

Can structured counselling and adherence tools improve adherence to immunosuppressive therapy in renal transplant patients?

by

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Abstract

Optimal adherence to immunosuppressants in renal transplant patients is vital for the survival of the transplanted kidney. Pharmacists are in an ideal position to counsel and support patients on adherence to medication and should be actively involved in the multidisciplinary healthcare team providing patient care, specifically medication taking. The aim of this study was to assess whether a pharmacist-led adherence enhancing intervention involving structured counselling and providing adherence tools such as diary cards and pillboxes, improved adherence to immunosuppressive therapy in renal transplant patients.

This was an open label randomised controlled study. 49 renal transplant patients were recruited from the specialised surgery outpatient clinic and transplant ward at Steve Biko Academic Hospital (known then as Pretoria Academic hospital). Patients were randomly assigned to either the intervention or the control group. The intervention group received an average of thirty minutes counselling about their medication from the study pharmacist as well as an adherence pack containing adherence tools. Patients in the intervention group were randomly allocated pillboxes. The control patients received the standard level of care that was normally provided at Steve Biko Academic Hospital in Pretoria, South Africa. At each repeat prescription and scheduled clinic visit patients from both the intervention and the control group received their medication and were interviewed by the study pharmacist. If the study pharmacist identified any problems with adherence in the patients in the intervention group further counselling, advice and support was given to the patient. Patients were followed up for either six months or six visits from their initial visit. Immunosuppressant medications as well as other chronic medications were monitored during the study. Data was collected using questionnaires. A clinician also assessed each patient's clinical condition at the end of the study to ascertain whether or not it had improved or declined over the period of the study. The data was analysed quantitatively.

No significant difference was found between the mean adherence of the intervention and the control groups. However, 85% of study participants indicated that the

pharmacist made a difference to the way they took their medication, and 95% of those patients indicated that the pharmacist had made a positive impact on the way they took their medication, 98% of study participants indicated that they were satisfied with the patient care they received and over half the study participants (66%) indicated that they wanted to receive support and advice from a pharmacist at every prescription dispensing visit. Overall the intervention received positive feedback from the participants.

This study indicates the need for further research into this area especially in the measurement of adherence. New more accurate methods for measuring adherence are required. Improving adherence to immunosuppressants in renal transplant patients could be improved by evaluating patient's adherence before transplant to identify any barriers to adherence, and providing a combination of individually tailored interventions over a sustained period of time. The pharmacist's role could also be improved by educating pharmacists at undergraduate level about the importance of adherence and including it in the training of all aspects of patient care, and providing information and support via continuing education to pharmacists already working in the profession.

“Keep watch also on the fault of patients which often makes them lie about the taking of things prescribed”

Hippocrates 400BC

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1.1 Introduction

When someone's life is at stake it is difficult to understand why they will not follow their health care providers' instructions and why they will not take an active role in their own care. This however is not a new concept. Around 400BC Hippocrates observed that patients often lie about their medication and cautioned his physicians to be alert to this fact.¹

Successful renal transplantation requires patients to adhere to long-term immunosuppressive drug regimens. These patients may also be taking many other medications for other chronic diseases e.g. hypertension and diabetes. Consequently these patients will be on an extensive list of drugs (polypharmacy) with many possible side effects and interactions.

Non-adherence to immunosuppressive medication among renal transplant patients has been found to be the third leading cause of kidney loss following rejection and infection.² It has been shown in renal transplant patients that non-compliers had a higher risk of late acute rejection. It was also found that non-compliers experience a higher increase in serum creatinine over time.³ Failure of renal transplant patients to take prescribed drugs properly (i.e. adhere to therapy) may result in rejection, graft loss, return to dialysis and in extreme cases, death.⁴

Adherence to medication is problematic in many drug therapies e.g. antihypertensives, diabetic medication and anti-retrovirals. The exact rate of adherence to medication regimens is difficult to assess because researchers in this area define and measure adherence in different ways. The general consensus is that adherence rates for long-term or chronic therapy tend to be about 50%. In a recent qualitative study up to 50% of transplanted patients reported failing to take their medication as prescribed.⁵

Strategies to improve non-adherence need to be multifactorial. There is no single intervention strategy that has been shown to be effective against all conditions and settings.⁶ A combination of strategies is often required to make a meaningful difference to a patient's adherence. A strategy comprising educational, behavioural and structural components provides a multilayered intervention with the best chance of successfully improving a patient's adherence to medication. Regular reinforcement

is also required to maintain adherence as adherence deteriorates over time.⁵ A major component in the adherence strategy is the role of the pharmacist.

The pharmacist's role in improving overall patient care is to build better understanding about medication therapy and promote better patient adherence to treatment regimens.⁷ Pharmacists need to develop strategies to assess patient knowledge and to determine possible reasons for lack of adherence with treatment. Once the reasons are ascertained, strategies to address these needs to be developed for the patient. Evidence suggests that an enhanced interaction between the patient and the pharmacist improves patient adherence with drug therapy.⁷ Pharmacists have been shown as key providers of patient counselling in correcting poor patient adherence.⁸ Addressing problems with treatment adherence requires the involvement of the entire multidisciplinary team and the contribution pharmacists can make are key to successfully achieving positive results.⁹

The purpose of this study was to ascertain whether adherence to immunosuppressive therapy in renal transplant patients is improved by a pharmacist providing structured counselling and adherence tools.

1.2 Adherence

Adherence is defined as 'the act or quality of sticking to something - to adhere to something'. In the context of treatment with medications adherence means a more collaborative process between the patient and the health care provider. The patient plays a more active role in their treatment and makes a commitment to follow the prescribed regimen as best as possible.¹⁰

Adherence is now the preferred term over compliance to describe patients' medication-taking behaviour.

Compliance can be defined as 'the act of conforming, yielding or acquiescing'. This implies the following of orders without involvement or input being given by the patient.¹⁰ The patient was required to do what he or she was told to do which is a form of reluctant obedience. So if a patient is deemed to be non-compliant, the patient is viewed to be incompetent to follow instructions or is showing deviant behaviour.

Whereas with adherence a patient is free to decide to follow the prescribers' recommendations and failure to do so should not be a reason to blame the patient.¹⁰

1.2.1 Types of non-adherence

The most common types of non-adherence include¹¹

- Failing to have a prescription filled
- Repeat prescriptions not obtained
- Taking an incomplete dose
- Taking the medication at the wrong time
- Forgetting to take one or more medications
- Stopping the medication

1.2.2 Factors involved in adherence

The phenomenon of adherence is a complex multidimensional one influenced by a number of factors which may be classified into five categories.¹²

1. Social and economic factors
2. Health system and care team related factors
3. Condition related factors
4. Therapy related factors
5. Patient related factors

1.2.3 Social and economic factors

Socioeconomic status has not consistently been found to be an independent predictor of adherence. However in developing countries low socioeconomic status may put patients in the position of having to choose between competing priorities e.g. transport and medication versus food and education.¹² Such priorities frequently include demands to use the limited resources available to the patient to meet the needs of other family members such as children or parents in their care.¹²

The main concerns are poverty, illiteracy, unemployment, lack of effective social support networks, unstable living conditions, long distance from treatment centre,

high cost of transport, high cost of medication, changing environmental situations, culture and lay beliefs about illness and treatment and family dysfunction.¹²

Low educational levels may impact on reaching the correct diagnosis as well as understanding how to use medicines.¹³ Poor literacy skills may be overlooked, especially if the patient is sensitive about their inadequacies.¹³

Income itself does not predict adherence but barriers related to low income can include inconsistent primary healthcare, inability to pay for consultations and medicines, lack of transport, family dysfunction and substance abuse.¹³ Using only one doctor and one pharmacy may improve continuity and communication as less time is wasted re-establishing relationships on each visit.¹³

If a person lives alone, they may not have the level of support that would be provided by family or a partner.¹³ The risk factors associated with social isolation, especially when housebound with illness; include access to supplies, remembering to take doses, difficulty managing administration and understanding and interpreting instructions.¹³

In a working environment it may not be practical for the patient to self-administer medication or it may not be possible to continue working after a dose e.g. if a medicine causes drowsiness.¹³ Initial planning of the therapeutic regimen needs to address these issues and be based on realistic expectations.¹³

Age is a factor reported as affecting adherence, but it is an inconsistent variable.¹² Age should be evaluated separately for each condition and if possible by the characteristics of the patient and by the age group i.e. children dependent on parent/guardian, adolescents, adults and the elderly.¹²

The adherence rates of infants and toddlers to recommended treatment regimens are largely determined by the ability of the parents or guardian to understand and follow through with the recommended management.

Once children are at school they spend less time at home with their parents and are increasingly influenced by their peers and the social environment.¹² They are in the

process of learning to regulate their own behaviour and control the world around them.¹²

Increasing numbers of single and working parents have shifted more of the responsibility for disease management onto the child.¹² Assigning too much responsibility to a child for management of their treatment can lead to poor adherence.¹²

Adolescents, though capable of greater autonomy in following recommended treatment regimens, struggle with other issues such as self-esteem, body image, social role definition and peer-related issues. Poor adherence in adolescents may be a sign of ‘rebellion’ on the patient’s part against the drug regimens control over their lives.¹²

Poor adherence to prescribed regimens affects all age groups but the prevalence of cognitive and functional impairments in elderly patients increase their risk of poor adherence. Many elderly patients have multiple chronic diseases which may require complex medical regimens which also decrease adherence. Age-related alterations in pharmacokinetics and pharmacodynamics make the elderly even more vulnerable to problems relating to non-adherence.¹² The elderly are also just as likely as younger people to make a rational and intentional decision to change or stop their medication without seeking professional advice.

1.2.4 Health system and care team related factors

A good patient health-care provider relationship may improve adherence, but there are many factors that can have a negative effect on adherence.¹² These factors include poorly developed and managed health services, too few and often over-worked health-care providers, short consultations, weak capacity of the system to educate, provide follow-up and support patients, poor training of healthcare providers in adherence and inadequate or non-existent reimbursement for treatment by medical aids.¹²

It is possible that due to improved adherence, therapies become more effective and the number of crises, relapses and complications may be decreased. This should

ultimately decrease total cost for the health system as a whole even if this means that more medications are required initially and chronically to assure optimal care .¹³

Factors that may contribute to non-adherence in patients not getting their prescriptions dispensed may relate to the pharmacy. When a patient arrives in the pharmacy for the prescription to be dispensed it may take longer than they expect, or they may not receive their complete prescription due to there being insufficient stock.¹³ Busy, uncomfortable or non-private surroundings may be seen as barriers to patients and decrease their adherence. A private area or a counselling room may improve the patient's perceptions of the advice being offered by the pharmacist.¹³

Changes to medication regimens should be kept to a minimum.¹³ Good initial medication choices by the healthcare team will minimise subsequent changes to therapy and simplify what the patients have to cope with.¹³

All members of the healthcare team will have to be able to effectively communicate with patients. A good rapport needs to be developed between the health care provider and the patient. To improve adherence health care providers will need skills in motivational interviewing as well as understanding disease states, therapy regimens, and interactions between prescribed medicines and also over-the-counter remedies, complementary and alternative therapies.¹³ A good relationship between the health care provider and the patient will assist patients to retain the information on a long-term basis.¹³

The healthcare provider should use terms that are easy to understand or explain the medical terms that they are using. One cannot assume that a patient will ask when they don't understand. It may take more than one consultation for a patient to fully understand the information required to adhere to a medication regimen. Verbal instructions need to be supported by written materials that are written in simple language that is easy to understand and that do not use complex medical terms.¹³

Doctors may be reluctant to inform a patient about every minor side effect as they feel this may increase intentional non-adherence. This may be justified if the side effect is rare or minor but the patient should be fully informed. The pharmacist is in the best position to add to the patient's level of knowledge and improve adherence.¹³

1.2.5 Condition related factors

Illness related factors can influence adherence.¹ Some strong determinants of adherence are related to the severity of symptoms, the level of disability (physical, psychological, social or vocational), rate of progression and severity of the disease, and the availability of effective treatments.^{12,13} The more serious a patient perceives their condition or disease to be and how important adherence is in the situation determines the adherence of the patient¹. However there are cases where the illness is severe and the patient is non-adherent. Life threatening illness is no guarantee of adherence.¹³ Non-adherence may arise from an active decision on the part of the patient and may not simply be due to a lack of competence or lack of knowledge about how to use the medication.¹⁴

The presence of depression in patients with diabetes or HIV/AIDS and drug and alcohol abuse can also have a negative effect on adherence.¹²

Multiple illnesses which require different therapies increase regimen complexity and decrease adherence.¹³ Many diseases are associated with poor cognitive function, such as those causing cardiac insufficiency, transplants and neurological conditions such as epilepsy and Parkinson's disease which will also negatively influence adherence.¹³ Other factors that reduce adherence relate to the illness itself e.g. poor vision in patients with glaucoma and decreased manual dexterity in patients with rheumatoid and osteoarthritis.¹³

1.2.6 Therapy related factors

These factors include the complexity of the treatment regimen (i.e. number of daily doses, number of different medications, and different methods of drug delivery), duration of treatment, previous treatment failures, frequent changes in treatment, the immediacy of beneficial effects, the cost of the medicines, actual or perceived side effects and the availability of medical support to deal with them.^{12,13} The medications themselves may cause memory disturbances or confusion in patients. The patient may forget to take a dose or they may forget that they have already taken a dose and take another.¹³

One needs to check if patients can demonstrate the correct use of medical devices e.g. inhalers. Then advice can be given to the patient about improving their technique if necessary.¹³ Even if a patient has been receiving a particular medication for some time one cannot assume they understand how to use it as they could have developed bad habits.

Education on medication for patients also needs to include storage conditions and expiry dates (especially in the case of eye drops which should be discarded thirty days after opening) as medication that is expired or damaged e.g. by moisture, light, heat or freezing may not be fully effective.¹³

Simplifying drug regimens and timing schedules should help patients adhere to their therapy.¹³ Treatment complexity is not the key issue in non-adherence but how well the treatment fits in with the individual patient's routine, expectations and preferences.¹⁴

The number of drugs a patient takes does not correlate with adherence. Patients who are prescribed several medications tend to take all types of drugs together or forget all of them when they miss that dose.¹⁵ This behaviour suggests that the number of medications is not as important as the number of times a day doses must be taken. A linear decline in adherence rates has been demonstrated with the increasing number of doses per day, with the greatest decline occurring when dosing increased from three to four times daily.¹⁶ Even once daily dosing does not lead to perfect adherence.¹⁵

Dietary restrictions or food requirements that relate to administration of a medicine (e.g. taking alendronate on an empty stomach while sitting or standing upright, or taking griseofulvin with a fatty meal) may also create a barrier to adherence.

If a patient only trusts homeopathic medicines they may view conventional medicines as harmful.¹³ If a patient views herbal medicines as safer than prescribed medications the patient may benefit from further education about the risks of herbal remedies.¹³ Just because it is 'natural' does not make it safe!

The percentage adherence i.e. the number of doses that must be taken for a treatment to be effective will vary. For example 70-80% may be adequate for thiazide diuretics,¹³ for antiretrovirals greater than 95% adherence is required for viral suppression and the prevention of resistance,²⁴ but for oral contraceptives or anticoagulants closer to 100% is required, and for H₂ antagonists¹³ or proton pump inhibitors in the treatment of gastric reflux intermittent use may be appropriate.

1.2.7 Patient related factors

These factors include the resources, knowledge, attitudes, beliefs, perceptions and expectations of the patient.¹²

Some patient related factors reported to adversely affect adherence include:¹²

- Forgetfulness
- Psychological stress
- Anxieties about possible adverse effects
- The lack of motivation
- Inadequate knowledge or the skills to manage the disease symptoms of the treatment
- Cultural rituals and beliefs e.g. purging etc
- Negative beliefs about the efficacy of the medication
- Non-acceptance
- Lack of perception of the health risk of the disease
- Misunderstanding of the treatment instructions
- Lack of acceptance of the treatment instructions
- Fear of dependence
- Stigmatisation due to the associated disease e.g. epilepsy, HIV/AIDS

There are two types of non-adherence: unintentional and intentional. This can be simplified to the terms 'can't take' and 'won't take'.¹⁷ Unintentional non-adherence is more about practical problems, physical and otherwise, like memory loss (forgetting to take a medicine, or taking a tablet at the wrong time of day) or difficulty opening a medicine container that prevents someone from taking medicines as prescribed.¹⁷

Intentional non-adherence is based on the patient's beliefs about the medicine e.g. whether or not it will work.¹⁷ Other examples of intentional non-adherence include reducing doses to avoid side effects, missing a dose in order to do a prohibited activity e.g. missing a dose of metronidazole to drink alcohol, getting repeat prescriptions for reliever inhalers e.g. salbutamol but not preventers e.g. corticosteroids.¹⁷

The distinction between unintentional non-adherence and intentional non-adherence can sometimes be unclear when subconscious issues affect behaviour.¹³ e.g. forgetting to take a medicine may result from lack of motivation to take it.¹⁷

Cultural beliefs about illness and medications may affect adherence.¹³

Some examples of cultural practices that impact on medication adherence are:

Food: Orthodox Jewish patients cannot have non-kosher medication, unless there are no alternatives.¹³

Alcohol: warning patients about alcohol interactions may offend those patients whose religion does not permit alcohol consumption. This includes Sikhs, Muslims and Buddhists. Alcohol is frowned upon in some Christian churches and Hinduism.¹³

Fasting: If a patient is fasting according to their religion they may not be able to take medications with food.

During Ramadan, Muslims must abstain from all food and drink between sunrise and sunset. Children before puberty and those who are ill or pregnant are exempt but may still choose to fast. Devout Hindus may fast regularly each week but this may only mean missing individual meals or eating only simple foods.¹³

Jewish religious practise includes fasting for 25 hours before Yom Kippur. Orthodox patients must be offered alternatives to oral medicines e.g. injections or suppositories.¹³

Route: In some cultures some dosage forms are considered more effective than others.¹³ It is a common misconception that injections are more 'powerful' than oral medications. In France the rectal route is highly rated.

Language: If there is a language barrier between the healthcare provider and the patient this will decrease the adherence of the patient to instructions regarding taking medications. One should resist using young children as interpreters.

1.2.8 Reasons for non-adherence in renal transplant patients

The following are some reasons renal transplant patients are non-adherent

- A belief that immunosuppressants are unnecessary, especially when one is feeling healthy.¹⁸
- The mistaken belief that a living donor match requires less or no immunosuppression. The recipient believes that their allograft is relatively histocompatible diminishing the recipient's incentive to rigorously follow medication protocols.¹⁹
- A belief that immunosuppressants stay in your "system" for longer than 24 hours.⁴
- Recipients who have had their transplanted organ for a longer length of time also show an increased likelihood of nonadherence.¹⁹
- Anger or frustration at being forced to maintain an exceedingly complex medical regimen.¹¹
- Depression, increased stress adverse effects.²⁰
- Poor understanding of their doctor's or pharmacist's instructions.¹¹
- An effort to lessen side effects of medications.¹¹
- A struggle for independence especially in adolescents.¹³
- Running out of medication.¹¹

1.2.9 Consequences of non-adherence in renal transplant patients

Successful renal transplantation requires patients to adhere to long-term complex multi-factorial regimens including regular time-consuming hospital visits, difficult immunosuppressive therapy protocols and treatment of concomitant diseases such as hypertension and diabetes.²¹

Non-adherence to immunosuppressant therapy in renal transplant patients could result in:²

- An increase in acute rejection episodes
- Increased organ loss which could lead either to dialysis or re-transplantation
- Increased susceptibility to renal and non-renal related illnesses
- Increased frequency of hospital admissions

- Increased mortality

Of consistently non-adherent renal transplant patients, 100% will lose their donor kidney by the fifth year.²

1.2.10 Adherence assessment tools

Although numerous methods for measuring medication adherence are available accurate measurement of adherence is difficult.²⁰

Adherence assessment tools can be described as either direct or non-direct.¹⁴

Direct

This can be by assessing the ingestion of the drugs via direct observation (e.g. DOTS in TB therapy) or by detecting it's presence in body fluids (ciclosporin blood level monitoring) or metabolites in the urine.²⁰

Indirect

This can be assessed by self-report by the patient or number of dosages removed from the container (as measured by pill count or electronic monitoring), and review of prescription records.²⁰

No one method is without limitations nor is any one method superior in all aspects to another.²⁰

1.2.11 Adherence support strategies

- **Simplifying the medication regimen**
 - synchronising doses: this is simply explaining that medicines can be taken together and can also be tied in with mealtimes.
 - dose frequency rationalisation: either by using a long-acting preparation if one is available and appropriate or drugs with a longer half-life so they can be taken less frequently. Changing from three times daily to twice daily will show more effect on adherence than from twice daily to once daily as the lunchtime dose is the one most often missed. If a patient has an adherence

problem twice daily dosing may actually be best since if one of these doses is missed it may not be as crucial as missing the only daily dose.¹³

- discontinuing medicines: a clinical review of a patient's medications may identify medicines that may be inappropriate and not contributing significantly to the patient's treatment and only be contributing to an increased pill burden.¹³

- **Counselling**

- take good medication histories including the prescription and non-prescription medicines the patient is taking.⁷

- identify perceptions about health and medicines, as perceptions affect adherence behaviour. You can correct misperceptions and reinforce correct perceptions.⁷

- don't simply tell patients about their medications; ask for feedback from the patient. Ask open-ended questions.

- do not assume that physicians have already discussed with the patients the medications they prescribe.⁷

- do not assume that patients understand all information given. Use lay terms where possible and avoid medical jargon. For example explain what 'every 6 hours' means and what 'on an empty stomach' means as this could lead to confusion for the patient.

- do not assume that if patients understand what is required, they will be able to take the medication correctly.⁷ Incorporating taking medication into a patient's life involves a behavioural change and you may have to advise the patient on how to integrate this new behaviour into their lifestyle.⁷

- do not assume that once patients start taking their medication correctly that they will continue to do so. Regular reinforcement is required⁷. There is a continuing need to evaluate a patient's perspective and address issues as they arise. A patient who is reasonable adherent today may become less adherent in the future.¹⁷

- do not assume if the patient is having problems that they will ask questions. Initiate discussion with open-ended questions. The patient may be embarrassed or not even realise they have problems.⁷

- **Labelling for comprehension**

- capital letters and bold print can often make words harder to read.¹³
- remember that heat sensitive labels can be darkened by excessive light or heat.¹³
- large print on labels for patients with poor vision and consider Braille if possible.¹³
- pictograms for patients who have poor vision or are illiterate.²²
- use words that are easy to understand i.e. Take rather than to be taken¹³
- use precise terms for more meaning e.g. Take in the morning rather than take daily.¹³
- rather use the terms breakfast, midday meal, evening meal and bedtime to indicate times of the day. Dinner, supper and tea can be misinterpreted.¹³
- 'Take every 6 hours' can be often misunderstood. Check how the patient interprets this i.e. over 24 hours or would they only count waking hours. Waking in the middle of the night to take a dose may be unnecessary so the label may be misleading. A better way to write the label would be 'Take one capsule four times a day. Space the doses evenly throughout the day'.¹³
- it is better to label the container than the outer packaging as it will be discarded and the patient will have no record of how to take the medication.¹³

- **Telephone/email/cell phone reminders:**

- reminders via telephone, email or text via cell phone (automated sms) for appointment and repeat prescription dates.

- **Electronic monitoring**

- expensive
- cannot always be fitted to dosage forms or packages
- does not guarantee ingestion of medicine, the dose may be discarded
- assumes only one source of medication supply

- **Self-report**

- inexpensive
- by way of questionnaires, but care must be taken in the way the questionnaire is worded

- is difficult to obtain honest disclosure of non-adherence because patients are reluctant to give truthful reports of non-adherence because they feel they will offend the health care provider. Overestimation of adherence is common.¹⁴

- **Pill counts**

- simple
- can be done at every visit
- time consuming
- assumes medication not in container was consumed
- can be manipulated by patients
- surprise pill counts at home may be more accurate but are difficult to implement.¹

- **Treatment diaries¹**

- explains what medication to take and when
- patient checks off when dose is taken or not taken
- can also be used to record side effects
- not useful if patient is illiterate

- **Drug reminder charts**

- they will help inform patients what time of day to take things.¹³
- they will help clarify which tablets can be taken at the same time.¹³
- the chart facilitates a connection with mealtimes to act as cues.¹³
- great value to the patient, the carer, the doctor and other health professionals and specialists especially when admitted to hospital.
- have to be kept updated (the pharmacist should check they are kept up to date as new prescriptions are brought in).¹³

- **Patient information leaflets**

-since recipients have different learning abilities, it is important to give recipients information that is tailored to their education level to facilitate understanding.²⁰

-verbal and written instructions are commonly used to inform patients as to how to take their therapy.²⁰ Written instructions back up what was said verbally as patients will leave the surgery and forget over 95% of the information given during the consultation.

- **Pictograms on medication labels**
 - pictograms have a role in enhancing understanding in low-literate patients.²²
 - they stimulate memory and aid recall over a prolonged period of time
- **Memory joggers (cues)**
 - cell phone reminders
 - watch/clock alarms
 - a cue can be any activity that patients perform regularly to which the medication regimen can be tied.¹⁵
 - TV programmes that are watched regularly at specific times can serve as cues of when to take medication
 - medication should be visible and not hidden away in a cupboard
 - keep medication near other items that are used regularly e.g. toothbrush.
 - tie specific behaviours to environmental cues by prompting the planning of when and how the behaviour can be carried out e.g. 'when I brush my teeth in the morning I take my medication'.¹⁴
- **Pill boxes/compliance packaging**
 - these are partitioned containers that can be filled once a week or every few days
 - there is a need to educate the patient re storage i.e. must be a cool dry place and less than 25 degrees
 - supplies can be carried with the patient e.g. in their handbag or kept at their workplace which will also be helpful if a patient is admitted to hospital due to an accident or emergency as there will be no delay in them getting their correct medication
 - advise patient to not carry their whole medication supply with them just in case it gets lost or stolen.
 - they are not childproof.¹³
 - it is important to check that the patient can easily remove the tablets and refill the container.¹³
 - not all solid dose forms are stable in these packs.¹³
 - most compliance packs cannot be labelled with the required information.¹³
 - payment for these packs may be an issue.¹³

- some regimens are too large for the containers, although some do have adjustable compartments.
- **Alternative medication formulations**
 - an alternative formulation could help with adherence e.g. a liquid or powder or different brand of tablet that may be smaller and easier to swallow
 - using a pill crusher makes some pills easier to take
 - using a pill cutter makes taking half tablets easier and more accurate with regards to dose
- **Direct observed therapy(DOT)**
 - medication taking is directly observed by another individual on a regular basis e.g. in DOTS therapy in TB treatment in South Africa. Many heroin substitution programmes (e.g. in New Zealand) also directly observe the administration of methadone on a daily basis.²³
- **The ‘Buddy’ system**
 - is advocated in the national treatment guidelines for HIV/AIDs.²⁴
 - promotes disclosure of their status to at least one other person be it a family member, friend or employer who then acts as the patients’ ‘treatment buddy’.
 - the ‘buddy’ then helps and supports the patient with their adherence
- **Support groups and community organisations**
 - e.g. for HIV/AIDS, diabetes, epilepsy
 - enlisting support from family and friends and involving communities has been shown to have a positive impact on treatment outcomes e.g. in global TB and river blindness programmes.¹

1.2.11 Factors that promote medication adherence

- spend time with the patient and explain the goals of therapy and need for adherence as many times as necessary.¹
- involve the patient as much as possible in devising the treatment plan.
- only recommend treatment that is effective when it is required
- select treatment with lower levels of side effects or concerns for long term use
- prescribe a minimum number of medications if possible e.g. when a patient has two concurrent infections try to prescribe one antibiotic that addresses both sensitivities

- simplify dosage regimen if possible either by selecting a different drug or using a slow release preparation that needs less frequent dosing during the day.¹³
- where possible give palatable formulations or formulations that are easily swallowed (especially in the case of paediatrics).
- inform the patient of potential side effects- severity, duration and coping mechanisms.
- provide adherence tools, diary card, pill box, pictograms on medication labels.
- encourage use of alarms and reminders.
- avoid unanticipated adverse drug reactions by encouraging patient to disclose any OTC drugs or traditional medicines.
- anticipate monitor and treat side effects.
- encourage links with support groups.
- never tell the patient when to take (i.e. at what time) their medication (except within certain limits i.e. if the medication causes drowsiness and must be taken at night) allow them to commit to a dosing schedule.
- define precisely once daily dosing, twice daily dosing, or on an empty stomach.
- give advice for when routine may be disrupted e.g. spare doses of pills in their handbag or at work.
- explain 'what if' situations e.g. vomiting pills or late doses.
- make follow up appointments to commit the patient to blood tests or other necessary tests and to collect medication.
- most importantly provide written information e.g. patient information leaflets, a patient will leave the surgery and forget over 95% of the consultation.¹

Non-adherent behaviour is not predictable²⁰ and no single strategy will enhance adherence in all patients.

1.3 Pharmacists role

Any effort made by a pharmacist to share information with patients and engage them in talking about their medicines has the potential to improve adherence. However a patient's beliefs about their medicines are an invisible influence on their medicine-

taking behaviour, which cannot be addressed without a discussion.¹⁷ When pharmacists spend time counselling patients in a meaningful way, patients achieve better outcomes.⁷ Pharmacists have been shown as key providers of patient counselling in correcting poor patient adherence.⁹

Patients can be empowered by informing them about their medications so they can feel they are actively participating in their medical condition. Patients who are satisfied with information about their medications are more likely to adhere to treatment and involve themselves in their treatment.²¹

Clinical medication review has been shown to be effective in optimising therapy, improving health outcomes, reducing the likelihood of drug-related problems and reducing waste.⁹ Medication reviews can be seen as a natural role for pharmacists because they employ both clinical skills (e.g. knowledge of therapeutics and patient counselling) and technical skills (e.g. supply and product knowledge), the combination of these attributes being unique to pharmacists.²⁵

Pharmacists in the United Kingdom run medicine review clinics that help to optimise drug treatment of patients with renal disease and improve communication between the hospital and the general practitioner. The Pharmacists provide patients with a “Compliance card”, which lists all their current drug treatment, which helps patients and the health care professional alike by providing an up to date list of drug therapy.²⁶

Transplant recipients who have a clinical pharmacist involved in their care adhere better to immunosuppressive therapy than recipients who do not have a clinical pharmacist involved in their care.²⁷

An example from the literature of an ideal situation where pharmacists are involved in the care of renal transplant patients is at ‘The Transplant Pharmacy, Sangsat Medical Corporation, Menlo Park, California’.²⁸ This service provides a personal transplant pharmacist who interacts with the patients. Their families, their transplant team as well as other health care clinicians, and the pharmacy provider to assure appropriate medication selection and timely delivery of all medications.²⁸ Each patient in this program receives routine clinical evaluations by the pharmacist that include an evaluation of patient understanding and compliance with medications.²⁸

Pharmacists need to ensure better patient outcomes by building better patient understanding about medication. The pharmacist is not only able to make information available at the point of care, but also must be aware and competent enough to guide patients to valid and reliable sources of health information, available via media and the internet.⁹ Pharmacists can also refer patients to other healthcare professionals when necessary and inform patients about relevant patient support groups.⁹ Pharmacists can provide a second opinion or discuss with the patient information they have found.⁹

Pharmacists are the most qualified healthcare professionals to deal with aspects of medicine use. Undergraduate education is usually not sufficient to provide pharmacists with the necessary skills required and additional expertise needs to be gained usually through appropriate training. This can be achieved through implementing medication review programmes, ensuring adequate training in the process and ongoing continuous development.²⁵

In order for pharmacists to take an active role in improving adherence among chronically ill patients, drug therapy cannot be looked at in isolation.²¹ Pharmacists need to work with other health care professionals by attending ward rounds and outpatient clinics to review medication.²¹ Pharmacists have a duty to patients to provide counselling about medication about the risks of prescribed drugs and written information about medicines. Pharmacists also have a responsibility to facilitate adherence to medications without assuming that it is the patient's responsibility to comply with directions.²¹

Addressing problems with treatment adherence requires the involvement of the entire multidisciplinary team and the contributions pharmacists can make is key to successfully achieving positive results. The process of pharmaceutical care must be ongoing and requires constant evaluation which can often be overlooked in patients with chronic disease.²¹

Individual patients may have different reasons why they do not wish to take a medicine so a structured action plan for each patient, reviewed on several subsequent

visits may be helpful. Attempts at persuasion will not work, and may damage the pharmacist-patient relationship.¹⁷

A study by Lee et al²⁹ supports the view that a multi-layered intervention (in this case consisting of daily blister packs and baseline individual and repeat face-to-face counselling by a pharmacist) can improve medication adherence and underscores the value of pharmacists as key providers of patient counselling in correcting poor patient adherence.³⁰

1.4 Renal transplantation

Patients with severe chronic renal failure will eventually need some form of renal replacement therapy to correct the accumulation of toxins, electrolytes and fluids. Renal replacement therapy includes: haemodialysis, peritoneal dialysis, haemofiltration, haemodiafiltration and transplantation.³¹

In patients with end-stage renal failure (ESRF), kidney transplantation is the renal replacement therapy of choice.³² Renal transplantation is the surgical transfer of a kidney from a donor to a recipient. The majority of patients prefer living with a transplant to life on dialysis.⁵ Patients on haemodialysis, for example are required to be attached to a dialysis machine three times a week for up to five hours at a time.³¹ This can interfere with the person's ability to work and makes the possibility of travel difficult if not impossible.³² There are also fewer dietary restrictions with renal transplantation. Transplantation allows the patient to lead a relatively normal life when compared to life as it was before for the patient on dialysis.³³ Renal transplantation is significantly more cost effective than any form of dialysis.³⁴ Recent studies show that renal transplantation prolongs patient lifespan relative to dialysis.³⁵ The main disadvantage of renal transplantation is that the patient has to take immunosuppressive medication continuously for the life of the transplant (which may have to be repeated if the patient is young) to prevent rejection of the kidney.

The first successful kidney transplant was performed at the Brigham hospital on December 23 1954 in Boston, Massachusetts by surgeon Joseph Murray. The kidney

was transplanted between genetically identical twins.³⁶ If an identical twin donates a kidney the recipient will not invoke an immune response against the 'foreign' tissue.³⁷ In all other cases the kidney will be recognised by the immune system of the recipient as 'foreign' and an immune response will attempt to destroy it.³² This is called transplant rejection.

1.5 Transplant rejection

Important antigens that evoke transplant rejection are glycoproteins that are coded for by the histocompatibility complex of genes, and are found on the surface of cells. In humans, the major histocompatibility complex is called the HLA (human leukocyte antigen) locus. HLA varies between individuals making perfect matching extremely difficult. These antigens are also the strongest inducers of T-lymphocyte-mediated kidney rejection.³²

In the rejection process, donor HLA molecules are presented via antigen-presenting cells to resting T-cells that have receptors for that specific antigen. This recognition process activates the T-cells which produce and secrete cytokines such as interleukins and express cell-surface receptors to them such as interleukin-2-receptors. The lymphocytes recognise the donor HLA and differentiate and proliferate under the influence of interleukin-2 (IL-2). Cytotoxic T-cells bind directly to donor cells and lyse them. Other T-cells produce more cytokines such as interleukin-4 (IL-4) and interferon- γ which activates the B lymphocytes, antibody production, complement fixation and macrophage infiltration. The end result is destruction of graft tissue, which impairs the ability of the transplanted kidney to function.³²

Rejection can be categorised into three categories: hyperacute, acute and chronic.³⁷

Hyperacute rejection happens within minutes to hours of the transplant operation. It occurs when circulating preformed cytotoxic, antidonor antibodies directed to the ABO blood group antigens or to the donor HLA class I antigens are present. The donor organ is irreversibly damaged. No treatment exists and nephrectomy is indicated.³⁸

Acute rejection usually occurs within the first few months after transplant. After the first year acute rejection is uncommon. It is T-cell mediated and injury is directed to the renal tubules.³⁸ Symptoms and signs include a sudden rise in creatinine which may be accompanied by an increase in blood pressure, reduced urine output and pain over the transplanted kidney. Biopsy of the transplanted kidney confirms the diagnosis. Mild rejection may be successfully treated with corticosteroids alone whereas moderate or severe³⁸ rejections may require the use of anti-T-cell antibodies. Untreated acute rejection will result in the loss of the donor organ.

Chronic rejection can occur in the donor kidney as early as a few months post-transplant but is more common one year after transplant. Deterioration of the kidney is slow and relentless and the decline in renal function ultimately results in a return to dialysis for the patient.³⁷ The precise mechanism of chronic rejection is poorly understood. Treatment with conventional anti-rejection agents such as corticosteroids or anti-T-cell antibodies does not appear to alter the progressive course.³⁸

1.6 Preventing transplant rejection

Preventing rejection of a transplant kidney can be limited in two ways. Firstly, by taking all possible steps to maximise the compatibility of organ and recipient. This is done by ensuring that the genetic makeup of the donor and recipient is closely matched by using human leukocyte antigen (HLA) tissue typing. The ABO blood group of the donor and recipient of a kidney must also be compatible.^{32,35} Secondly the recipient has to take immunosuppressant drugs for as long as the transplanted kidney functions.

1.7 Immunosuppressant drugs

The goals of immunosuppressive treatment are to prevent acute and chronic rejection, to minimise drug toxicity and including infection and malignancy and to achieve the highest possible rates of patient and graft survival.³⁸

Immunosuppressants have been used in combination since the first transplants.³⁷ Combinations of corticosteroids with either mercaptopurine or azathioprine were the first drugs used to limit kidney transplant rejection. Conventional maintenance

regimens consist of a combination of immunosuppressive agents that differ by their mechanism of action. Combination therapy aims to minimise the dose of drugs with a low therapeutic index minimising morbidity and mortality while maximising overall effectiveness and where possible sparing steroids while reducing the prospect of acute rejection.³⁷ Ciclosporin was first introduced in 1982 and from then patients could be initiated on a triple therapy of corticosteroids (namely prednisone), azathioprine and ciclosporin.

Current immunosuppressive therapy can be divided into two phases: induction and maintenance.³⁵ The induction phase of immunosuppression occurs during and immediately following transplantation and is divided into antibody and non-antibody regimens. Induction therapy with antibody therapy consisting of a short course of a powerful anti-lymphocyte antibody preparation such as anti-thymocyte globulin (ATG) or the murine anti-CD3 antibody OKT3 can be given to the patient in combination with calcineurin inhibitors, anti-proliferative agents and corticosteroids. Both non-anti-body induction treatment and maintenance treatments do not utilise antibody therapy but use calcineurin inhibitors, antiproliferative agents and corticosteroids.

Newer drugs available to prevent kidney transplant rejection include mycophenolate mofetil which can replace azathioprine and tacrolimus or sirolimus which can replace ciclosporin.

Newer induction agents include basiliximab and daclizumab which are monoclonal human/mouse antibodies which bind to the interleukin 2 receptor reducing the incidence of acute kidney transplant rejection.

1.7.1 Calcineurin inhibitors

Calcineurin inhibitors have been the mainstay of clinical immunosuppression since ciclosporin was introduced in 1982.³⁵ Calcineurin inhibitors were the first agents to target proliferating lymphocytes by blocking the elaboration of cytokines e.g. interleukin-2 (IL-2) essential for T-cell proliferation.

Ciclosporin and tacrolimus are calcineurin inhibitors that work early in the T-cell activation.³² T-cell activation involves a series of cascades and the enzyme calcineurin is one of the rate-limiting steps.³²

Ciclosporin binds to an immunophilin called cyclophilin A. Tacrolimus binds to another class of immunophilins known as FK binding proteins specifically FKBP-12. They form a complex that binds the phosphatase calcineurin and inhibits the calcineurin-catalysed dephosphorylation essential to permit movement of the nuclear factor of activated T-cells (NFAT) into the nucleus. NFAT is required for transcription of IL-2 and other growth and differentiation associated cytokines.³⁹ Preventing cytokine production halts the T-cell driven immune response.³⁷

Sirolimus (rapamycin) works at a later stage in T-cell activation than ciclosporin and tacrolimus. Sirolimus also binds FKBP-12 but the complex formed has no effect on calcineurin. The FKBP-12-sirolimus complex binds to and inhibits the mammalian target of rapamycin (mTOR) and inhibits the IL-2 mediated signal transduction pathway involved in cell cycle proliferation.^{32,39} Another mTOR inhibitor everolimus has also been developed.³⁹

Ciclosporin and tacrolimus are naturally occurring products and have significant toxicities.

The major adverse effects of ciclosporin are nephrotoxicity (seen acutely, and as a chronic largely irreversible effect), hirsutism, hyperlipidaemia, glucose intolerance, hypertension, tremor, gingival hyperplasia and hyperuricaemia.³¹

The most common side effects of tacrolimus are nephrotoxicity, diabetes, tremor and headache. It can also cause alopecia.^{32,35}

Sirolimus is not nephrotoxic which gives it an advantage over ciclosporin and tacrolimus. The main adverse effects of sirolimus are hypercholesterolaemia, hypertriglyceridaemia, thrombocytopenia, hypertension and nosebleeds.

Ciclosporin, tacrolimus and sirolimus are metabolised in the liver by the cytochrome P450 pathway, specifically the cytochrome P4503A isoenzyme.

Drugs that inhibit CYP450 can increase ciclosporin, tacrolimus and sirolimus blood levels. They include:³²

- Macrolide antibiotics (e.g. erythromycin, clarithromycin)
- Imidazoles (e.g. ketoconazole, fluconazole)

- Diltiazem
- Verapamil
- Cimetidine
- Danazole
- Grapefruit juice

Drugs that induce CYP450 can reduce ciclosporin, tacrolimus and sirolimus blood levels. They include:³²

- Anticonvulsants (e.g. phenytoin, carbamazepine, phenobarbitone)
- Rifampicin
- St Johns wort

Other nephrotoxic drugs may worsen the renal toxicity of ciclosporin such as non-steroidal anti-inflammatories, aminoglycosides and amphotericin B.

Both ciclosporin and tacrolimus have significant dose-related nephrotoxicity. This nephrotoxicity combined with erratic absorption and complex pharmacokinetics necessitates ongoing monitoring of drug levels to maintain therapeutic levels while avoiding toxicities.³⁵

C2 monitoring which is two hour post-dose levels are now more commonly done than trough levels for ciclosporin.³⁷

Only trough monitoring is undertaken to monitor tacrolimus.³⁷

1.7 2 Antiproliferative agents

Azathioprine is an antimetabolite. It is well absorbed and is quickly metabolised to its parent compound 6-mercaptopurine (6-MP). The thioguanine nucleotides which result from further degradation of 6-MP disrupt the cellular synthesis of RNA and DNA. It prevents mitosis and the proliferation of activated T and B cells.³⁷

The major side effect of azathioprine is bone marrow suppression which is both dose-dependent and reversible.³⁷

Other important adverse effects include increased susceptibility to infections (especially varicella and herpes simplex virus) hepatotoxicity (which requires a reduction in dose or even cessation of the drug), alopecia, gastrointestinal toxicity, pancreatitis and an increased risk of neoplasia.³⁹

Azathioprine has been linked to the development of non-melanoma skin carcinoma,⁴⁰ which is the most common malignancy in renal transplant patients. Patients taking azathioprine for a prolonged period should be instructed to avoid direct exposure to sunlight or use high SPF sunscreens when exposed.⁴¹

Concurrent use of drugs that inhibit xanthine oxidase (e.g. allopurinol) a major elimination pathway for thiopurines, requires the azathioprine dose to be reduced by 25-33% of the usual dose and white blood cell count monitored carefully if marrow suppression is to be prevented. It is best to not use the two drugs together. Azathioprine can be switched to mycophenolate mofetil which does not interact with allopurinol.³⁵

Mycophenolate mofetil impairs lymphocyte function by blocking purine synthesis via inhibition of the enzyme inosine monophosphate dehydrogenase. Mycophenolate was developed as a replacement for azathioprine for maintenance immunosuppression. Mycophenolate is far more selective than its predecessor azathioprine and inhibits proliferation of B and T cells. It has been shown to reduce the number of acute rejection episodes compared with azathioprine.³² It is not nephrotoxic and has less bone marrow toxicity than azathioprine.³⁵ It is commonly associated with gastrointestinal side effects such as gastritis and diarrhoea. Persistent diarrhoea, the most frequent adverse reaction to mycophenolate is the main reason the drug is discontinued.

Mycophenolate is contraindicated in pregnancy as it is teratogenic so azathioprine should be used in men planning to become fathers while on immunosuppressive treatment and in women of child-bearing age.⁴¹

1.7.4 Corticosteroids

Steroids play an important role in induction and maintenance of immunosuppression and in the treatment of rejection.³⁵

Steroids inhibit the production of a number of T-cell and macrophage cytokines such as interleukins, interferons and the tumour-necrosis factor TNF- α . This has a non-specific effect on disrupting the response of the adaptive and innate immune system.³⁷

Recipients will typically receive high dose intravenous methylprednisolone (500mg to 1g) immediately before the transplant and oral prednisone thereafter.³⁷

Unfortunately steroids are associated with many complications including bone disease (osteoporosis), hypertension, peptic ulcer disease, glucose intolerance, growth retardation, infection, obesity and lipid abnormalities.³⁵

Post-transplant diabetes, hypertension and hyperlipidaemia are all complications of immunosuppressive agents.³⁵

The two major disadvantages of the immunosuppressive drugs on top of their individual adverse effect profile are that they increase the incidence and or severity of infections and increase the incidence of malignancy.³⁵

Although an adequate level of immunosuppression is required to dampen the immune response to the allograft, the level of chronic immunosuppression is slowly decreased over time to help lower the overall risk of infection and malignancy; these risks directly correlate with the degree of overall immunosuppression.⁴¹

1.8 Polypharmacy

Polypharmacy is defined as the use of multiple medications by a patient. This may occur when too many forms of medication are used by a patient, more drugs are prescribed than clinically necessary⁴² or even when all prescribed medications are clinically indicated but there are too many pills to take (high pill burden).

The common result of polypharmacy is increased incidence of adverse drug reactions, higher health care costs and lower adherence.

Polypharmacy may result when patients consult multiple physicians or pharmacies. It may also occur when herbal or complementary (including traditional) medicines,

vitamins or over-the-counter (OTC) medications taken by the patient interact with physician prescribed medications.

Unfortunately certain diseases such as diabetes often force polypharmacy, as complications of the disease such as hypertension and dyslipidaemia also have to be treated.

Because renal transplant patients often have several co-morbid diseases e.g. hypertension, diabetes, dyslipidaemia in addition to being immunocompromised due to immunosuppressive therapy, they take numerous medications. A renal transplant patient may require more than ten different medications per day. Many of these medications have significant adverse effects and are associated with numerous drug interactions.⁴³

Patients with Diabetes mellitus have poorer outcomes following transplantation than do patients without diabetes. Nearly all patients demonstrate histological evidence of diabetic nephropathy within four years.³⁵

Post transplant discharge instructions commonly include 20 or more different medications.⁴² Patients often receive oral prophylactic agents for infections early after transplants e.g. for urinary tract infections which can be bacterial or fungal, oral candidiasis, and re-emergence of dormant tuberculosis. After three months the number of medications is reduced, but immunosuppressants are compulsory for the life of the renal transplant.⁴⁴

1.9 Relevance in South African context

Treatment of end-stage renal disease (ESRD) in South Africa is an important public health issue. The prevalence of ESRD in South Africa is unknown.⁴⁵

There is a huge shortfall of facilities to treat ESRD in South Africa and it is important to optimise treatment for ESRD due to budget constraints. Dialysis is not the solution to ESRD. Dialysis is very expensive and offers treatment to only a small number of patients due to limited facilities and expense.⁴⁵ Transplantation is a cost effective

alternative in the long term. It offers the chance of full rehabilitation and possible return to employment and can be offered to a greater number of patients so long as there are sufficient organs. Dialysis should only be seen as a staging procedure to transplantation in South Africa⁴⁵ and not a long term solution.

The National Department of health (DOH) in South Africa has indicated guidelines for the selection of patients for treatment as currently treatment for all is too costly.⁴⁵

The guidelines are:

- i. suitability for transplantation
- ii. age < 65 years
- iii. compliance with treatment
- iv. absence of other significant pathology that will interfere significantly with treatment.

In most public hospitals offering renal replacement therapy in South Africa, patients not suitable for renal transplantation for any medical reason such as severe cardiac disease, psychiatric disease or malignant disease are not offered dialysis or transplantation.⁴⁶ Social factors are also taken into consideration and patients who live in rural areas where there are no haemodialysis facilities and who do not have access to running water are also denied treatment. Patients > 60 years are also generally treated conservatively.⁴⁶

In a study by Moosa⁴⁶ the results are documented of 542 patients receiving 623 cadaver transplants at the renal unit, University of Stellenbosch and Tygerberg Hospital from 1976 to 1999. This paper focuses primarily on the impact of age, gender and race. Moosa concluded that age is an important determinant of outcome with increased mortality in patients older than 40 years but race is not. There were no racial differences in either patient or graft survival found in this paper.

Graft survival improves with age which is most likely due to declining immunological function. This may also account for increased susceptibility to infection in older patients that leads to early death.⁴⁶

Gender was not found to influence graft survival but females were found to have a higher overall mortality rate following renal transplantation at the centre in this

paper.⁴⁶ A standard immunosuppressive regimen was used throughout, female patients received relatively more immunosuppression for their body mass and therefore were more prone to the complications of over-immunosuppression.⁴⁶ There was no discrimination made for gender on whether to treat for ESRD or not in this paper. However the mean waiting period for females on dialysis before receiving an organ for transplant in this paper was statistically longer than that of males (14 months compared to 10 months).⁴⁶

In a study by Moshokoa et al⁴⁷ at Medunsa in South Africa non adherent behaviour was found not to be related to age. Non adherence was found to be more common in males and it increased with time since transplantation. Low socioeconomic status, poor education, poverty, long distance travel, crime, and work or study pressure were contributory factors to poor or decreased adherence rates. Ciclosporin levels were not found to be useful in screening for non adherence as only one trough level at follow up was below the normal range of 50-300ng/ml.

1.10 Summary of hypothesis

Taking immunosuppressants according to the prescribed plan is crucial to the survival of the transplanted kidney.³⁷

Multifactorial interventions that incorporate structural and counselling components and include appropriately skilled and motivated pharmacists appear useful to promote medication adherence and persistence.²³

Pharmacists in South Africa especially in the Public Health sector (with the exception of some pharmacists in Antiretroviral Treatment clinics) are not performing this important function so they are being under utilised and patients are not receiving the level of care they should. Pharmacists should play an important part in the multidisciplinary health care team that delivers health care in South Africa. The multidisciplinary team is an advantage in the health care of a patient because it gives a greater continuity of care. It means the patient has access to several health care professionals rather than to one whom the patient might not respond.⁴⁸ More emphasis needs to be placed on the role of the pharmacist in providing counselling and

adherence support. Pharmacists should not be confined to the pharmacy but be visible and active on the wards interacting and communicating with other health care professionals. They could also be involved at clinic level reviewing medication. Even at the outpatient pharmacy the pharmacist should be more involved with the patient and the actual dispensing of the prescription should be undertaken by the pharmacist assistants. There is a lack of motivation as pharmacists do not like to get out of their comfort zone and there is a lack of formal training within pharmacy especially at a postgraduate level, and on the job training is very limited. This lack of motivation could be due to shortage of staff and low pay but job satisfaction and the possibility of training could motivate pharmacists to get more involved in this field. If it can be shown that pharmacists can make a difference to patients' medication-taking behaviour for the better, then this should be motivation enough for pharmacists to take a more active role in pharmaceutical care and play an active role in the multidisciplinary health care team.

To receive a kidney is a precious gift, and to lose it as a result of non-adherence to an immunosuppressive treatment regimen is a tragedy. Adherence to an immunosuppressive treatment regimen is imperative in renal transplant patients and everyone involved in a patient's care should facilitate this.

The pharmacist is often the last member of the healthcare team whom the patient sees, so they are in the best position to reinforce and monitor adherence in patients.

1.11 Intervention to do

Scant evidence exists concerning the effectiveness of adherence-enhancing interventions in renal transplant populations.⁴⁹ Given this and the serious consequences of non-adherence in renal transplant patients, the purpose of this randomised controlled study was to test the effect of a pharmacist-led adherence-enhancing intervention in a population of renal transplant patients. The pharmacist provided individualised adherence counselling and adherence tools to patients in the intervention group.

The *alternative hypothesis* guiding this study was that:

- Patients in the intervention group will show a lower non-adherence rate compared to the control group who received standard care at the end of the intervention period (6 months).

2. Methods

2.1 Design

This was an open label randomised controlled study. There were two groups of patients in this study; the intervention group and the control group. The intervention group received an average of thirty minutes counselling about their medication from the study pharmacist as well as an adherence pack containing adherence tools. Patients in the intervention group were randomly allocated pillboxes. The control group received the standard counselling from a nursing sister at the specialised surgery outpatient clinic which is normal practise. The control patients also received the standard level of care from the study pharmacist that is usually provided at Steve Biko Academic Hospital (known then as Pretoria Academic Hospital). At each repeat prescription and scheduled clinic visit patients from both the intervention and the control group received their medication and were interviewed by the study pharmacist. If the study pharmacist identified any problems with adherence in the patients in the intervention group further counselling, advice and support was given to the patient. Patients were followed up for either six months or six visits from their initial visit. Immunosuppressant medications as well as other chronic medications were monitored during the study. The data was analysed quantitatively.

2.2 Sample and setting

A sample of 49 renal transplant patients was recruited from the specialised surgery outpatient clinic and transplant ward at Steve Biko Academic Hospital (known then as Pretoria Academic Hospital).

This study was approved by the ethics committee of the University of Pretoria. (Appendix 1) Each patient gave written informed consent for participation. (Appendix 2)

2.2.1 Inclusion and exclusion criteria

Inclusion criteria included:

- 18 years of age or older
- Functioning renal transplant (not on dialysis)
- Post-transplant care only provided by Steve Biko Academic Hospital (known then as Pretoria Academic Hospital)
- The patient is able to collect all prescriptions from the pharmacy themselves.
- Able to speak, hear and understand English, as determined by the ability to participate in and comprehend conversation about potential inclusion in the study.
- Able to provide written informed consent.

Exclusion criteria included:

- Less than 18 years of age
- Post-transplant care provided by another transplant centre
- The patient requires a representative to collect prescriptions from the pharmacy on their behalf.
- Inability to speak and understand English.

The study pharmacist identified renal transplant patients meeting study inclusion and exclusion criteria, when the patients attended the outpatient pharmacy at Steve Biko Academic (known then as Pretoria Academic Hospital) to present their prescriptions for dispensing. The study pharmacist explained the study to the patients and then gave them the Patient information leaflet (Appendix 2) about the study to read or read it to the patient. The patient had the opportunity to decide before the next visit whether they wished to participate in the study or not. Each patient had to give written informed consent before they could be included in the study.

2.2.2 Randomisation procedure

The patients were randomly assigned to the control and intervention groups using randomly generated numbers (Appendix 3) provided by the statistics department of the University of Pretoria. Patients in the intervention group were then randomly assigned pillboxes also using randomly generated numbers (Appendix 3).

2.3 Demographics and clinical data

Demographic data (gender, date of birth, employment status, year of transplant, source of donor kidney, being treated for diabetes, hypertension or diabetes) and clinical data including blood results (ciclosporin levels and serum creatinine) were obtained from the patients medical records. Permission to access medical records was obtained from the CEO of Steve Biko Academic Hospital (known then as Pretoria Academic Hospital). (Appendix 4) Demographic data was recorded on the Patient Demographics form. (Appendix 5)

A rating score indicating whether the patient's clinical condition had improved or declined was assigned to each participant on completion of the study by either the consultant or registrar of the specialised surgery outpatient clinic. (Appendix 6) This score was then entered into the clinician assessment form. (Appendix 7)

Each patient in both the intervention and the control group was required to bring all the unused medication (along with their diary card if they were in the intervention group) to the study pharmacist at each visit to the pharmacy when collecting their prescription. A pill count was conducted and adherence evaluated.

Patients were advised to take only the medication prescribed for that particular month. Unused medication from previous visits was to be put aside in order to ensure an accurate monthly pill count so as to enable adherence to be evaluated.

2.4 Variables and measurement

At each visit following the initial visit, details were recorded about the patient on the patient visit record sheet (Appendix 8). These details included all pharmaceutical data (medications, doses, frequency), pill count, medical events (readmissions, unplanned clinic visits and side effects) and blood results (ciclosporin A levels and serum creatinine). A major cause of suboptimal ciclosporin A levels is nonadherence.⁴ Changes in serum creatinine over time can be used as a measure of graft function.³

Adherence to chronic medication was evaluated from the pill count for each chronic medication. The pill count and the interview recorded on the Patient visit record sheet were completed for patients both in the intervention and the control groups so the results could be compared. At the end of the study the patient was asked to complete a patient feedback questionnaire (Appendix 9).

2.5 Intervention

At the initial visit control patients received the usual standard care from a pharmacist at Steve Biko Academic Hospital (known then as Pretoria Academic Hospital). This included their prescription being correctly and timeously dispensed and given to the patient with basic instructions and directions.

Intervention patients received structured counselling from the study pharmacist at the initial visit. This comprised of verbal information about the medication, patient information leaflets (Appendix 10), a patient medication card (Appendix 11), a diary card (Appendix 12) and a pillbox (Appendix 13) if they had been randomly allocated one. The study pharmacist followed a checklist (Appendix 14) when counselling each patient which ensured consistency. Each intervention patient received an adherence pack.

2.6 Contents of adherence pack

1. Diary card
2. Patient information leaflet about the study
3. Patient medication card
4. Patient information leaflets about chronic medications
5. Reminder card on adherence
6. Pillbox (if allocated one)
7. Medication bags
8. Fridge magnet
9. Pen

2.6.1 Diary card (Appendix 12)

At the initial visit the study pharmacist explained to the patient how to complete the diary card. At every visit each patient in the intervention group was given a diary card for all the chronic medications they were taking. The drug names, dates and times decided on by the patient were completed on the diary card. In some cases when the patient was on a number of medications more than one diary card was required.

Instructions on how to complete diary card

- Fill in with a tick (✓) if drug is taken at correct time
- Fill in with a cross (x) if drug is not taken at all
- Fill in with the letter 'v' if you vomit within 30 minutes of taking the dose
- Fill in with the letter 'L' and the time if dose is taken later than the time it was meant to be taken.

The patient was then asked to explain to the study pharmacist how they were going to complete the diary card to confirm their understanding.

2.6.2 Patient information leaflet about the study (Appendix 2)

This was included in the adherence pack so the patient could refer back to it at anytime. It also contained the study pharmacist's contact details so the patient could contact the study pharmacist if there were any problems or queries regarding the study.

2.6.3 Patient medication card (Appendix 11)

This card contained basic personal details about the patient, any known allergies and current recommended chronic medication intake. The card was designed to be a medicine reminder for the patient and a quick reliable reference for the next healthcare professional attending to the patient. The card would also be useful in an emergency situation.

2.6.4 Patient information leaflets about chronic medications (Appendix 9)

A patient information leaflet (PIL) was given to each patient for each chronic medication they were taking. This was backed up by verbal information from the pharmacist about how to take each medication.

2.6.5 Reminder card on adherence (Appendix 15)

This card gave useful tips and hints to the patient on how to improve and maintain adherence.

2.6.6 Pillbox (Appendix 11)

A pillbox was randomly allocated to half the patients in the intervention group. A pillbox is a useful adherence tool especially if a patient is illiterate or has impaired vision. The design of the pillbox used in this study was that each day is a separate piece in the box. One day's worth of medication can be removed and carried with the patient if they so wish.

2.6.7 Medication bags (Appendix 16)

The study pharmacist recommended to each intervention patient that they carry three days supply of their medications with them at all times. The medication bags were provided for this purpose. This was so if the patient lost their medication they were carrying with them or the bag containing their medication was stolen they would still have the bulk of their medication at home. More importantly if they could not get back to where the bulk of their medications were stored they would have a sufficient supply of medication with them so they would not miss a dose. This would also be useful if the patient was involved in an accident and taken to hospital. There would be no delay in taking their medication at the right time and hospital personnel would be alerted to the fact that the patient was on immunosuppressant medications.

2.6.8 Fridge magnet

This could be used to attach the patient's diary card to the fridge if they so wished.

2.6.9 Pen

To be used to complete diary card.

Patients who did not receive the intervention of structured counselling and adherence tools from the study pharmacist were no worse off than before as they would receive standard care from the study pharmacist as is usually provided at Steve Biko Academic Hospital (known then as Pretoria Academic Hospital).

2.7 Methods of data analysis

The statistical analysis of the data was done under the guidance of Dr Mike van der Linde and Professor Groënewald at the University of Pretoria. The data was analysed using a computerised statistical package; SAS[®] Version 8.2 running under z/VM on an IBM Z9 2096-R01 Mainframe computer at the University of Pretoria. Results were considered to be significant at the 5% level, i.e. the p value < 0.05.

The sample was determined as follows; the total population of renal transplant patients that attend the specialised surgery outpatient clinic at Steve Biko Academic Hospital totals 300. Nine of these patients obtain their medication privately. According to Strydom,⁵⁰ they maintain the following regarding drawing a random sample: “As mentioned above some methodologists suggest that drawing a 10% sample of a known population has become convention which serves as a handy rule of some”. It was decided upon (with the advice of the statistician) that a minimum of 40 (13%) of the total population of renal transplant patients was required for a representative sample. 49 patients were recruited for the study.

For each patient at each repeat prescription or scheduled clinic visit where they presented a prescription for dispensing to the study pharmacist, adherence was calculated for each immunosuppressant medication and chronic medication prescribed using the formula below⁴⁰ which was adapted to take into account the pill count for each medication.

$$\% \text{ adherence} = \frac{(\text{sum of quantity dispensed over interval} / \text{quantity to be taken per day}) + \text{pill count} * 100}{\text{number of days in interval between first and last dispensing}}$$

The percentage adherence of the immunosuppressant medications were compared in the intervention and the control groups. Within the intervention group the percentage adherence of the immunosuppressant medications were compared between those patients who received a pillbox from the study pharmacist and those who did not.

The percentage adherence of the other chronic medications was also compared between the intervention and the control groups. The percentage adherence of the other chronic medications was also compared between the intervention patients that received a pillbox from the study pharmacist and those who did not.

Ciclosporin A levels were obtained from the patient records and recorded for each patient on the Patient Visit Record Sheet (Appendix 8). It was determined whether patients in both the intervention and the control groups achieved target ciclosporin A levels. A t-test was also performed to compare the intervention and control groups.

Serum creatinine levels were also obtained from patient records and recorded for each patient on the Patient Visit Record Sheet (Appendix 8). It was determined for patients in both the intervention and the control groups whether serum creatinine increased or decreased over the study period.

Results from the questionnaire section of the patient visit record sheet and the patient feedback questionnaire are quantitative data so were evaluated accordingly;

Questionnaires were collated; data was coded using pre-specified coding frames (except for the open questions which were coded after data collection) and was either, nominal, ordinal or interval/ratio. The different drugs were also assigned a code that would always pertain to that particular drug e.g. ciclosporin 25mg = 14, ciclosporin 100mg = 15. (Appendix 17)

Open questions require an additional stage in data processing.⁴¹ To these questions the respondent can answer in any way they wish⁴¹. The coding frame is then usually

based on the actual responses made and developed after the data has been collected.⁴¹ This is how it was done in this study. From the questionnaires the study pharmacist listed the different responses that had been given, grouped them together and assigned them codes (Appendix 18). Coded data was then entered into a database for analysis using the SAS software package.

2.8 Feasibility of study population

This study population was chosen for this study as these particular patients have to return to the specialised surgery outpatient clinic at Steve Biko Academic Hospital for follow up care. These patients also have to get their prescription dispensed at the outpatient pharmacy of the hospital so loss to follow up would be minimised.

3. Results

3.1 Patient demographics

(Refer to Appendix 19 for raw data)

49 renal transplant patients enrolled and signed informed consent to participate in the study. They were randomly assigned to either the intervention group (with or without pillbox) or the control group. There were 23 controls and 26 interventions (14 with pillboxes).

Four patients were excluded from this study. Two patients changed their minds and did not wish to participate. Another patient had to send a representative to collect her repeat prescriptions as she could not attend the hospital herself due to work commitments. The final patient did not understand English very well (her husband wanted to interpret but he wasn't always available).

Out of the 45 patients that started the study 4 patients did not complete the study. Of these 4 patients two patients died, and the other two patients were lost to follow up. 41 patients in total completed the study.

As shown in Table 1. the demographics of the intervention and the control groups were similar.

Table 1: Demographics of study participants

	Total group n=45	Intervention group n=23	Control group n=22
Sex			
Male	31	14	17
Female	14	9	5
Employed	13	8	5
Unemployed	32	15	17
Diabetic treatment			
Yes	8	4	4
No	37	19	18
Hypertensive treatment			
Yes	40	20	20
No	5	3	2
Epileptic treatment			
Yes	3	1	2
No	42	22	20
Donor			
Live	4	2	2
Cadaver	41	21	20
Mean age	45	43.5	46.5
Age range	23-65	23-65	24-63
Average age at transplant	34.78	34.13	35.45
Mean time since transplant (years)	10.56	9.87	11.27

3.2 Patient visit record sheet (Refer to Appendix 20 and 21 for raw data)

3.2.1 Immunosuppressant regimen

In this study there were six different immunosuppressant regimens that the study participants were taking.

- Ciclosporin, azathioprine and prednisone (23 participants)
- Ciclosporin and azathioprine (one participant)
- Ciclosporin and prednisone (14 participants)
- Azathioprine and prednisone (4 participants)
- Ciclosporin, mycophenolate mofetil and prednisone (one participant)
- Ciclosporin (two participants)

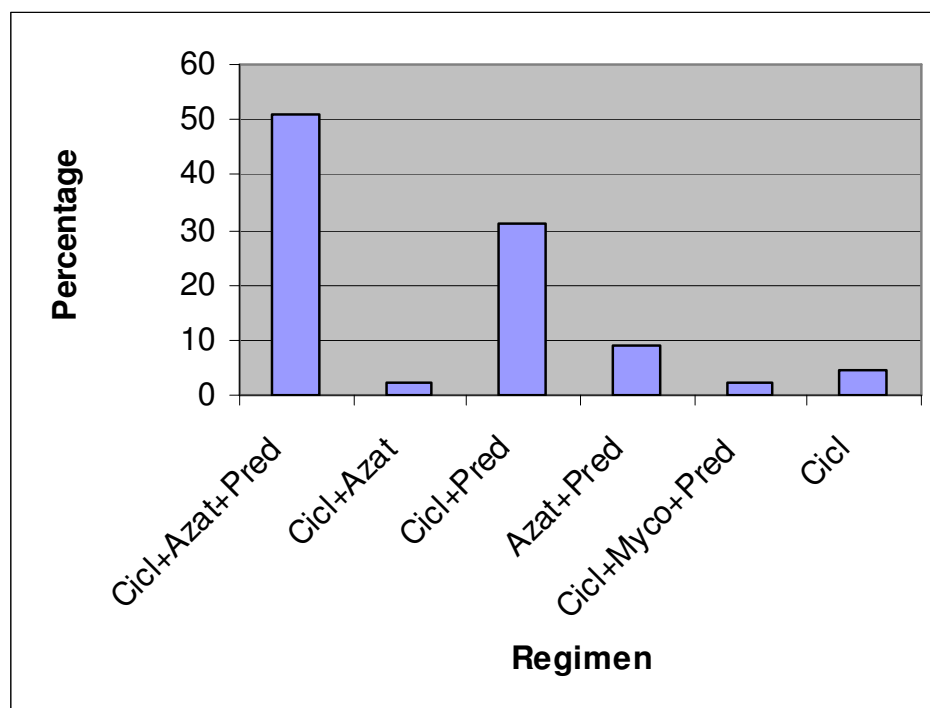


Figure 1: Percentage of total number of study participants on different immunosuppressant regimens

Key: Cicl = ciclosporin
Azat = azathioprine
Pred = prednisone
Myco = mycophenolate mofetil

3.2.2 Mean adherence

When the average of the means for drug class i.e. immunosuppressant and chronic were compared against patient type i.e. intervention and control there was no significant difference.

Table 2: Mean adherence by drug class and patient type

Drug class	Patient type	Mean	Standard deviation
Immunosuppressant	Control	88.49	±15.47
Chronic	Control	90.03	±12.37
Immunosuppressant	Intervention	87.54	±14.12
Chronic	Intervention	86.58	±18.19

Then a General linear model (GLM) was used to assess whether adherence could be predicted, from patient type (intervention or control) and the drug class (immunosuppressant or chronic). The dependent variable of mean adherence had a probability of 0.58 and an R square value of 0.0064.

The means for the control and intervention patients are too close together to be significant. The means for drug class of either immunosuppressant or chronic, are also too close together to be significant.

A GLM model was used to assess whether adherence could be predicted from the drug class (immunosuppressant or chronic) and presence or absence of a pillbox. The dependent variable of mean adherence had a probability of 0.99 and R square value of 0.00071.

Once again the mean adherences of the immunosuppressant and chronic drugs are too close together to be significant. Also the mean adherences of the patients with or without a pillbox are too close together.

3.2.3 The effect of the pillbox

When patients in the intervention group who did not receive a pillbox were compared to patients in the intervention group who did receive a pillbox, no significant difference was found. For the patients who did not receive a pillbox the p value was

too large (0.24) to be significant and for those who did receive a pillbox the p value was even greater (0.31). Refer to Appendix 22 (without pillbox) and Appendix 23 (with pillbox). Therefore the null hypothesis which was testing that there was no difference between the patients who received a pillbox and those who did not, could not be rejected.

3.2.4 Readmission to hospital

In total seven study participants were readmitted to hospital during the study period; three of which were control patients and four were intervention patients.

The control patients collectively spent a total of 14 days in hospital and the intervention patients collectively spent a total of 72 days in hospital.

3.2.5 Ciclosporin dose

The mean ciclosporin dose and minimum and maximum ciclosporin dose for patients taking ciclosporin is shown in Table 6. The mean dose for both groups was similar.

Table 3: Ciclosporin dose

Patient type	Mean dose	Minimum dose	Maximum dose
All patients	253 mg	50 mg	500 mg
Control patients	249 mg	50 mg	500 mg
Intervention patients	256 mg	50 mg	450 mg
No pillbox	256 mg	200 mg	450 mg
Pillbox	257 mg	50 mg	450 mg

3.2.6 Wellness

The wellness scores were similar for the two groups:

For the control patients:

- Six study participants scores improved from initial to the last visit
- Seven study participants scores decreased from initial to the last visit
- Nine study participants scores remained unchanged from initial to last visit

For the intervention patients

- Six study participants scores improved from initial to the last visit
- Seven study participants scores decreased from initial to the last visit

- Nine study participants scores remained unchanged from initial to last visit

3.2.7 Side effects

In the control group of study participants there were 357 reports of side effects and in the intervention group there were 602 reports of side effects as outlined in Table 4.

Table 4: Side effects

Side effect	Control group	Intervention group
GIT	50	97
Cardiovascular	16	15
Respiratory	67	52
CNS	150	247
Infection	19	16
Endocrine	4	0
ENT	13	22
Dental	4	42
Skin	4	8
Pain	25	90
Eyes	5	13

3.2.8 Number of unplanned/unscheduled clinic visits

During the course of the study

- 20 control study participants had one unplanned visit
- 27 intervention study participants had one unplanned visit
- Six intervention study participants had two unplanned visits
- One intervention study participant had three unplanned visits

A chi-square test was performed to assess whether there was any association between number of unplanned visits and patient type; no association was found.

3.2.9 Reasons for unplanned/unscheduled clinic visits

In the control group of study participants there were 80 reasons given for unplanned/unscheduled clinic visits. In the intervention group there were 118 reasons given for unplanned/unscheduled clinic visits. Refer to Table 5.

Table 5: Reasons for unplanned/unscheduled clinic visits

Reason	Control group	Intervention group
Infection	36	43
GIT	8	8
Cardiovascular	12	1
Pain	8	20
Dental	4	13
Eyes	0	8
Endocrine	0	1
Skin	4	12
Blood	4	12
Medication related	4	0

3.2.10 Changes to ciclosporin dose

Four study participants from the control group and four study participants from the intervention group had their ciclosporin doses changed over the course of the study. Thus no association between dose and patient type was found.

3.2.11 Special investigations

Of all the study participants two control patients and four intervention patients required special investigations.

In the control group an X-ray and a Hep C test were undertaken. In the intervention group a thyroid function test, sputum sample, X-ray and blood glucose test were undertaken.

3.2.12 Pillbox rating

Of the 14 patients in the intervention group that received pillboxes the ratings given for the pillbox (which were recorded at each visit) are depicted in Figure 2:

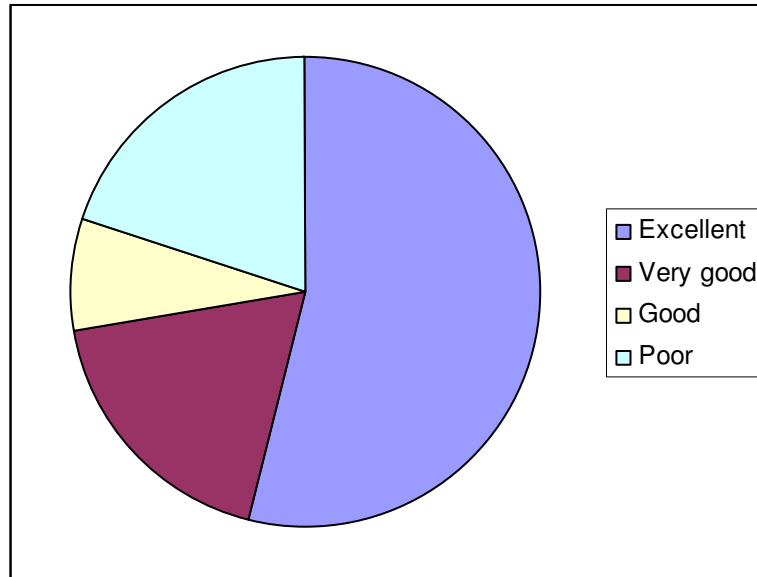


Figure 2: Ratings of the pillbox given by study patients in the intervention group that were allocated a pillbox

3.3 Patient feedback

(Refer to Appendix 24 for raw data)

According to the Patient feedback questionnaire completed by study participants at the conclusion of the study, 85% (V2 values on questionnaire see Appendix 9) indicated that the pharmacist made a difference to the way that they took their medication. Of these study participants (V3 values on questionnaire see Appendix 9) 36% indicated that they thought that the pharmacist made a major difference and 38% thought that the pharmacist made a big difference to the way that they took their medication. A chi-square test was performed on V3 values and patient type (intervention and control) and there was an association found between V3 and patient type with a p value of 0.02. Fishers exact test was also performed and it showed that there is an effect between V3 and patient type ($Pr \leq 0.01$). Refer to Appendix 25.

95% of study participants thought the pharmacist had a positive impact on the way that they took their medication.

98% of study participants indicated that they understood how and when to take their medication and were satisfied with the patient care they received from their pharmacist.

44% of study participants indicated that they did not require any further information from the pharmacist while 12% indicated that they would like to receive updates on their medication when there were changes to their prescription.

A further 66% indicated that they wanted to receive support and advice from a pharmacist at every visit to the pharmacy to get a prescription dispensed.

Other comments were as follows:

- Seven per cent of study participants (all control patients) would have liked the study to continue.
- Seven per cent of study participants liked the special/personal attention.
- Seven per cent of study participants (all intervention patients as control patients did not receive pillboxes) indicated that the pillbox was very helpful and helped them remember to take their tablets.
- 22% of study participants said the pharmacist provided an excellent service with good support in a friendly and professional manner.

3.4 Clinician assessment sheet

(Refer to Appendix 26 for raw data)

Ciclosporin blood levels were recorded for each patient and were assessed as below, in range or above the C2 (ciclosporin blood level two hours post dose) acceptable concentration range recommended by the laboratory.

For control patients all C2 levels were below range except for one which was within range.

For intervention patients all C2 levels were below range except for one that was above range.

For each patient the ciclosporin blood levels were compared across all visits (from initial to final visit) to ascertain whether the levels had either increased, remained unchanged or decreased.

In the control group:

- Five decreased
- Eight increased
- Three increased then decreased

- One decreased then increased

In the intervention group:

- Eight decreased
- Seven increased
- Three increased then decreased
- One decreased then increased
- Two fluctuated.

Serum creatinine levels were recorded for each patient at each clinic visit that blood was taken. These values were compared from initial visit to final visit to ascertain whether they had increased, remained unchanged or decreased. Values were compared in a pair wise manner as most study participants only had two values recorded.

In the control group:

- nine decreased
- eight increased
- one remained unchanged
- one increased then decreased
- one decreased then increased

In the intervention group:

- 10 decreased
- Nine increased
- One increased then decreased
- One decreased then increased
- Two fluctuated

At the completion of the study a clinician was asked to give each study participant a score (see Appendix 6). A chi-square test was performed to see if there was any association between the clinician score and the patient type (intervention and control). An association between patient type and clinician score (V20) could not be established with a p value of 0.6. Refer to Appendix 27.

4. Discussion

No significant difference was found between the mean adherence of the intervention and the control groups (even when a General linear model (GLM) was used) which resulted in the alternative hypothesis being rejected.

In this particular study, the entire study population was already receiving support from the nursing staff of the renal transplant unit. Patients received extensive counselling before discharge after the transplant, and were told that they could return to the ward at any time (without an appointment) if they were ill or needed any help due to illness or medication problems such as side effects. This may possibly explain why statistical differences were not demonstrated.

Despite no differences being found in improved adherence between the control and intervention groups, 85% of study participants indicated (via the Patient Feedback Questionnaire-Appendix 9) that the pharmacist made a difference to the way they took their medication, 95% of study participants indicated that the pharmacist made a positive impact on the way they took their medication, 98% of study participants indicated that they were satisfied with the patient care they received and over half of the study participants (66%) indicated that they wanted to receive support and advice from a pharmacist at every prescription dispensing visit. Study participants in the intervention group were more likely to indicate that the pharmacist made a big difference to the way that they took their medication whereas participants of the control group were more likely to indicate some difference. This reflects the fact that study participants in the intervention group received more counselling, advice and support from the pharmacist than study participants in the control group. Thus overall the intervention received positive feedback from the participants.

The most common immunosuppressant regimen in the study population was the combination of ciclosporin, azathioprine and prednisone. Ciclosporin was included in every regimen except for those study participants who received their renal transplant before ciclosporin became available. One study participant was taking mycophenolate mofetil due to adverse drug reactions associated with azathioprine.

All but two ciclosporin blood levels were below range; one in the intervention group was above range and one in the control group was within range. However ciclosporin levels were found not be useful to assess non-adherence in study participants as the range suggested by the laboratory was found to be too high. The renal transplant surgeon and nephrologist did not try to obtain the C2 values suggested by the laboratory as their experience had indicated that patients with C2 values within the range often acquired ciclosporin toxicity. Achieving C2 values significantly lower than the suggested laboratory values still prevented rejection of the transplanted kidney and there was less chance of renal toxicity.

The use of a pillbox which was one of the adherence tools used in this study showed no effect on the mean adherence between the two groups. Over half of the study participants that received a pillbox (53.85%) rated it as excellent whereas a fifth (20%) rated it as poor. The pillbox may have been more beneficial to patients if introduced to them when they began taking their immunosuppressant medication as most patients had been taking their medication for some time. Patients may have been resistant to the change in the way that they took their medication by the introduction of a pillbox. Patients in the intervention group were randomly allocated a pillbox. If all the patients in the intervention group had been given the choice of whether they would use a pillbox or not then the pillbox may have had a positive influence on adherence. One of the study participants in the control group actually asked for a pillbox.

Patients in the intervention group reported more side effects in all categories especially CNS, GIT, pain and dental than patients in the control group, possibly as a result of them being made more aware of the possible side effects associated with the medication they were taking (by the pharmacist during adherence counselling); control patients may have been experiencing side effects but were not attributing the symptoms to the medication they were taking. Study participants in the intervention group were made aware of possible side effects or symptoms that should be investigated and this may have prompted these patients to come to clinic more than the study participants in the control group who were not made aware.

Although not found to be statistically significant study participants in the intervention group had more unplanned/unscheduled clinic visits than those in the control group. This may have also been influenced by the intervention made by the study pharmacist. Study participants in the intervention group had more reasons (118) to attend the clinic for an unplanned/unscheduled visit than the control patients (80). Infection was the most common reason reported in both groups. This is to be expected in this group of patients who are immunocompromised due to the medication they are taking and are more likely to get an infection compared to the general population. Pain was stated as the second most common reason for an unplanned/unscheduled clinic visit in both groups.

Although the intervention patients totalled a greater number of hospital admission days than the control patients, this result mainly reflects to one intervention patient spending 13 days in hospital due to complications of diabetes, and to another intervention patient spending 18 days in hospital due to heart failure and thrombosis.

Limitations to this study include the possibility of the Hawthorne effect having an influence on the study participants i.e. participants in a study are more likely to perform better than they would if there were not in the study. In this study, all participants were more likely to take their medication i.e. be more adherent than they would have normally been when not under the constraints of the study.

Time constraints of pharmacists especially in the public health sector due to extensive staff shortages could also have had a bearing on the results of this study. Pharmacists are generally under pressure and there is often insufficient time to spend with patients to give optimal adherence counselling. Pharmacists are often confined to the dispensary and therefore find it logistically difficult to get to the wards to counsel patients when they are discharged from hospital about their medication. Counselling patients about their medication upon discharge is the optimal time to give adherence advice and identify problems and barriers to adherence before incorrect habits are established concerning medication taking behaviour.^{51,52}

Pharmacists are the best placed healthcare professionals to give adherence counselling, and advice and support concerning medication taking to patients.

Communication skills, patient counselling, drug information and pharmacology form part of the undergraduate curriculum of the BPharm degree.^{53,-59}

The number of patients receiving renal transplants at Steve Biko Academic Hospital each year is small, so study participants were taken from the whole population of renal transplants at the hospital. This meant that some patients had been on immunosuppressants to prevent rejection of their transplanted kidney for a few years. During the course of this study only one patient received a renal transplant and provided informed consent to participate in this study. If this study had been undertaken over a number of years and over multiple sites then maybe the effects of the pharmacist-led adherence-enhancing intervention would have become more apparent.

The statistician determined a minimum of 40 patients were required for a representative sample in this study. 49 patients were recruited and 41 of these completed the study. The sample size obtained was above the minimum number required but if a larger sample size had been obtained there may have been a statistically significant difference between the two groups.

Since adherence wanes with time⁵ and regular reinforcement helps to maintain adherence,⁷ if the study had been undertaken over a longer period of time e.g. 12 to 18 months a difference in adherence between the two groups may have become apparent. Some patients indicated on the Patient Feedback Questionnaire (Appendix 9) that they would have liked the study to continue.

5. Conclusion

Although the statistics from the results in this study could not prove that the pharmacist-led adherence-enhancing intervention improved adherence in renal transplant patients, this study is still valid in showing the benefits a pharmacist can have in improving the medication taking behaviour in patients. Overall the intervention received positive feedback from the participants in the study.

This study indicates the need for further research into this area especially in the measurement of adherence. New more accurate methods for measuring adherence are required. Pharmacists should play more of an active role in the multidisciplinary team in advising and supporting patients on medication. Both private and public sector patients would benefit from the pharmacist reviewing and advising them on their prescriptions and their medication taking behaviour. No one intervention is successful in all patients; a combination of individually tailored interventions over a sustained period of time appears to give the best outcome.

Time constraints of pharmacists in the public health sector due to extensive staff shortages makes it difficult for pharmacists to play more of an active role and provide a more comprehensive service. However with the implementation of the OSD (occupation-specific dispensation) pay structure the state sector may be able to attract, employ and retain more pharmacists. If pharmacists play more of an active role within the multidisciplinary healthcare team the job will be more challenging for the individual but also more rewarding. This may in turn attract more students to study pharmacy if the pharmacists place in the multidisciplinary healthcare team becomes more visible. Pharmacists should be more visible and accessible to the public since they are the advisor on the safe, rational and appropriate use of medicine.

Interventions that could be instituted to improve adherence to immunosuppressants in renal transplant patients include evaluating patient's adherence before transplant, so as not to exclude them from having a transplant but to assess the patient and identify any barriers to adherence, providing continuous reinforcement and support to maintain adherence as once-off interventions do not work, and educating patients

about therapy for other chronic conditions such as hypertension and diabetes as this could also influence the possibility of rejection or functioning of the renal transplant.

Ways in which the pharmacist's role could be improved in enhancing adherence in renal transplant patients include educating future pharmacists at undergraduate level about the importance of adherence and including it in all aspects in the training of pharmaceutical care, (no mention of adherence is made in any of the BPharm curriculum at South Africa's seven pharmacy schools)⁵³⁻⁵⁹ and providing information and support via continuing education to pharmacists already working in the profession. This would address all aspects of improving adherence in patients including, improving communication, increasing patient involvement, understanding the patient's perspective, providing information, assessing adherence on a regular basis, reviewing medications, improving communication between healthcare professionals and providing and suggesting interventions to improve adherence. (Refer to the NICE guidelines on 'Medicines Adherence' January 2009)⁶⁰

Promoting adherence thoroughly is the natural role of the pharmacist.

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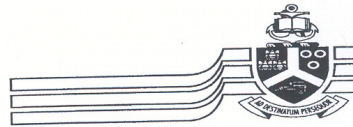
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Appendix 1:

FWA 00002567, Approved dd 22 May 2002 and
Expires 24 Jan 2009
IRB 0000 2235 IORG0001762 Approved dd Jan 2006 and
Expires 21 Nov 2008



University of Pretoria
Faculty of Health Sciences Research Ethics Committee
University of Pretoria
Date: 31/10/2006

Soutpansberg Road
MRC-Building
Room 2 - 19

Private Bag x 385
Pretoria
0001

Number : 114/2006

Title : Adherence to immunosuppressive therapy can be improved in renal transplant patients with structured counselling and adherence tools.

Investigators: Chemist A van der Westhuizen; Principal Pharmacist, Pretoria Academic Hospital, University of Pretoria, Pretoria
E: angelenevan@lantic.net T: 354 4748 F: 346 5941 C: 0726207694

Sponsor : None.

VAT No : None.

Study Degree: M.Sc (Special)

This Protocol and Informed Consent have been considered by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria on 25/10/2006 and found to be acceptable.

Mr P Behari	B.Proc. KZN; LLM – Unisa; (Lay Member)
Advocate AG Nienaber	(female)BA(Hons) (Wits); LLB; LLM (UP); Dipl.Datametrics (UNISA)
Prof V.O.L. Karusseit	MBChB; MFGP (SA); M.Med (Chir); FCS (SA): Surgeon
Prof M Kruger	(female) MB.ChB.(Pret); Mmed.Paed.(Pret); Ph.D. (Leuven)
Dr N K Likibi	MB.BCh.; Med.Adviser (Gauteng Dept.of Health)
*Dr F M Mulaudzi	(female) Department of Nursing,
*Mrs E.L. Nombe	(female) B.A. CUR Honours; MSC Nursing – UNISA (Lay Member)
*Snr Sr J. Phatoli	(female) BCur (Et.Al) Senior Nursing-Sister
*Dr L Schoeman	(female) Bpharm, BA Hons (Psy), PhD
*Prof J.R. Snyman	MBChB, M.Pharm.Med: MD: Pharmacologist
*Dr R Sommers	(female) MBChB; M.Med (Int); MPhar.Med;
Prof TJP Swart	BChD, MSc (Odont), MChD (Oral Path) Senior Specialist; Oral Pathology
Dr A P van Der Walt	BChD, DGA (Pret) Director: Clinical Services of the Pretoria Academic Hospital
*Prof C W van Staden	MBChB; Mmed (Psych); MD; FTCL; UPLM; Dept of Psychiatry

DR R SOMMERS; MBChB; M.Med (Int); MPhar.Med.
SECRETARIAT of the Faculty of Health Sciences Research Ethics Committee - University of Pretoria

* = Members attended the meeting on 25/10/2006.

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Appendix 2:

Pretoria Academic Hospital



PATIENT INFORMATION LEAFLET AND INFORMED CONSENT FORM

(This form is to be completed in duplicate one copy for the patient and one for patient file)

Can structured counselling and adherence tools improve adherence to immunosuppressive therapy in renal transplant patients?

Dear Mr./Mrs./Ms.....date /..../....

1) THE NATURE AND PURPOSE OF THIS STUDY

I understand that I am being asked to take part in a research study. The purpose of this study is to find out whether counselling from a pharmacist regarding the purpose of their medication and how to take medication correctly improves how patients take their medication.

2) EXPLANATION OF PROCEDURES TO BE FOLLOWED

Any patient who has received a kidney transplant at Pretoria Academic Hospital will be able to take part in this study so long as they are over 18 years of age. Inclusion in this study is entirely voluntary.

There will be two groups of patients in this study. The intervention group and the control group. The intervention group will receive thirty minutes counselling about their medication from a pharmacist. The control group will receive the standard counselling from a nursing sister at the outpatient clinic which is normal practise. At each repeat prescription and scheduled clinic visit patients from both the intervention and control group will receive their medication and be interviewed by a pharmacist about their medication. The questions will enquire about wellness, side effects, clinic visits, and any readmission to hospital, any changes made to medication including dosage, whether any blood levels or investigations have been done and if a pillbox was used whether it was useful. Each patient will be followed up each visit for six months from the initiation visit. At the completion of the study each patient will be asked to fill in a Feedback Questionnaire, which will ask questions asking whether the pharmacist made any difference to the way you took your medication and what information you would like to receive from a pharmacist at each repeat dispensing of your medication.

1 of 4

Patients from both the intervention and control group will be required to bring all the medication they have left back with them to each repeat prescription or clinic visit. This is so the pharmacist can count the remaining medication. Patients must only take the medication that has been dispensed for them that month. This means if any medication is left over from the previous month it must be put aside (after the pharmacist has counted it) and not taken in the following month. At the end of the study the study pharmacist will reconcile all the remaining medication and advise the patient what to do.

3) RISK AND DISCOMFORT INVOLVED

There is no risk in taking part in this study. The only discomfort to you may be that it may take a little longer when obtaining your prescription, as the pharmacist will have to ask you some questions.

4) POSSIBLE BENEFITS OF THIS STUDY

The patients in the intervention group in this study may benefit from the counselling they receive from the pharmacist whilst the control group will be no worse off than they would be if they were not part of this study. If it is found that patients take their medication better if they receive counselling from a pharmacist it will be suggested that all kidney transplant patients receive this level of care before they are discharged from hospital after receiving their kidney transplant and when they receive their repeat prescriptions.

5) I understand that if I do not want to participate in this study, I will still receive standard treatment for my illness.

6) I may at any time withdraw from this study.

7) HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This research study protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria and written approval has been granted by that committee. The study has 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. A copy of the Declaration may be obtained from the investigator should you wish to review it.

8) INFORMATION If I have any questions concerning this study I should contact:

Angelene van der Westhuizen tel: 012 3542269 cel: 0726207694

9) CONFIDENTIALITY

All records obtained whilst in this study will be regarded as confidential. Results will be published or presented in such a fashion that patients remain unidentifiable.

10) CONSENT TO PARTICIPATE IN THIS STUDY

I have read or had read to me in a language that I understand the above information before signing this consent form. The content and meaning of this information has been explained to me. I have been given the opportunity to ask questions and am satisfied that they have been answered satisfactorily. I understand that if I do not participate it will not alter my management in any way. I hereby volunteer to take part in this study.

I, the undersigned consent to being included in the above named study and give permission for my clinical notes to be used in this study. My name and personal details will at all times remain confidential.

I also agree to bring along whatever medication I have left to each prescription repeat or clinic visit for the next six months.

I also agree to a short interview with a pharmacist concerning the medication at each repeat dispensing.

I have received a signed copy of this informed consent agreement.

.....
Patient/Guardian signature

.....
Date

.....
Person obtaining informed consent

.....
Date

.....
Witness

.....
Date

VERBAL PATIENT INFORMED CONSENT (applicable when patients cannot read or write)

I, the undersigned, ... have read and have explained fully to the patient, named and/or/is/ his/her relative, the patient information leaflet, which has indicated the nature and the purpose of the study in which I have asked the patient to participate. The explanation I have given has mentioned both the possible risks and benefits of the trial and the alternative treatments available for his/her illness. The patient indicated that he/she understands that he/she will be free to withdraw from the study at any time for any reason.

I hereby certify that the patient has agreed to participate in this trial.

Patient's name _____
(Please print)

Investigator's name _____
(Please print)

Investigator's signature _____ Date _____

Witness's name _____ Witness's signature _____ Date _____
(Please print)

(Witness – sign that he/she has witnessed the process of informed consent)

Appendix 3:

Random numbers

Twenty random numbers were generated (with replacement) which range from 1 to 10. Starting with the first random number generated, five random numbers were selected without repetition (indicated as * below). The selected numbers are the Patient numbers in the group of ten numbers who make up the EXPERIMENTAL five of the group. The rest of the numbers indicate the CONTROL group who make up the other five of the group

Seven sets of random selections taken ten at a time

07 06 07 02 03 03 07 05 02 02 07 07 05 05 03 08 09 07 09 08
* * * * *

01 = Control
02 = Experimental
03 = Experimental
04 = Control
05 = Experimental
06 = Experimental
07 = Experimental
08 = Control
09 = Control
10 = Control

03 10 09 04 05 06 05 01 09 04 10 05 02 03 06 05 05 02 08 04
* * * * *

01 = Control
02 = Control
03 = Experimental
04 = Experimental
05 = Experimental
06 = Control
07 = Control
08 = Control
09 = Experimental
10 = Experimental

05 10 04 03 08 03 02 10 07 02 03 09 09 10 05 05 01 01 06 03
* * * * *

01 = Control
02 = Control
03 = Experimental
04 = Experimental
05 = Experimental
06 = Control
07 = Control
08 = Experimental
09 = Control
10 = Experimental

01 08 05 07 06 05 06 02 07 01 03 05 04 04 02 04 01 01 10 10



* * * * *

01 = Experimental
02 = Control
03 = Control
04 = Control
05 = Experimental
06 = Experimental
07 = Experimental
08 = Experimental
09 = Control
10 = Control

06 03 05 04 01 10 01 08 10 08 05 06 08 09 08 01 10 04 05 10

* * * * *

01 = Experimental
02 = Control
03 = Experimental
04 = Experimental
05 = Experimental
06 = Experimental
07 = Control
08 = Control
09 = Control
10 = Control

04 06 04 08 09 08 09 04 05 06 05 05 05 01 02 08 01 04 06 01

* * * * *

01 = Control
02 = Control
03 = Control
04 = Experimental
05 = Experimental
06 = Experimental
07 = Control
08 = Experimental
09 = Experimental
10 = Control

01 06 04 08 07 05 06 05 02 03 09 09 05 08 07 03 07 05 03 06

* * * * *

01 = Experimental
02 = Control
03 = Control
04 = Experimental
05 = Control
06 = Experimental
07 = Experimental
08 = Experimental
09 = Control
10 = Control

Three sets of random numbers for pillbox allocations taken ten at a time

08 07 05 08 10 05 02 09 10 08 06 01 02 03 06 03 02 07 08 03

* * * * *



01 = Control
02 = Pillbox
03 = Control
04 = Control
05 = Pillbox
06 = Control
07 = Pillbox
08 = Pillbox
09 = Control
10 = Pillbox

06 05 02 06 03 06 04 02 05 01 07 04 02 04 01 10 03 03 07 10
* * * * *

01 = Control
02 = Pillbox
03 = Pillbox
04 = Pillbox
05 = Pillbox
06 = Pillbox
07 = Control
08 = Control
09 = Control
10 = Control

04 06 09 04 06 03 09 03 02 05 06 06 03 02 09 02 04 09 08 07
* * * * *

01 = Control
02 = Pillbox
03 = Pillbox
04 = Pillbox
05 = Control
06 = Pillbox
07 = Control
08 = Control
09 = Pillbox
10 = Control

A PILLBOX is to be given in the order specified only to the EXPERIMENTAL patients as they present themselves in the three groups of ten each.



Appendix 4:

Permission to access Records / Files / Data base at the PRETORIA ACADEMIC Hospital

To: Chief Executive Officer/Information Officer
PRETORIA ACADEMIC Hospital

From: The Investigator
PRETORIA ACADEMIC Hospital

Dr. KENOSHI

MRS
Dr. A. F. VAN DER WESTHUIZEN

Re: Permission to do research at PRETORIA ACADEMIC Hospital

Drs _____, _____ and I are researchers working at the _____
Unit, Department of PHARMACY at PRETORIA Hospital. I am requesting permission on behalf
of all of us to conduct a study on the PRETORIA ACADEMIC Hospital grounds that involves access to patient
records.

The request is lodged with you in terms of the requirements of the Promotion of Access to Information Act.
No. 2 of 2000.

The title of the study is: ADHERENCE TO IMMUNOSUPPRESSIVE THERAPY CAN BE
IMPROVED IN RENAL TRANSPLANT PATIENTS WITH STRUCTURED COUNSELLING
AND ADHERENCE TOOLS

The researchers request access to the following information:

Access to the clinical files, record book and the data base.

We intend to publish the findings of the study in a professional journal and/ or at professional meeting like
symposia, congresses, or other meetings of such a nature.

We intend to protect the personal identity of the patients by assigning each patient a random code number.

We undertake not to proceed with the study until we have received approval from the Faculty of Health
Sciences Research Ethics Committee, University of Pretoria.

Yours sincerely

Arendse Westhuizen
Signature of the Principle Investigator

Permission to do the research study at this hospital and to access
the information as requested, is hereby approved.

Chief Executive Officer

Dr. _____ Hospital

Signature of the CEO

Dr M. E. KENOSHI
CHIEF EXECUTIVE OFFICER
PRETORIA ACADEMIC HOSPITAL

17/6/2006
Hospital Official Stamp



Appendix 5:

PATIENT DEMOGRAPHICS

Patient number:

Please answer each question by drawing a circle around an appropriate number in a shaded box or by writing your answer in the shaded space provided

1. What is your gender?

Male	1
Female	2

2. What is your date of birth (use *ddmmyy*)?

3. What is your current employment status?

Employed	1
Unemployed	2

4. In what year did you receive your kidney transplant?

5. What was the source of the donor kidney?

From a cadaver	1
From a live donor	2

6. Are you being treated for diabetes?

Yes	1
No	2

7. Are you being treated for hypertension?

Yes	1
No	2

8. Are you being treated for epilepsy?

Yes	1
No	2

Thank you for your time and co-operation

For Office Use

V1

--	--

 1

V2

--

 3

V3

 4

V4

--

 10

V5

 11

V6

--

 15

V7

--

 16

V8

--

 17

V9

--

 18

Appendix 6:

Clinician assessment form for renal transplant patients

Patient name _____

Hospital number _____

Dates patient seen by pharmacist _____ **to** _____

Scores

-3 = significant/major decline in clinical condition

-2 = definite decline in clinical condition

-1 = slight decline in clinical condition

0 = baseline/no change in clinical condition (patient's clinical condition at first visit to pharmacist)

1 = slight improvement in clinical condition

2 = definite improvement in clinical condition

3 = significant/major improvement in clinical condition

Score for patient comparing patient at baseline to final visit

SCORE = _____



Appendix 7:

CLINICAL ASSESSMENT FORM

Patient number:

Please answer each question by writing your answer in the shaded space provided

1. Date of First visit (dd/mm/yy)

--	--	--

2. Ciclosporin blood level at First visit

--	--	--

3. Serum creatinine level at First visit

--	--	--

4. Date of Second visit (dd/mm/yy)

--	--	--

5. Ciclosporin blood level at Second visit

--	--	--

6. Serum creatinine level at Second visit

--	--	--

For Office Use

V1

--	--

 1

V2

 3

V3

 9

V4

 13

V5

 16

V6

 22

V7

 26



	For Office Use									
7. Date of Third visit (dd/mm/yy)										
	V8 <table border="1"><tr><td></td><td></td><td>29</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>			29						
		29								
8. Ciclosporin blood level at Third visit										
	V9 <table border="1"><tr><td></td><td></td><td>35</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>			35						
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9. Serum creatinine level at Third visit										
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		30								
10. Date of Fourth visit (dd/mm/yy)										
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11. Ciclosporin blood level at Fourth visit										
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		48								
12. Serum creatinine level at Fourth visit										
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		52								
13. Date of Fifth visit (dd/mm/yy)										
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		55								
14. Ciclosporin blood level at Fifth visit										
	V15 <table border="1"><tr><td></td><td></td><td>61</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>			61						
		61								
15. Serum creatinine level at Fifth visit										
	V16 <table border="1"><tr><td></td><td></td><td>65</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>			65						
		65								



For Office Use

16. Date of Sixth visit (dd/mm/yy)

--

V17			68

17. Ciclosporin blood level at Sixth visit

--

V18			74

18. Serum creatinine level at Sixth visit

--

V19			78

19. Clinician score

--

V20			81
-----	--	--	----

Thank you for your time and co-operation



Appendix 8:

PATIENT VISIT RECORD SHEET

Patient number:

For Office Use

V1

--	--

 1

Please attach the Patient's sticker here

Please answer each question by drawing a circle around an appropriate number in a shaded box or by writing your answer in the shaded space provided

1. Date of visit (dd/mm/yy)

--

V2

 3

2. Drug identification

Drug one	
Drug two	
Drug three	
Drug four	
Drug five	
Drug six	
Drug seven	
Drug eight	
Drug nine	
Drug ten	

V3

--	--

 9
V4

--	--

 11
V5

--	--

 13
V6

--	--

 15
V7

--	--

 17
V8

--	--

 19
V9

--	--

 21
V10

--	--

 23
V11

--	--

 25
V12

--	--

 27

3. Pill count per drug

Drug one	
Drug two	
Drug three	
Drug four	
Drug five	
Drug six	
Drug seven	
Drug eight	
Drug nine	
Drug ten	

V13

--	--

 29
V14

--	--

 31
V15

--	--

 33
V16

--	--

 35
V17

--	--

 37
V18

--	--

 39
V19

--	--

 41
V20

--	--

 43
V21

--	--

 45
V22

--	--

 47



For Office Use

4. Quantity of each drug dispensed

Drug one		V23		49
Drug two		V24		51
Drug three		V25		53
Drug four		V26		55
Drug five		V27		57
Drug six		V28		59
Drug seven		V29		61
Drug eight		V30		63
Drug nine		V31		65
Drug ten		V32		67

5. Quantity of each drug to be taken per day

Drug one		V33		69
Drug two		V34		71
Drug three		V35		73
Drug four		V36		75
Drug five		V37		77
Drug six		V38		79
Drug seven		V39		81
Drug eight		V40		83
Drug nine		V41		85
Drug ten		V42		87

6. Number of missed doses for each drug

Drug one		V43		89
Drug two		V44		91
Drug three		V45		93
Drug four		V46		95
Drug five		V47		97
Drug six		V48		99
Drug seven		V49		101
Drug eight		V50		103
Drug nine		V51		105
Drug ten		V52		107

7. Number of late doses for each drug

Drug one		V53		109
Drug two		V54		111
Drug three		V55		113
Drug four		V56		115
Drug five		V57		117
Drug six		V58		119
Drug seven		V59		121
Drug eight		V60		123
Drug nine		V61		125
Drug ten		V62		127



For Office Use

8. Wellness of patient

Excellent	1
Very good	2
Good	3
Fair	4
Poor	5

V63 129

9. Which of the following side effects have you experienced while on immunosuppressive therapy? (You may indicate more than one answer)

Tiredness, lack of energy	1
Burning feeling in hands and/or feet	2
Excessive growth of body and facial hair	3
Thickened, swollen or bleeding gums	4
Nausea, vomiting, loss of appetite, diarrhea, stomach cramps	5
Tremor (shaking)	6
Headaches	7
Weight loss or gain	8
Feeling depressed	9
Flushing of face, acne or darkening of skin	10
Painful menstrual periods or lack of periods	11
Increase in size of breasts in males	12
Muscle cramps, tenderness or weakness	13
Blocked or stuffy nose	14

V64 130

V65 131

V66 132

V67 133

V68 134

V69 135

V70 136

V71 137

V72 138

V73 139

V74 141

V75 143

V76 145

V77 147

V78 149

Other (specify:)

Other (specify:)

Other (specify:)

Other (specify:)

V79 151

V80 153

V81 155

10. How many unplanned/unscheduled clinic visits have you had since your last visit to the pharmacist?

V82 157

11. What was the reason for each unplanned/unscheduled clinic visits?

Visit 1 (specify:)
Visit 2 (specify:)
Visit 3 (specify:)
Visit 4 (specify:)

V83 159

V84 161

V85 163

V86 165



For Office Use

12. If you were **readmitted to hospital** since your **last** visit to the pharmacist what was the **reason** for readmittance?

Reason 1 (specify:)

V87 167

Reason 2 (specify:)

V88 169

13. If you were **readmitted to hospital** since your **last** visit to the pharmacist, **how many days in total** were you **in hospital**?

V89 171

14. If there has been a **change** in your **medication**, what **drug changes** have been **made**?

Drug change 1		V90			174
Drug change 2		V91			176
Drug change 3		V92			178
Drug change 4		V93			180
Drug change 5		V94			182
Drug change 6		V95			184
Drug change 7		V96			186
Drug change 8		V97			188
Drug change 9		V98			190
Drug change 10		V99			192

15. If there has been a **change** in your **dosage**, what **dosage changes** have been **made**?

Drug change 1		V100			194
Drug change 2		V101			196
Drug change 3		V102			198
Drug change 4		V103			200
Drug change 5		V104			202
Drug change 6		V105			204
Drug change 7		V106			206
Drug change 8		V107			208
Drug change 9		V108			210
Drug change 10		V109			212

16. If **cyclosporin blood levels** were done, what was the **results**?

V110 214



For Office Use

17. If any **other special investigations** were done, what were these?

Investigation 1 (specify:)

V111 218

Investigation 2 (specify:)

V112 220

Investigation 3 (specify:)

V113 222

18. If you received a **pillbox** from the pharmacist, what are your thoughts about its **use**?

Excellent

1

V114 224

Very good

2

Good

3

Fair

4

Poor

5

19. Any other comments

V115 225

V116 227

V117 229

20. Next **clinic appointment** or **repeat prescription visit** (dd/mm/yy)

V118 231

Thank you for your time and co-operation



Appendix 9:

PATIENT FEEDBACK QUESTIONNAIRE

Patient number:

For Office Use

V1 1

Please answer each question by drawing a circle around an appropriate number in a shaded box or by writing your answer in the shaded space provided

1. Do you think the pharmacist has made any difference to the way you have taken your medication?

Yes	1
No	2
I don't know	3

V2 3

2. Please mark on the following scale how much of a difference you think the pharmacist has made to the way you take your medication

None	1
Small	2
Some	3
Big	4
Major	5

V3 4

3. Do you think the pharmacist has made a positive or negative impact on the way you take your medication?

Positive	1
Negative	2
I don't know	3

V4 5

4. Do you understand how and when to take your medication?

Yes	1
No	2
I don't know	3

V5 6

5. Are you satisfied with the patient care that you have received from the pharmacist?

Yes	1
No	2
I don't know	3

V6 7



For Office Use

6. What **further information** would you like to **receive** from the pharmacist?

V7 8

V8 10

V9 12

7. Do you want to receive **support** and **advice** from a pharmacist at **each prescription** and **clinic visit** regarding your medication?

Yes	1
No	2
I don't know	3

V10 14

8. What **other comments** do you have?

V11 15

V12 17

V13 19

Thank you for your time and co-operation

Appendix 10:

INDICATIONS CONTRA-INDICATIONS DOSAGE SIDE-EFFECTS PREGNANCY
OVERDOSE IDENTIFICATION PATIENT INFORMATION

CICLOHEXAL 25 (soft gelatine capsules) **CICLOHEXAL 100 (soft gelatine capsules)** **CICLOHEXAL ORAL (100 mg/1 mL oral solution)**

SCHEDULING STATUS:

S4

PROPRIETARY NAME

(and dosage form):

CICLOHEXAL 25 (soft gelatine capsules)
CICLOHEXAL 100 (soft gelatine capsules)
CICLOHEXAL ORAL (100 mg/1 mL oral solution)

COMPOSITION

Each CicloHexal 25 soft gelatine capsule contains 25 mg **ciclosporin**.

Ethanol content 25,8%v/v (absolute)

Each CicloHexal 100 soft gelatine capsule contains 100 mg ciclosporin.

Ethanol content 25,8%v/v (absolute)

Each 1 mL oral solution contains 100 mg ciclosporin.

Ethanol content 25,8%v/v (absolute).

PHARMACOLOGICAL CLASSIFICATION

A 34 Other.

PHARMACOLOGICAL ACTION

Ciclosporin is a cyclic polypeptide consisting of 11 amino acids and it is a potent immunosuppressive agent.

The exact mechanism of action of ciclosporin is not yet known. It has been suggested, based on animal studies, that ciclosporin inhibits the development of cell mediated reactions, including allograft immunity, delayed cutaneous hypersensitivity, experimental allergic encephalomyelitis, Freund adjuvant arthritis, graft versus host disease and also T-cell dependent anti-body production. It seems as though ciclosporin blocks the resting lymphocytes in the G₀ or early G₁ phase of the cell cycle.

Lymphokine production, as well as the release of interleukin2, (T cell growth factor -TCGF), is also inhibited.

Evidence suggests that ciclosporin acts specifically and reversibly on the lymphocytes.

Pharmacokinetics.

CicloHexal soft gelatine capsules and CicloHexal oral solution are bio-equivalent.

The substance is extensively bio-transformed to approximately 15 metabolites, possessing little or no pharmacological activity.

Parent drugs and the metabolites are excreted mainly via the bile, with only 6% of the oral dose excreted in the urine and 0,1% is excreted in the urine as unchanged drug.

The terminal half life ranges from 6,3 hours, in healthy volunteers to 20,4 hours in patients with severe liver disease.

Ciclosporin is 90% bound to proteins, mostly lipoproteins.

INDICATIONS

1. Transplantation indications

Ciclosporin is indicated as an immunosuppressive agent for the prophylaxis of graft rejection, following transplantation of kidney, liver, pancreas, heart, combined heart-lung and bone marrow allogeneic transplantation. It is also used for the prevention of graft versus host disease, following bone marrow transplantation. It can also be used in the treatment of transplant rejection in patients previously receiving other immuno-suppressive agents. Ciclosporin may be used alone or in combination with corticosteroids.

2. Psoriasis

Ciclosporin is indicated in patients with severe psoriasis, in whom conventional therapy is ineffective or inappropriate and the risks of treatment are justified.

CONTRA-INDICATIONS

Known hypersensitivity to ciclosporin or to any of the other ingredients of this formulation.

Psoriatic patients with abnormal renal function, uncontrolled hypertension or infections or any kind of malignancy.

Safety of use during pregnancy has not been established.

Since ciclosporin passes into the breast milk, breast feeding should be discontinued.

WARNINGS

The physician should be aware that ciclosporin is potentially nephrotoxic and hepatotoxic. This awareness is particularly important when treating patients with pre-existing renal or hepatic disease. The risk versus benefit ratio should be determined in each case. Only physicians, experienced in immuno-suppressive therapy and the management of bone marrow and solid organ transplantation, should prescribe ciclosporin.

Patients receiving the medicine should be managed in adequate facilities.

Psoriasis-patients with abnormal renal function, uncontrolled hypertension or infections or any kind of malignancy, as well as patients receiving concomitant immunosuppressive- or radiotherapy should not receive ciclosporin.

Effect on Renal impairment- caution is required in patients with hyperuricaemia or hyperkalaemia. The addition of other medications should be carefully monitored for interactions.

Since ciclosporin can impair renal function, a reliable baseline level of serum creatinine should be established by at least two measurements prior to treatment, and serum creatinine should be monitored at 2-weekly intervals for the first three months of therapy. Thereafter, if creatinine remains stable, measurements should be done every 2 months in patients who are administered 2,5 mg per kilogram per day and at monthly intervals in patients who require higher doses. If the serum creatinine remains increased by more than 30% above creatinine levels recorded before starting ciclosporin therapy at more than one measurement, the dosage of ciclosporin must be reduced by 25-50%.

These recommendations apply even if the patient's values still lie within the laboratory normal range. If dose reduction is not successful within one month, ciclosporin treatment should be discontinued.

Blood pressure: At least two blood pressure measurements on separate occasions should be done before ciclosporin treatment is started. Discontinuation of ciclosporin therapy is also recommended if hypertension developing during ciclosporin therapy cannot be controlled with appropriate therapy. Ciclosporin blood levels may be of value in cases of possible medicine interactions as well as in assessing compliance.

In psoriatic patients on ciclosporin as well as on conventional therapy, development of malignancies (in particular of the skin) has been reported. In a few psoriatic patients treated with cyclosporin, lymphoproliferative disorders have occurred. These were responsive to prompt discontinuation of treatment (see also section "Side Effects"). Although relapse occurs commonly after discontinuation of cyclosporin therapy for psoriasis, maintenance therapy is not recommended for longer than one year.

DOSAGE AND DIRECTIONS FOR USE

Organ transplantation and dose adjustment: treatment with ciclosporin should be initiated with-in 12 hours before surgery at a dose of 10 to 15 mg/kg given in two divided doses.

This dose should be maintained as the daily dose for one to two weeks postoperatively before being gradually reduced in accordance with blood levels until a maintenance dose of about 2 to 6 mg/kg given in two divided doses is reached.

When ciclosporin is given together with low doses of corticosteroids some patients may need lower doses (e.g. 3 to 6 mg/kg given in two divided doses for the initial treatment). Some centres have successfully lowered the ciclosporin dose to such levels in selected renal transplant patients without an apparent rise in the rejection rate. See also "Practical recommendation".

Bone marrow transplantation: The day before transplantation 12,5 to 15 mg/kg should be given in

two divided doses. This daily dose is maintained for about 5 days. For continuation of treatment 12,5 mg/kg/day is given for at least 3 to 6 months (preferable 6 months), before gradually decreasing the dose to zero, which sometimes may require up to 1 year. In some patients graft-versus-host disease occurs after discontinuation of ciclosporin treatment, but usually responds favourably to re-introduction of therapy (in low doses of mild chronic graft-versus-host disease).

See also "Practical recommendations".

The recommended dosage for treatment of established graft-versus-host disease (GVHD) : A dose of 12,5 to 15 mg/kg/day given in two divided doses, is recommended. This dosage should continue for 50 days and then be reduced by 5% per week until 2 mg/kg/day is reached. The agent may then be discontinued.

Psoriasis: For inducing remission, the recommended initial dose is 2,5 mg/kg/day given in two divided oral doses. If there is no improvement after 1 month, the daily dose may be gradually increased but should not exceed 5 mg/kg/day.

Treatment should be discontinued in patients in whom sufficient response of psoriatic lesions cannot be achieved within 6 weeks on 5 mg/kg/day or in whom the effective dose is not compatible with the safety guidelines given below. (see "Warning").

Initial dose of 5 mg/kg/day in two divided doses is justified in patients whose condition requires rapid improvement.

For maintenance treatment, doses have to be titrated individually to the lowest effective level. Dose adjustments should be made in increments of 0,5 to 1 mg/kg body mass and should not exceed 5 mg/kg/day.

Practical recommendations: Oral Drink Solution: CicloHexal oral drink solution should be diluted with preferably orange or apple juice; however, other drinks such as soft drinks can be used according to individual taste. The solution should be stirred well and drunk at once. Owing to its possible interference with the P450-dependent enzyme system, grapefruit juice should be avoided for dilution. (Also see storage instructions).

Capsules: Capsules should be swallowed whole. Leave capsules in blister pack until required for use. Capsules should not be stored above 30°C.

When a blister pack is opened, a characteristic smell is noticeable. This is normal and does not mean there is anything wrong with the capsules.

SIDE-EFFECTS AND SPECIAL PRECAUTIONS

The following side effects can be observed during administration of ciclosporin: A subjective burning sensation may occur in the hands and feet, usually in the first week of oral administration. The most frequently observed side effects in organ transplant patients are tremor, hirsutism, impaired renal function, hepatic dysfunction, gingival hypertrophy and gastro-intestinal disturbances (anorexia, nausea, vomiting). The most frequently observed side effects in bone marrow transplant patients are tremor, gastrointestinal disturbances (anorexia, nausea, vomiting), hirsutism and impaired renal function. Facial oedema and angio-oedema have also been observed.

In about one quarter of the patients reversible impairment of renal function has been observed; and ciclosporin may cause increases in serum bilirubin, liver enzymes, urea and creatinine. These changes appear to be dose-related and reversible. Serum creatinine and urea levels may also be elevated during ciclosporin therapy even in the presence of good renal function. Impaired renal function requires close monitoring of these parameters and frequently dosage adjustment.

Due to its potent immunosuppressive activity, the use of ciclosporin may lead to an increased susceptibility to infection.

Do not give concomitantly with other immunosuppressive agents except corticosteroids, since this is known to lead to an increase in the incidence and severity of infections.

Hyperkalaemia and hyperuricaemia may occur

Patients receiving ciclosporin should avoid high dietary potassium intake and potassium containing or potassium-sparing medication.

Hypertension has been observed in most heart transplant patients given ciclosporin

The combination of hypertension, fluid retention and convulsions has been observed mainly in children. Vaccination may be less effective in children receiving ciclosporin, and attenuated live vaccines should not be used.

A syndrome of thrombocytopaenia, thromboembolic complications and Microangiopathic haemolytic anaemia (which may result in graft failure) has been reported.

There is an increased incidence of lympho proliferative disorders in patients receiving ciclosporin therapy.

Experience of administration of ciclosporin to young children is limited

Interactions

Hyperkalaemia may occur during ciclosporin therapy. Patients receiving ciclosporin should avoid high dietary potassium intake and potassium containing or potassium-sparing medication.

Vaccination may be less effective when administered during treatment with ciclosporin. The use of live attenuated vaccines should be avoided.

Care should be taken when co-administering ciclosporin and systemic antibiotics or other compounds which are known to have nephrotoxic effects e.g. aminoglycosides, amphotericin B.

The trimethoprim component of cotrimoxazole, when co-administered with ciclosporin has been reported to cause a reversible deterioration in renal function.

Ketoconazole, erythromycin, doxycycline, oral contraceptives and some calcium channel blockers (diltiazem, nifedipine, verapamil), have been reported to increase the plasma concentration of ciclosporin.

Phenytoin, phenobarbitone, rifampicin, carbamazepine and isoniazid have been reported to cause a decrease in plasma / blood concentration of ciclosporin.

Intravenous administration of sulphadimidine and trimethoprim results in a marked decrease in serum ciclosporin levels.

Avoid co-administration of the above mentioned medicines and ciclosporin. Should it be essential to co-administer these medicines, the blood levels of ciclosporin must be closely monitored and the dosage of ciclosporin adjusted accordingly.

Prednisolone clearance is reduced in patients treated with ciclosporin and plasma levels of ciclosporin increase following the administration of high dose methyl prednisolone.

KNOWN SYMPTOMS OF OVERDOSAGE AND PARTICULARS OF ITS TREATMENT

No experience of acute overdose with ciclosporin is available. Signs of nephrotoxicity might occur.

Symptomatic treatment and general supportive measures should be followed in all cases of overdose.

Forced emesis could be of value within the first few hours of intake. Ciclosporin is not dialysable to any great extent, nor is it effectively cleared with charcoal haemoperfusion.

IDENTIFICATION

CicloHexal 25 - red brown soft gelatine capsules. 5 minims oval.

Diameter - 7mm $\pm$ 1mm. Length - 11,5mm $\pm$ 1mm. Capsule content - clear solution

CicloHexal 100 - red brown soft gelatine capsules. 20 minims oblong.

Diameter - 9,5mm $\pm$ 1mm. Length - 24mm $\pm$ 1mm. Capsule content - clear solution

CicloHexal Oral - clear, colourless to yellowish, viscous solution, free from undissolved or foreign matters; smell of ethanol.

PRESENTATION

CicloHexal 25 - Aluminium/aluminium blisters - 10 tablets per blister strip, 5 blister strips per carton (50 tablets).

CicloHexal 100 - Aluminium/ aluminium blisters - 10 tablets per blister strip, 5 blister strips per carton (50 tablets).

CicloHexal Oral - round amber glass bottles (50 mL)

STORAGE INSTRUCTION

Capsules - Store below 25°C. Protect from light.

KEEP OUT OF REACH OF CHILDREN

Oral Solution - Use contents within 2 months after opening the bottle. Store above 20°C and below 25°C. This is because the formulation contains oily components of natural origin which tend to solidify at low temperatures. A jelly like formation may occur at temperatures below 20°C, which is however reversible at temperatures up to 30°C.

REGISTRATION NUMBERS

CicloHexal 25 : 32/34/0682

CicloHexal 100 : 32/34/0683

CicloHexal Oral : 32/34/0681

NAME AND BUSINESS OF ADDRESS OF APPLICANT

Hexal Pharma (SA) (PTY) Ltd



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

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3610

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SAEPI HOME PAGE **TRADE NAME INDEX** **GENERIC NAME INDEX** **FEEDBACK**

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Appendix 11:

IMPORTANT NOTES

CYCLOSPORIN:

- ① Patients taking Cyclosporin should avoid fat-rich meals and grapefruit juice as this can increase the level of cyclosporin in the blood which could lead to more side effects
- ① Patients should also avoid high dietary intake of potassium (e.g. bananas) and should not take potassium supplements or potassium sparing diuretics
- ① Live attenuated vaccines should be avoided
- ① Patients should avoid taking NSAID's (e.g. diclofenac) because of possible renal function impairment
- ① Regular dental examinations are necessary to control plaque to prevent gingival hyperplasia (gum overgrowth). Good oral hygiene will also help prevent oral infections such as candida
- ① Try and take the cyclosporin at the same time each day at a regular 12 hourly interval to maintain consistent blood levels.

- ✓ Keep all medicines out of the reach of children
- ✓ Keep all medicines in a cool dry place
- ✓ Do not share your medicines with other people
- ✓ If you miss a dose don't double the dose the next time
- ✓ If it is within 2 hours of missing the dose you can take the dose
- ✓ If you vomit within one hour of taking a dose you can take another dose.
- ✓ If you experience any side-effects please keep a record and discuss them with your doctor or pharmacists at the next visit
- ✓ Do not stop taking any medication without consulting your doctor first.
- ✓ Do not take any other medication (including herbal or vitamins) that are not prescribed without first consulting with your doctor or pharmacist
- ✓ Make sure you never run out of medication
- ✓ Report to the doctor any sign of infection including sore throat.

Pretoria Academic Hospital



PATIENT MEDICATION CARD

STICKER

[illegible]



Appendix 12:

DIARY CARD FOR: _____

		Morning Dose			Evening Dose		
Name of drug		Cyclosporin	Azathioprin	Prednisone	Cyclosporin	Azathioprin	
Number of tablets to be taken (or dose)							
Month	Jan-Feb 08						
Monday	22/01/2008						
Tuesday	23/01/2008						
Wednesday	24/01/2008						
Thursday	25/01/2008						
Friday	26/01/2008						
Saturday	27/01/2008						
Sunday	28/01/2008						
Monday	29/01/2008						
Tuesday	30/01/2008						
Wednesday	31/01/2008						
Thursday	01/02/2008						
Friday	02/02/2008						
Saturday	03/02/2008						
Sunday	04/02/2008						
Monday	05/02/2008						
Tuesday	06/02/2008						
Wednesday	07/02/2008						
Thursday	08/02/2008						
Friday	09/02/2008						
Saturday	10/02/2008						
Sunday	11/02/2008						
Monday	12/02/2008						
Tuesday	13/02/2008						
Wednesday	14/02/2008						
Thursday	15/02/2008						
Friday	16/02/2008						
Saturday	17/02/2008						
Sunday	18/02/2008						
Monday	19/02/2008						
Tuesday	20/02/2008						
Wednesday	21/02/2008						
Thursday	22/02/2008						
Friday	23/02/2008						
Saturday	24/02/2008						
Sunday	25/02/2008						
Monday	26/02/2008						
Tuesday	27/02/2008						
Wednesday	28/02/2008						
Thursday	01/03/2008						
Friday	02/03/2008						

✓ tick if dose taken

V if you vomit within 30 min

L for a late dose

X cross if dose forgotten



Appendix 13: Pillbox



Appendix 14:

Counselling checklist for pharmacists for intervention patients

What to take to first counselling session with patient:

Patient's prescription (TTO)

Dispensed medication labelled according to Good Pharmacy Practice i.e. name, hospital number and date

Adherence pack containing:

Diary card

Patient information leaflet about the study

Patient medication card

Patient information leaflets for all medications and fact sheets if available

Reminder card on adherence

Pill box (if necessary)

White medication bags

Fridge magnet for attaching diary card to fridge

Pen (for completing diary card)

Counselling session:

Introduce yourself by name and that you are the pharmacist. Greet patient by name (if difficult to pronounce check with the patient and write phonetically in patient file so it can be pronounced correctly next time).

Check that all the patient details are correct and the right prescription is there for the patient.

Introduce the new drugs to the patient that they will be taking by name and show them the bottle/container and if possible what they look like.

Give the patient the appropriate patient information leaflets.

Dosage instructions:

Show the patient their medication card and explain how to take their medication.

Explain what every 12 hours means and work out with them what would be the best times to take their medication according to their daily schedule. Explain any additional instructions on taking any of their medication e.g. with or after food, or on an empty stomach.

Side effects:

Explain the relevant side effects according to their therapy and give advice on how to cope with minor/expected side effects and which side effects should be reported back to the clinic if they are experienced.

Medication storage:

Keep out of the reach of children.

Store at the required temperature whether that be less than 25 degrees Celsius or in the fridge.

Tell them to keep three days medication with them at all times so that they will never be without if they do not manage to get home on time to take their medication. This also allows for if they lose their medication or if it gets stolen they will still have their main supply at home.

Other medication:

Check what other medication they are taking that is not on the prescription in front of you. Advise them not to take any other medication whether it is OTC, prescribed, vitamins, herbal, traditional or homeopathic without first checking with the clinic doctor or pharmacist. There could be interactions with their immunosuppressive medication, which could make them ineffective or cause more side effects.

Explain that just because a medicine is 'natural' or 'herbal' does not make it safe. Sometimes these medicines have even more side effects than prescribed medicines.

Get the patient to explain how they are going to take their medicine and any problems they may encounter with taking the medication. You will then be able to check their understanding and be able to give more counselling advice if needed.

Diary card:

Give the patient the diary card.

Fill in the drug names and times decided on by the patient.

Explain how to fill in the diary card i.e.

fill in with a tick ✓ if the drug is taken at the correct time

fill in with a cross x if the drug is not taken at all

fill in with a 'v' if they vomit within thirty minutes of taking a dose

fill in with a 'l' and the time if they take the dose later than the time it was meant to be taken

Check the patient's understanding, if they are not clear go over it again. If the patient is illiterate you may have to use colours/highlighters to help to distinguish between the different drugs. A pillbox may be useful in this case. Explain to the patient how to use it and how to fill it.

Explain to the patient that when they come for their next visit they will have to bring all the bottles/containers and drugs that they have left along with their diary card back to the pharmacist. Explain to them this is so we can see how they are coping and whether they need any more advice. It is also so we can count their pills and check on their adherence.

Recommend that the patient carry three days supply on their person (in the white medication bags you can supply or in any other compliance aid they wish to use). If you give them the white bags make sure they are labelled correctly with drug names and dosage instructions. This is so if they lose their medication or their bag is stolen (with the medication in) they still have the bulk supply of their medication at home.

Also if they don't manage to get back to where they keep their medication they will have sufficient supply of their medication so they will not miss a dose (this is very important, stress the importance of not missing doses). Also if the patient is involved in an accident and they are brought into hospital, they will have their medication on them so there will be no delay in taking their medication at the correct time.

If the patient has no more questions and you are happy that they understand everything you have explained to them the session is complete. Make sure the patient has our contact numbers (on study patient information leaflet) and knows what to do in an emergency.

Appendix 15:

Adherence Reminder card

- 1-** Diary card. It is also a good idea to keep a record of side effects experienced
- 2-** Memory joggers. A timer or an alarmed watch or a cell phone alarm.
- 3-** Pillbox. Use a pillbox or other similar compliance aid to help you remember to take your tablets.
- 4-** Buddy. It is a good idea to have someone that can help remind you when to take your medication.
- 5-** Spare doses. Keep extra tablets in strategic places such as your car or handbag so you will never miss a dose.
- 6-** Medication should be visible. Keep pills near other items that are regularly used e.g. toothbrush. Do not hide away in a cupboard.



Appendix 16: Medication bag

UITE KINDERS SE BEREIK - BEA HOLE LE BANA - BEKA KUDE EBANTWANEN (KEEP OUT OF
KIDS REACH - KEEP OUT OF CHILDREN'S REACH - BEA HOLE LE BANAWAGCHEN)

NAAM:
NAME:

DOSIS / DOSE:

NEEM ☐ TABLET
TAKE ☐ KAPSULE
CAPSULE

MAAL PER DAG
TIMES A DAY

MEDISYNE
MEDICINE

Lot
Batch

Verv
Exp

S

*Dit is gevaarlik om die voorgeskrewe dosis te oorskry
It is dangerous to exceed the stated dose.*

PRETORIA AKADEEMIESE HOSPITAAL
PRETORIA ACADEMIC HOSPITAL
Gauteng



Appendix 17:

Appendix 17:	
Drug dose list coding for PVRs 2 & 15	
Drug	Code
allopurinol 100mg	1
allopurinol 300mg	2
amitriptyline 10mg	3
amitriptyline 25mg	4
aspirin 300mg	5
atenolol 100mg	6
atenolol 50mg	7
azathioprine 50mg	8
calcium carbonate 460mg	9
carbamazepine 200mg	10
carvedilol 25mg	11
cinnarazine 25mg	12
colchicine 1mg	13
cyclosporin 25mg	14
cyclosporin 100mg	15
digoxin 0.25mg	16
enalapril 10mg	17
folic acid 5mg	18
furosemide 40mg	19
gliclazide 80mg	20
hydralazine 50mg	21
hydrochlorothiazide 25mg	22
hydroxyzine 25mg	23
indapamide 2.5mg	24
isosorbide mononitrate 20mg	25
metformin 850mg	26
methyl dopa 250mg	27
mycophenolate 250mg	28
nifedipine XL 30mg	29
perindopril 4mg	30
phenobarbitone 30mg	31
phenytoin 100mg	32
potassium chloride 600mg	33
prednisone 5mg	34
promethazine 10mg	35
pyridoxine 25mg	36
simvastatin 20mg	37
sodium valproate 300mg	38
sodium valproate 500mg	39
thyroxine 0.05mg	40
thyroxine 0.1mg	41
vitamin Bco tablets	42
warfarin 5mg	43
spironolactone 25mg	44
minoxidil 5mg	45
omeprazole 20mg	46

Appendix 18:

Appendix 18:	
PFQ Q8 coding What other comments do you have?	1
Prefers speaking to women rather than men	2
Patient would like pharmacy to open at 7am (it opens at 7.30am)	3
Would like study to continue	4
Patient likes special/personal attention	5
Pillbox was very helpful-helped patient to remember to take their tablets	6
The pharmacist taught me a lot of things	7
The patient has more confidence now about taking their medication	8
Excellent service/support, friendly professional manner	9
Thankyou/highly appreciate it	10
The program though it was short was very helpful and useful	11
Patient liked receiving information on medication every time	12
Patient doesn't like it when a group of doctors come and listen at her consultation at clinic	13
Patient was more careful about taking his meds because knew pharmacist was going to count them	14
This is very positive-it is good to have a pharmacist to do this	15
It was faster to get meds because of dedicated pharmacist-no long queues so it saved a lot of time	16
It also helped to be able to ask questions	17
none	

Appendix 19: Raw data from Patient demograph



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YUNIBESITHI YA PRETORIA



Obs	V1	V2				V6	V7	V8	V9
1	01	2	200554	2	1998	1	2	1	2
2	02	2	120870	2	1991	1	2	2	2
3	03	1	061144	1	2004	1	2	1	2
4	04	2	260462	2	1993	1	2	1	2
5	05	1	300550	1	1998	1	2	1	2
6	06	1	240859	1	1998	1	2	1	2
7	07	2	071141	2	1985	1	2	1	2
8	08	2	180948	2	1990	1	2	2	1
9	09	1	110144	2	1993	1	2	1	2
10	10	1	081162	1	1990	1	2	1	2
11	11	1	150150	2	2000	1	1	1	2
12	12	1	020359	2	1996	1	2	1	2
13	14	1	201063	1	1997	1	1	1	2
14	15	2	140166	2	2006	1	1	1	2
15	16	1	130446	2	1997	1	1	1	2
16	17	2	060373	2	1996	1	2	2	2
17	18	1	150167	2	2006	1	2	1	2
18	19	1	170160	1	1991	1	2	1	2
19	20	2	240358	2	1987	1	2	2	2
20	21	1	100747	1	1984	1	1	1	2
21	22	1	260762	2	1998	2	1	1	2
22	23	2	260565	2	2002	1	2	1	2
23	24	1	090559	2	1995	1	2	1	2
24	25	1	260380	2	2004	1	2	1	1
25	26	1	100177	2	2000	2	2	1	2
26	27	1	250462	1	1992	1	2	1	2
27	28	1	240975	1	1997	1	2	1	2
28	29	1	221158	2	1999	1	2	1	2
29	30	2	220284	2	1995	1	2	1	2
30	31	2	141071	2	1993	1	2	1	2
31	32	1	081282	2	1998	1	2	1	2
32	33	1	250462	2	1994	1	2	1	1
33	34	1	051159	1	1992	1	2	1	2
34	36	1	061156	2	1994	1	2	1	2
35	37	2	150857	2	1993	2	2	1	2
36	38	1	210172	2	2003	1	2	1	2
37	39	1	200359	2	2004	1	2	1	2
38	41	1	240162	2	2007	1	1	1	2
39	42	1	190156	2	2002	1	2	1	2
40	43	1	090261	2	2003	1	1	1	2
41	44	1	150168	2	2002	2	2	1	2
42	46	2	030265	1	1994	1	2	1	2
43	47	1	030463	1	1995	1	2	2	2
44	48	2	270563	2	1999	1	2	1	2
45	49	1	240574	1	1985	1	2	1	2



V2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	31	68.89	31	68.89
2	14	31.11	45	100.00

V3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
07/11/41	1	2.22	1	2.22
11/01/44	1	2.22	2	4.44
06/11/44	1	2.22	3	6.67
13/04/46	1	2.22	4	8.89
10/07/47	1	2.22	5	11.11
18/09/48	1	2.22	6	13.33
15/01/50	1	2.22	7	15.56
30/05/50	1	2.22	8	17.78
20/05/54	1	2.22	9	20.00
19/01/56	1	2.22	10	22.22
06/11/56	1	2.22	11	24.44
15/08/57	1	2.22	12	26.67
24/03/58	1	2.22	13	28.89
22/11/58	1	2.22	14	31.11
02/03/59	1	2.22	15	33.33
20/03/59	1	2.22	16	35.56
09/05/59	1	2.22	17	37.78
24/08/59	1	2.22	18	40.00
05/11/59	1	2.22	19	42.22
17/01/60	1	2.22	20	44.44
09/02/61	1	2.22	21	46.67
24/01/62	1	2.22	22	48.89
25/04/62	2	4.44	24	53.33
26/04/62	1	2.22	25	55.56
26/07/62	1	2.22	26	57.78
08/11/62	1	2.22	27	60.00
03/04/63	1	2.22	28	62.22
27/05/63	1	2.22	29	64.44
20/10/63	1	2.22	30	66.67
03/02/65	1	2.22	31	68.89
26/05/65	1	2.22	32	71.11
14/01/66	1	2.22	33	73.33
15/01/67	1	2.22	34	75.56
15/01/68	1	2.22	35	77.78
12/08/70	1	2.22	36	80.00
14/10/71	1	2.22	37	82.22
21/01/72	1	2.22	38	84.44
06/03/73	1	2.22	39	86.67
24/05/74	1	2.22	40	88.89
24/09/75	1	2.22	41	91.11
10/01/77	1	2.22	42	93.33
26/03/80	1	2.22	43	95.56
08/12/82	1	2.22	44	97.78



V4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	13	28.89	13	28.89
2	32	71.11	45	100.00

V5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1984	1	2.22	1	2.22
1985	2	4.44	3	6.67
1987	1	2.22	4	8.89
1990	2	4.44	6	13.33
1991	2	4.44	8	17.78
1992	2	4.44	10	22.22
1993	4	8.89	14	31.11
1994	3	6.67	17	37.78
1995	3	6.67	20	44.44
1996	2	4.44	22	48.89
1997	3	6.67	25	55.56
1998	5	11.11	30	66.67
1999	2	4.44	32	71.11
2000	2	4.44	34	75.56
2002	3	6.67	37	82.22
2003	2	4.44	39	86.67
2004	3	6.67	42	93.33
2006	2	4.44	44	97.78
2007	1	2.22	45	100.00

V6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	41	91.11	41	91.11
2	4	8.89	45	100.00

V7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	8	17.78	8	17.78
2	37	82.22	45	100.00

V8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	40	88.89	40	88.89
2	5	11.11	45	100.00



V9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	3	6.67	3	6.67
2	42	93.33	45	100.00



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	UNIVERSITY OF PRETORIA YUNIBESITHI YA PRETORIA										V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28
1	01	Control		19/02/07	15	14	34	08	30	33	07	29	.	.	00	00	00	30	00	00	00	00	.	.	07	07	07	10	04	07			
2	01	Control		19/03/07	15	14	34	08	30	33	07	29	.	.	00	00	00	00	00	00	00	00	.	.	07	07	07	07	04	07			
3	01	Control		16/04/07	15	14	34	08	30	33	07	29	.	.	00	00	00	00	00	00	00	00	.	.	07	07	07	07	04	07			
4	01	Control		14/05/07	15	14	34	08	30	33	07	29	.	.	00	00	00	00	00	00	00	00	.	.	07	07	07	07	04	07			
5	01	Control		11/06/07	15	14	34	08	30	33	07	29	.	.	00	00	00	00	04	00	01	04	.	.	07	07	07	07	04	07			
6	01	Control		09/07/07	15	14	34	08	30	33	07	29	.	.	00	00	00	00	00	00	00	00	.	.	07	07	07	07	04	07			
7	01	Control		06/08/07	15	14	34	08	30	33	07	29	.	.	00	00	00	00	00	00	00	00	.	.	07	07	07	07	04	07			
8	02	Intervn	No pillbox	26/02/07	15	14	34	.	.	.	.	.	.	.	00	00	00	.	.	.	.	.	.	07	04	04	.	.	.				
9	02	Intervn	No pillbox	26/03/07	15	14	34	.	.	.	.	.	.	.	00	00	00	.	.	.	.	.	.	07	04	04	.	.	.				
10	02	Intervn	No pillbox	23/04/07	15	14	34	.	.	.	.	.	.	.	00	00	00	.	.	.	.	.	.	07	04	04	.	.	.				
11	02	Intervn	No pillbox	21/05/07	15	14	34	.	.	.	.	.	.	.	00	00	00	.	.	.	.	.	.	07	04	04	.	.	.				
Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60	
1	04	04	.	.	02	02	02	03	01	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
2	04	04	.	.	02	02	02	02	01	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
3	04	04	.	.	02	02	02	02	01	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
4	04	04	.	.	02	02	02	02	01	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
5	04	04	.	.	02	02	02	02	01	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
6	04	04	.	.	02	02	02	02	01	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
7	04	04	.	.	02	02	02	02	01	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
8	.	.	.	.	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	02	02	02	.	.	.	.	.	.	.	
9	.	.	.	.	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	02	02	02	.	.	.	.	.	.	.	
10	.	.	.	.	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	01	01	.	.	.	.	.	.	.	
11	.	.	.	.	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92	
1	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	
2	.	.	2	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	
3	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	
4	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	32	.	.	.	.	.	.	.	.	.	
5	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	
6	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	
7	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	
8	.	.	3	.	2	.	.	.	.	.	.	10	.	13	14	24	20	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	
9	.	.	3	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	
10	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	31	.	.	.	.	.	.	.	.	.	
11	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	
Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118							
1	.	.	.	.	.	.	.	08	.	.	.	.	.	.	.	.	.	.	.	.	.	.	06	.	.	13/03/07							
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	31	.	.	16/04/07							
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0252	.	.	.	.	.	32	.	.	14/05/07							
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	33	.	.	11/06/07							
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	06	.	.	09/07/07							
6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0216	.	.	.	.	.	01	.	.	06/08/07							
7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	34	.	.	.							
8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0217	.	.	.	.	.	05	10	.	26/03/07							
9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23/04/07							
10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	21/05/07							
11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0108	.	.	.	.	.	.	.	18/06/07							



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	
12	02	Intervn	No pillbox	18/06/07	15	14	34	.	.	.	.	.	.	.	00	00	00	.	.	.	.	.	.	.
13	02	Intervn	No pillbox	16/07/07	15	14	34	.	.	.	.	.	.	.	00	00	00	.	.	.	.	.	.	.
14	02	Intervn	No pillbox	13/08/07	15	14	34	.	.	.	.	.	.	.	00	00	00	.	.	.	.	.	.	.
15	03	Intervn	No pillbox	12/03/07	15	14	34	08	29	07	37	19	33	22	01	01	00	00	00	00	02	00	02	00
16	03	Intervn	No pillbox	10/04/07	15	14	34	08	29	07	37	19	33	22	01	01	00	00	00	00	04	00	02	00
17	03	Intervn	No pillbox	07/05/07	15	14	34	08	29	07	37	19	33	22	00	00	00	00	00	00	00	00	00	00
18	03	Intervn	No pillbox	04/06/07	15	14	34	08	29	07	37	19	33	22	00	00	00	00	00	00	00	00	00	00
19	03	Intervn	No pillbox	02/07/07	15	14	34	08	29	07	37	19	33	22	00	00	00	00	00	00	00	00	00	00
20	03	Intervn	No pillbox	30/07/07	15	14	34	08	29	07	37	19	33	22	00	00	00	00	00	00	00	00	00	00
21	04	Control	.	02/07/07	15	14	34	07	37	30	25	05	.	.	00	00	00	00	00	00	00	00	00	00
22	04	Control	.	30/07/07	15	14	34	07	37	30	25	05	.	.	02	03	00	85	00	00	00	00	00	00

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
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12	.	.	.	.	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	02	02	02	.	.	.	.	.	.	
14	.	.	.	.	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	03	.	03	.	.	.	.	.	.	.	
15	07	04	11	04	02	02	02	14	02	11	02	01	04	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
16	07	07	11	04	02	02	02	14	02	11	02	02	04	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
17	07	07	11	04	02	02	02	14	02	11	02	02	04	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
18	07	07	11	04	02	02	02	14	02	11	02	02	04	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
19	07	04	11	04	02	02	02	14	02	11	02	01	04	01	.	.	.	.	.	.	.	.	.	.	.	01	01	01	01	.	01	
20	07	07	11	04	02	02	02	14	02	11	02	02	04	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
21	02	02	.	.	02	06	13	11	01	01	11	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
22	02	02	.	.	02	06	13	11	01	01	11	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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13	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	30	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
14	.	.	1	.	.	.	.	.	.	7	.	.	.	.	.	54	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
15	.	.	3	.	.	.	.	.	.	.	.	.	.	.	13	17	26	36	00	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.
17	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	45	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.
19	01	01	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	24	.	.	.	.	.	.	.	.	.	.	.
20	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	24	.	.	.	.	.	.	.	.	22	.	.
21	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	32	.	.	00	.	.	.	.	.	06	05	005	.	.	.	.
22	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	02	.	.	.	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
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12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16/07/07
13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23	.	.	.	13/08/07
14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0179	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10/04/07
16	.	.	.	.	.	.	.	19	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	07/05/07
17	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0164	03	.	.	.	19	.	.	.	04/06/07
18	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19	.	.	.	.	02/07/07
19	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30/07/07
20	.	.	.	.	.	.	.	19	.	.	.	.	.	.	.	.	.	0193	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	36	.	.	.	.	.	.	.	.	.	0251	.	.	.	.	.	.	.	30/07/07
22	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	27/08/07



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

[illegible]



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	
34	06	Intervn	No pillbox	14/05/07	15	08	34	30	07	.	.	.	.	.	03	01	00	01	00	.	.	.	.	.
35	06	Intervn	No pillbox	11/06/07	15	08	34	30	07	.	.	.	.	.	05	01	01	01	03	.	.	.	.	.
36	06	Intervn	No pillbox	09/07/07	15	08	34	30	07	.	.	.	.	.	06	00	00	01	00	.	.	.	.	.
37	06	Intervn	No pillbox	06/08/07	15	08	34	30	07	.	.	.	.	.	08	00	00	01	00	.	.	.	.	.
38	07	Intervn	Pillbox	16/04/07	34	08	37	29	30	05	19	33	07	04	00	00	00	00	00	00	00	00	00	02
39	07	Intervn	Pillbox	14/05/07	34	08	37	29	30	05	19	33	07	04	95	14	00	06	07	00	91	08	08	00
40	07	Intervn	Pillbox	11/06/07	34	08	37	29	30	05	19	33	07	04	09	12	12	05	06	00	03	00	06	00
41	07	Intervn	Pillbox	09/07/07	34	08	37	29	30	05	19	33	07	04	08	14	00	05	04	14	01	07	09	00
42	07	Intervn	Pillbox	06/08/07	34	08	37	29	30	05	19	33	07	04	03	08	00	04	05	07	02	06	06	28
43	07	Intervn	Pillbox	03/09/07	34	08	37	29	30	05	19	33	07	04	91	05	06	03	00	00	04	05	00	06
44	08	Control	.	19/03/07	34	08	10	31	32	.	.	.	.	.	08	10	13	16	10	.	.	.	.	.

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
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35	.	.	.	.	02	02	02	01	01	.	.	.	.	.	01	01	01	01	01	01	.	.	.	.	.	.	.	.	.	.	.
36	.	.	.	.	02	02	02	01	01	.	.	.	.	.	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
37	.	.	.	.	02	02	02	01	01	.	.	.	.	.	04	.	.	01	.	.	.	.	.	.	.	.	.	.	.	.	.
38	02	04	04	02	13	02	01	01	01	11	11	01	01	11	.	.	.	.	.	.	.	01	01	01	01	01	01	01	01	01	01
39	02	04	04	04	13	02	01	01	01	11	11	01	01	01	.	03	.	.	.	01	.	.	09	02	02	01	02	02	01	02	02
40	02	04	04	04	13	02	01	01	01	11	11	01	01	01	.	.	.	.	.	03	.	.	20	.	.	.	.	.	.	.	.
41	02	04	04	02	13	02	01	01	01	11	11	01	01	11	.	.	.	.	.	04	.	.	.	.	.	.	.	.	.	.	.
42	02	04	04	04	13	02	01	01	01	11	11	01	01	01	01	01	01	01	01	.	01	01	01	01	01	01	01	01	.	01	01
43	02	04	04	04	13	02	01	01	01	11	11	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
44	.	.	.	.	02	14	05	04	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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35	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	14	.	.	.	.	.	.	.	.	.	.
36	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
37	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	38	.	.	.	00	.	.	.	.	.	.	.	.	.	.
38	01	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
39	02	01	2	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
40	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	56	57	18	.	01	32	.	.	.	.	.	.	.	.	.
41	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	57	.	.	.	01	57	.	.	.	.	.	.	.	.	.
42	01	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	25	54	.	.	02	13	17	32	.	.	.	.	.	.	.
43	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	.	02	13	32	.	.	.	.	.	.	.	.
44	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
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35	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	09/07/07	
36	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	07/08/07	
37	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0233	.	.	.	.	.	.	.	
38	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	14/05/07	
39	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11/06/07	
40	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	02	17	.	.	09/07/07	
41	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	.	.	.	06/08/07	
42	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	03/09/07	
43	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
44	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16/04/07	



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	
45	08	Control	.	16/04/07	34	08	10	31	32	.	.	.	.	.	02	12	05	01	01	.	.	.	.	.
46	08	Control	.	14/05/07	34	08	10	31	32	.	.	.	.	.	00	00	01	00	00	.	.	.	.	.
47	08	Control	.	11/06/07	34	08	10	31	32	.	.	.	.	.	18	48	15	02	10	.	.	.	.	.
48	08	Control	.	09/07/07	34	08	10	31	32	.	.	.	.	.	00	00	00	00	00	.	.	.	.	.
49	08	Control	.	06/08/07	34	08	10	31	32	.	.	.	.	.	00	00	00	00	00	.	.	.	.	.
50	09	Control	.	26/03/07	15	14	08	34	17	37	24	09	35	.	08	08	01	02	00	00	02	30	13	.
51	09	Control	.	23/04/07	15	14	08	34	17	37	24	09	.	.	02	02	32	00	00	00	02	00	.	.
52	09	Control	.	21/05/07	15	14	08	34	17	37	24	09	.	.	02	02	89	02	00	00	02	78	.	.
53	09	Control	.	18/06/07	15	14	08	34	17	37	24	09	.	.	02	02	00	01	01	01	02	28	.	.
54	09	Control	.	09/07/07	15	14	08	34	17	37	24	09	.	.	12	12	07	12	08	07	08	28	.	.
55	09	Control	.	06/08/07	15	14	08	34	17	37	24	09	.	.	02	02	01	00	00	00	02	00	.	.

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
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46	.	.	.	.	02	14	05	04	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
47	.	.	.	.	02	14	05	04	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
48	.	.	.	.	02	14	05	04	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
49	.	.	.	.	02	14	05	04	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
50	05	10	04	.	02	02	11	02	11	01	01	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
51	05	10	.	.	02	02	13	02	01	01	01	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
52	05	10	.	.	02	02	13	02	01	01	01	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
53	05	10	.	.	02	02	13	02	01	01	01	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
54	05	10	.	.	02	02	13	02	01	01	01	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
55	10	.	.	.	02	02	02	01	01	01	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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47	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	22	35	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
48	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	55	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
49	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
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51	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
52	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
53	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	56	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
54	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	05	.	.	.	.	.	.	.	19	35	.
55	.	.	4	1	.	.	.	.	.	.	9	.	.	.	.	30	.	.	.	.	01	10	.	.	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
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47	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17	.	.	09/07/07
48	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	.	.	.	06/08/07
49	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
50	.	.	.	.	.	.	.	17	.	.	.	.	.	.	.	.	.	.	.	.	.	.	06	.	.	23/04/07
51	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0085	.	.	.	.	01	.	.	21/05/07
52	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17	.	.	18/06/07
53	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	09/07/07
54	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0100	.	.	.	.	.	.	.	06/08/07
55	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20	.	.	03/09/07



Obs	V1	PATIENT	PILLBOX		V2	V3	V4	V5	V6	V7		UNIVERSITY OF PRETORIA YUNIBESITHI YA PRETORIA	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28				
56	10	Control	.	23/04/07	15	14	34	33	29	02	.	.	.	.	02	02	05	09	03	06	.	.	.	.	07	04	04	10	07	05
57	10	Control	.	23/07/07	15	14	34	33	29	02	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	04	04	10	07	05
58	10	Control	.	21/08/07	15	14	34	33	29	02	.	.	.	.	02	01	01	03	02	03	.	.	.	.	07	04	04	10	07	05
59	10	Control	.	18/09/07	15	14	34	33	29	02	.	.	.	.	01	01	01	03	00	00	.	.	.	.	07	04	04	10	07	05
60	10	Control	.	22/10/07	15	14	34	33	29	02	.	.	.	.	81	84	84	80	81	84	.	.	.	.	07	04	04	10	07	05
61	10	Control	.	20/11/07	15	14	34	33	29	02	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	04	04	10	07	05
62	11	Control	.	26/03/07	15	14	08	34	29	37	22	07	.	.	00	00	00	00	00	00	00	00	00	00	07	07	09	07	04	07
63	11	Control	.	23/04/07	15	14	08	34	30	29	37	22	07	19	00	00	00	00	00	00	00	00	00	00	07	07	09	07	04	07
64	11	Control	.	21/05/07	15	14	08	34	30	29	37	22	07	19	00	00	00	00	00	00	00	00	00	00	07	07	09	07	04	07
65	11	Control	.	18/06/07	15	14	08	34	30	29	37	22	07	19	00	00	00	00	00	00	00	00	00	00	07	07	09	07	04	07
66	11	Control	.	16/07/07	15	14	08	34	30	29	37	22	07	19	00	00	00	00	00	00	00	00	00	00	07	07	09	07	04	07

Obs V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60

56	.	.	.	.	02	01	01	03	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
57	.	.	.	.	02	01	01	03	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
58	.	.	.	.	02	01	01	03	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
59	.	.	.	.	02	01	01	03	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
60	.	.	.	.	02	01	01	03	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
61	.	.	.	.	02	01	01	03	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
62	02	04	04	.	02	02	14	02	01	02	11	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
63	02	04	04	04	02	02	14	02	01	02	11	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
64	02	04	04	04	02	02	14	02	01	02	11	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
65	02	04	04	04	02	02	14	02	01	02	11	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
66	02	04	04	04	02	02	14	02	01	02	11	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

Obs V61 V62 V63 V64 V65 V66 V67 V68 V69 V70 V71 V72 V73 V74 V75 V76 V77 V78 V79 V80 V81 V82 V83 V84 V85 V86 V87 V88 V89 V90 V91 V92

56	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
57	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
58	.	.	3	.	.	.	.	.	7	.	.	.	.	.	.	54	.	.	.	00	.	.	.	.	.	.	.	.	.	.
59	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	54	.	.	.	01	32	.	.	.	.	.	.	.	.	.
60	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	53	.	.	.	00	.	.	.	.	.	.	.	.	.	.
61	.	.	2	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
62	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
63	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	19	.	.
64	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
65	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
66	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.

Obs V93 V94 V95 V96 V97 V98 V99 V100 V101 V102 V103 V104 V105 V106 V107 V108 V109 V110 V111 V112 V113 V114 V115 V116 V117 V118

56	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0085	.	.	.	.	.	.	.	22/05/07
57	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0086	.	.	.	.	09	.	.	21/08/07
58	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18/09/07
59	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15/10/07
60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0072	.	.	.	.	16	09	.	20/11/07
61	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
62	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23/04/07
63	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0101	.	.	.	.	.	.	.	21/05/07
64	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18/06/07
65	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16/07/07
66	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0146	.	.	.	.	.	.	.	13/08/07



Obs	V1	PATIENT	PILLBOX		V2	V3	V4	V5	V6	V7		UNIVERSITY OF PRETORIA YUNIBESITHI YA PRETORIA	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28					
67	11	Control	.	13/08/07	15	14	08	34	30	29	37	22	07	19	00	00	00	00	00	00	07	07	09	07	04	07					
68	11	Control	.	10/09/07	15	14	08	34	30	29	37	22	07	19	00	00	00	00	00	00	07	07	09	07	04	07					
69	12	Control	.	26/03/07	15	08	34	27	29	.	.	.	.	.	00	00	00	00	00	.	.	.	.	.	.						
70	12	Control	.	23/04/07	15	08	34	27	29	.	.	.	.	.	01	00	00	00	00	.	.	.	.	.	.						
71	12	Control	.	21/05/07	15	08	34	27	29	.	.	.	.	.	00	00	00	00	00	.	.	.	.	.	.						
72	14	Intervn Pillbox	16/04/07	15	14	08	34	22	37	26	20	.	.	.	01	03	01	02	02	00	01	01	.	.	04	10	04	07	04	04	
73	14	Intervn Pillbox	15/05/07	15	14	08	34	22	37	26	20	.	.	.	00	00	01	01	01	00	01	88	.	.	04	10	04	07	04	04	
74	14	Intervn Pillbox	26/06/07	15	14	08	34	22	37	26	20	.	.	.	00	00	00	00	00	00	00	00	.	.	04	10	04	07	04	04	
75	14	Intervn Pillbox	26/07/07	15	14	08	34	22	37	26	20	.	.	.	01	00	00	00	00	00	14	91	.	.	02	06	02	04	02	02	
76	14	Intervn Pillbox	06/08/07	15	14	08	34	22	37	26	20	.	.	.	00	04	01	02	01	01	86	.	.	.	04	10	04	07	04	04	
77	14	Intervn Pillbox	03/09/07	15	14	08	34	22	37	26	20	.	.	.	00	00	00	00	00	00	00	00	.	.	.	04	10	04	07	04	04

Obs V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60

67	04	02	04	04	02	02	14	02	01	02	01	11	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
68	02	04	04	04	02	02	14	02	01	02	11	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
69	.	.	.	.	02	14	02	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
70	.	.	.	.	02	14	02	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
71	.	.	.	.	02	14	02	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
72	04	01	.	.	01	03	01	02	01	01	01	10	.	.	.	.	.	.	.	.	.	.	14	14	15	04	04	15	04	04
73	04	01	.	.	01	03	01	02	01	01	01	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
74	04	01	.	.	01	03	01	02	01	01	01	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
75	02	18	.	.	01	03	01	02	01	01	01	10	.	.	.	.	01	.	.	.	.	.	.	.	.	.	.	.	.	.
76	04	01	.	.	01	03	01	02	01	01	01	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
77	07	01	.	.	01	03	01	02	01	01	02	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs V61 V62 V63 V64 V65 V66 V67 V68 V69 V70 V71 V72 V73 V74 V75 V76 V77 V78 V79 V80 V81 V82 V83 V84 V85 V86 V87 V88 V89 V90 V91 V92

67	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
68	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
69	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
70	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
71	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
72	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
73	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
74	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	30	.	.	.	02	24	36	.	.	.	.	.	.	.	.
75	.	.	4	1	.	.	.	.	.	.	.	.	.	.	.	41	21	.	.	00	.	.	.	.	.	.	.	.	.	.
76	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	18	35	.	.	00	.	.	.	.	.	.	.	.	.	.
77	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	35	.	.	.	01	37	.	.	.	.	.	.	.	.	.

Obs V93 V94 V95 V96 V97 V98 V99 V100 V101 V102 V103 V104 V105 V106 V107 V108 V109 V110 V111 V112 V113 V114 V115 V116 V117 V118

67	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10/09/07
68	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
69	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23/04/07
70	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	21/05/07
71	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18/06/07
72	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0108	.	.	.	.	1	.	.	.	.	.	.	.	14/05/07
73	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	11/06/07
74	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	18	09	.	.	.	.	.	09/07/07
75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	09	.	.	.	.	.	.	06/08/07
76	.	.	.	.	.	.	.	26	.	.	.	.	.	.	.	0095	.	.	.	.	1	.	.	.	.	.	.	.	03/09/07
77	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28							
78	15	Intervn	Pillbox	16/04/07	15	14	34	29	07	22	37	21	30	.	01	09	24	04	05	05	02	54	91	.	07	14	11	07	04	04
79	15	Intervn	Pillbox	11/06/07	15	14	34	29	07	22	37	21	30	.	00	00	00	00	00	00	00	06	00	.	07	14	11	07	04	04
80	15	Intervn	Pillbox	09/07/07	15	14	34	29	07	22	37	21	30	.	00	00	00	00	00	00	00	00	00	.	11	16	14	11	07	07
81	15	Intervn	Pillbox	03/09/07	15	14	34	29	07	22	37	21	30	.	00	00	00	00	00	00	00	83	00	.	07	14	10	07	04	04
82	15	Intervn	Pillbox	10/10/07	15	14	34	29	07	22	37	21	30	.	75	76	75	75	80	80	74	76	80	.	07	14	07	07	04	04
83	15	Intervn	Pillbox	29/10/07	15	14	34	29	07	22	37	21	30	.	14	42	14	14	07	80	11	42	07	.	07	14	07	07	04	04
84	16	Control	.	02/04/07	15	34	20	26	02	17	02	37	.	.	00	00	00	00	02	00	00	00	.	.	07	07	02	11	05	07
85	16	Control	.	30/04/07	15	34	20	26	02	17	02	37	.	.	00	00	00	00	02	00	00	00	.	.	07	07	02	11	05	07
86	16	Control	.	28/05/07	15	34	20	26	02	17	02	37	.	.	00	00	00	00	02	00	00	00	.	.	07	07	02	11	05	07
87	16	Control	.	25/06/07	15	34	20	26	02	17	02	37	.	.	00	00	00	00	02	00	00	00	.	.	07	07	02	11	05	07
88	16	Control	.	23/07/07	15	34	20	26	02	17	02	37	.	.	00	00	00	00	02	00	00	00	.	.	07	07	02	11	05	07

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
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78	04	14	02	.	02	06	04	02	01	01	01	06	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
79	04	14	02	.	02	06	04	02	01	01	01	06	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
80	07	16	07	.	02	06	03	02	01	01	01	06	01	.	.	.	.	.	.	.	.	.	.	01	01	01	01	01	01	01	.	
81	04	14	04	.	02	06	03	02	01	01	01	06	01	.	.	.	.	.	.	.	.	.	.	02	02	02	02	02	02	01	02	
82	06	14	04	.	02	06	02	02	01	01	13	06	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
83	06	14	04	.	02	06	02	02	01	01	13	06	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
84	02	04	.	.	02	02	11	04	01	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
85	02	04	.	.	02	02	11	04	01	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
86	02	04	.	.	02	02	11	04	01	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
87	02	04	.	.	02	02	11	04	01	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
88	02	04	.	.	02	02	11	04	01	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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78	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	33	.	.	.	09	.	005	.	.	.
79	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
80	01	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
81	02	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
82	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
83	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
84	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
85	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
86	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
87	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
88	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
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78	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0370	.	.	.	2	.	.	.	14/05/07
79	.	.	.	.	.	.	29	.	.	.	.	.	.	.	.	.	.	0174	.	.	.	1	.	.	.	09/07/07
80	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	03/09/07	
81	.	.	.	.	.	.	33	36	.	.	.	.	.	.	.	.	.	0151	.	.	.	1	.	.	.	01/10/07
82	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	29/10/07	
83	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	
84	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30/04/07	
85	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	27	.	.	28/05/07	
86	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0120	.	.	.	.	06	.	25/06/07	
87	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	27	.	.	23/07/07	
88	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20/08/07	



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28							
89	16	Control	.	20/08/07	15	34	20	26	02	17	02	37	.	.	00	00	00	00	02	00	00	00	07	07	02	11	05	07		
90	17	Control	.	30/04/07	15	14	08	34	37	.	.	.	.	.	00	00	00	00	00	.	.	.	.	07	07	09	07	02	.	
91	17	Control	.	28/05/07	15	14	08	34	37	24	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	07	09	07	02	05
92	17	Control	.	25/06/07	15	14	08	34	37	24	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	07	09	07	02	05
93	17	Control	.	23/07/07	15	14	08	34	37	24	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	07	09	07	02	05
94	17	Control	.	20/08/07	15	14	08	34	37	24	.	.	.	.	02	02	90	02	03	15	.	.	.	.	07	07	09	07	02	05
95	17	Control	.	17/09/07	15	14	08	34	37	24	.	.	.	.	00	00	00	00	00	02	.	.	.	.	07	07	09	07	02	05
96	18	Control	.	02/04/07	15	14	08	34	29	.	.	.	.	.	03	06	00	00	01	.	.	.	.	.	07	07	09	10	07	.
97	18	Control	.	07/05/07	15	14	08	34	29	.	.	.	.	.	00	00	00	02	01	.	.	.	.	.	07	07	09	10	07	.
98	19	Intervn No pillbox	.	02/04/07	15	29	30	06	09	.	.	.	.	.	06	00	00	00	12	.	.	.	.	.	07	04	04	04	10	.
99	19	Intervn No pillbox	.	30/04/07	15	29	30	06	09	.	.	.	.	.	00	00	00	02	19	.	.	.	.	.	07	04	04	04	10	.

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
89	02	04	.	.	02	02	11	04	01	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
90	.	.	.	.	02	02	14	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
91	.	.	.	.	02	02	14	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
92	.	.	.	.	02	02	14	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
93	.	.	.	.	02	02	14	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
94	.	.	.	.	02	02	14	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
95	.	.	.	.	02	02	14	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
96	.	.	.	.	02	02	14	03	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
97	.	.	.	.	02	02	14	03	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
98	.	.	.	.	02	01	01	01	03	.	.	.	.	06	.	.	.	12	.	.	.	.	06	02	02	02	02	02	.	.	.	.
99	.	.	.	.	02	01	01	01	03	.	.	.	.	.	.	.	05	.	.	.	.	.	01	01	01	01	01	01	.	.	.	.

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92	
89	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	14	47	25	.	.	00	.	.	.	.	.	.	.	.	.	.	.	
90	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	24	.	.	
91	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	
92	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	
93	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	19	.	.	.	01	19	.	.	.	.	.	.	.	.	.	.	.	
94	.	.	3	.	.	.	.	.	.	.	.	.	.	.	14	54	52	18	27	00	.	.	.	.	.	.	.	.	.	.	.	.	
95	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.	
96	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	16	.	.	.	01	39	.	.	.	.	.	.	.	.	.	.	.	
97	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	07	.	.	.	.	.	.	.	.	.	.	.	
98	.	.	3	.	.	4	.	.	.	.	.	.	.	13	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.	
99	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
89	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0162	.	.	.	.	26	.	.	.
90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0164	05	.	.	.	03	.	.	28/05/07
91	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25/06/07
92	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23/07/07
93	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0126	.	.	.	.	.	.	.	20/08/07
94	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	03	09	.	.	17/09/07
95	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
96	.	.	.	.	.	.	34	.	.	.	.	.	.	.	.	.	.	0214	.	.	.	.	.	.	.	07/05/07
97	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	04/06/07
98	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	05	.	.	30/04/07
99	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23	.	.	.	28/05/07



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28							
100	19	Intervn	No pillbox	28/05/07	15	29	30	06	09	.	.	.	.	.	00	01	00	01	14	.	.	.	.	.	07	04	04	04	10	.
101	19	Intervn	No pillbox	25/06/07	15	29	30	06	09	.	.	.	.	.	02	01	02	00	03	.	.	.	.	.	07	04	04	04	10	.
102	19	Intervn	No pillbox	23/07/07	15	29	30	06	09	.	.	.	.	.	00	00	00	00	15	.	.	.	.	.	07	04	04	04	10	.
103	19	Intervn	No pillbox	20/08/07	15	29	30	06	09	.	.	.	.	.	00	00	00	00	05	.	.	.	.	.	07	04	04	04	10	.
104	20	Intervn	Pillbox	10/04/07	08	34	04	37	.	.	.	.	.	.	04	00	01	03	.	.	.	.	.	09	07	07	02	.	.	
105	20	Intervn	Pillbox	07/05/07	08	34	04	37	.	.	.	.	.	.	91	00	02	03	.	.	.	.	.	09	07	07	02	.	.	
106	20	Intervn	Pillbox	04/06/07	08	34	04	37	.	.	.	.	.	.	91	00	01	92	.	.	.	.	.	09	07	07	02	.	.	
107	20	Intervn	Pillbox	02/07/07	08	34	04	37	.	.	.	.	.	.	94	00	02	93	.	.	.	.	.	09	07	07	02	.	.	
108	20	Intervn	Pillbox	30/07/07	08	34	04	37	.	.	.	.	.	.	00	00	00	03	.	.	.	.	.	09	07	07	02	.	.	
109	20	Intervn	Pillbox	27/08/07	08	34	04	37	.	.	.	.	.	.	06	00	02	91	.	.	.	.	.	09	07	07	02	.	.	
110	21	Control	.	10/04/07	15	34	05	30	22	29	.	.	.	.	00	00	00	00	00	00	00	.	.	.	07	04	02	04	02	04

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
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100	.	.	.	.	02	01	01	01	03	.	.	.	.	.	.	.	.	.	14	.	.	.	.	.	02	01	01	01	02	.	.	.
101	.	.	.	.	02	01	01	01	03	.	.	.	.	.	.	.	.	.	18	.	.	.	.	.	.	.	.	.	.	.	.	.
102	.	.	.	.	02	01	01	01	03	.	.	.	.	.	.	.	.	.	.	.	.	.	01	01	01	01	01	.	.	.	.	.
103	.	.	.	.	02	01	01	01	03	.	.	.	.	.	.	.	.	.	14	.	.	.	.	.	03	03	03	03	03	.	.	.
104	.	.	.	.	14	02	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
105	.	.	.	.	14	02	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
106	.	.	.	.	14	02	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
107	.	.	.	.	14	02	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
108	.	.	.	.	14	02	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
109	.	.	.	.	14	02	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
110	.	.	.	.	02	01	11	01	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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100	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
101	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
102	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
103	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	23	28	.	.	.	00	.	.	.	.	.	.	.	.	.	.
104	.	.	3	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
105	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
106	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
107	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
108	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
109	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
110	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
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100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0092	.	.	.	.	25	.	.	.	25/06/07
101	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23/07/07	
102	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20/08/07	
103	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0151	.	.	.	.	.	.	.	.	
104	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	07/05/07	
105	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	14	.	.	04/06/07	
106	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	04	.	.	1	37	.	.	02/07/07	
107	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	30/07/07	
108	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	32	.	.	27/08/07	
109	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	33	.	.	.	
110	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	07/05/07	



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28
111	21	Control	.	07/05/07	15	34	05	30	22	29	.	.	.	.	00	00	00	00	00	00	00	00	04
112	21	Control	.	04/06/07	15	34	05	30	22	29	.	.	.	.	01	01	00	00	00	00	00	00	04
113	21	Control	.	02/07/07	15	34	05	30	22	29	.	.	.	.	00	00	00	00	00	00	00	00	04
114	21	Control	.	30/07/07	15	34	05	30	22	29	.	.	.	.	00	00	00	00	00	00	00	00	04
115	21	Control	.	27/08/07	15	34	05	30	22	29	.	.	.	.	00	00	00	00	00	00	00	00	04
116	22	Control	.	07/05/07	15	34	08	06	29	04	.	.	.	.	00	00	00	00	00	00	00	00	07
117	22	Control	.	28/06/07	15	34	08	06	29	04	.	.	.	.	00	00	00	00	00	00	00	00	07
118	22	Control	.	30/07/07	15	34	08	06	29	04	.	.	.	.	00	00	00	00	00	00	00	00	07
119	22	Control	.	03/09/07	15	34	08	06	29	04	.	.	.	.	05	14	28	00	00	00	00	00	04
120	22	Control	.	05/11/07	15	14	34	08	06	29	04	.	.	.	00	00	00	00	00	00	00	00	10
121	22	Control	.	14/01/08	15	14	34	08	06	29	04	.	.	.	05	00	28	14	00	00	00	00	10

Obs V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60

111	.	.	.	.	02	01	11	01	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
112	.	.	.	.	02	01	11	01	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
113	.	.	.	.	02	01	11	01	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
114	.	.	.	.	02	01	11	01	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
115	.	.	.	.	02	01	11	01	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
116	.	.	.	.	02	01	02	01	02	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
117	.	.	.	.	02	01	02	01	02	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
118	.	.	.	.	02	01	02	01	02	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
119	.	.	.	.	02	01	02	01	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
120	07	.	.	.	01	03	01	02	01	03	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
121	07	.	.	.	01	03	01	02	01	03	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs V61 V62 V63 V64 V65 V66 V67 V68 V69 V70 V71 V72 V73 V74 V75 V76 V77 V78 V79 V80 V81 V82 V83 V84 V85 V86 V87 V88 V89 V90 V91 V92

111	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
112	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
113	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
114	.	.	1	.	.	.	.	.	.	.	.	.	.	.	14	57	.	.	.	.	00	.	.	.	.	.	.	.	.	.
115	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	27	.	.	.	.	.	.	.	.
116	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	32	.	.	.	.	00	.	.	.	.	.	.	.	.	.
117	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	54	.	.	.	.	00	.	.	.	.	.	.	.	.	.
118	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	54	.	.	.	.	00	.	.	.	.	.	.	.	.	.
119	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
120	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
121	.	.	4	1	.	.	.	.	.	.	.	.	.	.	14	34	.	.	.	.	00	.	.	.	.	.	.	.	.	.

Obs V93 V94 V95 V96 V97 V98 V99 V100 V101 V102 V103 V104 V105 V106 V107 V108 V109 V110 V111 V112 V113 V114 V115 V116 V117 V118

111	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	04/06/07
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113	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30/07/07
114	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	27/08/07
115	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0197	.	.	.	.	.	.	.	.	.	.	.	.
116	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0626	.	.	.	.	.	.	.	.	.	.	.	04/06/07
117	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	09	.	30/07/07
118	.	.	.	.	.	.	04	.	.	.	.	.	.	.	.	.	0087	.	.	.	.	.	41	.	.	.	.	27/08/07	
119	.	.	.	.	.	.	29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01/10/07	
120	.	.	.	.	.	.	15	14	.	.	.	.	.	.	.	.	0053	.	.	.	.	.	.	.	.	.	.	03/12/07	
121	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0076	.	.	.	.	.	04	.	.	.	.	.	



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28						
122	23	Intervn	No pillbox	10/04/07	15	14	08	34	07	30	19	29	37	.	03	13	00	00	00	00	00	02	.	07	07	09	06	04	04
123	23	Intervn	No pillbox	07/05/07	15	14	08	34	07	30	19	29	37	.	00	00	00	00	00	00	00	00	.	07	11	09	06	04	04
124	23	Intervn	No pillbox	04/06/07	15	14	08	34	07	30	19	29	37	.	00	41	00	00	00	00	00	00	.	07	07	09	06	04	04
125	23	Intervn	No pillbox	02/07/07	15	14	18	34	07	30	19	29	37	.	02	05	00	00	00	00	00	00	.	07	07	09	06	04	04
126	23	Intervn	No pillbox	30/07/07	15	14	08	34	07	30	19	29	37	.	01	01	00	00	00	00	00	00	.	07	07	09	06	04	04
127	23	Intervn	No pillbox	27/08/07	15	14	08	34	07	30	19	29	37	.	00	00	00	00	00	00	00	00	.	07	07	09	06	04	04
128	24	Intervn	Pillbox	10/04/07	15	06	29	01	30	.	.	.	.	.	00	00	00	00	00	.	.	.	.	10	04	07	05	02	.
129	24	Intervn	Pillbox	07/05/07	15	06	29	02	30	.	.	.	.	.	00	00	00	00	00	.	.	.	.	10	04	07	05	04	.
130	24	Intervn	Pillbox	02/07/07	15	06	29	02	30	.	.	.	.	.	00	01	02	01	01	.	.	.	.	10	04	07	05	04	.
131	24	Intervn	Pillbox	30/07/07	15	06	29	02	30	22	.	.	.	.	00	00	28	30	28	00	.	.	.	10	04	07	05	04	04
132	24	Intervn	Pillbox	19/11/07	15	06	29	02	30	.	.	.	.	.	00	00	00	02	00	.	.	.	.	14	07	11	07	08	.

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
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122	02	04	04	.	02	02	14	13	01	01	11	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
123	02	04	04	.	02	04	14	13	01	01	11	01	01	.	02	02	.	.	.	.	.	01	.	02	02	02	02	02	02	02	02	02
124	02	04	04	.	02	02	14	13	01	01	11	01	01	.	.	.	.	.	.	.	.	.	02	02	01	01	01	01	01	01	01	01
125	02	04	04	.	02	02	14	13	01	01	11	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
126	02	04	04	.	02	02	14	13	01	01	11	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
127	02	04	04	.	02	02	14	13	01	01	11	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
128	.	.	.	.	03	01	02	01	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
129	.	.	.	.	03	01	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
130	.	.	.	.	03	01	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
131	.	.	.	.	03	01	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
132	.	.	.	.	03	01	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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123	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	55	54	50	.	01	02	.	.	.	.	.	.	.	.	.	.	.	
124	01	.	1	.	.	.	.	.	.	.	.	.	.	.	.	40	50	.	02	25	20	.	.	03	04	007	.	.	.	.	.	.	
125	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	06	.	.	.	.	.	.	.	.	.	.	.	.	
126	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	14	19	18	.	03	03	.	.	.	.	.	.	.	.	.	.	.	
127	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.	.	
128	.	.	3	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	01	.	.	.	.	.	.	.	003	.	.	.	.	.	.
129	.	.	2	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.	.	
130	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	14	57	.	01	32	.	.	.	.	.	.	.	.	.	.	.	.	
131	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	47	57	.	00	.	.	.	.	.	.	.	.	.	22	.	.	.	
132	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	22	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
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122	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	07/05/07
123	.	.	.	.	.	.	.	14	.	.	.	.	.	.	.	.	.	0183	.	.	.	.	.	.	.	04/06/07
124	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15	.	.	.	02/07/07
125	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30/07/07
126	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0256	.	.	.	.	.	.	.	27/08/07
127	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
128	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	09	.	.	07/05/07
129	.	.	.	.	.	.	.	30	02	.	.	.	.	.	.	.	.	0157	02	.	.	2	20	.	.	04/06/07
130	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0140	.	.	.	2	.	.	.	30/07/07
131	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0175	.	.	.	2	.	.	.	27/08/07
132	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	14/01/08



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	
133	24	Intervn	Pillbox	14/01/08	15	06	29	02	30	.	.	.	.	.	00	01	02	01	04	.	.	.	.	.
134	25	Intervn	Pillbox	10/04/07	15	14	29	34	05	38	32	.	.	.	00	00	00	00	00	00	00	00	00	08
135	25	Intervn	Pillbox	07/05/07	15	29	34	05	38	32	.	.	.	.	00	00	00	00	00	00	.	.	.	10
136	25	Intervn	Pillbox	04/06/07	15	29	34	05	38	32	.	.	.	.	00	00	00	00	00	00	.	.	.	07
137	25	Intervn	Pillbox	30/07/07	15	29	34	05	38	32	.	.	.	.	00	00	00	00	00	00	.	.	.	07
138	25	Intervn	Pillbox	27/08/07	15	29	34	05	38	32	.	.	.	.	00	00	00	00	00	00	.	.	.	07
139	25	Intervn	Pillbox	17/09/07	15	29	34	05	38	32	.	.	.	.	00	00	00	00	00	00	.	.	.	07
140	26	Control	.	07/05/07	15	34	18	36	29	.	.	.	.	.	00	00	00	00	00	.	.	.	.	11
141	26	Control	.	04/06/07	15	14	34	18	29	36	.	.	.	.	00	00	00	00	00	00	00	.	.	11
142	26	Control	.	29/06/07	15	14	34	18	29	36	.	.	.	.	00	00	00	00	00	00	.	.	.	11
143	26	Control	.	14/08/07	15	14	34	18	29	36	.	.	.	.	00	00	00	00	00	00	.	.	.	11

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
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134	10	.	.	.	02	02	01	02	11	02	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
135	.	.	.	.	02	02	02	11	02	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
136	.	.	.	.	02	01	02	11	02	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
137	.	.	.	.	02	01	02	11	02	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
138	.	.	.	.	02	01	02	11	02	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
139	.	.	.	.	02	01	02	11	02	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
140	.	.	.	.	04	02	01	02	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
141	.	.	.	.	04	04	01	02	11	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
142	.	.	.	.	04	04	02	01	02	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
143	.	.	.	.	04	04	02	01	02	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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133	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	57	.	.	.	00	.	.	.	.	.	.	.	.	.	.
134	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
135	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
136	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	44	.	.	.	00	.	.	.	.	.	.	.	.	.	.
137	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
138	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	14	54	57	.	.	00	.	.	.	.	.	.	.	.	.	.
139	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
140	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	49	.	.	.	01	26	.	.	.	.	.	.	36	.	.
141	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	19	36	.
142	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
143	.	.	1	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	01	32	.	.	.	09	.	007	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
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133	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0132	.	.	.	2	.	.	.	.
134	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	07/05/07
135	.	.	.	.	.	.	14	.	.	.	.	.	.	.	.	.	.	0107	.	.	.	3	.	.	.	04/06/07
136	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	23	.	.	02/07/07	
137	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0100	.	.	.	2	.	.	.	27/08/07
138	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	17/09/07	
139	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	
140	.	.	.	.	.	.	14	15	.	.	.	.	.	.	.	.	.	0146	.	.	.	.	06	.	.	04/06/07
141	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23	06	.	.	02/07/07
142	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30/07/07
143	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10/09/07



Obs V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117		V118
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[illegible]



Obs	V1	PATIENT	PILLBOX		V2	V3	V4	V5	V6	V7		UNIVERSITY OF PRETORIA YUNIBESITHI YA PRETORIA	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28							
155	28	Intervn	Pillbox		25/06/07	15	14	08	34	07	29	30	.	.	.	30	30	35	96	15	28	14	.	.	.	07	07	09	06	04	07		
156	28	Intervn	Pillbox		06/08/07	15	14	08	34	07	29	30	.	.	.	00	00	00	00	00	02	00	.	.	.	07	07	09	06	04	07		
157	28	Intervn	Pillbox		03/09/07	15	14	08	34	07	29	30	.	.	.	00	00	00	02	00	00	00	.	.	.	07	07	09	06	04	07		
158	29	Control	.		16/04/07	15	14	08	34	30	29	22	.	.	.	02	02	05	02	00	04	00	.	.	.	07	07	09	07	04	07		
159	29	Control	.		14/05/07	15	14	08	34	30	29	22	.	.	.	00	00	00	00	00	00	00	.	.	.	07	07	09	07	04	07		
160	29	Control	.		11/06/07	15	14	08	34	30	29	22	.	.	.	00	00	00	00	00	00	00	.	.	.	07	07	09	07	04	07		
161	29	Control	.		09/07/07	15	14	08	34	30	29	22	.	.	.	00	00	00	00	00	00	00	.	.	.	08	08	09	07	04	07		
162	29	Control	.		06/08/07	15	14	08	34	30	29	22	.	.	.	00	00	00	00	00	00	00	.	.	.	08	08	09	07	04	07		
163	29	Control	.		03/09/07	15	14	08	34	30	29	22	.	.	.	00	00	00	00	00	00	00	.	.	.	07	07	09	07	04	07		
164	30	Intervn	Pillbox		16/04/07	15	14	08	34	29	30	07	22	05	37	06	06	00	00	00	00	00	00	00	00	00	00	07	11	07	04	04	04
165	30	Intervn	Pillbox		14/05/07	15	14	08	34	29	30	07	22	05	37	04	06	00	00	00	00	00	00	00	00	00	00	07	11	07	04	04	04

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
155	04	.	.	.	02	02	14	13	01	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
156	04	.	.	.	02	02	14	13	01	02	01	.	.	.	.	.	.	.	.	.	.	.	.	02	02	02	02	02	02	02	02	.
157	04	.	.	.	02	02	14	13	01	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
158	02	.	.	.	02	02	14	02	01	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
159	02	.	.	.	02	02	14	02	01	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
160	02	.	.	.	02	02	14	02	01	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
161	02	.	.	.	02	02	14	02	01	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
162	02	.	.	.	02	02	14	02	01	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
163	02	.	.	.	02	02	14	02	01	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
164	04	04	02	02	02	04	02	01	01	01	01	01	11	11	.	.	.	.	.	.	.	.	01	03	03	02	02	02	02	02	02	02
165	04	02	02	02	02	04	02	01	01	01	01	11	11	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
155	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
156	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
157	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	46	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
158	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
159	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
160	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
161	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
162	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	02	.	.	.	.	.	.	.	.	.
163	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
164	02	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
165	.	.	2	.	.	.	4	.	.	.	.	.	.	.	.	.	53	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118	
155	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	06/08/07
156	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0117	.	.	.	5	08	21	.	03/09/07	
157	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	.	
158	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0131	.	.	.	.	.	.	.	14/05/07	
159	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11/06/07	
160	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	09/07/07	
161	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0134	.	.	.	.	.	.	.	06/08/07	
162	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	03/09/07	
163	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
164	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	07	.	.	14/05/07	
165	.	.	.	.	.	.	.	22	.	.	.	.	.	.	.	.	.	0144	.	.	.	1	.	.	.	11/06/07	



UNIVERSITEIT VAN PRETORIA
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YUNIBESITHI YA PRETORIA

OBS	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28
166	30	Intervn	Pillbox	11/06/07	15	14	08	34	29	30	07	22	05	37	06	10	00	00	00	00	00	00	00	00	07	11	07	04	04	04
167	30	Intervn	Pillbox	10/07/07	15	14	08	34	29	30	07	22	05	37	02	04	02	01	01	01	01	87	87	87	07	11	07	04	04	04
168	30	Intervn	Pillbox	06/08/07	15	14	08	34	29	30	07	22	05	37	05	10	00	00	00	00	00	00	00	00	07	11	07	04	04	04
169	30	Intervn	Pillbox	03/09/07	15	14	08	34	29	30	07	22	05	37	04	08	00	00	00	00	00	00	00	00	07	11	07	04	04	04
170	31	Intervn	Pillbox	23/04/07	14	08	06	34	41	.	.	.	.	.	00	00	00	00	00	.	.	.	.	07	04	02	04	04	.	
171	31	Intervn	Pillbox	21/05/07	14	08	06	34	41	.	.	.	.	.	00	00	00	00	00	.	.	.	.	07	04	02	04	04	.	
172	31	Intervn	Pillbox	18/06/07	14	08	06	34	41	.	.	.	.	.	00	00	00	00	00	.	.	.	.	11	04	02	04	04	.	
173	31	Intervn	Pillbox	16/07/07	14	08	06	34	41	.	.	.	.	.	00	00	00	00	01	.	.	.	.	11	04	02	04	04	.	
174	31	Intervn	Pillbox	13/08/07	14	08	06	34	41	.	.	.	.	.	20	10	05	10	10	.	.	.	.	11	04	02	04	04	.	
175	31	Intervn	Pillbox	10/09/07	14	08	06	34	41	.	.	.	.	.	03	00	00	00	00	.	.	.	.	11	04	02	04	04	.	
176	32	Control	.	23/04/07	15	34	29	37	.	.	.	.	.	.	05	06	02	03	.	.	.	.	.	07	04	04	04	.	.	

Obs V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60

[illegible]

Obs V61 V62 V63 V64 V65 V66 V67 V68 V69 V70 V71 V72 V73 V74 V75 V76 V77 V78 V79 V80 V81 V82 V83 V84 V85 V86 V87 V88 V89 V90 V91 V92

166	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	39	.	.	.	00	.	.	.	.	.	.	.	.
167	.	.	3	1	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	01	16	19	.	.	.	.	.	.
168	01	01	3	.	.	.	4	.	.	7	.	.	.	.	.	.	27	18	32	33	01	16	.	.	.	.	.	.
169	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	14	18	.	.	02	28	10	.	.	.	.	.	.
170	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	17	43	49	21	00	.	.	.	.	.	.	.
171	.	.	1	.	.	.	.	.	6	.	.	.	.	.	.	.	51	48	.	.	00	.	.	.	.	.	.	.
172	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.
173	.	.	5	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	01	15	.	.	.	.	.	.	.
174	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	14	54	47	18	.	01	32	.	.	.	.	.	.
175	.	.	3	.	.	.	.	.	7	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.
176	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117		V118
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[illegible]



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	
177	32	Control	.	21/05/07	15	34	29	37	.	.	.	.	.	04	03	05	00	.	.	.	.	.	.	.
178	32	Control	.	18/06/07	15	34	29	37	.	.	.	.	.	00	00	00	00	.	.	.	.	.	.	.
179	32	Control	.	16/07/07	15	34	29	37	.	.	.	.	.	02	01	00	00	.	.	.	.	.	.	.
180	32	Control	.	13/08/07	15	34	29	37	.	.	.	.	.	02	03	00	00	.	.	.	.	.	.	.
181	32	Control	.	10/09/07	15	34	29	37	.	.	.	.	.	00	00	00	00	.	.	.	.	.	.	.
182	33	Control	.	10/04/07	15	14	34	16	43	37	01	44	39	.	00	00	00	00	89	00	00	00	08	.
183	33	Control	.	07/05/07	15	34	16	43	37	01	44	.	.	.	00	00	00	00	00	00	00	.	.	.
184	33	Control	.	08/06/07	15	34	16	43	37	01	44	.	.	.	00	00	00	00	00	00	00	.	.	.
185	33	Control	.	02/07/07	15	34	16	43	37	01	44	.	.	.	00	00	00	00	00	00	00	.	.	.
186	33	Control	.	06/08/07	15	34	16	43	37	01	44	.	.	.	00	00	00	00	00	56	00	.	.	.
187	33	Control	.	03/09/07	15	34	16	43	37	01	44	.	.	.	00	00	00	00	00	00	00	.	.	.

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
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177	.	.	.	.	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
178	.	.	.	.	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
179	.	.	.	.	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
180	.	.	.	.	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
181	.	.	.	.	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
182	07	04	12	.	02	02	01	11	11	11	02	01	04	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
183	04	.	.	.	02	01	11	11	11	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
184	04	.	.	.	02	01	11	11	11	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
185	04	.	.	.	02	01	11	11	11	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
186	04	.	.	.	02	01	11	12	11	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
187	04	.	.	.	02	01	11	12	11	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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177	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
178	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
179	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	15	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
180	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
181	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
182	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
183	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	35	.	.	.	.	.	.	.	.	.
184	.	.	4	1	.	.	.	.	.	7	.	.	.	.	.	14	54	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
185	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	14	57	18	.	.	.	00	.	.	.	.	.	.	.	.	.	.
186	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
187	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
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177	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	18/06/07
178	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	16/07/07
179	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0158	.	.	.	.	22	.	.	13/08/07
180	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10/09/07
181	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
182	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	07/05/07
183	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0254	.	.	.	.	.	.	04/06/07
184	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	02/07/07
185	.	.	.	.	.	.	.	43	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30/07/07
186	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0173	.	.	.	.	09	.	.	03/09/07
187	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01/10/07



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7		UNIVERSITY OF PRETORIA YUNIBESITHI YA PRETORIA	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28					
188	33	Control	.	04/10/07	15	34	16	43	37	01	44	.	.	.	00	00	00	00	00	00	07	04	02	03	02	07				
189	34	Control	.	25/06/07	08	34	37	30	.	.	.	.	05	06	03	08	.	.	.	07	07	04	04	.	.					
190	34	Control	.	23/07/07	08	34	37	30	.	.	.	.	05	04	02	05	.	.	.	07	07	04	04	.	.					
191	34	Control	.	20/08/07	08	34	37	30	.	.	.	.	02	02	03	02	.	.	.	07	07	04	04	.	.					
192	34	Control	.	17/09/07	08	34	37	30	.	.	.	.	02	03	03	03	.	.	.	07	07	04	04	.	.					
193	34	Control	.	15/10/07	08	34	37	30	.	.	.	.	04	04	03	05	.	.	.	07	07	04	04	.	.					
194	34	Control	.	12/11/07	08	34	37	30	.	.	.	.	03	03	01	05	.	.	.	07	07	04	04	.	.					
195	36	Intervn	No pillbox	04/06/07	15	14	34	17	37	29	06	22	.	.	02	04	00	07	00	04	01	01	.	.	07	10	07	04	02	07
196	36	Intervn	No pillbox	02/07/07	15	14	34	17	37	29	06	22	.	.	01	00	00	00	00	05	02	.	.	07	10	07	04	02	10	
197	36	Intervn	No pillbox	30/07/07	15	14	34	17	37	29	06	22	.	.	01	01	11	01	00	12	02	.	.	07	10	07	04	02	10	
198	36	Intervn	No pillbox	27/08/07	15	14	34	17	37	29	06	22	.	.	00	00	03	04	10	03	00	00	.	.	07	10	07	04	02	10

Obs V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60

188	04	.	.	.	02	01	11	12	11	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
189	.	.	.	.	02	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
190	.	.	.	.	02	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
191	.	.	.	.	02	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
192	.	.	.	.	02	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
193	.	.	.	.	02	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
194	.	.	.	.	02	02	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
195	04	04	.	.	02	03	02	01	11	02	01	01	.	02	02	01	01	01	01	01	01	.	.	.	.	.	.	.	.
196	04	04	.	.	02	03	02	01	11	03	01	01	.	01	.	.	.	01	.	.	.	01	01	01	01	01	01	01	01
197	04	04	.	.	02	03	02	01	11	03	01	01	.	.	.	.	01	.	.	.	.	.	.	.	.	.	.	.	.
198	04	04	.	.	02	03	02	01	11	03	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs V61 V62 V63 V64 V65 V66 V67 V68 V69 V70 V71 V72 V73 V74 V75 V76 V77 V78 V79 V80 V81 V82 V83 V84 V85 V86 V87 V88 V89 V90 V91 V92

188	.	.	2	.	.	.	.	.	.	.	.	.	.	.	14	54	57	.	.	00	.	.	.	.	.	.	.	.	.
189	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
190	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
191	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
192	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	57	54	.	.	00	.	.	.	.	.	.	.	.	.
193	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	57	.	.	01	30	.	.	.	.	.	.	.	.	.
194	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
195	.	.	3	.	.	.	.	.	.	7	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
196	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
197	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	30	.	.	00	.	.	.	.	.	.	.	.	.	.
198	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.

Obs V93 V94 V95 V96 V97 V98 V99 V100 V101 V102 V103 V104 V105 V106 V107 V108 V109 V110 V111 V112 V113 V114 V115 V116 V117 V118

188	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
189	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23/07/07	
190	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29	.	.	.	.	.	.	20/08/07	
191	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17/09/07	
192	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	15/10/07	
193	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	28	.	.	.	.	.	.	12/11/07	
194	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
195	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	09	.	.	.	.	.	.	02/07/07	
196	.	.	.	.	.	.	29	.	.	.	.	.	.	.	.	1496	.	.	.	.	.	.	.	.	.	.	.	30/07/07	
197	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	27/08/07	
198	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	10	12	.	.	.	.	17/09/07	



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28							
199	36	Intervn	No pillbox	17/09/07	15	14	34	17	37	29	06	22	.	.	07	07	04	07	04	15	09	00	.	.	07	10	07	04	02	10
200	36	Intervn	No pillbox	22/10/07	15	14	34	17	37	29	06	22	.	.	00	00	00	00	00	00	00	00	.	.	07	10	07	04	02	10
201	37	Intervn	No pillbox	07/05/07	15	34	37	01	29	30	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	06	04	07	07	04
202	37	Intervn	No pillbox	04/06/07	15	34	37	01	29	30	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	06	04	07	07	04
203	37	Intervn	No pillbox	30/07/07	15	34	37	02	29	30	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	06	04	05	07	04
204	37	Intervn	No pillbox	03/10/07	15	34	37	02	29	30	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	06	04	05	07	04
205	37	Intervn	No pillbox	22/10/07	15	34	37	01	29	30	.	.	.	.	04	06	04	06	06	04	.	.	.	.	07	06	04	07	07	04
206	37	Intervn	No pillbox	14/01/08	15	34	37	01	29	30	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	06	04	07	07	04
207	38	Intervn	No pillbox	14/05/07	15	14	08	34	29	30	.	.	.	.	00	00	00	00	02	01	.	.	.	.	07	11	09	06	07	04
208	38	Intervn	No pillbox	11/06/07	15	14	08	34	29	30	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	11	09	06	07	04
209	38	Intervn	No pillbox	09/07/07	15	14	08	34	29	30	.	.	.	.	00	00	00	00	00	00	.	.	.	.	07	11	09	06	07	04

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
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199	04	04	.	.	02	03	02	01	11	03	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
200	04	04	.	.	02	03	02	01	11	03	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
201	.	.	.	.	02	13	01	02	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
202	.	.	.	.	02	13	01	02	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
203	.	.	.	.	02	13	01	01	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
204	.	.	.	.	02	13	01	01	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
205	.	.	.	.	02	13	01	02	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
206	.	.	.	.	02	13	01	02	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
207	.	.	.	.	02	04	14	13	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
208	.	.	.	.	02	04	14	13	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
209	.	.	.	.	02	04	14	13	02	01	.	.	.	.	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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199	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	58	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
200	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	38	.	.	.	.	.	.	.	.	.	.
201	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
202	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
203	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	08	07	011	.	.	.	.
204	.	.	5	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
205	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
206	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	38	.	.	.	10	11	007	.	.	.	.
207	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	54	57	.	.	00	.	.	.	.	.	.	.	.	.	.	.
208	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
209	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	10	.	.	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
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199	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0083	.	.	.	.	12	.	.	.	22/10/07
200	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
201	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0145	.	.	.	.	20	.	.	04/06/07	
202	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0118	.	.	.	.	.	.	.	02/07/07	
203	.	.	.	.	.	.	02	.	.	.	.	.	.	.	.	.	.	0184	.	.	.	2	09	.	.	27/08/07	
204	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0234	.	.	.	.	.	.	.	22/10/07	
205	.	.	.	.	.	.	01	.	.	.	.	.	.	.	.	.	.	0139	.	.	.	.	01	17	.	19/11/07	
206	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0189	.	.	.	.	09	.	.	.	
207	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23	01	.	.	11/06/07	
208	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	09/07/07	
209	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0193	.	.	.	.	.	.	.	06/08/07	



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28							
210	38	Intervn	No pillbox	06/08/07	15	14	08	34	29	30	.	.	.	.	00	00	00	00	00	00	00	07	11	09	06	07	04			
211	38	Intervn	No pillbox	03/09/07	15	14	08	34	29	30	.	.	.	.	00	00	00	00	00	00	00	07	11	09	06	07	04			
212	38	Intervn	No pillbox	01/10/07	15	14	08	34	29	30	.	.	.	.	02	02	00	89	00	00	.	.	.	.	07	11	09	06	07	04
213	39	Control	.	10/04/07	15	14	08	34	29	07	45	19	33	37	00	00	00	00	00	00	00	00	00	00	07	11	09	10	07	04
214	39	Control	.	07/05/07	15	14	08	34	29	07	45	19	33	37	00	00	00	00	00	00	00	00	00	07	11	09	10	07	04	
215	39	Control	.	02/07/07	15	14	08	34	29	07	45	19	33	37	00	00	00	00	00	00	00	00	00	07	11	09	10	07	04	
216	39	Control	.	30/07/07	15	14	08	34	29	07	45	37	30	22	00	00	00	00	00	00	00	00	00	07	11	09	10	07	04	
217	39	Control	.	27/08/07	15	14	08	34	29	07	45	37	30	22	00	00	00	00	00	00	00	00	00	07	11	09	10	07	04	
218	39	Control	.	22/10/07	15	14	08	34	29	07	45	37	30	22	00	00	00	00	00	00	00	00	00	07	11	09	10	07	04	
219	41	Intervn	No pillbox	11/06/07	15	14	08	34	29	.	.	.	.	.	03	01	00	00	14	.	.	.	.	11	07	09	11	07	.	
220	41	Intervn	No pillbox	09/07/07	15	14	08	34	29	30	.	.	.	.	00	00	00	00	28	00	.	.	.	.	07	14	09	11	07	04

Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
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210	.	.	.	.	02	04	14	13	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
211	.	.	.	.	02	04	14	13	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
212	.	.	.	.	02	04	14	13	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
213	04	07	10	04	02	04	14	03	02	01	01	02	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
214	04	07	10	04	02	04	14	03	02	01	01	02	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
215	04	07	10	04	02	04	14	03	02	01	01	02	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
216	04	04	04	04	02	04	14	03	02	01	01	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
217	02	04	04	04	02	04	14	03	02	01	11	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
218	02	04	04	04	02	04	14	03	02	01	11	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
219	.	.	.	.	04	02	14	04	02	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
220	.	.	.	.	02	06	14	04	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
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210	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
211	.	.	3	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
212	.	.	5	.	.	.	.	.	7	.	.	.	.	.	.	14	27	47	57	.	01	32	.	.	.	.	.	.	.	.	.	.
213	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
214	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	25	17	28	.	00	.	.	.	.	.	.	.	.	46	.	.	
215	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.
216	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	.	00	.	.	.	.	.	.	.	.	19	33	46	.
217	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	14	57	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.
218	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	33	.	.
219	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	32	.	.	.	00	.	.	.	.	.	.	.	.	.	30	.	.
220	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	28	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.	.

Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118
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210	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	03/09/07
211	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01/10/07
212	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0230	.	.	.	.	.	.	.	.
213	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	07/05/07
214	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0111	.	.	.	.	24	.	.	04/06/07
215	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30/07/07
216	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0162	.	.	.	.	11	.	.	27/08/07
217	.	.	.	.	.	.	.	45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25/09/07
218	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0130	.	.	.	.	.	.	.	.
219	.	.	.	.	.	.	.	14	15	.	.	.	.	.	.	.	.	0188	.	.	.	.	40	.	.	09/07/07
220	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	06/08/07



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28
221	41	Intervn	No pillbox	06/08/07	15	14	08	34	29	30	.	.	.	.	00	00	00	00	00	00	00	00	04
222	41	Intervn	No pillbox	03/09/07	15	14	08	34	29	30	.	.	.	.	71	00	77	00	00	00	00	00	04
223	41	Intervn	No pillbox	01/10/07	15	14	08	34	29	30	.	.	.	.	00	00	00	00	56	00	00	00	04
224	41	Intervn	No pillbox	29/10/07	15	14	08	34	29	30	.	.	.	.	00	00	00	00	00	00	00	00	04
225	42	Control	.	11/06/07	15	14	34	07	29	02	.	.	.	.	00	00	04	02	05	01	00	00	05
226	42	Control	.	09/07/07	15	14	34	07	29	02	.	.	.	.	00	00	02	00	01	02	00	00	05
227	42	Control	.	06/08/07	15	14	34	07	29	02	.	.	.	.	02	04	04	01	03	03	00	00	05
228	42	Control	.	03/09/07	15	14	34	07	29	02	.	.	.	.	00	00	00	00	00	02	00	00	05
229	42	Control	.	25/09/07	15	14	34	07	29	02	.	.	.	.	14	28	14	07	21	09	00	00	05
230	42	Control	.	05/11/07	15	14	34	07	29	02	.	.	.	.	14	28	14	07	21	09	00	00	05
231	43	Intervn	Pillbox	06/08/07	15	08	34	29	19	30	07	.	.	.	05	00	00	00	00	00	00	00	04

Obs V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60

221	.	.	.	.	02	06	14	04	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
222	.	.	.	.	02	06	14	04	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
223	.	.	.	.	02	06	14	04	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
224	.	.	.	.	02	06	14	04	02	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
225	.	.	.	.	02	04	02	01	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
226	.	.	.	.	02	04	02	01	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
227	.	.	.	.	02	04	02	01	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
228	.	.	.	.	02	04	02	01	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
229	.	.	.	.	02	04	02	01	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
230	.	.	.	.	02	04	02	01	03	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
231	04	.	.	.	04	03	02	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs V61 V62 V63 V64 V65 V66 V67 V68 V69 V70 V71 V72 V73 V74 V75 V76 V77 V78 V79 V80 V81 V82 V83 V84 V85 V86 V87 V88 V89 V90 V91 V92

221	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
222	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	55	.	.	.	01	02	.	.	.	.	.	.	.	.
223	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
224	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.
225	.	.	1	.	.	.	.	5	.	.	.	.	.	.	.	29	.	.	00	.	.	.	.	.	.	.	.	.	.
226	.	.	1	.	.	.	.	.	7	.	.	.	.	.	.	44	.	.	00	.	.	.	.	.	.	.	.	.	.
227	.	.	2	.	.	.	.	.	7	.	.	.	.	.	.	14	44	.	00	.	.	.	.	.	.	.	.	.	.
228	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
229	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	09	.	.	.	.	.	.	.	.	.	.
230	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	.
231	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	31	.	.	00	.	.	.	.	.	.	.	.	.	.

Obs V93 V94 V95 V96 V97 V98 V99 V100 V101 V102 V103 V104 V105 V106 V107 V108 V109 V110 V111 V112 V113 V114 V115 V116 V117 V118

221	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	09	.	.	03/09/07
222	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0126	.	.	.	.	.	.	01/10/07
223	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29/10/07
224	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
225	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	04	03	.	09/07/07
226	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	06/08/07
227	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0814	03	.	.	.	01	.	03/09/07
228	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	01	.	.	25/09/07
229	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	29/10/07
230	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0145	.	.	.	.	11	.	.
231	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0149	.	.	.	3	06	.	03/09/07



Obs	V1	PATIENT	PILLBOX		V2	V3	V4	V5	V6	V7		UNIVERSITY OF PRETORIA YUNIBESITHI YA PRETORIA	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28					
232	43	Intervn	Pillbox		28/08/07	15	08	34	29	19	30	07	.	.	.	20	14	06	12	10	00	00	.	.	11	10	07	07	04	04	
233	43	Intervn	Pillbox		01/10/07	15	08	34	29	19	30	07	.	.	.	00	08	08	08	00	04	00	.	.	11	10	07	07	04	04	
234	43	Intervn	Pillbox		06/11/07	15	08	34	29	19	30	07	.	.	.	00	00	00	00	00	00	00	.	.	11	10	07	07	04	04	
235	43	Intervn	Pillbox		26/11/07	15	08	34	29	19	30	07	22	44	.	00	00	00	00	00	00	00	00	00	15	14	11	11	17	07	
236	43	Intervn	Pillbox		25/02/08	15	08	34	29	19	30	07	.	.	.	00	00	00	00	00	00	00	.	.	11	10	07	07	04	04	
237	44	Intervn	Pillbox		04/06/07	15	14	08	34	29	30	37	22	.	.	00	00	00	00	00	00	00	.	.	07	07	09	07	07	07	
238	44	Intervn	Pillbox		02/07/07	15	14	08	34	29	30	37	22	.	.	00	00	00	00	56	00	00	.	.	07	07	09	07	07	07	
239	44	Intervn	Pillbox		30/07/07	15	14	08	34	29	30	37	22	.	.	82	82	00	02	14	00	00	00	.	.	07	07	09	07	07	07
240	44	Intervn	Pillbox		27/08/07	15	14	08	34	29	30	37	22	.	.	00	00	00	02	14	00	00	00	.	.	07	07	09	07	07	07
241	44	Intervn	Pillbox		17/09/07	15	14	08	34	29	30	37	22	.	.	00	00	00	00	00	56	00	00	.	.	07	07	09	07	07	07
242	44	Intervn	Pillbox		22/10/07	15	14	08	34	29	30	37	22	.	.	00	00	00	02	14	00	00	00	.	.	07	07	09	07	07	07

Obs V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60

232	04	.	.	.	04	03	02	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
233	04	.	.	.	04	03	02	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
234	04	.	.	.	04	03	02	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
235	07	07	14	.	04	03	02	02	08	01	01	01	03	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
236	04	.	.	.	04	03	02	02	01	01	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
237	02	04	.	.	02	02	14	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
238	02	04	.	.	02	02	14	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
239	02	04	.	.	02	02	14	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
240	02	04	.	.	02	02	14	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
241	02	04	.	.	02	02	14	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
242	02	04	.	.	02	02	14	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs V61 V62 V63 V64 V65 V66 V67 V68 V69 V70 V71 V72 V73 V74 V75 V76 V77 V78 V79 V80 V81 V82 V83 V84 V85 V86 V87 V88 V89 V90 V91 V92

232	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
233	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	42	.	.	.	.	00	.	.	.	.	.	.	.	.	.
234	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
235	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
236	.	.	3	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	01	40	.	.	.	13	.	021	.	.
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239	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
240	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	30	.	.	.	.	00	.	.	.	.	.	.	.	.	.
241	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
242	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.

Obs V93 V94 V95 V96 V97 V98 V99 V100 V101 V102 V103 V104 V105 V106 V107 V108 V109 V110 V111 V112 V113 V114 V115 V116 V117 V118

232	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	17/09/07
233	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0178	.	.	.	.	.	.	.	1	01	.	.	29/10/07
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235	.	.	.	.	.	.	19	.	.	.	.	.	.	.	.	.	0078	.	.	.	.	.	.	.	1	.	.	.	25/02/08
236	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0185	.	.	.	.	.	.	.	1	.	.	.	.
237	.	.	.	.	.	.	30	.	.	.	.	.	.	.	.	.	0089	.	.	.	.	.	.	.	1	.	.	.	02/07/07
238	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	30/07/07
239	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	27/08/07
240	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0281	.	.	.	.	.	.	.	.	10	.	.	17/09/07
241	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	22/10/07
242	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.



Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28
243	46	Intervn	Pillbox	18/06/07	15	14	08	34	19	37	.	.	.	.	00	00	00	00	00	00	00	00	04
244	46	Intervn	Pillbox	16/07/07	15	14	08	34	19	37	.	.	.	.	02	02	02	02	87	01	.	.	04
245	46	Intervn	Pillbox	13/08/07	15	14	08	34	19	37	.	.	.	.	00	00	00	00	00	00	.	.	04
246	46	Intervn	Pillbox	08/10/07	15	14	08	34	19	37	.	.	.	.	00	00	00	00	00	00	.	.	04
247	46	Intervn	Pillbox	05/11/07	15	14	08	34	19	37	.	.	.	.	00	00	00	00	00	00	.	.	04
248	46	Intervn	Pillbox	04/12/07	15	14	08	34	19	37	.	.	.	.	00	00	00	00	00	00	.	.	04
249	46	Intervn	Pillbox	31/12/07	15	14	08	34	19	37	.	.	.	.	00	00	00	00	00	00	.	.	04
250	47	Intervn	No pillbox	28/05/07	15	14	08	37	.	.	.	.	.	.	00	00	00	00	.	.	.	.	.
251	47	Intervn	No pillbox	25/06/07	15	14	08	37	.	.	.	.	.	.	00	00	00	00	.	.	.	.	.
252	47	Intervn	No pillbox	23/07/07	15	14	08	37	.	.	.	.	.	.	00	00	00	00	.	.	.	.	.
253	47	Intervn	No pillbox	15/10/07	15	14	08	37	.	.	.	.	.	.	00	00	00	00	.	.	.	.	.

Obs V29 V30 V31 V32 V33 V34 V35 V36 V37 V38 V39 V40 V41 V42 V43 V44 V45 V46 V47 V48 V49 V50 V51 V52 V53 V54 V55 V56 V57 V58 V59 V60

243	.	.	.	.	02	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
244	.	.	.	.	02	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
245	.	.	.	.	02	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
246	.	.	.	.	02	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
247	.	.	.	.	02	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
248	.	.	.	.	02	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
249	.	.	.	.	02	02	02	02	11	01	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
250	.	.	.	.	02	04	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
251	.	.	.	.	02	04	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
252	.	.	.	.	02	04	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
253	.	.	.	.	02	04	02	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Obs V61 V62 V63 V64 V65 V66 V67 V68 V69 V70 V71 V72 V73 V74 V75 V76 V77 V78 V79 V80 V81 V82 V83 V84 V85 V86 V87 V88 V89 V90 V91 V92

243	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
244	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
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246	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
247	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
248	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
249	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	54	.	.	.	00	.	.	.	.	.	.	.	.	.
250	.	.	1	.	.	.	.	.	7	.	.	.	.	.	14	27	54	.	.	00	.	.	.	.	.	.	.	.	.
251	.	.	1	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
252	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.
253	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	22	.	.	.	00	.	.	.	.	.	.	.	.	.

Obs V93 V94 V95 V96 V97 V98 V99 V100 V101 V102 V103 V104 V105 V106 V107 V108 V109 V110 V111 V112 V113 V114 V115 V116 V117 V118

243	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0195	.	.	.	5	08	.	.	16/07/07
244	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	13/08/07
245	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	10/09/07
246	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0109	.	.	.	5	.	.	.	05/11/07
247	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	03/12/07
248	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	.	.	31/12/07
249	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0176	.	.	.	5	09	.	.	.
250	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25/06/07
251	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	30	.	.	23/07/07
252	.	.	.	.	.	.	.	37	.	.	.	.	.	.	.	.	.	.	.	0106	.	.	.	20/08/07
253	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0092	.	.	.	.	01	.	.	12/11/07



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Mrs AF van der Westhuizen - Research Project - T05168 - FAR9031 - MF424140 25
 (A01-R1) : PROC PRI   m data file PATIENT DATA 12:12 Thursday, April 30, 2009

Obs	V1	PATIENT	PILLBOX	V2	V3	V4	V5	V6	V7	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28									
265	49	Control	. 05/11/07	14	34	30	28	.	.	.	.	.	.	.	00	00	00	00	.	.	.	.	.	.								
266	49	Control	. 04/12/07	15	34	30	28	.	.	.	.	.	.	.	00	00	00	00	.	.	.	.	.	.								
Obs	V29	V30	V31	V32	V33	V34	V35	V36	V37	V38	V39	V40	V41	V42	V43	V44	V45	V46	V47	V48	V49	V50	V51	V52	V53	V54	V55	V56	V57	V58	V59	V60
265	.	.	.	.	04	01	01	08	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
266	.	.	.	.	02	01	01	08	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
Obs	V61	V62	V63	V64	V65	V66	V67	V68	V69	V70	V71	V72	V73	V74	V75	V76	V77	V78	V79	V80	V81	V82	V83	V84	V85	V86	V87	V88	V89	V90	V91	V92
265	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	00	.	.	.	.	.	.	.	.	.	.	
266	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	14	18	57	.	.	00	.	.	.	.	.	.	.	.	.	.	
Obs	V93	V94	V95	V96	V97	V98	V99	V100	V101	V102	V103	V104	V105	V106	V107	V108	V109	V110	V111	V112	V113	V114	V115	V116	V117	V118						
265	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0025	.	.	.	.	.	.	.	03/12/07						
266	.	.	.	.	.	.	.	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	23	01	.	.						





V1	PATIENT	PILLBOX	DRUG					MIN	MAX	DCLASS	DEGMADH	LOT
PATDCL												
1	Control	.	Atenolol 50mg					96.429	100.000	Chronic	Adherent	9
Cont/Chron												
1	Control	.	Azathioprine 50mg	6	100.000	0.000	0.0000	100.000	100.000	Immunosup	Adherent	9
Cont/Immun												
1	Control	.	Cyclosporin 25mg	6	100.000	0.000	0.0000	100.000	100.000	Immunosup	Adherent	9
Cont/Immun												
1	Control	.	Cyclosporin 100mg	6	100.000	0.000	0.0000	100.000	100.000	Immunosup	Adherent	9
Cont/Immun												
1	Control	.	Nifedipine XL 30mg	6	97.619	5.832	2.3810	100.000	85.714	Chronic	Adherent	9
Cont/Chron												
1	Control	.	Perindopril 4mg	6	97.619	5.832	2.3810	100.000	85.714	Chronic	Adherent	9
Cont/Chron												
1	Control	.	Potassium chloride 600mg	6	100.000	0.000	0.0000	100.000	100.000	Chronic	Adherent	9
Cont/Chron												
1	Control	.	Prednisone 5mg	6	100.000	0.000	0.0000	100.000	100.000	Immunosup	Adherent	9
Cont/Immun												
4	Control	.	Aspirin 300mg	5	101.377	38.203	17.0847	100.000	44.444	Chronic	Adherent	14
Cont/Chron												
4	Control	.	Atenolol 50mg	5	102.091	38.204	17.0852	103.571	44.444	Chronic	Adherent	14
Cont/Chron												
4	Control	.	Cyclosporin 25mg	5	87.060	39.317	17.5833	89.286	44.444	Immunosup	Adherent	14
Cont/Immun												
4	Control	.	Cyclosporin 100mg	5	87.775	39.400	17.6204	92.857	44.444	Immunosup	Adherent	14
Cont/Immun												
4	Control	.	Isosorbide mononitrate 20mg	5	89.203	39.759	17.7806	93.333	44.444	Chronic	Adherent	14
Cont/Chron												
4	Control	.	Perindopril 4mg	5	87.298	42.568	19.0369	93.333	34.921	Chronic	Adherent	14
Cont/Chron												
4	Control	.	Prednisone 5mg	5	89.203	39.759	17.7806	93.333	44.444	Immunosup	Adherent	14
Cont/Immun												
4	Control	.	Simvastatin 20mg	5	89.870	39.873	17.8317	96.667	44.444	Chronic	Adherent	14
Cont/Chron												
8	Control	.	Azathioprine 50mg	5	57.143	74.231	33.1970	100.000	-71.429	Immunosup	Under adherent	17
Cont/Immun												
8	Control	.	Carbamazepine 200mg	5	85.000	22.784	10.1895	96.429	46.429	Chronic	Adherent	17
Cont/Chron												
8	Control	.	Phenobarbitone 30mg	5	97.857	3.194	1.4286	100.000	92.857	Chronic	Adherent	17
Cont/Chron												
8	Control	.	Phenytoin 100mg	5	92.143	15.649	6.9985	100.000	64.286	Chronic	Adherent	17
Cont/Chron												
8	Control	.	Prednisone 5mg	5	85.714	28.121	12.5763	100.000	35.714	Immunosup	Adherent	17
Cont/Immun												
9	Control	.	Azathioprine 50mg	5	115.357	39.399	17.6199	100.000	94.643	Immunosup	Adherent	14
Cont/Immun												
9	Control	.	Calcium carbonate 460mg	4	50.000	57.735	28.8675	50.000	0.000	Chronic	Under adherent	14
Cont/Chron												
9	Control	.	Cyclosporin 25mg	5	89.524	7.454	3.3333	92.857	76.190	Immunosup	Adherent	14
Cont/Immun												
9	Control	.	Cyclosporin 100mg	5	89.524	7.454	3.3333	92.857	76.190	Immunosup	Adherent	14
Cont/Immun												
9	Control	.	Enalapril 10mg	5	98.333	2.321	1.0378	100.000	95.238	Chronic	Adherent	14
Cont/Chron												
9	Control	.	Indapamide 2.5mg	5	100.952	2.130	0.9524	100.000	100.000	Chronic	Adherent	14
Cont/Chron												
9	Control	.	Prednisone 5mg	5	93.095	9.903	4.4288	96.429	76.190	Immunosup	Adherent	14
Cont/Immun												
9	Control	.	Simvastatin 20mg	5	99.286	1.597	0.7143	100.000	96.429	Chronic	Adherent	14
Cont/Chron												
10	Control	.	Allopurinol 300mg	5	86.744	30.553	13.6637	97.059	32.967	Chronic	Adherent	17
Cont/Chron												
10	Control	.	Cyclosporin 25mg	5	81.606	28.510	12.7500	93.103	30.769	Immunosup	Adherent	17
Cont/Immun												

10	Control Cont/Immun	.	Cyclosporin 100mg	5	81.606	28.510	12.7500	93.103	30.769	96.552	Immunosup	Adherent	17
10	Control Cont/Chron	.	Nifedipine XL 30mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	17
10	Control Cont/Chron	.	Potassium chloride 600mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	17
10	Control Cont/Immun	.	Prednisone 5mg	5	81.606	28.510	12.7500	93.103	30.769	96.552	Immunosup	Adherent	17
11	Control Cont/Chron	.	Atenolol 50mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	7
11	Control Cont/Immun	.	Azathioprine 50mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	7
11	Control Cont/Immun	.	Cyclosporin 25mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	7
11	Control Cont/Immun	.	Cyclosporin 100mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	7
11	Control Cont/Chron	.	Furosemide 40mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	7
11	Control Cont/Chron	.	Hydrochlorothiazide 25mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	7
11	Control Cont/Chron	.	Nifedipine XL 30mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	7
11	Control Cont/Chron	.	Perindopril 4mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	7
11	Control Cont/Immun	.	Prednisone 5mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	7
11	Control Cont/Chron	.	Simvastatin 20mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	7
12	Control Cont/Immun	.	Azathioprine 50mg	2	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	11
12	Control Cont/Immun	.	Cyclosporin 100mg	2	98.214	2.525	1.7857	98.214	96.429	100.000	Immunosup	Adherent	11
12	Control Cont/Chron	.	Methyldopa 250mg	2	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	11
12	Control Cont/Chron	.	Nifedipine XL 30mg	2	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	11
12	Control Cont/Immun	.	Prednisone 5mg	2	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	11
16	Control Cont/Chron	.	Allopurinol 300mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	10
16	Control Cont/Immun	.	Cyclosporin 100mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	10
16	Control Cont/Chron	.	Enalapril 10mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	10
16	Control Cont/Chron	.	Gliclazide 80mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	10
16	Control Cont/Chron	.	Metformin 850mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	10
16	Control Cont/Immun	.	Prednisone 5mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	10
16	Control Cont/Chron	.	Simvastatin 20mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	10
17	Control Cont/Immun	.	Azathioprine 50mg	5	98.214	3.993	1.7857	100.000	91.071	100.000	Immunosup	Adherent	11
17	Control Cont/Immun	.	Cyclosporin 25mg	5	98.571	3.194	1.4286	100.000	92.857	100.000	Immunosup	Adherent	11
17	Control Cont/Immun	.	Cyclosporin 100mg	5	98.571	3.194	1.4286	100.000	92.857	100.000	Immunosup	Adherent	11
17	Control Cont/Chron	.	Indapamide 2.5mg	4	91.964	25.816	12.9079	103.571	53.571	107.143	Chronic	Adherent	11
17	Control Cont/Immun	.	Prednisone 5mg	5	98.571	3.194	1.4286	100.000	92.857	100.000	Immunosup	Adherent	11
17	Control Cont/Chron	.	Simvastatin 20mg	5	97.857	4.792	2.1429	100.000	89.286	100.000	Chronic	Adherent	11
18	Control Cont/Immun	.	Azathioprine 50mg	1	80.000	.	.	80.000	80.000	80.000	Immunosup	Adherent	1

18	Control Cont/Immun	.	Cyclosporin 25mg	1	90.000	.	80.000	80.000	80.000	Immunosup	Adherent	1	
18	Control Cont/Immun	.	Cyclosporin 100mg				80.000	80.000	80.000	Immunosup	Adherent	1	
18	Control Cont/Chron	.	Nifedipine XL 30mg				77.143	77.143	77.143	Chronic	Under adherent	1	
18	Control Cont/Immun	.	Prednisone 5mg	1	74.286	.	74.286	74.286	74.286	Immunosup	Under adherent	1	
21	Control Cont/Chron	.	Aspirin 300mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Chronic	Adherent	23
21	Control Cont/Immun	.	Cyclosporin 100mg	5	100.026	2.572	1.1504	100.000	96.429	103.704	Immunosup	Adherent	23
21	Control Cont/Chron	.	Hydrochlorothiazide 25mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Chronic	Adherent	23
21	Control Cont/Chron	.	Nifedipine XL 30mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Chronic	Adherent	23
21	Control Cont/Chron	.	Perindopril 4mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Chronic	Adherent	23
21	Control Cont/Immun	.	Prednisone 5mg	5	100.026	2.572	1.1504	100.000	96.429	103.704	Immunosup	Adherent	23
22	Control Cont/Chron	.	Amitriptyline 25mg	5	61.158	21.386	9.5640	53.846	40.000	87.500	Chronic	Under adherent	9
22	Control Cont/Chron	.	Atenolol 100mg	5	61.158	21.386	9.5640	53.846	40.000	87.500	Chronic	Under adherent	9
22	Control Cont/Immun	.	Azathioprine 50mg	5	41.158	33.395	14.9349	44.444	0.000	87.500	Immunosup	Under adherent	9
22	Control Cont/Immun	.	Cyclosporin 25mg	1	40.000	.	.	40.000	40.000	40.000	Immunosup	Under adherent	9
22	Control Cont/Immun	.	Cyclosporin 100mg	5	56.872	20.956	9.3717	53.846	32.857	87.500	Immunosup	Under adherent	9
22	Control Cont/Chron	.	Nifedipine XL 30mg	5	61.158	21.386	9.5640	53.846	40.000	87.500	Chronic	Under adherent	9
22	Control Cont/Immun	.	Prednisone 5mg	5	45.158	31.364	14.0262	44.444	0.000	87.500	Immunosup	Under adherent	9
26	Control Cont/Immun	.	Cyclosporin 25mg	4	75.434	37.953	18.9764	80.435	28.866	112.000	Immunosup	Under adherent	7
26	Control Cont/Immun	.	Cyclosporin 100mg	5	80.347	34.656	15.4985	100.000	28.866	112.000	Immunosup	Adherent	7
26	Control Cont/Chron	.	Folic acid 5mg	5	80.347	34.656	15.4985	100.000	28.866	112.000	Chronic	Adherent	7
26	Control Cont/Chron	.	Furosemide 40mg	2	106.000	8.485	6.0000	106.000	100.000	112.000	Chronic	Adherent	7
26	Control Cont/Chron	.	Nifedipine XL 30mg	5	80.347	34.656	15.4985	100.000	28.866	112.000	Chronic	Adherent	7
26	Control Cont/Immun	.	Prednisone 5mg	5	80.347	34.656	15.4985	100.000	28.866	112.000	Immunosup	Adherent	7
26	Control Cont/Chron	.	Pyridoxine 25mg	3	63.245	35.626	20.5689	60.870	28.866	100.000	Chronic	Under adherent	7
26	Control Cont/Chron	.	Simvastatin 20mg	1	100.000	.	.	100.000	100.000	100.000	Chronic	Adherent	7
27	Control Cont/Chron	.	Allopurinol 100mg	5	98.571	3.194	1.4286	100.000	92.857	100.000	Chronic	Adherent	15
27	Control Cont/Immun	.	Cyclosporin 100mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	15
27	Control Cont/Chron	.	Perindopril 4mg	5	98.214	3.093	1.3832	100.000	92.857	100.000	Chronic	Adherent	15
27	Control Cont/Immun	.	Prednisone 5mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	15
27	Control Cont/Chron	.	Simvastatin 20mg	5	95.714	6.389	2.8571	100.000	85.714	100.000	Chronic	Adherent	15
29	Control Cont/Immun	.	Azathioprine 50mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	8
29	Control Cont/Immun	.	Cyclosporin 25mg	5	102.857	3.912	1.7496	100.000	100.000	107.143	Immunosup	Adherent	8
29	Control Cont/Immun	.	Cyclosporin 100mg	5	102.857	3.912	1.7496	100.000	100.000	107.143	Immunosup	Adherent	8

29	Control	.	Hydrochlorothiazide 25mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	8
29	Control	.	Nifedipine XL 30mg	5	96.429	7.986	3.5714	100.000	82.143	100.000	Chronic	Adherent	9
29	Control	.	Perindopril 4mg	5	95.000	5.416	2.4223	96.429	89.286	100.000	Immunosup	Adherent	9
29	Control	.	Prednisone 5mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	9
32	Control	.	Cyclosporin 100mg	6	69.699	74.071	30.2393	95.161	-80.000	116.667	Chronic	Under adherent	13
32	Control	.	Nifedipine XL 30mg	5	96.429	7.986	3.5714	100.000	82.143	100.000	Chronic	Adherent	9
32	Control	.	Prednisone 5mg	5	95.000	5.416	2.4223	96.429	89.286	100.000	Immunosup	Adherent	9
32	Control	.	Simvastatin 20mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	9
33	Control	.	Allopurinol 100mg	6	69.699	74.071	30.2393	95.161	-80.000	116.667	Chronic	Under adherent	13
33	Control	.	Cyclosporin 25mg	1	103.704	.	.	103.704	103.704	103.704	Immunosup	Adherent	13
33	Control	.	Cyclosporin 100mg	6	96.365	13.131	5.3608	95.161	80.000	116.667	Immunosup	Adherent	13
33	Control	.	Digoxin 0.25mg	6	96.365	13.131	5.3608	95.161	80.000	116.667	Chronic	Adherent	13
33	Control	.	Prednisone 5mg	6	96.365	13.131	5.3608	95.161	80.000	116.667	Immunosup	Adherent	13
33	Control	.	Simvastatin 20mg	6	96.365	13.131	5.3608	95.161	80.000	116.667	Chronic	Adherent	13
33	Control	.	Warfarin 5mg	6	91.834	15.242	6.2226	86.607	77.419	116.667	Chronic	Adherent	13
33	Control	.	Spirolactone 25mg	5	94.898	14.120	6.3147	90.323	80.000	116.667	Chronic	Adherent	13
34	Control	.	Azathioprine 50mg	5	88.571	4.657	2.0825	89.286	82.143	92.857	Immunosup	Adherent	15
34	Control	.	Perindopril 4mg	5	85.714	5.051	2.2588	82.143	82.143	92.857	Chronic	Adherent	15
34	Control	.	Prednisone 5mg	5	88.571	2.988	1.3363	89.286	85.714	92.857	Immunosup	Adherent	15
34	Control	.	Simvastatin 20mg	5	91.429	3.194	1.4286	89.286	89.286	96.429	Chronic	Adherent	15
39	Control	.	Atenolol 50mg	5	80.741	28.103	12.5681	100.000	50.000	103.704	Chronic	Adherent	3
39	Control	.	Azathioprine 50mg	5	80.741	28.103	12.5681	100.000	50.000	103.704	Immunosup	Adherent	3
39	Control	.	Cyclosporin 25mg	5	80.741	28.103	12.5681	100.000	50.000	103.704	Immunosup	Adherent	3
39	Control	.	Cyclosporin 100mg	5	80.741	28.103	12.5681	100.000	50.000	103.704	Immunosup	Adherent	3
39	Control	.	Furosemide 40mg	3	84.568	29.994	17.3170	100.000	50.000	103.704	Chronic	Adherent	3
39	Control	.	Hydrochlorothiazide 25mg	2	75.000	35.355	25.0000	75.000	50.000	100.000	Chronic	Under adherent	3
39	Control	.	Nifedipine XL 30mg	5	80.741	28.103	12.5681	100.000	50.000	103.704	Chronic	Adherent	3
39	Control	.	Perindopril 4mg	2	75.000	35.355	25.0000	75.000	50.000	100.000	Chronic	Under adherent	3
39	Control	.	Potassium chloride 600mg	3	84.568	29.994	17.3170	100.000	50.000	103.704	Chronic	Adherent	3
39	Control	.	Prednisone 5mg	5	80.741	28.103	12.5681	100.000	50.000	103.704	Immunosup	Adherent	3
39	Control	.	Simvastatin 20mg	5	80.741	28.103	12.5681	100.000	50.000	103.704	Chronic	Adherent	3
39	Control	.	Minoxidil 5mg	5	80.741	28.103	12.5681	100.000	50.000	103.704	Chronic	Adherent	3
42	Control	.	Allopurinol 300mg	5	88.621	21.009	9.3955	96.429	51.220	100.000	Chronic	Adherent	5

42	Control	.	Atenolol 50mg	5	66.921	39.313	17.5814	89.286	17.073	100.000	Chronic	Adherent	5
42	Control	.	Cyclosporin 25mg	5	78.571	26.245	11.7369	92.857	50.000	100.000	Chronic	Under adherent	8
42	Control	.	Cyclosporin 100mg	5	97.143	6.389	2.8571	100.000	85.714	100.000	Immunosup	Adherent	8
42	Control	.	Nifedipine XL 30mg	5	75.271	26.723	11.9509	85.714	34.146	100.000	Immunosup	Under adherent	5
42	Control	.	Prednisone 5mg	5	84.286	22.812	10.2020	100.000	50.000	100.000	Immunosup	Adherent	8
48	Control	.	Atenolol 50mg	5	85.000	20.578	9.2029	89.286	50.000	100.000	Immunosup	Adherent	8
48	Control	.	Azathioprine 50mg	5	74.286	27.595	12.3408	89.286	39.286	100.000	Chronic	Under adherent	8
48	Control	.	Cyclosporin 25mg	5	81.429	25.555	11.4286	100.000	50.000	100.000	Chronic	Adherent	8
48	Control	.	Cyclosporin 100mg	5	87.143	21.665	9.6890	100.000	50.000	100.000	Chronic	Adherent	8
48	Control	.	Furosemide 40mg	5	89.286	22.016	9.8457	100.000	50.000	100.000	Chronic	Adherent	8
48	Control	.	Methyldopa 250mg	5	88.571	21.783	9.7416	100.000	50.000	100.000	Immunosup	Adherent	8
48	Control	.	Nifedipine XL 30mg	5	67.857	23.146	10.3510	71.429	35.714	100.000	Chronic	Under adherent	8
48	Control	.	Perindopril 4mg	5	99.310	1.542	0.6897	100.000	96.552	100.000	Immunosup	Adherent	22
48	Control	.	Prednisone 5mg	5	99.310	1.542	0.6897	100.000	96.552	100.000	Immunosup	Adherent	22
48	Control	.	Simvastatin 20mg	5	99.310	1.542	0.6897	100.000	96.552	100.000	Immunosup	Adherent	22
49	Control	.	Cyclosporin 25mg	5	99.310	1.542	0.6897	100.000	96.552	100.000	Immunosup	Adherent	22
49	Control	.	Mycophenolate 250mg	5	99.310	1.542	0.6897	100.000	96.552	100.000	Immunosup	Adherent	22
49	Control	.	Perindopril 4mg	5	99.310	1.542	0.6897	100.000	96.552	100.000	Chronic	Adherent	22
49	Control	.	Prednisone 5mg	5	99.310	1.542	0.6897	100.000	96.552	100.000	Immunosup	Adherent	22
2	Intervn	0	Cyclosporin 25mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	16
2	Intervn	0	Cyclosporin 100mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	16
2	Intervn	0	Prednisone 5mg	6	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	16
3	Intervn	0	Atenolol 50mg	5	100.051	2.530	1.1313	100.000	96.552	103.704	Chronic	Adherent	3
3	Intervn	0	Azathioprine 50mg	5	100.051	2.530	1.1313	100.000	96.552	103.704	Immunosup	Adherent	3
3	Intervn	0	Cyclosporin 25mg	5	99.361	3.848	1.7211	100.000	93.103	103.704	Immunosup	Adherent	3
3	Intervn	0	Cyclosporin 100mg	5	99.361	3.848	1.7211	100.000	93.103	103.704	Immunosup	Adherent	3
3	Intervn	0	Furosemide 40mg	5	100.051	2.530	1.1313	100.000	96.552	103.704	Chronic	Adherent	3
3	Intervn	0	Hydrochlorothiazide 25mg	5	100.051	2.530	1.1313	100.000	96.552	103.704	Chronic	Adherent	3
3	Intervn	0	Nifedipine XL 30mg	5	100.051	2.530	1.1313	100.000	96.552	103.704	Chronic	Adherent	3
3	Intervn	0	Potassium chloride 600mg	5	98.672	5.289	2.3655	100.000	89.655	103.704	Chronic	Adherent	3
3	Intervn	0	Prednisone 5mg	5	100.051	2.530	1.1313	100.000	96.552	103.704	Immunosup	Adherent	3
3	Intervn	0	Simvastatin 20mg	5	97.292	8.281	3.7036	100.000	82.759	103.704	Chronic	Adherent	3
5	Intervn	0	Allopurinol 300mg	4	81.378	27.903	13.9515	82.398	53.571	107.143	Chronic	Adherent	9

5 Intv/Immun	0	Azathioprine 50mg	4	76.786	26.964	13.4818	78.571	50.000	100.000	Immunosup	Under adherent	9
5 Intv/Immun	0	Cyclosporin 25mg	4	76.786	26.964	13.4818	78.571	50.000	100.000	Immunosup	Under adherent	9
5 Intv/Immun	0	Cyclosporin 100mg	4	76.786	26.964	13.4818	78.571	50.000	100.000	Immunosup	Under adherent	9
5 Intv/Chron	0	Perindopril 4mg	4	76.786	26.964	13.4818	78.571	50.000	100.000	Chronic	Under adherent	9
5 Intv/Immun	0	Prednisone 5mg	4	73.214	20.881	10.4407	71.429	50.000	100.000	Immunosup	Under adherent	9
5 Intv/Chron	0	Simvastatin 20mg	2	0.000	0.000	0.0000	0.000	0.000	0.000	Chronic	Under adherent	9
5 Intv/Chron	0	Thyroxine 0.05mg	3	83.333	28.868	16.6667	100.000	50.000	100.000	Chronic	Adherent	9
6 Intv/Chron	0	Atenolol 50mg	5	97.857	4.792	2.1429	100.000	89.286	100.000	Chronic	Adherent	9
6 Intv/Immun	0	Azathioprine 50mg	5	98.571	1.956	0.8748	100.000	96.429	100.000	Immunosup	Adherent	9
6 Intv/Immun	0	Cyclosporin 100mg	5	80.000	6.488	2.9014	78.571	71.429	89.286	Immunosup	Under adherent	9
6 Intv/Chron	0	Perindopril 4mg	5	95.714	1.597	0.7143	96.429	92.857	96.429	Chronic	Adherent	9
6 Intv/Immun	0	Prednisone 5mg	5	99.286	1.597	0.7143	100.000	96.429	100.000	Immunosup	Adherent	9
19 Intv/Chron	0	Atenolol 100mg	5	97.857	3.194	1.4286	100.000	92.857	100.000	Chronic	Adherent	16
19 Intv/Chron	0	Calcium carbonate 460mg	5	60.000	24.537	10.9731	50.000	32.143	89.286	Chronic	Under adherent	16
19 Intv/Immun	0	Cyclosporin 100mg	5	98.571	3.194	1.4286	100.000	92.857	100.000	Immunosup	Adherent	16
19 Intv/Chron	0	Nifedipine XL 30mg	5	98.571	1.956	0.8748	100.000	96.429	100.000	Chronic	Adherent	16
19 Intv/Chron	0	Perindopril 4mg	5	98.571	3.194	1.4286	100.000	92.857	100.000	Chronic	Adherent	16
23 Intv/Chron	0	Atenolol 50mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Chronic	Adherent	5
23 Intv/Immun	0	Azathioprine 50mg	4	100.926	1.852	0.9259	100.000	100.000	103.704	Immunosup	Adherent	5
23 Intv/Immun	0	Cyclosporin 25mg	5	67.169	64.026	28.6334	96.429	-46.429	103.704	Immunosup	Under adherent	5
23 Intv/Immun	0	Cyclosporin 100mg	5	98.598	4.113	1.8393	100.000	92.857	103.704	Immunosup	Adherent	5
23 Intv/Chron	0	Folic acid 5mg	1	100.000	.	.	100.000	100.000	100.000	Chronic	Adherent	5
23 Intv/Chron	0	Furosemide 40mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Chronic	Adherent	5
23 Intv/Chron	0	Nifedipine XL 30mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Chronic	Adherent	5
23 Intv/Chron	0	Perindopril 4mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Chronic	Adherent	5
23 Intv/Immun	0	Prednisone 5mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Immunosup	Adherent	5
23 Intv/Chron	0	Simvastatin 20mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Chronic	Adherent	5
36 Intv/Chron	0	Atenolol 100mg	5	81.952	15.951	7.1335	82.143	57.143	100.000	Chronic	Adherent	13
36 Intv/Immun	0	Cyclosporin 25mg	5	95.286	8.684	3.8835	100.000	80.000	100.000	Immunosup	Adherent	13
36 Intv/Immun	0	Cyclosporin 100mg	5	94.571	8.339	3.7294	96.429	80.000	100.000	Immunosup	Adherent	13
36 Intv/Chron	0	Enalapril 10mg	5	92.429	9.086	4.0633	96.429	80.000	100.000	Chronic	Adherent	13
36 Intv/Chron	0	Hydrochlorothiazide 25mg	5	99.810	20.081	8.9805	92.857	80.000	133.333	Chronic	Adherent	13
36 Intv/Chron	0	Nifedipine XL 30mg	5	86.238	15.962	7.1383	89.286	61.905	100.000	Chronic	Adherent	13

36	Intervn	0	Prednisone 5mg	5	00.057	20.257	9.0593	89.286	60.714	114.286	Immunosup	Adherent	13
36	Intervn	0	Simvastatin 20mg	5	00.057	20.257	8.7645	100.000	64.286	114.286	Chronic	Adherent	13
37	Intervn	0	Allopurinol 100mg	2	86.235	56.683	40.0810	86.235	46.154	126.316	Chronic	Under adherent	14
37	Intervn	0	Allopurinol 300mg	5	70.545	40.433	18.0821	50.000	33.333	126.316	Immunosup	Under adherent	14
37	Intervn	0	Cyclosporin 100mg	5	68.440	36.925	16.5133	50.000	33.333	115.789	Chronic	Under adherent	14
37	Intervn	0	Perindopril 4mg	5	70.545	40.433	18.0821	50.000	33.333	126.316	Chronic	Under adherent	14
37	Intervn	0	Prednisone 5mg	5	68.440	36.925	16.5133	50.000	33.333	115.789	Immunosup	Under adherent	14
37	Intervn	0	Simvastatin 20mg	5	70.545	40.433	18.0821	50.000	33.333	126.316	Chronic	Under adherent	14
38	Intervn	0	Azathioprine 50mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	4
38	Intervn	0	Cyclosporin 25mg	5	98.571	3.194	1.4286	100.000	92.857	100.000	Immunosup	Adherent	4
38	Intervn	0	Cyclosporin 100mg	5	98.571	3.194	1.4286	100.000	92.857	100.000	Immunosup	Adherent	4
38	Intervn	0	Nifedipine XL 30mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	4
38	Intervn	0	Perindopril 4mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	4
38	Intervn	0	Prednisone 5mg	5	98.929	2.396	1.0714	100.000	94.643	100.000	Immunosup	Adherent	4
41	Intervn	0	Azathioprine 50mg	5	45.000	122.984	55.0000	100.000	-175.000	100.000	Immunosup	Under adherent	0
41	Intervn	0	Cyclosporin 25mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	0
41	Intervn	0	Cyclosporin 100mg	5	49.286	113.401	50.7143	100.000	-153.571	100.000	Immunosup	Under adherent	0
41	Intervn	0	Nifedipine XL 30mg	5	40.000	89.443	40.0000	100.000	-100.000	100.000	Chronic	Under adherent	0
41	Intervn	0	Perindopril 4mg	4	100.000	0.000	0.0000	100.000	100.000	100.000	Chronic	Adherent	0
41	Intervn	0	Prednisone 5mg	5	100.000	0.000	0.0000	100.000	100.000	100.000	Immunosup	Adherent	0
47	Intervn	0	Azathioprine 50mg	4	66.026	39.244	19.6221	66.667	30.769	100.000	Immunosup	Under adherent	12
47	Intervn	0	Cyclosporin 25mg	4	64.927	40.599	20.2993	66.667	26.374	100.000	Immunosup	Under adherent	12
47	Intervn	0	Cyclosporin 100mg	4	66.026	39.244	19.6221	66.667	30.769	100.000	Immunosup	Under adherent	12
47	Intervn	0	Simvastatin 20mg	4	66.026	39.244	19.6221	66.667	30.769	100.000	Chronic	Under adherent	12
7	Intervn	1	Amitriptyline 25mg	5	80.000	44.721	20.0000	100.000	0.000	100.000	Chronic	Adherent	22
7	Intervn	1	Aspirin 300mg	5	85.000	22.361	10.0000	100.000	50.000	100.000	Chronic	Adherent	22
7	Intervn	1	Atenolol 50mg	5	75.714	5.868	2.6245	78.571	67.857	82.143	Chronic	Under adherent	22
7	Intervn	1	Azathioprine 50mg	5	62.143	14.196	6.3487	57.143	50.000	82.143	Immunosup	Under adherent	22
7	Intervn	1	Furosemide 40mg	5	93.214	5.114	2.2868	92.857	87.500	100.000	Chronic	Adherent	22
7	Intervn	1	Nifedipine XL 30mg	5	83.571	4.072	1.8211	82.143	78.571	89.286	Chronic	Adherent	22
7	Intervn	1	Perindopril 4mg	5	84.286	9.649	4.3154	82.143	75.000	100.000	Chronic	Adherent	22
7	Intervn	1	Potassium chloride 600mg	5	82.143	11.294	5.0508	78.571	71.429	100.000	Chronic	Adherent	22

7 Intervn Intv/Immun	1	Prednisone 5mg	5	75.714	12.010	5.3750	71.429	62.500	89.286	Immunosup	Under adherent	22
7 Intervn Intv/Chron	1	Simvastatin 20mg	5	75.714	12.010	8.5714	100.000	57.143	100.000	Chronic	Adherent	22
14 Intervn Intv/Immun	1	Azathioprine 50mg	5	75.714	12.010	8.2728	93.333	66.667	118.182	Immunosup	Adherent	10
14 Intervn Intv/Immun	1	Cyclosporin 25mg	5	89.492	13.210	5.9077	93.333	66.667	100.000	Immunosup	Adherent	10
14 Intervn Intv/Immun	1	Cyclosporin 100mg	5	96.098	21.741	9.7229	96.552	66.667	127.273	Immunosup	Adherent	10
14 Intervn Intv/Chron	1	Gliclazide 80mg	4	85.575	14.734	7.3671	87.816	66.667	100.000	Chronic	Adherent	10
14 Intervn Intv/Chron	1	Hydrochlorothiazide 25mg	5	94.257	18.499	8.2728	93.333	66.667	118.182	Chronic	Adherent	10
14 Intervn Intv/Chron	1	Metformin 850mg	5	84.924	28.272	12.6436	93.103	46.667	118.182	Chronic	Adherent	10
14 Intervn Intv/Immun	1	Prednisone 5mg	5	92.439	15.811	7.0707	93.333	66.667	109.091	Immunosup	Adherent	10
14 Intervn Intv/Chron	1	Simvastatin 20mg	5	94.947	18.509	8.2775	96.552	66.667	118.182	Chronic	Adherent	10
15 Intervn Intv/Chron	1	Atenolol 50mg	5	91.024	23.649	10.5764	100.000	50.000	110.526	Chronic	Adherent	1
15 Intervn Intv/Immun	1	Cyclosporin 25mg	5	73.101	96.181	43.0134	100.000	-73.684	189.189	Immunosup	Under adherent	1
15 Intervn Intv/Immun	1	Cyclosporin 100mg	5	87.440	25.428	11.3717	100.000	50.000	113.514	Immunosup	Adherent	1
15 Intervn Intv/Chron	1	Hydralazine 50mg	5	72.387	97.527	43.6152	100.000	-73.684	189.189	Chronic	Under adherent	1
15 Intervn Intv/Chron	1	Hydrochlorothiazide 25mg	5	105.761	48.618	21.7425	100.000	50.000	184.211	Chronic	Adherent	1
15 Intervn Intv/Chron	1	Nifedipine XL 30mg	5	87.440	25.428	11.3717	100.000	50.000	113.514	Chronic	Adherent	1
15 Intervn Intv/Chron	1	Perindopril 4mg	5	91.024	23.649	10.5764	100.000	50.000	110.526	Chronic	Adherent	1
15 Intervn Intv/Immun	1	Prednisone 5mg	5	87.440	25.428	11.3717	100.000	50.000	113.514	Immunosup	Adherent	1
15 Intervn Intv/Chron	1	Simvastatin 20mg	5	88.706	22.301	9.9735	100.000	50.000	104.054	Chronic	Adherent	1
20 Intervn Intv/Chron	1	Amitriptyline 25mg	5	95.688	2.981	1.3330	96.296	92.857	100.000	Chronic	Adherent	20
20 Intervn Intv/Immun	1	Azathioprine 50mg	5	86.005	10.481	4.6871	87.500	73.214	100.000	Immunosup	Adherent	20
20 Intervn Intv/Immun	1	Prednisone 5mg	5	100.741	1.656	0.7407	100.000	100.000	103.704	Immunosup	Adherent	20
20 Intervn Intv/Chron	1	Simvastatin 20mg	5	86.733	4.742	2.1208	87.500	80.357	92.593	Chronic	Adherent	20
24 Intervn Intv/Chron	1	Allopurinol 100mg	1	111.111	.	.	111.111	111.111	111.111	Chronic	Adherent	12
24 Intervn Intv/Chron	1	Allopurinol 300mg	4	43.750	42.018	21.0090	38.393	0.000	98.214	Chronic	Under adherent	12
24 Intervn Intv/Chron	1	Atenolol 100mg	5	75.026	36.074	16.1327	98.214	25.000	103.704	Chronic	Under adherent	12
24 Intervn Intv/Immun	1	Cyclosporin 100mg	5	75.741	36.042	16.1186	100.000	25.000	103.704	Immunosup	Under adherent	12
24 Intervn Intv/Chron	1	Nifedipine XL 30mg	5	54.312	44.957	20.1053	46.429	0.000	103.704	Chronic	Under adherent	12
24 Intervn Intv/Chron	1	Perindopril 4mg	5	55.384	45.737	20.4540	48.214	0.000	103.704	Chronic	Under adherent	12
25 Intervn Intv/Chron	1	Aspirin 300mg	5	97.407	29.963	13.4000	100.000	50.000	133.333	Chronic	Adherent	3
25 Intervn Intv/Immun	1	Cyclosporin 25mg	1	103.704	.	.	103.704	103.704	103.704	Immunosup	Adherent	3
25 Intervn Intv/Immun	1	Cyclosporin 100mg	5	97.407	29.963	13.4000	100.000	50.000	133.333	Immunosup	Adherent	3
25 Intervn Intv/Chron	1	Nifedipine XL 30mg	5	87.407	36.510	16.3278	100.000	50.000	133.333	Chronic	Adherent	3

25	Intervn	1	Phenytoin 100mg		95.933	24.350	17.1796	100.000	50.000	133.333	Chronic	Adherent	3
25	Intv/Chron												
25	Intervn	1	Prednisone 5mg				3.4000	100.000	50.000	133.333	Immunosup	Adherent	3
25	Intv/Immun												
25	Intervn	1	Sodium valproate 300mg				4.3572	107.143	53.571	142.857	Chronic	Adherent	3
25	Intv/Chron												
28	Intervn	1	Atenolol 50mg	5	91.905	14.444	6.4594	100.000	66.667	100.000	Chronic	Adherent	10
28	Intv/Chron												
28	Intervn	1	Azathioprine 50mg	5	63.333	64.979	29.0593	100.000	-50.000	100.000	Immunosup	Under adherent	10
28	Intv/Immun												
28	Intervn	1	Cyclosporin 25mg	5	70.476	49.533	22.1518	100.000	-14.286	100.000	Immunosup	Under adherent	10
28	Intv/Immun												
28	Intervn	1	Cyclosporin 100mg	5	70.476	49.533	22.1518	100.000	-14.286	100.000	Immunosup	Under adherent	10
28	Intv/Immun												
28	Intervn	1	Nifedipine XL 30mg	5	72.381	43.696	19.5412	100.000	0.000	100.000	Chronic	Under adherent	10
28	Intv/Chron												
28	Intervn	1	Perindopril 4mg	5	93.333	14.907	6.6667	100.000	66.667	100.000	Chronic	Adherent	10
28	Intv/Chron												
28	Intervn	1	Prednisone 5mg	5	79.762	26.460	11.8331	92.857	39.286	100.000	Immunosup	Under adherent	10
28	Intv/Immun												
30	Intervn	1	Aspirin 300mg	5	99.706	3.164	1.4149	100.000	94.828	103.704	Chronic	Adherent	12
30	Intv/Chron												
30	Intervn	1	Atenolol 50mg	5	99.361	3.848	1.7211	100.000	93.103	103.704	Chronic	Adherent	12
30	Intv/Chron												
30	Intervn	1	Azathioprine 50mg	5	98.672	5.289	2.3655	100.000	89.655	103.704	Immunosup	Adherent	12
30	Intv/Immun												
30	Intervn	1	Cyclosporin 25mg	5	72.742	7.818	3.4961	71.429	64.286	82.759	Immunosup	Under adherent	12
30	Intv/Immun												
30	Intervn	1	Cyclosporin 100mg	5	84.968	4.001	1.7895	85.714	78.571	89.655	Immunosup	Adherent	12
30	Intv/Immun												
30	Intervn	1	Hydrochlorothiazide 25mg	5	99.706	3.164	1.4149	100.000	94.828	103.704	Chronic	Adherent	12
30	Intv/Chron												
30	Intervn	1	Nifedipine XL 30mg	5	99.361	3.848	1.7211	100.000	93.103	103.704	Chronic	Adherent	12
30	Intv/Chron												
30	Intervn	1	Perindopril 4mg	5	99.361	3.848	1.7211	100.000	93.103	103.704	Chronic	Adherent	12
30	Intv/Chron												
30	Intervn	1	Prednisone 5mg	5	99.361	3.848	1.7211	100.000	93.103	103.704	Immunosup	Adherent	12
30	Intv/Immun												
30	Intervn	1	Simvastatin 20mg	5	99.706	3.164	1.4149	100.000	94.828	103.704	Chronic	Adherent	12
30	Intv/Chron												
31	Intervn	1	Atenolol 100mg	5	96.429	7.986	3.5714	100.000	82.143	100.000	Chronic	Adherent	14
31	Intv/Chron												
31	Intervn	1	Azathioprine 50mg	5	92.857	15.972	7.1429	100.000	64.286	100.000	Immunosup	Adherent	14
31	Intv/Immun												
31	Intervn	1	Cyclosporin 25mg	5	83.571	31.094	13.9057	100.000	28.571	100.000	Immunosup	Adherent	14
31	Intv/Immun												
31	Intervn	1	Prednisone 5mg	5	92.857	15.972	7.1429	100.000	64.286	100.000	Immunosup	Adherent	14
31	Intv/Immun												
31	Intervn	1	Thyroxine 0.1mg	5	92.143	15.649	6.9985	100.000	64.286	100.000	Chronic	Adherent	14
31	Intv/Chron												
43	Intervn	1	Atenolol 50mg	5	97.788	33.926	15.1721	82.353	61.538	140.000	Chronic	Adherent	4
43	Intv/Chron												
43	Intervn	1	Azathioprine 50mg	5	80.355	34.137	15.2665	63.636	58.824	140.000	Immunosup	Adherent	4
43	Intv/Immun												
43	Intervn	1	Cyclosporin 100mg	5	79.607	38.258	17.1094	77.778	36.364	140.000	Immunosup	Under adherent	4
43	Intv/Immun												
43	Intervn	1	Furosemide 40mg	5	88.697	29.901	13.3723	81.818	61.538	140.000	Chronic	Adherent	4
43	Intv/Chron												
43	Intervn	1	Nifedipine XL 30mg	5	82.173	33.255	14.8719	72.727	58.824	140.000	Chronic	Adherent	4
43	Intv/Chron												
43	Intervn	1	Perindopril 4mg	5	95.435	35.629	15.9339	77.778	61.538	140.000	Chronic	Adherent	4
43	Intv/Chron												
43	Intervn	1	Prednisone 5mg	5	87.628	33.553	15.0055	77.778	58.824	140.000	Immunosup	Adherent	4
43	Intv/Immun												
44	Intervn	1	Azathioprine 50mg	5	102.667	19.206	8.5894	100.000	80.000	133.333	Immunosup	Adherent	5
44	Intv/Immun												

44	Intervn	1	Cyclosporin 25mg	5	106.220	20.220	9.0427	100.000	80.000	133.333	Immunosup	Adherent	5
	Intv/Immun												
44	Intervn	1	Cyclosporin 100mg	5	106.220	20.220	9.0427	100.000	80.000	133.333	Immunosup	Adherent	5
	Intv/Immun												
44	Intervn	1	Hydrochlorothiazide 25mg	5	106.220	20.220	8.5894	100.000	80.000	133.333	Chronic	Adherent	5
	Intv/Chron												
44	Intervn	1	Nifedipine XL 30mg	5	34.667	84.215	37.6622	50.000	-100.000	133.333	Chronic	Under adherent	5
	Intv/Chron												
44	Intervn	1	Perindopril 4mg	5	49.333	102.480	45.8306	100.000	-133.333	100.000	Chronic	Under adherent	5
	Intv/Chron												
44	Intervn	1	Prednisone 5mg	5	98.667	21.596	9.6579	92.857	74.286	133.333	Immunosup	Adherent	5
	Intv/Immun												
44	Intervn	1	Simvastatin 20mg	5	102.667	19.206	8.5894	100.000	80.000	133.333	Chronic	Adherent	5
	Intv/Chron												
46	Intervn	1	Azathioprine 50mg	6	90.519	20.185	8.2407	98.276	50.000	103.704	Immunosup	Adherent	13
	Intv/Immun												
46	Intervn	1	Cyclosporin 25mg	6	90.519	20.185	8.2407	98.276	50.000	103.704	Immunosup	Adherent	13
	Intv/Immun												
46	Intervn	1	Cyclosporin 100mg	6	90.519	20.185	8.2407	98.276	50.000	103.704	Immunosup	Adherent	13
	Intv/Immun												
46	Intervn	1	Furosemide 40mg	6	91.412	20.427	8.3391	99.107	50.000	103.704	Chronic	Adherent	13
	Intv/Chron												
46	Intervn	1	Prednisone 5mg	6	90.519	20.185	8.2407	98.276	50.000	103.704	Immunosup	Adherent	13
	Intv/Immun												
46	Intervn	1	Simvastatin 20mg	6	91.114	20.320	8.2958	98.276	50.000	103.704	Chronic	Adherent	13
	Intv/Chron												



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Appendix 22: Intervention patients without a pillbox vs degree of n



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PILLBOX = no pillbox

The FREQ Procedure

Table of PATDCL by DEGMADH

PATDCL	DEGMADH		
Frequency			
Expected			
Cell Chi-Square			
Percent			
Row Pct			
Col Pct	Adherent	Under ad- herent	Total
-----+-----+-----+			
Intv/Immun	22	13	35
	24.306	10.694	
	0.2187	0.497	
	30.56	18.06	48.61
	62.86	37.14	
	44.00	59.09	
-----+-----+-----+			
Intv/Chron	28	9	37
	25.694	11.306	
	0.2069	0.4702	
	38.89	12.50	51.39
	75.68	24.32	
	56.00	40.91	
-----+-----+-----+			
Total	50	22	72
	69.44	30.56	100.00

PILLBOX=No pillbox

The FREQ Procedure

Statistics for Table of PATDCL by DEGMADH

Statistic	DF	Value	Prob

Chi-Square	1	1.3928	0.2379
Likelihood Ratio Chi-Square	1	1.3975	0.2371
Continuity Adj. Chi-Square	1	0.8542	0.3554
Mantel-Haenszel Chi-Square	1	1.3734	0.2412
Phi Coefficient		-0.1391	
Contingency Coefficient		0.1378	
Cramer's V		-0.1391	

Fisher's Exact Test



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	r (F)	22
		0.1778
		0.9248
Table Probability (P)		0.1025
Two-sided Pr $\leq$ P		0.3083

Sample Size = 72

Appendix 23: Intervention patients with pillbox adherence



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PILLBOX= pillbox

The FREQ Procedure

Table of PATDCL by DEGMADH

PATDCL	DEGMADH		
Frequency			
Expected			
Cell Chi-Square			
Percent			
Row Pct			
Col Pct	Adherent	Under ad- herent	Total
-----+-----+-----+			
Intv/Immun	27	10	37
	28.92	8.0805	
	0.1274	0.456	
	31.03	11.49	42.53
	72.97	27.03	
	39.71	52.63	
-----+-----+-----+			
Intv/Chron	41	9	50
	39.08	10.92	
	0.0943	0.3374	
	47.13	10.34	57.47
	82.00	18.00	
	60.29	47.37	
-----+-----+-----+			
Total	68	19	87
	78.16	21.84	100.00

PILLBOX=Pillbox
The FREQ Procedure

Statistics for Table of PATDCL by DEGMADH

Statistic	DF	Value	Prob
-----+-----+-----+			
Chi-Square	1	1.0151	0.3137
Likelihood Ratio Chi-Square	1	1.0059	0.3159
Continuity Adj. Chi-Square	1	0.5552	0.4562
Mantel-Haenszel Chi-Square	1	1.0035	0.3165
Phi Coefficient		-0.1080	
Contingency Coefficient		0.1074	
Cramer's V		-0.1080	

Fisher's Exact Test

-----+-----	
Cell (1,1) Frequency (F)	27
Left-sided Pr <= F	0.2274

Right-sided Pr $\geq$ F

- - - - -

Table Probability (P)

Two-sided Pr $\leq$ P



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Sample Size = 87

Appendix 24: Raw data from feedback questionn



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Obs	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13
1	01	1	5	1	1	1	.	.	.	1	.	.	.
2	02	1	4	1	1	1	01	.	.	1	08	15	16
3	03	1	5	1	1	1	03	.	.	1	17	.	.
4	04	1	3	1	1	1	01	.	.	1	04	03	09
5	06	1	4	1	1	1	01	.	.	1	17	.	.
6	07	1	4	1	1	1	10	.	.	1	08	.	.
7	08	1	5	1	1	1	.	.	.	1	.	.	.
8	09	1	5	1	1	1	03	.	.	2	08	.	.
9	10	1	3	1	1	1	01	.	.	2	03	.	.
10	11	3	5	2	3	3	03	.	.	3	02	.	.
11	14	1	4	1	1	1	01	.	.	2	08	09	.
12	15	1	4	1	1	1	.	.	.	1	15	.	.
13	16	1	5	1	1	1	01	.	.	1	03	.	.
14	17	2	2	1	1	1	01	.	.	2	08	11	.
15	19	1	4	1	1	1	04	.	.	1	10	09	08
16	20	1	5	1	1	1	01	.	.	2	05	09	.
17	21	1	5	1	1	1	.	.	.	1	08	.	.
18	22	1	3	1	1	1	06	.	.	1	14	.	.
19	23	1	5	1	1	1	01	.	.	2	17	.	.
20	24	1	4	1	1	1	.	.	.	1	05	.	.
21	25	1	4	1	1	1	.	.	.	1	.	.	.
22	27	1	3	1	1	1	01	.	.	1	08	.	.
23	28	2	2	1	1	1	01	03	05	1	04	15	.
24	29	2	.	1	1	1	01	.	.	1	.	.	.
25	30	1	4	1	1	1	03	.	.	1	01	.	.
26	31	1	4	1	1	1	03	.	.	1	17	09	.
27	32	2	3	1	1	1	.	.	.	2	.	.	.
28	33	1	4	1	1	1	01	.	.	1	04	.	.
29	34	1	4	1	1	1	.	.	.	3	07	16	13
30	36	1	5	1	1	1	.	.	.	1	.	.	.
31	37	1	5	1	1	1	.	.	.	2	.	.	.
32	38	1	5	1	1	1	.	.	.	2	.	.	.
33	39	1	5	1	1	1	01	.	.	1	08	.	.
34	41	1	5	1	1	1	01	.	.	1	05	08	.
35	42	1	3	1	1	1	.	.	.	2	09	08	.
36	43	2	.	1	1	1	01	.	.	3	.	.	.
37	44	1	4	1	1	1	01	.	.	1	08	.	.
38	46	1	4	3	1	1	.	.	.	1	.	.	.
39	47	1	3	1	1	1	.	.	.	1	.	.	.
40	48	1	4	1	1	1	07	.	.	1	03	09	.
41	49	1	3	1	1	1	01	.	.	2	17	.	.



V2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	35	85.37	35	85.37
2	5	12.20	40	97.56
3	1	2.44	41	100.00

V3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	2	5.13	2	5.13
3	8	20.51	10	25.64
4	15	38.46	25	64.10
5	14	35.90	39	100.00

Frequency Missing = 2

V4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	39	95.12	39	95.12
2	1	2.44	40	97.56
3	1	2.44	41	100.00

V5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	40	97.56	40	97.56
3	1	2.44	41	100.00

V6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	40	97.56	40	97.56
3	1	2.44	41	100.00

V7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	18	66.67	18	66.67
3	5	18.52	23	85.19
4	1	3.70	24	88.89
6	1	3.70	25	92.59
7	1	3.70	26	96.30
10	1	3.70	27	100.00

Frequency Missing = 14



V8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3	1	100.00	1	100.00

Frequency Missing = 40

V9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
5	1	100.00	1	100.00

Frequency Missing = 40

V10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	27	65.85	27	65.85
2	11	26.83	38	92.68
3	3	7.32	41	100.00

V11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	3.33	1	3.33
2	1	3.33	2	6.67
3	3	10.00	5	16.67
4	3	10.00	8	26.67
5	3	10.00	11	36.67
7	1	3.33	12	40.00
8	9	30.00	21	70.00
9	1	3.33	22	73.33
10	1	3.33	23	76.67
14	1	3.33	24	80.00
15	1	3.33	25	83.33
17	5	16.67	30	100.00

Frequency Missing = 11



V12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3	1	8.33	1	8.33
8	2	16.67	3	25.00
9	5	41.67	8	66.67
11	1	8.33	9	75.00
15	2	16.67	11	91.67
16	1	8.33	12	100.00

Frequency Missing = 29

V13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
8	1	25.00	1	25.00
9	1	25.00	2	50.00
13	1	25.00	3	75.00
16	1	25.00	4	100.00

Frequency Missing = 37

Appendix 25: Chi-Square test comparing V3 by pati



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Table of V3 by

V3	PATIENT		
Frequency			
Expected			
Cell Chi-Square			
Percent			
Row Pct			
Col Pct	Control	Intervn	Total
2	1	1	2
	0.9231	1.0769	
	0.0064	0.0055	
	2.56	2.56	5.13
	50.00	50.00	
	5.56	4.76	
3	7	1	8
	3.6923	4.3077	
	2.9631	2.5398	
	17.95	2.56	20.51
	87.50	12.50	
	38.89	4.76	
4	3	12	15
	6.9231	8.0769	
	2.2231	1.9055	
	7.69	30.77	38.46
	20.00	80.00	
	16.67	57.14	
5	7	7	14
	6.4615	7.5385	
	0.0449	0.0385	
	17.95	17.95	35.90
	50.00	50.00	
	38.89	33.33	
Total	18	21	39
	46.15	53.85	100.00

Frequency Missing = 2

Statistics for Table of V3 by PATIENT

Statistic	DF	Value	Prob
Chi-Square	3	9.7268	0.0210
Likelihood Ratio Chi-Square	3	10.6134	0.0140
Mantel-Haenszel Chi-Square	1	1.1205	0.2898
Phi Coefficient		0.4994	
Contingency Coefficient		0.4468	
Cramer's V		0.4994	



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ve expected counts less
ot be a valid test.

Fisher's Exact Test

Table Probability (P) 4.007E-04
Pr <= P 0.0113

Effective Sample Size = 39

Frequency Missing = 2





Obs	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20
1	01	190207	----	---	190307	----	---	160407	0252	095	140507	----	---	110607	----	---	090707	0216	064	+0
2	02	260207	0217	108	260307	----	---	230407	----	---	210507	0108	118	180607	----	---	160707	----	---	+0
3	03	120307	----	---	100407	----	---	070507	0164	434	040607	----	---	020707	----	---	300707	0193	372	+0
4	04	020707	0025	242	300707	----	---	290807	----	---	170907	0219	283	191107	0239	293	190208	----	---	-1
5	05	260307	----	---	230407	0142	086	210507	----	---	160707	----	---	030907	0136	100	-----	----	---	-3
6	06	190307	0212	081	160407	----	---	140507	0506	084	110607	----	---	090707	----	---	060807	0233	083	+0
7	07	160407	----	093	140507	----	---	110607	----	085	-----	----	087	-----	----	---	030907	----	---	+0
8	08	190307	----	---	160407	----	127	140507	----	---	110607	----	---	090707	----	110	060807	----	---	+0
9	09	260307	----	---	230407	0085	242	210507	----	---	180607	----	---	090707	0100	260	060807	----	---	+0
10	10	230407	0085	088	230707	0086	087	210807	----	---	180907	----	---	221007	0072	---	201107	----	---	+0
11	11	260307	----	---	230407	0101	144	210507	----	---	180607	----	---	160707	0146	185	130807	----	---	+0
12	12	260307	----	---	230407	----	---	210507	----	---	-----	----	---	-----	----	---	-----	----	---	+0
13	14	160407	0108	149	150507	----	---	260607	----	---	260707	----	---	060807	0095	136	030907	----	---	+0
14	15	160407	----	---	110607	0174	119	090707	----	---	030907	0151	117	101007	----	---	291007	----	---	+0
15	16	020407	----	---	300407	----	---	280507	0120	110	250607	----	---	230707	----	---	200807	0162	128	+0
16	17	300407	0164	152	280507	----	---	250607	----	---	230707	0126	170	200807	----	---	170907	----	---	+0
17	18	020407	0214	116	070507	----	---	-----	----	---	-----	----	---	-----	----	---	-----	----	---	+0
18	19	020407	----	---	300407	----	---	280507	0092	119	250607	----	---	230707	----	---	200807	0151	106	+0
19	20	100407	----	---	070507	----	---	040607	----	126	020707	----	---	300707	----	---	270807	----	131	+0
20	21	100407	----	---	070507	----	---	040607	0135	126	020707	----	---	300707	----	---	270807	0197	131	-1
21	22	070507	0626	124	280607	----	---	300707	0087	131	030907	----	---	051107	0053	146	140108	0076	140	+0
22	23	100407	----	---	070507	0183	106	040607	----	---	020707	----	---	300807	0256	098	270807	----	---	+0
23	24	100407	----	---	070507	0157	088	020707	0140	098	300707	0175	082	191107	----	---	140108	0132	086	+0
24	25	100407	----	---	070507	0107	181	040607	----	174	300707	0100	173	270807	----	---	170907	----	---	+0
25	26	070507	0146	236	040607	----	---	290607	----	---	140807	----	---	191107	0297	213	171207	----	---	+0
26	27	160407	----	143	140507	----	---	110607	----	---	090707	0167	143	060807	----	---	030907	----	---	+0



27	28	160407	----	---	140507	0053	135	110607	----	---	250607	----	---	060807	0117	127	030907	----	---	+0
28	29	160407	0131	239	140507	----	---	110607	----	---	090707	0134	201	060807	----	---	030907	----	---	-1
29	30	160407	----	---	140507	0144	177	110607	----	---	100707	----	---	060807	0165	122	030907	0099	119	+0
30	31	230407	----	---	210507	0025	112	180607	----	---	160707	----	---	130807	0052	107	100907	----	---	+0
31	32	230407	0145	147	210507	----	---	180607	----	---	160707	0158	145	130807	----	---	100907	----	---	+0
32	33	100407	----	---	070507	0254	139	-----	----	---	020707	----	---	060807	0173	120	030907	----	---	+0
33	34	250607	----	---	230407	----	---	200807	----	101	170907	----	---	151007	----	---	121107	----	099	+0
34	36	040607	----	---	020707	1496	186	300707	----	---	270807	----	---	170907	0083	178	-----	----	---	+0
35	37	070507	0145	289	040607	----	---	300707	0184	278	031007	----	---	221007	0234	400	140108	0189	400	-3
36	38	140507	----	---	110607	----	---	090707	0193	101	060807	----	---	030907	----	---	011007	0230	124	-1
37	39	100407	----	---	070507	0111	083	020707	----	---	300707	0162	068	270807	----	---	221007	0130	077	+0
38	41	110607	0188	114	090707	----	---	060807	----	---	030907	0126	122	011007	----	---	-----	----	---	+0
39	42	110607	----	---	090707	----	---	060807	0814	139	030907	----	---	250907	----	---	051107	0145	150	+2
40	43	060807	0149	312	280807	----	---	011007	0078	332	061107	----	---	261107	0041	375	250208	0185	---	+0
41	44	040607	0089	123	020707	----	---	300707	----	---	270807	0281	135	170907	----	---	221007	----	---	-1
42	46	160707	0195	093	130807	----	---	180607	----	---	081007	0109	098	051107	----	---	041207	----	---	+0
43	47	280507	----	---	250607	----	---	230707	0106	105	151007	0092	113	140108	0116	117	-----	----	---	+0
44	48	020707	----	---	300707	0072	431	270807	----	---	221007	0110	369	191107	0100	321	140108	----	---	+0
45	49	160707	----	---	130807	0030	315	100907	----	---	081007	----	---	051107	0025	339	041207	----	---	-3

Appendix 27: Clinician score (V20) by patient



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Table of V20 by PATIENT

V20	PATIENT		
Frequency			
Expected			
Cell Chi-Square			
Percent			
Row Pct			
Col Pct	Control	Intervn	Total
	-----+	-----+	-----+
-3	1	2	3
	1.4667	1.5333	
	0.1485	0.142	
	2.22	4.44	6.67
	33.33	66.67	
	4.55	8.70	
	-----+	-----+	-----+
-1	3	2	5
	2.4444	2.5556	
	0.1263	0.1208	
	6.67	4.44	11.11
	60.00	40.00	
	13.64	8.70	
	-----+	-----+	-----+
0	17	19	36
	17.6	18.4	
	0.0205	0.0196	
	37.78	42.22	80.00
	47.22	52.78	
	77.27	82.61	
	-----+	-----+	-----+
2	1	0	1
	0.4889	0.5111	
	0.5343	0.5111	
	2.22	0.00	2.22
	100.00	0.00	
	4.55	0.00	
	-----+	-----+	-----+
Total	22	23	45
	48.89	51.11	100.00

Statistics for Table of V20 by PATIENT

Statistic	DF	Value	Prob
Chi-Square	3	1.6230	0.6542
Likelihood Ratio Chi-Square	3	2.0164	0.5690
Mantel-Haenszel Chi-Square	1	0.4157	0.5191
Phi Coefficient		0.1899	
Contingency Coefficient		0.1866	
Cramer's V		0.1899	



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ve expected counts less
ot be a valid test.

Sample Size = 45