R 278.93	R 1,952.51
TRANDATE AMPS 20ML	5	R 387.78	R 1,938.90
ZINACEF VIALS 750MG	12	R 161.47	R 1,937.64
COMBIVIR TABS	6	R 321.00	R 1,926.00
SPEC OXYTOCIN 101U/ML	4	R 480.00	R 1,920.00
CATH RAAF DUAL LUMEN RIGHT ARTER 3.2MM	1	R 1,869.21	R 1,869.21
CATH LEADER CATH SHORT	11	R 163.29	R 1,796.19
AMVISC INTRAOCULAR PLUS 0.8	4	R 440.57	R 1,762.28
DRAIN NICITA NEPHROSTOMY C NEEDLE 14CH	2	R 879.76	R 1,759.52
CATH YANKAUER C STD BULB TIP	414	R 4.24	R 1,755.36
NAROPIN POLYBAG 200ML	2	R 873.12	R 1,746.24
ATROPINE SULPHATE FRES 0.5MG	67	R 25.72	R 1,723.24
URETERAL CATH DISP OLIVE TIP 4FG	9	R 189.69	R 1,707.21
HAEMACCEL INF	8	R 213.13	R 1,705.04
CATH FOLEY BIOGATH 2W 2OP EYES 30ML*16F	11	R 153.43	R 1,687.73
CATH T/LUMEN 8.5FR	2	R 837.90	R 1,675.80
CATH NEPHROSTOMY BALLOON	1	R 1,665.00	R 1,665.00
LASIX AMP 10MG	38	R 43.61	R 1,657.18



URETERIC MALLEABLE TIP FILIFORM 65CM	2	R 815.27	R 1,630.54
KEFZOL VIAL 500MG	6	R 270.54	R 1,623.24
ADAPTIC NON ADH DIGIT DRESSING MEDIUM	8	R 197.62	R 1,580.96
CATH ATRIUM THORACIC 28FR RIGHT AND CA	14	R 112.34	R 1,572.76
CATH HICKMAN DUAL LUMEN	1	R 1,541.98	R 1,541.98
CATH FOLEY BIOCATH 2W 2OP EYES 10ML*22F	10	R 153.43	R 1,534.30
CATH FOLEY BIOCATH 2W 2OP EYES 30ML*24F	10	R 153.43	R 1,534.30
CATH ACCUFLO VENT CATH BARIUM	2	R 763.98	R 1,527.96
CALCIUM GLUCPNATE FRESENIUS 10% 10ML	21	R 71.75	R 1,506.75
ALLEVYN ADHESIVE DRESSING 225MM*225MM	1	R 1,506.02	R 1,506.02
ASPEN VANCOMYCIN 1G	1	R 1,503.78	R 1,503.78
SURGIPAD 100MM*200MM	8	R 182.73	R 1,461.84
CATH FORGARTY ARTERIAL EMBOLECT 2F*60	3	R 485.00	R 1,455.00
CATH MALECOT NEPHROSTOMY FR20	2	R 725.20	R 1,450.40
CATH ATRIUM THORACIC 32FR STRAIGHT TAPER	16	R 89.88	R 1,438.08
CATH BRONCHOCATH CATH LEFT 28CH	2	R 713.16	R 1,426.32
CATH BRONCHOCATH CATH LEFT 35CH	2	R 713.16	R 1,426.32
CATH BRONCHOCATH CATH LEFT 39CH	2	R 713.16	R 1,426.32
CATH BRONCHOCATH CATH LEFT 41CH	2	R 713.16	R 1,426.32
POR 8 AMP 1ML	4	R 352.16	R 1,408.64
MISTABRON INHALENT SOLU AMP 600MG	15	R 93.46	R 1,401.90
BAXTER CONTINU FLO	38	R 35.77	R 1,359.26
HEPARIN FRESENIUS 5000U/5ML VIAL	5	R 260.99	R 1,304.95
AMINOPHYLLIN IV INJECTION 10ML	24	R 54.08	R 1,297.92
BAXTER PCA PATIENT CONTROL MODULE	11	R 116.09	R 1,276.99
THIOPENTONE 0.5G	5	R 250.96	R 1,254.80
CATH URETRIC OLIVE TIP CURVED CHO3	6	R 206.92	R 1,241.52
FOGARTY ARTERIAL EMBOLECT CATH 6F*80CM	4	R 310.00	R 1,240.00
CATH FOLEY BIOCATH 2W 2OP EYES 10ML*24F	8	R 153.43	R 1,227.44
COVOCHOL POWDER FOR INJECTION	8	R 152.60	R 1,220.80
ANEASTHETIC THROAT SWAB 75*25CM	27	R 45.00	R 1,215.00
ETHANOLAMINE OLEATE INJECTION	1	R 1,206.82	R 1,206.82
CATH HICKMAN RAD SILICNE	1	R 1,201.95	R 1,201.95
NALOXONE NEONATAL 0.02MG	11	R 108.81	R 1,196.91
STAMEY CATH UC2104/400-161	4	R 296.00	R 1,184.00
P.O.P. BANDAGE 50MM*3.5M GYPSONA S	12	R 97.08	R 1,164.96
PROTAMINE SULPHATE AMPS 5ML	3	R 386.70	R 1,160.10
STEMETIL AMP 1.25% 1ML	15	R 76.60	R 1,149.00
URETERAL CATH DISP OLIVE TIP 5FG	6	R 189.69	R 1,138.14
CATH HICKMAN CL SILCICN	1	R 1,132.62	R 1,132.62
COMFEEL PLUS TRANS DRESS 15CM*20CM	5	R 219.02	R 1,095.10
STREPTASE AMP 750.0001.U.	1	R 1,092.39	R 1,092.39
CORNEAL PROTECTOR GROUCH	1	R 1,082.08	R 1,082.08
CATH ATRIUM THORACIC 36FR STRAIGHT TAPER	12	R 89.88	R 1,078.56
CATH FOLEY BIOCATH 2W 2OP EYES 10ML*12F	7	R 153.43	R 1,074.01
VOLUVEN 6% 500ML	20	R 241.01	R 3,068.60
DESTRADIOL IMPLANT	6	R 172.80	R 1,036.80
ADAPTIC NON ADH DIGIT DRESSING LARGE	5	R 204.69	R 1,023.45

RINKILASTIC BAND 100MM*4M	7	R 144.91	R 1,014.37
CALCIUM CHLORIDE AMP 10% 10ML	12	R 84.21	R 1,010.52
ASPEN VANCOMYCIN 500MG	1	R 998.15	R 998.15
KETAMINE 10MG	2	R 476.52	R 953.04
P.O.P. BANDAGE 150MM*3.5M GYPSONA S	10	R 95.12	R 951.20
IMPERVIOUS STOCKINETTE LARGE	9	R 105.38	R 948.42
CATH FORGARTY ARTERIAL EMBOLECT 3F*80	3	R 310.00	R 930.00
CATH FORGARTY ARTERIAL EMBOLECT 4F*80	3	R 310.00	R 930.00
CATH FORGARTY ARTERIAL EMBOLECT 5F*80	3	R 310.00	R 930.00
CATH FOLEY BIOCATH 2W 2OP EYES 10ML*20F	6	R 153.43	R 920.58
CATH FOLEY BIOCATH 2W 2OP EYES 30ML*14F	6	R 153.43	R 920.58
CATH FOLEY BIOCATH 2W 2OP EYES 30ML*18F	6	R 153.43	R 920.58
CATH URETERIC RUSCH CYLINDRICAL TIPCHO5	15	R 61.27	R 919.05
ANEXATE AMP 1MG	3	R 297.47	R 892.41
CATH URETERAL AXXCESS 6FR 70CM	7	R 125.80	R 880.60
DRAIN NICITA NEPHROSTOMY C NEEDLE 12CH	1	R 879.76	R 879.76
OROGRAFIN 30% 250ML	2	R 436.75	R 873.50
CATH TRIO PAED	1	R 869.40	R 869.40
HEALON INJ 10MG	3	R 281.14	R 843.42
STOCKINETTE PHIL-NETTE 75MM	4	R 210.06	R 840.24
EPANUTIN READYMIX PARENTERAL 250MG	5	R 168.04	R 840.20
UMBILICAL ARTERY CATH 5FG	1	R 828.35	R 828.35
NORCURON VIAL 10MG	1	R 811.91	R 811.91
UMBILICAL ARTERY CATH 3.5FG	1	R 784.88	R 784.88
METROCLOPROMIDE 10MG 2ML INJ	26	R 29.52	R 767.52
CATH FOLEY BIOCATH 2W 2OP EYES 10ML*16F	5	R 153.43	R 767.15
CATH FOLEY BIOCATH 2W 2OP EYES 30ML*12F	5	R 153.43	R 767.15
DYNACAST PRLDE SYN SPLINT TAPE	1	R 757.05	R 757.05
KONAKION MM PAED AMPS 2MG	9	R 83.79	R 754.11
NEXIAM IV INF 40MG	1	R 745.97	R 745.97
MAGNESIUM SULPHATE AMP 50% 2ML	26	R 28.52	R 741.52
CARDIFEN CAPS 10MG	3	R 244.59	R 733.77
SODIUM CHLORDE 0.9% MINIBAG 100ML	21	R 34.83	R 731.43
CATH DOUBLE LUMEN 7FR 60CM	1	R 730.01	R 730.01
SODIUM CHLORDE 0.9% MINIBAG 50ML	66	R 11.04	R 728.64
CATH MALECOT NEPHROSTOMY FR14	1	R 725.20	R 725.20
CATH MALECOT NEPHROSTOMY FR24	1	R 725.20	R 725.20
CATH ATRIUM THORACIC 28FR	8	R 89.88	R 719.04
CATH BRONCHOCATH CATH RIGHT 35CH	1	R 713.16	R 713.16
ASPEN CEFOXITIN	2	R 349.24	R 698.48
LEUKOPLAST SLEEK ROLL 50MM*3M	2	R 348.78	R 697.56
AMPICILLIN 500MG	1	R 695.70	R 695.70
CATH ATRIUM THORACIC 36FR RIGHT ANGLED	6	R 112.34	R 674.04
SODIUM CHORIDE 0.9% 1L	43	R 11.99	R 4,830.62
CATH URETERIC CATH OLIVE TIP CHO6	10	R 64.06	R 640.60
SOFTBAN ORTH PADDING NATURAL 75MM*3M	10	R 61.82	R 618.20
TAVAN IV 500MG	3	R 205.48	R 616.44
CATH FOLEY BIOCATH 2W 2OP EYES 30ML*20F	4	R 153.43	R 613.72

CATH FOLEY BIOCATH 2W 2OP EYES 30ML*22F	4	R 153.43	R 613.72
CLOPAMON AMPS 10MG 2ML	15	R 40.80	R 612.00
SCOTCHCAST ONE STEP SPLINT 50*250MM	16	R 38.08	R 609.28
PAPAVERETUM 20MG	7	R 86.40	R 604.80
SURTURE STRIP PLUS 12MM*102MM	1	R 600.98	R 600.98
SCOTCHCAST PLUS 125MM*3.6M	12	R 49.35	R 592.20
ISOPTIN AMP 5MG	6	R 96.84	R 581.04
STERI STRIP 1546R	49	R 11.85	R 580.65
KARMAN FLEXIBLE CANNULA 7MM	10	R 57.65	R 576.50
KARMAN FLEXIBLE CANNULA 8MM	10	R 57.65	R 576.50
SCOTCHCAST ONE STEP SPLINT 75*300MM	13	R 43.68	R 567.84
CATH ATRIUM THORACIC 32FR RIGHT ANGLED	5	R 112.34	R 561.70
STERILE WATER FOR IRRIGATION 1L CHARGEABLE	15	R 11.75	R 1,685.10
TEGADERM FILM DRESS 1626W 100*120MM	166	R 3.30	R 547.80
CLEXANE 40MG	1	R 547.11	R 547.11
PHENERGAN AMP 1ML	8	R 68.29	R 546.32
NIMBIX AMPS 30ML	1	R 546.11	R 546.11
SCOTCHCAST ONE STEP SPLINT 125*375MM	4	R 133.43	R 533.72
ADD A LINE SOLUTION SET 20DROPS	112	R 4.61	R 516.32
TORA-DOL AMP 10MG	9	R 56.89	R 512.01
Y-TYPE TUR IRRIGATION SET	33	R 15.51	R 511.83
CAVAFIX CERTO IV	3	R 170.19	R 510.57
CAVAFIX CERTO VENA BASILICA	3	R 170.19	R 510.57
METRONIDAZOLE 500MG	8	R 60.47	R 483.76
AIRWAY EXCHANGE CATHETER	1	R 454.90	R 454.90
CATH MALECOT SILICONE RENAL	1	R 445.91	R 445.91
TRACRIUM AMPS 5ML	1	R 435.61	R 435.61
EPILIM IV INJECT 400MG	2	R 215.90	R 431.80
DALACIN C 600MG INJ 4ML	15	R 28.46	R 426.90
GAUZE PARAFFIN 100*400MM CUTICELL	12	R 35.00	R 420.00
GLUCAGEN NOVO HYPOKIT	2	R 209.87	R 419.74
FUROSEMIDE INJ 20MG	10	R 41.14	R 411.40
LEUKOPLAST SLEEK ROLL 25MM*3M	2	R 205.16	R 410.32
SCOTCHCAST ONE STEP SPLINT 100*375MM	7	R 57.84	R 404.88
ADMIN SET 20DR/ML CONTINU FLO	26	R 14.97	R 389.22
FEEDING TUBE PVC 8CH 50CM	8	R 47.96	R 383.68
MICROFOAM 100MM*5M	3	R 126.91	R 380.73
SCOTCHCAST ONE STEP SPLINT 100*750MM	4	R 94.79	R 379.16
PATIENT CONTROL ANALGESIA DEVICE 50ML	1	R 377.32	R 377.32
SCOTCHCAST PLUS 75MM*3.6M ALL COLOURS	13	R 28.86	R 375.18
SOFTBAN ORTH PADDING NATURAL 150MM*3M	3	R 124.78	R 374.34
CARDIFEN CAPS 5MG	5	R 74.60	R 373.00
ATERAX AMP 100MG	6	R 61.90	R 371.40
ADAPTIC N/ADH DIGIT DRESSING SM	2	R 182.70	R 365.40
SCOTCHCAST PLUS 100MM*3.6M	10	R 36.31	R 363.10
RINGER LACTATE 200ML	25	R 14.46	R 361.50
PANADO TABS 500MG	10	R 33.73	R 337.30
FEEDING TUBE 50CM 6FR	7	R 47.96	R 335.72

RESTON FOAM1	5	R 66.99	R 334.95
RIVOTRIL AMP 1MG	3	R 110.92	R 332.76
BLENOXANE AMP 15MG	1	R 327.85	R 327.85
CATH URETERAL CATH OPEN END SET	1	R 325.00	R 325.00
CATH URETERIC CATH OLIVE TIP CHO4	5	R 64.06	R 320.30
RE MK	2	R 159.10	R 318.20
SODIUM CHORIDE 0.9% 200ML	25	R 12.41	R 3,977.50
RETRACTOR PAD	2	R 138.60	R 277.20
ADMIN SET GEMSTAR PAV EPIDURAL SPLIT SET	1	R 266.00	R 266.00
DOPAMINE HCL FRESENIUS 200MG	1	R 265.02	R 265.02
STOCKINETTE PHIL-NETTE 100MM	1	R 261.31	R 261.31
CIPROBAY IV 100MG	2	R 127.57	R 255.14
SOFTBAN ORTH PADDING NATURAL 100MM*3M	3	R 82.09	R 246.27
VOLTAREN AMP 75MG	7	R 34.37	R 240.59
DEXTROSE FRESENIUS 50%	2	R 118.86	R 237.72
NITROCINE AMP 10MG	1	R 235.67	R 235.67
LIGNOCAINE 1% VIAL	3	R 78.55	R 235.65
ADAPTIC DRESSING IMPREG 75MM*75MM ST	1	R 231.33	R 231.33
DEPO-MEDROL C LIDOCAINE 40MG/2ML	4	R 56.32	R 225.28
MANNITOL 5% FOR IRRIGATION 3L	14	R 16.05	R 224.70
SPINAL MANOMETER STERILE	6	R 36.72	R 220.32
MICROPORE 72MM*10M	4	R 54.49	R 217.96
CATH FOLEY BARDIA TEF COAT 5/10ML 22FG	8	R 26.97	R 215.76
BUSCOPAN CO AMP 5ML	3	R 71.26	R 213.78
SOFTBAN ORTH PADDING NATURAL 50MM*3M	5	R 41.95	R 209.75
MITONYCIN C 2MG	2	R 103.46	R 206.92
DIPRIVAN 1% VIAL 50ML	3	R 67.60	R 202.80
CYSTRO IRRIGATION SET	51	R 3.81	R 194.31
STERI STRIP 1547R	16	R 11.85	R 189.60
SOLU-MEDROL AMP 500MG 8ML	1	R 184.39	R 184.39
CATH URETERIC RUSCH CYLINDRICAL TIPCHO3	3	R 61.27	R 183.81
ANEXATE AMP 0.5MG	1	R 181.33	R 181.33
COMFEEL PLUS TRANS DRESS 10CM*10CM	1	R 174.11	R 174.11
CANNULA FLEXIBLE STRAIGHT	3	R 57.65	R 172.95
SOLU-MEDROL AMP 125MG 2ML	3	R 57.48	R 172.44
SCOTCHCAST PLUS 50MM*3.6M	7	R 24.58	R 172.06
CATH WISHARD PVC CATH 50CM FG20	7	R 24.04	R 168.28
CATH FOLEY BARDIA TEFLN COATED 30ML*12F	6	R 26.97	R 161.82
CATH FOLEY BARDIA TEFLN COATED 30ML*22F	6	R 26.97	R 161.82
CATH FOLEY BARDIA TEFLN COATED 30ML*24F	6	R 26.97	R 161.82
SODIUM CHORIDE 0.9% FOR IRRIGATION 3L	13	R 45.34	R 350.61
SOLUTION ADMIN SET PAED Y SITE 60DR/ML	39	R 4.12	R 160.68
DEPO-MEDROL AMP 40MG	3	R 53.17	R 159.51
TEGADERM ISLAND DRESS 90*250MM	27	R 5.71	R 154.17
LIGNOCAINE 2% VIAL 20ML	1	R 144.40	R 144.40
ASCORBIC ACID FRSENIUS AMP 500MG	2	R 71.54	R 143.08
TEGADERM FILM DRESS 1624W 60*70MM	82	R 1.72	R 141.04
P.O.P. SLAB 100MM*750MM GYPSONA	1	R 137.89	R 137.89

DIPRIVAN 2% VIAL 50ML	1	R 135.19	R 135.19
CATH FOLEY BARDIA TEFLN COATED 30ML*20F	5	R 26.97	R 134.85
KONAKION MM AMP 10MG	1	R 133.61	R 133.61
STERILE WATER FOR IRRIGATION 3L CHARGEABLE	11	R 52.55	R 1,469.71
CATH URETERIC CATH OLIVE TIP CHO5	2	R 64.06	R 128.12
CATH WISHARD PVC FG32	8	R 15.75	R 126.00
TESTOSTERONE IMPLANT 25MG	1	R 123.45	R 123.45
NEURO SUCTION CATHETER RIGID	11	R 10.54	R 115.94
POTASSIUM CHLORIDE AMP 15%	3	R 36.68	R 110.04
P.O.P. BANDAGE 75MM*3.5M GYPSONA S	2	R 52.30	R 104.60
COBAN BANDAGE 150MM*4.5M	2	R 52.06	R 104.12
RINKILASTIC BAND 60MM*4M	1	R 104.07	R 104.07
FEEDING TUBE 50CM*5FR	2	R 47.96	R 95.92
ATROPINE AMP 0.5MG	6	R 15.95	R 95.70
TEGADERM FILM DRESS 1627W 100*250MM	11	R 8.37	R 92.07
ATROPINE AMP 1MG	5	R 17.56	R 87.80
TEGADERM ISLAND DRESS 90*150MM	22	R 3.89	R 85.58
RINKILASTIC BAND 25MM*4M	4	R 21.10	R 84.40
TEGADERM ISLAND DRESS 50*70MM	54	R 1.56	R 84.24
CALCIUM CHLORIDE FRESENIUS 10% 10ML	1	R 80.97	R 80.97
CENTRAL VENOUS PRES MONIT SET 15DROPS/ML	3	R 25.31	R 75.93
SODIUM BICARBONATE 8.5% ALKA BAG 50ML	6	R 12.01	R 72.06
TRACHEAL PAED TUBE GUIDE 5CH 500MM	1	R 71.26	R 71.26
SOLU-CORTEF AMP 500MG 4ML	2	R 34.20	R 68.40
TRANCHESTOMY TAPE	2	R 34.00	R 68.00
CATH SUCTION CONTROL CATH 42CM 8CH	14	R 4.78	R 66.92
SOFT CLOTH DRESSING 241MM*86MM	22	R 3.00	R 66.00
DEXTROSE PVC BAG 50%	3	R 21.71	R 65.13
MAINTELYTEGLUCOSE 5% 1L	4	R 16.05	R 64.20
CATH WISHARD PVC FG26	4	R 15.75	R 63.00
CATH WISHARD PVC FG28	4	R 15.75	R 63.00
KARMAN FLEXIBLE CANNULA 6MM	1	R 57.65	R 57.65
CATH SUPRALATEX 2W FOLEY CATH FG16*5CC	15	R 3.70	R 55.50
CATH SUPRALATEX 2W FOLEY CATH FG18*5CC	15	R 3.70	R 55.50
CATH FOLEY 10FG	6	R 9.00	R 54.00
CATH FOLEY PAEDIATRIC 8FG	6	R 9.00	R 54.00
CATH FOLEY BARDIA TEF COAT 5/10ML 24FG	2	R 26.97	R 53.94
CATH SUCTION CONTROL CATH 42CM 10CH	10	R 4.78	R 47.80
CATH WISHARD PVC FG24	3	R 15.75	R 47.25
CATH FOLEY CATH STATLOCK	1	R 42.90	R 42.90
GLUCOSE WATER 5% 200ML	3	R 13.79	R 41.37
CATH SUCTION CONTROL CATH 42CM 12CH	12	R 3.41	R 40.92
TEGADERM ISLAND DRESS 60*100MM	21	R 1.92	R 40.32
SOFT CLOTH DRESSING 62MM*86MM	47	R 0.85	R 39.95
NEONATALYTE GLUCOSE 10% 200ML	3	R 13.20	R 39.60
TEGADERM FILM DRESS 1628W 150*200MM	4	R 9.03	R 36.12
COBAN BANDAGE 100MM*4.5M	1	R 34.70	R 34.70
CATH SUPRALATEX 2W FOLEY CATH FG12*5CC	9	R 3.70	R 33.30



CATH SUPRALATEX 2W FOLEY CATH FG14*5CC	9	R 3.70	R 33.30
TEGADERM ISLAND DRESS 90*100MM	11	R 2.96	R 32.56
SODIUM CHORIDE 5% 200ML BOTTLE	4	R 37.27	R 11.84
TUBE RYLES DUODENAL FG18	8	R 4.01	R 32.08
CATH WISHARD PVC FG30	2	R 15.75	R 31.50
CATH WISHARD PVC FG34	2	R 15.75	R 31.50
GLUCOSE WATER 5% 1000ML	2	R 15.58	R 31.16
SOLU-MEDROL AMP 40MG 1ML	1	R 31.00	R 31.00
TEGADERM FILM DRESS 1629W 200*300MM	2	R 15.19	R 30.38
CATH FOLEY PAEDIATRIC 6FG	2	R 15.00	R 30.00
BLOOD ADMIN SET 10DR/ML 1.9ML	4	R 7.22	R 28.88
SOFT CLOTH DRESSING 415MM*85MM	5	R 5.26	R 26.30
NEOSTIGMINE FRESENIUS AMP 0.5MG	1	R 25.35	R 25.35
OSMITIROL	2	R 12.22	R 24.44
CATH SUCTION CONTROL CATH 42CM 6CH	5	R 4.78	R 23.90
FUNGIZONE IV INFUSION	1	R 23.69	R 23.69
CATH SUPRALATEX 2W FOLEY FG14*30CC	6	R 3.70	R 22.20
CATH SUPRALATEX 2W FOLEY FG18*30CC	6	R 3.70	R 22.20
TUBE RYLES DUODENAL FG14	4	R 4.01	R 16.04
CATH WISHARD PVC FG22	1	R 15.75	R 15.75
TEGADERM FILM DRESS 1622W 44*44MM	11	R 1.36	R 14.96
CATH NELATON RED 6FG	6	R 2.20	R 13.20
CONTINU FLO SOLUTION	2	R 5.50	R 11.00
CATH NELATON RED 10FG	1	R 11.00	R 11.00
GLUCOSE WATER 5% MINIBAG 50ML	1	R 11.00	R 11.00
TUBE RYLES DUODENAL FG16	2	R 4.01	R 8.02
SOFT CLOTH DRESSING 122MM*86MM	4	R 1.68	R 6.72
CATH NELATON RED 8FG	1	R 2.20	R 2.20
AMINOPHYLLIN IV 250MG	0	R 66.95	R 0.00
BOTOX VIAL 1001.U./ML	0	R 2,145.00	R 0.00
CLAFORAN VIAL 1G	0	R 116.79	R 0.00
CYMEVENE INJ 500MG	0	R 1,861.40	R 0.00
DEPO-MEDROL C LIDOCAINE 40MG/5ML	0	R 162.52	R 0.00
DEPO-TESTOSERONE AMP 100MG	0	R 185.90	R 0.00
DIPROSONE AMP 5MG	0	R 47.00	R 0.00
DOBUTREX VIAL 250MG	0	R 279.48	R 0.00
DORMICAN AMP 5 MG	0	R 984.97	R 0.00
EFFORTIL AMP 10MG 1ML	0	R 87.04	R 0.00
FRAXIOARINE INJ 2850U 0.3ML	0	R 339.75	R 0.00
HEALON 14MG	0	R 427.46	R 0.00
HEALON INJ 14MG	0	R 392.53	R 0.00
HEPARIN FRESENIUS 25001U/5ML VIAL	0	R 258.13	R 0.00
HEPARIN FRESENIUS 5000U/1ML AMP	0	R 162.33	R 0.00
HEPARIN FRESENIUS 5ML VIAL	0	R 97.17	R 0.00
INSULIN ACTRAPID HMGE VIAL 10ML	0	R 193.43	R 0.00
IPRADOL AMP 5MCG 2ML	0	R 91.47	R 0.00
KETAMINE 50MG	0	R 968.55	R 0.00
LANOXIN AMPS 0.5MG	0	R 57.77	R 0.00



LARGACTIL AMP 50MG	0	R 100.53	R 0.00
LASIX SPECIAL AMP 10MG	0	R 583.91	R 0.00
MANNITOL AMP 25% 50ML	0	R 24.38	R 0.00
PREMARIN AMP 25MG	0	R 151.78	R 0.00
ROCEPHIN VIAL 250MG	0	R 30.89	R 0.00
TAVAN IV 250MG	0	R 151.88	R 0.00
UROGRAFIN 60% 20ML	0	R 839.83	R 0.00
ZINACEF VIALS 250MG	0	R 113.17	R 0.00
BIOTAINE 0.5% IN PURIFIED WATER PER ML	0	R 8.14	R 0.00
BIOTAINE IN ALCOHOL 0.5% PER ML NONCHARGE	0	R 42.62	R 0.00
CETIDINE SOLUTION 1.3 PER ML	0	R 11.95	R 0.00
PVP SOLUTION NL NON CHARGEABLE	0	R 216.97	R 0.00
PVP-I SCRUB PER ML	0	R 45.07	R 0.00
AUTO TRANSFUSION KIT 745C OBLIQUE	0	R 1,644.96	R 0.00
HIGH CAP SOL/BLOOD ADMIN SET 20DR/ML	0	R 11.08	R 0.00
CATH HICKMAN CATH 13.5*30CM	0	R 2,322.00	R 0.00
CATH PERMCATH DUAL LUMEN CATH KIT	0	R 2,016.57	R 0.00
AXIOM THORACIC SILICONE CATH	0	R 135.30	R 0.00
CATH ADD A CATH SIZE 16CH	0	R 225.00	R 0.00
CATH BIPOLAR PACING CATH 5FR 110CM	0	R 1,070.56	R 0.00
CATH CATH PASSERS DISP LONG 55CM	0	R 4,853.89	R 0.00
CATH FOLEY BARDIA TEF COAT 5/10ML 14FG	0	R 26.97	R 0.00
CATH FOLEY BARDIA TEF COAT 5/10ML 16FG	0	R 26.97	R 0.00
CATH FOLEY BIOCATH 2W 2OP EYES 10ML*14F	0	R 153.43	R 0.00
CATH JACQUES STERILE 8EG	0	R 6.39	R 0.00
CATH PERMCATH DUAL LUMEM CATH KIT 40CM	0	R 2,713.01	R 0.00
CATH SINGLE LUMEN CATH PIC 50CM	0	R 201.60	R 0.00
CATH SUPRALATEX 2W FOLEY CATH FG20*5CC	0	R 3.70	R 0.00
CATH YANKAUER SUCT FINE CAPAC P/TIP	0	R 698.88	R 0.00
DRAIN NICITA NEPHROSTOMY C NEEDLE 16CH	0	R 879.76	R 0.00
EPIDURAL SET FELXTIP PLUS 17GA	0	R 227.59	R 0.00
OCCULUSION CATH BAL	0	R 925.00	R 0.00
STONE EXTRACTOR N-CIRCLE TIPLESS	0	R 2,133.54	R 0.00
SUPRA SUMP DRAIN FULLER ELLIOT ST FG32	0	R 11.00	R 0.00
SUPRA SUMP DRAIN FULLER ELLIOT ST FG22	0	R 11.00	R 0.00
SUPRA SUMP DRAIN FULLER ELLIOT ST FG24	0	R 11.00	R 0.00
SUPRA SUMP DRAIN FULLER ELLIOT ST FG26	0	R 11.00	R 0.00
SUPRA SUMP DRAIN FULLER ELLIOT ST FG28	0	R 11.00	R 0.00
SUPRA SUMP DRAIN FULLER ELLIOT ST FG34	0	R 11.00	R 0.00
SUPRA SUMP DRAIN FULLER ELLIOT ST FG36	0	R 11.00	R 0.00
YANKAUER C FLANGED TIP WITH VENT	0	R 4.24	R 0.00
FLUORETS STRIPS	0	R 144.40	R 0.00
SURESTEP STRIPS HOSPITAL	0	R 171.00	R 0.00
ADAPTIC NON ADH DIGIT DRESSING X-LARGE	0	R 210.40	R 0.00
ALLEVYN ADHESIVE DRESSING 75MM*75MM	0	R 263.30	R 0.00
COMFEEL PLUS TRANS DRESS 15CM*15CM	0	R 201.75	R 0.00
COTTON BUDS	0	R 8.69	R 0.00
GAUZE PARAFFIN 100*100MM CUTICELL	0	R 20.88	R 0.00



INADINE DRESSING 9.5CM*9.5CM STERILE	0	R 731.49	R 0.00
MEROCEL BARON SINUS PACK 2.5*1.2*2CM	0	R 2,572.78	R 0.00
RESTON FOAM2	0	R 47.30	R 0.00
RINKILASTIC BAND 80MM*4M	0	R 119.37	R 0.00
SINUS/NASAL DRESSING	0	R 1,822.57	R 0.00
SOFT CLOTH DRESSING 185MM*86MM	0	R 2.38	R 0.00
SOFT CLOTH DRESSING 30MM*10MM	0	R 3.80	R 0.00
SUGICAL CODMAN PATTIE X-RAY 0.5*.1.5*10	0	R 1,191.66	R 0.00
SUGICAL CODMAN PATTIE X-RAY 0.5*2*10	0	R 1,202.39	R 0.00
TENSOPLAST	0	R 302.39	R 0.00
PANADO CAPS	0	R 11.69	R 0.00
ZOFRAN ZYDIS TABS 4MG	0	R 395.26	R 0.00
RHEMACRODEX 10% SOD CHLORIDE 0.9% 500ML	0	R 45.60	R 0.00
SODIUM CHORIDE 0.45% 1L	0	R 15.13	R 0.00