PROFESSIONAL PHARMACY SERVICES TO PRIVATE HOSPITAL PATIENTS

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EXECUTIVE SUMMARY

Background

Growth of Private Hospitals
The contribution of private hospitals to the overall health care in Australia is significant, with one in three days of hospitalisation provided by private hospitals [2]. The sophistication of the procedures performed in these hospitals has markedly increased over the past decade [3]. The expansion in this sector may result in patients requiring additional services, including professional pharmacy services.

Current Pharmacy Services in Private Hospitals
Ninety two percent of NSW private hospitals are serviced by community pharmacies with ninety percent of these pharmacies being located outside the hospital grounds. Data from in-depth interviews with pharmacists servicing this sector reveal that services vary greatly in these hospitals [4]. Peterson et al surveyed Australian private hospitals in 1988 and also showed the vast majority of these hospitals were serviced by community pharmacies and services varied across the sector [5].

Results from interviews with NSW private hospital pharmacists, reveal that supply is the principle function. Many also provide education to hospital staff and are members on hospital committees. Some perform clinical duties including medication chart review and counselling [4], however methods are not guided by national standards [6, 7]. The frequency of service delivery varies widely. Some pharmacists perform clinical duties weekly whilst others provide services daily [4].

Factors Influencing Current Private Hospital Pharmacy Services
Private Hospital pharmacy services have been defined for the purposes of this project, as the services pharmacists provide to their contracted hospitals. These may include clinical services such as chart review and counselling and non-clinical services such as dispensing and participating in hospital meetings. Factors that may limit pharmacy service provision in private hospitals include a lack of: time; staffing numbers and remuneration [4]. As previously stated, ninety two percent of private hospitals in NSW are serviced by community pharmacies, which may reflect the general trend in private hospitals Australia-wide [5]. These pharmacies are remunerated generally through the
dispensing of prescriptions and product sales. If professional services are to be provided in a private hospital setting, this may require pharmacies to have adequate resources to employ pharmacists to spend time with hospital in-patients whilst still requiring pharmacists in the retail businesses. If standardised pharmacy services are to be provided in private hospitals, training for pharmacists may also be required.

**Benefits of Clinical Pharmacy Services**

Patient Medication Education services provided by pharmacists have many positive outcomes [8-10]. Studies have shown that verbal and written information can increase patient knowledge [8] and written materials can reinforce verbal information and result in increased compliance [8-10].

Medication regimen reviews, performed by pharmacists have demonstrated benefits such as reducing average numbers and monthly costs of medications [1, 11, 12]. Patients have also reported improvement in their health after receiving medication reviews [1].

**Private Hospital Pharmacists’ Current Views toward Services**

There is a clear desire to provide professional clinical pharmacy services amongst NSW private hospital pharmacists, as many believe these services will have positive clinical and economic outcomes. One pharmacist said: “what we do now in the nursing home is medication review and we should extend the ability of our medication review not just to nursing homes but extend it wider to discharge private hospital patients…. You can see the value in it, and the dollar savings by quantifying the review”.

**Significance of the Project**

With the increase in sophistication of the private hospital sector, and increasing evidence that professional pharmacy services have positive clinical and economic outcomes, it is desirable to test services in this sector.

The outcomes of the project include: a system in private hospitals (extending to the community), for the provision of medication education and medication regimen review services and a training package for pharmacists wanting to provide these services to private hospital patients.
Patients receiving services may increase their knowledge and adherence of medication regimens and their satisfaction in medication management and potentially decrease their number and monthly costs of medications. This decrease in medication costs may not only benefit individual patients but may decrease government spending on Pharmaceutical Benefits. We also envisage that pharmacists would gain an increase in knowledge and skills to perform these services. This project aims to further increase the role of the community pharmacist and allow them to be remunerated for the provision of these services to private hospital patients through available guild/government funds for medication reviews. If outcomes prove to be significant, future remuneration for services may be shared by guild/government, private hospitals and private health funds.
Aims and Objectives
The specific aims of this study were to develop a model for implementation and subsequently evaluate these two professional pharmacy services within private hospitals in NSW. The research was divided into four distinct phases:

1. Interviews
2. Focus Groups
3. Development of Intervention Materials and pilot study
4. Implementation/Evaluation of the Interventions

Phase One Aim:
To interview private hospital pharmacists to develop appropriate service models for implementing in private hospitals.

The specific objectives of the in-depth interviews with pharmacists were to:

- Explore the perceived feasibility of providing the services
- Identify barriers that may prevent implementation
- Identify how pharmacists perceived they would provide the services, including which members of the health care team may be involved and which patients would benefit and when each service would be best provided
- Identify processes that may need to take place before the implementation and evaluation could occur
- Inform the proposal of service models that could be explored in a focus group environment with a variety of health care professionals and consumers.

Phase Two Aim:
To explore appropriate implementation strategies with private hospitals.

The specific objectives of the focus groups were to:

- Explore health care professionals’ views on the proposed services and models of implementation
- Refine the proposed models for implementation
- Identify barriers to service implementation
- Identify processes that needed to take place before implementation and evaluation could occur.
Phase Three Aim:
To develop and pilot project materials.

The specific objectives included:
- Searching for validated tools
- Designing project materials
- Developing data management plan
- Testing instrument feasibility
- Refining project materials
- Obtaining ethical approval from the University of Sydney

Phase Four Aim:
To implement and evaluate two professional services provided to private hospital patients.
Project Outline

**Phase One:** Semi-structured interviews with private hospital pharmacists were held at their work site or at the university. These interviews were tape-recorded and subsequently the tapes were transcribed verbatim and qualitatively analysed for emerging themes.

**Phase Two:** Focus groups and interviews with key hospital employees (nurses, pharmacists and discharge planners took place at both metropolitan and non-metropolitan private hospitals. In these meetings, models for service implementation informed by Phase One were discussed.

**Phase Three:** Development of materials was done in consultation with a graphic artist. The Medication Education Service training was conducted with a private hospital pharmacist and this session was tape recorded in order to write the training manual, so all details could be included. A small pilot of project materials was conducted to refine the materials and project processes.

**Phase Four:** A random sample of fifteen private hospitals was selected based on pharmacy location and location within metropolitan or non metropolitan NSW. Hospitals and servicing pharmacies were approached and once recruited, discharge planners and pharmacists were trained on how to conduct the project (seven hospitals recruited).

Patients on five or more medications were recruited within 72 hours of discharge. Patients completed baseline questionnaires on their adherence and satisfaction with information about medicines and data on their current medications was documented. Patients were then randomized to one of three study arms as per Table 1. (A total of 89 patients were recruited.)

Patients randomized to study arm 2 or 3 received a tailored Medication Education Service (MES) service, provided by the private hospital pharmacist. Follow-up data was collected at 1 week and three months post discharge.
Table 1: Study design

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Control</th>
<th>MES* at Discharge</th>
<th>MES at discharge + HMR within 3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>T0</strong> (24-48hrs before discharge)</td>
<td>SIMS#</td>
<td>SIMS</td>
<td>SIMS</td>
</tr>
<tr>
<td></td>
<td>MARS!</td>
<td>MARS</td>
<td>MARS</td>
</tr>
<tr>
<td></td>
<td>No. Meds</td>
<td>No. Meds</td>
<td>No. Meds</td>
</tr>
<tr>
<td></td>
<td>Cost Meds</td>
<td>Cost Meds</td>
<td>Cost Meds</td>
</tr>
<tr>
<td><strong>T1</strong> (1 week post discharge)</td>
<td>SIMS</td>
<td>SIMS</td>
<td>SIMS</td>
</tr>
<tr>
<td></td>
<td>MARS</td>
<td>MARS</td>
<td>MARS</td>
</tr>
<tr>
<td></td>
<td>No. Meds</td>
<td>No. Meds</td>
<td>No. Meds</td>
</tr>
<tr>
<td></td>
<td>Cost Meds</td>
<td>Cost Meds</td>
<td>Cost Meds</td>
</tr>
<tr>
<td><strong>T2</strong> (3 months post discharge)</td>
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<td>SIMS</td>
<td>SIMS</td>
</tr>
<tr>
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<td>MARS</td>
<td>MARS</td>
<td>MARS</td>
</tr>
<tr>
<td></td>
<td>No. Meds</td>
<td>No. Meds</td>
<td>No. Meds</td>
</tr>
<tr>
<td></td>
<td>Cost Meds</td>
<td>Cost Meds</td>
<td>Cost Meds</td>
</tr>
</tbody>
</table>

* MES = Medication Education Service
\# SIMS = Satisfaction with Information about Medicines Scale
\! MARS = Medication Adherence Report Scale

MES involved the pharmacists providing a tailored service for each patient including the following steps:

- Patient recruitment (discharge planner)
- Gather materials
- Consult discharge planner
- Prepare medication card
- Gather medications
- Introduce self to patient
- Assess patient’s status
- Provide information
- Summarise
- Document
- Follow-up
A standardised documentation form was completed after each service and a copy of this form was forwarded to the patients preferred community pharmacist and medical practitioner.
Results

Interviews and focus groups were conducted with pharmacist, nurses and discharge planners and informed the design of the intervention study and project materials. These interviews revealed that a Medication Education Service (MES) was deemed feasible and appropriate and that Home Medicines Review (HMR) could be provided to patients after leaving hospital (conducted by their preferred pharmacy, and general practitioner). Following interviews, all project materials were developed based on results, the literature and in consultation with practicing pharmacists and hospital based practitioners. A small pilot of project materials was conducted, and slight amendments were made to documentation.

Seven private hospitals took part in Phase Four, and 89 patients were enrolled into the study. In total there were 30 control patients and 59 patients that received the MES intervention. Within 3 months post discharge no HMR services were provided, therefore the HMR arm of the study was combined with the MES only arm, as they all received the standardised intervention. Baseline results revealed that there were no significant differences in the types of patients in each of the study arms (age: p = 0.94, gender: p = 0.54).

Documentation

The accuracy of documentation of discharge planners and pharmacists in respects to discharge medications were high, with discharge planners having a median accuracy score of 87% and pharmacists having a median accuracy score of 100%. This difference is statistically significant (p < 0.05).

Medication Education Service (MES)

The average time taken to provide the MES was 45 minutes. On average pharmacists documented that they provided 15 items per MES service (Table 2). The majority of these were providing information to the patient (average of 9 items per service). Other common items provided included recommending follow-up monitoring, referral to the patients’ medical practitioners post discharge as well as documenting extra medical conditions or medications that had been overlooked on the discharge planners documentation form.
Table 2: Pharmacy items provided during MES

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std dev</th>
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<td>Total number of pharmacy items</td>
<td>59</td>
<td>7</td>
<td>27</td>
<td>14.7119</td>
<td>4.94818</td>
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<tr>
<td>Information items</td>
<td>59</td>
<td>4</td>
<td>19</td>
<td>9.4746</td>
<td>3.12584</td>
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<td>Referrals to Med Practitioners</td>
<td>59</td>
<td>0</td>
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<td>1.3276</td>
<td>1.30301</td>
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<tr>
<td>Extra medical condition noted</td>
<td>59</td>
<td>0</td>
<td>6</td>
<td>1.1186</td>
<td>1.47490</td>
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<tr>
<td>Monitoring items</td>
<td>59</td>
<td>0</td>
<td>4</td>
<td>1.0000</td>
<td>0.98261</td>
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<tr>
<td>Extra medication noted</td>
<td>59</td>
<td>0</td>
<td>5</td>
<td>0.6441</td>
<td>1.24239</td>
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<td>Referrals to other HCPs</td>
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<td>3</td>
<td>0.3220</td>
<td>0.70566</td>
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<td>2</td>
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<td>0.55866</td>
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<td>0.2203</td>
<td>0.49368</td>
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<td>Adherence aid recommended</td>
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<td>1</td>
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<td>0.32614</td>
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<tr>
<td>Different directions noted</td>
<td>59</td>
<td>0</td>
<td>1</td>
<td>0.0678</td>
<td>0.25355</td>
</tr>
<tr>
<td>Extra allergy noted</td>
<td>59</td>
<td>0</td>
<td>1</td>
<td>0.0678</td>
<td>0.25355</td>
</tr>
<tr>
<td>Cease a medication</td>
<td>59</td>
<td>0</td>
<td>1</td>
<td>0.0339</td>
<td>0.18252</td>
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<tr>
<td>Different strength of medication noted</td>
<td>59</td>
<td>0</td>
<td>1</td>
<td>0.0339</td>
<td>0.18252</td>
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</table>

**Cost of Medicines**

In analysing the differences in costs of medications between the control patients and the intervention group, there is a trend to decrease the cost of medications by 90 days post discharge. The difference between control patients and intervention patients at this time for regular prescription drugs is significant (p < 0.05) with intervention patients decreasing their drug costs more than controls. These medication costs were based on the predicted profile patients were taking on day 90 post discharge (based on medication history printouts). Analysis of total medication costs pre discharge versus post discharge (i.e. continuous data), does not show any significant difference between control and intervention patients.

**Number of Medications**

In analysing the differences in the numbers of all medications patients were taking at 90 days post discharge versus baseline, we can see that the numbers of all medications have decreased for all patients, however there is a significant difference between the control and intervention patients (p < 0.05) with intervention patients taking less numbers of medicines than controls (mean decrease of 1 medicine versus
3.9 medicines in intervention group). Similarly, when looking at continuous data and the number of dispensing occurring pre and post discharge, we see a trend to decrease dispensing in the intervention arms, but this difference is not significant.

**Adherence**

Using the same techniques as above we analysed the difference between MARS scores at each time point across the study arms. The MARS instrument is scored out of 25, and the higher the score, the more adherent a patient is predicted to be. There were no significant differences in MARS scores at any time point across or within any study arm. The MARS instrument is scored out of 25, and the median score at each time point for each study arm was constantly 24 (Table 3).

**Table 3: Total MARS score by study arm and stage**

<table>
<thead>
<tr>
<th>Study arm</th>
<th>Stage</th>
<th>n</th>
<th>Mean</th>
<th>Median</th>
<th>Std dev</th>
<th>Minimum</th>
<th>Maximum</th>
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<tr>
<td>1 (Control)</td>
<td>1(T0)</td>
<td>27</td>
<td>23.2</td>
<td>24.0</td>
<td>1.7</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>2(T1)</td>
<td>17</td>
<td>23.3</td>
<td>24.0</td>
<td>1.6</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>3(T2)</td>
<td>16</td>
<td>23.2</td>
<td>24.0</td>
<td>1.4</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>2 (MES)</td>
<td>1</td>
<td>29</td>
<td>23.1</td>
<td>24.0</td>
<td>2.4</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>15</td>
<td>23.5</td>
<td>24.0</td>
<td>1.8</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>14</td>
<td>23.5</td>
<td>24.0</td>
<td>1.8</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>3 (MES+HMR)</td>
<td>1</td>
<td>25</td>
<td>23.8</td>
<td>24.0</td>
<td>1.4</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>18</td>
<td>23.2</td>
<td>24.0</td>
<td>1.8</td>
<td>20</td>
<td>25</td>
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<tr>
<td></td>
<td>3</td>
<td>15</td>
<td>23.1</td>
<td>24.0</td>
<td>2.2</td>
<td>17</td>
<td>25</td>
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</table>

**Satisfaction**

The differences in Satisfaction with Information about Medicines Scale (SIMS) scores were compared at each time point and study arm. This 17 item instrument was scored out of 17, and the higher the score the greater their level of satisfaction with information about medicines. At 7 days, satisfaction scores had decreased from baseline for both intervention and control, however the change in intervention group scores were significantly higher at this time point than patients in the control arm (p < 0.05) (Table 4 and 5). At day 90, scores for the control arm were still lower than at baseline and those for the intervention had improved slightly from baseline. The difference between these
groups at this time point was approaching significance (p =0.08) with intervention patients have higher satisfaction scores than the control.

Table 4: Mean patient satisfaction score (total SIMS) by study arm and stage

<table>
<thead>
<tr>
<th>Study arm</th>
<th>Stage</th>
<th>n</th>
<th>Mean</th>
<th>Std dev</th>
<th>Minimum</th>
<th>Maximum</th>
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<tbody>
<tr>
<td>1 (Control)</td>
<td>1(T0)</td>
<td>29</td>
<td>13.6</td>
<td>3.9</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>2(T1)</td>
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<td>10.5</td>
<td>5.0</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>3(T2)</td>
<td>16</td>
<td>11.6</td>
<td>4.4</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>2 (MES)</td>
<td>1</td>
<td>30</td>
<td>11.1</td>
<td>4.4</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>15</td>
<td>11.1</td>
<td>4.3</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>13</td>
<td>12.9</td>
<td>4.1</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>3 (MES + HMR)</td>
<td>1</td>
<td>28</td>
<td>10.5</td>
<td>4.6</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>18</td>
<td>9.9</td>
<td>5.4</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>16</td>
<td>11.3</td>
<td>4.4</td>
<td>5</td>
<td>17</td>
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Table 5: Change in patient satisfaction by study arm

<table>
<thead>
<tr>
<th>Study arm</th>
<th>Difference stage 1 to 2</th>
<th>Difference stage 1 to 3</th>
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<tr>
<td>Arms 1, 2 and 3</td>
<td>-3.7</td>
<td>-2.0</td>
</tr>
<tr>
<td></td>
<td>-0.2</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
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<td>-0.1</td>
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<tr>
<td>Arms 1, 2 and 3</td>
<td>-3.7</td>
<td>-2.0</td>
</tr>
<tr>
<td></td>
<td>-0.4</td>
<td>0.6</td>
</tr>
<tr>
<td>P value</td>
<td>0.0144</td>
<td>0.0797</td>
</tr>
</tbody>
</table>
Conclusion
Pharmacy needs to be recognised as an important service provider within the private hospital arena. Concurrently there are increasing efforts within Australia to improve the continuity of care between hospital and the home. These issues are just as important for private hospital patients, particularly in respect to medication confusion and misadventure.

The Medication Education Service (MES) appears to be an acceptable service model to be provided to private hospital patients at the time of discharge by servicing community pharmacists. In this study, outcomes suggest that this service may decrease numbers and costs of medications for patients within 3 months of discharge as well as improve patient satisfaction. In order to provide this service to all patients identified by nurses or discharge planners on multiple medications, standardised training for pharmacists is recommended as well as remuneration for service provision.

This research suggests that the MES service has the potential to decrease regular prescription costs by $2.58/day per person, as well as decrease the overall number of drugs patients are taking, however the total costs of pharmacy dispensing in the entire three month follow-up period does not show a significant difference. It therefore would appear appropriate that this service be further researched in a longer study, to confirm these trends and conclude that this service has the potential to improve the health care of Australians being treated in private hospital settings.
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INTRODUCTION

The main theme of this research was to explore changes in patient outcomes due to the extended roles pharmacists can play within the private hospital sector, in particular, by providing clinical pharmacy service such as medication education and medication review. The private hospital sector in Australia, as far as pharmacy is concerned is unique, as it is a platform where traditional hospital pharmacy roles and community practice meet. It is a sector where the vast majority of pharmacists, utilise and are remunerated through the pharmaceutical benefits scheme, yet are responsible for the provision of goods and services to many patients in an acute care, non-ambulatory setting. Despite this interesting arena for pharmacy practice, little research has been conducted within this sector in Australia and anecdotal evidence suggested that pharmacy services in this sector maybe underdeveloped.

Private hospitals form a substantial part of the Australian health care system. The Australian Bureau of Statistics reports that nearly one in every three days of hospitalisation in this country is spent in private hospitals [2]. Furthermore this sector has been expanding over the last decade with several more specialist procedures being performed in these hospitals [3].

The sector is dynamic, with new hospitals opening and older hospitals closing, hence it is an ever-changing arena [2]. The Australian Bureau of Statistics reports from a national census of private hospitals in 2001-2002, that there were 277 acute hospitals, 24 psychiatric hospitals and 236 free standing day hospital facilities in Australia at this time. In this year over 2 million patients were treated in this setting. This translates to an 8% increase in separations in acute and psychiatric private hospitals over 2001-02 [2].

In 2001-02 there were 4.4 million procedures performed in the acute and psychiatric private hospitals. The most common types of procedures were classified as non-invasive (40.5%) which included procedures such as exercise therapy for rehabilitation or dietary education. Procedures on the digestive system (11.4%) were the next most commonly performed category and musculoskeletal (6.9%) and gynaecological procedures (4.7%) ranked 3rd and 4th respectively.

These non-invasive and surgical procedures may still be considered less acute than those larger operations performed in major public teaching hospitals, however the
APHA reports that the numbers of sophisticated surgical procedures performed within this sector are also on the rise and procedures such as cardiac bypass surgery (once only performed in large public institutions), is common place in many private hospitals [3] (see Figure 1.1).

Figure 1.1 Surgical procedures by type from 1993-1997 (APHA)

1.1 PHARMACEUTICAL SERVICE PROVISION

1.1.1 Community Pharmacy Practice

Services provided in a community pharmacy setting have been classified as either “product focused” or “cognitive” [13]. According to the International Pharmaceutical Federation’s community pharmacy section [14], the community-based pharmacist:

- is an expert in pharmaceutical care, pharmacotherapy and health promotion;
- is a professional communicator to patients, other health care providers and decision-makers;
- delivers a high quality of products, services and communication, and
- documents his/her actions, communicates the outcomes to professional colleagues.
In 1989 however, Monsanto and Mason [15] surveyed 1000 randomly selected consumers in the United States who reported that very few had been given a pharmacy service other than the dispensing of their prescription medication and receiving advice on non-prescription products. These findings are in contrast with the pharmacist’s opinion of their role reported by Krass et al [16] in 1991 in which pharmacists reported they were most frequently involved in the provision of advice about prescribed medications, OTC medications and the diagnosis and treatment of minor conditions. The role of the community pharmacist has changed substantially over the years [17]. Clinical services in the community setting were described as “less developed” than those within a hospital setting in the late 90’s [18]. However, in Australia we have seen the community pharmacy environment embrace new services and become a world leader in the provision of cognitive pharmacy services [12, 19-21]. Despite the fact that new remunerated services have been developed in this country such as Home Medicines Review, Provision of Consumer Medicines Information and The Quality Care Pharmacy Programme, the uptake of these new services in some areas has been slow [13, 22] and clinical services within the community pharmacy setting are still in a transitional stage.

As most Australian private hospitals utilise the services of a community pharmacy, it is important to recognise that implementing new services in this hospital sector, utilising community pharmacists mainly from an ambulatory care setting may have its challenges.

1.1.2 Hospital Pharmacy Practice

Within the hospital sector, a divide between the types of services offered also exists. The Society of Hospital Pharmacists of Australia has divided services into various sections [6] (see Figure 1.2).

Clinical services within this sector are the trademark of hospital pharmacy and include several specialised services (see Figure 1.3).

Clinical pharmacy was pioneered within the hospital setting during the 1960s. Hepler and Strand [23] have described this era as one of “professional transition”, where pharmacists moved to the patient’s bedside from the more traditional apothecary roles.
Clinical pharmacy has been defined as, the provision of services by pharmacists, in attempts to promote rational drug therapy, which is safe, appropriate, and cost effective [24].

Figure 1.2 Hospital pharmacy services
In Australia, clinical pharmacy is defined as “the practice of pharmacy in a multidisciplinary health care team directed at achieving patient treatment goals by ensuring: That the correct patient receives the optimum dose of the most appropriate medication for a specific condition via a rational dosage form and regimen, over an appropriate time period; That untoward effects and interactions of drugs are identified, resolved and where possible prevented; Involvement in patient education and counselling, monitoring of drug therapy, prescriber education, and research; That the quality use of medicines is promoted through other activities as appropriate” [6].

Hatoum et al [25] conducted an extensive literature search in the mid 1980’s and categorised clinical services into:
• monitory of drug therapy;
• drug information and education;
• participation in management of medical emergencies and chronic diseases;
• detection and reporting of adverse drug reactions;
• control of medication administration;
• financial and personnel management, and
• clinical drug investigations.

The roles of clinical pharmacists practicing in hospitals settings have been well studied. The American Society of Health-Systems pharmacists (ASHP), (formerly known as the American Society of Hospital Pharmacists), constantly surveys American pharmacists about their roles within hospital/institutional settings [26-34]. Since 1998 these surveys have been restructured into a three part series within the acute care hospital settings [34] to explore:
• prescribing and transcribing
• dispensing and administration
• monitoring, patient education and wellness.

The results of the 2000 survey on monitoring, patient education, and wellness, (which translate most closely to the Australian definition of clinical pharmacy), revealed that there was an increasing amount of time being spent on medication-monitoring activities, although this still equated to less than 20% of pharmacists’ time being spent on such activities. The survey also showed that pharmacists monitored certain types of patients based on their medication use. Interestingly, 89% of the hospitals reported that medication counselling was performed primarily by nursing and pharmacists were infrequently involved, although in about half the hospitals there were mechanisms to have the pharmacist involved in medication education for certain patient groups. Disappointingly, 63% of the institutions surveyed reported that that less than 25% of patients receive patient counselling from a pharmacist during their inpatient stay. Counselling documentation rates were also reported to be low. This paper states that documentation of activities is critical if pharmacy is to move toward cognitive services and secure remuneration [34].

In Australia clinical pharmacy services are well established in many large public hospitals. In 1992 Hughes described the advancement that clinical pharmacy had made over the past 2 decades in Australia [35]. This paper commented on a survey
that reported that 88% of our hospitals provided clinical services, however it was realised that there was no uniform level of service and participation on ward rounds was low. At this time, clinical pharmacy services that were ranked as most important included the provision of drug information, patient counselling, staff education, and medication chart review [35].

In 1995, a more extensive survey of Clinical pharmacy services in Australia, was conducted by Tennant and Hughes [36]. This survey sought information about the frequency of service provision and benefits and revealed that clinical services were widespread yet documentation of service benefits was low. One service identified and reported in this survey was a community liaison and follow-up service. It was reported that the prevalence of this clinical activity was low in Australian hospitals. The five most prevalent clinical services included:

- performing medication chart reviews;
- participating in Drug and Therapeutics Committees;
- performing clinical pharmacist interventions;
- providing patient education and counselling, and
- reporting medication errors.

In 1998, Wilson et al [37] sent questionnaires to 296 directors of hospital pharmacy services or senior hospital pharmacy directors. This questionnaire explored 26 commonly provided services in hospitals (clinical and non-clinical services). With a 58.5% response rate the most common clinical services identified as being provided in Australian Hospitals at this time included: informal drug education to hospital staff, medication chart review, intervention in and monitoring of drug therapy and discharge medication counselling.

There are many different aspects of pharmacy services that should be provided in all institutional settings according to Smith et al [38], to ensure that patients receive a high standard of care and optimise their medication outcomes. All of the above can be summarised in the following table, and ideally all pharmacists should perform these basic functions in their day-to-day proceedings. As stated, the level of pharmaceutical services will vary according to patients’ needs but all of the functions listed in Table 1.1 are the minimum that should be provided for each patient [38].
Table 1.1 Basic hospital pharmacy services

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
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<tbody>
<tr>
<td>Develop and use patient medication profile</td>
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<tr>
<td>Interpret, question, clarify, verify, and validate all drug-related orders</td>
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</tr>
<tr>
<td>Provide a safe and efficient drug-dispensing system</td>
<td></td>
</tr>
<tr>
<td>Monitor drug therapy for safety, efficacy, and desired clinical outcome</td>
<td></td>
</tr>
<tr>
<td>Screen for drug allergies, drug-drug interactions, drug-food interactions, and concomitant drug use</td>
<td></td>
</tr>
<tr>
<td>Detect and report drug allergies and adverse drug reactions</td>
<td></td>
</tr>
<tr>
<td>Recommend initial or alternative drug therapies</td>
<td></td>
</tr>
<tr>
<td>Respond to drug information requests from physicians, nurses, and patients</td>
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<tr>
<td>Teach health-care providers and patients about drug use</td>
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<tr>
<td>Obtain medication histories by interviewing patients</td>
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<tr>
<td>Assist in the selection of the drugs of choice and dosage forms</td>
<td></td>
</tr>
<tr>
<td>Conduct drug-use evaluations to gauge the appropriateness of drug use and achievement of desired therapeutic outcomes</td>
<td></td>
</tr>
<tr>
<td>Apply pharmaceutical principles for selecting drug therapies</td>
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</table>

adapted from [38]

Although clinical pharmacy services maybe well established within a public hospital sector in Australia, the private sector, which utilises community pharmacy, may need attention.

1.1.3 Private Hospital Pharmacy Practice

Little is known about the practice of pharmacy within the Australian private hospital sector. Anecdotal evidence suggests that services provided in this sector in Australia are limited [4, 5].

As much of the American health system is privatised, literature gathered by the American Society of Health-System Pharmacists regarding services in American hospitals may be utilised for comparison. The ASHP national surveys have noted that there is a lack of consistency in clinical pharmacy practice and ill-defined priorities in the provision of clinical services [27-34]. Factors reported to influence service provision in the US, include numbers of staff, adoption of new technology, location of services
(e.g. hospital-based versus non hospital based) and shifts in service priorities [32, 34]. As previously stated, services such as medication education and monitoring of patients is limited in many institutions and patients receiving services are prioritised based on their medications or medical conditions [34].

The system in the United Kingdom appears to be more closely aligned to the Australian system. Pharmaceutical service provision within the independent hospital setting in the UK was the subject of doctoral research by Turkistani [39]. This research revealed that there is much variation amongst services in these independent hospitals and suggested that pharmaceutical service-provider models could effect service provision. In general, the models where pharmacists were employed by the hospital or contracted from NHS hospitals were ranked as superior compared to models where hospitals used independent pharmacists or non-pharmacists to provide pharmaceutical services.

One Australian study conducted by Peterson et al [5] in 1988 suggested that pharmacy services in the Australian private hospital sector were limited and that the size of hospital and the model of pharmaceutical service provision influenced the types of services provided. This survey also suggested that the city in which the hospital was located also influenced services [5].

In this Peterson study the sample included 50% of private hospitals located only in capital cities. The survey explored 11 key hospital activities, however did not describe how any of these activities were provided nor the frequency of provision, hence the data was fairly superficial. The 11 key hospital pharmacy activities examined included services such as “intravenous additive services”, “cytotoxic drug reconstitution” and “parenteral nutrition formulation”, of which few private hospitals in Australia provide, (in fact, many of these sterile services are now outsourced within public hospitals). This survey also showed that 39% of hospitals specialised in mainly surgical procedures, hence the need to provide many of these 11 core services may be redundant.

A qualitative study by Wyer [40] published in 2000 explored pharmacy services in Australian Collocated Hospitals. A collocation involves the development of a private hospital on the campus of a public hospital. This study concluded that these private hospitals offered similar general clinical services to their public hospital counterparts; however they rarely provided the more technical services such as aseptic/cytotoxic reconstitution, confirming some results of the Peterson study. This qualitative study recognised that there were several factors influencing the services provided at each
site, and that one “best practice model” for each hospital was not practical, nor possible given the diversity of private hospital settings.

As little is known about this sector, it is important to firstly establish the extent and quality of services and if warranted develop and implement specific standardised services that can improve private hospital patient’s outcomes.

1.2 PHARMACEUTICAL SERVICE PHILOSOPHIES

There are two terms that are commonly used within the literature, pharmaceutical care [23] and continuity of care [41]. Some may argue that “pharmaceutical care” and “continuity of care” are specific services within their own right; however it maybe more easily understood if we consider these as overarching philosophies, where specific services may be adopted under each umbrella term. In fact it could also be further argued that pharmaceutical care is the fundamental overarching philosophy under which continuity of care itself exists, as does the terms, professional pharmacy services, cognitive pharmacy services and clinical and administrative services. In other words, each type of care may be further broken down into parts and further broken into “specific services”, which are clearly defined and therefore more easily adopted by a care provider in order to enhance patient care.

1.2.1 Pharmaceutical Care

Hepler and Strand [23] developed a philosophical approach in the early 1990s. This new approach was labelled “Pharmaceutical care” and was defined as: “The responsible provision of drug therapy for the purpose of achieving specific outcomes that improve a patient’s quality of life”. These outcomes are:

- Cure of a disease
- Elimination or reduction in a patient’s symptomatology
- Arresting or slowing of a disease process
- Preventing a disease or symptomatology.

This concept has been widely adopted in many developed countries; however the understanding of how to provide pharmaceutical care has been interpreted differently in many countries [42].
Some pharmacists may argue that clinical pharmacy and pharmaceutical care are the same. Other pharmacists have classified services with the addition of pharmaceutical care. vanMil and Tromp [43] divided the activities of pharmacists into three tiers.

- Supportive pharmaceutical actions, which are the logistics of service provision, e.g. ensuring a drug is delivered on time.
- Clinical pharmacy, which are disease or drug orientated, e.g. the pharmacists checks for drug-drug interactions at the time of dispensing.
- Pharmaceutical care, which is patient orientated, where the pharmacists translates clinical pharmacy knowledge to the patient, e.g. provision of counselling tailored to the patient’s needs.

Benrimoj [44, 45] described a model based on a number of specific and clearly defined cognitive pharmaceutical services, implemented in a staged hierarchical approach where pharmacists may build on “relatively simple” services as opposed to the large nebulous concept of pharmaceutical care. He argues that clear definitions of services with measurable outcomes are necessary in order to show the benefits of pharmaceutical service provision and in turn argue to government, third party payers and consumers for remuneration.

Specific pharmacy services, utilising Benrimoj’s step-up approach may be more appropriately implemented in an Australian private hospital setting, utilising the skills of community pharmacists and the knowledge of the clinical hospital system.

1.2.2 Continuity of Care

In recent times, especially within the Australian health care sector, there has been much focus on the gap between health care settings especially with regards to patient discharge from hospital to home. The service-terms often used to bridge this gap, include “continuity of care” and seamless care” [46]. This type of care has been defined as the smooth transfer of care (without interruption as the patient moves between primary and secondary or tertiary care [46, 47].

The Australian Pharmaceutical Advisory Council in 1998 published the “National guidelines to achieve the continuum of quality use of medicines between hospital and community” [48]. These APAC guidelines consist of seven broad principles, which form
the basis for standard procedures to be developed and implemented in each individual institutional setting. A summary of these principles is obtained in Table 1.2.

**Table 1.2 Summary of APAC principles**

<table>
<thead>
<tr>
<th>Principle One</th>
<th>The admitting institution should develop and coordinate a medication discharge plan</th>
</tr>
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<tbody>
<tr>
<td>Principle Two</td>
<td>Accurate medication histories should be obtained at the time of admission</td>
</tr>
<tr>
<td>Principle Three</td>
<td>Medications should be evaluated at the time of admission</td>
</tr>
<tr>
<td>Principle Four</td>
<td>Treatment plans should be developed during a patient’s hospital stay</td>
</tr>
<tr>
<td>Principle Five</td>
<td>A pre-discharge medication review should occur as well as the dispensing of adequate amounts of medications for discharge</td>
</tr>
<tr>
<td>Principle Six</td>
<td>A discharge folio should be provided to each patient containing relevant information (e.g. CMI, care plans etc)</td>
</tr>
<tr>
<td>Principle Seven</td>
<td>All relevant details of admission, medication changes and follow-up should be communicated to the patient’s nominated health care provider(s) responsible for ongoing care.</td>
</tr>
</tbody>
</table>

adapted from the APAC Guidelines [48]

Despite the wide distribution of such guidelines, the literature shows that there has been poor compliance with such guidelines [49, 50].

A survey was conducted to identify the level of APAC guideline implementation in Australian hospitals as well as investigate the resources required and other associated implications of implementing these guidelines. The results of this survey were published in 2003, revealing that only 3 hospitals out of the 101 respondents reported that they could fully meet the seven principles within the guidelines [51]. Discharge planning (principle one) was only provided for the majority of overnight patients in 20% of the sample hospitals, and the supply of medication information at discharge (principle 6) was provided to the majority of patients at only 14 hospitals. Some further hospitals commented that they provided discharge counselling to specialised groups of patients only. This paper suggests that there is currently a lack of resources, (staff and funding) [51] to fully implement these guidelines, leaving much to be desired.
The Commonwealth Department of Health and Ageing commissioned the NSW Therapeutic Assessment Group (NSW TAG), to undertake a 6-month project to evaluate the implementation and effectiveness of these guidelines. The main barriers to implementation of the guidelines identified by the group included [52]:

- Lack of resources (human and other) to implement the guideline principles
- Lack of awareness, lack of dissemination and publicity, perceived lack of applicability of the guidelines
- Hospital workflow, internal procedures or administrative issues
- Lack of coordination, teamwork or partnership approach among stakeholders, lack of communication
- Lack of commitment and support from above, lack of leadership or internal “drivers”
- Poor information technologies, IT systems not oriented to continuity of care issues.

The main facilitators to uptake of the guidelines included [52]:

- Awareness and commitment to the guideline’s principles among hospital staff and in the community, including a strategic approach to ensure dissemination and education about the guidelines
- Focus on integration, communication, and teamwork in relation to hospital-community liaison
- External ‘drivers’, i.e. State or Federal Government initiatives providing incentive for action
- Acquiring resources for implementation, including funding
- Making use of information technology capabilities.

These issues are not unique to Australia. Similar guidelines were introduced in the United Kingdom in 1989 that stated that all patients should be provided with written information about their medicines. A survey to review the discharge services for elderly patients in NHS non-specialist hospitals found the following [53]:

- 27% of hospitals supplied all elderly patients with written information about their medicines
- 2% of hospitals had pharmacists counselling all elderly patients on discharge
- 5% of hospitals sent a copy of the discharge medications to a nominated community pharmacy
- 2.5% of hospitals provided domiciliary visits to elderly patients, and
• 9% of hospitals contacted the community pharmacist post-discharge. These less than optimal results were attributed also to inadequate resources [53].

A central theme within much of the literature with respect to continuity of care is the notion of “discharge planning” (principle one of the APAC guidelines). The American Hospital Association’s definition of discharge planning includes words such as: “Successful discharge planning is a centralised, coordinated, interdisciplinary process that ensures all patients have a plan for continuing care after they leave hospital.” [48] The Council on the Ageing, based in Victoria, Australia, have their own definition, which states: “Discharge planning is a process through which people, hospital and community based services can work together to establish structures and networks which facilitate care across a range of services required. Discharge planning is central in planning and organising continuity of care.” [48]

When reviewing the literature regarding discharge planning, we find that much of the literature is nursing focused, yet multidisciplinary models are supported. Hedges et al [54] conducted a focused literature review of the discharge planning process and concluded that intrinsic to a successful discharge was the involvement of both hospital and community health care professionals. A Cochrane review assessing outcomes of discharge planning involved the review of 8 published studies. This review concluded that there was some evidence that discharge planning may lead to a reduced hospital length of stay, and in some cases reduced readmission to hospital. There was also some evidence that discharge planning increased patient satisfaction [55].

In Australia, a Medication or Community Liaison service has been established in some hospitals in order to prevent problems that maybe associated with the gap between hospital and the home; however this service is not available widely, as is reflected in the poor adoption of APAC guidelines. The terms “Medication Liaison” and “Community Liaison” are often used interchangeably, however certain researchers and providers prefer not to use the term “community” to place the emphasis more on the service and not the practice setting [56]. The Society of Hospital Pharmacists of Australia defines the role a Community Liaison Pharmacist to: “ensure continuity of pharmaceutical care for patients in the health care system”, and “provide links between hospital care and the home as well as between different health care providers” [6].

A paper published in the Australian Journal of Hospital Pharmacy in 1997 by Stowasser et al [57], identified that there were often inaccuracies in patient’s
medications when patients were admitted and discharged from hospital (i.e. at the interface between community and hospital), hence continuum of care was inadequate. This paper acknowledged that discharge summaries may take weeks to months to reach patient’s general practitioners and that there is often no formal process to alert community pharmacists to medication changes or issues during hospitalisation. This paper goes on to say that “a fundamental requirement for medication liaison is accurate information on medication use”.

In a discussion paper by McGuire et al [56], the problems with medications and the discharge process were identified as falling into 1 of 3 categories. McGuire states that: “practitioners run the gauntlet of either: receiving no information about their patients’ medications (this is certainly the situation facing community pharmacists); receiving information, albeit in an untimely manner; or receiving misinformation (incomplete or erroneous)".

1.3 BENEFITS OF PHARMACEUTICAL SERVICES

There are significant problems in the use of medications throughout society and it has been stated by The American Society of Health-Systems pharmacists that: “pharmacists should structure their practices to help alleviate these problems” [58]. According to Penna et al [59], patients are older, are sicker, have more chronic illnesses, see more providers who prescribe more drugs and take drugs that are far more toxic and far more expensive. Penna [60] states that “the epidemic of drug related illness, resulting from poor pharmacotherapeutic management will not abate without active intervention by dedicated, caring pharmacists. The treatment of illnesses with medicines is not going to diminish and drugs will not become less potent, less specific, less costly or less risky. The number of medications available to treat illness will continue to increase. The number of drugs requiring specialised knowledge for their administration will grow. The number of patients treated with drugs will increase. The trends in demography, epidemiology, and technology all point to one conclusion: that the public will need pharmacists more in the future than it does today”.

Medications are given to improve patient’s quality of life; however as Hepler and Strand [23] stated, less than optimal outcomes can result from the following causes:

- Inappropriate prescribing
- Inappropriate delivery
• Inappropriate behaviour by the patient
• Patient idiosyncrasy
• Inappropriate monitoring.

Hepler and Strand [23] go on to say that drug related morbidity is often proceeded by a drug related problem, and identifies eight categories of drug related problems.

• Untreated Indications
• Improper drug selection
• Subtherapeutic dosage
• Failure to receive drugs
• Overdose
• Adverse drug reactions
• Drug Interactions
• Drug use without an indication

These less than optimal outcomes can often be avoided or rectified by a pharmacist. It therefore seems critical and viable that pharmacists are employed to look after patients’ drug therapies and help make pro-active decisions about drug therapy or intervene where necessary to avoid these less than optimal outcomes.

Significant costs are associated with inappropriate drug choice, adverse drug reactions, and sub-therapeutic treatment [23, 61]. If pharmacists can prevent or detect and resolve drug related problems that can lead to drug-related morbidity and mortality then we can improve health outcomes and reduce the cost of care [23, 61]. By providing pharmaceutical services, the total cost of health care can be reduced and the length of hospitalisation [23]. Numerous innovative clinical pharmacy programs are documented in the literature; however, data substantiating the cost savings of these programs are limited [62]. It has been suggested, as early as the 1970’s, that economic analyses are necessary to adequately evaluate additional health care services, and the use of such valuable tools to demonstrate the benefits of innovative pharmacy services may be the solution to increasing the acceptance of such programs by the medical profession, third-party payers and the consumer [63].

Pharmacists’ unique knowledge of medicines causes their contribution to be fundamental to the provision of a high quality service [64]. Pharmacists can potentially reduce the unnecessary use of pharmaceutical's and associated lab tests and
decrease unnecessary hospital and other health care costs that result from drug-related problems [65-67]. When a pharmacist works in close cooperation with a physician to provide pharmaceutical care, patient outcomes can improve, with a concomitant decrease in total health care costs [23, 68]. Pharmacy must be in a position to justify the services provided and it must be able to identify the benefits it gives to the patients [69, 70].

Clapman et al [71] created the following economic theory of drug use control:

- Drugs have economic consequences far beyond their direct cost. For example, appropriate drug therapy can substitute for other modes of care or reduce the time required for care.
- Some patients receive inappropriate drug treatment because of inappropriate prescribing, inappropriate drug delivery procedures or both.
- Patients who receive inappropriate drug treatment may experience sub-optimal therapeutic effects, adverse consequences, e.g. toxicity, or both. Either outcome can increase length of stay or other costs of care (perhaps far more than the cost of the inappropriate drugs themselves).
- An appropriately constructed drug-use control system can increase the reliability of drug delivery, (e.g. avoid medication errors) and improve the appropriateness both of prescribing and of drug monitoring and thereby reduce total costs of care.

Hepler and Strand [68] developed a similar economic theory:

- Drug treatment involves risks.
- In some medical pharmacy systems these risks are not properly controlled, and drug therapy causes substantial preventable morbidity and mortality (toxic and adverse reactions and perhaps treatment failures).
- The cost of such morbidity may be substantially greater than the cost of drug treatment itself.
- Pharmaceutical services can improve outcomes and reduce costs of care. This can be done by preventing or detecting or resolving drug-related problems that can lead to drug-related morbidity and mortality, both by increasing the effectiveness of drug therapy and by avoiding adverse effects.

These above theories may be justified by a study conducted at the University of Arizona that showed that improper use of prescription drugs cause nearly 200,000
deaths annually, sends nearly 9 million people to hospital, and costs the United States more than 76 billion dollars each year for direct patient care. The researchers projected that 45.6 billion of those costs could have been eliminated and more than 120,000 patient deaths prevented if the services of pharmacists were used more fully in-patient care settings [72].

A technical assistance bulletin from the American Society of Hospital Pharmacists, on assessing cost-containment strategies for pharmacies in organised health-care settings stated, that the pharmacist, if they worked with the patient and other health professionals, could influence the perceived need for the drug, the selection of the product, the patient’s use of the drug throughout the duration of therapy, and this integrated approach could reduce the total cost of drug therapy [73].

A study by Herfindal et al [74] evaluated the effect of pharmacists’ interventions on prescribing in orthopaedics. This study consisted of an experimental group and a control group at different hospital sites. Base-line data was collected from both hospitals on mean drug costs, number of doses and number of courses of therapy. A pharmacist then provided services in the experimental group and there was a consistent reduction from baseline in overall and antibiotic drug costs, number of doses, and the number of courses of therapy per patient-day; however the difference did not reach statistical significance. This study suggested that pharmacists’ interventions may reduce overall drug and particularly antibiotic costs by decreasing the excessive use of drugs and by promoting rational use of drug therapy but it is well noted that further studies need to be done [23, 75, 76]. A more recent review of the benefits of clinical pharmacy services between 1996 and 2000 was published in 2003 [77]. This review concluded that the quality of study design had improved in the last decade; however opportunities still exist to improve study designs used in economic evaluations. Despite problems with study designs, it was concluded from this review that there is evidence that clinical pharmacy services can provide substantial economic benefits [77]. The reductions in drug costs as mentioned above is one benefit of providing pharmaceutical services, but as well as drug cost containment, results show that pharmacists’ activities can be effective in producing positive clinical, economic and humanistic outcomes [18, 78]. Studies have shown that pharmacists becoming involved in specific aspects of disease management have shown positive outcomes and improvements [78, 79].
Many studies have looked at one particular disease state where ranges of clinical services were provided. Few studies have looked at the benefits of providing pharmaceutical services to several different cohorts of patients. Those studies that have looked at clinical pharmacy services in general, have shown that provision of services “add value to patient care and reduce health utilisation costs” [78]. Chrischilles et al [80-82] performed a cost-benefit analysis of the effect of clinical pharmacy services in family practice. This analysis demonstrated costs effectiveness attributable to the ability of clinical pharmacy services to improve physician efficiency, reduce adverse reactions, improve compliance, and improve the quality of care. Clapman et al [71] showed a significant reduction in both costs per admission and length of stay when a pharmacist made rounds with the medical team in the patient care area. Haig et al [67] also looked at the effects of pharmacist participation on a medical team. He found that pharmacists could significantly reduce pharmacy costs and charges, hospital charges and length of stay. McKenny and Wasserman [83] suggested that pharmaceutical services can affect length of stay by reducing the incidence of adverse drug reactions in the late 1970’s.

An interesting study conducted by Helling et al, cited by Carter [79] looked at patients’ perceptions of quality in ambulatory care. This study showed that following a single encounter with a clinical pharmacist, patient’s perceptions of their overall medical care were significantly higher than those of patients who did not encounter a clinical pharmacist during their visit to a family practice office.

Health care professionals may too experience benefits when pharmacists provide a pharmacy services. Reliance upon pharmacists may improve prescribers’ efficiency as pharmacists can decrease the physician’s time spent prescribing, monitoring, and adjusting drug therapy [66]. A study by Schweigert et al [84] showed that pharmacists are a useful source of drug information and are used frequently by other health professionals. He stated that pharmacists’ recommendations have a high degree of acceptance when concerning drug therapy.

These studies have demonstrated that clinical pharmacy services result in a lower incidence of drug-induced illness and pharmaceutical care can be cost-effective [85]. A benefit analysis describes and quantifies the benefits that accrue to the organisation because of the implementation of a service; these could include cost savings, improvements in quality of care, reductions in length of stay and risk management benefits [73]. Benefit and economic analyses also need to be conducted within the
Australian private hospital sector, to show that pharmacists are cost effective. Economists and researchers tend to favour outcome measurement. This approach is better for ensuring value for the health care dollars spent, controlling the individual components of care, decreasing the incidence of unnecessary service, and increasing the likelihood that commonly accepted performance standards and treatment protocols are used [86].

Considerations of the costs and benefits of providing a pharmaceutical service is necessary to determine efficiency. Efficiency is concerned with providing the greatest benefits at the lowest cost. Pharmaceutical services may improve the efficiency of health care if the increased cost of providing this service does not exceed the increased benefit in health care savings. The provision of a good pharmaceutical service may increase pharmacy-related costs because pharmacists require payment for professional services in addition to the drug product cost. However this increase in pharmaceutical costs is not necessarily a negative finding because the increase must be contrast with the concomitant savings in total health care costs. However, healthcare costs may increase if pharmacists receive payment for pharmaceutical services and fail to improve outcomes [66]. This is why outcome measurement (measuring the benefits) is of up most importance.

Some examples of outcome criteria of providing a quality pharmaceutical services that could be used in evaluating a service were documented in a paper by Farris et al [78] and include the following:

- Cure of disease
- Reduction or elimination in symptoms
- Slow disease process
- Prevent disease symptoms
- Increase patient knowledge of drug therapy
- Improved medication compliance
- Improved medication therapy
- Improved prescribing
- Improved dispensing
- Improved medication administration
- Improved drug monitoring
- Decreased drug interactions (eg drug-drug, drug-food, drug-disease)
- Decreased adverse drug reactions
• Decreased sub-optimal therapy
• Improved identification of drug allergies
• Improved identification of drug intolerances
• Reduced medication intolerance
• Decreased misuse/abuse
• Patient satisfaction

The prevalence of drug-related morbidity, the evidence that much of it is preventable, and the evidence that preventing it may actually decrease total costs while improving quality of care clearly establishes the element of the social need for a pharmaceutical service to be provided [23]. The evidence suggests that pharmacists can improve outcomes and decrease total costs of care but more research in this area is needed especially within the Australian private hospital sector.

Two pharmacy services of particular interest within this research were Medication Education or Counselling and Medication Review. These services have been documented as being provided in both hospital and community settings, hence spanning both health care arenas. As a result these services may be well suited to be provided to private hospital patients by servicing pharmacists at the time of discharge, hence providing a continuity of care approach.

Within this section (Section 1.3), we have explored the specific benefits of Medication Education (Section 1.3.1), Medication Review (Section 1.3.2) as well as the benefits of services including medication education and review when provided at the time of hospital discharge (Section 1.3.3).

1.3.1 Benefits of Medication Education Services to Patients

When reviewing the literature on the benefits of pharmacy services we find that pharmacist-conducted patient counselling or medication education is aimed at improving therapeutic outcomes by maximising proper use of medications [72, 87]. The literature concludes that it is important that inpatients receiving discharge medications should receive counselling prior to discharge, and the pharmacist should verify that patients (or their caregivers) understand the purpose, proper use, and expected outcomes of their drug therapy [85, 87, 88]. They should determine the patient’s
understanding through patient feedback. Supplemental written information should be provided when indicated [87].

The Indiana Health Service has set up counselling standards which are documented in Table 1.3 [89].

Table 1.3 Indiana Health Service counselling standards

<table>
<thead>
<tr>
<th>Counselling sessions for new medications shall include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The disease, symptom or complaint for which the patient is taking the medication</td>
</tr>
<tr>
<td>• The name and strength of the medication</td>
</tr>
<tr>
<td>• How the medication is to be used; for example, dose and dosage form; administration route, schedule, and technique; duration of therapy; preparation for use; proper storage; drug-drug and food-drug interactions and ancillary instructions</td>
</tr>
<tr>
<td>• Desired therapeutic outcome and what to do if it doesn’t occur</td>
</tr>
<tr>
<td>• Potential unwanted effects and what to do if they occur</td>
</tr>
<tr>
<td>• How to minimise unwanted effects</td>
</tr>
<tr>
<td>• Other treatment plan elements such as follow up appointments at the facility, eg. injections</td>
</tr>
<tr>
<td>• Presentation of supplemental written information as required</td>
</tr>
</tbody>
</table>

The literature has documented several benefits from pharmacists counselling patients. As early as 1978, Puckett et al [90] perceived that counselling would decrease misuse and medication errors as well as improve compliance.

Medication education has been shown to increase patient’s knowledge and adherence when provided in community and aged care facilities, which in turn may prevent medication misadventure [8-10, 91].

Counselling provided to elderly patients at the time of hospital discharge in a study conducted by Al-Rashed et al [92] showed that patient’s knowledge and compliance was significantly better than patients who had received no intervention. Furthermore the intervention group had less unplanned medical visits compared with controls.
1.3.2 Benefits of Medication Review Services

The definition of a medication review can be two fold. Simple medication review, often performed by clinical hospital pharmacists on ward rounds in an institutional setting [93-95], is the basic level of a review, and is often referred to as a medication chart review [96, 97]. This review entails a regular review to monitor for drug therapy interactions, adverse effects or reactions, and to clarify the drug order. It is a service performed to ensure that patients receive “the correct drug administered by the appropriate route in the correct dose at the proper time” [96, 97]. Similarly, community pharmacists may also perform this basic level of review at the time of dispensing, where they review a patient’s history in conjunction with the new prescription to detect a variety of potential drug related problems [94, 98-100]. These reviews are conducted with a small amount of information available; hence fewer medication issues may be identified.

In contrast, a comprehensive medication management review is a more sophisticated review comprised of systematic evaluation of a patient’s medication treatment regimen in the context of additional clinical information and the patient’s health status. It involves a team approach including the patient, pharmacist, medical practitioner and other health professionals as needed. Medication review findings and recommendations are made and follow-up of this information occurs.

The Australian practice standards for comprehensive medication management review comprise 10 criteria [7]. These include:

- Training in medication review
- Pro-forma for medication review process
- The on-going nature of medication review
- Patient consent
- The maintenance of medication profiles
- The use of medication charts and case notes in residential care facilities
- Documentation of the pharmacist actions
- Communication and reporting of potential therapeutic problems to the prescribing medical practitioner
- Reporting of medication administration issues to appropriate staff (nursing) in residential care facilities, and
- Documentation procedures for the outcomes of medication review.
As the process to perform a comprehensive medication management review is more in-depth and involved, the time taken to conduct a review is therefore longer and for practical reasons occurs independently of the dispensing process [1, 101]. Both review services have had benefits studied and documented. In 1987, Kidder [102] reviewed 23 studies produced between 1975 and 1987 studying the effects of pharmacists review in skilled nursing and intermediate care facilities. Fifteen studies, reporting drug use before and after the medication review, showed that the number of prescription use per patient decreased following review.

In Australia, medication reviews in the community were assessed in the Medaware campaign [103]. Eighty-four percent of patients interviewed by pharmacists had medication problems identified. Compliance issues, adverse drug effects and the need for referral were identified in 37%, 23% and 29% of patients respectively. Hospitalisation was prevented in an estimated 15% of cases and intervention was assessed as potentially life saving in 4% of cases. Eleven percent of patients had their medication costs reduced.

Total spending on medications were also reduced following simple review in a study published by Wright et al in 1994 [104]. This study showed that pharmacists made 177 clinical interventions from 1158 regular medications taken by 312 patients in nursing and residential homes. The potential cost savings were predicted to be in the order of 4672 pounds per annum, which corresponded to an 8.1% reduction in medication costs for those patients.

Comprehensive medication reviews in a domiciliary setting have been studied in Australia. Chen’s doctoral research revealed that several benefits resulted from this review process [101]. Medication regimen reviews, performed by pharmacists have demonstrated benefits such as reducing average numbers and monthly costs of medications [1, 11, 12]. Patients have also reported improvement in their health after receiving medication reviews [11].

### 1.3.3 Benefits of Pharmacy Services Provided at the Time of Hospital Discharge

The two services described above, Medication Education and Medication Review may be services that could benefit private hospital patients at the time of discharge. There is
little literature looking at the benefits of Medication Liaison Services, however in recent years this literature has been expanding.

A small study conducted in the Netherlands proposed that increased communication between community and hospital pharmacists could resolve potential patient problems on discharge. This study however did not appear to have a comparison group, however the study did report that many patients had uncertainties about their medication use at home including issues such as continuation of medicines or dosages that were not recorded and these issues could be resolved through communication [105]. If patients were provided with a comprehensive education service at discharge, as well as provided with written information, that could furthermore be distributed to community carers such as patients’ preferred Medical Practitioners and Community Pharmacists then these issues maybe less of a problem.

One study assessed pharmacists’ attitudes towards a standardised pharmacy to pharmacy referral form at discharge [106]. With this form, the documentation of medications as well as medical history could be passed from hospital to community pharmacy at the time of discharge. This documentation overall was very well received by the community pharmacists. In 85% of cases the pharmacists indicated that the referral form benefited the patient through indication-specific counselling. Eighty seven per cent of cases reported that the referral form had a positive impact on the pharmacist-patient interaction. This study, although mainly descriptive in nature, was able to demonstrate in a couple of cases, the prevention of medication misadventure. These patients had not understood or remembered information provided to them and due to the documentation, this could be followed up by their community pharmacist and patients put on the right track [106]. Further studies looking at standardised processes of communicating patient information to health care providers at discharge are needed, especially comparative studies where a cohort would receive such information and another group would not.

A study conducted in patients with cardiovascular problems employed a before and after design to assess the effectiveness of a discharge medication program [107]. This intervention was designed to alert physicians to missing secondary prevention medications at discharge using a standard data collection form. Patients that received the intervention had higher rates of necessary prescriptions such as aspirin, beta blockers, statins and ACE inhibitors subsequently added to their discharge medicines. Furthermore, the group followed during the intervention period had a lower risk of death
or hospital readmission than those discharged before the intervention was implemented. Unfortunately no conclusions about a causal link between the intervention and the observed improvements can be made due to the pre-post study design, as there could be several other influencing factors on these outcomes. However it was concluded that the discharge medication protocol was feasible and showed that appropriate evidence-based medicines could be prescribed at discharge [107]. In this study, a nursing-model was used, with recommendations made to physicians from the discharge-planning nurse. Trials will need to be done in order to establish which health care professional is best suited (more efficient and more effective) at providing medication related continuity of care services.

A Randomised Controlled Trial conducted by Stowasser [108, 109] showed that a Medication Liaison services may increase the number of clinical interventions patients’ receive from pharmacists, which have been shown to decrease readmission probability, medical procedures and lab monitoring as well as potentially saving many health dollars [110]. Furthermore, Stowasser’s Medication Liaison services were highly rated by Resident Medical Officers, General Practitioners and Community Pharmacists [109]. Stowasser’s Medication Liaison service involved compiling a comprehensive medication history prior to discharge, preparation of discharge communication including a list of medications on admission and discharge, corresponding therapy changes, intended duration of therapy, sources of supply, allergies and adverse drug reactions, new therapeutic devices, medication related-problems and actions required by the general practitioner. This information was forwarded to the patients’ general practitioners and community pharmacists within 24 hours of discharge [108]. During admission patients in the control and intervention groups received their usual level of clinical services provided by ward pharmacists; this may or may not have included discharge counselling. This study showed several benefits of the service, although these benefits were self-reported by patients in a follow-up questionnaire and perhaps actual changes in medications could have been collected via dispensed medication histories and doctors notes to improve the quality of such data. Furthermore, patients themselves may need to be empowered as to medication issues and changes at the time of discharge, and this study did not address the amount of information these patients were receiving. Nonetheless this is the first study within Australia to assess a Medication Liaison Service, and has formed the basis for this service to be further studied in different sectors within the health care system (e.g. In Cardiovascular patients, or within the private hospital setting)
Another randomised controlled trial has been conducted in South Australia by Spurling et al [111] and concluded that patients receiving a Medication Liaison Service (MLS) had an increase in knowledge, compliance and a decrease in the number of medication related problems compared to the control group. In this study, patients were randomised to either have a home visit within one week of discharge or the standard discharge procedure at the institution the study was conducted at. Those receiving the home visit had several issues identified 26% of problems were related to patient confusion and 45% were related to under or over usage of medicines. All patients were visited at home (control and intervention) six weeks post discharge and at this stage there was significantly less problems identified in the intervention versus control group. The MLS in this study was based on that of Stowasser [108, 109] and included the following six steps [111]:

- Step 1: Discharge planning assessment of patient as early as possible during admission
- Step 2: Compilation of complete medication history
- Step 3: Assessing the appropriateness of the medication regimen during admission and developing a medication management plan for discharge
- Step 4: Compiling and interim discharge summary and faxing this to the General Practitioner and Community Pharmacist
- Step 5: Providing a patient home visit within a week post-discharge and compiling a report. Visits consisted of
  - Reinforcing the doctor’s instructions
  - Establishing a comprehensive medication profile (including OTC and herbal preparations)
  - Ensuring ceased medications were no longer being used
  - Establishing patient medication issues
  - Establishing patient’s understanding of their medications, their use and relevant disease states and educating as needed
  - Checking medication storage and expiry
  - Checking the supply of medications including prescriptions required
  - Identify and resolve medication-related problems
  - Provide patients with CMI or other relevant information
- Step 6: Following-up with the General Practitioner and Community Pharmacist as well as hospital staff to discuss the medication management plan as deemed necessary.
These two randomized controlled trials, where medication liaison services were utilised have demonstrated the following outcomes [52]:

- Fewer medication-related problems
- Fewer visits to health care professionals
- Improvements in functional health status
- A trend to reduction in readmission rates

In contrast, a randomised controlled trial performed in the United Kingdom, showed no significant differences between patients receiving a discharge plan and those receiving standard care [112]. The primary outcome was hospital readmission within 6 months of discharge. Other outcome measures included death, attendance at medical clinics or surgeries as well as satisfaction, knowledge and adherence. The intervention included:

- An assessment of the medication
- Rationalisation of drug treatment
- Assessment of patient’s ability to manage their medication
- Provision of Information on current drugs
- Liaison with carers and community professionals

The discharge plan was given to the patient, their chosen community pharmacist and their general practitioner. Patients were followed up at home by their community pharmacist with 7-14 days of discharge. During this visit, pharmacists could check for discrepancies between what was on the plan and what was actually being taken by each patient. The only outcome that was different between the groups was patient knowledge which was higher in the intervention group. This study shows that more work may be needed in this area, if we are to establish routine funding for such services [112].

1.4 SUMMARY

Overall pharmacy services have shown several benefits across the sectors and there is growing evidence that services provided during the transition between hospital and home, may have patient benefits. The standardisation of such services may still be lacking, as within the literature some services appear to be loosely defined. Clear service definitions are required if implementation is to occur.
Medication Education and Medication Review are two services which may fit well into a Medication Liaison Model, and warrant further study between the settings. In order to implement such services clear guidelines will be pertinent. The review service in fact, is not a new concept for further continuity of care research. Recommendation 18 of the APAC guidelines report [52], acknowledges that continuity of care following discharge from hospital can be facilitated through the Home Medicines Review process, however often hospital-based practitioners (pharmacists and doctors) are not involved. The recommendation therefore is: That the commonwealth consider commissioning a focused project to (a) explore the feasibility of Medication Review and Home Medicines Review being initiated from within the hospital system, and (b) develop appropriate funding models. This project would need to involve general practice, hospital clinicians and pharmacists in both hospital and community settings [52].

The Australian private hospital sector, with respects to pharmacy services, has not been extensively explored, yet these hospitals are expanding with respects to the procedures now performed in this sector as well as the numbers of patients treated in this setting. The overarching philosophy of Pharmaceutical Care has been widely adopted by the world-wide pharmacy profession, yet implementation of a conceptual framework is difficult. Similarly the concept of continuity of care is important, yet the implementation of guidelines within Australia have not been fully adopted. Specific pharmacy services, such as medication education and medication review, however have been studied and have shown specific patient benefits.

Therefore the main theme of this research is to explore the extended roles pharmacists can play with an Australian private hospital arena, specifically in providing medication education and medication review services to patients around the time of hospital discharge.

1.5 BROAD RESEARCH AIMS

The aims of this research were to:

- Explore appropriate models and methods to facilitate the implementation of a Medication Education Service and a Medication Review Service to private hospital patients.
- Implement and evaluate these services in a sample of Private Hospitals.


2 PHASE ONE AND TWO INTERVIEWS AND FOCUS GROUPS

2.1 INTRODUCTION

Before the initiation of this study, work had been previously done to explore pharmacy within the private hospital setting [4]. This work had identified that pharmacists were interested in providing professional pharmacy services (e.g. Medication Education and Medication Review) within a private hospital setting, however they had identified that they would require facilitators (e.g. remuneration, training, a standardised approach) in order to provide such services. In order to develop a standard applicable procedure for implementation, it was necessary to further seek individual’s opinions working within this sector.

This section describes the results of a series of in-depth interviews with private hospitals pharmacists, the results of two preliminary focus group discussions with a range of health care professional working inside the private hospital sector in New South Wales as well as follow-up discussions with discharge planners/nurses and practicing pharmacists on model development. This phase of the research focused on exploring two specific professional pharmacy services, medication education to patients and medication review services in order to inform the design of an intervention project, implementing the two professional services to patients in private hospitals in New South Wales.

2.2 AIMS AND OBJECTIVES

The overall aim of this qualitative research was to find appropriate models and methods to facilitate the implementation of the two professional pharmacy services, namely, a medication education service and a medication review service. In general terms the in-depth interviews performed explored pharmacists perceptions of what these services should look like within the private hospital setting, whereas the focus groups mainly explored how the actual research project would be implemented and evaluated.

The specific objectives of the in-depth interviews with pharmacists were to:

- Explore the perceived feasibility of providing the services
- Identify barriers that may prevent implementation
• Identify how pharmacists perceived they would provide the services, including which members of the health care team may be involved and which patients would benefit and when each service would be best provided
• Identify processes that may need to take place before the implementation and evaluation could occur
• Inform the proposal of service models that could be explored in a focus group environment with a variety of health care professionals and consumers.

The specific objectives of the focus groups were to:
• Explore health care professionals’ views on the proposed services and models of implementation for the research project
• Refine the proposed research models for implementation
• Identify barriers to research implementation
• Identify processes that needed to take place before research (implementation and evaluation) could occur.

2.3 METHODS

Background
Qualitative techniques may be used for a wide range of research purposes. They may be chosen as the primary research method or used to compliment quantitative research [113, 114]. Qualitative methods are useful as an exploratory phase of research and particularly essential when the researchers have little knowledge about the area of investigation [115]. In this study a qualitative approach was adopted as a means of exploring new services to be developed within the private hospital sector.

The main types of qualitative techniques are interviews, focus groups, and observation studies. Of these, interviews are the most commonly employed in pharmacy practice research [116]. However the use of focus groups has become increasingly prominent [117].

Interviews may be classified as structured, semi-structured or unstructured, and may be one to one or group interviews. Structured interviews involve tight control over the format of the questions and answers. In essence, the structured interview is like a questionnaire administered face to face with the respondent invited to offer limited option responses. The tight control over the order of questions and range of responses...
has the advantage of 'standardisation'. In contrast semi-structured interviews are a lot more flexible in terms of the order in which topics are considered and more significantly let the interviewee develop ideas and speak more widely on issues raised by the researcher. Unstructured interviews go further in the extent to which emphasis is placed on the interviewees' thoughts. The researcher aims to be unobtrusive, and introduces a theme or topic and then lets the interviewee develop their ideas and pursue their train of thought. Semi-structured and unstructured interviews are really on a continuum, and it is likely that any interview will slide between the semi-structured and unstructured scale [118].

One to one interviews are the most common form of semi-structured or unstructured interviews and involve a meeting between one researcher and an informant. These interviews can be easier to arrange than a group interview and the opinions and views expressed stem from one source. Group interviews are where the researcher involves the use of more than one informant. During a group interview subjects should interact with one another and the discussion should operate at the level of the group. Group interviews can, however hold the prospect of drowning out certain views of people, and views expressed may be ones that are perceived to be ‘acceptable’ within the group [118].

For straightforward questioning, phone interviews can be less expensive, less time-consuming and can have quite high response rates; however they rely on interviewees having to answer the phone and may introduce various amounts of bias. As with most conversation, you are trying to build a relationship of trust where the other person feels free to speak. Fundamentally, the person being interviewed is actively processing the researcher to find out where they stand in relation to the interviewees own world [119]. Face to face interviews can assist or hinder this formation of a relationship of trust depending on how the interviewee perceives the researcher. If there are vast differences between the two parties with regard to sex, age, ethnicity, social status, educational qualifications or professional expertise this can influence the nature of the data that emerges [118].

Observational studies are where the researcher systematically records descriptions of events, behaviours and artefacts in the setting of interest [120]. Observational studies allow the researcher to discover complex interconnections [121], however the researcher may have a selective perception, and influence the phenomenon being studied [120, 122].
Methods Utilised
Semi-structured interviews were employed for the initial phase of this research as there were some specific themes that needed to be explored. Furthermore, we wanted to give the pharmacists being interviewed adequate opportunity to relay their opinions and thoughts on the two services being proposed. Face to face interviews were chosen so we could collect some observational data (i.e. non verbal cues) as well as for the convenience of the persons being interviewed, in that most interviews took place at the interviewee's place of work and they could therefore have the opportunity to attend to urgent pharmacy matters during the interviews if needed. One-to-one interviews occurred at most sites, however at one hospital more than one staff member had input into the discussions. It was revealed that after several interviews with pharmacists servicing private hospitals it may be also appropriate to discuss research issues in a group environment where ideas could be developed using input from each other's experience. Focus groups were arranged where some nurses and pharmacists discussed the proposed ideas. As some preliminary implementation models could be developed following the interviews with pharmacists servicing private hospitals, focus groups seemed to be the best way to get other key stakeholders opinions (nurses) on the proposed models to confirm that they would be acceptable and manageable within the current private hospital and community structure. It must be noted that interview participants were asked about how these services would work in a real-life setting, but made comment on research methodology at certain times. For this reason the results are divided into general service model results and research model results. Focus group participants were mainly asked about the research models, however also made some comments on the actual services themselves.

After the implementation model had been developed for the research, based on the results of the interviews and focus groups, there was need to discuss this project proposal with other key stakeholders, namely general medical practitioners, medical specialists, nurses, community pharmacists and consumers as they would be having specific roles in the proposed services and their input would be vital in fine-tuning the service models.

2.3.1 Sample Selection and Recruitment
Sampling in qualitative research is often fundamentally different to sampling in quantitative research. The aim is to describe the process involved in a phenomenon,
rather than its distribution. Because of this qualitative research typically uses non-probability sampling techniques [115]. There are however, several sampling techniques available.

Pharmacists servicing private hospitals had been identified in previous research. A group of these pharmacists were conveniently selected including pharmacists that serviced hospitals from both on-site and off-site pharmacies as well as those in metropolitan and non-metropolitan areas. Pharmacists were contacted via telephone and asked if they would be willing to participate in an interview about two specific pharmacy services. Details were faxed to pharmacists willing to participate and an interview time and date was arranged.

Focus group members were also conveniently selected. Initially pharmacists servicing private hospitals were recruited via telephone conversations. Some pharmacists were then asked to nominate other health care professionals and consumers which resulted in two focus groups being held consisting of nurses, discharge planners and pharmacists.

2.3.2 Interview Procedures

For initial in-depth interviews an interview plan was designed to meet the specific study objectives (Appendix 1). The interview contained open-ended questions relating to each of the specific pharmacy services (medication education and medication review).

The main topic areas for the pharmacists were:

- The feasibility and benefits of providing a medication education and review service
- How each pharmacist would go about providing the services
- The potential barriers or problems with service provision
- The processes that needed to be put in place for the services to be provided.

At the time of these interviews the researcher provided each pharmacist involved with an information sheet, consent form and definitions of the two professional pharmacy services to be discussed (Appendix 2-4). The researcher then explained the objectives of the research and requested permission for the proceedings to be audio-taped and all pharmacists consented. All interviews were conducted at the work site with the
exception of one, which was conducted in the Faculty of Pharmacy at the University of Sydney.

For each Focus group a template of research service provision models informed by the results of the in-depth interviews were tabled. These proposed models formed the basis for most of the discussion. Some additional discussion was held regarding project implementation processes and perceived barriers. Both focus groups were held at the participants’ work places.

2.3.3 Data Processing and Analysis

A complete verbatim transcript of each interview was typed, read and thematic analysis conducted utilising Nvivo software package for qualitative analysis. Each transcript was scrutinized and words, sentences and passages were coded into nodes and subsequently nodes were further categorised into child and sibling nodes.

Focus group transcripts were also typed verbatim. These transcripts and notes were then read and re-read to identify analytical themes and categories and coded in the same way as the individual interviews.

2.4 RESULTS

2.4.1 Semi-structured in-depth interviews

A total of 8 interviews were conducted with 11 different pharmacists taking part in the interviews, representing 11 private hospitals in NSW. The majority of the interviews were one-to-one, however at one site four pharmacist were involved in the interview procedure, however two of these pharmacists took part on and off, in-between their normal working functions (e.g. dispensing, answering the phone etc.). Four interviews were conducted outside metropolitan Sydney; the other four were conducted in Sydney. Seven interviews were conducted at the pharmacist’s workplace (hospital or pharmacy) and one interview was conducted in the Faculty of Pharmacy, University of Sydney. The hospitals being serviced currently by the interviewees included 5 hospitals with an on-site pharmacy, and 6 hospitals with an off-site pharmacy model, as well as 5 hospitals located outside metropolitan Sydney and 6 located in Sydney.
2.4.1.1 Medication Education Service

The interview process was broken into two sections, the first section discussed issues about the medication education service. Pharmacists were given the following outline of what may be involved in the provision of a medication education service based on previous work done within The Faculty of Pharmacy, University of Sydney [123]:

<table>
<thead>
<tr>
<th>Medication Education Service</th>
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<tbody>
<tr>
<td>Medication Education is the provision of information using appropriate communication methods, including written information to an individual patient to promote understanding on drugs and actions to improve the quality use of medicines.</td>
</tr>
</tbody>
</table>

The pharmacists' role is to:

- Assess patients' health beliefs regarding medications and use this information to tailor sessions to their needs
- Assess patients' levels of knowledge and confidence about their medications
- Assess patients' perceptions of drug therapy outcomes including effectiveness and adverse effects experienced
- Interact personally with patients, encourage them to ask questions and voice concerns
- Provide relevant information in an easy to understand, interactive manner, regarding patients' medication regimens tailored to their needs (both written and verbal information to be provided)
- Reinforce advice given to patients by fellow health care professionals

It is important to note that many pharmacists already provided some medication education, or counselling services in the hospitals they serviced, however these services are often provided on an ad hoc basis and there is no standardised procedure followed. Nonetheless, some pharmacists' comments related to what already happened in their institutions at that time and not always their perceptions of how it might happen in the future.
2.4.1.1.1 Feasibility (Objective 1)

Pharmacists were asked about how they felt about providing a medication education service. All of the pharmacists were very positive about the provision of such a service.

“*It is almost essential, in ideal circumstances it would be done for everybody*”

“I think it is essential, like you can’t not do it, particularly in certain patient groups.”

“I believe we have got to do it”

“It is ideal if they are well enough to understand or intelligent enough to understand”

“I think it is a fantastic idea”

A couple of pharmacists really thought that it wasn’t just a good idea, but that it had to happen, and there seemed to be a sense of urgency about the need for such changing roles.

“The role of pharmacy is really having to change within a private hospital because the time is changing and we have to get more into a professional role…that is what our responsibility is to the patient anyway”

“The pharmacy really should do something or they could put a vending machine in”

Many pharmacists articulated the aim of such a service.

“So what you are looking for here is a standard procedure of educating them. How to take it, side effects, what to look for etc.”

“What we are aiming to do is make sure they have the information, and that we can transfer than information to their GPs and…. To their local pharmacist”
2.4.1.1.2 Perceived Benefits and Shortfalls

The benefits of such a service identified in the interviews included the opportunity to optimise therapy.

“You can’t optimise therapy by a cursory look at a prescription, and that is a lot of the times what we do, but you can’t optimise therapy for a patient just doing that, you need to take a more holistic approach”

One pharmacist commented on giving the patient an understanding of their medication and increasing their confidence about using the medication.

“I can see that being of real benefit in regards to the patient having an understanding of their medication and just being there to answer questions they may have about how confident they are about using the medication.”

Increasing knowledge was a common theme.

“I think it is an unfair expectation for them to remember off the top of their head what they are on and how often they take it, but if you present them with a packet they should be able to tell you what it is for and how often they take it.”

One pharmacist commented on a medication education service as giving the patient control and empowering them to take care of themselves.

“It gives them back a feeling of control as well, because in hospital when the nurses are giving them all their medications a lot of them become very passive and then the transition from being in hospital to being at home, I mean it is traumatic enough that they are not well, but then they have to start taking responsibility, particularly if you can get in quite early and keep them informed, telling them what they are getting and why and then the transition may be a little easier”

One benefit many pharmacists perceived was improving patient compliance.
“You might concentrate on compliance and make it easier for them…. they need to know what has stopped and started and why”

“They will be more compliant and it won’t lead to them taking medications that should have been ceased that may inadvertently then lead to a worse outcome and cause more problems.”

All these identified benefits were summed up perfectly by one pharmacist:

“The benefits of the service are to avoid medication errors, improve compliance and optimise the medications. It is all well intended that you take this antibiotic three times a day, and if you take it after food you lose 20% from absorption, or if you didn’t complete the course it could defeat the purpose, so of course it is important. Every drug to take properly is important.”

As far as shortfalls of an education service were concerned, one pharmacist perceived that many patients would not remember the information they were told in the education service.

“Within a week they might remember the information but at the end of a month they will probably know as much as they did before”

This pharmacist thought, that those who would not remember the information, probably didn’t really want to know about their medication in the first place.

“A hell of a lot of patients aren’t interested, they just want to get on with life, taking their pills like putting petrol in a car”

Other pharmacists recognised that the service would take time and resources.

2.4.1.1.3 Barriers to implementation (Objective 2)

Several barriers were identified that could stand in the way of implementing a medication education service. Barriers included resources, hospital policy, and other health care professionals, the location of the pharmacy as well as patients themselves. These barriers are described below.
2.4.1.3.1 Resources

A lack of staff and remuneration seem to be the pharmacists’ greatest fears of starting to provide a medication education service.

“The problem is we don’t have ideal circumstances, we are restrained by our time, money and staff.”

“Money is an essential ingredient, the service has to be adequately funded. The only funding you need is for the pharmacist’s time, because there is definitely an extra time commitment”

“I don’t want anything that is going to make more work that you get no remuneration for.”

“Staff wise it is a big problem, we don’t have the staff to target everyone… it is time restrictions yeah.”

“Time is always pressing there are not enough pharmacists in the hospital.”

2.4.1.3.2 Other Health Care Professionals

Pharmacists also commented that they would need help from other health care professionals to make sure the medication education service is provided optimally. Some pharmacists perceived that sometimes there might be problems.

“A day before discharge would be an alright time to provide the service, provided that the discharge summary is done, that maybe half the problem knowing what they are actually going to be on and getting doctors to do the summary.”

“Being a multifaceted team here actually getting the communication between the 5 different parties that work together is always difficult, because the nurse might see a patient and say “this patient needs counselling” and then that nurse at night changes over so there is another party that comes in. The doctor may have to specify if they want it or they don’t and they also have to do all the paper work so we are informed too.”
One pharmacist explained that in the hospital she serviced, there used to be a discharge planner, however that position was now obsolete. Because there was no one there to inform the pharmacist of the discharge purpose this is a barrier in itself, not knowing when a patient will be going home.

“They may just come and go and we don’t get to see them…. There used to be a discharge planner and she would go around and inform, but that position in the hospital is now gone so it is up to the pharmacist at ward level to be there and to know and most of the time that is impossible.”

2.4.1.3.3 Policy

The way a hospital is set up and the functions that the hospital expects a pharmacist to perform can vary from institution to institution as described in chapter two. The hospital policy and bureaucracy could be a potential barrier to implementing the medication education service in some institutions.

One pharmacist who had recently implemented his own discharge counselling session stated:

“There were some barriers I had to get through here, there was hospital bureaucracy and principally consisted of committees that are supposed to ok things.”

One pharmacist servicing a hospital that had recently cut back on pharmacy services said:

“It is going to depend a little bit on what the institution is allowing to be performed in their hospital, our pharmacy role has changed dramatically in the last 12 months based on the management style of the hospital, so the model probably is great where you have the involvement of the hospital and the hospital is happy for you to have an involvement, where it doesn’t want your involvement it may be difficult to implement services to the patient because we are selectively being used on strictly a cost basis…..So it is really going to depend on what the hospital attitude is.”
Many of the pharmacists talked about the timing and knowing when a patient was going seemed to be the hardest thing where communication between specialists and other hospital staff was sometimes inadequate; some pharmacists did mention that surgical patients often do however have an estimated day of discharge.

"With regards to the day before, unless it was someone that had come in for a very predictable surgical procedure and had a 5 day recovery, and everyone went home on day 5 you could line yourself up before but it is really difficult because the doctors here do a round and say “yeah you can go” so timing is hard”

“We have a predicted discharge date so if they are in for a knee we know they are going to be here for 7-10 days. Medical patients are a bit harder, usually if they are at risk, if they are poly-pharmacy they will say, “look here is the discharge summary”, when it is done, but more often than not it is the morning of discharge when all the paper work starts to be done and you don’t often see any standardisations because of the high turn around here, they want to decrease bed stay so as soon as all the paper work starts to manifest kick them out. It is a little bit hard for us, and one thing we have to look at.”

Not all pharmacists thought that adjusting to hospital policy would be a major problem, many pharmacists as mentioned were already providing an education service and some hospitals welcomed the professional pharmacy services.

“What I have heard is that the private hospital would like pharmacy to conduct this clinical pharmacy bit and they might even be prepared to pay extra I think, I don’t know but I think that is what I heard.”

2.4.1.3.4 Location

To provide a face-to-face medication education service to patients, pharmacists would need to get out of their pharmacies and visit the patients on the wards. For some pharmacists this may be perceived as a problem and for others this was not a perceived barrier. One pharmacist that serviced one hospital on-site and the other off-site said:
“It doesn’t matter if you are on or off site we could do it just as easily at our other hospital were we are off-site, we are on-site still a lot of the time”

Other pharmacists felt that not being a pharmacy located within the grounds it maybe difficult to provide the education service.

“If you’re an off-site pharmacy and you are working for the hospital on a set day and you do your rounds, you could identify patients on admission, when things change, and before going home, but you would only have one day to do that, and if you had to do 5 (patients) you would make people wait”

Most pharmacists perceived they that could provide an education service whilst the patient was in hospital, and hence the location of where the patient lived was not applicable except if follow-up would be required

“For patients who are out of town, all we can do is do the Webster pack up, take it to them and talk them through their medications and hope they are going to do the right thing. It is really hard for us to have any follow-up”.

2.4.1.3.5 Patients

Some issues regarding the patients themselves were identified. One pharmacist identified that some patients may not want to wait to listen to a pharmacist, especially if their education session was happening on the day of discharge.

“People won’t wait, or if they do, their frame of mind is that they really don’t want to talk and then they don’t get the benefits anyway. I have had that before, when you get up there and the patient is quite ropeable and they just want to go and they don’t really care”

With regards to measuring patient knowledge, one pharmacist felt that much of what the patient was told maybe forgotten, and some patients may not really want to know much about their medications

“Most of them will have been told much of what they are going to be told here and they will say they know nothing about this because they didn’t give a damn or have forgotten and like ways if you ask them in a week they might remember
but at the end of the month they will know about as much as they did before…
That is what the 60 year olds and 70 year olds always believed. The less they know the better off they are”

One other pharmacist talked about patient attitudes.

“I am still trying to learn about private patients, because they have high expectations and they expect more than in the public system, so I think they can be touchy”

Some patient’s will not want the service for several reasons including how they are feeling, or whether the pharmacist is known to them

“Sometimes they are not well and don’t want to talk”

“If you are not their pharmacist and they don’t trust you or want you to interfere or don’t want your input you get to know about it very quickly, “I don’t need anything from you”, you get that line”

As far as not wanting to fill in questionnaires or surveys for the project, many pharmacists felt that the majority of patients will enjoy taking part

“Generally they will love it they will be doing something during the day”

“I actually think they will enjoy it”

2.4.1.1.4 Perceived Service Descriptions (Objective 3)

In this section descriptions are about the kinds of patients that should be selected for an education service, the timing of the service, the role of the pharmacist and other health care professionals, the time the service takes and the follow-up required as well as methodological issues for the research such as how to acquire consent.

Pharmacists were asked to describe how they felt they would provide a medication education service in their hospital. As previously mentioned some hospitals already provided such a service and hence spoke from experience rather than how they perceived it would happen.
2.4.1.4.1 Patient Selection

Many pharmacists felt that an education service really should be provided to everyone, but most explained to do this would be very difficult. Certain types of patients were identified as those that would be more appropriate to receive a medication education service.

“You would concentrate on patients who were not day only or overnight patients, so you would concentrate on rehabilitation, palliative care and medical patients, they are the patients who are on multiple drugs, they are the patients who need the most help.”

“I think it depends on the type of surgery they are having, how much they need. The cardiac patients having a bypass or something, it is important that you have the most input… they need to know what has stopped and started and why.”

“In a general medical ward I can see that being a real benefit but in a surgical area I don’t know that it is going to be as appropriate”

Some education candidates could be recruited due to the types and numbers of medications patients are taking.

“People who have had changes in drugs, or you could consider high risk drugs like warfarin, so certain drug classes as well”

“Elderly patients who have a history of poly pharmacy”

Some pharmacists realised that even with a select group of patients it may still be difficult to provide this service to all candidates.

“In a small operation, I wouldn’t be looking at doing any more than 2 patients a day, that is all that is practical otherwise it is too much. I would get too much interference in just keeping the wheels on…. We would like to do 8 out of 10 or 7 out of 10, I expect I won’t be able to do some people… I wouldn’t prioritise the patients, I would go to the nurse in charge, and I would say I have a choice of doing 2 of these 4 patients, which ones do you think I should do? And the nurse
would say “well this person is very with it and they are very competent and they have no problems at all” or “this patient is really confused”.

2.4.1.4.2 Timing of Service Provision

Pharmacists were asked about the most appropriate time to provide a medication education service. Interestingly, all pharmacists’ felt that this service should be provided prior to discharge.

“For a hospital service it has to be before they go home really because it would be pointless sending your staff off premises, and ideally it would be in the days before discharge….we want concordance and you only get that through education and understanding and we want that to carry over for when they leave so a few days before discharge”

“In a home environment, I think that is good, but that takes a long time and not everyone is from around here and the whole logistics would be hard, I think a day before would be alright.”

“I think closer to going home would be better, often their medications are being changed while they are in hospital anyway so they are going to go home on new medications I presume so around discharge time.”

“I would say 48 hours before going home”.

Some pharmacists felt that education should be an ongoing thing and that it should be provided each day, when needed for patients, especially when new medication had been started or other medications had been stopped.

“It is just a continuous thing, when something is stopped or started, when you are on your round, you look at it, and it might only be one thing a day, but you say ‘did you notice the little blue pill they gave you this morning” and then you will say “well that was that” and you can talk to them a bit, but at the end you should bring it all together and give them a list and go through it, but sometimes they know a little bit more about what is going on and it is not total bombardment when you are going to see them”
2.4.1.4.3 Delivery of the Medication Education Service

Many pharmacists described the service that they were currently providing and how it was conducted.

“We endeavour to walk them through everything that they get, whether they are having dispensed from here or whether it is still in their regimen, it will be done, so we ask the doctors at discharge to give the full list of their meds, not just what they need and we run through it.”

“Discharge counselling as a whole, the nurse can initiate it, the doctor can initiate it, a patient could initiate it. The patient request form is within the hospital, as soon as they arrive in the hospital there is a sheet and they fill it in and the nurse sends it down to us if the patient wants it. The doctor and the nurse ones come via the computer system.”

Some pharmacists talked about the tools they use to aid the counselling process.

“We use Ed-med and the medi-list system. We put those two together and we often use that in our discharge counselling. It is better than the discharge summary in the medical record.”

“The service includes an explanatory medication list, with all the details necessary for the community pharmacists to know what is happening”

One pharmacist also commented about the time it takes for their current service to be provided.

“It really takes between 30 and 45 minutes per patient, that includes the whole service, so that is the preparatory phase, the delivery phase and possibly the follow-up phase, rather the ringing of the pharmacists phase, which would take 4 or 5 minutes. Preparation phase - 30 minutes, Communication with patient - 15 minutes, It can take 10-15 minutes for the preparation, it is dependant on your own personal preference, I mean sometimes you get bogged down in things that are really interesting.”

The difference in current services being provided are that in many situations they are ad hoc and few use a standardised documentation form that can be forwarded to community carers. Furthermore no pharmacists have undergone any formal training in
order to provide the services they are currently providing. Many pharmacists recognised that they would like to standardise this process, as well as have a formal communication link between themselves and the patients’ community carers such as the General Practitioner and Community Pharmacist.

When asked about following patients up after the medication education service had been provided, there were mixed ideas on how this could be performed.

“For follow-up, when you get the patient’s consent specify that you would like to contact them at a later date to see how they are going, that should be included.”

“You could follow them up via telephone”

Many pharmacists felt the patient’s own community pharmacist and GP would best to follow-up patients once they had left the hospital.

“I think the community pharmacist could follow them up with the education type service, I think that would be the case here because we never see them again…. If they were in the area I would like to have the ability to go and settle them in and see what is going on but we don’t have the funds for it.”

2.4.1.1.4.4 Roles of Other Health Care Professionals

Many pharmacists spoke about other health care professionals being involved in the service.

“You can very often get an idea from nurses who work on the floor. They can highlight to you that there is a patient that is a bit confused or has a million medications and they don’t know which ones they are on… they are usually the best ones to tell you I think.”

“It should be initiated by the discharge planner…they would be the people who would coordinate the process.”

One pharmacist recognised that the hospital doctors may not need to be involved directly with the service, but they need to be aware that the service will be occurring.
“Communication with the doctors on what we wish to do is important. If you have a doctor that has a room full of patients, they should be communicated with and their consent determined.”

2.4.1.4.5 Methodological Issues

Acquiring Consent

Some pharmacists commented on how the consent process within the study and if people would be willing to participate.

“I don’t think you will have any problems with getting patients, I think they will be happy to have someone helping them. I don’t perceive you will have any problem with their pharmacists or their GP, because it is not like you are trying to get involved in the day to day life of the patient or infringing on those people’s responsibilities, all you are trying to do is optimise the service that is coming out of the organisation.”

With regards to identifying patient’s GP’s and local pharmacists

“Their local pharmacy, you would have to ask. The GP has usually referred them, so that is not a problem.”

“I don’t see that the medication education service provided by a hospital, I don’t see it going outside the hospital…it has got to be carried on by the community pharmacist, but I don’t see the need to contact the patient’s doctor. We ask them if we have permission to contact their regular community pharmacist, they say yes or no and then we ask who it is”

2.4.1.5 Processes that may need to take place before the implementation and evaluation could occur (Objective 4)

These issues once again can be divided into standard issues about the service, and other issues pertinent to the research.

2.4.1.5.1 Standard Service Issues

Funding Structure
Many pharmacists commented about being remunerated to provide such a service.

“The one thing I didn’t mention is money. That is an essential ingredient that the service has to be funded. The only funding you need for it is the funding for time, because there is definitely an extra time commitment. 45 minutes of professional time.

“I don’t want anything that is going to make more work that you get no remuneration for.”

Pharmacist Training
Pharmacists recognised that training would be required in order to standardise the service. No objection to training was noted.

2.4.1.5.2 Research Issues

Hospital approval
Before the service can be implemented, Hospitals will need to agree to take part in the research and health care professionals involved will need to agree to the process (nurses, doctors and pharmacists). During the interviews, some pharmacists spoke about what needed to happen in order for this project to get underway in terms of hospital protocol.

“I certainly think that this would be good for the hospital and I think that they are probably keen to look at different areas of quality assurance anyway. I think it would need to go initially to the CEO of the hospital and then with a back-up letter to whoever the quality assurance supervisor is of the organisation. Maybe the pharmacy could provide that letter to the hospital even.”

“Hospital administration…. yeh I think they would welcome the idea. There are clinical committees, so the chief pharmacist could present it there.”

“It should probably be referred to the medical board of the hospital. It should probably come through me. I would say I had been talking to you regarding a research project…I am sure they will be more than happy.”
Even after the hospital agrees to provide the service, the forms and letters to be used may need to be approved by the relevant persons.

“You have to have the tool accepted by the, first of all by the person in charge of the relevant areas, and then get them to forward it to the nursing division. ….You have to work with nurses so it has got to go through the nursing division. It also has to go through the hospital forms division or department. Then you have to have a way to explain to staff what you are doing, you have to have a form and a programme kick off.”

2.4.1.6 Proposed Medication Education Service (MES) Model (Objective 5)

After analysing the interviews, the thoughts of the pharmacists were assembled into a preliminary model of the service provision so that it could be discussed during focus groups with pharmacists, a range of health care professionals and hospital administrators. The Proposed MES model contains three broad steps (Figure 2.1):
Focus groups explored further each of these steps including what was to be involved, who was to be involved and how the process would occur (see Section 2.4.2).

This model is the culmination of the exploration of issues surrounding the Medication Education Service from the interview transcriptions. The Medication Review Service, similarly needed to be explored and follows.

2.4.1.2 Medication review service

The second part of the interviews focused on the Medication Review Service. Many issues identified were the same for both the Medication Education and Medication Review Services.
Pharmacists were given the following outline of what maybe involved in the provision of a medication review service based on previous work done with the Faculty of Pharmacy, University of Sydney [123].

### Medication Review

A medication review is a structured and collaborative health care service provided to consumers to ensure their medicine use is optimal and fully understood and that continuity of care is enhanced. Comprehensive information about the consumer and their medication use is collated and assessed in order to identify and meet medication-related needs and to identify, resolve and prevent medication-related problems in order to enhance quality of life and optimise the benefits achieved from medication use.

The pharmacist’s role is to:

- Interview patient to identify, assess and manage medication related issues
- Facilitate respectful and effective liaison with fellow health professionals on medication related matters contributing to optimum patient health outcomes
- Provide information on medication and related matters to patients, general practitioners, community pharmacists and other health providers
- Correct misunderstandings and provide reassurance regarding medications and their use

#### 2.4.1.2.1 Feasibility (Objective 1)

Pharmacists were again asked about the feasibility of such a service. Overall their comments towards this service were very positive.

"Once again it is very important."

"I think they are good."

"We need to step into this medication review."

The logistics of conducting the service within the hospital setting was divided amongst the group. Many believed that it should occur in their home setting.
“It is out of control for us for a patient here going home, we have to make sure that the link between the community pharmacist and the GP is heightened”

“You can’t do it like a DMMR…. There are loose ends that you can gain by doing a DMMR that you can’t gain from a patient being in a hospital”

“If you do a review you have to go to their home anyway, it is the only way in my mind that you can do a proper review, if you go into the house, because it is only when you are in the house that you can find what they have got.”

One group of pharmacists felt that they already performed part of the review service in hospital.

“I think we do it without us really knowing it, because we are following them so closely for so long, I think the review is actually happening….the review in many cases is there we just don’t formalise it.”

Some advantages to conducting a review during the patients’ stay were discussed.

“There are certain advantages of doing a medication review in a patient hospital. The advantages are that you have access to or could get access to all the medical records.”

One pharmacist was very hesitant to be involved in the review process

“We would be interested but I still find it very difficult to see that we can do the review…you have got to be awfully careful too that not too much channelling happens here because that is supposed to be organised by their regular pharmacy and pharmacist.”

One pharmacist articulated the shortfalls of the current system.

“What we haven’t done is been able to ensure that they interact with someone else out there and someone else is following them up and watching them. All we have been able to do to this point is educate the patient the best we can, write it all down and then send them all out and hope that it all gets fixed.”
2.4.1.2.2 Barriers to Implementation (Objective 2)

The pharmacists identified several barriers to the review service. Barriers included resources, other health care professionals, patients' preferences, hospital policy and location issues.

2.4.1.2.2.1 Resources

Many pharmacists identified that this process would take time and would need to be remunerated. Furthermore they recognised that staff assisting in this process would need to be trained.

“It is a problem of…. Having qualified staff and having funding”

“We are financed only for 2 pharmacists… and we don't have time to do that…we don't have the facilities or finances rather to do it.”

“I hate saying this, but it comes back to money, if you can offer X amount to sit down (and complete a review), I am only too happy.”

2.4.1.2.2.2 Other Health Care Professionals

Many pharmacists felt that General Practitioners may not want them as hospital pharmacists, providing the service.

“Doctor's consent that is the problem, not so much consent but quality communication with the prescriber, that is the main problem.”

“You have a lot of aggravation with your medical practitioners.”

“That will be a complication working with general practitioners.”

Doctors working within the hospital setting were not seen as a barrier in most interviews.

“They won't mind…I think they won't have a problem at all.”

“I think they would welcome it.”
One pharmacist however brought up the idea that if the patient had come in for review of their medications then the specialist may not want the pharmacist to interfere.

“It depends on the patient being admitted. If they are there for the very reason that their medications are going to be reviewed, they are having problems at home or there is a reason for them to be there, for whatever reason, but their medications are being reviewed by a specialist, then that will probably be more difficult. If they are there for you know they have got a broken hip or something and whilst you are there you are checking over their medications and you see there is a potential problem then I think that is going to be a lot easier.”

Some hospital pharmacists felt that if the review process was to be done in the community setting by the patients' preferred pharmacy that a barrier to implementation may the pharmacy itself, as it may not be set up to perform HMRs.

“It depends if that community pharmacy has the facilities to do the review”

And other pharmacists felt that it had to be local community pharmacy or else relationships could be jeopardised.

“We want their pharmacy to be active and involved in the care. If we step over them then the trust for the patient to their local pharmacy may be decreased same as the trust back to here, if they live far away and they are going to keep coming back here or calling us, that is not how it should work.”

2.4.1.2.2.3 Patient Choice

In keeping with the idea or notion of conflict between whether or not it is the hospital pharmacist or the community pharmacist that is involved, some patients themselves may have a preference and this may inhibit a particular service model being implemented.

“I think it may also depend on the relationship the patient has with their community pharmacy, because you find that there are certain patients who have seen the pharmacist for a very long time and would be a lot more comfortable for their community pharmacy to do it, and then there are those people who go to their local pharmacy when something is due and really don't
have any great allegiance to anyone and those people we might do it, so I think that is a factor”.

2.4.1.2.2.4 Policy
Hospital policy was mentioned as a barrier with respects to the processes that may need to take place in order to implement such a service and this was talked about in the context of taking time.

“It is a problem of getting the tools together, getting them organised through the hospital.”

Other procedures may get in the way of hospital pharmacists providing this review service.

“Hospital pharmacists are not all accredited and the arrangement to get the accreditation, and to accredit the pharmacy here under the arrangement is difficult, if not impossible, we have made enquires and we were refused participation…because we only have a section 94 and not a 90 I think it was related around that”

2.4.1.2.2.5 Location
The issues with location are similar to that of the follow-up after a medication education service. Many patients treated in private hospitals do not come from the surrounding area of the hospital and hence follow-up by the hospital pharmacist in certain circumstances would be impossible.

2.4.1.2.3 Perceived Service Descriptions (Objective 3)
Pharmacists were asked about how they thought the medication review service would best happen, including which would be the best patients, who would perform which tasks, where it would occur as well as the timing of the service. Furthermore some pharmacists commented on the research methodology that could be employed. No hospitals were currently providing a formal medication review service, and some pharmacists found it a challenge to imagine exactly how this may occur.
2.4.1.2.3.1 Patient Selection

With regards to which patients would be selected for the review process, most pharmacists felt that it would be similar sorts of patients that required the MES.

“It would be exactly the same”

“If they have got medications that are more likely to change down the line then they should get this second service.”

“Someone with multiple medical conditions.”

“Those who are elderly, at home by themselves and confused with their medications…on lots of medications.”

There were some groups of patients that pharmacists felt may not be appropriate. These quotes were with respects to patients undergoing cardiovascular surgery and came from a couple of hospitals.

“It is usually not wrong, because it has come straight from the specialist and it is totally fine and rational and they don't need anything else.”

“Once they are in hospital they have actually been reviewed by their doctor and their doctor may have asked other specialists to give consults so they have gone through a few doctors, I don't know what more I can add.”

This pharmacist felt that a specialist team also looked after patients in the psychiatric ward, and a review service may not be appropriate.

“There is a psychiatric ward there. I wouldn't get involved with the psychiatric patients only because there is an academic team from the university already looking after their own with a specialist psychiatrist coming in so there is a lot of input already, ands I think you have to be a specialist pharmacist in psychiatric drugs to start putting your foot in that area.”

2.4.1.2.3.2 Timing of Service Provision
With respects to the timing of the review service there were mixed views. Some pharmacists felt that an inpatient review may be appropriate and hence the review could commence very early with a patient's stay. As previously mentioned some pharmacist felt that they already provided reviews for patients having long stays anyway.

“While you might provide the discharge service in the few days before discharge, you might provide the medication review before that, you might provide it in the first few days or the middle of a patients stay rather than waiting for the last few days…. I think the review should be initiated as soon as possible because of the lag time in response.”

Most pharmacists thought a review could happen after the patient had been discharged and this would be a good link between hospital and home thus allowing the patient to receive the appropriate follow-up.

“We refer back to their local pharmacies…. although we have the chart here, we don't have the history, getting the GP is step one.”

2.4.1.2.3.3 Actual Delivery of the Medication Review Service

Pharmacists spoke about how they thought the review service would be provided. Many had trouble articulating this as they do not currently have any experience.

“I think it could be a modified medication review service, where one has a form, a purpose built, purpose designed medication review form that would sit in the patient’s notes. You write your medication review on this form (it probably would be double sided). It would be similar to the one we prepare for discharge and on that would be our recommendations and comments….The purpose of that is that the community pharmacist will now understand the changes that were made, or express concern about any changes that were not made and that are impacting medically on the patient, which the hospital pharmacist is not in a position to do.”

“The hospital pharmacist identifies the patient that would need this service, the initial part of this service, and then all the follow-up and all the actual changes and whatever happens is passed onto the community pharmacist.”
"When you have done the review you could discuss that with the GP who is more likely to be the one to suggest changes at that point and then you relay the final thing you have discussed with the GP and you hand that over to the community pharmacist, say we have done a review, discussed it with the GP, this is what the patient is on and this is what the GP is intending to do in the future, could you now follow-up on the patient from now on."

"When it kicks in it will say Dear Dr.... this patient is on these medications and we have highlighted these areas that need to be looked at, say diabetes control or hypertension, and that will go to the GP. From there it is going to be in the GPs court to initiate the DMR which is in lines with the agreement."

"There is no point spending all this time doing it, saying well this is going to go to the VMO who is not going to see the patient for 6months, it is going to go to the GP who has got no idea who we are, because we are a flash in the pan pharmacy for them...we want their pharmacy to be active and involved in their care."

"If you do a review you have to go to their home anyway, it is the only way in my mind that you can do a proper review, if you go to the house because it is only when you are in the house that you can find what they have got."

2.4.1.2.3.4 Follow-up

When asked about follow-up after a review service most pharmacists felt that that was definitely in the hands of the patient’s preferred community pharmacist.

"I think the follow-up should be communicated to the community pharmacist...I don’t see the hospital pharmacist getting involved, the community pharmacist would be taking over...the hospital pharmacist is kicking off the whole procedure and the follow-up needs to be done and reported back to the hospital pharmacist out of professional courtesy and also for audit purposes."

"I would like to see more follow-up at home, they are not really going to get the hospital pharmacist out there."
“we want to refer them back there, we want their pharmacy to be active and involved in their care.”

“We couldn’t keep all the patients we were recommending for reviews, because we couldn’t follow them all up.”

2.4.1.2.3.5 Roles of Pharmacists

As both pharmacists involved in servicing the hospital, as well as patients’ preferred community pharmacists may be involved, roles of each of these persons was discussed.

With respect to the community pharmacist, as previously outlined their role would be potentially the most significant with respects to performing an HMR, or they may just have a follow-up role depending on which service model is adopted.

“The community pharmacist aspect would work in the same way as the domiciliary medication reviews, where if the community pharmacist was not an accredited pharmacist he would have access to an accredited pharmacists in his practice.”

“You could just hand-over to the community pharmacist, say we have done a review, discussed it with the GP, this is what the patient is on, this is what the GP is intending to do in the future could you follow-up on the patient from now on.”

With respect to the role of the hospital pharmacist, as above it was either thought that hospital pharmacist should be responsible for the review process or they should hand-over the responsibility to the community pharmacist.

“You could communicate your desire for the community pharmacist to conduct a DMMR.”

“I think I am in a better position to conduct the review, because I have all the information right in front of me and while they are in hospital for 1 week, 2 weeks I have progress notes by the nurses and all that. It is a bit of an insult to me if I were to you know ask the community pharmacist to conduct a review”.
Some pharmacists felt that there would be a lot of collaboration between both hospital and community pharmacists in order to complete the review service.

“Even if we were doing the review we would probably talk to the community pharmacist anyway and it would probably be a collaborative effort because they would have known the patient for a long period of time.”

One pharmacist thought it should be the patient’s choice as to which pharmacist conducted the review.

“You could model it both ways, it is the patient’s choice and it would always have to be the patient’s choice. You may find that there are some people who have stock piling or something and they may not want their regular pharmacist to know about so they maybe more happy to have you discover their stash.”

2.4.1.2.3.6 Roles of Other Health Care Professionals

The other professionals involved in this service could include General Practitioners, Nurses/Discharge Planners, and perhaps specialist medical practitioners. Pharmacists in the interviews gave their views on the roles of each team member. Some pharmacists felt that the nurses/discharge planners who identified the patients initially for the MES could also identify patients needing reviews and coordinate the referral.

“The nurses are going to be the ones to help, they are the ones looking after the patients, and they know the ones who are going to have difficulty with their medications.”

“It would be up to the discharge planner…. so if we say ‘this person is a classic’ then it is up to the discharge planner to organise an HMR for the patient.”

The role of the doctors, specialists and GP’s, was discussed and it was acknowledge in most cases that they would need to start the ball rolling for the review process to occur.

“It could either come from the specialist that put the patient in, whether or not informing them that this service is available to any of their patients that do come in, because often there is a team of different people involved anyway with the
patient coming in, the GP, maybe the specialist, maybe more than one specialist, the hospital doctor as well, there is a whole variety of people that will be involved with that patients stay, any of those people, any of those professionals, medical professionals could initiate a review.”

The majority of pharmacists agreed that it should be coordinated by the GP.

“If you get someone with multiple medical conditions who comes in for surgery on their foot, you often find that people are not willing to touch any of their other medications, which is fair enough, because the people looking after them are surgical and they don’t want to fiddle with their heart medications, they don’t want to fiddle with their glaucoma drugs because it is not their area, so it is more difficult to do a review as an inpatient…. As far as getting that changed here, something they have been on for 15 years, that won’t happen.”

2.4.1.2.3.7 Research Issues

Acquiring Consent

Acquiring consent for completing a medication review during the research project is a more complex process depending on which model of medication review would be used for hospital patients. If the review process is coordinated from the hospital then consent maybe required from the GP and the community pharmacist as well as the patient before the review could occur and the order of obtaining consent could be difficult. Although the same people need to consent in an outpatient setting through the HMR process, it is initiated by the GP and an appropriate pharmacist can be contracted to conduct the review, after the process has been initiated.

Some pharmacists commented on how they perceived it could occur.

“Before you do a medication review, you tell the pharmacist to identify the prescriber. Then it would be necessary to talk to that person, to communicate with that person in some way, obviously person to person is better, and get a consent or permission to perform a medication review, from that doctor, that is the only way. If you couldn’t contact the doctor or communicate with them to get their consent, then it shouldn’t go ahead.”
“With the review in their local area, that more needs to be initiated by their doctor.”

“If we have to initiate this and then we have to initiate consent from the GP then it is an entirely different thing. We don’t need the aggravation of telling the GPs these are the ones that need to be reviewed….they won’t do anything, they will just want money.”

“It is going to be in the GPs court to initiate the DMR, which is in the lines with the agreement.”

Pharmacists commented that there would be no problem getting consent neither from pharmacists nor from patients.

2.4.1.2.4 Processes that need to take place before the implementation and evaluation could occur (Objective 4)

As for the MES, the same issues were identified as needing to be addressed before implementation. A funding structure would need to be developed which may include remuneration for handover of information, remuneration for patient recruitment/identification and a method of tapping into commonwealth funds for review, if the HMR process was to be used. Furthermore, pharmacists may require training if they themselves complete the review. As for MES, research issues were also identified which included, hospital approval being sought, as well as perhaps approval for the project to be carried out in the community setting by divisions of general practice.

2.4.1.2.5 Proposed Medication Management Review Service Model (Objective 5)

After reviewing the qualitative data certain models of service provision can be proposed for the Medication Review service. This service may piggyback onto the MES or it may stand-alone.

Two broad models were created based on the results of interviews (discussed in focus groups):

- Hospital pharmacist provides the MMR commencing whilst patient is in hospital.
- Community pharmacist provides the MMR in line with the HMR process.
2.4.2 Focus groups

Two focus groups were conducted in Orange and Wagg Wagga. Although this may give a rural bias to the results, it was deemed appropriate as many of the interviews had occurred in metropolitan sites, and from previous research, it was felt that there was little differences between metropolitan and rural hospitals in that patients from all over the state are often treated in these institutions and do not always come from surrounding areas. Focus groups consisted of three pharmacists, a nurse and a discharge planner. The proposed research models for service delivery were discussed in each of these groups in order to conclude the most suitable structure for future development and implementation within the research project.

2.4.2.1 Items for Discussion for the Medication Education Service (MES)

Figure 2.2 outlines the research model that was proposed and discussed within these focus group sessions.

2.4.2.1.1 Refinement of MES model

All focus group participants agreed that for the ease of patient recruitment it should be patients on 5 or more medications, and they should be identified at ward level by a nurse or discharge planner. No specific target group was identified as all hospitals had different cohorts of people; however certain patient groups such as “psychiatric patients” were identified as perhaps not being suitable for the study.

Nurses concluded that patients could be identified before discharge and pharmacists agreed that they would need at least 24 hours notice (if possible) in order to prepare for the MES. Pharmacists and nurses believed that the MES service would be beneficial, and should mainly relate to going through each medication with the patient, and documenting these on a medi-list or medication card.

Dissemination to the patient’s preferred GP and community pharmacist of a documentation form of medications and any patient problems was generally thought to be a good initiative, with fax or postage the most preferred media to be used. Generally it was thought that follow-up of patients should then be in the realm of their community carers (GP and Pharmacist) and that the hospital nurses and pharmacist would not generally be required to follow-up issues with the patient after discharge. The
conclusion of these focus groups was that MES would be a good initiative and the process of recruitment could be stream-lined following these discussions.
Patient identified by pharmacist during their rounds or by Nursing Staff of Doctor. (Maybe targeted on admission). Selection criteria include: Patient’s on multiple medications and/or patient’s commencing new therapies after hospital procedures or those on medications that require monitoring. Exclusion criteria: patients who don’t speak or understand English, those in a critical condition or who are demented or have other psychiatric conditions. (Judged by the HCP)

Patients approached by recruiting staff (pharmacist, doctor, nurse, or admissions staff) (ideally this should occur early in patient’s stay) and asked if they are willing to participate in study. Patients informed that they will either be assigned to an active or comparison group to receive a medication education service and review service, and that they will be followed-up by a researcher after discharge. They will be informed that this will require them to fill in some brief questionnaires throughout the study period and may involve their GP and pharmacist. Consent form signed and details of their regular community pharmacist obtained and their preferred GP.

Trained pharmacist, servicing private hospital (SPHP) to be notified 24-48 hrs before patient discharge by patient’s doctor or nurse. Nurse on the ward is to administer the questionnaire to the patient, explaining that patients may use any written material to assist with their answers. During this time, the pharmacist should collect relevant background information about the patient’s medication management from the medication chart, hospital notes and any other health care professional.

Pharmacist then to approach active patients and deliver the MES. These patients are then screened for suitability for medication review, and randomized to active or control.

All patients to be followed up after discharge (1-3 weeks) and repeat the questionnaires. These will be sent via mail and followed up with a telephone call by the researcher. Active patients will be encouraged to visit their community pharmacy who will have been contacted and briefed on the study and asked to provide a follow-up brief medication education service to the active patient. Background information regarding the patient’s medication management will be obtained from the community pharmacists and GPs.

Final Questionnaire sent at 3-4months and followed up with a telephone call from the researcher.
2.4.2.2 Items for Discussion for Private hospital Medication Review

The two research models proposed in the focus groups are outlined in Figure 2.3 and Figure 2.4:

**Figure 2.3 Proposed Research Model 1 of PHMR (Private Hospital Medication Review)**

1. Patients on 5 or more medications fit the criteria for PHMR.
2. Those patients identified as fitting the criteria for PHMR in the active group will then have their preferred GP contacted. If the GP consents to the medication review, the GP will then initiate the medication review through the HMR process.
3. Researcher to follow-up with patient’s preferred community pharmacist and GP on changes and recommendations made, number of medications before and after review and cost of medications before and after.

**Figure 2.4 Proposed Research Model 2 of PHMR (Private Hospital Medication Review)**

1. Patients on 5 or more medications fit the criteria for PHMR.
2. Those patients identified as fitting the criteria for PHMR in the active group will then have their preferred GP contacted. If the GP consents to the medication review, the SPHP (servicing private hospital pharmacist) will commence the medication review.
3. After completion of the review the SPHP then sends a report to the patient’s GP and Community pharmacist and follow up with a telephone case conference.
4. Researcher to collate changes and recommendations made and number and costs of medications before and after review.
2.4.2.2.1 Refinement of Medication Review Model

In both focus groups participants decided that Model 1 was preferred, as HMR was a service that already existed within the community and could piggyback quite nicely on top of the MES service.

As focus group participants all agreed that the MES receivers should all be those on 5 or more medications, it was also recognised that all participants would fit the criteria for HMR. It was therefore decided that all patients recruited to the study should be randomized from initiation into one of three study arms:

- Control (standard hospital discharge service)
- MES only
- MES and patients should be flagged for HMR (process to occur as it would usually within the community, i.e. GP referral).

2.4.2.3 Barriers to Research Implementation Identified in Focus Groups

With the two models generally agreed upon, both Pharmacists and Nurses identified that time would be perhaps the largest barrier to conducting the research project. Time to recruit patients and implement questionnaires was thought to be minimal but was still identified as a potential problem depending on the area of the hospital involved.

The administration that might be involved within the project was also identified as a potential problem. Remuneration for time involved was certainly identified as perhaps aiding in the recruitment and administration process. It was however identified that individual nurses, or discharge planners would not receive personal reimbursement for their time, however suggestions as to the remuneration to the hospital could be filtered to a particular ward’s education or social fund, was seen as an acceptable solution.

Other barriers were identifying patients in enough time before discharge to let the pharmacist know that the MES service was required. Many procedures are scheduled and an estimated discharge time is often known, but it was recognized that there would always be some patients that would be difficult to predict discharge times.

Of particular concern in one focus group was the randomization process, were the nurses felt it was unfair if someone had been identified as needing a service that they may fall into the control arm of the study and not receive any pharmacy input. This discussion was interesting, seeing that the pharmacy service at the time of interview
was limited to only one day a week, hence there must have been several patients at the time that did not have any pharmacy input.

2.4.2.4 Processes to Occur Before Research Implementation

In the focus groups there was discussion regarding what would need to occur before the research project could be implemented. Researchers were alerted to the fact that hospitals would need to consent to participate within the research, and this process may be different at different sites. Some hospitals would have the project approved at a quality assurance meeting and it would form part of their quality process. It was noted that some hospitals may have an ethics committee that may need to approve the process. It was decided that each hospital should be approached individually, usually with some aid from the servicing pharmacist to allow the researcher to find out which persons were best to contact and what approval process would be needed at each site. Generally it was though that the CEO would need to consent and nominate a hospital staff member to look after the project.

Pharmacists (nominating to flag patients for HMR, rather than conduct this service themselves), felt that little training to provide the MES service would be required. Training on the project design and how to conduct the research was identified as being need by nurses/discharge planners and pharmacists.
3 INTERVENTION METHODOLOGY

3.1 INTRODUCTION

This section outlines the methods employed in order to:

- Develop and pilot project materials
- Implement the research models
- Evaluate the impact of the research intervention.

Stage one outlines the search for original validated questionnaires within the literature, the ethics approval process, the development and refinement of project materials, the development of the data management plan and the piloting of materials within a hospital population. Stage two deals with the intervention implementation at each hospital site.

STAGE ONE (METHODOLOGY AND RESULTS FOR PHASE 3)

3.2 RESEARCH TOOLS AND OUTCOME MEASURES

The literature review had revealed that professional pharmacy services like medication education could provide benefits such as an improvement in patient knowledge and compliance. A search for tools to measure these aspects was therefore commenced. Few knowledge questionnaires were identified, and all of these dealt with a specific disease state (e.g. The Knowledge, Attitude and Self-Efficacy Asthma Questionnaire) [124].

Tools used to assess compliance that were identified included the Morisky Scale [125] and the Brief Medication Questionnaire (BMQ) [126]. The BMQ is useful in testing both patient knowledge of their medication taking behaviour and their compliance as this questionnaire, asks patients to recall their medications names, strengths and what they were used for as well as how many times a day they took their medicines, as well as the number of times they missed their doses. It also asks about any bothers people maybe experiencing whilst taking their medications. As the questionnaire included the knowledge questions it was felt that patients maybe able to be scored on their accuracy, as well as receiving the potential for non-adherence score.

Another questionnaire that appeared to be relevant and useful was the Satisfaction with Information about Medicines Scale (SIMS) [127]. This tool developed by Horne et
al from the United Kingdom, was developed to assess the extent to which patients feel they have received enough information about prescribed medicines [127]. This seemed a particularly useful tool in tracking if patients’ satisfaction with their information about medicines changed following an intervention such as a medication education service.

Other outcomes measures decided upon based on research by Chen et al, following the medication management review intervention suggested we could monitor patients’ medication at different time-points following MES and HMR to track changes in numbers and costs and types of medications [1].

In summary the primary outcome measures initially chosen within the research included:

- Knowledge
- Adherence
- Satisfaction
- Numbers of medications
- Costs of Medications

3.3 ETHICS APPROVAL

The project plan was prepared for approval with the University of Sydney Human Ethics Committee. Approval was granted on 7/7/03 (Appendix 5).

3.4 PROJECT MATERIALS

Project Materials were designed in consultation with a graphic artist. The contents of materials were based on the qualitative phases of the research as well as the literature.

3.4.1 Information Sheets and Consent Forms

As the project had several layers, information sheets and consent forms needed to be developed for each research participant. Firstly an information sheet and consent form for the hospital representative or CEO was developed (Appendix 6 and 7) as these would be the crucial people that need to approve the project in order for it to occur in
their institution. Information and consent forms were also designed for the Discharge planners/Nurses that would be recruiting patients and the Private Hospital Pharmacists that would be involved in the MES (Appendix 8-10). Information sheets and consent forms also needed to be developed for the patients involved in the research (Appendix 11 and 12) as well as their nominated community pharmacists and medical practitioners. Cover letters to accompany information sheets for community pharmacists and medical practitioners were also designed, as these people would not be able to be personally recruited by a researcher, but rather would receive a letter in the mail, asking them about their willingness to participate within the research. Depending on which study arm the patient was randomised to, would determine which cover letter and information sheet the community pharmacist or medical practitioner would receive (Appendix 13-20).

3.4.2 Information regarding HMR

In order to inform community pharmacists and medical practitioners about the research they needed to be sent relevant information. As outlined in Section 3.4.1, each participant would receive the relevant cover letter, information sheet and consent form. Pharmacists and Medical Practitioners of patients randomised to study arm three (flagged for HMR), would need to receive information regarding how to conduct an HMR and patients in this arm would also need to receive information about this process. The following information sheets were therefore developed (Appendix 21-23):

- Patient Information Sheet (Home Medicines Review)
- Pharmacy Information (HMR – How to start)
- Pharmacy Information owner/staff accredited pharmacist (What to do when a patient requests an HMR)
- Pharmacy Information external accredited pharmacist (What to do when a patient request an HMR)
- GP HMR Fact Sheet and Process Chart.

3.4.3 Questionnaires

The original patient questionnaires chosen were the Satisfaction with Information about Medicines Scale (SIMS) and the Brief Medication Questionnaire (BMQ) as outlined in Section 3.2. The SIMS scores were to be collected at three time points (before
discharge, one week after discharge and three months after discharge). The BMQ scores were to be collected one week after discharge and three months after discharge. Base-line scores for the BMQ could not be collected as the questionnaire asks patients to document how they have been taking their medications within the last seven days. During hospital admissions the majority of patients are not self-medicating, but therefore this instrument was useful to be compared between the study arms post discharge. These two questionnaires utilised in the pilot study can be viewed in Appendix 24 and 25.

3.4.4 Discharge Planner Documentation Form

Collection of base-line medication data for patients in all study arms was necessary. Patients receiving MES would have their medications documented by the pharmacist but those in the control arm would need to have their medications documented for the purpose of study evaluation. Therefore all patients had their medications documented by the discharge planner/nurse before randomisation into one of the study arms (Appendix 26). This documentation had three purposes:

- Collection of medication data for study arm one patients at base-line
- Information would be required by the Private Hospital Pharmacist so as they could prepare their MES session with the patient (i.e. bring relevant information such as Consumer Medicines Information, or Self-Care Fact Cards etc)
- Comparison analysis of documentation accuracy of discharge planners verses pharmacists.

Other data was collected on this documentation form including patient allergies, current medical conditions and any other relevant history that may impact on the MES service.

3.4.5 MES Documentation Form

The MES documentation form was divided into sections (Appendix 27). It was necessary to keep this form brief so as it would be user friendly for pharmacists yet comprehensive enough to pass on any relevant details/issues to the patients preferred community pharmacist and medical practitioner.
The first section of the form was the patients’ details. An important documented point within this section was the patients’ reason for admission. It was felt this should be included in order to help with the flow of information from hospital carers to community carers. The next section documented the patients preferred community pharmacy and medical practitioner details. This information could be used in order to forward the documentation to the appropriate health care professional, but also for community carers to contact each other either for medication review referral (study arm three), or clarification of treatment.

The next section involved the documentation of medications and directions (10 lines, based on assumption that private hospital patients would on average be on less than 10 medications). The last section on the first page involves the documentation of patient conditions and allergies. Common medical ailments within Australia, in alphabetical order were placed in this section based on Australian Bureau of Statistics Data [128] and discussions with pharmacists within the private hospital sector, as well as the Medication Assistance Service (MAS) Pharmacist Record Form [129]. As patients were to be excluded from the research with specialised needs, we did not include Cancer or Mental Illness as categories, however included an open category for other diseases to be listed.

The second page of this documentation form was for capturing the essential components of the medication education service. The initial section developed was the summary of information provided to the patient. Based on standards developed for the provision of information to patients by the profession [6, 7], as well as consultation with pharmacists, a check list developed by Websterpak®, and a review of the Medication Assistance service (MAS) Pharmacist Record Form [129], a check list of possible items that could be discussed was developed.

The next section developed was the documentation of patient issues. These items were primarily based on a checklist developed by Websterpak®, and included issues such as adherence (we wanted to identify issues with adherence as this was to be one of our outcome measures), adverse effects, as well as issues such as impaired sight (which may cause difficulty with reading labels), difficulty in swallowing medication or difficulty with opening medication lids. This section was refined after consultation with a practicing private hospital pharmacist, as they felt that issues such as sight impairment, swallowing difficulties and difficulties with opening lids could be combined into one check box, labelled “other”. Also after this consultation it was agreed that the patient
issues should be at the top of the second page of the MES, as these issues should be raised early within the MES session so as to tailor the service to the patients’ needs and issues.

The recommendations section was again a culmination of information from the literature [6, 7, 129].

The final section was space for the pharmacist to document their details so as patients, medical practitioners or community pharmacists could contact them to discuss any issues if necessary. The date of the MES was also important to document and finally we also asked pharmacists to document the time taken to provide the MES service, so this data could be used to calculate average service time and hence in future calculate appropriate remuneration levels.

Therefore it can be seen that slight but potentially significant changes were made to the MES documentation (compare Appendix 27 and 28), before pilot testing this form.

3.4.6 Medication Card

A medication card was developed as an adjunct to the MES service (Appendix 29). This card was for the patient only and needed to contain easy to follow instructions that patients could understand. Several medication cards exist within hospitals, each allowing pharmacists to document similar types of information. This medication card was a combination of one already in use at the pilot hospital site, as well as one developed by the Commonwealth Department of Veterans’ Affairs and The Pharmaceutical Society of Australia [130].

3.4.7 PowerPoint Presentation to Hospital Staff

A verbal and visual presentation was designed (Appendix 30), in order to explain the project design and what would be required of individuals within the research project. This presentation was available for hospital staff (CEO, discharge planners, nurses and pharmacists) requiring more information about the project, and could be used as an overall explanation of what the research was about, or could be used as part of the training of project subjects.
3.4.8 Pharmacist Training Manual

A training manual needed to be developed for private hospital pharmacists. The main purpose of this manual was to explain the MES process in a step-wise fashion. Interesting methodology was adopted to create such a manual. A very draft version of a manual was created with an outline of the tasks to be performed by the Private Hospital Pharmacists. A training/consultative session was then held with a Private Hospital Pharmacist where the MES process was explained, with the help of this draft manual. This session was tape-recorded and the transcript was then used to further develop the manual, allowing more detail about how each step of the service should be provided. This culminated in the final pharmacy training manual to be used in the project (Appendix 31).

3.4.9 Discharge Planners/Nurses Training Manual

A training manual was developed for nurses/discharge planners, using a similar process to the pharmacists' manual. This manual's, however, main purpose was to explain the Discharge Planners role within the project, as well as how to identify and recruit patients that would fit the criteria for MES/HMR. A draft manual was used for the pilot project and refined for use in the main data collection part of the study (Appendix 32).

3.4.10 Pharmacist Kit

A kit was prepared for Private hospital Pharmacists containing all the materials they would require for the project. The kit was packaged into purple carry files, which were easily transportable from pharmacies to the hospital wards. Each kit contained the training manual, and several MES files, that each contained the MES documentation form and a medication card. These files were to be given to each patient receiving an MES, and CMIs or other information could be added to each file. These kits also contained the researcher’s business card, in case any questions needed to be asked whilst providing MES services, as well as pharmacist referral to general practitioner forms, in case referral for patients was needed (Appendix 33).
3.4.11 Hospital Box

A box with all project materials required for the research was prepared in order to be placed on each ward participating in the research (Appendix 34). Each box contained the envelopes for patient randomisation. As there were three study arms, there were three types of envelopes (however from the outside, all envelopes appeared the same).

Envelope One contained an instruction sheet for discharge planners/nurses/researchers co-ordinating the research (Appendix 35). It also contained a green envelope with information for the community pharmacist, regarding the need for pharmacy print outs (Appendix 13 and 15) as well as a white envelop to be posted back to the researcher with project data.

Envelope Two contained an instruction sheet (Appendix 36), a green envelope for the community pharmacist containing project information (Appendix 14 and 15), a purple envelope for the Medical Practitioner containing project information (Appendix 18), and a yellow envelope to be posted back to the researcher.

Envelope Three contained an instruction sheet (Appendix 37), a green envelope for the community pharmacist containing information (Appendix 16, 17 and 23), a purple envelope for the medical practitioner containing relevant information (Appendix 19, 20 and 22) and an orange envelope for the researcher.

As outlined in the discharge planner/nurses guidelines, Discharge planner documentation, consent forms and MES documentation forms were to be added to the various envelopes (see Appendix 32).

The box also contained the discharge planner/nurses guidelines, the researcher’s business card, a list of NSW pharmacy names addresses and phone numbers, (to aid in completing the documentation form), a copy of the ethics approval letter, as well as all the patient information sheet, consent forms, SIMS questionnaires and the Discharge planner Documentation Forms. Furthermore, a tape recorder, tapes and batteries could be stored in this box, for the pharmacist to use if they were to tape record their MES session. (Tape-recording could form part of the training as the researcher could review the MES session and give feedback to pharmacists on their performance).
3.5 DATA MANAGEMENT PLAN

Using the ECHO model (Economic, Clinical and Humanistic Outcomes) [131] and the Process, Impact Outcome model of data analysis we developed a plan for the types of data that could be analysed throughout the project (Table 3.1, Table 3.2 and Table 3.3).

Table 3.1 Economic data

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Analysis</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROCESS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacist time taken to complete MES</td>
<td>MES documentation forms and tape recordings</td>
<td>Descriptive statistics ie mean time to perform MES</td>
</tr>
<tr>
<td>IMPACT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs of medications across study arms and time points</td>
<td>Medication lists and PBS costings</td>
<td>Analysis of repeat measures ANOVA</td>
</tr>
<tr>
<td>OUTCOME</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.2 Clinical data

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>Data Source</th>
<th>Analysis</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation of Discharge Planners vs Pharmacists</td>
<td>Documentation forms</td>
<td>Comparison of proportions of correctness (Chi-square)</td>
<td>Assumes that information collected by pharmacist is accurate, however we have community pharmacy printouts to back up this information</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMPACT</th>
<th>Data Source</th>
<th>Analysis</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pharmacy services/ interventions provided</td>
<td>MES Documentation form</td>
<td>Descriptive statistics</td>
<td></td>
</tr>
<tr>
<td>Adherence across study arms and time point</td>
<td>BMQ scores</td>
<td>Analysis of repeat measures ANOVA</td>
<td>Assumes BMQ instrument measures adherence</td>
</tr>
<tr>
<td>Number of medications</td>
<td>Documentation forms and community pharmacy printouts</td>
<td>Analysis of repeated measures ANOVA</td>
<td>Numbers are assumed correct. Patients may visit more than one pharmacy or may have hoarded medications. Data from pharmacies is approx 75% accurate.</td>
</tr>
<tr>
<td>Types of medication changes across study time points</td>
<td>Documentation forms, printouts. Coded via MIMS classification codes</td>
<td>Analysis of repeat measures ANOVA</td>
<td>MIMS classes used vs AMH classes</td>
</tr>
</tbody>
</table>

OUTCOME
Table 3.3 Humanistic data

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>Data Source</th>
<th>Analysis</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>That MES and HMR are delivered appropriately</td>
<td>MES and HMR reports from pharmacists</td>
<td>Review of findings and recommendations by an expert consultant OR panel rating of reviews (1-5)</td>
<td>All pharmacists have been trained or accredited</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMPACT</th>
<th>Data Source</th>
<th>Analysis</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient satisfaction with information across time points and between groups</td>
<td>SIMS scores</td>
<td>Analysis of repeat measures ANOVA</td>
<td>SIMS instrument may prompt patients to seek information, hence improvements could be seen in all study arms. Sensitivity of the instrument?</td>
</tr>
</tbody>
</table>

3.6 PILOT TESTING OF INSTRUMENT FEASIBILITY

A pilot project was conducted at one hospital site to test the feasibility of the research materials. The hospital was asked for its willingness to participate within the research and a meeting was held with the researcher and the private hospital representative to explain the project. This information was then taken to the CEO and consent was obtained. A private hospital pharmacist and discharge planner/nurse from the institution were then trained using the developed project materials.

Issues arising from implementation of the research project included:

- The recruitment process. Recruitment was slow with the first patient being recruited almost one month after the project commenced within the hospital.

- Timing of patient discharge. As pharmacists needed time to prepare the MES and leave their pharmacies to go to the wards, patients needed to be identified
as early as possible so as not to be missed by the pharmacist. Details of the expected discharge date were not forwarded to pharmacists within the pilot.

- The SIMS instrument. This instrument could be confusing if not read properly by patients. Some small explanation therefore was required for some patients which would become the role of the discharge planner/nurse or research assistant when recruiting patients. This seemed to be most difficult for very elderly patients.

- BMQ/SIMS. The BMQ/SIMS instrument was sent to patients one week post discharge. Only two patients returned this instrument in the pilot, and one was returned blank. The other, was filled in by the patient, yet the data was difficult to verify, as it appeared new medications had been started, and either several medications had been left off, or the patient had had medications ceased. Other sections of the instrument had been left blank.

- Discharge planner/Nurse training manual. More details could be added to this manual to explain the administrative process of choosing envelopes and dealing with the distribution of patient information after recruitment. Few example forms were originally contained in this manual.

After the pilot, these minor amendments were made to project materials and the recruitment processes:

- Support would be offered to all hospitals in order to aid in patient recruitment. Several levels of support would be offered, varying from phone call/ e-mail support, right up to the actual recruitment of patients and the project coordination, with the nurse/discharge planner responsible for the identification of patients only.

- The Discharge Planner Documentation form essentially remained unchanged, other than the expected date of discharge was added, to alert the Private hospital pharmacist on the amount of the time they had to provide the MES service
Discharge Planners/Nurses or Research Assistants were made aware of the fact that a small explanation of the SIMS questionnaire may be required by some patients in order for them to complete this instrument. All patients after being recruited were offered more explanation about question one of the tool if needed.

The BMQ was eliminated from the project and replaced with a different adherence instrument. The BMQ, although initially considered appropriate, ran the risk of not being completed and returned by patients as it may have appeared too cumbersome. Secondly in the original validation study by Svarstad et al [126], the BMQ had been administered by a pharmacist and not self-administered by the patient. We decided that it was too difficult to ask patients to self-administer this questionnaire based on the results within the pilot. The Medication Adherence Report Scale (MARS) was therefore adopted, which is a five item scale used to predict patient’s adherence scores. This instrument was developed by Rob Horne et al [132] from the UK, and although the instruments validation is unpublished there is a draft paper available about its validation on the medicines partnership website. It was felt that although we would not be able to gather information on patient knowledge, we could gather information on satisfaction, adherence and numbers of costs of medicines with few problems, and we could now gather this information at all study time-points (Appendix 38).

Finally the discharge planner/nurses manual was updated to include example forms to aid with project administration. This manual would also be used by project coordinators, if hospital discharge nurses/staff were unable to perform the project coordination.

STAGE TWO (METHODOLOGY FOR PHASE 4)

3.7 PROJECT DESIGN

A prospective randomised controlled trial with three arms of the study was used:

Study Arm One: Control patients. These patients would receive the standard services provided by the hospital. In most cases this is a limited pharmacy service (mainly a supply function).
**Study Arm Two:** MES Only. Patients randomised to study arm two would receive the Medication Education Service provided by the servicing hospital pharmacist. This service would be documented on a standardised form, which the patient would keep, as well as a copy be forwarded to their preferred community pharmacy and medical practitioner.

**Study Arm Three:** MES + HMR. Patients randomised to study arm three would receive the Medication Education Service and documentation as described above, and also be flagged for a Home Medicines Review Service. This service could only occur on the referral of their medical practitioner to their preferred community pharmacy (utilising the existing service methodology).

Four primary outcomes of the interventions were to be measured, these included:
- Patient Satisfaction with Information about Medicines scores
- Patient Adherence scores
- Numbers of Medications
- Costs of medications

The study design and time points for collection of outcome measures can be seen in Table 3.4.
Table 3.4 Study design

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>MES at Discharge</th>
<th>MES at discharge + HMR within 3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>T0</strong></td>
<td>SIMS</td>
<td>SIMS</td>
<td>SIMS</td>
</tr>
<tr>
<td>(24-48hrs</td>
<td>MARS</td>
<td>MARS</td>
<td>MARS</td>
</tr>
<tr>
<td>before</td>
<td>No. Meds</td>
<td>No. Meds</td>
<td>No. Meds</td>
</tr>
<tr>
<td>discharge)</td>
<td>Cost Meds</td>
<td>Cost Meds</td>
<td>Cost Meds</td>
</tr>
<tr>
<td><strong>T1</strong></td>
<td>SIMS</td>
<td>SIMS</td>
<td>SIMS</td>
</tr>
<tr>
<td>(1 week</td>
<td>MARS</td>
<td>MARS</td>
<td>MARS</td>
</tr>
<tr>
<td>post</td>
<td>No. Meds</td>
<td>No. Meds</td>
<td>No. Meds</td>
</tr>
<tr>
<td>discharge)</td>
<td>Cost Meds</td>
<td>Cost Meds</td>
<td>Cost Meds</td>
</tr>
<tr>
<td><strong>T2</strong></td>
<td>SIMS</td>
<td>SIMS</td>
<td>SIMS</td>
</tr>
<tr>
<td>(3 months</td>
<td>MARS</td>
<td>MARS</td>
<td>MARS</td>
</tr>
<tr>
<td>post</td>
<td>No. Meds</td>
<td>No. Meds</td>
<td>No. Meds</td>
</tr>
<tr>
<td>discharge)</td>
<td>Cost Meds</td>
<td>Cost Meds</td>
<td>Cost Meds</td>
</tr>
</tbody>
</table>

The Null Hypotheses were:

**Ho1:** There is no difference in the mean age across the three study arms.

**Ho2:** There is no difference in the proportion of males across the 3 study arms.

**Ho3:** There is no difference in the number of diagnoses across 3 study arms.

**Ho4:** There is no difference in the numbers of medications used across study arms and at different time-points.

**Ho5:** There is no difference in the costs of medications.

**Ho6:** There is no difference in SIMS scores.

**Ho7:** There is no difference in MARS scores.
3.8 RANDOMISATION AND RECRUITMENT OF HOSPITALS

A list of NSW private hospitals was compiled using Department of Health and Ageing data and supplemented with information from internet searches and the yellow pages (Appendix 39). Hospitals were then excluded from the randomisation process that were highly specialised (i.e. those with mental health facilities and the children’s rehabilitation hospital) and hospitals with less than 20 beds. Each of the hospitals were then stratified according to their pharmacy model (off site or on-site) and their location metropolitan and non-metropolitan.

Table 3.5 and Table 3.6 represent the random list of hospitals located in metropolitan Sydney with off site pharmacies, and those in metropolitan Sydney with on-site pharmacies respectively. The original plan was to also recruit hospitals outside metropolitan Sydney, however with the many recruitment issues that occurred within Sydney, the data collection required much input from the researchers, hence no Non-Metropolitan sites were included in the final sample.
<table>
<thead>
<tr>
<th>Hospital</th>
<th>Number</th>
<th>Location</th>
<th>Specialty</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mt Wilga</td>
<td>77</td>
<td>Off Metro</td>
<td>Specialised</td>
<td>Rehab</td>
</tr>
<tr>
<td>Wolper Jewish</td>
<td>66</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Strathfield Private</td>
<td>99</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Roma</td>
<td>34</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Castlecrag</td>
<td>46</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Sydney Private</td>
<td>106</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Holroyd</td>
<td>40</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Westside</td>
<td>43</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Poplars</td>
<td>37</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Minchinbury</td>
<td>44</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Sydney South West</td>
<td>81</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Dalcross</td>
<td>53</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Hirondelle</td>
<td>42</td>
<td>Off Metro</td>
<td>Specialised</td>
<td>Rehab</td>
</tr>
<tr>
<td>Delmar</td>
<td>50</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Mosman</td>
<td>60</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Longueville</td>
<td>32</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Metropolitan Rehab</td>
<td>35</td>
<td>Off Metro</td>
<td>Specialised</td>
<td>Rehab</td>
</tr>
<tr>
<td>Manly waters</td>
<td>52</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Eastern suburbs</td>
<td>44</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Peninsular</td>
<td>47</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>President</td>
<td>50</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Kareena</td>
<td>103</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Alwyn Rehab</td>
<td>26</td>
<td>Off Metro</td>
<td>Specialised</td>
<td>Rehab</td>
</tr>
<tr>
<td>Hurstville community</td>
<td>57</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Hunters Hill</td>
<td>66</td>
<td>Off Metro</td>
<td>General</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.6 Randomised list of Sydney Metropolitan hospitals with on-site pharmacies

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Code</th>
<th>On/off</th>
<th>Metro</th>
<th>Specialty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mater Misericordia</td>
<td>185</td>
<td>On</td>
<td>Metro</td>
<td>General</td>
</tr>
<tr>
<td>St George Private</td>
<td>206</td>
<td>On</td>
<td>Metro</td>
<td>General</td>
</tr>
<tr>
<td>St Vincent’s Darlinghurst</td>
<td>230</td>
<td>On</td>
<td>Metro</td>
<td>General</td>
</tr>
<tr>
<td>St Luke’s</td>
<td>99</td>
<td>On</td>
<td>Metro</td>
<td>General</td>
</tr>
<tr>
<td>Westmead Private Hospital</td>
<td>136</td>
<td>On</td>
<td>Metro</td>
<td>General</td>
</tr>
<tr>
<td>Sydney Adventist</td>
<td>329</td>
<td>On</td>
<td>Metro</td>
<td>General</td>
</tr>
<tr>
<td>The Hills</td>
<td>186</td>
<td>On</td>
<td>Metro</td>
<td>General</td>
</tr>
<tr>
<td>Lady Davidson Hospital</td>
<td>112</td>
<td>On</td>
<td>Metro</td>
<td>Specialised, Rehab</td>
</tr>
<tr>
<td>Prince of Wales Private</td>
<td>168</td>
<td>On</td>
<td>Metro</td>
<td>General</td>
</tr>
<tr>
<td>North Shore Private</td>
<td>164</td>
<td>On</td>
<td>Metro</td>
<td>General</td>
</tr>
</tbody>
</table>

The first hospitals on each of the lists were approached in the randomised order. In most cases the pharmacist servicing the hospital was contacted initially to find out details of key contact persons, as well as establish their willingness to participate. In some hospitals it was the pharmacist that drove the project, arranging approval from CEOs, identifying discharge planners/nurses and enquiring about ethics approval, at other hospitals, it was the researcher who was responsible for following up these key issues. Once hospital approval was sought, including CEOs or representatives, Discharge planners/nurses and pharmacists the training commenced.

Researchers initially set out to recruit 15 hospitals and at least 300 patients. Hospitals were supposed to include both metropolitan and non metropolitan settings. Due to time constraints and recruitment difficulties, the number of hospitals recruited was 7 and all of these were in Metropolitan Sydney. Recruitment of institutions took a considerable amount of time (this was unexpected from initial qualitative work).

3.9 TRAINING
The standardised training manuals (Appendix 31 and 32) were distributed to both pharmacists who would be involved in the project and nurses or discharge planners. In most cases, these groups were trained separately, although in some institutions the pharmacist sat in on the discharge planners/nurses training. A power-point presentation (Appendix 30) was presented to each participant. Obviously for pharmacists the main focus of their training was on service delivery and the 10 main
steps of the MES service were explained in detail with a worked example within their manual. For discharge planners/nurses, the main focus in their training was on patient recruitment and the completing of the documentation form, as well as the study protocol. In many cases, during this training, it was identified that assistance from a researcher may be needed in order to aid with the project administration and patient randomisation.

3.10 PATIENT RECRUITMENT

Patients were identified by discharge planners or nurses on the ward that were taking 5 or more medications. These patients were subsequently approached by either a discharge planner/nurse, or a researcher and asked if they were interested in partaking in the research. After the initial pilot, a list was kept at each hospital of the numbers of people approached and the reasons for refusal into the study.

At the time of recruitment, patients were issued with an information sheet, a consent form, and the SIMS/MARS questionnaire. These were left with the patient for a short while after a brief explanation of the project and questionnaire if warranted.

Patient recruitment was not as simple as predicted. Although nursing staff/discharge planners were trained to recruit patients and trained in the project administration, their recruitment rates were low. A possible explanation may be that this was not seen as a priority, and ate into their daily routine. Although incentive payments were linked to patient recruitment, these monies were directed to the hospital rather than the discharge planners themselves, which may be a reason for slow uptake. For this reason research assistants and the principle researcher were often needed to aid in patient recruitment and project administration. As the principle investigator was responsible for the vast majority of recruitment of patients in many institutions, it was difficult for them to be at all hospitals each day of each week. Furthermore, as a researcher was required on-site to aid the recruitment process, it was not deemed feasible to recruit hospitals from outside metropolitan Sydney within the twelve month time frame as travel time and costs would be significantly more than initially predicted.

Initial sample size calculations were based on the best case scenario, i.e. set with 90% power and trying to detect very small changes between outcomes within and between study arms (Figure 3.1). For this reason the sample sizes were ambitious. If we
recalculate the sample sizes based on larger more clinically relevant changes and set them at a lower power a more realistic sample size estimate is gained (Figure 3.2).
### Number of Medications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>Post Test</th>
<th>Standard Deviation</th>
<th>Controls per Case</th>
<th>P value (%)</th>
<th>Power (%)</th>
<th>Estimated Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean number of medications at baseline</td>
<td>8</td>
<td>6.5</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>90</td>
<td>84</td>
</tr>
</tbody>
</table>

(Chen et al [1] have shown an average decrease of 1.5 medications per review, and average starting number of 8 is estimated in a private hospital setting, as compared to 10 in an aged care facility.) Note. A smaller starting number of medications, e.g. 6 and a decrease to 5 with a standard deviation of 2, estimates a starting sample size of 84.

### Costs of Medications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>Post Test</th>
<th>Standard Deviation</th>
<th>Controls per Case</th>
<th>P value (%)</th>
<th>Power (%)</th>
<th>Estimated Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean cost of medications / month at baseline</td>
<td>$160.00</td>
<td>$146.00</td>
<td>30</td>
<td>1</td>
<td>5</td>
<td>90</td>
<td>96</td>
</tr>
</tbody>
</table>

(Chen et al [1] has shown approximately 10% decrease in costs per month after review, initial costs based on $20 per medication where average number is 8). If starting with $120.00 a decrease to $108.00 with a standard deviation of 26 estimates a sample size of 99.

### SIMS scores

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>Post Test</th>
<th>Standard Deviation</th>
<th>Controls per Case</th>
<th>P value (%)</th>
<th>Power (%)</th>
<th>Estimated Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean score at baseline</td>
<td>9</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>90</td>
<td>84</td>
</tr>
</tbody>
</table>

### MARS Scores

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>Post Test</th>
<th>Standard Deviation</th>
<th>Controls per Case</th>
<th>P value (%)</th>
<th>Power (%)</th>
<th>Estimated Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean score Baseline</td>
<td>20</td>
<td>21</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>90%</td>
<td>84</td>
</tr>
</tbody>
</table>
## Figure 3.2 Adjusted sample size calculations

| Number of Medications | Mean number of medications at baseline = 8  
|                       | Mean number of medications post test = 6  
|                       | Standard Deviation = 3  
|                       | Controls per Case = 1  
|                       | P value = 5%  
|                       | Power = 70  
|                       | Estimated Sample Size = 28  
| Costs of medications | Mean cost of medications / month at baseline= $160.00  
|                       | Mean cost of medications post test = $140.00  
|                       | Standard Deviation = 30  
|                       | Controls per case = 1  
|                       | P value = 5%  
|                       | Power = 70  
|                       | Estimated Sample Size = 28  
| SIMS scores           | Mean score at baseline = 9  
|                       | Mean score post test = 11  
|                       | Standard Deviation = 2  
|                       | Controls per case = 1  
|                       | P value = 5%  
|                       | Power = 80  
|                       | Estimated Sample Size = 16  
| MARS Scores           | Mean score Baseline = 20  
|                       | Mean score post test = 22  
|                       | Standard deviation = 2  
|                       | Controls per case = 1  
|                       | P value = 5%  
|                       | Power = 80%  
|                       | Estimated Sample Size = 16  


As recruitment was not as forthcoming as predicted, we recalculated sample sizes (Figure 3.2) and decided that by December 2005, we would aim to have approximately 30 patients in each study arm. As a three month follow-up was needed for patients, December 2005 needed to be the recruitment cut off, so as to allow the three months for follow-up and sufficient time for data entry and analysis.

3.11 SCORING OF SIMS/MARS

The Satisfaction with Information about Medicines Scale (SIMS) [127], is a seventeen item questionnaire, designed to measure patients’ views about the amount of information they have received about certain aspects of their medications. The options available to answer each of these 17 questions regarding the amount of information received are: none needed; none received; too little; about right; too much. The scoring of these is interesting with a score of 0 (meaning no satisfaction), if none received, too little or too much is the response. A score of 1 is attributed to an answer of either none needed or about right (showing satisfaction with the amount of information received). These scores are then added for each question to give a total score out of 17 (see example in Figure 3.3).
In the above example the patient completing this would have received a score of:

- one for question one,
- one for question two and
- zero for question three.

The Medication Adherence Report Scale (MARS) [132], is a five item questionnaire that measures patient behaviour when taking their medications and has been validated against the Morisky adherence tool [125]. The five items are: I forget to take them; I alter the dose; I stop taking them for a while; I decide to miss out a dose; and I take less than instructed. The options available are on a five point likert scale and include: always; often; sometimes; rarely; and never. A score of one is attributed to always; a score of two is attributed to often; up to a score of five for never along the scale. Hence the total score for the five items is between 5-25 (see example in Figure 3.4).
In this example the patient would have received a score of 3 for question one, 5 for question two, 5 for question 3, and 4 for questions 4 and 5. This would have given a total score of 21 out of a possible 25.

3.12 DISCHARGE PLANNER DOCUMENTATION

After the patient had consented to participate in the research, the discharge planner/nurses were asked to document patient details on the standardised documentation form (Appendix 27). This information was recorded in an access database where the accuracy of drug information documented was assessed by a researcher, a pharmacist and a medical practitioner independently. Documentation was coded as accurate if the coder felt that they could prescribe, dose or dispense the
medicine for this patient with the information provided. If there was ambiguity with
doses, names of medications or strengths, meaning that the document was coded as
unreliable. A kappa statistic could be generated to look at the reliability of coders
(doctor and pharmacist).

3.13 PATIENT RANDOMISATION

After consent was obtained, and the documentation form was complete, the discharge
planner/nurse, or research would select an envelope from the hospital project box. This
envelope would contain information regarding which study arm the patient had been
randomised to (control, MES only or MES + HMR). The instructions on each sheet
inside the envelopes could then be carried out by the relevant party. Patients that had
been randomised to receive a Medication Education Service, then had their discharge
planner documentation form faxed to the servicing pharmacists, in order for the
pharmacist to prepare their MES. (Details of project instructions can be viewed in
Appendix 35-37).

3.14 MEDICATION EDUCATION SERVICE

The MES consisted of 10 steps to be performed by the pharmacist, in fact 11 steps are
outlined in the MES training manual, however step one is patient recruitment which
was performed by the discharge planner/nurse. The MES steps are as follows:

- Patient recruitment (discharge planner)
- Gather materials
- Consult Discharge Planner
- Prepare Medication card
- Gather Medications
- Introduce Yourself to Patient
- Assess patient’s Status
- Provide Information
- Summarise
- Document
- Follow-Up

For more details about each of these steps refer to the MES training manual (Appendix
31).
This information was all recorded in an access database where the accuracy of drug information documented was assessed by a researcher as it was for the discharge planners, as well as a pharmacist and a medical practitioner independently. Documentation was coded as accurate if the coder felt that they could prescribe, dose or dispense the medicine for this patient with the information provided. If there was ambiguity with doses, names of medications or strengths, meaning that the document was coded as unreliable. As mentioned above, a kappa statistic could be generated to look at the reliability of coders and furthermore, the accuracy of information documented could also be compared for the documentation of discharge planners, versus the documentation of pharmacists for patients.

Information could also be gathered from the MES documentation form on the pharmacy items that were provided for each patient, as well as the time taken to provide this service.

3.15 HOME MEDICATION REVIEW

Patients randomised to study arm three were flagged for a Home Medicines Review Service. Information regarding this service was distributed to the patient, the community pharmacy and medical practitioner. The medication review service is reliant on a referral from the medical practitioner to the community pharmacy. This process was left in the hands of the medical practitioners to refer patients they deemed appropriate for service. A three month follow-up was chosen for all patients, as this was considered a reasonable time for a review to occur if it was deemed appropriate. If patients had received an HMR, then a copy of the report was requested.

3.16 DATA ENTRY

An Access database was designed to store all the project data. Data entry was performed by researchers involved in the project. Each piece of documentation was fully recorded within the data base.
### 3.16.1 Interpretation of Data

Much of the data was unambiguous and needed no judgment during entry. However certain pieces of data entry needed interpretation.

As previously discussed (Section 3.12 and Section 3.14) medication documentation details were entered and recorded as either reliable (accurate) or non-reliable. To validate the researchers coding these were also coded by a pharmacist and medical practitioner independently, and the final coding is consensus data of these two practitioners.

Details of medications including dates of dispensing obtained from pharmacy history printouts were entered into the data base as they were documented. The judgment of whether the patient was taking this medication at one week post discharge as well as at three months post discharge was where interpretation was required. For this reason a formula was developed in order to standardise the documentation of medications being coded as being taken at one week and three months post discharge.

\[
Z \text{ was defined as the pack size.}
\]
\[
Y \text{ was defined as the number of tablets used per day.}
\]
\[
\text{Therefore } \frac{Z}{Y} = \text{ the usage}
\]
\[
D \text{ was defined as the number of days post discharge that the medication had been dispensed (negative numbers were medications that were pre-discharge).}
\]

In order to code if the medication was being taken at day 7 or day 90 the following formulas were used:

If D is negative, Stage 2 (7 days post discharge) is true if: \[D + \frac{Z}{Y} \geq 7 \text{ (+/- 20\% of } \frac{Z}{Y})\]

If D is positive, Stage 2 is true if: \[D < 7 \text{ and } D + \frac{Z}{Y} \geq 7 \text{ (+/- 20\% of } \frac{Z}{Y})\]

If D is negative, Stage 3 (90 days post discharge) is true if: \[D + \frac{Z}{Y} \geq 90 \text{ (+/- 20\% of } \frac{Z}{Y})\]

If D is positive, Stage 3 is true if: \[D + \frac{Z}{Y} \geq 90 \text{ (+/- 20\% of } \frac{Z}{Y})\]

If a patient is taking a medication at Stage 1 (discharge day) and Stage 3 (90 days post discharge), then assume that Stage two is correct if the medication is a regular medication.
Medications were coded as regular prescription medications, or not. A medication was coded as non regular, if it was given directions of prn, or it was an antibiotic which often has a definitive course. If the medication was an over the counter item it was also not coded as a regular prescription medication. By separating medications into regular prescription items or other, we could perform analysis on either all medications or regular prescription items only. The reason for such differentiation is that often patients would be taking over the counter items, however these would not be recorded on the medication printouts, and hence it was impossible to record the usage of such items. Similarly, when required usage (prn) may be difficult to predict.

Some assumptions regarding the usage of medications needed to be made whilst entering data. The same assumptions were used for all patients taking these medications, unless they had specific directions documented. For example, any directions that were followed by prn, were coded as if the patient was taking exactly half the maximum dose specified. For example if the medication was Panadeine Forte 2 QID (four times a day) prn, the patients usage would be 4 per day (half of the maximum recommended), if it was a documentation of sleeping tablets - 1 a night prn, this would be coded as the patient taking 1 tablet every 2 days (half of the recommended max).

Warfarin was being taken by several patients, with directions of mdu or take as per INR. The assumptions made were that if a patient had 1 mg tablets documented, then their usage of these were 1 per day, 2mg tablets had a usage of 1 every 2 days and 5mg tablets were coded as being used once per week. These are conservative estimates based on patterns of clinical usage.

3.17 DATA ANALYSIS

Data was extracted from Access into Excel and then analysed using SAS. Descriptive statistics were performed on MES data to calculate the mean time to provide the service, and the number of pharmacy items being provided.

Baseline data was compared across study arms to check for baseline differences. Analysis of Variance (ANOVA) was performed for each of the major outcomes listed in
the data management plan. Consultation with a statistician confirmed the results and researcher interpretation.
4 EVALUATION OF PROFESSIONAL PHARMACY SERVICES IN PRIVATE HOSPITALS

4.1 HOSPITAL RECRUITMENT
Seven hospitals took part in the research; this includes the piloting of materials. Of the seven hospitals, four were serviced by an off-site community pharmacy and three had a pharmacy located within the hospital grounds.

4.2 PATIENT RECRUITMENT
In total 89 patients participated in this research project. It was documented that 163 patients were approached and of these 84 participated in the study (52% response rate). As previously stated the pilot site did not document the number of patients approached (N=5 that consented to participate). The following table (Table 4.1) shows recruitment numbers for each hospital site, and reasons for refusal.
Table 4.1 Patient recruitment details

<table>
<thead>
<tr>
<th>Hosp no.</th>
<th>Pharmacy model</th>
<th>No. approached</th>
<th>No. consenting</th>
<th>Reasons for not participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Off-site</td>
<td>10</td>
<td>4</td>
<td>English too poor&lt;br&gt;Less than 5 medications&lt;br&gt;Going to another institution&lt;br&gt;Too unwell&lt;br&gt;Too tired&lt;br&gt;Changed mind</td>
</tr>
<tr>
<td>2</td>
<td>On-site</td>
<td>20</td>
<td>11</td>
<td>Discharged prior to pharmacist service&lt;br&gt;Not interested&lt;br&gt;Arthritis limits writing ability&lt;br&gt;Changed mind&lt;br&gt;Does not want to bother medical practitioner</td>
</tr>
<tr>
<td>3</td>
<td>Off-site</td>
<td>54</td>
<td>23</td>
<td>Did not want hassles post discharge&lt;br&gt;Did not want to bother medical practitioner and pharmacist&lt;br&gt;Too much hassle&lt;br&gt;Not interested&lt;br&gt;Did not feel they required pharmacy input&lt;br&gt;Going to hostel/nursing home&lt;br&gt;Enrolled in / participated in clinical trial&lt;br&gt;Lack of understanding&lt;br&gt;Too sick/suffering pain&lt;br&gt;Travelling overseas post discharge</td>
</tr>
<tr>
<td>4</td>
<td>Off-site</td>
<td>24</td>
<td>23</td>
<td>Too unwell</td>
</tr>
<tr>
<td>5</td>
<td>On-site</td>
<td>13</td>
<td>7</td>
<td>Not interested&lt;br&gt;Does not like answering questions&lt;br&gt;Medications are constantly changing&lt;br&gt;Too invasive on privacy&lt;br&gt;Confident in medication/does not feel they require pharmacy input</td>
</tr>
<tr>
<td>6</td>
<td>Off-site</td>
<td>42</td>
<td>16</td>
<td>Not interested&lt;br&gt;Poor understanding&lt;br&gt;Visual impairment&lt;br&gt;Difficulty in communicating&lt;br&gt;Concerns about privacy&lt;br&gt;Did not feel they required pharmacy input</td>
</tr>
</tbody>
</table>

4.3 PATIENT DEMOGRAPHIC DATA

4.3.1 Age

Data on the age of 79 patients was collected. The mean age of patients taking part in the study was 73 years with the range being from 49 to 89 years of age.
Ages were approximately normally distributed, and a one way ANOVA was used to test for the difference amongst study arms. There was no difference in mean age across the three study arms (p=0.94) (Table 4.2).

Table 4.2 Mean age by study arm

<table>
<thead>
<tr>
<th>Study arm</th>
<th>n</th>
<th>Mean age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26</td>
<td>72.4</td>
</tr>
<tr>
<td>2</td>
<td>26</td>
<td>72.6</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
<td>73.3</td>
</tr>
<tr>
<td>Overall</td>
<td>79</td>
<td>72.8</td>
</tr>
</tbody>
</table>

*Note: Age missing for 10 participants

4.3.2 Patient Gender

The difference between numbers of men and women in the three study arms was tested using a Fisher’s exact test. There was no difference in gender across the three study arms (p=0.5367) (Table 4.3).

Table 4.3 Numbers of men and women by study arm

<table>
<thead>
<tr>
<th>Female</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>13</td>
<td>15</td>
<td>17</td>
<td>45</td>
</tr>
<tr>
<td>Male</td>
<td>17</td>
<td>15</td>
<td>12</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>30</td>
<td>29</td>
<td>89</td>
</tr>
</tbody>
</table>

4.3.3 Number of Diagnosis

Since numbers of diagnoses were not normally distributed, the difference amongst them was tested using a Wilcoxon rank sum test. The hypothesis of no difference amongst study arms was rejected (p=0.0008) (Table 4.4) with the control arm having less numbers of diagnosis documented.
Table 4.4 Number of diagnoses by study arm

<table>
<thead>
<tr>
<th>Study arm</th>
<th>n</th>
<th>Mean number of diagnoses</th>
<th>Median number of diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
<td>3.7</td>
<td>3.0</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>5.1</td>
<td>5.0</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>5.1</td>
<td>5.0</td>
</tr>
<tr>
<td>Overall</td>
<td>89</td>
<td>4.7</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Although there is a difference detected here between control and intervention patients, an explanation may lie in the documentation. A sub analysis of patients within study arms 2 and 3 was conducted to see the pattern of which professionals documented the diagnosis. As can be seen in the table below, several diagnosis were only documented by one or the other professional or both, hence the patient had a more complete profile when nurses and pharmacists profiles are added together.

Table 4.5 represents the numbers of diagnoses made by nurses, pharmacists or both (using a Kruskal-Wallis test, since the distribution was not normally distributed) for patients in study arms 2 and 3.

Table 4.5 Documentation of diagnosis for patients in study arms 2 and 3

<table>
<thead>
<tr>
<th></th>
<th>Number of diagnoses (n=59 patients)</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse only</td>
<td></td>
<td>0.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Pharmacist only</td>
<td></td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Both</td>
<td></td>
<td>3.0</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Kruskal-Wallis P<0.0001

It can be seen here that the pharmacists picked up a significantly larger number of diagnosis compared to nurses/discharge planner (p<0.0001). It could therefore be postulated that there was probably no difference in the number of diagnosis between the study arm 1 and the intervention group, but rather a difference in the accuracy and completeness of documentation (see 5.3).
4.4 DOCUMENTATION COMPARISONS BETWEEN DISCHARGE PLANNERS AND PHARMACISTS

Each medication entry on the discharge planner documentation forms and pharmacists' MES forms were coded for accuracy (see Section 3.12). This accuracy documentation was performed by a pharmacist, a medical practitioner and consensus results were entered by the researcher.

Firstly, the differences in accuracy scores between nurses and the pharmacists were calculated, and a t test was used to see whether these differed between study arms 2 and 3. As pharmacists and nurses were blinded to patients study arms at the time of documentation, no difference should be detected between study arms (Table 4.6).

Table 4.6 Difference in accuracy of nurses and pharmacists by study arm

<table>
<thead>
<tr>
<th>Study arm</th>
<th>Type of assessment</th>
<th>n</th>
<th>Consensus</th>
<th>n</th>
<th>Pharmacist</th>
<th>n</th>
<th>Doctor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>29</td>
<td>10.8</td>
<td>29</td>
<td>7.3</td>
<td>29</td>
<td>12.0</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>30</td>
<td>9.1</td>
<td>29</td>
<td>8.4</td>
<td>29</td>
<td>8.3</td>
</tr>
<tr>
<td>P value</td>
<td></td>
<td>0.7239</td>
<td>0.8261</td>
<td>0.4670</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To compare the accuracy of discharge planners and pharmacists in providing this documentation we performed a Wilcoxon Signed Ranks Test as the scores were not normally distributed. These tests were repeated on three sets of data: correctness assessed by a doctor, correctness assessed by a pharmacist, and consensus correctness. The results are shown in Table 4.7 with plots 1 to 3 showing the relationship between nurse and pharmacist reliability scores as assessed by the three methods (Appendix 40).
Table 4.7 Overall score (% correct): nurse and pharmacist

<table>
<thead>
<tr>
<th>Type of assessment</th>
<th>Consensus Mean</th>
<th>Consensus Median</th>
<th>Pharmacist Mean</th>
<th>Pharmacist Median</th>
<th>Doctor Mean</th>
<th>Doctor Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>83.4</td>
<td>87.5</td>
<td>80.6</td>
<td>88.5</td>
<td>82.0</td>
<td>84.5</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>93.4</td>
<td>100.0</td>
<td>88.5</td>
<td>91.3</td>
<td>92.1</td>
<td>100.0</td>
</tr>
<tr>
<td>P value</td>
<td>0.0004</td>
<td>0.0165</td>
<td></td>
<td></td>
<td>0.0006</td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>59</td>
<td>58</td>
<td>58</td>
<td>58</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To check that the researcher’s definition of accuracy was consistent across health professionals, a practicing medical practitioner and pharmacist were asked to code the data for accuracy. The medical practitioner’s results showed that pharmacists documented with accuracy with a median of 100% versus 85% for discharge planners (statistical difference at p=0.0006). The pharmacist showed that there was a median score of 91% for pharmacist documentation accuracy versus 89% for discharge planner documentation. This difference was also significant. A kappa analysis of the accuracy labelling occurred, with the kappa statistic of 0.613 showing fair reliability between the health professionals (medical practitioner and pharmacist).

A discussion then occurred between the pharmacist and medical practitioner and consensus of each discrepancy was decided upon, resulting in the final analysis of documentation accuracy. Consensus data revealed that the median accuracy of pharmacists was 100% versus 88% for discharge planners (p=0.0004).

4.5 MEDICATION EDUCATION SERVICE

Of the 89 patients recruited to the study, 59 were randomised to receive a Medication Education Service (i.e randomised to study arm 2 or 3). Fifty five patients received an individualised tailored service provided by the pharmacist servicing the hospital before they were discharged. Unfortunately eight patients were discharged before the pharmacist could provide the service. (Four of these patients are not included in the sample (see 4.2), as their documentation was never completed by the pharmacist, and the researcher was not aware of recruitment at the time). The other four patients are included and in these cases each was sent a medication card, appropriate CMI and
any other relevant information. This was documented and sent to the patients preferred community pharmacy and general practitioner; however no details of specific patient issues could be documented. As these patients were randomised to receive the service, their data is included following recommendations from Fisher et al [133], which states that you should analyse as randomised whether subjects are compliant with treatment or not.

### 4.5.1 Time taken to provide MES

The time taken to provide the MES ranged from 20-90mins with the median time taken being 40 minutes (Table 4.8). This data was recorded for 50 of the MES services (n = 59).

Times were not normally distributed, and a rank sum test was used to compare them. There was no statistically significant different (p=0.8133) between the times to provided MES between the study arms.

<table>
<thead>
<tr>
<th>Study arm</th>
<th>n</th>
<th>Mean time taken (mins)</th>
<th>Median time taken (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>25</td>
<td>46.6</td>
<td>40.0</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>44.6</td>
<td>40.0</td>
</tr>
<tr>
<td>Overall</td>
<td>50*</td>
<td>45.6</td>
<td>40.0</td>
</tr>
</tbody>
</table>

*Note: MES time taken was missing for 9 participants in study arms 2 and 3.

### 4.5.2 Pharmacy Items Provided During the MES

The MES documentation form allowed pharmacists to record in point form the pharmacy items they provided to individual patients. This information could be divided into the following categories:

- Information provided (including the following)
  - Medication directions
  - Indications for use
  - Possible adverse effects
  - Management of adverse effects
- Medication interactions
- Storage requirements
- Contact details for support groups
- Diet and lifestyle
- Demonstration of medication devices
- CMI
- Self care card
- Medication card
- Other
  - Monitoring recommended
  - OTC recommended
  - Referral to Medical Practitioner
  - Referral to other health care professional
  - Adherence aid recommended
  - Other recommendations
  - Extra medical conditions noted
  - Extra medications noted
  - Change directions
  - Strength of medication different
  - Extra allergy noted
  - Cease a medication

On average pharmacists documented that they provided 15 items per MES service. The majority of these were providing information to the patient. Most patients were informed about the directions, indication for use, side effects and their management as well as provided with life-style advice, CMIs and a medication card. Other common items provided included recommending follow-up monitoring, referral to the patients’ medical practitioners post discharge as well as documenting extra medical conditions or medications that had been overlooked on the discharge planners documentation form (Table 4.9).
<table>
<thead>
<tr>
<th>Table 4.9 Pharmacy items provided during MES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>N</strong></td>
</tr>
<tr>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Total number of pharmacy items</td>
</tr>
<tr>
<td>Information items</td>
</tr>
<tr>
<td>Referrals to Med Practitioners</td>
</tr>
<tr>
<td>Extra medical condition noted</td>
</tr>
<tr>
<td>Monitoring items</td>
</tr>
<tr>
<td>Extra medication noted</td>
</tr>
<tr>
<td>Referrals to other HCPs</td>
</tr>
<tr>
<td>OTC recommendations</td>
</tr>
<tr>
<td>Other recommendations</td>
</tr>
<tr>
<td>Adherence aid recommended</td>
</tr>
<tr>
<td>Different directions noted</td>
</tr>
<tr>
<td>Extra allergy noted</td>
</tr>
<tr>
<td>Cease a medication</td>
</tr>
<tr>
<td>Different strength of medication noted</td>
</tr>
</tbody>
</table>

4.6 OUTCOMES OF THE SERVICE

4.6.1 Medication Cost and Numbers by Stage

The mean cost of all prescription and other drugs is shown in Table 4.10 and the mean number of drugs is shown in Table 4.11.

As numbers and drug costs were not normally distributed, differences between costs and numbers, from stage 1 to 2, and from stage 1 to 3, were calculated. These were approximately normally distributed, and ANOVA was used to compare mean differences. In addition, study arms 2 and 3 were combined, and a t test was used to compare the difference between study arm 1 and the combined study arms 2 and 3.

There were no significant differences between study arms from stage 1 to stage 2. The following differences all relate to changes from stage 1 to stage 3 (Table 4.12).
The p value for the difference amongst all study arms was borderline (p=0.0593), with mean decreases in **numbers** of drugs from stage 1 to stage 3: 1.0, 4.0 and 3.8, in arms 1, 2 and 3 respectively. The numbers of all drugs declined more in the combined arm (study arms 2 and 3 amalgamated), than in study arm 1 (1.0 vs 3.9, p=0.0289), and it was borderline for regular **prescription** drugs (combine arms decreased by 2.1 compared with study arm 1 at 0.6, p=0.0606).

When arms 2 and 3 were combined, there was a significant difference in the decrease in cost of regular **prescription** drugs, with the cost in arm 1 decreasing by $0.44/day, compared with $3.02/day in arms 2 and 3 combined (p=0.0376). This is a savings on prescription costs of $2.58/day per person receiving the intervention.
Table 4.10 Mean cost of drugs by stage in dollars

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Table 4.12 Tests (p values) for differences in drug costs and numbers of drugs

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4.6.2 Costs of Medications

Another analysis performed on the costs of medications was comparing dispensed medication costs per day prior to admission and post admission (Table 4.13).

Table 4.13 Mean pre- and post-dispensing daily drug costs by study arm

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<th>Patient expense ($)</th>
<th>Schedule price ($) (based on PBS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
</tr>
<tr>
<td>1</td>
<td>22</td>
<td>1.13</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>0.57</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>1.64</td>
</tr>
</tbody>
</table>
There were no significant differences between pre- and post-discharge in schedule price/day [using the Pharmaceutical Benefits Scheme (PBS) dispensed prices for maximum quantities], or in the patients’ daily expenses (the actual amount of money spent by the patient), either over three separate study arms, or when study arms 2 and 3 were combined (Table 4.14).

Table 4.14 Difference in pre- and post-dispensing daily drug costs

<table>
<thead>
<tr>
<th>Study arm</th>
<th>Pre-Post difference in</th>
<th>Patient expense ($)</th>
<th>Schedule price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>mean</td>
<td>n</td>
</tr>
<tr>
<td>1</td>
<td>11</td>
<td>0.1</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>0.2</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>-0.4</td>
<td>14</td>
</tr>
<tr>
<td>2 and 3 combined</td>
<td>31</td>
<td>-0.1</td>
<td>32</td>
</tr>
</tbody>
</table>

These costs are calculated per day, based on the number of days post discharge that medications had been dispensed, from medication history printouts. If patients horde medications, or acquire an extra packet “just in case”, these numbers may not be an accurate reflection of what is actually being taken.

Table 4.15 shows the pre and post costs per dispensing for study arms and Table 4.16 shows the mean differences. No significant differences were seen between the groups with respect to the average schedule price per dispensing.

Table 4.15 Pre and post schedule costs per dispensing

<table>
<thead>
<tr>
<th>Study arm</th>
<th>Dispensing Schedule price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
</tr>
<tr>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
</tr>
</tbody>
</table>
Table 4.16 Mean differences in pre-post costs

<table>
<thead>
<tr>
<th>Study arm</th>
<th>Pre-post difference in dispensed schedule price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-2.3</td>
</tr>
<tr>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>3</td>
<td>-0.3</td>
</tr>
<tr>
<td>2 and 3 combined</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Total printout data suggests that, patients’ medications increase in costs per item; however this is then counteracted by the fact that less medications in total are being taken. To verify this we had a look at the number of items each patient had dispensed pre discharge and post discharge (Table 4.17). The difference between the two numbers, for each group was compared using ANOVA. The test is not significant (p=0.1841), however it does suggest that patients receiving the intervention are having less medications dispensed post discharge versus control.

Table 4.17 Mean number of dispensings per patient pre and post discharge per study arm

<table>
<thead>
<tr>
<th>Study arm</th>
<th>n</th>
<th>Variable</th>
<th>Mean</th>
<th>Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21</td>
<td>Count Of pre-discharge dispensings</td>
<td>18.57</td>
<td>-3.86</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Count Of post-discharge dispensings</td>
<td>22.43</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>Count Of pre-discharge dispensings</td>
<td>13.65</td>
<td>1.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Count Of post-discharge dispensings</td>
<td>12.30</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>Count Of pre-discharge dispensings</td>
<td>17.07</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Count Of post-discharge dispensings</td>
<td>16.53</td>
<td></td>
</tr>
</tbody>
</table>

This data supports the fact that patients receiving an intervention are taking less medications post discharge, and in total this corresponds to an overall decrease in medication costs. The medications they are taking however are trending to be more expensive medications; however there is no significant difference in this data.
4.6.3 Types of Medications

MIMS categories were used in order to classify the drug types. With 21 categories of drugs and 89 patients it is not feasible to analyse differences in study arms, but rather we investigated patterns of use (Table 4.18).
Table 4.18 Counts of classes of drugs at different time points and study arms

<table>
<thead>
<tr>
<th>Stage</th>
<th>Drug Class</th>
<th>Study Arm 1</th>
<th>Study Arm 2</th>
<th>Study Arm 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(N=30)</td>
<td>(N=30)</td>
<td>(N=29)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Rx only</td>
<td>Total</td>
</tr>
<tr>
<td>1</td>
<td>Alimentary</td>
<td>19</td>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular</td>
<td>110</td>
<td>108</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>CNS</td>
<td>21</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Analgesia</td>
<td>38</td>
<td>16</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Musculoskeletal</td>
<td>15</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Endocrine</td>
<td>29</td>
<td>28</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Infections</td>
<td>5</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Respiratory</td>
<td>15</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Skin</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Vitamins/Minerals</td>
<td>14</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Eye</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Genitourinary</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Alimentary</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular</td>
<td>69</td>
<td>68</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>CNS</td>
<td>12</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Analgesia</td>
<td>12</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Musculoskeletal</td>
<td>12</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Endocrine</td>
<td>17</td>
<td>17</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Infections</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Respiratory</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Skin</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Vitamins/Minerals</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Eye</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Genitourinary</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Alimentary</td>
<td>9</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular</td>
<td>68</td>
<td>66</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>CNS</td>
<td>20</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Analgesia</td>
<td>16</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Musculoskeletal</td>
<td>15</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Endocrine</td>
<td>18</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Infections</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Respiratory</td>
<td>8</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Skin</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Vitamins/Minerals</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Eye</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Genitourinary</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

NB. This table documents classes of drugs in which > 5 medications had been dispensed at one stage.
One of the most striking differences is that the PRN use of analgesia and CNS medications, which appears to be much higher in the control patients at time point three, compared to the intervention groups.

The number of cardiovascular (CV) drugs taken appears to have decreased for all patients but it appears to have decreased more in the intervention patients from baseline. That is, at baseline patients in study arm one are taking an average of 3.6 regular prescribed CV drugs and at time point 3 they are taking an average of 3 CV drugs each, compared to the intervention group who at baseline are taking an average of 3.6 CV drugs each and at time point three this group are taking an average of 2.2 regularly prescribed CV drugs each.

### 4.6.4 Satisfaction Scores

Patient satisfaction was measured by total SIMS scores (Table 4.19). These scores were not normally distributed; hence the differences from stage 1 to 2 and from stage 1 to 3 were calculated and analysed by ANOVA and t tests. There was a significant difference between study arms in the change from stage 1 to stage 2 (Table 4.20), while the difference to stage 3 was not significant, but showed a similar trend.

#### Table 4.19 Mean patient satisfaction score (total SIMS) by study arm and stage

<table>
<thead>
<tr>
<th>Study arm</th>
<th>Stage</th>
<th>n</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>29</td>
<td>13.6</td>
<td>3.9</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>19</td>
<td>10.5</td>
<td>5.0</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>16</td>
<td>11.6</td>
<td>4.4</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>30</td>
<td>11.1</td>
<td>4.4</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>15</td>
<td>11.1</td>
<td>4.3</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>13</td>
<td>12.9</td>
<td>4.1</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>28</td>
<td>10.5</td>
<td>4.6</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>18</td>
<td>9.9</td>
<td>5.4</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>16</td>
<td>11.3</td>
<td>4.4</td>
<td>5</td>
<td>17</td>
</tr>
</tbody>
</table>

*Mean difference does not equal mean difference between stage means, due to missing values*
Table 4.20 Change in patient satisfaction by study arm

<table>
<thead>
<tr>
<th>Study arm</th>
<th>Difference stage 1 to 2</th>
<th>Difference stage 1 to 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 1, 2 and 3</td>
<td>1</td>
<td>-3.7</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>-0.2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>-0.7</td>
</tr>
<tr>
<td>P value</td>
<td>0.0497</td>
<td>0.1503</td>
</tr>
<tr>
<td>Arms 1, 2 and 3</td>
<td>1</td>
<td>-3.7</td>
</tr>
<tr>
<td></td>
<td>2 and 3</td>
<td>-0.4</td>
</tr>
<tr>
<td>P value</td>
<td>0.0144</td>
<td>0.0797</td>
</tr>
</tbody>
</table>

SIMS scores tended to decrease one week post discharge; however the decrease in scores was greater for the control arm than study arms two and three. There were slight improvements in the overall intervention group versus control by three months.

4.6.5 Adherence Scores

Since adherence, as measured by total MARS scores, was not normally distributed, we looked at the change in score from stage 1 to stage 2 and from stage 1 to stage 3, by study arm. These differences were approximately normally distributed, so ANOVA was used to test differences among the 3 treatments, and between study arm 1 and combined study arms 2 and 3. No significant differences in adherences scores were found (Table 4.21).
<table>
<thead>
<tr>
<th>Study arm</th>
<th>Stage n</th>
<th>Mean</th>
<th>Median</th>
<th>Std Dev</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>23.2</td>
<td>24.0</td>
<td>1.7</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>23.3</td>
<td>24.0</td>
<td>1.6</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>23.2</td>
<td>24.0</td>
<td>1.4</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>23.1</td>
<td>24.0</td>
<td>2.4</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>23.5</td>
<td>24.0</td>
<td>1.8</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>23.5</td>
<td>24.0</td>
<td>1.8</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>23.8</td>
<td>24.0</td>
<td>1.4</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>23.2</td>
<td>24.0</td>
<td>1.8</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>23.1</td>
<td>24.0</td>
<td>2.2</td>
<td>17</td>
<td>25</td>
</tr>
</tbody>
</table>
5 DISCUSSION AND CONCLUSIONS

5.1 RECRUITMENT AND SAMPLE SIZE

Issues regarding recruitment and sample sizes are outlined in Chapter 3 of this report. A larger sample size is always ideal, but not always feasible or practical within set time-frames. Perhaps more outcomes from this service could have been detected with a larger sample size, particularly we could do sub analysis on different hospitals as well as different pharmacy models (on site versus off site results) and furthermore we could recruit non-metropolitan hospitals to analyse if there are difference at different practice settings. Therefore further research with more administrative support in order to recruit more hospitals and more patients may be warranted.

5.2 MEDICATION DOCUMENTATION BY HEALTH CARE PROFESSIONALS

The comparison of the documentation by nurses/discharge planners versus servicing pharmacists showed that pharmacists were consistently more accurate in documenting patients discharge medications. This may suggest that pharmacists may be more suitable to provide discharge summaries than nurses. It may stand to reason that a “medication expert” would be more accurate, as medications are the main focus of a pharmacists’ working life, whereas nurses are required to focus on many more tasks other than medication issues.

It must be noted, that nurses/discharge planners were asked to document medications for the following reasons:

- So as pharmacists would be able to prepare for the MES service
- So as the researcher would be able to have a list of medications for patients randomised to study arm one (no pharmacy involvement).

In contrast pharmacists were asked to document for these reasons:

- Documentation would be forwarded to the patient
- Documentation would be forwarded to the patients’ preferred pharmacist and medical practitioner
- Documentation would be forwarded to the researcher for analysis.
For this reason it may not be reasonable to make a conclusion that pharmacists are in a better position to provide such documentation as the nurses/discharge planners knew that their documentation was not going to the patients’ preferred health care professionals, nor to the actual patients themselves, and it was only a temporary document. In one hospital, the discharge planner chose to photocopy medication charts rather than transcribe. This method proved to be the most accurate of all the discharge planners, hence may be a suitable suggestion for transfer of information to pharmacists providing MES in the future, rather than allowing for the risk of transcription errors. Medication charts, however may not be suitable for patients or other health professionals.

Perhaps in the event of computerised medication charts within hospital settings, the transcription phase of documentation would become redundant and instead this would be replaced with an overall check of the medication printout. However, for the time being within a private hospital sector, there is still a reliance on hand written documentation, thus, it would appear that pharmacists are in the best position to record patients medications at the time of discharge.

5.3 DOCUMENTATION OF DISEASE STATES

It may be noted that there was difference in the number of diagnosis of patients in the control group versus patients in the intervention cohorts. This difference however may be attributed to the fact that patients within study arm 1, only had one documentation source (discharge planners/nurses). As can be seen in the above discussion point, nurses may not be accurate and perhaps may leave off information about patients’ diagnosis. Furthermore, for patients in study arms 2 and 3 they had documentation by both discharge planners/nurses and pharmacists, hence the two sources of data may make their profile more complete.

For this reason we performed a sub analysis of patients within study arms 2 and 3 to see the pattern of which professionals documented the diagnosis. Several diagnosis were only documented by one or the other professional or both, hence the patient had a more complete profile when nurses and pharmacists profiles are added together.

It can be concluded that the pharmacists picked up a significantly larger number of diagnosis compared to nurses/discharge planners (p<0.0001). It could therefore be
postulated that there was probably no difference in the number of diagnosis between the study arm 1 and the intervention group, but rather a difference in the accuracy and completeness of documentation. This is therefore a similar argument, that at this time, it appears that a pharmacist may be better placed than nursing staff to be recording patient diagnoses on medication documentation records.

5.4 MEDICATION EDUCATION SERVICE

The time taken to provide the MES was on average 45 minutes. This is a considerable amount of time, and in certain hospitals with large turnover rates, may require a pharmacist to be employed on a full-time basis to provide such services. In other hospitals with small numbers of suitable patients this may be done on an ad hoc basis. For this reason, the researchers feel that this service would be best remunerated on a fee for service basis. We would recommend that this service be remunerated at a standard price of $75 per service; this indicative amount was derived by using the current service remuneration arrangements as a guide and adjusting for the time required (e.g. $140.00 per HMR). This fee should include the time taken to provide the service as well as preparation and travel time and materials such as CMIs, fact cards etc.

We would propose that the MES be funded in a similar way to the current HMR funding. Pharmacists servicing institutions should receive a referral from a hospital based practitioner (discharge planner, nurse or perhaps medical practitioner). Once a referral is received, the pharmacist would need to gather materials and visit the patient before discharge. Once the service is provided, the documentation form should be circulated to the patients’ preferred community pharmacy and medical practitioner. Following this, a claim could be submitted through the HIC for payment for service.

This research has revealed that patients receiving the MES may decrease their numbers of medications and it is reasonable to assume that this therefore should correlate with a decrease in costs (including PBS costs). These savings may warrant payment for this new professional service in this cohort of patients. These results were confirmed by looking at cross sectional data, however continuous data has not confirmed these findings, hence further work is warranted.
Further research may also be warranted on the types of pharmacy items performed per MES. For example when pharmacists make recommendations to medical practitioners, or community pharmacists looking after the patients are these recommendations evidence based? Furthermore did the pharmacists provide the MES service in the way they were trained? And does their documentation correspond to the actual service that was provided? Further research may be needed to refine this service, training and the documentation form.

5.5 HOME MEDICATION REVIEW

Interestingly within the study time frame, no HMR services were provided for any of the 29 patients flagged for review in study arm three. The uptake of HMR in Australia has been slow [134], and various reasons have been proposed as to why this service was not adopted earlier. In this study, the patients that were recruited, nominated their preferred medical practitioner, and considering that these patients came from all over NSW, it was not feasible to facilitate the process through area health services, as it would have involved them all. In other projects, where HMR has been involved, this strategy has certainly aided the process [101].

There may be several reasons for the low uptake of HMRs and these are listed below:

- Three months is not adequate time for the HMR process to occur.
- Patients that had been flagged for a review had already received the MES service.
- Medical Practitioners still do not like referring for HMRs.

The researchers believed that three months was ample time for the referral and review to take place. Perhaps with pressures on the workforce, however, this service is not seen as a priority. It could be theorised that medical practitioners felt that the MES was a good start for making changes to patients’ therapy, and hence an HMR was not necessary at this time. There has been much speculation over the medication review service, and there may still be some medical practitioners that do not like the pharmacists’ review process or reports. However, there has been growth of this service over the last few years [135] hence we would have expected some medical practitioners to refer for this service. In fact, it must be noted that we did have two referrals for HMR in this study arm, however the pharmacist did not provided the service within this time. Similarly we had some pharmacists that recommended patients
be referred to them, but still the HMR service did not occur within the 3 month time-frame. Perhaps in future studies, a longer time-frame may be required.

In addition, in the initial outline for this research, the investigators had proposed that case conferencing may follow a medication review service, based on research outcomes by Chen et al (Chen, 2001 #99)(Chen, 1999 #103). However, as the model chosen by the pharmacists after focus groups and interviews was the existing HMR service model, already in situ in the community, the issue of case conferencing was dropped from the research project. Perhaps closer collaborative models of reviews including case conferencing could facilitate this process, and potentially an alternative review model including case conferencing could be explored in the future in this arena.

5.6 ASSUMPTIONS MADE DURING DATA ANALYSIS

In order to analyse the numbers and costs of medications at one week (day 7) and three months (day 90) post discharge we had to predict what patients were taking at these time points based on the medication printouts sent from their preferred community pharmacy. This data however may not be accurate, as patients may have visited more than one pharmacy, or may have had previous supplies of medication (hoarded medications). In order to predict if a patient was taking these medications at each stage a formula was developed (see Section 3.16.1). Although we know that this data may not be the exact numbers and costs that patients were taking at this time, it was the best assumption that could be made, and the same method was used for all patients in all study arms.

In order to try to verify this data, we also performed a pre and post analysis on dispensed medications before admission versus dispensed medications post discharge. This data too, has flaws as it still is based on pharmacy printouts which may not include all patient dispensings, however it may show if there was differences in pharmacy visit patterns post discharge versus pre admission. In order to gain more accurate data we could have asked for HIC data in order to try to further complete patient profiles. Based on Whitehead's unpublished doctoral research, the HIC data is still fraught with issues, as medicines not above thresholds are not on the HIC data base, in order to overcome this, a mix of both HIC data and pharmacy printouts may be the most accurate, yet still may have missing data.
In fact the total printout data suggests that, patients’ medications increase in costs per item; however this is then counteracted by the fact that less medications in total are being taken. This data supports the fact that patients receiving an intervention are taking less medications post discharge, and in total this corresponds to an overall decrease in medication costs. The medications they are taking however are trending to be more expensive medications; and potentially patients are becoming more compliant, with schedule prices per day trending to increase, however there is no significant differences in this data, so further studies are certainly warranted.

5.7 MARS AND SIMS INSTRUMENTS

Interestingly many patients had very high base-line satisfaction scores. One reason for this perhaps could be that they are content whilst being an inpatient and having their medication administered by nursing staff at this stage. We had hypothesised that the SIMS scores would increase for patients receiving the MES intervention; however this was not the case. In fact, on average all patients’ satisfaction scores decreased post discharge, however they decreased more in control patients. This decrease in satisfaction could be because after discharge patients are now responsible for their own medication administration, and this may seem overwhelming post hospital admission. Furthermore, perhaps patients may have expected that they would receive more information before making the transition from hospital to home by all professionals involved (medical, nursing and pharmacy staff).

Although this result was initially surprising to the researchers, other unpublished studies performed by Chen et al in chronic pain, have revealed similar score patterns, with patients receiving an intensive pain intervention not improving in their pain scores, and those receiving a less intensive intervention having scores showing deterioration.

The SIMS instrument underwent criterion related validity testing using the MARS and BMQ (Beliefs about Medicines Questionnaire) [127]. In order to do this, Pearson correlation coefficients were calculated between MARS, BMQ and SIMS scores, with significant correlations being detected [127]. The SIMS instrument, however had not been validity tested in a post discharge population, used in this research although it appeared to be a useful tool in gaining an overall impression about patients’ satisfaction with the information they had received. In addition, there was no literature found on its use in subsequent studies.
The MARS instrument had been validated against the similar Morisky scale for measuring adherence [125, 132]. No published reports of the MARS being used as a tool to measure the effect of an intervention were found by the researchers. The baseline MARS scores obtained within this research project were very high, indicating a high level of medication adherence by the cohorts of patients consenting to the project. As with the SIMS scores, it was originally hypothesised that the MES intervention may be able to improve adherence scores, compared to control patients. With such high scores, however, it was not possible to detect any changes using this instrument; hence the sensitivity to show change was low. Perhaps with a much larger sample size we may be able to show small changes using this tool.

Possible explanations for such high scores may be that only adherent patients consented to participate in the study in the first place (research bias), or that patients, knowing that other information was being shared between their health professionals, felt that their health professionals may be reviewing the results of this questionnaire, although this is less likely as the SIMS scores post discharge were certainly not as high. The Brief Medication Questionnaire (BMQ) [126], may have been a better instrument to use in order to gain a more accurate picture of patient medication taking behaviour, although this instrument is not able to be self-administered, therefore we would have had to have employed research assistants to follow-up patients and administer this questionnaire in their homes, which within this study would not have been economically feasible.

5.8 RECOMMENDED CHANGES TO MES

Overall the MES seems a feasible and useful service to be provided to private hospital patients at discharge, by the servicing community pharmacist. Small changes to the documentation form are suggested based on issues that occurred during the research.

- The number of lines that were left for medication documentation should be increased to 15 rather than 10, as many patients were taking more than 10 medications
- The documentation form should include a small box to record the last warfarin doses and INR results, so as patients and their health care professionals have an idea of what doses are to be administered post discharge.
- There should be a tick-box added in the recommendation section, allowing pharmacists to document whether HMR is recommended.
Standardised training session could also be held, with mentoring available for initial MES provision. The use of tape recordings of services and later review by a mentor, could be a cost-effective and useful method of providing feedback. These methods may need further research.

5.9 CONCLUSIONS

This research revealed that the MES has the potential to impact on the numbers and costs of medications of patients leaving the private hospital sector and returning to home. Furthermore, patients were more satisfied with information about medicines, than those whom did not receive the service. Pharmacists appear to be well placed to provide such a service, however their time for this service must be remunerated.

Further larger and longer studies may be warranted, however this research has further confirmed results of other studies showing benefits of counselling (Section 1.3.1) and services provided around the time of discharge (Section 1.3.3). The private hospital sector requires clinical pharmacy services, as these patients, although not always as acute as their public hospital counterparts, should receive services at the level recommended within APAC guidelines [48]. Pharmacists appear to be well placed to provide these services.

A complete package of materials was developed for this research, and with minimal changes these are ready for large scale implementation in all private hospitals. Patients, government and the pharmacy profession stand to benefit from this service and therefore it is felt that the research results would be a useful negotiating tool for another remunerable professional pharmacy service.

In conclusion, this research has revealed that the MES may have the potential to decrease prescription costs per person, as well as decrease the overall number of drugs patients are taking. Total dispensing costs in the three months post discharge however, did not confirm this finding, hence further research is warranted.

Savings to the Pharmaceutical Benefits Scheme, in this predicted magnitude, even if sustained for only 1 month, could cover the cost of each MES service provided by pharmacists. It therefore would appear appropriate that this service be further
researched, and if these cost findings are confirmed, the MES should subsequently be implemented to improve the health care of Australians being treated in private hospital settings.
6 RECOMMENDATIONS

There were several recommendations arising from this research and they are summarised below:

Recommendation One: MES should be remunerated at a rate of $75 per service in a similar fashion to HMR.

Recommendation Two: A standardised training session should be attended by pharmacists providing MES.

Recommendation Three: Slight changes should be made to the MES documentation form including:
- Increasing the number of lines left for documenting medications from 10 to 15.
- Adding a small box to record the last warfarin doses and INR results on the MES documentation form.
- Adding a tick-box in the recommendation section, allowing pharmacists to document whether HMR is recommended.

Recommendation Four: A larger scale research project should be conducted to confirm the benefits of MES, in particular changes in medication costs.
- This larger project would require administrative support at each hospital.
- This project should follow patients for at least 6 months to monitor changes in medication usage, allow more time for HMR, and monitor readmission rates, and other medical expenses.
- HIC data should be accessed, to give a more complete medication profile.
- An additional study arm could be added to compare the benefits of HMR alone, versus MES, or MES + HMR.
7 REFERENCES


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Appendix 1: Instrument for Phase One Qualitative Interviews

Professional Pharmacy Services to Private Hospitals

Introduction: Hello, I am Rebekah Moles, a PhD student from the University of Sydney. You may recall that I asked you a series of questions about the services you provided to the private hospital(s) that you service. Since then, I have received a grant from the Guild/Government to trial and implement two professional pharmacy services in private hospitals. Before we go ahead and trial the two services, medication education and medication review, we wish to seek the views of experienced practitioners in the private hospitals sector. Your help in this research will help shape this implementation process and in turn shape private hospital pharmacy practice in the future. In this interview I would like to ask you a few questions about two specific professional pharmacy services as outlined on the information sheet. You have a copy of the definitions and pharmacists' roles for the two services in front of you. All information you provide will remain confidential, and you can withdraw from the interview at any time.

(Give time to read through the information sheet and definitions of services sheet)

Do you have any questions about the information in front of you?

I will firstly ask a series of questions about Medication education services, and then I will repeat the same series of questions about medication review services.

How do feel about pharmacists providing Medication Education/Medication review services to patients?

Prompt if required

Do you think it is a good or bad idea and why?
What benefits do you think the services will have? What will it achieve?
Would you be prepared to provide those services?

If you were to provide a medication education service/Medication review service to patients how would you go about doing it?

Prompt
Which patients would you provide it to?
How would you identify the patients?

When during the patient’s stay would be best to provide the services, or is it better after they go?

In the study patients will have to sign a consent form, and pharmacists will also need consent from the patient’s doctor and regular pharmacist, how would you go about getting consent from all three parties?

In the study case conferencing after the review may need to occur with the Hospital Pharmacist, the Doctor and the Community Pharmacist, how do you envisage this may happen?

4. What potential barriers do you see, that may prohibit a medication education/medication review service being provided?

Prompt

Patients
Other HCPs
Hospital Admin
Location
Resources

5. What do you think needs to be done in order for a medication education/medication review service to be implemented?
(What facilitators may aid the process? How might barriers be overcome, or what processes need to be put in place for them to occur?)

Prompt

Letters to Hospital Admin/Committees
In-services
Training of pharmacists (are you accredited to provide medication reviews? Have you got guild insurance?)

Letters to GPs

6. If you were to implement a medication education/medication review service in X hospital, how would you go about getting the service up and running?

Prompt
   Who would you contact?
   How would you go about it? (Meetings/Letters?)

I would now like to ask you about medication review services.

7. Any other information that may aid the research?

8. For further follow up to whom at the hospital should I contact?

Thank you for your help it is very much appreciated. If I have any other queries or need to clarify the information, do you mind if I contact you again?

Thank you
As you may recall, your pharmacy has already taken part in the initial phase of this research project to identify and classify the different models of Pharmacy Practice in Australian Private Hospitals.

The private health care sector in Australia has been growing at a rapid rate over the last decade. This expansion in the health care sector will correspond with an increase need in pharmacy services. This additional survey is to define two potential professional pharmacy services within the practice models in private hospitals.

If you choose to participate in this further stage of this study you will be re-interviewed and perhaps accompanied to your hospital site(s). A series of questions about specific professional pharmacy services will be asked during an audio-taped interview.

Any data collected for the purposes of this study will remain strictly confidential and not be used to identify any pharmacy or pharmacist. Information obtained from this research may be used in future research or published.

Participation is entirely voluntary and you are not obliged to participate. You may withdraw from the research at any time.

The purpose of the study is define two potential professional pharmacy services within the models of pharmacy practice in Australian Private Hospitals.

Data collection will involve the researcher conducting an interview that will be held at the pharmacy and/or the hospital.
To obtain more accurate information than researcher observation alone, data collection will involve the researcher audio-taping the interview. Audio-tapes will not record the subject’s name and place of business and information will be destroyed once the research has been completed to guarantee confidentiality.

If you require any further information about this project you may contact Rebekah Moles on:
(02) 9351 5968

This information sheet is for you to keep.

Any persons with concerns for complaints about the conduct of this research study can contact the secretary of the Human Ethics Committee at the University of Sydney on (02) 9351 4811
I, __________________________ hereby voluntarily consent to further participate in the study entitled "Professional Pharmacy Services to Private Hospitals."

This project is being conducted by researcher Rebekah Moles under the supervision of Professor Charlie Benrimoj from the Faculty of Pharmacy, University of Sydney.

I understand that any data collected for the purposes of this study will remain strictly confidential and not be used to identify any pharmacy or pharmacist. I have been informed that information obtained from this research may be used in future research or published.

My participation is entirely voluntary and the following details relating to the purpose of the study and method of data collection have been clearly explained.

The purpose of the study is to define two potential professional pharmacy services within the models of pharmacy practice in Australian Private Hospitals.

Data collection will involve the researcher conducting an interview that will be held at the pharmacy and/or the hospital.

To obtain more accurate information than researcher observation alone data collection will involve the researcher audio-taping the interview. Audio-tapes will not record the subject’s name and place of business and information will be destroyed once the research has been completed to guarantee confidentiality.
I have been informed of my right to question any part of the procedure or withdraw from the project at any time.

Name: ______________________ Signature: ______________________

Witness: ____________________ Signature: ______________________

Date: ______________________

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, University of Sydney on (02) 9351 - 4811.
Appendix 4: Definitions of services

DEFINITIONS OF PROFESSIONAL PHARMACY SERVICES

Medication Education Service
Medication Education is the provision of information using appropriate communication methods, including written information to an individual patient to promote understanding on drugs and actions to improve the quality use of medicines.

The pharmacists’ role is to:

- Assess patients’ health beliefs regarding medications and use this information to tailor sessions to their needs
- Assess patients’ levels of knowledge and confidence about their medications
- Assess patients’ perceptions of drug therapy outcomes including effectiveness and adverse effects experienced
- Interact personally with patients, encourage them to ask questions and voice concerns
- Provide relevant information in an easy to understand, interactive manner, regarding patients’ medication regimens tailored to their needs (both written and verbal information to be provided)
- Reinforce advice given to patients by fellow health care professionals
- Assist patients with management of their medications

Medication Review and Case Conferencing
A medication review is a structured and collaborative health care service provided to consumers to ensure their medicine use is optimal and fully understood and that continuity of care is enhanced. Comprehensive information about the consumer and their medication use is collated and assessed in order to identify and meet medication-related needs and to identify, resolve and prevent medication-related problems in order to enhance quality of life and optimise the benefits achieved from medication use.

The pharmacists’ role is to:

- Interview patient to identify, assess and manage medication related issues
- Facilitate respectful and effective liaison with fellow health professionals on medication related matters contributing to optimum patient health outcomes
- Provide information on medication and related matters to patients, general practitioners, community pharmacists and other health providers.
- Correct misunderstandings and provide reassurance regarding medications and their use
7 July 2003

Professor C Benrimoj
Faculty of Pharmacy
Pharmacy Building – A15
The University of Sydney

Dear Professor Benrimoj

The Executive Sub-committee at its meeting on 3 July 2003 considered your correspondence dated 1 July 2003. After considering the additional information, the Sub-committee approved your protocol on the study below with a condition. Please note that subject to annual monitoring returns, the approved protocol is valid for five years.

Title: Professional pharmacy services to private hospitals – phase 3
Ref No: 6919
Approval Period: July 2003 – July 2004
Report Due: 31 July 2004
Authorised Personnel: Professor S I Benrimoj
Miss Rebekah Moles
Professor Jo-anne Brien

Condition
Please provide written approvals from each hospital when they become available.

The additional information will be filed with your application.

In order to comply with the National Statement on Ethical Conduct in Research Involving Humans, and in line with the Human Research Ethics Committee requirements the Chief Investigator’s responsibility is to ensure that:

1. The individual researcher’s protocol complies with the final and Committee approved protocol.
2. Modifications to the protocol cannot proceed until such approval is obtained in writing.
3. The confidentiality and anonymity of all research subjects is maintained at all times, except as required by law.
(4) All research subjects are provided with a Participant Information Sheet and Consent Form, unless otherwise agreed by the Committee.

(5) The Participant Information Sheet and Consent Form are to be on University of Sydney letterhead and include the full title of the research project and telephone contacts for the researchers, unless otherwise agreed by the Committee.

(6) The following statement must appear on the bottom of the Participant Information Sheet. Any person with concerns or complaints about the conduct of a research study can contact the Manager of Ethics Administration, University of Sydney, on (02) 9351 4811.

(7) The standard University policy concerning storage of data and tapes should be followed. While temporary storage of data or tapes at the researcher’s home or an off-campus site is acceptable during the active transcription phase of the project, permanent storage should be at a secure, University controlled site for a minimum of five years.

(8) A progress report should be provided by the end of each year. Failure to do so will lead to withdrawal of the approval of the research protocol and re-application to the Committee must occur before recommencing.

(9) A report and a copy of any published material should be provided at the completion of the Project.

Yours sincerely

[Signature]

Associate Professor Stewart Kellie
Chairman, Human Research Ethics Committee

Encl. Private Hospital Discharge Planner Subject Information Sheet
Patient Subject Information Sheet
Private Hospital CEO Subject Information Sheet
Private Hospital Pharmacist Subject Information Sheet
Community Pharmacist Subject Information Sheet 1
Community Pharmacist Subject Information Sheet 2
Medical Practitioner Subject Information Sheet 1
Medical Practitioner Subject Information Sheet 2
Discharge Planner/Pharmacist/Medical Practitioner Consent Form
Patient Consent Form
CEO/Hospital Representative Consent Form
Satisfaction with Information About Medicines Scale (SIMS)
Brief Medication Questionnaire (BMQ)

cc: Miss R Moles, Faculty of Pharmacy, Pharmacy Building – A15, The University of Sydney
Appendix 6: CEO/Hospital Representative Information sheet

Private Hospital CEO/Representative Subject Information Sheet

Professional Pharmacy Services to Private Hospital Patients

Professional Pharmacy services such as medication education, and medication review have shown significant patient benefits when provided in community and nursing home settings. Medication education has increased knowledge and compliance and medication reviews have decreased numbers and costs of medications for patients. Research has also highlighted the opportunities for medical practitioners and pharmacists to collaborate in a range of activities, which aim to minimise drug-related problems and help ensure the optimal use of medicines by patients.

This project aims to investigate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients.

The project will involve private hospital pharmacists providing a standardised Medication Education Service to patients (MES). These patients may then be followed up by a home medicines review (HMR).

Hospitals involved in this project will be required to nominate a representative to:

1. Meet with the researcher and have the details of the project explained.
2. Assist in identifying the appropriate hospital staff (discharge planner and contracted pharmacist) to meet with the researcher.

This project is funded by the pharmacy guild of Australia through The Commonwealth Department of Health and Aged Care, third community pharmacy agreement.

Your participation in this project will help us to develop, implement and evaluate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients. Your involvement is entirely voluntary and you are free to withdraw at anytime.

If you require further information or have any other questions, please contact Miss Rebakah Moles at the Faculty of Pharmacy, The University of Sydney on (02) 9351 5968.

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, The University of Sydney on (02) 9351 4811.
Appendix 7: Hospital Representative Consent Form

CEO/Hospital Representative Consent Form

Professional Pharmacy Services to Private Hospital Patients

I, __________________________, hereby voluntarily consent to participate in the study entitled "Professional Pharmacy services to Private Hospital Patients".

This project is being conducted by Miss Rebekah Moles from the Faculty of Pharmacy, The University of Sydney.

I understand that any data collected for the purpose of this study will remain strictly confidential and not be used to identify any hospital, medical practitioner, pharmacy, pharmacist or patient. I have been informed that the information obtained from this research may be used in future research or published.

Details of the study have been clearly explained by the researcher and I have been issued with an information sheet. I am aware of the purpose of this project and what my involvement entails. My participation is entirely voluntary.

I have been informed of my right to question any part of the procedure or withdraw from the project at any time.

Name: ________________________________

Address: __________________________________________

____________________________________________________

____________________________________________________

Signature: ___________________________ Date: ____________

Name of Witness: ____________________________

Witness Signature: ____________________________

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, The University of Sydney on (02) 9351 4811.
Private Hospital Discharge Planner Subject Information Sheet

Professional Pharmacy Services to Private Hospital Patients

Professional Pharmacy services such as medication education, and medication review have shown significant patient benefits when provided in community and nursing home settings. Medication education has increased knowledge and compliance and medication reviews have decreased numbers and costs of medications for patients. Research has also highlighted the opportunities for health care professionals to collaborate in a range of activities, which aim to minimise drug-related problems and help ensure the optimal use of medicines by patients.

This project aims to investigate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients.

The project will involve private hospital pharmacists to be trained to implement a medication education service (MES) to patients recruited by the discharge planner. Some patients will also be randomised to receive a home medicines review service conducted by their community pharmacist and General Practitioner. The coordination of this project will be by the discharge planner and researchers.

To perform this coordination, discharge planners will be involved in the following steps:

1. Training: Brief training for discharge planners on study protocol will be conducted at the work place by the researcher

2. Recruitment: Patients on 5 or more medicines will be recruited to participate. Only patients who are over 18 years of age, understand English and are not critically or mentally ill will be invited to participate. The discharge planner will be responsible for providing patients with information sheets and consent forms and administering the data collection instrument. After patients have completed their surveys the discharge planner is responsible for randomising the patient to the three arms of the study.

3. Data collection: All patients recruited (active and control) will have their current medication lists documented by the discharge planner

4. Notify Pharmacist: When a patient is randomised to an active arm of the study the discharge planner will notify the private hospital pharmacist that there is a patient to receive an MES.

5. Follow-up: The discharge planner will be responsible for supplying the summary of the MES service to patients nominated GP and community pharmacist along with information sheets and consent forms. Patients that have been randomised to the arm of the study where a home medicine review service is to occur will need their GP to be notified via phone. The discharge planner will coordinate this process.

Private Hospital Discharge planners will be reimbursed for their time coordinating the project.
This project is funded by the pharmacy guild of Australia through The Commonwealth Department of Health and Ageing, third community pharmacy agreement.

Your participation in this project will help us to develop, implement and evaluate a sustainable, cost-effective mechanism for the delivery of professional pharmacy services to private hospital patients. Your involvement is entirely voluntary and you are free to withdraw at anytime.

If you require further information or have any other questions, please contact Miss Rebekah Moles at the Faculty of Pharmacy, The University of Sydney on (02) 9351 5968.

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, The University of Sydney on (02) 9351 4811.
Appendix 9: Private Hospital Pharmacist Information Sheet

Private Hospital Pharmacist Subject Information Sheet

Professional Pharmacy Services to Private Hospital Patients

Professional Pharmacy services such as medication education, and medication review have shown significant patient benefits when provided in community and nursing home settings. Medication education has increased knowledge and compliance and medication reviews have decreased numbers and costs of medications for patients. Research has also highlighted the opportunities for medical practitioners and pharmacists to collaborate in a range of activities, which aim to minimise drug-related problems and help ensure the optimal use of medicines by patients.

This project aims to investigate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients.

The project will involve private hospital pharmacists to be trained to implement a medication education service (MES) to patients.

To perform this professional service, pharmacists will be involved in the following steps:

1. Training: A formal training session will be conducted in order to standardise the MES.

2. Delivery of Service: Medication education will be given to all patients referred by the discharge planner.

3. Review of Service: Some MES sessions will be tape recorded to ensure that the service is being delivered in a standardised manner.

4. Documentation: Private hospital pharmacists will document their session, with relevant clinical interventions performed as well as the time taken to perform the service. All documentation will then be passed to the discharge planner so as appropriate information may be sent to the relevant GPs and community pharmacists as well as the researcher.

Private Hospital Pharmacists will be reimbursed for their time involved in the project, ($65 per patient), for the provision of MES.

This project is funded by the pharmacy guild of Australia through The Commonwealth Department of Health and Ageing, third community pharmacy agreement.

Your participation in this project will help us to develop, implement and evaluate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients. Your involvement is entirely voluntary and you are free to withdraw at anytime.

If you require further information or have any other questions, please contact Miss Rebekah Moles at the Faculty of Pharmacy, The University of Sydney on (02) 9351 5968 or Prof. Jo-anne Brien, St Vincent’s Hospital on (02) 8382 2605.

Any person with complaints about the conduct of a research study can contact Rodney Echlestone executive officer, Human Research Ethics Committee, St Vincent’s Hospital (02) 8382 2075, recyclingone@stvincents.com.au.
Appendix 10: Health Care Professional Consent Form

Discharge Planner/ Pharmacist / Medical Practitioner Consent Form

Professional Pharmacy Services to Private Hospital Patients

I, ___________________________________________ hereby voluntarily consent to participate in the study entitled "Professional Pharmacy services to Private Hospital Patients".

This project is being conducted by Miss Rebekah Moles from the Faculty of Pharmacy, The University of Sydney.

I understand that any data collected for the purpose of this study will remain strictly confidential and not be used to identify any hospital, medical practitioner, pharmacy, pharmacist or patient. I have been informed that the information obtained from this research may be used in future research or published.

I have been shown the signed consent form for the relevant patient(s), participating in the study.

Details of the study have been clearly explained by the researchers or hospital staff and I have been issued with a subject information sheet. I am aware of the purpose of this project and what my involvement entails. My participation is entirely voluntary.

I have been informed of my right to question any part of the procedure or withdraw from the project at any time.

Name: ___________________________________________

Address: ___________________________________________

Phone: ___________________________________________

Signature: ___________________________ Date: _____________

Name of Witness: _______________________________________

Witness Signature: ___________________________

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, The University of Sydney on (02) 9351 4811.
Appendix 11: Patient Information Sheet

Patient Subject Information Sheet

Professional Pharmacy Services to Private Hospital Patients

Professional Pharmacy services such as medication education, and medication review have shown significant patient benefits when provided in community and nursing home settings. Medication education has increased knowledge and compliance to medication regimens and medication reviews have decreased numbers and costs of medications for patients. Research has also highlighted the opportunities for health professionals to collaborate in a range of activities, which aim to minimise drug-related problems and help ensure the optimal use of medicines by patients.

This project aims to investigate the impact of pharmacists providing professional services to private hospital patients.

The project may involve your private hospital pharmacist providing a medication education service including an interview and assessment of your current medications. This may also be followed by a home medication review service conducted by your preferred GP and community pharmacy.

If you give your written consent, you will be asked to complete some written questionnaires both in hospital and at home. A telephone call to remind you to fill in such surveys at home may occur.

After you have consented to participate in the study you will be placed in one of three study groups. The discharge planner will select an envelope which will advise them of which study group you are in. Depending on which study group you are in, your private hospital pharmacist may then supplement your knowledge of your current medication regimen. This session may be audiotaped to assess the quality of the pharmacy service. Furthermore, depending on the study group you are in, you may also be offered a home medicines review service that will be conducted by your preferred community pharmacy and GP. This service usually requires a pharmacist to visit you in your home at a time convenient for you.

This project is funded by the pharmacy guild of Australia through The Commonwealth Department of Health and Aged Care, third community pharmacy agreement.

Your participation in this project will help us to develop, implement and evaluate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients. Your involvement is entirely voluntary and you are free to withdraw at anytime.

If you require further information or have any other questions, please contact Miss Rebekah Moles at the Faculty of Pharmacy, The University of Sydney on (02) 9351 5968.

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, The University of Sydney on (02) 9351 4811.
Appendix 12: Patient Consent Form

Patient Consent Form

Professional Pharmacy Services to Private Hospital Patients

I, ___________________________ hereby voluntarily consent to participate in the study entitled "Professional Pharmacy services to Private Hospital Patients".

This project is being conducted by Miss Rebekah Moles from the Faculty of Pharmacy, The University of Sydney.

I give permission for the hospital staff and researchers to contact my preferred community pharmacy, ___________________________ and medical practitioner, ___________________________ and pass on relevant medical information for the purpose of the study evaluation. I understand that my computerised dispensed medication records and my medical records may be collected and reviewed.

I give my permission for a medication education service that may be provided by the pharmacist to be tape-recorded.

I understand that any data collected for the purpose of this study will remain strictly confidential and not be used to identify any medical practitioner, pharmacy, pharmacist or patient. I have been informed that the information obtained from this research may be used in future research or published.

Details of the study have been clearly explained by private hospital staff. I am aware of the purpose of this project and what my involvement entails. I have been issued with a subject information sheet. My participation is entirely voluntary.

I have been informed of my right to question any part of the procedure or withdraw from the project at any time.

Name: ____________________________________________

Address: ___________________________________________

______________________________________________

______________________________________________

Phone: ____________________________________________

Signature: ___________________________ Date: ___________

Name of Witness: ______________________________________

Witness Signature: ___________________________

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, The University of Sydney on (02) 9351 4811.
Appendix 13: Cover letter to Community Pharmacists nominated by Patients randomised to Study Arm 1.

Dear Community Pharmacist,

One of your patients has had a recent private hospital admission and has consented to participate in a study entitled “Professional Pharmacy Services to Private Hospital Patients”.

Enclosed is a copy of the patient’s consent form, a project information sheet for you to keep, as well as a consent form and an addressed, stamped envelope.

Please read the information sheet, which explains your role within the research, (namely to forward patient history printouts at 3 months after discharge). If you consent to this study, would you please complete the written consent form and place it within the addressed envelope to send to the researcher.

You will need to generate a tax invoice so as payment can be made for your time involved in the study on receipt of patient print outs. Inclosed are requirements for the invoice.

If you consent to participate in the study, you will be contacted and asked to produce a print out of the patient’s current list of medications from your computer records.

Once you have sent the documentation at three months, you will be reimbursed for your time ($20 for each patient).

Thank you for considering participating in this study.

You may receive a phone call to remind you to complete the enclosed form.

Rebekah Moles
PhD Student
Appendix 14: Cover letter to Community Pharmacists nominated by patients randomised to Study Arm 2.

Dear Pharmacist,

One of your patients has had a recent private hospital admission and has consented to participate in a study entitled Professional Pharmacy Services to Private Hospital Patients.

The private hospital pharmacist has provided a Medication Education Service (MES) for your patient, and the documentation of this service is enclosed. You may wish to file this documentation with your patients records.

Any issues arising should be discussed with the patient and their general practitioner.

We hope you appreciate this service that has been provided for your patient.

Also enclosed within is a copy of the patients consent form, a project information sheet for you to keep, as well as a consent form and an addressed, stamped envelope.

Please read the information sheet, which explains your role within the research, (namely to forward patient history printouts 3 months after discharge). If you consent to this study, would you please complete the written consent form and place it within the addressed envelope to send to the researchers.

You will need to generate a tax invoice so as payment can be made for your time involved in the study on receipt of patient print outs. Inclosed are requirements for the invoice.

If you consent to participate in the study, you will be contacted and asked to produce a print out of the patients current list of medications from your computer records.

Once you have sent the documentation at three months, you will be reimbursed for your time ($20 for each patient).

Thank you for considering participating in this study.

You may receive a phone call to remind you to complete the enclosed forms.

Rebekah Moles
PhD Student
Appendix 15: Information Sheet for Community Pharmacists nominated by patients in study arms 1 or 2.

Community Pharmacist Subject Information Sheet 1

Professional Pharmacy Services to Private Hospital Patients

Professional Pharmacy services such as medication education, and medication review have shown significant patient benefits when provided in community and nursing home settings. Medication education has increased knowledge and compliance and medication reviews have decreased numbers and costs of medications for patients. Research has also highlighted the opportunities for medical practitioners and pharmacists to collaborate in a range of activities, which aim to minimise drug-related problems and help ensure the optimal use of medicines by patients.

This project aims to investigate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients.

The project will involve private hospital pharmacists providing a standardised Medication Education Service to patients (MES).

Community Pharmacists involved in the project will be required to:

1. Provide computerised medication history printouts for patients consenting to take part in the project at 3 months after discharge. (A researcher will contact you for this information)

Community pharmacists will be reimbursed for their time involved in the project, ($20 per patient). Note 3-month data must be sent to the researcher.

This project is funded by the pharmacy guild of Australia through The Commonwealth Department of Health and Ageing, third community pharmacy agreement.

Your participation in this project will help us to develop, implement and evaluate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients. Your involvement is entirely voluntary and you are free to withdraw at anytime.

If you require further information or have any other questions, please contact Miss Rebekah Moles at the Faculty of Pharmacy, The University of Sydney on (02) 9351 5968.

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, The University of Sydney on (02) 9351 4811.
Appendix 16: Cover letter to Community Pharmacists nominated by patients randomised to Study Arm 3.

Dear Community Pharmacist

One of your patients has had a recent private hospital admission and has consented to participate in a study entitled “Professional Pharmacy Services to Private Hospital Patients”.

The private hospital pharmacist has provided a Medication Education Service (MES) for your patient, and the documentation of this service is enclosed. You may wish to file this documentation with your patients records.

Any issues arising should be discussed with the patient and their general practitioner.

We hope you appreciate this service that has been provided for your patient.

Also enclosed within, is a copy of the patients consent form, a project information sheet for you to keep, as well as a consent form and an addressed, stamped envelope.

This patient has been flagged for a Home Medicines Review (HMR) service following discharge. If the patient’s GP completes an HMR referral you will be required to coordinate this service. Enclosed is information on how to register and claim for HMR, and how to find an accredited pharmacist if necessary.

Please read the information sheet, which explains your role within the research, (namely to forward patient history printouts at 3 months after discharge, and to coordinate a home medicines review service). If you consent to this study, would you please complete the written consent form and place it within the addressed envelope to send to the researcher.

You will need to generate a tax invoice so as payment can be made for your time involved in the study on receipt of patient print outs. Included are requirements for the invoice.

If you consent to participate in the study, you will be contacted and asked to produce a print out of the patients current list of medications from your computer records and provide HMR documentation if appropriate.

Once you have sent the documentation at three months, you will be reimbursed for your time ($20 for each patient). You may claim for HMR remuneration through the HIC.

Thank you for considering participating in this study.

You may receive a phone call to remind you to complete the enclosed form.

Rebekah Moles

PhD Student
Appendix 17: Information Sheet for community pharmacists nominated by patients randomised to Study Arm 3.

Community Pharmacist Subject Information Sheet 2

Professional Pharmacy Services to Private Hospital Patients

Professional Pharmacy services such as medication education, and medication review have shown significant patient benefits when provided in community and nursing home settings. Medication education has increased knowledge and compliance and medication reviews have decreased numbers and costs of medications for patients. Research has also highlighted the opportunities for medical practitioners and pharmacists to collaborate in a range of activities, which aim to minimise drug-related problems and help ensure the optimal use of medicines by patients.

This project aims to investigate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients.

The project will involve private hospital pharmacists providing a standardised Medication Education Service to patients (MES). These patients will then be followed up by a home medicines review (HMR).

Community Pharmacists involved in the project will be required to:

1. Provide computerised medication history printouts for patients consenting to take part in the project at 3 months after discharge. (A researcher will contact you for this information)

2. Identify and contract an accredited pharmacist to complete an HMR for referred patients.

3. Document changes in patients treatment within the 3-month time frame and send this information to the researchers.

Accredited pharmacists involved in the project will be required to:

4. Complete an HMR service for patients referred to the pharmacy, documenting the relevant findings and recommendations and submitting a copy to the researches as well as the GP.

Community pharmacists will be reimbursed for their time involved in the project, ($20 per patient). Note 3-month data must be sent to the researcher. Pharmacies may also claim for HMR via the usual commonwealth funding process.

This project is funded by the pharmacy guild of Australia through The Commonwealth Department of Health and Ageing. Third community pharmacy agreement.

Your participation in this project will help us to develop, implement and evaluate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients. Your involvement is entirely voluntary and you are free to withdraw at anytime.

If you require further information or have any other questions, please contact Miss Rabekah Moles at the Faculty of Pharmacy, The University of Sydney on (02) 9351 5968.

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, The University of Sydney on (02) 9351 4811.
Appendix 18: Letter to Medical Practitioners nominated by patients randomised to Study Arm 2.

Dear Medical Practitioner,

One of your patients has had a recent private hospital admission and has consented to participate in a study entitled Professional Pharmacy Services to Private Hospital Patients.

The private hospital pharmacist has provided a Medication Education Service (MES) for your patient, and the documentation of this service is enclosed. You may wish to file this documentation with your patients records.

Any issues arising should be discussed with the patient and their community pharmacist.

We hope you appreciate this service that has been provided for your patient.

Rebekah Moles

PhD Student
Appendix 19: Cover letter to Medical Practitioners nominated by Patients randomised to Study Arm 3.

Dear Medical practitioner,

One of your patients has had a recent private hospital admission and has consented to participate in a study entitled "Professional Pharmacy Services to Private Hospital Patients".

The private hospital pharmacist has provided a Medication Education Service (MES) for your patient, and the documentation of this service is enclosed. You may wish to file this documentation with your patient's records.

Any issues arising should be discussed with the patient and their community pharmacist.

We hope you appreciate this service that has been provided for your patient. Also enclosed within, is a copy of the patient's consent form, a project information sheet for you to keep, as well as a consent form and an addressed, stamped envelope.

This patient has been flagged for a Home Medicines Review (HMR) service following discharge (NB this is also known as a DMMR). If you feel this service would be appropriate, you will be required to initiate the referral to the community pharmacy. Enclosed is a fact sheet about the service and the referral form.

Please read the information sheet, which explains your role within this research project, (namely to refer the patient for an HMR and provide documentation of the home medicines review service). If you consent to this study, would you please complete the written consent form and place it within the addressed envelope to send to the researcher.

You will need to generate a tax invoice so as payment can be made for your time involved in the study on receipt of patient histories and HMR documentation. Inclosed are requirements for the invoice.

Within the next few months, (if you consent to participate in the study), you will be contacted and asked to produce a list of the patient's current medications and provide HMR documentation if appropriate.

Once you have sent the documentation at three months, you will be reimbursed for your time ($20 for each patient). You may claim for HMR remuneration through Medicare.

Thank you for considering participating in this study.

You may receive a phone call to encourage you to complete the enclosed form.

Rebekah Moles
PhD Student
Appendix 20: Information Sheet for Medical Practitioners nominated by patients randomised to Study Arm 3.

Medical Practitioner Subject Information Sheet

Professional Pharmacy Services to Private Hospital Patients

Professional Pharmacy services such as medication education, and medication review have shown significant patient benefits when provided in community and nursing home settings. Medication education has increased knowledge and compliance and medication reviews have decreased numbers and costs of medications for patients. Research has also highlighted the opportunities for medical practitioners and pharmacists to collaborate in a range of activities, which aim to minimise drug-related problems and help ensure the optimal use of medicines by patients.

This project aims to investigate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients.

The project will involve private hospital pharmacists providing a medication education service to patients. These patients will then be followed up by a home medicines review (HMR).

Medical practitioners involved in the project will be required to:

1. Refer patients to their preferred community pharmacy for an HMR.
2. Document changes in patients treatment within the 3-month time frame and send this information to the researchers.

Medical Practitioners will be reimbursed for their time involved in the project, ($20 per patient) on receipt of 3 month documentation.

Medical practitioners may also claim for HMR via the usual commonwealth funding process.

This project is funded by the pharmacy guild of Australia through The Commonwealth Department of Health and Ageing, third community pharmacy agreement.

Your participation in this project will help us to develop, implement and evaluate a sustainable, cost effective mechanism for the delivery of professional pharmacy services to private hospital patients. Your involvement is entirely voluntary and you are free to withdraw at anytime.

If you require further information or have any other questions, please contact Miss Rebekah Moles at the Faculty of Pharmacy, The University of Sydney on (02) 9351 5968.

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, The University of Sydney on (02) 9351 4811.
Appendix 21: Patient Information Sheet Home Medicines Review

Professional Pharmacy Services to Private Hospital Patients

Patient Information Sheet:

Home Medicines Review

1. What is a Home Medicines Review?

A Home Medicines Review is a service that allows a thorough check of all the medicines you are taking by a pharmacist, at the request of your GP, and with your agreement. The review usually takes place in your home, at a time convenient to you. For more information, read the brochure called Home Medicines Review, available from your pharmacy. Pharmacists and GPs may also refer to this service as a Domiciliary Medication Management Review (DMMR).

2. Who can have a Home Medicines Review?

Anyone living in their own home can have a Home Medicines Review if their GP thinks their condition and the medicines they are taking make the review worthwhile. Some situations are more likely to put people at risk of medicine-related problems, such as:

- taking five or more regular medicines or taking more than a total of 12 doses of medicine(s) per day;
- recent changes to your medication routine (doses or medicines);
- attending a number of different doctors, both GPs and specialists;
- and
- having recently come out of hospital.

3. Who can decide whether I need a Home Medicines Review?

Your GP can refer you to have a Home Medicines Review after thinking about your medication needs during a consultation. Anyone - you, your career, a family member, your pharmacist or community nurse - can ask the doctor if this service might be helpful for you. If you agree, only your GP can refer you for a Home Medicines Review. He or she will then fill out a special referral form, which you take (or your doctor sends) to your preferred pharmacy.

4. What benefits does the service offer?

The review is for your benefit. It gives you the opportunity to spend time asking questions about your medicines that your doctor or pharmacist may not always have the time to answer. Home Medicines Reviews can help you better understand your medicines and how to take them. This increased understanding can help to reduce your risk of having medicine-related problems and can improve your overall health.

5. Do I have to have the Home Medicines Review?

It is your decision. You don’t have to have the review if you believe it will not be of benefit; you would feel uncomfortable having it or for any other reason. If you refuse, you do not lose the opportunity to have a review later on, if needed.
6. How often can I have a Home Medicines Review?

You can have a Home Medicines Review once every 12 months or sooner if there has been a significant change in your condition or your medicines, such as after coming out of hospital. Your GP will take this into account in deciding whether you need a Home Medicines Review.

7. What do I have to do?

Tell your GP which is your preferred community pharmacy (chemist). The pharmacy will arrange a suitable time for a pharmacist to visit you and discuss your medicines in detail. Before the visit think about or write down all the questions you would like answered and any concerns you have about your medicines. Make sure you have all your medicines available, including ones bought without a prescription at a pharmacy, supermarket or health food store, those bought from any other health professionals (eg naturopath) or any prescription medicines from other doctors or hospitals. Information about your medicines and your conditions will be passed to the pharmacist(s) involved.

8. What happens after the pharmacist visits?

Your GP will discuss the results of the review with the pharmacist, including any suggestions of potential benefit to you. You return to your GP to develop a medication management plan together. He or she will offer you a copy and your GP and pharmacist will work with you to put the plan into action.
Appendix 22: GP HMR Fact Sheet and Process Chart

Professional Pharmacy Services to Private Hospital Patients

GP HMR Fact Sheet and Process Chart

What is DMMR?
DMMR is a service provided to patients living at home in the community. Patients may also refer to this service as Home Medicines Review. The goal of DMMR is to maximise an individual patient’s benefit from their medication regimen, accomplished through a team approach involving the general practitioner (GP) and the patient's preferred community pharmacy, with the patient as the central focus.

What are the objectives of DMMR?
- achieve safe, effective, and appropriate use of medications by detecting and addressing medication-related problem/s that interfere with desired patient outcomes;
- improve the patient’s quality of life and health outcomes using a best practice approach, that involves a collaborative effort between the GP, pharmacist, other relevant health professionals, and the patient (and where appropriate, their carer);
- improve the patient’s and health professionals’ knowledge and understanding about medications, and
- facilitate cooperative working relationships between members of the health care team, in the interests of patient health and well being.

Who is eligible to receive DMMR?
The DMMR process is available to people living in their homes. It does not apply to in-patients of a hospital, day hospital facility, or care recipients in residential aged care facilities. The patient should not have received a DMMR service within the past 12 months (unless there has been a significant change in their condition or medication regimen). The GP must assess the need for a DMMR based on potential patient benefits and quality use of medicines goals. Those patients most likely to benefit are:
- patients at risk of medication related problems because of their co-morbidities, age or social circumstances;
- the characteristics of their medicines (eg warfarin);
- the complexity of their medication treatment regimen;
- patients recently discharged from hospital with multiple changes in therapy;
- suspected non-compliance or difficulties managing medication related therapeutic devices.

Who is involved in DMMR?
- the patient and their carer, where appropriate, as the central focus;
- the general practitioner;
- a pharmacist from the patient’s preferred community pharmacist;
- an accredited pharmacist (if different from the preferred community pharmacist);
- other members of the health care team that are identified as appropriate, such as community nurses, physiotherapists, diabetes educators.
What is the MBS fee for DMMR?
The MBS fee for a GP completing a DMMR is $120 with a rebate of 85%, or $102. This includes the initial consultation at which the patient’s eligibility for DMMR is assessed and the referral form completed, liaison with the pharmacist, and development of the medication management plan for discussion and agreement with the patient at a second consultation. Any further follow-up, if required, would be part of subsequent consultations separate to the DMMR.

How do you claim the MBS DMMR benefit?
You can submit a Medicare direct bill assignment form or provide the patient with an account. For a DMMR service to be eligible for a Medicare rebate the requirements for the item must be met, including patient consent for the service and agreement with the medication management plan developed.

What is my role in the DMMR process?

1. Identify need for DMMR or receive a request for referral for assessment for DMMR by the patient and/or care, pharmacist or other members of the health care team.
2. Assess need for service from a quality use of medicines perspective with the patient as the focus and, if appropriate, formally initiate DMMR.
3. Obtain patient consent and document in medical record.
4. Complete the DMMR referral form (or otherwise provide patient details and relevant clinical information) and ensure its delivery to the patient’s preferred community pharmacy.
5. Community pharmacy notifies you of the time and date of the DMMR interview and accredited pharmacist’s details (if different to the coordinating pharmacist).
6. Pharmacist provides you with a DMMR report, you discuss findings and suggested management strategies with the pharmacist including respective roles in implementation of the proposed management plan, monitoring and follow-up.
7. Develop a draft medication management plan, using DMMR report as a basis and arrange follow-up consultation with patient.
8. At consultation, you and patient agree on medication management plan; patient to sign or agreement to be noted in patient records.
9. Forward one copy of agreed medication management plan to preferred community pharmacy, offer a copy to the patient and retain one (copies may also be provided to other relevant health professionals as appropriate and with the patient’s agreement).
10. Implementation of agreed actions with appropriate follow-up and monitoring.
Appendix 23: Pharmacy Information HMR – How to start

Pharmacy Information
HMR - How to start

- Register to become a HMR Service Provider
Forms have been sent to all pharmacies with the HMR Service Implementation Module, (white documents with red stripe, shrink wrapped) is also available on www.hic.gov.au <http://www.hic.gov.au/> or www.guild.org.au <http://www.guild.org.au/>

The Pharmacy Guild of Australia can send you the documents, phone 02 9966 8377.

- Register with the Pharmacy Guild of Australia to commence QCPP
For information contact the Pharmacy Guild of Australia on 9966 8377.

- Complete the Service Implementation Module of the QCPP.
This includes a Communication and Concordance Module to aid delivery of effective communication with both the GP and the consumer.

- Now you can participate
If you are accredited to conduct medication review you are ready to accept your general practitioners referral.

A registered pharmacist can conduct the patient interview.

If you are not yet accredited, an accredited pharmacist can be employed to complete the HMR.

- For information on accreditation to conduct medication review, aacp@aacp.com.au or phone 02 6270 1850.
- PSA is co-ordinating all the training, phone 02 9438 1833.
- The Pharmacy Guild of Australia is also in the process of surveying accredited pharmacists. For information please phone 9966 8377.
Pharmacy Information owner/staff accredited pharmacist

What to do when a patient requests an HMR

- **Pharmacy staff can explain the process to the patient:**
  Our pharmacist will come and see you to have a chat about your medications; they will want to have a look at all the medications you are taking. They will ask you a few questions; it should not take very long. We have to ask you a few questions. (Use Pharmacy HMR Questionnaire)

- **Organise a time for interview that may be suitable**
  Check with the patient what time suits them and where they would prefer to speak to the pharmacist. Guidelines suggest the interview is at the patients home, it may be elsewhere if the patient prefers.

- **Print our six months dispensed medication history**
  This allows you to check if the medications are the same as the GP ordered, doses appropriate and as ordered, regimen appropriate and ordered, and also to check adherence to regimen.

- **Interview the patient**
  This is a new process and the patients are unfamiliar at the moment. Tell the patient what to expect when you start and remove yourself from interruptions.

  Eg: I won’t take very long, I need to ask you a few questions about your medications, would you like me to check the expiry dates? etc

- **All the information you have gathered can now be used to conduct the medication management review part of the process.**

- **Write your report to the GP, report by phone or face to face whichever he/she prefers.** If you need further information this is a good time to ask, then you can amend your written report.

- **The GP may involve the pharmacy in ongoing monitoring:** It is important that all pharmacists are aware of the report and the patient involved.

- **File to maintain privacy in safe, alphabetical file so the information is retrievable.
Pharmacy Information external accredited pharmacist

What to do when a patient requests an HMR

- **Pharmacy staff can explain the process to the patient:**
  A pharmacist will come and see you to have a chat about your medications, they will want to have a look at all the medications you are taking. They will ask you a few questions, it should not take very long. I need to ask you a few questions now.

- **Organise a time for interview that may be suitable**
  Check with the patient what time suits them and where they would prefer to speak to the pharmacist. Guidelines suggest the interview is at the patient's home, it may be elsewhere if the patient prefers. Give these patients a list of what they need to bring with them.

- **Contact the accredited pharmacist**
  Check if the time for interview suits and arrange to fax the dispensed medication history (for the previous six months) and the information from the GP to the accredited pharmacist.

- **The accredited pharmacist will contact the GP to report:** The pharmacy will also get a copy of the report. The GP may involve the pharmacy in ongoing monitoring, so it is important that all pharmacists on the staff are aware of the report and the patient involved.

- **File the information, to maintain privacy use a safe, alphabetical file so the information is retrievable.**
**Satisfaction with Information About Medicines Scale**

**Information about medicines**
Please rate your overall feeling about the information you have received for each of the following aspects of all your medicines.

**How much information have you received about the following?**

Please tick the appropriate circle

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<td>1. What your medicine is called.</td>
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<td>2. What your medicine is for.</td>
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<td>3. What it does.</td>
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<td>4. How it works.</td>
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<td>5. How long it will take to act.</td>
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<td>6. How you can tell if it working.</td>
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<td>7. How long you will need to be on your medicine.</td>
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<td>8. How to use your medicine.</td>
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<td>9. How to get a further supply.</td>
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<td>10. Whether the medicine has any unwanted effects (side effects)</td>
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<td>11. What are the risks of you getting side effects.</td>
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<td>12. What you should do if you experience unwanted side effects</td>
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<td>13. Whether you can drink alcohol whilst taking this medicine.</td>
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<td>14. Whether this medicine interferes with other medicines.</td>
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<td>15. Whether the medication will make you feel drowsy.</td>
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<td>16. Whether the medicine will affect your sex life.</td>
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<td></td>
</tr>
<tr>
<td>17. What you should do if you forget to take a close</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Thank you for your time.**
Please fill in your details on the back, and hand this completed form to your discharge planner/nurse.
professional pharmacy services

to private hospital patients

thank you for agreeing to participate in this study,
on the following pages is a questionnaire that I would invite you to complete.
BMQ Brief Medication Questionnaire

Please list below all of the medications you took in the PAST WEEK. For each medication you list please answer each of the questions to the best of your ability. There is space for 10 medications, please use only the number required. If you require more space, please insert a page.

**Medication 1**

Medication Name and Strength: __________________________

How many days did you take it? __________________________

How many times per day did you take it? __________________

How many pills did you take each time? __________________

How many times did you miss taking a pill? ________________

For what reason were you taking it? ______________________

How well does this medicine work for you? □ not well   □ okay   □ well

**Medication 2**

Medication Name and Strength: __________________________

How many days did you take it? __________________________

How many times per day did you take it? __________________

How many pills did you take each time? __________________

How many times did you miss taking a pill? ________________

For what reason were you taking it? ______________________

How well does this medicine work for you? □ not well   □ okay   □ well
**Medication 3**

Medication Name and Strength: ____________________________

How many days did you take it? ____________________________

How many times per day did you take it? __________________

How many pills did you take each time? ____________________

How many times did you miss taking a pill? _________________

For what reason were you taking it? _______________________

How well does this medicine work for you? not well  ok  well

**Medication 4**

Medication Name and Strength: ____________________________

How many days did you take it? ____________________________

How many times per day did you take it? __________________

How many pills did you take each time? ____________________

How many times did you miss taking a pill? _________________

For what reason were you taking it? _______________________

How well does this medicine work for you? not well  ok  well
**Medication 5**

Medication Name and Strength: __________________________

How many days did you take it? _________________________

How many times per day did you take it? _________________

How many pills did you take each time? _________________

How many times did you miss taking a pill? _______________

For what reason were you taking it? _____________________

How well does this medicine work for you? not well okay well

**Medication 6**

Medication Name and Strength: __________________________

How many days did you take it? _________________________

How many times per day did you take it? _________________

How many pills did you take each time? _________________

How many times did you miss taking a pill? _______________

For what reason were you taking it? _____________________

How well does this medicine work for you? not well okay well
**Medication 7**

Medication Name and Strength: ____________________________

How many days did you take it? ____________________________

How many times per day did you take it? ____________________

How many pills did you take each time? ____________________

How many times did you miss taking a pill? _________________

For what reason were you taking it? _______________________

How well does this medicine work for you? not well okay well

**Medication 8**

Medication Name and Strength: ____________________________

How many days did you take it? ____________________________

How many times per day did you take it? ____________________

How many pills did you take each time? ____________________

How many times did you miss taking a pill? _________________

For what reason were you taking it? _______________________

How well does this medicine work for you? not well okay well
**Medication 9**

Medication Name and Strength: ____________________________

How many days did you take it? ____________________________

How many times per day did you take it? _________________

How many pills did you take each time? __________________

How many times did you miss taking a pill? ________________

For what reason were you taking it? ______________________

How well does this medicine work for you?  

- [ ] not well
- [ ] okay
- [ ] well

**Medication 10**

Medication Name and Strength: ____________________________

How many days did you take it? ____________________________

How many times per day did you take it? _________________

How many pills did you take each time? __________________

How many times did you miss taking a pill? ________________

For what reason were you taking it? ______________________

How well does this medicine work for you?  

- [ ] not well
- [ ] okay
- [ ] well
Do any of your medications bother you in any way?  □  □

IF YES, please name the medication and check below how much it bothers you (up to 5 medications).

**Medication 1**

Medication Name and Strength: ____________________________

How much did it bother you?  □  □  □

In what way did it bother you? ____________________________

_________________________________________________________________

**Medication 2**

Medication Name and Strength: ____________________________

How much did it bother you?  □  □  □

In what way did it bother you? ____________________________

_________________________________________________________________
BMQ  Brief Medication Questionnaire

**Medication 3**

Medication Name and Strength: ____________________________

How much did it bother you?  [ ] a lot  [ ] some  [ ] a little

In what way did it bother you? ____________________________
____________________________________________________
____________________________________________________

**Medication 4**

Medication Name and Strength: ____________________________

How much did it bother you?  [ ] a lot  [ ] some  [ ] a little

In what way did it bother you? ____________________________
____________________________________________________
____________________________________________________

**Medication 5**

Medication Name and Strength: ____________________________

How much did it bother you?  [ ] a lot  [ ] some  [ ] a little

In what way did it bother you? ____________________________
____________________________________________________
____________________________________________________
Below is a list of problems that people sometimes have with their medicines. Please check how hard it is for you to do each of the following:

A. Open or close the medication bottle:
   Which medications: ____________________________
   □ very hard □ somewhat hard □ not hard at all

B. Read the print on the bottle:
   Which medications: ____________________________
   □ very hard □ somewhat hard □ not hard at all

C. Remember to take the pills:
   Which medications: ____________________________
   □ very hard □ somewhat hard □ not hard at all

D. Get your repeats in time:
   Which medications: ____________________________
   □ very hard □ somewhat hard □ not hard at all

E. Take so many pills at the same time:
   Which medications: ____________________________
   □ very hard □ somewhat hard □ not hard at all
Information about medicines
Please rate your overall feeling about the information you have received for each of the following aspects of all your medicines.

<table>
<thead>
<tr>
<th>How much information have you received about the following?</th>
<th>none needed</th>
<th>none received</th>
<th>too little</th>
<th>about right</th>
<th>too much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What your medicine is called.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. What your medicine is for.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. What it does.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. How it works.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5. How long it will take to act.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. How you can tell if it working.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. How long you will need to be on your medicine.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. How to use your medicine.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>9. How to get a further supply.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Medicines Scale

<table>
<thead>
<tr>
<th></th>
<th>none needed</th>
<th>none received</th>
<th>too little</th>
<th>about right</th>
<th>too much</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Whether the medicine has any unwanted effects (side effects)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. What are the risks of you getting side effects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. What you should do if you experience unwanted side effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Whether you can drink alcohol whilst taking this medicine.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>14. Whether this medicine interferes with other medicines.</td>
<td></td>
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<td></td>
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<tr>
<td>15. Whether the medication will make you feel drowsy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Whether the medicine will affect your sex life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. What you should do if you forget to take a dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Thank you for your time.**
Please fill in your details on the back, and place in the stamped address envelope provided and post.
Please supply the following details:

name: ________________________________

address: ______________________________

                                  ________________________________

                                  ________________________________

phone: ________________________________

Date of Completion of Survey: ____________
### Discharge Planner Documentation Sheet

- **Hospital:**
- **Patient’s Name:**
- **Address:**
- **Date of Discharge:**

- **Preferred Community Pharmacy:**
- **Address:**
- **Phone:**

- **Preferred Medical Practitioner:**
- **Address:**
- **Phone:**

### Patient’s Current Medications

<table>
<thead>
<tr>
<th>DRUG NAME</th>
<th>STRENGTH</th>
<th>DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
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<tr>
<td>5.</td>
<td></td>
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<tr>
<td>6.</td>
<td></td>
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<tr>
<td>7.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **ALLERGIES:**

- **REASON FOR ADMISSION:**

- **CURRENT MEDICAL CONDITIONS:**

- **ANY OTHER COMMENTS:** (e.g. recently ceased medications/Problems encountered)
Appendix 27: Draft MES Documentation Form

MES Documentation Sheet

Hospital: ____________________________
Patient’s Name: _____________________
Address: ____________________________
____________________________________
____________________________________
Phone: ______________________________
Reason for admission: ________________
____________________________________

Preferred Community Pharmacy: ____________________________
Address: ____________________________________________
________________________________________
Phone: _____________________________________________

Patient’s Current Medications (including OTC and Complimentary)

<table>
<thead>
<tr>
<th>DRUG NAME</th>
<th>STRENGTH</th>
<th>DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Patient History

☐ Asthma  ☐ Arthritis  ☐ Diabetes  ☐ Heart condition  ☐ Hypertension
☐ Other (provide details): ____________________________

ALLERGIES: ________________________________________

Private Hospital Pharmacist: __________________________
Phone: _____________________________________________
Date of MES delivery: __/__/20________
Time taken to complete MES: ____mins  Signature: __________________________
## Summary of service

### Information provided

- [ ] medication directions
- [ ] indications for use
- [ ] possible adverse effects
- [ ] management of adverse effects
- [ ] medication interactions
- [ ] storage requirements
- [ ] contact details for support groups

Provide details:

### Patient issues

- [ ] adherence
- [ ] adverse effects
- [ ] reading labels - sight
- [ ] difficulty swallowing
- [ ] difficulty opening lids
- [ ] other

Provide details:

### Recommendations

- [ ] additional monitoring
- [ ] referral to G.P.
- [ ] referral to other health care professional
- [ ] adherence aids (webster pak/dosette)
- [ ] OTC medication
- [ ] other

Provide details:

---

Page 1 of 2
Appendix 28: MES Documentation Form

**MES Documentation Sheet**

**Hospital:**
Patient's Name: ____________________________
Address: __________________________________
Phone: ________________________________
Reason for admission: ______________________

**Preferred Community Pharmacy:**
Address: __________________________________
Phone: __________________________________

**Preferred Medical Practitioner:**
Address: __________________________________
Phone: __________________________________

<table>
<thead>
<tr>
<th>Patient's Current Medications (including OTC and Complementary)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DRUG NAME</strong></td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
</tr>
<tr>
<td>7.</td>
</tr>
<tr>
<td>8.</td>
</tr>
<tr>
<td>9.</td>
</tr>
<tr>
<td>10.</td>
</tr>
</tbody>
</table>

**Patient History**
- [ ] Asthma
- [ ] Arthritis
- [ ] Diabetes
- [ ] Heart condition
- [ ] Hypertension

[ ] Other (provide details: ____________________________________________]

**ALLERGIES:** ______________________________________________________

---

Page 1 of 2
## Summary of service

### Patient issues:
- [ ] adherence
- [ ] adverse effects
- [ ] other __________________

Provide details: ______________________________________________________
_______________________________________________________________
_______________________________________________________________

### Information provided:
- [ ] medication directions
- [ ] indications for use
- [ ] possible adverse effects
- [ ] management of adverse effects
- [ ] medication interactions
- [ ] storage requirements
- [ ] contact details for support groups

Provide details: ______________________________________________________
_______________________________________________________________
_______________________________________________________________

- [ ] clot and lifestyle advice
- [ ] demonstration of medication devices
- [ ] GMI (Consumer Medicines Information)
- [ ] self care fact card
- [ ] medication card
- [ ] other __________________

Provide details: ______________________________________________________
_______________________________________________________________
_______________________________________________________________

### Recommendations:
- [ ] additional monitoring
- [ ] adherence aids (web-based or devices)
- [ ] referral to medical practitioner
- [ ] OTC medication
- [ ] referral to other health care professional
- [ ] other __________________

Provide details: ______________________________________________________
_______________________________________________________________
_______________________________________________________________
Appendix 30: Power Point Presentation for Hospital Staff

PROFESSIONAL PHARMACY SERVICES TO PRIVATE HOSPITAL PATIENTS
Rebekah Moles
Faculty of Pharmacy
University of Sydney

AIM
• Implement and evaluate two professional pharmacy services to private hospital patients
  – MEDICATION EDUCATION
  – MEDICATION REVIEW

BACKGROUND
• Pharmacy services vary greatly in private hospitals.
• Many benefits of professional pharmacy services - (yet to be researched in an Australian Private Hospital setting).

MODELS OF SERVICE PROVISION

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Number of Hospitals (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off Site</td>
<td>59 (81%)</td>
</tr>
<tr>
<td>On Site</td>
<td>10 (14%)</td>
</tr>
<tr>
<td>Mixed</td>
<td>4 (5%)</td>
</tr>
</tbody>
</table>

RANGE OF PHARMACY SERVICES

NON-Clinical PHARMACY SERVICES
Ordering
Manufacturing
Shipping
Delivery to hospitals
Provision of Hospital Stock
Hospital committees
After Hours/On call service
Financial administration
Hospital Accreditation and QA

Clinical & Educational PHARMACY SERVICES
Medication chart review
Clinical Interventions
Clinical monitoring
Clinical Rounds/Meetings
Admission Histories
Patient counseling
Drug information

New South Wales

44 Hospitals in Metropolitan Sydney (66%)
3 Hospitals in Outer Metropolitan (4%)
26 Hospitals outside Metropolitan Sydney (30%)
FUTURE EXPECTATIONS

- Professional Pharmacy Services
  - Patient education services
  - Medication review services
- Standardisation
- Training
- Resources

PROPOSED SERVICE MODEL

DISCHARGE PLANNER
- Recruits patients (≥ 5 meds)

SERVICING PHARMACIST
- Provides MES

PATIENT RECEIVES HMR
- After discharge

METHODS

- SAMPLING
  - Random sample of hospitals (81)
  - (67) with exclusions (Specialised hospitals, <20 Beds)
  - Stratified into 4 groups
    - On Site Pharmacy Non-Metro
    - Off Site Pharmacy Non-Metro
    - On-Site Pharmacy Metro
    - Off Site Pharmacy Metro

METHODS

- SAMPLING
  - Randomised controlled study where patients on ≥5 meds may be placed in one of three arms
  - Control
  - Medication Education
  - Medication Education + Medication Review

METHODS

- EVALUATION INSTRUMENTS
  - SIMS (Satisfaction with information about medicines scale)
  - MARS (Medication Adherence Report Scale)
  - NUMBER OF MEDICATIONS
  - COST OF MEDICATIONS

Study Arms

<table>
<thead>
<tr>
<th>Study Arm</th>
<th>SIMS</th>
<th>MARS</th>
<th>Cost Meds</th>
<th>MARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0 (2 weeks after discharge)</td>
<td>SIMS</td>
<td>MARS</td>
<td>Cost Meds</td>
<td>MARS</td>
</tr>
<tr>
<td>T1 (1 week post discharge)</td>
<td>SIMS</td>
<td>MARS</td>
<td>Cost Meds</td>
<td>MARS</td>
</tr>
<tr>
<td>T2 (3 months post discharge)</td>
<td>SIMS</td>
<td>MARS</td>
<td>Cost Meds</td>
<td>MARS</td>
</tr>
</tbody>
</table>
EXPECTED OUTCOMES

- Developed System in Private hospitals (extending to the community) for the provision of professional pharmacy services.
- Developed training and accreditation package for pharmacists wanting to provide in-patient MES.

HOW WILL IT WORK

RECRUITMENT

- Discharge Planner identifies patients for discharge taking ≥5 medications that are being discharged to their home.
- Approach patient and explain study
- Give patients the information sheet and consent form

HOW WILL IT WORK

RECRUITMENT

- Once a patient consents, the Discharge Planner gives patient the SIMS/MARS questionnaire (let the patient complete the questionnaire themselves)

HOW WILL IT WORK

• STUDY ARM ONE
- GREEN ENVELOPE
  - Add a copy of the patient consent form
  - Address to the community pharmacist

HOW WILL IT WORK

• STUDY ARM ONE
- Original Consent
- Discharge Planner Documentation
- SIMS
- SEND TO RESEARCHER
How Will It Work

• Study Arm Two
  - Fax a copy of Discharge Planner Documentation Form to private hospital pharmacist
  - Pharmacist will provide the MES

• Gather Materials
  - Use the information on the discharge planner documentation sheet to gather CMI’s, Fact Cards and other hand information or placebo devices.

• Consult Discharge Planner
  - Once you are on the ward just double check there are no changes since the info had been faxed, and just check if there is anything special you should know about the patient before talking to them.

• Prepare Med Card
  - You can use the card provided or a med-profs or equivalent print-out.
  - There may be some extra information you wish to add to an electronic card such as recent test results etc. (see example)

• Gather Medications
  - Take all patient meds with you so you can do a “show and tell”

• Introduce Yourself to the Patient
  - Ask if they are happy to have the information recorded and explain it is for the researcher, and no-one else will ever listen to it.
• ASSESS PATIENT STATUS
  – Ask patient if they have any concerns, especially check if they ever forget to take meds or if they have side-effects or other worries.

• PROVIDE INFO
  – Go through each med one by one, and supplement with written info as well as lifestyle advice etc.

• SUMMARISE
  – Double check they have no further questions

• DOCUMENT
  – Might be easier to do this as you go through the MES.
  – The sheet provided has spaces for most of the information you will have gained from the patient and the info you have given.

• FOLLOW-UP
  – If anything needs fixing immediately then of course this will be attended to at this time.
  – E.g a major contra-indication
  – No prescriptions for a particular med that is to continue

• MAKE 3 COPIES
  – The patients will keep the original and then the 3 copies are to go to the discharge planner/nurse
HOW WILL IT WORK

• STUDY ARM TWO
  GREEN ENVELOPE
  – Copy of patient consent form
  – Copy MES Documentation
  – Address to the Community Pharmacist

• STUDY ARM THREE
  GREEN ENVELOPE
  – Copy of patient consent form
  – Copy MES Documentation
  – Address to the Community Pharmacist

How will it work

• STUDY ARM TWO
  PURPLE ENVELOPE
  – Copy MES Documentation
  – Address to the GP

• STUDY ARM THREE
  – Fax a copy of Discharge Planner Documentation Form to private hospital pharmacist
  – Pharmacist will provide the MES

• STUDY ARM THREE
HOW WILL IT WORK

• STUDY ARM THREE
  PURPLE ENVELOPE
  – Copy of patient consent form
  – Copy MES Documentation

  – Address to the GP

• STUDY ARM THREE
  – Original Consent
  – Discharge Planner Documentation
  – SIMS
  – MES documentation

  – SEND TO RESEARCHER

• STUDY ARM THREE
  DISCHARGE PLANNER WILL CONTACT GP VIA TELEPHONE
  – EXPLAIN THAT A LETTER (PURPLE ENVELOPE) IS IN THE MAIL
  REQUESTING THAT THE GP REFER PATIENT X FOR A MEDICATION REVIEW SERVICE
Guidelines for Pharmacists

The Medication Education Service has been developed as part of a research project conducted by Rabieh Niles and associates at the Faculty of Pharmacy, University of Sydney.

This project has been funded by the Commonwealth Department of Health and Aged Care as part of the Third Community Pharmacy Agreement.

We acknowledge the support of the Pharmacy Guild of Australia.
Contents

Introduction
Objectives of MES
Training
How to provide a MES
Overview
Patient recruitment
Gather materials
Consult discharge planner
Prepare medication card
Gather medications
Introduce yourself to patient
Assess patient's status
Provide information
Summarise
Document
Follow up

Example Forms
Discharge planner documentation sheet
MES documentation sheet
Medication card
Pharmacist referral form
introduction

Professional pharmacy services have shown significant patient benefits when provided in community and nursing home settings. Medication education can increase patients' knowledge and adherence. Medication education services may not routinely be provided to patients in a private hospital setting.

This professional pharmacy service will aim to provide a cost effective means to improve health outcomes of the Australian population.

Objectives of MES

- To provide a comprehensive standardised pharmaceutical information service to private hospital patients at the time of discharge.
- To provide patients with the opportunity to discuss issues and ask questions about their medications.
- To increase patients' satisfaction with private hospital pharmacy services.
- To increase patients' adherence to prescribed medication.
- To identify potential medication issues that may be followed up when the patient moves from the hospital to the community setting.
- To provide a link between health professionals working in hospital and community settings.

Training

1. The initial training requires pharmacists to attend a face to face training workshop. This session lasts approximately one hour and walks through the steps of the MES with worked examples.
2. The second training stage is providing a MES with an accredited pharmacist to mentor you through the process, providing support and immediate feedback.
3. The third part of the training involves ongoing mentoring, where MES sessions are tape recorded. Recordings of the sessions can be watched with the relevant documentation forms, evaluating the appropriateness of session content and allowing feedback and assistance to be targeted.
How to provide a MES

Overview

1. Patient recruitment (discharge planner)
2. Gather materials
3. Consult discharge planner
4. Prepare medication card
5. Gather medications
6. Introduce yourself to patient
7. Assess patient's status
8. Provide information
9. Summarise
10. Document
11. Follow up
1. Patient recruitment

- Patients should be recruited at times negotiated between the discharge planner/nurse and the hospital pharmacist.
- The hospital discharge planner or equivalent will recruit patients.
- Patients on third or more medications will be recruited.
- The discharge planner will document the recruited patients medications, as well as the reason for their admission (see example page 7).
- The discharge planner will be responsible for notifying the pharmacist of patients requiring a MEC and transfer the documentation to the pharmacist.

2. Gather materials

- The pharmacist will gather materials that may be useful during the service (e.g relevant Chlors, Self Care Fact Cards, placebo devices).
- C.M.I.s (Consumer Medicines Information) leaflets may be printed from data bases such as e-More or eAPP (Australian Products Prescription Guide) or via the computer dispensing system in the pharmacy.
- Guidelines for the provision of CMI are available in the Australian Pharmaceutical Formulary and Handbook (APF).
- Example: In the case documented on pages 7-11, CMI for Moxib, Tarmin@Valume® and Endone® may have been printed for the patient. When counselling the patient, highlighting of particularly relevant information is recommended. The adverse effect of Endone® causing constipation.
- SCFCs: Self Care Fact Cards or other relevant information leaflets maybe gathered from the pharmacy. These information leaflets maybe used during the MEC, or maybe given to the patient to refer to at a later stage.

3. Consult Discharge Planner

- Speak to the discharge planner or relevant nurse attending to the patient.
- Example: “I’m here to see X, is there anything I need to know before I provide my MEC, such as recent changes to medications?”

4. Prepare Medication Card

- Medication cards are provided within the MEC Kit for Pharmacists. Information within this card is for the patient, and hence must be written in “easy to understand” language.
- Patient details should be completed on the front section of the card and can be obtained from the patient file, or the documentation form provided by the discharge planner/nurse.
- The inside section of the card should list all medications currently being taken by the patient. Details of medications being used may be compiled using the patients medication chart, the discharge planner’s documentation form and by talking to the patient.
- The brand name and the active ingredient may be included on the card to avoid duplication of therapy. Special instructions or counselling points may also be added to the card, and maybe done so prior, during or post the MEC.
• If the patient has recent pathology, biochemistry or clinical results that are to be monitored, these can be documented on the back of card, so we can have an active role in their own monitoring.

• Once the card has been completed, the pharmacist should write the name clearly on the card with their contact number, to allow the patient to follow-up any issues if required.

5. Gather medications

• Gather the patient’s medications to take to the MES consultation. Medications may be found in the medication tally or the patient’s drawer.

6. Introduce yourself to Patient

• Introduce yourself to the Patient and explain who you are and what you are doing.

Example: “Hello Mr X I am the Pharmacist that looks after this hospital. I am here to go through your medications with you.”

7. Assess Patient’s status

• Gather information about patient specific issues (e.g. medication concerns, side effects, adherence). This will allow you to tailor your service to the individual needs.

• Assess the Patient’s health beliefs and any concerns about their medications.

• Assess the Patient’s current level of drug knowledge.

• Assess the Patient’s current drug therapy outcomes, including the effectiveness of medications and any adverse effects that the patient may have been experiencing.

• Assess the Patient’s current level of adherence and address any reason for non-adherence.

Example: “How have you been going with your medication? Are there any issues in particular you would like to discuss?”

8. Provide information

• During service provision, each medication should be discussed, using the medication card, CMNs and other materials.

• Encourage the patient to ask questions and voice any concerns as you go through each medication.

• Provide relevant information regarding all aspects of the patient’s medication regimen tailored to meet the specific needs of the patient.

• Provide relevant information on lifestyle and non-drug measures.

• Demonstrate the use of therapeutic devices and compliance aids if necessary.

• Reinforce advice given to patients by fellow healthcare professionals.

• Encourage the patient to regularly seek medication advice from their pharmacist or medical practitioner.

9. Summarise

• Ensure that the Patient has understood the information you have provided and is satisfied that their issues have been addressed.

Example: “Do you have any questions about anything we have discussed?”
10. Document

- It is vital that there is comprehensive documentation of the service, so as to provide the patient's and other healthcare professionals with an overview of any issues that may need follow-up as well as informing them of the service you have provided.

Patient Details

- The documentation sheet should include the patient's details. (An addressograph label may suffice).
- The reason for admission can be gathered from the discharge planner's nurse's documentation form, or the patient notes.
- Details of the patient's preferred community pharmacy and preferred medical practitioners should be obtained from the discharge planner's documentation sheet, the patient notes or the patient.
- The patient's current medications, their history and allergies can be obtained from the discharge planner's documentation sheet, the medication chart/note and supplemented by the patient.

Patient Issues

- Any issues that are raised during the MES should be documented. Tick boxes are available and should be supplemented with details.

Adherence: This box should be ticked if the patient intentionally or unintentionally misses doses of prescribed medications. If this box is ticked the nurse for non-adherence should be documented.

Example: If a patient says they often forget to take their antihypertensive medication, because they do not feel unwell, then the adherence box should be ticked. During the MES, strategies to promote adherence should be discussed.

Adverse Effects: This box should be ticked if a patient describes any adverse effect of their medication.

Details of the side effects and causative agents should be documented.

Example: In the case described on pages 7-11, the patient has complained of constipation since commencing Endosar®. Furthermore, the patient complains of drowsiness, which may be due to the combination of several centrally acting medications such as Tramal®, Endosar®, Valium®, and Hyprodom®. These adverse effects have been documented.

- Other: Any other treatment-related issues that the patient raises should be documented. For example difficulty swallowing, opening medications or sight difficulties etc.

Information Provided

- A summary of the information provided to the patient should be documented on the MES sheet. Particular issues that are raised and addressed should be documented in this section, as well as the documentation of additional resources given to the patient such as CMI.

Example: In the case described on page 7-11, the side effects, which were raised as a patient issue, were documented as being discussed with the patient. The patient was given some advice to help manage constipation such as increasing fluids, fruit and fibre. The commencement of an over the counter laxative was also discussed.

The patient was also advised to discuss short-term use of their Valium® and Hyprodom® with the medical practitioner.

Self Care Fact Cards on Arthritis and Asthma were provided and CMI on Tramal® and Endosar® given.
Recommendations

- Any recommendations for patient treatment, monitoring or follow-up should be documented on the form.

- Additional Monitoring: This box should be ticked if the patient requires ongoing monitoring of a condition. This may be blood pressure monitoring, INR monitoring, blood sugar levels, asthma control etc. Monitoring may need to be performed by the patient, the community pharmacist or a medical practitioner. This should be clearly documented.

  Example: In the case discussed on pages 7-11, the patient has a documented history of asthma. The medication prescribed to control asthma symptoms is Ventolin®. The monitoring of asthma in this case is via monitoring of symptoms and reliever use. If Ventolin® is required more than 3 times per week, the patient has been advised to discuss the use of a preventer/mediation with their medical practitioner. In this case the patient is monitoring their reliever usage.

- Referral to Medical Practitioner: this box should be ticked if you feel the patient should be referred to their medical practitioner. A Referral Letter to General Practitioner form should be completed and given to the patient to take to their medical practitioner.

  Example: In the case described on page 7-11, the patient has been prescribed beta-blockers (atenolol) and two other CNS medications. The psychotropic guidelines state that there is little basis for the use of more than one beta-blocker concurrently in a patient. The use of the agents should be reviewed and dose tapering may be warranted. The medical practitioner is to be consulted regarding this recommendation, and hence referral is necessary (see example page 11).

- Referral to other health care professional: This box should be ticked if you feel the patient needs to be referred to another health care professional such as a podiatrist, physiotherapist, optometrist etc. Referral may be necessary for diabetic patients (foot and eye checks) or patients with muscle injury for example.

- Adherence aids: This box should be ticked when the patient has adherence problems and may benefit from a storage aid such as a blister pack or dose stack box. This should be documented with your recommendation and patients should be notified to flag this with their preferred community pharmacist.

- OTC Medications: this box should be ticked if during the MFS you believe there is a non-prescription medicine that would benefit the patient. The name of the medication should be documented.

  Example: In the case described on page 7-11, the patient complains of constipation. This constipation may be caused by the Finasteride® that the patient is using for pain control. When opioid medication is being used, stimulant laxatives may be recommended in conjunction, to avoid opioid-induced constipation. The recommendation of short-term use of Colace® with Senna has been made and documented in this case.

- Other: This box should be ticked if any other recommendation is made to the patient. All recommendations should be documented.

  Complete your details and the time taken to provide the MFS at the end of this documentation sheet.

After you have completed the Documentation Sheet, three copies should be made. The original sheet is to be given to the patient and the three copies to the discharge planner/nurse for distribution to the Patient’s Medical Practitioner and Community Pharmacist.

11. Follow up

- Follow-up any immediate clinical interventions with the appropriate health care professional (patient’s preferred community pharmacist, general practitioner nurse or specialist).
Pharmacist Referral to General Practitioner

Client information

Name: John Doe
Age (if child): 6
Address: 123 Pleasant St, Springfield

Telephone (for follow-up): 0423 456 789

Reason for referral
Review of concurrent use of Valium and Hypnosedan

Action already taken
Spoken to patient regarding tapering of doses

Other relevant information
Also taking Tramal & Endone post right hip replacement. Complains of sedation and constipation.

Pharmacist's signature: Sue Page
Date: 20/12/03
Pharmacy name sticker: St Elizabeth Hospital
Professional Pharmacy Services to Private Hospital Patients
Guidelines for the Discharge Planner/Nurse

This manual has been developed as part of a research project conducted by Rabellah Mokh and associates at the Faculty of Pharmacy, University of Sydney.

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We acknowledge the support of the Pharmacy Guild of Australia.
Professional Pharmacy Services to Private Hospital Patients

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introduction

Professional Pharmacy Services have shown significant benefits when provided in community and nursing home settings. Medication education can increase patients’ knowledge and adherence. Medication review can decrease numbers and costs of medications.

Professional pharmacy services have not routinely been provided to private hospital patients, and this project aims to provide cost-effective services in order to improve the health outcomes of the Australian population.

The two services being investigated are:

1. Medication Education Service (MES): A pharmaceutical information service provided by pharmacists around the time of hospital discharge.

2. Home Medicines Review (HMHR): A comprehensive medication management service, offered by community pharmacies in conjunction with patients’ medical practitioners after discharge.

Objectives of Project.

- To provide a comprehensive, standardised pharmaceutical information service to private hospital patients at the time of discharge +/- a home medicines review service.
- To provide patients with the opportunity to discuss issues and ask questions about their medications.
- To increase patients’ satisfaction with private hospital pharmacy services.
- To increase patients’ adherence to prescribed medication.
- To identify potential medication issues that may be followed-up when the patient moves from the hospital to the community setting.
- To provide a link between health professionals working in hospital and community settings.
- To rationalise patient treatment and in turn decrease numbers and costs of prescribed medicines.

Training

The training requires discharge planners/nurses to attend a face to face training workshop. This session takes approximately half an hour and walks through the steps of patient recruitment to follow up with worked examples.
The Role of the Discharge Planner/Nurse

1. Patient recruitment

- Patients should be recruited at times negotiated between the discharge planner/nurse and the serving hospital pharmacist.
- Recruit patients taking 5 or more regular medications (i.e., PRN medications should not be counted in the 5; however, all medication including PRN medications should be documented). Patients should be recruited within 72 hours of their going home.
- Do not recruit patients taking less than 5 regular medications, or those not being discharged to their home (i.e., do not recruit nursing home patients). Do not recruit patients that cannot speak or understand English. Do not recruit patients with disorders which may require very specialised services (e.g., acute psychosis).
- Approach the patient and explain that there is a study investigating pharmacy services provision to patients being discharged from the hospital. Ask if they would be interested in reading about this and perhaps participating. (Example information sheet and consent form on pages 5 & 6)

Example: “Mr. X, currently there is a study being done in this hospital researching pharmacy services, which aims to improve the discharge process. If you choose to participate, basically you may have a pharmacist come and chat to you here, and then you might have your regular pharmacist come to your home to go through your medications with you and then coordinate the best medication plan for you with your medical practitioner. Will I give you the information and consent form if you are interested.”

2. SIMS/MARS

(Satisfaction with Information about Medicines Scale)
(Medication Adherence Reporting Scale)
- Once the patient has consented to participate in the study, take them a copy of the SIMS/MARS. Ask them to complete these brief questionnaires which should only take them a few minutes (example pg 7).

3. Documentation Sheet

- The documentation of patient details are needed to assess the medication outcomes of the services (e.g. changes in numbers and costs of medications).
- An addressograph label for the initial section of the form may suffice.
- Details regarding the patient’s preferred community pharmacy can be obtained from the consent form. The address and phone number of the pharmacy may not be immediately available. To locate the pharmacy address:
  1. Look at any prescribed medication; the patient brought into hospital with them, as the medication labels should have the pharmacy details. Or
  2. Look in the Pharmacy Pages provided by the researcher, using the suburb/town as the guide. Or
  3. Check the yellow pages under “Pharmacies”. Or
  4. Ring Rebabah’s Mobile: 02 925 37968
3. Documentation Sheet (cont)

- Details of the preferred medical practitioner (usually the GP) can be obtained from the consent form. Addresses and phone numbers can often be found in the patients file. You may need to check details with the patient.

- Transcribing information from the medication charts should be done to complete the documentation of the patients’ current medications.

- Allergies should be documented within the patients’ notes, as well as the patient’s current medical conditions and reasons for admission.

- Any other comments that you feel are pertinent to the patient should also be documented, such as recently ceased medications, or any adverse effects encountered.

Example: In the example documented on page 8, the patient has experienced constipation. This has been documented by the discharge planner/nurse, as it may be medication-induced.

4. Project Coordination

After the SIM/MARS has been completed as well as your documentation form you should then select the envelope top of your pile. The information sheet within the envelope will then direct you to which study arm the recruited patient will enter (instruction sheets page 4.1).

Control Patients (Study Arm 1)

- Photocopy the consent form example pg 6 you should now have 1 copy and the original.

- Place the copy of the consent form in the GREEN envelope found within the large envelope, seal and address to the patient’s preferred community pharmacy (details should be found on the discharge planner documentation sheet) example pg 8.

- Gather the original consent form, the SIM/MARS, the Discharge Planner documentation sheet and place them within the WHITE stamped addressed envelope.

- Place the WHITE and GREEN envelopes in thermal.

MES Only Patients (Study Arm 2)

- Contact the servicing hospital pharmacist and supply a copy of the patient consent form and your documentation sheet.

The pharmacists will then come and provide a MES to the patient. This service may be tape recorded and documented. The pharmacist should make 3 copies of the MES documentation (4 in total, original and 3 copies). The pharmacists will give the patient the original form, and the discharge planner/nurse the 2 copies and the tape. (Example MES documentation sheet pg 12)

- Photocopy the patient consent form (you should now have 1 copy and the original).

- Place the copy of the consent form and the MES documentation sheet in the GREEN envelope found within the large envelope, seal and address to the patient’s preferred community pharmacy. Details should be found on the Discharge Planner documentation sheet.

- Place a copy of the MES documentation sheet within the PURPLE envelope found within the large white envelope, seal and address to the patient’s preferred medical practitioner. Details should be found on the discharge planner documentation sheet.

- Gather the original consent form, a copy of the MES documentation sheet, the SIM/MARS, the Discharge Planner documentation sheet the audio tape and place in the YELLOW stamp addressed envelope.

- Place the YELLOW, GREEN and PURPLE envelopes in the mail.

MES + HMR Patients (Study Arm 2)

- Contact the servicing hospital pharmacist and supply a copy of the patient consent form and your documentation sheet.

The pharmacists will then come and provide a MES to the patient. This service will be tape recorded and documented. The pharmacist should make 3 copies of the MES documentation (4 in total, original and 3 copies). The pharmacists will give the patient the original form, and the discharge planner/nurse the 2 copies and the audio-tape.
Professional Pharmacy Services to Private Hospital Patients

MES + HMR Patients (Study Arm 3) cont.

- Find a sheet within your large envelope titled “Patient Information Sheet: Home Medicines Review”. Give this sheet to the patient to read. So phrasing that they have been flagged to receive this service and their doctor will decide if it is necessary (example pg 14).

- Photocopy the patient consent form twice – you should now have 3 consent forms: 2 copies and the original.

- Place the copy of the consent form and the MES documentation sheet in the GREEN envelope found within the large envelope, seal and address to the patient’s preferred community pharmacy. (Details should be found on the Discharge Planner documentation sheet).

- Place a copy of the consent form and the MES documentation sheet within the PURPLE envelope (found within the large white envelope), seal and address to the patient’s preferred medical practitioner. (Details should be found on the discharge planner documentation sheet).

- Phone the medical practitioner’s surgery to alert them to the purple envelope arriving in the post.

Example: “Hello this is XYZ calling from ABC hospital. One of your patients Mr. X has consented to participate in a study being conducted here by researchers from The University of Sydney. Part of this study is looking at Medication Review Services provided to private hospital patients after discharge and Mr. X has been flagged for an HMR service. Information about the study is in the mail, so please look out for a bright purple envelope within the next few days explaining the study and your role if you choose to participate. Thank you.”.

- Record on the instruction sheet with whom you spoke.

- Gather the original consent form, 2 copies of the MES Documentation sheet, the SMS, the Discharge Planner Documentation sheet the audio tape and the instruction form and place in the ORANGE stamp addressed envelope.

- Place the ORANGE, GREEN and PURPLE envelopes in the mail.
Professional Pharmacy Services to Private Hospital Patients

The University of Sydney

Patient Subject Information Sheet

Professional pharmacy services such as medication therapy and medication review two areas of specialty where pharmacists, often provided in community and nursing home settings. Medication evaluation has played an important role in the treatment of patients with chronic diseases. This research project also highlights the opportunities for health professionals to develop specific areas of focus within their roles, which are related to medication management and help to reduce the potential use of medication by patients.

The project aims to implement the use of pharmacists providing professional services to private hospital patients.

The project will involve providing hospital pharmacy services, including medication therapy management, and medication review services. The project will be conducted in collaboration with your local pharmacist and hospital pharmacy services.

If you have any questions or concerns, please contact us at the University of Sydney.

Any person with complaints about the patient can contact the secretary of the Human Research Ethics Committee, The University of Sydney, or at 1300 1300 1300.
Patient Consent Form

Professional Pharmacy Services to Private Hospital Patients

I hereby willingly consent to participate in the study entitled 'Professional Pharmacy Services to Private Hospital Patients'.

This project is being conducted by Ms. Rosaline Mok from the Faculty of Pharmacy, The University of Sydney.

I give permission for the hospital staff and researchers to contact my hospital community pharmacist and medical practitioner.

I have been given the necessary information for the purpose of the study medication. I understand that any computerized dispensing medication records and my medical records may be accessed and reviewed.

I grant my permission for a member of the research team to contact me directly should any problems arise.

I understand that any information collected for the purpose of this study will remain entirely confidential and will not be used to identify any medical practitioner pharmacy, pharmacist or patient. I have been informed that the information obtained from this research may be used in future research or published.

Details of the study have been clearly explained by the hospital staff. I am aware of the purpose of the project and what my treatment consists of. I have been counselled with a subject information sheet. My participation is entirely voluntary.

I have been informed of my right to resign at any time without prejudice.”

Name:
Address:
Phone:
Signature: Date:
Name of Witness:
Witness Signature:

Any person with complaints about the conduct of a research study can contact the secretary of the Human Ethics Committee, The University of Sydney on (02) 9351 4877.

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### Discharge Planner Documentation Sheet

<table>
<thead>
<tr>
<th>Patient's Current Medications</th>
<th>Strength</th>
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</table>

**Allergies:**
- Alicia

**Reason for Admission:** Pneumonia, right sided hip replacement

**Current Medical Conditions:**
- Asthma
  - Asthma
- COPD
- Heart Failure

**Any Other Comments:**
- Patient had a history of chronic obstructive pulmonary disease (COPD) and was treated with inhaled bronchodilators before discharge.
Professional Pharmacy Services to Private Hospital Patients

This patient has been randomised to study arm A.

At this time you should have:
- Patient Consent Form (including name of preferred community pharmacy)
- GAB
- Discharge Planner Documentation Form

You should now:
- Photocopy the patient consent form
- Prepare copy of the consent form and the GAB
- Place them in the green envelope
- Seal the green envelope

Then you should:
- Gather the patient consent form
- The GAB and
- Your Documentation Form

And place them in the stamped addressed envelope to be returned to the researcher.

Thank you for your time involved in this project. Please contact the researcher if you have any questions.

Between Waves

Phone: 02 9377 5400
Mobile: 0418765898
Email: waves@pharmacy.uts.edu.au
This patient has been randomized to study arm two.

At this time you should have:
- Patient Consent Form (including name of preferred community pharmacy)
- Tariff
- Discharge Plan Documentation Form

You should have:
- Contact the relevant hospital pharmacist and let them know that there is a patient requiring an MELS
- Give the pharmacist a copy of your Discharge Plan documentation form and patient consent form

Given the pharmacist has completed the MELS you should then:
- Check there are 2 copies of the MELS (patient's original and hospital copy)
- Marking the patient consent form
- Place the copy of the consent form into the green envelope provided
- The envevelope should already have the patient's name and hospital number

Please open the green envelope and address it to the patient's preferred community pharmacy
- Post the green envelope

Thank you:
- Place a copy of the MELS within the purple envelope
- Send the envelope and address to the patient's GP
- Place the Discharge Plan documentation form

Finally you should:
- Give the patient the patient consent form
- The MELS
- Your Documentation form
- A copy of the MELS documentation

And please place the stamped addressed CUDAM envelope to be returned to the researcher.

Thank you for your input involved in this project. Please contact the researcher if you have any questions.

Barabara Morin
Phone: 02 9551 5638
Mobile: 0400 880 495
E-mail: barabaramorin@nswhealth.gov.au
Patient Information Sheet:

Home Medications Review

1. What is a Home Medications Review?

A Home Medications Review is a service that allows a thorough check of all the medications you are taking by a pharmacist at home under your consent and with your agreement. This service would take place in your home at a time convenient to you. For more information, read the brochure called Home Medications Review: Patient Information Sheet in the office of a pharmacy, Pharmacists and GP may order this service as a Transitional Medicine Management Review (TMMR).

2. Who can have a Home Medications Review?

Anyone living alone and those having a Home Medications Review if their GP thinks there are concerns with the medicines being taken may make the review worthwhile. Some situations are more likely to occur in people at risk of medicare-related problems, such as:
- having more than one medication prescription
- recent changes to your medication regimen (less prescribed)
- using a number of different doctors and GPs and medications
- changed recently come out of hospital

3. Why decide to have a Home Medications Review?

Your GP can order you to receive a Home Medications Review after talking about your medication needs during a consultation. Remember, if you are a new member of your local community health service, we will discuss the need for a Home Medications Review with you at your first visit. A visit involves a special form, which is used by your doctor to conduct this assessment.

4. When should you have the service offered?

The service is for your benefit. It gives you the opportunity to spend some time discussing your medication needs and how they might be improved. This involves understanding and discussing your medication needs and improving your overall health.

5. Do I have to have the Home Medications Review?

If you're interested, you don’t have to have this service. If you believe it will not be of benefit, you would feel uncomfortable having it or for any other reason. If you believe, you do not lose the opportunity to have a review later on, if needed.
Appendix 34: Hospital Box
Appendix 35: Instruction Sheet in Envelope One

This patient has been randomised to study arm one.

At this time you should have:

- Patient Consent Form (including name of preferred community pharmacy)
- SIMS
- Discharge Planner Documentation Form

You should now:

- Photocopy the patient consent form
- Place the copy of the consent form inside the GREEN envelope (NB there are already some papers within this envelope)
- Seal the green envelope and address it to the patient's preferred community pharmacy
- Post the green envelope

Then you should:

- Gather the patient consent form
- The SIMS and
- Your Documentation form

And place these in the stamped addressed envelope to be returned to the researcher.

Thank you for your time involved in this project. Please contact the researcher if you have any questions:

Rebekah Moles
Phone: 02 9351 5968
Mobile: 0408 960 488
E-mail: rebekhm@pharm.usyd.edu.au
Appendix 36: Instruction Sheet In Envelope Two

This patient has been randomised to study arm two.

At this time you should have:

- Patient Consent Form (including name of preferred community pharmacy)
- SIMS
- Discharge Planner Documentation Form

You should now:

- Contact the private hospital pharmacist and let them know that there is a patient requiring an MES
- Fax the Pharmacists a copy of your Discharge planner documentation form and patient consent form

Once the Pharmacist has completed the MES you should then:

- Check there are 3 copies of the MES (patient has original) and audio tape
- Photocopy the patient consent form
- Place the copy of the consent form inside the GREEN envelope (NB there are already some papers within this envelope)
- Place a copy of the MES within the GREEN envelope
- Seal the green envelope and address it to the patients preferred community pharmacy
- Post the green envelope

Then you should:

- Place a copy of the MES within the PURPLE envelope
- Seal this envelope and address it to the patients GP
- Post the PURPLE envelope

Finally you should:

- Gather the patient consent form
- The SIMS
- Your Documentation form
- Audio tape
- A copy of the MES documentation

And place these in the stamped addressed YELLOW envelope to be returned to the researcher.

Thank you for your time involved in this project. Please contact the researcher if you have any questions:

Rebekah Moles
Phone: 02 9351 5968
Mobile: 0408 960 488
E-mail: rebekahm@pharm.usyd.edu.au
Appendix 37: Instruction Sheet in Envelope Three

This patient has been randomised to study arm three.

At this time you should have:
- Patient Consent Form (including name of preferred community pharmacy)
- SIMS
- Discharge Planner Documentation Form

You should now:
- Contact the private hospital pharmacist and let them know that there is a patient requiring an MES
- Fax the Pharmacists a copy of your Discharge planner documentation form and patient consent form

Once the Pharmacist has completed the MES you should then:
- Check there are 3 copies of the MES (patient has original) and audio tape
- Find in your large envelope a piece of paper titled PATIENT INFORMATION SHEET: HOME MEDICINES REVIEW
- Take this sheet and give it to the patient to keep, explain that they have been flagged to receive this service, and their GP will decide if this is required.

Then you should:
- Photocopy the patient consent form (x2)
- Place one copy of the consent form inside the GREEN envelope (NB there are already some papers within this envelope)
- Place a copy of the MES within the GREEN envelope.
- Seal the GREEN envelope and address it to the patient's preferred community pharmacy
- Post the GREEN envelope

Then you should:
- Place a copy of the consent form in the PURPLE envelope
- Place a copy of the MES with the PURPLE envelope
- Seal this envelope and address to the patient's GP
- Post the PURPLE envelope

Finally you should:
- Phone the medical practitioner to alert them to the PURPLE envelope in the post.
  Did you speak to? ☐ Medical Practitioner ☐ Receptionist ☐ Other __________________________
- Gather the patient consent form
  " " The SIMS
  " " Your Documentation form
  " " Audio tape
  " " A copy of the MES documentation
  " " This form

And place these in the stamped addressed ORANGE envelope to be returned to the researcher:

Thank you for your time involved in this project. Please contact the researcher if you have any questions:

Rebekah Moles
Phone: 02 9351 5968
Mobile: 0408 940 488
E-mail: rebekahm@pharm.usyd.edu.au
Appendix 38: SIMS/MARS Questionnaire

professional pharmacy services
to private hospital patients

thank you for agreeing to participate in this study.
on the following pages is a questionnaire that I would invite you to complete.
**Information about medicines**
Please rate your overall feeling about the information you have received for each of the following aspects of all your medicines.

**How much information have you received about the following?**

<table>
<thead>
<tr>
<th>Please tick the appropriate circle</th>
<th>none</th>
<th>needed</th>
<th>none</th>
<th>received</th>
<th>too little</th>
<th>about right</th>
<th>too much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What your medicine is called.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. What your medicine is for.</td>
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<td></td>
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<tr>
<td>3. What it does.</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. How it works.</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5. How long it will take to act.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. How you can tell if it working.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. How long you will need to be on your medicine.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. How to use your medicine.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. How to get a further supply.</td>
<td></td>
<td></td>
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</table>
### About Medicines Scale

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<th>none received</th>
<th>too little</th>
<th>about right</th>
<th>too much</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Whether the medicine has any unwanted effects (side effects)</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>11. What are the risks of you getting side effects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. What you should do if you experience unwanted side effects</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>13. Whether you can drink alcohol whilst taking this medicine.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Whether this medicine interferes with other medicines.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Whether the medication will make you feel drowsy.</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>16. Whether the medicine will affect your sex life.</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>17. What you should do if you forget to take a dose</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Thank you for your time.**

Please complete the questions and your details on the back, and hand this completed form to your discharge planner/nurse or place in the stamp addressed envelope provided.
Questions about using your medicines
Many people find a way of using their medicines which suits them. This may differ from the instructions on the label or from what the doctor has said. We would like to ask you a few questions about how you use your medicines.

Here are some ways in which people have said that they use their medicines. For each of the statements, please tick the box which best applies to you.

Your own way of using your medicines

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<tr>
<th></th>
<th>Always</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
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</thead>
<tbody>
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<td>1. I forget to take them.</td>
<td>0</td>
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<td>2. I alter the dose.</td>
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<td>4. I decide to miss out a dose.</td>
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<td>5. I take less than instructed.</td>
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Please supply the following details:

name: ____________________________________________

address: ____________________________________________

phone: ____________________________

Date of Completion of Survey: ____________________________
## Appendix 39: Compiled List of NSW Private hospitals

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<th>Name</th>
<th>Bed Number</th>
<th>Pharmacy Location</th>
<th>Area of Hospital</th>
<th>Type of hospital</th>
<th>Specialisation</th>
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<td>General</td>
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</tr>
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</table>
Appendix 40: Plots of documentation Accuracy Data

Plot 1

Pharmacist reliability vs nurse reliability, consensus

Plot 2

Pharmacist reliability vs nurses reliability, Doctor assessment
Plot 3

Pharmacist reliability vs nurse reliability, Pharmacist assessment

Pharmacist reliability (%) vs Nurse reliability (%)