SAFE TRANSFER OF ELDERLY PATIENTS ACROSS CARE SETTINGS:

THE STEP STUDY

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RN BN (HONS) MRCNA

A THESIS SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS OF THE DEGREE OF

DOCTOR OF PHILOSOPHY

2010

School of Nursing & Midwifery
College of Health & Sciences
THESIS CERTIFICATION

I, Martha Mansah hereby declare that the work presented in this thesis submitted in fulfilment of the requirements for the award of Doctor of Philosophy in the School of Nursing and Midwifery, College of Health and Science, University of Western Sydney to the best of my knowledge is wholly my own work except otherwise referenced or acknowledged. I certify that I have not submitted this thesis in part or fully for a degree in this or any other educational institution.

Signature

_____________________

Date

_____________________
ACKNOWLEDGEMENTS

Thank you Heavenly Father, for bringing me on this journey, I feel that with you in my life, I can do wonders.

Thank you Prof. Rhonda Griffiths, for your ongoing input; you really are an amazing woman and a great supervisor. Thank you Prof. Esther Chang, for your care and nurture during this study. Thank you Dr. Ritin Fernandez, for your much needed support, dedication and encouragement. I am truly blessed to have all of you in this work and in my life.

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Finally, to Mum and Dad, a big thank you. I am eternally grateful for your endless love and supporting my passions. To my Soul Mate, Abel, thank you so much for your love and prayers. My appreciation also goes towards my sisters and brothers, for patiently allowing me to get away from all my house work duties. Now don’t get too excited that I am back; it is time for the next creative impulse!

M. Mansah
26 August 2010
ABSTRACT

Patient safety has become a prime consideration for health care facilities since publication of the report ‘To Err is Human’ in 1999. Elderly patients are recognised as a high-risk group for errors and adverse events during hospitalisation, particularly as they move between settings to receive care for their comorbid and chronic conditions. With the ageing Australian population, incidence of errors and adverse events during hospitalisation remains of major concern and have significant implications for health care providers, individuals and their families. Commonly reported adverse events include errors involving medications and falls. Loss of patient information has been associated with nursing and medical mismanagement. At transition points, poor communication of medical information is responsible for 50% of all medication errors and 20% of adverse drug events in hospitals.

Researchers have developed various strategies to minimise errors and adverse events, with varying results. These strategies include the use of electronic computerised physician order entry, discharge planner and transition coordinators. Despite these strategies, errors and adverse events commonly occur during hospitalisation and the incidence is increasing, particularly for the elderly patients. Therefore, this study seeks to increase knowledge of factors that contribute to errors and adverse events as a result of elderly patients transfer across care sites. It aims to close a gap in the research literature by developing and implementing a practical, low cost strategy that promote communication during care transfer.

The overall aim of this thesis is to develop a strategy that promotes safe transfer of elderly patients across care settings (STEP Study). The study comprises three distinct, yet interrelated phases. An Audit of Errors and Adverse Events in Elderly In-patients at a Metropolitan Hospital was the first phase of study. The audit examined the incidence and types of errors and adverse events occurring in elderly patients admitted to a tertiary hospital between 1 July 2005 to 30 June
2006. This study identified that elderly patients are at high risk of errors and adverse events at that time. Poor communication was recognised as one of the major contributing factors in incidents. Phase two of the research was a systematic review, titled *The Effectiveness of Strategies to Promote Safe Transfer of Elderly People Across Care Settings*. The findings demonstrated that the presence of two factors can significantly reduce errors and adverse events during the transfer of elderly people: a comprehensive plan of care and the availability of well-trained healthcare practitioners for follow-up care and effective collaboration and communication between facilities. The findings from these studies informed phase three, which was the development and pilot testing of the *interactive Patient Transition Checklist* (*iPTC*). A structured communication tool designed to improve transfer, monitoring, and planning for ongoing care. The pilot testing demonstrated the feasibility of iPTC intervention within an acute care setting.
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CONFERENCE PRESENTATIONS


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<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
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<tr>
<td>ACU</td>
<td>Aged Care Unit</td>
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<td>ADEs</td>
<td>Adverse Drug Events</td>
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<td>AIMS</td>
<td>Australian Advanced Incident Monitoring</td>
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<td>AHS</td>
<td>Area Health Service</td>
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<tr>
<td>CI</td>
<td>Confidence Intervals</td>
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<tr>
<td>CTI</td>
<td>Care Transition Intervention</td>
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<tr>
<td>ED</td>
<td>Emergency Department</td>
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<tr>
<td>IIMS</td>
<td>Incident Information Management System</td>
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<tr>
<td>IOM</td>
<td>Institute of Medicine</td>
</tr>
<tr>
<td>iPTC</td>
<td>interactive Patient Transition Checklist</td>
</tr>
<tr>
<td>NHS</td>
<td>National Health Service</td>
</tr>
<tr>
<td>NH&amp;MRC</td>
<td>National Health and Medical Research Council</td>
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<tr>
<td>NSW</td>
<td>New South Wales</td>
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<td>NSW DoH</td>
<td>NSW Department of Health</td>
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<tr>
<td>PCE</td>
<td>Potentially Compensable Event</td>
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<tr>
<td>RCA</td>
<td>Root Cause Analysis</td>
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<tr>
<td>RIB</td>
<td>Reportable Incident Brief</td>
</tr>
<tr>
<td>RR</td>
<td>Relative Risk</td>
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<tr>
<td>SAC</td>
<td>Severity Assessment Code</td>
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<tr>
<td>SR</td>
<td>Systematic Review</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>SSWAHS</td>
<td>Sydney South West Area Health Service</td>
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<tr>
<td>UTI</td>
<td>Urinary Tract Infection</td>
</tr>
<tr>
<td>WMD</td>
<td>Weighted Mean Difference</td>
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<td>WHO</td>
<td>World Health Organisation</td>
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### KEY DEFINITION OF TERMS

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<tr>
<th><strong>Adverse event</strong></th>
<th>A consequential bad outcome, an injury (harm) to the patient, in response to an error that occurs during the process of care (Sheikh &amp; Hurwitz, 2001).</th>
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<tr>
<td><strong>Care settings or setting</strong></td>
<td>Refers to hospitals, wards within hospitals or residential aged care facilities (Crotty, Rowett, Spurling, Giles, &amp; Phillips, 2004).</td>
</tr>
<tr>
<td><strong>Culture</strong></td>
<td>The configuration of attitudes, values, beliefs, meanings, behaviours and practices which together can be seen to be definitive of ‘what people are’ or ‘where people come from’. Culture can be seen as a ‘state’ or something people possess, while it appears more fruitful to regard it as a performance and also a process (Braithwaite, et al., 2006).</td>
</tr>
<tr>
<td><strong>Continuity of care</strong></td>
<td>Describes effective communication in the movement of patients and information across primary secondary and tertiary care boundaries (Elliott, Brien, Aslani, &amp; Chen, 2009).</td>
</tr>
<tr>
<td><strong>Disability</strong></td>
<td>A temporary or permanent impairment of physical or mental function or economic loss in the absence of impairment (Mills, Boyden, &amp; Rubamen, 1978).</td>
</tr>
<tr>
<td><strong>Elderly</strong></td>
<td>Refers to people aged 65 years and over (Australian Bureau of Statistics, 2009).</td>
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<tr>
<td><strong>Error</strong></td>
<td>A failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. It does not have to result in an adverse event (Sheikh &amp; Hurwitz, 2001).</td>
</tr>
<tr>
<td><strong>Fragmented Care</strong></td>
<td>Described as a poorly executed transfer where there is a breakdown in care continuity, conflicted recommendations regarding treatment management and practitioners in different settings operating independently with no common care plan (Coleman, et al., 2004).</td>
</tr>
<tr>
<td><strong>Human Error theory</strong></td>
<td>Is organisation practice to underpin system design and individual performances that aims to prevent errors and adverse events (Armitage, 2009a, 2009b).</td>
</tr>
<tr>
<td><strong>Iatrogenic</strong></td>
<td>An injury caused by medical procedure that was not the natural consequences of the patient’s disease (Steel, Gertman, Crescenzi, &amp; Anderson, 2004).</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>IIMS</td>
<td>Incident Information Management System (IIMS) – is a database used by health professionals e.g. nurses, doctors to record, review and monitor errors and adverse events (Braithwaite, et al., 2006).</td>
</tr>
<tr>
<td>Incident</td>
<td>An unplanned event resulting in, or having the potential for, injury, damage or other loss (Braithwaite, et al., 2006).</td>
</tr>
<tr>
<td>Medical Records</td>
<td>These contain a patient’s progress notes written by clinicians, medications charts, investigation of scans and blood results.</td>
</tr>
<tr>
<td>Near miss</td>
<td>When harm is prevented (Conerly, 2007; Kaplan &amp; Rabin Fastman, 2003).</td>
</tr>
<tr>
<td>Patient safety</td>
<td>A practice that prevents unintended harm to patients and uses current scientific evidence, knowledge and patients’ preference to provide best optimal care (Kohn, Corrigan, &amp; Donaldson, 2000).</td>
</tr>
<tr>
<td>Patient safety culture</td>
<td>Approaches that enable individuals and health facilities to develop and emphasises changes or improvement in clinical practice and management (Kline, Willness, &amp; Ghali, 2008).</td>
</tr>
<tr>
<td>RCA</td>
<td>Root Cause Analysis (RCA) – incidents that had, or could have, detrimental outcomes undergo an RCA, whereby in-depth investigations are undertaken on the errors or adverse events and recommendations provided (NSW Department of Health, 2005a).</td>
</tr>
<tr>
<td>SAC</td>
<td>Severity Assessment Code (SAC) – a risk matrix used to stratify the consequence and likelihood of an incident to generate a numerical rating from 1 to 4 (NSW Department of Health and the Clinical Excellence Commission, 2009).</td>
</tr>
<tr>
<td>System approach</td>
<td>This recognises errors and mishaps as consequences, not causes, and deals with failings at an organisational level (de Vries, Hollmann, Smorenburg, Gouma, &amp; Boermeester, 2009; Reason, 2000).</td>
</tr>
<tr>
<td>Tertiary hospital</td>
<td>A tertiary hospital refers to a full complement care services including paediatrics, general medicine, and various branches of surgery and psychiatry (South Western Sydney Health Network, 2004-2008).</td>
</tr>
<tr>
<td>Transfer or transition</td>
<td>The movement of a patient from one setting of care to another e.g. between services in a hospital and other settings.</td>
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CHAPTER 1

Background and significance of the study
1.1 INTRODUCTION

The elderly frequently transfer between health providers as their needs change during the course of a chronic or acute illness. They are at particular risk of errors and adverse events when they move between care settings (Parrish, O'Malley, Adams, Adams, & Coleman, 2009).

This thesis reports on the development of a pilot study intervention to promote the safe transfer or transition of elderly people between care settings. The term transfer or transition in this thesis refers to the movement of elderly patients between health care practitioners and settings. In addition, settings or care settings in this thesis relates to hospitals, wards within hospitals or residential aged care facilities (Crotty, et al., 2004). Throughout the thesis, the term elderly refers to people aged 65 years and over.

This chapter provides the profile of the elderly population living in Australia. It discusses the underlying reasons for elderly patients’ vulnerability during transition. It introduces the reader to the study by providing background to the thesis, describing the study aims and objectives. Further, the significance of the thesis is examined and, in doing so, sets the scene for the following seven chapters.
1.2 PROFILE OF ELDERLY AUSTRALIANS

In August 2010, the Australian population reached 22,415,755 people (Australian Bureau of Statistics, 2010). The population in 2006 included 2.7 million Australians aged 65 years and over, representing 13% of the population (Australian Bureau of Statistics, 2006). Of these, 52% were aged 65 to 74 years, 36% were aged 75 to 84 years and 12% were aged 85 years and over (Australian Government Department of Health and Ageing, 2007). Women made up a greater proportion (55%) of older Australians, and their predominance increases with age. In 2006, the proportion of females aged 65 to 74 years, 75 to 84 years and 85 years and over age were 51%, 56% and 67%, respectively (Figure 1). By 2036, the number of people aged 65 years and over is expected to more than double, from 2.7 million to 6.3 million, and will represent 24% of the Australian population (Australian Bureau of Statistics, 2006; Australian Institute of Health and Welfare, 2007; Australian Patient Safety Foundation, 2000).

![Figure 1: Percentages of age categories of elderly Australians, females and males](image_url)
The increasing proportion of elderly Australians is a well-recognised demographic change which is projected to have major effects on population health, economic growth and government expenditure (Australian Institute of Health and Welfare, 2007; Australian Pharmaceutical Advisory Council, 2000a).

### 1.3 PATIENT SAFETY

In October 1999, the Institute of Medicine (IOM) released “To Err is Human: Building a Safer Health System”, which highlighted *patient safety* as a practice that prevents unintended harm to patients, and uses current scientific evidence, knowledge and patients’ preference to optimise care (Kohn, et al., 2000). The IOM report highlighted the causes and identified the effects of *fragmented care*, a scenario that is common in the health system (Kohn, et al., 2000). Fragmented care is described as a poorly executed transfer where there is a breakdown in care continuity, conflicted recommendations regarding treatment management and practitioners in different settings operating independently with no common care plan (Coleman, et al., 2004).

International studies identified that up to 98,000 people die in hospitals each year due to medical errors. Many more are seriously harmed (Leape, et al., 1991; Regenstein, 2004; Thomas & Brennan, 2000a; Valentin, et al., 2009). Lack of communication, poor coordination and discontinuity of care between settings were frequently implicated as contributing to errors and adverse events. The report reviewed the literature on the basis of two large population-based chart
review studies, and estimated that adverse events occur in 2.9% (Thomas & Brennan, 2000b) to 3.7% (Leape, et al., 1991) of hospitalised patients. The report ascertained that, despite the errors and adverse events, the health system remains static and has employed few risk management strategies to improve patient safety (Valentin, et al., 2009). These errors and adverse events have been compared to the holes in the various layers of Swiss cheese in which, without defence, errors occur that sometimes harm patients (Reason, 2000).

These errors and adverse events have until now been identified as shortcomings of the system rather than the individual clinicians’ responsibility. The system approach sees errors and mishaps as consequences, not causes, and deals with failings at an organisational level (de Vries, et al., 2009; Reason, 2000).

*Errors* are defined as the failure of a planned action to be completed as intended or the use of an inappropriate plan to achieve an aim (Sheikh & Hurwitz, 2001). *Adverse events* are defined as a consequential bad outcome, an injury to the patient, in response to an error that occurs during care (Kohn, et al., 2000). Error does not lead to adverse events in all cases. However, for adverse events to take place, an error must have occurred. Errors and adverse events have often been attributed to poor communication of medical information (Institute for Safe Medication Practices, 2005; Rozich & Resar, 2001). Moreover, changes in practice, professional incompetence, a failure to decide or act appropriately on available information and the violation of policies, have regularly occurred, in isolation or in combination (Benner, et al., 2002). Errors and adverse events have also been associated with inadequate numbers of staff or an inappropriate
staff mix, individual work overload, a high staff turnover, a stressful environment and inadequate supervision from senior staff (Kendall-Gallagher & Blegen, 2009; Lang, Hodge, Olson, Romano, & Kravitz, 2004). In addition, errors have been associated with problems in products, procedures, and systems (Australian Pharmaceutical Advisory Council, 2000b).

Following the IOM report, patient safety has become recognised globally as a health care priority (World Health Organisation, 2006), yet the incidence of adverse events encountered during hospital admission, especially in elderly patients, remains high. These events often occur through discontinuity of care, which threatens the safety and quality of patient care (Chu, Brown, & Lukin, 2009). For these reasons, patient safety in the Emergency Department (ED) and during the transfer to other settings is one of the highest risk areas (Beach, Croskerry, & Shapiro, 2003; Smits, Groenewegen, Timmermans, van der Wal, & Wagner, 2009). Elderly people make up the bulk of emergency presentation. Ambivalence in the emergency environment and lack of standardisation in the transition process has been implicated as predisposing factors (Horwitz, et al., 2009). Additionally, ED staff are simultaneously caring for numerous patients with highly variable needs and conditions, which requires a shifting and resetting of the nurses’ cognitive frame and communicative approach (Beach, et al., 2003). The Garling’s report (2008) on acute care services in New South Wales (NSW) public hospitals attested to what had been summarised in the IOM report (Kohn, et al., 2000) that (1) lack of cohesion, (2) continuity of care and (3)
communication breakdown between EDs and the medical and surgical wards are considerable barriers to patient safety.

Studies of hospital patients have demonstrated that errors and adverse events are common. The adverse event rate in hospital admissions has been estimated to range from 3% to 17%. A quarter to a half of the adverse events was considered preventable. These studies (Chapter 3) were conducted in the USA (Brennan, et al., 1991; Brennan, et al., 2004; Thomas, et al., 2000), Australia (Wilson, et al., 1995), the United Kingdom (Vincent, Neale, & Woloshynowycz, 2001), Denmark (Schioler, et al., 2001), New Zealand (Davis, Lay-Yee, Briant, & Scott, 2003; Davis, et al., 2001) and Canada (Baker, et al., 2004; Forster, et al., 2004). These studies have increased the urgency to improve patient safety in the health system. A recent study (Aranaz-Andres, et al., 2008) undertaken in Spain retrospectively examined 24 hospitals, with a total sample of 5,624 medical records, to screen for adverse events. Among patients with adverse events, 18% suffered more than one adverse event, many of whom required an increased hospital stay and readmission. Elderly patients aged 65 years and over demonstrated a higher frequency of experiencing adverse events than younger patients.

It is important to learn from reported incidents. The World Health Organisation and World Alliance for Patient Safety Report noted that the incident information reporting system is in place for clinicians to learn from experience: “...it is important to note that reporting in itself does not improve safety. It is the response to reports that lead to change” (2005 p.12). A plethora of research has
demonstrated that errors are far from being random and instead fall into recurrent patterns. Incidents of the same type that have occurred repeatedly feature the same set of circumstances that provoked the mistakes, regardless of who was involved (National Health Service, 2000). These factors stem from an organisation’s policies and procedures, the culture of the workplace and the approach of management towards risk and continuous improvements processes (Leape & Berwick, 2005; McDonald & Leyhane, 2005).

Human errors in nursing and medical care are usually unavoidable. In some high-risk industries such as aviation, to reduce the rate of serious accident, the Human Error Theory (Reason, 2000) underpins organisational practice and individual performances (Armitage, 2009a, 2009b). The aims are to design systems to prevent errors from leading to adverse events. Errors should be caught and their consequences neutralised before they manifest as adverse events (Chapter 4). Systems are typically developed and operated with the assumption that errors can or will occur. Therefore, health services around the world have introduced various strategies to reduce the incidence of errors and adverse events and to promote clinical patient safety (Aranaz-Andres, et al., 2008; Mendes, et al., 2009; Perez Blanco, et al., 2009). In Australia, many quality assurance programs, including chart audits of clinicians’ work and surveys of patients on their clinical care experiences, have been used to improve work performances (Marshall, Harrison, & Flanagan, 2009). In NSW, the implementation of the Incident Information Management System (IIMS) and the Root Cause Analysis (RCA) databases are strategies used to record, review and monitor errors and adverse
events (Braithwaite, et al., 2006). Identifying the circumstances when the adverse events occur and finding solutions to the identified problems are key approaches to preventing incident occurrence (Runciman, 2002a).

The IIMS records all incidents in four categories: (1) clinical, (2) complaints, (3) property and (4) security and hazards. Each category includes staff, visitors and contractors (Jorm, Braithwaite, & Travaglia, 2006). Incidents entered into IIMS include unplanned events resulting in adverse events, for example ill health, complications from treatment, damage, disability, death, prolonged hospital stay or other loss. Potential errors and near misses — accidents that do not result in patient harm — are also entered into the IIMS database. Incidents that had, or could have, detrimental outcomes undergo an RCA, whereby in-depth investigations are undertaken and recommendations provided (NSW Department of Health, 2005a).

Understanding the causes and effects of incidents will help to identify the actions needed to reduce errors and adverse events, and may also indicate the people or organisations that are best placed to implement those actions (Conley, Jordan, & Ghali, 2009). Interventions as simple as an incident audit can provide useful information to drive quality improvement activities when the theoretical assumptions of human errors are used to underpins clinical practice (Weingart, et al., 2009). In industries in which communication failure can have major adverse consequences, such as rail, aviation and the military, one safety initiative has been the use of standardised transmission of information: a predetermined
structure is used to reduce the omission of important information, and involves an expectation on the part of the recipient of the order in which information will be given (Gardezi, et al., 2009; Lingard, et al., 2005; Long, Pearson, Page, & Jordan, 2008).

Health care needs to be made safer through simplification and standardisation of policies and procedures (Graves, et al., 2009), through the use of human error factors to develop systems that avoid reliance on memory (Farley, et al., 2008) and attention to the effects of human conditions on errors and organisation (Brady, et al., 2009). Such approaches would particularly enable individuals and health facilities to develop a patient safety culture which emphasises changes and improvement in clinical practice and management (Kline, et al., 2008)

1.3.1 Hospitalisation and elderly people

Elderly people are the highest users of all categories of health care (Wolff, Bourke, Campbell, & Leembruggen, 2004) and they are more likely to be admitted to hospital for management of chronic diseases and associated comorbidities (Pronovost, Thompson, Holzmueller, Lubomski, & Morlock, 2005). Consequently, elderly patients are often at risk of care fragmentation. The elderly experience the highest rate of errors and adverse events associated with transfer between care settings (Baker & Norton, 2004), which includes transition between hospitals, wards within hospitals and from hospitals to home and residential aged care facilities (Crotty, et al., 2004). A recent study (Smits, et al., 2009) found that 25% of errors and adverse events occurred in patients
transferred from the ED to other care settings. In Australia, among the elderly, the average number of visits to a physician is 8.6 annually per person, compared with around 4 per person for people aged under 65 years (Australian Government Department of Health and Ageing, 2007). Elderly Australians also have a higher rate of admission to hospitals than the general population. They are admitted for multiple reasons and their stay in hospital is typically longer (National Health Priority Action Council, 2006). Over the period 2005–2006, admissions of Australians aged 65 years or over represented 35% of all hospital admissions and 47% of all occupied bed days, although this age group comprises only 13% of Australia’s population (Australian Government Department of Health and Ageing, 2007).

Errors and adverse events reported involving the elderly are medication errors (Briesacher, Limcangco, Simoni-Wastila, Doshi, & Gurwitz, 2005; Cravens, et al., 2005; Reese, Hicks, McWilliams, Britton, & McKean, 2003); falls (Claflin, 2005b; Paniagua, Malphurs, & Phelan, 2006); medical errors (Barber, 2004); and confusion and agitation (Abdallah, Remington, Melillo, & Flanagan, 2008). Researchers have indicated that 15% of reported adverse events are related to medication errors (Wolff, et al., 2004), with approximately 60% of them occurring at key transitions: from ED to critical care, from residential aged care facility to hospital, from surgical unit to rehabilitation facility (Rozich & Resar, 2001). Likewise, when elderly patients are transferred from one environment (e.g. residential aged care facility) to another (e.g. medical ward), they have been reported increase in the incidence of falls. These are often related to changes in
the health care environment such as timings of medication rounds, types of
nursing handovers, staffing ratios and even the patient unfamiliarity with the
environment (Oliver, Healey, & Haines, 2010). Studies have reported that up to
one third of adults living in the community who are aged 65 or older report at
least one fall annually (Blomquist, 2006; Jeske, et al., 2006). Twenty to 30% of
patients who suffer falls experience a decrease in functionality and mobility. In
addition, half of these patients do not regained their previous level of
functioning (Anstey, von Sanden, & Luszcz, 2006; Beland, et al., 2006; von
Renteln-Kruse, Krause, Dieckmann, & Vogel, 2006).

Confusion and agitation during care transition are often unrecognised as
contributing factors to adverse events. Although these states increase the
complexity of care and increase the patient’s risk of poor outcomes during and
after acute illness (McGilton, Rivera, & Dawson, 2003). Minimal evidence exists
to guide best practice in the management of elderly patients presenting with
confusion and agitation, and who are readmitted to hospital post-discharge or
transferred between wards in a facility (Bourbonniere & Evans, 2002; Naylor,
Stephens, Bowles, & Bixby, 2005). The underlying factors are usually associated
with infection, delirium, or both (Bergmann, Murphy, Kiely, Jones, &
Marcantonio, 2005; Cotter, 2005). However, inadequate information, failure to
explain and give feedback to elderly patients on reasons for their transfer, or
poor assistance in planning for discharge to home or care environments
contribute to many elderly patients experiencing confusion or agitation (Cohen-
Mansfield, Culpepper, & Werner, 1995; Crotty, et al., 2004).
Given the demonstrated association between elderly patient transfers and errors, considerable effort must be directed at making transitions safe. Recommendations to improve transitions include improving team awareness and communication, and exploring systems to facilitate effective transfer of relevant patient data (Beach, et al., 2003).

1.3.2 Reducing errors and adverse events

Barriers to effective care transitions have been identified and strategies to reduce their incidence and impact have been proposed (Coleman, 2003). These strategies are generally based on comprehensive plans of care and the availability of well-trained healthcare practitioners (Cook & Rasmussen, 2005) who have current information about the patient’s clinical status and care plan (Naylor, 2006). Other strategies include collaboration across and between health care institutions and a standard computerised pharmacist intervention. However, most health care facilities and providers function independently, without prior knowledge of previous services provided, treatment attended and recommendations made by other health care providers (Forster, et al., 2005). There is no standardised administration record or computerised database which records elderly patients’ medical history, past and current medications and any further care regime (Coldiron, et al., 2005). Adverse events attributed to poorly executed transfers compromise elderly patients and subsequently their families (Dunnion & Kelly, 2008).
Reviewing the IIMS and RCA are two methods used to examine unintended events or errors that could have harmed or did harm a patient (Smits, et al., 2009). The IIMS is an electronic system, available to all NSW Health employees through the Intranet of the Area Health Service (AHS), for recording all incidents that occur in the public health facilities.

Reducing adverse events and addressing potential and actual threats to elderly patient safety is a priority for health services. Hospitalised elderly patients are a known risk group for falls and medications errors. However, they should be identified and acknowledged as particularly vulnerable during transfer of care across clinical settings. The development of interventions that monitor and improve effective care transitions should involve care coordination, continuity and enhancement of communication between the multidisciplinary team and family members.

1.4 PROBLEM STATEMENT

Elderly patients move within and between facilities. Evidence demonstrates that patient safety can be compromised in the process (Coleman, 2003; Parry, Min, Chugh, Chalmers, & Coleman, 2009) resulting in an extended length of stay and unplanned readmissions (Coleman, Mahoney, & Parry, 2005; Forster, Murff, Peterson, Gandhi, & Bates, 2003). Reducing adverse events and addressing potential and actual threats to elderly patient safety is a priority for health services. However, if the quality of transitional care is to improve, research
needs to target the identified system weaknesses which include continuity of care across settings, identification of patients at risk and promoting collaboration between and within agencies. This study aims to improve the safety of elderly patient transition between care settings.

1.5 AIMS

The four major aims of the thesis are to:

1. Identify the occurrence of errors and adverse events in a tertiary hospital setting over a given period of time.
   - This aim was achieved by undertaking and analysing the IIMS and the RCA databases (Chapter 2).

2. Identify interventions demonstrated to minimise errors and adverse events during transfer of elderly patients between care settings.
   - A systematic review (Chapter 5) was undertaken of the best available evidence of strategies with demonstrated effectiveness to promote safe transfer of elderly patients associated with hospital transfer, discharge and follow-up. It was completed and published on the Joanna Briggs Institute database of systematic reviews (Mansah, Fernandez, Griffiths, & Chang, 2009).

3. Develop an intervention to promote the safe transfer of elderly patients.
   - This development led to a form called the interactive Patient Transition Checklist (iPTC). The iPTC followed extensive scrutiny: reviewing the literature, consulting with experts in the field, content validity and trailing of the form (Chapter 6).
4. Pilot test the iPTC intervention in the ED and medical and surgical wards of a tertiary hospital.

- The pilot study evaluated the feasibility of the iPTC in promoting communication from the ED to the medical and surgical wards (Chapter 7).

1.6 SIGNIFICANCE OF THE STUDY

The combination of complex diagnosis and frequent transfers between multiple care providers presents an increased risk of errors and adverse events for elderly patients. The New South Wales Department of Health, the Sydney South West Area Health Service and recommendations from ‘Final report of the special commission of inquiry: Acute care services in NSW public hospitals’ (Garling, 2008) each identified care fragmentation as one of the challenges compromising elderly persons’ safety in the NSW health care system.

This study provides direct best-practice evidence to reduce errors and adverse events in the elderly care transition. Therefore, the study is significant to the clinical sector and to elderly people across Australia. The study also pilot tested an intervention to improve communication between health care providers and facilities. The pilot test was designed as the basis for a large randomised controlled trial. The study provides a basis for policy change in the health system and assistance in the development of guidelines for the transfer of elderly patients.
The use of *multi methods* research is an innovation which enables many directions and multiple techniques to solve a problem (Almarsdóttir & Traulsen, 2009; Creswell, 2009). The use of combined quantitative (e.g. surveys) and qualitative (e.g. interviews) approaches also known as ‘mixed method’ were implemented (Burns & Grove, 2009). Although the qualitative component was a small part of the thesis, when combined with quantitative methods it provided comprehensive, collaborative evidence and added depth to the study.

### 1.7 STRUCTURE OF THE THESIS

This thesis uses three discrete yet interrelated investigations to add to existing knowledge, identify future strategic directions for stakeholders to explore and to inform new policies for improving elderly patients’ safety. In order to increase cohesion and clarity for the reader, the methodological issues and results are discussed within the chapter in which each study is reported. The contents of each of the eight chapters are listed below.

- **Chapter 1** provides a background and rationale for the study. It provides an overview of the research and how the individual investigations are distinct, yet interrelated.

- **Chapter 2** reports on the findings of an audit on the incidence of errors and adverse events using the IIMS and RCA databases in a tertiary hospital, describes the causes of errors and adverse events, and provides recommendations from nursing and medical staff experts to decrease such events. Chapter 2 was initiated before the literature review because the
main scope of developing an intervention into patient safety in the health care environment was to determine the: (i) most common errors and adverse events, (ii) their contributing factors and (iii) recommendations to prevent or reduce such incidents. The audit findings directed the literature review by providing strategic review of the databases, and a focus to the planned intervention.

- **Chapter 3** presents a comprehensive literature review of national and international research findings and perspectives of elderly patients’ safety during care transitions.

- **Chapter 4** presents the conceptual framework for the study and the overarching research design that was used to achieve each study aim.

- **Chapter 5** presents a systematic review of the best available evidence of interventions to reduce the incidence of errors and adverse events among elderly patients during transition.

- **Chapter 6** presents the steps and process undertaken to develop the iPTC form.

- **Chapter 7** presents results of a pilot test iPTC intervention and presents the survey of nurses’ utilisation of the iPTC.

- **Chapter 8** provides the overall conclusions and describes the strengths and limitations of the research and presents recommendations and implications for utilisation in clinical practice. Future research directions are also presented in this chapter.

Due to the methodological constraints of the thesis, the thesis begins to narrow from chapter two.
1.8 CONCLUSION

This chapter presented the background to the research, including the aims, and significance of the study. Chapter one recognised the importance of patient safety and the embedded nature of elderly patients’ errors and adverse events during transfer of care. Chapter two reports the in-patient errors and adverse events using an audit of the Incident Information Management System and Root Cause Analysis databases. This is to determine the frequently occurring errors and adverse events, their contributing factors and the expert panels’ recommendations to prevent or reduce such incidents in elderly hospitalised patients.
CHAPTER 2

An audit of errors and adverse events among elderly in-patients at a tertiary hospital: a one year report
2.1 INTRODUCTION

An adverse event causes harm, threatens or compromises the safety of a patient. This is either caused from direct patient care or as a consequence from the physical environment (Calder, et al., 2010). Common adverse events that occur as a result of health care delivery include medication errors, falls, wrong site procedures, hospital acquired infection, pressure sores, restraints injuries, incorrect documentations and aggressive disruptive behaviour (Brady, et al., 2009). This often differs from the expectations of patients that they have accesses to the health care system for error free and efficient service (Friedman, Provan, Moore, & Hanneman, 2008). Therefore, screening for adverse events has become a common part of the quality improvement process in Australian hospitals (Iedema, et al., 2006). This chapter reports on findings from an audit of the Incident Information Management System (IIMS) and Root Cause Analysis (RCA) databases in one large tertiary hospital in New South Wales (NSW), Australia. A tertiary hospital refers to a full complement care services, including paediatrics, general medicine, and branches of surgery and psychiatry (South Western Sydney Health Network, 2004-2008).

The records for the financial year 1 July 2005 to 30 June 2006 were reviewed by the researcher. The purpose was to identify errors and adverse events, contributing factors and expert panel recommendations for improvement. The audit results informed the development and pilot test intervention that is presented in Chapters 6 and 7.
2.1.1 Study Aims

There were three major aims in this study:

1. Examine factors associated with errors and adverse events involving elderly patients in a tertiary hospital;

2. Review the recommendations by the expert review panels; and

3. Compare the nature of errors and adverse events reported by staff at the hospital and, as also reported in peer reviewed journals.

2.1.2 Incident Information Management System

The IIMS database was developed as a quality assurance tool based on the Australian Advanced Incident Monitoring System (AIMS) and was designed in Australia by Professor Runciman (Runciman, 2002b). The IIMS was implemented across NSW public health facilities in 2005 as a unique standardised multidisciplinary incident registry (Jorm, et al., 2006). All NSW health employees are required by the IIMS policy (NSW Department of Health, 2005a) to complete mandatory comprehensive training in the use of IIMS and are required to report incidents involving patients, visitors and staff (Braithwaite, et al., 2006). To lodge a report, clinicians and managers need to follow a standard computerised process that requires a detailed description of the incident and the possible contributing factors. Each incident is issued with a unique IIMS identification number which must be recorded and displayed with a red sticker in the patient’s medical records. The IIMS system is regulated by the Health Records and Information Privacy Act 2002 (NSW Department of Health and the Clinical
Excellence Commission, 2009) which means that to access data, clinicians and researchers must agree to maintain confidentiality and de-identified data.

The IIMS objectives are to:

- Record the results of reviews and provide recommendations for future improvement (NSW Department of Health and the Clinical Excellence Commission, 2009).
- Develop an awareness of error and patient safety culture in the clinical setting (NSW Department of Health and the Clinical Excellence Commission, 2009).
- Assist managers to deal with incidents in their area (NSW Department of Health, 2005a).

The Severity Assessment Code (SAC) developed by the Veterans Administration (VA) in America is included in the IIMS database (NSW Department of Health, 2005c). The potential severity of an incident and the likelihood of the event occurring again are coded as a risk numerical matrix rated 1 (most severe) to 4 (minor incident) (NSW Department of Health and the Clinical Excellence Commission, 2009).

- SAC 1: Extreme risk: incidents undergo RCA review. This is an urgent in-depth investigation into an incident that provides recommendations to be implemented to reduce or prevent future similar occurrences (NSW
Department of Health, 2005c). Investigation occurs at the local hospital level and is also reported to the NSW Department of Health (DoH).

- SAC 2: High risk: incident investigation occurs at the local hospital level. Incidents are reported to the NSW DoH only if there is potential for media interest.

- SAC 3: Moderate risk: reviewed at local hospital level with recommendations reviewed by the Patient Safety Committee and the clinical leadership team.

- SAC 4: Low risk: reviewed at local hospital level with recommendations provided to the Patient Safety Committee and the clinical leadership team (NSW Department of Health and the Clinical Excellence Commission, 2009).

All investigations and recommendations are undertaken by a panel of experts involving patient safety officers, nurses, doctors, allied health and the hospital management committee.

**Components of the IIMS database used in the study**

For reporting purposes to Department of Health, incidents are classified into 22 category types (NSW Department of Health, 2005a). In this audit, there were 11 classifications that were displayed in the IIMS database. Each classification is described below.

- A fall is classified as an incident when a patient trips, falls out of bed, is found lying on the ground or by other means. It can be witnessed or not witnessed.
Medications/IntraVenous (IV) errors include events that are attributed to the process of prescribing, dispensing or administering a drug. For example, medication prescribing errors or incorrect dosage of medication being administered.

Blood/blood product errors include events that are attributed to the dispensing, administration or quality of blood and blood products. For example, a blood unit is mislabelled, the incorrect blood pack is dispensed from transfusion service or a patient suffers a reaction to the blood transfusion (Travaglia, Hunter, Carroll, & Braithwaite, 2006).

Clinical management involves actions in the care of patients including investigation, treatment, monitoring, observation and diagnosis. For example, retained instruments during surgery or procedures carried out on the wrong part of the body (NSW Department of Health and the Clinical Excellence Commission, 2009). It can also be attributed to the behaviour of the clinician.

Documentation errors include any written, typed, drawn or printed text into which information has been entered. For example, a nurse or doctor has written in the wrong patient medical record or a medication chart is filed into another patient's medical records, or specimens are incorrectly labelled (Jorm, et al., 2006).

Aggression/aggressor describes a broad mix of situations where threatening behaviours occur. For example, patient to staff aggression or patient to patient aggression.

Behaviour/human performance involves inappropriate patient or staff member behaviour in the clinical environment. For example, a patient
threatening to self harm; a staff member behaving rudely towards a patient or visitor.

- Medical devices/equipment/property relates to, for example, a faulty patient lifter or procedure, or routine maintenance not performed on the required equipments (Braithwaite, et al., 2006).

- Accidents and Occupational Health and Safety (OHS) are incidents that involve the physical environment or staff member. For example, a patient slips on a wet floor or sustains a burn after spilling a hot drink over his or her arm.

- Nutrition reports include any incident relating to feeding and nutrition, for example, a patient with diabetes receiving the wrong meal or a patient on a naso-gastric feeding program given the wrong rate of administration.

- Pressure ulcer reports on the development of new pressure ulcers, worsening of existing pressure sores or presentation of pressure sores from the patient’s home or residential aged care facility (NSW Department of Health and the Clinical Excellence Commission, 2009).

2.1.3 Root Cause Analysis Database

In Australia, all SAC 1 adverse events in hospital settings (Figure 2) are reviewed using RCA and must have a Reportable Incident Brief (RIB) prepared. An example of a SAC 1 adverse event is a patient receiving the wrong blood group, and as a result suffered a severe adverse reaction and died (NSW Department of Health and the Clinical Excellence Commission, 2009). A RIB is the method used to report defined health care incidents to the NSW DoH (NSW Department of Health, 2005a). The Area Health Service Executive must approve the RIB before
the Clinical Governance Unit is notified for further processing and investigation. After initial approval for follow-up, the NSW DoH must be notified within 24 hours. Information from the RIB report must be de-identified and treated as confidential. This information is called privileged RCA. The RCA report must be provided to the NSW DoH within 65 days after the Chief Executive of the hospital where the event occurred is notified of the incident. The final RCA report describes the reportable incident, provides a causation statement and recommendations for system changes. Hence, to improve procedures or practices and minimise recurrence of the incident (Hsu, 2007). The recommendations are required to be implemented and evaluated at 3, 6 and 12 months, with follow-up reports to the Area Patient Safety Manager. The majority of RCA recommendations are evaluated for effectiveness and completed within 12 months. The RCA recommendations are made by expert patient safety officers, including nurses, doctors, allied health and management committees (NSW Department of Health and the Clinical Excellence Commission, 2009).
Figure 2: IIMS process of recommendations (Adapted from NSW Department of Health and the Clinical Excellence Commission 2009).
2.2 METHOD

The retrospective audit included incidents that were reported and entered by clinicians to the IIMS database. Incidents that were notified to the RCA database were based on the IIMS database reviews of SAC ones. A retrospective audit reports data that has occurred over a previous period in time (Burns & Grove, 2009), and this audit was completed in 2007. The audit was undertaken to identify the causes of errors and adverse events and to review expert panel recommendation of strategies to prevent further occurrences. The audit was one component of a larger study to inform an evidence based intervention to reduce the incidence of errors and adverse events involving elderly patients.

2.2.1 Inclusion and exclusion criteria

This study focused on incidents reported in the IIMS and RCA databases from 1 July 2005 to 30 June 2006 that involved patients who were aged 65 years or over. Incidents of patients aged \( \leq 64 \) years and incidents involving visitors, volunteers and contractors were excluded, as they were not the focus of this study.

2.3 DATA COLLECTION

The IIMS and RCA databases were retrieved by the Patient Safety Committee Manager of the Sydney South West Area Health Service (SSWAHS) Clinical Governance Unit and provided to the researcher in an Excel spreadsheet file. All the fields in the Excel documents were already grouped under the classifications
of: incident identification number, patient title, incident location, incident date and time, age band, place of incident, principle incident type, incident description, contributing factor, outcome for the subject, actual SAC, results of incident, and recommendation. These particular fields were all chosen for analysis because they provided comprehensive details about each incident involving elderly patients. Once the data were received from the Patient Safety Committee Manager, data were managed and regrouped using the IIMS audit data collection form developed by the researcher (Appendix 1) to provide a logical sequence for reporting the findings. The RCA data were also provided in an Excel spreadsheet format with the following fields: causation statement of how the incident occurred, outcome of incident, risk category of contributing factor to the incident, and recommendations for procedures or practices to minimise future similar errors or adverse events.

2.4 ETHICS APPROVAL

Ethics clearance was obtained from the Sydney South West Area Health Service Human Research Ethics Committee and the University of Western Sydney (UWS) Human Research Ethics Committee (Appendices 2 and 3). Both committees determined that as only de-identified data were sought by the researcher, there was a low risk to the subjects, therefore patient consent was not required and a waiver of consent was provided. The committees did, however, specify the following requirements for protection of privacy and confidentiality (National Health and Medical Research Council, 2007).
Protection of privacy and confidentiality: A separate list containing each patient code and their corresponding medical record number was stored in a secure location as prescribed by the National Statement on Ethical Conduct in Research involving humans (National Health and Medical Research Council, 2007). This was accessible only by the researcher and the immediate supervisors. Excel spreadsheets and Statistical Package for the Social Sciences ™ Version 17 for Windows (SPSS) databases were located on a secure drive with password protection, only accessible by the researcher and the immediate supervisors.

2.5 DATA ANALYSIS

A mixed method (quantitative and qualitative) approach was used to analyse the data.

2.5.1 Analysis of IIMS data

Data were cleaned for spelling errors and inconsistency and typological errors were rectified. The data were then exported to SPSS for analysis. Initially we aimed to code the location of each incident at place of incident level such as bedroom, bathroom or diagnostic procedure room. However, where data at such a level were not available, it was coded as ward area. Continuous data are presented as mean, median and standard deviation (SD). Categorical data are presented as numbers and percentages. Comparison was determined by chi square and student’s t-test.
All of the recommendations by the expert review panel were narrative and there were more than one recommendation for each incident. As a result they were coded, according to the focus of the recommendation, in the following categories: (i) adherence to policies and procedures, (ii) effective communication, (iii) education of clinicians, (iv) close supervision of patient by clinicians, and (v) follow up.

### 2.5.2 Analysis of RCA data

Content analysis was performed on recommendations recorded in the RCA database. Recommendations were transcribed and themes identified. This included the use of open line-by-line coding, reading and rereading by the researcher, and browsing and validating codes (Strauss & Corbin, 1998). Two coders (the researcher and one research assistant) reviewed the data and coded it to classify the data. There was no disagreement or disparity between the items coded. Roberts and Taylor (2002) have emphasised that analysing qualitative data involves an in-depth examination and interpretation of the data. Further, as the codes developed, themes emerged as the researchers searched for patterns and meaning in the data and arranged them in a way that classified the data (Polit & Beck, 2010). The reporting of the factors contributing to errors and adverse events may exceed 100%, as the majority of incidents had more than one variable that contributed to its occurrence.

Analyses were undertaken on falls, medications, clinical management, documentation and aggression/aggressor behaviour incidents. These topics
were selected by consensus methods of experts in patient safety as events that frequently involve elderly people. The Patient Safety Committee Manager, with experts in the clinical field, entered the reviewed and summarised RCA recommendations.

The next section is the analysis results of data from the IIMS and RCA databases.

2.6 RESULTS

As the IIMS and RCA databases are linked, the results of these sources of data are presented together. The majority of the incidents were reported by nurses (87%) compared to doctors (7%), allied health (3%) and others (3%). Others included catering, cleaning and electrical staff. The most common underlying contributing factors were failure to adhere to policies and procedures, communication breakdown and lack of follow-up.

2.6.1 Patient demographics

A total of 643 incidents involving elderly patients during the period 1 July 2005 to 30 June 2006, were reported in the IIMS database. The mean age of the patients was 77.3 years (SD +6.8; range 65 to 95 years). The incidents involved 57% males (n=368), 39% females (n=250) and four percent (n=25) were missing data and unable to be categorised.
2.6.2 Classification of incidents

The incidents were grouped according to the IIMS classification system. However, as some incidents occurred infrequently, related groups were combined, for example, blood/blood product (n=4) was combined with medication/IV fluids (n=132), accident/OHS (n=11) and medical device/equipment/property (n=19) were combined, and nutrition (n=14) and pressure ulcers (n=3) were combined in a group classified as “others”. Eight major types of incidents were identified: falls (n=309), medications/IV fluids (n=136), clinical management (n=104), medical device/equipment/property (n=30), behaviour/human performance (n=19), documentation (n=17), aggression/aggressor behaviour (n=11; 2%) and others (n=17).

2.6.3 Description of incidents

The reported incidents occurred most frequently in the medical ward, followed by the Aged Care Unit (ACU), and then the surgical and emergency departments (Figure 3).

Figure 3: Incident Location
The incidents occurred most frequently during the timeframes 0700 to 1200 hours (30%) and 1300 to 1800 hours (28%), followed by 1900 to 2400 hours (19%) and fewest from 0100 to 0600 (15%); missing data accounted for 8%. The incidents occurred mostly in the patients’ bedroom (n=332; 54%), followed by the ward area (n=153; 25%), bathroom area (n=56; 9%), diagnostic procedure room (n=44; 7%) and other locations (n=31; 5%), which included allied health outpatient room (n=16; 3%), health service clinic (n=12; 2%) and the pharmacy department (n=3; 0.4%).

In the next section, the results relating to falls, medications, clinical management, documentation and aggression/aggressor behaviour incidents are presented. The results for each of these incidents are presented as follows: type of incident, factors contributing to the incident, and recommendations for management.

### 2.6.4 Falls

Falls were the most frequently reported incident. Just over half were documented for patients aged 75 to 84 years (n=165; 54%), then 65 to 74 years (n=100; 32%), with the age group 85 years and over experiencing the least number of falls (n=44; 14%). Seventy-eight percent of falls were witnessed by other patients or visitors rather than by nursing or medical staff and were
documented as “patient failure”. Falls took place in the bedroom (n=206; 68%), the bathroom (n=55; 18%) and ward area (n=42; 14%). The majority of falls (34%) occurred between 0700 and 1200 (Table 1).

The most common contributing factors were analysed and presented below. For a number of incidents there was more than one variable reported. Therefore the percentage reported relates to a particular contributing factor and not to the overall number of falls.

Factors contributing to falls adverse events

Patient related: Thirty-six percent (n=110) were related to the elderly patient not using the buzzer to call for assistance, 28% (n=86) were attributed to the elderly patient’s confusion and 14% (n=43) to unsteady gait.

Communication: Ten percent (n=30) of falls were caused by a lack of communication between nurses on the patient’s fall risk assessment. Eight percent (n=24) were attributed to a communication barrier between the elderly patient and nurse, particularly where patients were from a non-English speaking background.

Environmental: Four percent (n=13) of falls took place due to a wet floor. Only 1% (n=3) of falls were attributed to bedrails not being in place.

Medications: Three percent (n=8) were considered to be caused by a side effect of prescribed medications.
**Recommendations for management**

There was no reported SAC 1 (severe injury or death). However, falls can cause psychosocial damage to the person’s well-being by contributing to low self-esteem and fear of falling again (Russell, et al., 2009; Spice, et al., 2009). Recommendations by the management review panel to reduce the incidence of falls were to provide education to nurses on completing an elderly patient falls risk assessment (n=135; 44%) and the close supervision of at risk elderly patients by nursing staff (n=118; 38%).

**2.6.5 Medications/intravenous therapy**

There were 136 errors and adverse events relating to medication / IV therapy. There were almost equal numbers of males (n=67; 49%) and females (n=60; 44%), with gender not stated for 7% (n=9). These medication errors were reported more frequently in the age groups 75 to 84 years (n=65; 48%), and 65 to 74 years (n=50; 37%), compared to the 85 years and over (n=21; 15%).

Medications / IV errors took place in the elderly patients’ bedroom (n=61; 45%), ward area (n=48; 40%), and the drug cupboard for scheduled medications (n=12; 9%). Eleven percent (n=15) of incidents had missing and incomplete data. The majority of medications / IV errors occurred within the timeframe of 0700 to 1200 hours, 1300 to 1800 hours and 1900 to 2400 hours respectively (Table 1).
Factors contributing to medications / IV adverse events

Two major factors contributed to medications / IV errors in clinical settings: health care practitioners and ineffective communications.

Health care practitioners: Violation of the policies and procedures involving the “five rights” (right patient, right drug, right route, right dosage and right time) accounted for 88% (n=120) of errors. A doctor’s illegible writing on medication charts contributed to 79% (n=108) of errors, a lack of clinical experience (n=26; 19%) and the stress of increased workload (n=19; 14%) also contributed to medication / IV errors. Only three incidents (2.2%) were related to the pharmacist dispensing wrong medications.

Communication: Failure of communications from nurses to other nurses and nurses to doctors contributed to half the medication errors (n=66; 49%), and a failure to follow-up by nurses when patients moved between wards (n=36; 26%) was also a frequently identified factor.

Recommendations for management

Across the review panels there were three frequently occurring recommendations: (1) nurses must thoroughly revisit the policies and procedures (n=75; 55%); (2) nurses should receive further education relating to the “five rights” of medications administration (n=41; 30%); and (3) strategies should be developed to improve communication between nurses and legible hand writing (n=8; 6%).

There were no recorded SAC 1 incidents relating to medications or IV therapy. However, there is an urgent need for strategies to be developed to mandate
nurses to effectively communicate with each other and across the multidisciplinary team. This is recognised as an important element in reducing medications errors (Conley, et al., 2009; Marres, Bemelman, & Leenen, 2009; Romano, et al., 2009).

### 2.6.6 Clinical management

The third most frequently occurring incident reported was clinical management. Clinical management encompasses delays in providing care treatment (n=29; 28%), inappropriate procedures (n=25; 24%), poor transfer between wards (n=17; 16%), near misses (n=14; 13%), inappropriate staff behaviour (n=13; 13%) and inadequate discharge planning from hospital (n=6; 6%).

The incidents occurred in the ward area (n=37; 36%), bedroom (n=27; 26%) and diagnostic procedure area (n=25; 25%) and other settings (n=13; 13%); other settings was documented vaguely as hospital (n=5), health service building (n=5) and transit area (n=3). It was reported that these incidents occurred mainly during the timeframes of 1300 to 1800 hours (47%) and 0700 to 1200 hours (31%) (Table 1).
Table 1: Time of incidents occurrence for falls, medication/IV and clinical management

<table>
<thead>
<tr>
<th>Incident time of falls</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Number (%)</td>
</tr>
<tr>
<td>0700 to 1200 noon</td>
<td>106 (34%)</td>
</tr>
<tr>
<td>1300 to 1800 hours</td>
<td>70 (23%)</td>
</tr>
<tr>
<td>0100 to 0600 hours</td>
<td>68 (22%)</td>
</tr>
<tr>
<td>1900 to 2400 hours</td>
<td>64 (21%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incident time of Medications/IV</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Number (%)</td>
</tr>
<tr>
<td>0700 to 1200 noon</td>
<td>38 (35%)</td>
</tr>
<tr>
<td>1300 to 1800 hours</td>
<td>29 (27%)</td>
</tr>
<tr>
<td>1900 to 2400 hours</td>
<td>27 (25%)</td>
</tr>
<tr>
<td>0100 to 0600 hours</td>
<td>14 (13%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incident time of Clinical Management</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Number (%)</td>
</tr>
<tr>
<td>0700 and 1200 noon</td>
<td>28 (31%)</td>
</tr>
<tr>
<td>1300 to 1800 hours</td>
<td>42 (47%)</td>
</tr>
<tr>
<td>1900 to 2400 hours</td>
<td>11 (12%)</td>
</tr>
<tr>
<td>0100 to 0600 hours</td>
<td>9 (10%)</td>
</tr>
</tbody>
</table>

Table 1 showed that time played a critical role in all the three major incident types in elderly patients’ care. The errors and adverse events occurred most in the mornings, from 0700 to 12 noon and in the afternoons from 1300 to 1800 hours.
Factors contributing to clinical management of adverse events

Adverse events and errors of clinical management were mainly attributed to two factors: health care practitioner and communication breakdown.

Health care practitioners: Twenty-six percent (n=27) of incidents occurred due to a non-adherence to policies and procedures. Staff workload (n=12; 12%), inexperience (n=8; 8%) and lack of skill mix (n=5; 5%) were noted as contributing to these errors and adverse events.

Communication: Thirty-six percent (n=37) of incidents were considered to be associated with poor communication between staff. Lack of follow-up by nurses regarding patient care (n=17; 16%) also contributed to the incidents.

Errors and adverse events included seven deaths (8%), 22 procedural complications (24%) and one potential harmful procedure. There were six SAC 1 scores that required investigation by an RCA multidisciplinary panel (see page 40).

IIMS recommendations for management

General recommendations were provided by the IIMS panel regarding all clinical management incidents. These were: revised education for nursing staff (n=34; 33%), stringent adherence to policies and procedures (n=28; 27%), and improved communication between staff (n=16; 15%).
The six SAC 1 incidents were subjected to RCA review. The factors identified by the review panels as contributing to these incidents are discussed next.

**Factors contributing to RCA adverse events**

Qualitative analysis of the RCA database identified three recurring factors that appear to contribute to errors and adverse events in elderly patients, namely communication breakdown, the absence of follow-up and the failure of staff to identify a patient.

*Breakdown of communications* between nurses to nurses and doctors was identified as a common factor when the sequence of events surrounding an error or adverse event were analysed. For example, a patient who was critically ill had been transferred inappropriately to the ward due to poor communication between the transferring and receiving ward. Another example involved a patient with a perforated bowel, whose condition deteriorated rapidly. Her consultant was not informed and the patient died. These adverse events were considered by the review team to constitute a breakdown in communication between care teams.

The second contributing factor identified was *lack of follow-up care*. For example, a patient who was prescribed anticoagulation medication complained for eight days of hip pain following a fall. The complaint was not investigated and the patient died of a retroperitoneal bleed. The review identified a lack of
follow-up between nurses, the registrar and the consultant surgeon as contributing to the patient’s death.

*Failure to identify a patient* was the third contributing factor. For example, a lumbar puncture was performed on the wrong patient. Lack of communication between teams, poor clinical handover and poor communication with the patient was found to have contributed to this adverse event.

**The recommendations for precautions to reduce and prevent RCA adverse events**

The review panels’ recommendations identified four actions or precautions which, if followed by clinicians, would reduce errors and adverse events, namely: structured communication, follow-up care, and the education of staff and the identification of patients.

*Structured communication* refers to the process of formal documentation and standardised communications. Health professionals are required to document discussions relating to patient care, instructions for care and the care that has been provided. Failure to follow this fundamental requirement contributed to a number of the errors and adverse events. *Follow-up care* refers to the requirement for health professionals to document care plans and also progress against care plans using a reporting format that is approved by the health facility and accessible by all providers. *Ongoing education* that is relevant, evidence based and at an appropriate level for the health professional is a requirement for
professional practice. Education includes findings from research, as well as organisational policies and procedures and knowledge of incidents occurring in the workplace.

The results of this audit indicate that health professionals frequently do not correctly identify the patient prior to any form of interaction between a care provider and patient. Recommendations of the review panels emphasised the need to take precautions and follow policies for identifying patients, including identifying a patient by medical record number, date of birth and name, to ensure the right patient and the right procedure.

2.6.7 Documentation

There were 17 incidents relating to inappropriate and/or absent documentation. Of these, nine had medical notes missing on transfer of patients from the ED to the ward. Six of these incidents were attributed to instructions being written in the medical notes of a different patient to the intended recipient. Urgent referrals were not documented for two patients.

Factors contributing to documentation adverse events

These errors were attributed to health professional error and poor communications.

Health care practitioners: Ten incidents were attributed to the inaccurate identification of patients by health professionals and six to poorly written nursing reports at handover.
**Communication:** Lack of communication between staff contributed to nine incident reports and lack of follow-up care was considered to be a factor in two incidents.

**Recommendations for management**

While no documentation related incident resulted in an adverse event classified as SAC 1, errors that occurred had the potential to be ‘harmful’ to the patient. The review panels identified the need to revise particular policies and procedures and improve communications between colleagues.

### 2.6.8 Aggression/aggressor behaviour

Eleven incidents were attributed to aggressive behaviour by patients or patient’s visitors. Nine of these incidents were aggressive behaviour by patients towards staff and two incidents involved patient’s relatives.

Four incidents were in the ACU, four in a medical ward and three in the ED. Seven incidents took place in the ward area and four in the bedroom. Three occurred in the morning, five in the afternoon and three at night.

**Factors contributing to aggression/aggressor**

Aggression/aggressor behaviour by patients was related to two main factors: confusion (n=8) and breakdown of communication between nurse and patient (n=1). There was no trigger identified in the remaining two incidents.
Recommendations for management

None of the events attributed to aggression were classified as SAC 1, although they were disruptive and distressing to staff. Recommendations by the review panel were that health professionals should be exposed to education on techniques available to manage aggression, and that care plans should reflect specific patient behaviour.

2.7 SUMMARY OF RESULTS

In reviewing the IIMS and RCA databases, communication played a central and underlying role in all major incident types, and this information has been used to inform the development of the iPTC. The importance of good communication and the need to improve communication processes and practices between health professionals was established. In the changing health care environment when managing patient’s complex needs, it is essential that care providers communicate effectively with patients, their family and support persons. It is a pivotal element that can reduce or prevent aggression and improve interpersonal relationships.

National and international reports of errors and adverse events demonstrate similarities between the natures of incidents that occur. In fact, in some cases errors and adverse events were almost replicated across the reports (Benn, et al., 2009; NSW Department of Health and the Clinical Excellence Commission, 2009). Many of those incidents could have been avoided if past experiences
were examined and practice change adopted. This is critical to the development of an organisational patient safety culture.

The findings of this audit of the IIMS database identified falls, medications and clinical management as the most frequent cause of incidents that impact on elderly patients’ safety whilst hospitalised. The individual incidents recorded in the database demonstrate the failure by clinicians at all levels and from all disciplines to adhere to hospital policies and procedures. Moreover, the breakdown of written and verbal communication between staff, and lack of knowledge about, and poor follow-up of care are continuing, despite the efforts of facilities to promote a culture of safety (Kline, et al., 2008) and the establishment of bodies such as the Clinical Excellence Commission that have patient safety as their central focus (Armitage, 2009a; Donaldson & Muir-Gray, 1998; Murie & McGhee, 2003).

These common errors and omissions by clinicians lead directly and indirectly to adverse events in hospitals. These factors were also captured in the RCA recommendations which identified improvements in structured communication follow-up, identification of patients and adherence to policies and procedures as interventions which, if practiced by all clinicians, would significantly reduce the incidence of errors and adverse events.

The next section presents in-depth discussion of the results and implications for clinical nursing practice. The discussion will focus on the prevention of falls and
medication errors, the management of aggression and the improvement of clinical management and communication.

2.8 DISCUSSION

In this audit, 643 reported incidents involving elderly patients, during the period 1 July 2005 to 30 June 2006, were retrieved. The IIMS database was a new innovation to the Area Health Service at that time and the process for reporting was being refined. Therefore there may be some under-reporting of errors and adverse events during the study period. Staff education and training was ongoing at the time, and not all staff had completed the mandatory process for authorisation to use the database (Michael, Ryan, & Hughes, 2006). However, education is not the only cause of under-reporting of errors and adverse events. Studies agree that a significant number of incidents are under reported each year, owing to fear of litigation or disciplinary action (Benn, et al., 2009), lack of awareness, complexity in using the incidence reporting system (Kucukarslan & Nadkarni, 2008; Travaglia, et al., 2006) and lack of patient safety culture in the workplace (NSW Department of Health and the Clinical Excellence Commission, 2009). The lack of feedback received on incidents is also a factor influencing staff willingness to report errors and adverse events (Benn, et al., 2009; Kreckler, Catchpole, McCulloch, & Handa, 2008; Travaglia, et al., 2006).

A recent study (NSW Department of Health and the Clinical Excellence Commission, 2009) found that for the three years of the IIMS database (2005 to
reporting of incidents increased by 45%. This suggests that while underreporting is on-going, the introduction of the IIMS reporting process has improved incident reporting in NSW public health facilities. This is an encouraging indicator of an improved reporting culture and improved awareness of patient safety (Conley, et al., 2009).

In this report, 87% of incidents were reported by a nurse, which is consistent with findings from other studies (Kreckler, et al., 2008; NSW Department of Health, 2005a, 2005b; NSW Department of Health and the Clinical Excellence Commission, 2009). These results indicate that nurses have an increased awareness of the need to report errors and adverse events and, in the case of the IIMS database, have experience in completing the necessary reporting requirements compared to doctors and allied health professionals (NSW Department of Health, 2005a). Previous studies undertaken on the incident reporting system in NSW found doctors’ perceptions of what constitutes an error differ from nurses. Doctors are also less likely to consider that a particular incident warrants reporting, thus discouraging other doctors from reporting (Travaglia, et al., 2006). Incidents that involved allied health professionals mainly occurred on the wards, and were reported by nurses (Jorm, et al., 2006). These findings show the need for education on the requirements for reporting errors and adverse events and the role of each professional in establishing a culture of safety. In addition, the NSW IIMS should be included in facility orientation programs and in the ongoing professional development activities across health sectors.
Worldwide, falls are the major leading cause of unintentional injuries among elderly people (Boyd & Stevens, 2009; Miller, et al., 2009; Russell, et al., 2009). In Australia (NSW Health, 1996; Russell, et al., 2009), inpatient falls are the most common adverse event experienced by elderly patients, and that finding is evident in other studies (Dessypris, et al., 2009; Roe, et al., 2009; Spice, et al., 2009; Weaver, 2008).

Falls are likely to be reported as the event is obvious and is immediately recognised as an incident. Elderly patients often contribute to a fall (Boyd & Stevens, 2009), and in the study reported here 78% of falls were attributed to the actions of the patient. Elderly people are frail (Weaver, 2008), and unsteady when ambulating, which predisposes them to falls (Boyd & Stevens, 2009); they take multiple medications which have side effects (Kreckler, et al., 2008); and they may have impairments caused by confusion (Russell, et al., 2009) and dementia (Mitchell, 2009). In this audit, the majority of falls involved people aged 65 to 84 years, more so than people aged 85 years and over. This was supported by other studies (Rose, 2008; Weaver, 2008) that showed that falls are significantly reduced in elderly patients over the age of 85 years. This finding could be attributed to the reduced mobility among people of this age as they may be bedridden or wheelchair bound (Mitchell, 2009).

Falls are associated with increased morbidity and mortality amongst the elderly, and even where there is no physical injury (Kreckler, et al., 2008; Michael, et al., 2006), the fear of subsequent falls does result in emotional disturbance, loss of
self confidence, increased dependence, and anxiety about falling again (Hart-Hughes, Quigley, Bulat, Palacios, & Scott, 2004; Lueckenotte & Conley, 2009). Falls can also precipitate admission to a residential aged care facility. In this report, it was found that 68% of falls occurred in the proximity of the patient’s bed during the morning period (0700 to 12 noon), which is similar to other studies on falls in the elderly (Milisen, et al., 2007; Miller, et al., 2009; Nazarko, 2008). Strategies have been suggested, such as having a ‘special’ or ‘ floater’ nurse or ‘volunteer’ personnel in the wards during that peak time. These personnel would be assigned specialty tasks, such as answering the patients’ buzzer and attending to them appropriately, whilst other nurses assisted with other treatments and ward activities, including medications, dressings and showers (Giles, et al., 2006). This may reduce falls caused by the elderly attempting to independently get out of or return to bed at this crucial time.

Researchers have recommended improvements in falls risk management strategies (Kreckler, et al., 2008; Oliver, et al., 2008; Wong, et al., 2004). The Royal College of Nursing (2005) reinforced that health professionals caring for elderly patients must maintain basic professional competence by completing a falls risk assessment for each elderly patient admitted to the ward or emergency setting. These assessments enable closer supervision, medical interventions and adequate planning prior to, and after, discharge (Rose, 2008; Russell, et al., 2009; Spice, et al., 2009; Wachter, 2006). This was supported in this audit, where a recurring recommendation from the expert review panel was for all nurses to
complete an assessment of elderly patient fall status as routine at admission and reviewed again at discharge.

Medication errors are also common among elderly people (Benn, et al., 2009). The medication errors reported in the IIMS database and included in this audit did not result in serious adverse events. However, these adverse events did cause temporary harm, for example diarrhoea or hypoglycaemia, which, in the elderly patients, has the potential to lead to severe harm such as dehydration and falls (Boockvar, et al., 2009; Coleman, et al., 2004; Feldman, et al., 2009).

The majority of medication incidents involved errors of dosage, prescribing, transcribing and administration. While some of these errors were attributed to human failure such as wrong drug, route, patient, or time, factors relating to the ward processes were also identified as precipitating factors, such as increased workload (Jorm, et al., 2006). The hospital’s policies and procedures for medication administration (Sydney South West Area Health Service, 2006), include the requirement for nurses to communicate with doctors to clarify changes to medication orders, communicate with other nurses about the patient’s medication regime when patients are being transferred to another care setting, and to confirm the patient’s name, date of birth and known allergies prior to administering the medication. More importantly, the policy also requires clinicians to document communication actions in the medical records. Despite the hospital’s policies and procedures, the findings of this audit indicate
that clinicians were not complying with the safety of medications administration (Mannion, Konteh, & Davies, 2009; van Doormaal, et al., 2009).

Confusion, sometimes associated with aggression and aggressive behaviour, is another relatively common factor that contributes to, or is reported to be, an adverse event among elderly patients (Poole, 2003). Aggression and aggressive behaviour reported in the audit led to staff feeling disturbed and overwhelmed and created an unpleasant environment for other elderly patients and visitors. Strategies that have been reported to manage aggression and reduce harm involved orientating the elderly patient to the care setting and softly talking to them (Jones, Borbasi, Nankivell, & Lockwood, 2006). In addition, elderly patients are to be encouraged to engage with and participate in their care, for example, assisting with showering, dressing and feeding. Another study (Allen, 1999) calls for a comprehensive assessment of elderly patients’ behaviour, history and previous interactions with others. It highlights the need for assessment of behaviour to be documented in the care plan and emphasised in the handover report from nurse to nurse. Furthermore, all elderly patients who are confused and are displaying aggression should undergo an in-depth medication review and blood test to determine if there are underlying, confounding factors (Poole, 2003). The recommendations from the expert review panel associated with the incidents reviewed by this audit also included providing ongoing education to champion nursing staff on critical decision-making in managing aggression in elderly patients, visitors or patient’s relatives.
This audit identified that clinical management was the third highest category of events recorded on the IIMS database and some of these events resulted in SAC 1 incidents. Incidents are most frequently reported to have occurred from 0600 to 1200 noon and 1600 to 2000 hours, with the highest peak in the morning between 0800 and 0900 hours (Michael, Ryan and Hughes, 2006). Likewise, the incidents identified by this audit also demonstrated that the most crucial time for falls, medications, and clinical management incidents were the morning (0700 to 12 noon) and afternoon (1300 to 1800) period. This outcome provides important information that must be considered when planning interventions to reduce these incident types in the hospital settings.

These errors and adverse events were primarily associated with the transfer of elderly patients between wards and between facilities and with omissions that should have been included in discharge planning. Both of these activities have been reported as contributing to errors and adverse events in other studies (Coleman, Parry, Chalmers, & Min, 2006). A recent study found the transfer of patients and omissions of discharge planning to be the fourth highest category of incidents in public health facilities and frequently associated with falls, and medication errors (NSW Department of Health and the Clinical Excellence Commission, 2009). The identified contributing factors included failure to provide information during handover of care to another clinical team, lack of care coordination on transferring elderly patients back to the community and failure of patient clinical records to arrive with them at their care destinations. Similar findings emerged in this audit, where nurses recorded poor transition in
16% of cases and 26% were related to lack of follow up of patient’s medication regimes from the previous ward. This was echoed in another report by the National Health Service (2000) which associated poor transition between care sites as a series of adverse events that contributed to a patient’s death. Therefore, comprehensive safe transfer between ward and discharge to a residential aged care facility or home is a necessary requirement to prevent errors and adverse events.

In the audit reported here, the RCA identified breakdown of communication and lack of follow-up as the major contributing factors to incidents. Nurses and doctors failed to document their communications and an inadequate verbal handover of patients resulted in incorrect information. A study by Lingard, Espin & Whyte (2004) found that one third of errors in the operating theatre were the result of a communication breakdown. The Joint Commission on Accreditation of Healthcare Organisations (The Joint Commission, 2006, 2009) also suggested that poor communication contributed to 70% of adverse events, and Greenberg (2007) indicated that communication failures lead to serious adverse events for surgical patients.

The review of the RCA database completed for this study highlighted the need for structured communication, follow-up of care and correct identification of patients to prevent, or at least minimise, the incidence of adverse events. The fact that the RCA expert review groups recommended improvement in communications between clinicians demonstrates that, while clinicians may
acknowledge that good communication is critical to optimal outcomes for all patients, in practice, communication breakdown remains a common vulnerability. Strategies have been developed to improve communications, for example the SBAR tool (situation, background, assessment and recommendation) which was designed to guide clinical practice (Marshall, et al., 2009). This tool was initially developed to standardise important and urgent communication by the United States Navy in nuclear submarines (Haig, Sutton, & Whittington, 2006). This tool was found to improve the content and clarity of communications in the clinical environment (Marshall, et al., 2009). Moreover, a checklist has also been found to reduce errors resulting from poor communication in the operating room (Lingard, et al., 2006).

According to Tuft and Reynolds (1997), the most important structure health care organisations can have in place for their employees are designs to enhance communication of information between individuals, departments, other organisations and, in some cases, with the general public. While research has demonstrated that a structured communication process during patient transfer does improve continuity of care and reduce adverse events (Braithwaite, et al., 2006), the successful implementation of a particular tool requires staff to appreciate the potential for such a process to improve the safety of patients in their care and to improve outcomes (Benn, et al., 2009; Mannion, et al., 2009).

The findings of the audit reported here reinforce findings from other studies (Benn, et al., 2009; National Health Service, 2000) which indicate that near
misses were not being reported in-depth. For example, in this audit only 13% of near misses were reported. This finding suggests that the type of incident and level of harm may influence the likelihood of reporting. An event resulting in patient harm is most likely to be reported. When harm is prevented (near miss), the likelihood of reporting is reduced (Conerly, 2007; Kaplan & Rabin Fastman, 2003). The ability to review a near miss presents a valuable learning opportunity for the identification and rectification of factors that contribute to error before harm occurs (Barach & Small, 2000). This is crucial as it also serves to build on knowledge, education and training.

The IIMS database has some disadvantages, as it did not report incidences of patient belongings being misplaced, such as dentures, walking frames, spectacles and hearing aids (NSW Department of Health and the Clinical Excellence Commission, 2009). This could be considered a system approach failure, that clinicians working in NSW Public Health do not recognise these issues as errors pertaining to elderly patients’ care. Consequently, it can be concluded that nurses who are most likely to report incidents (Kreckler, et al., 2008) do not view missing patient belongings to be an error of care and only see these items as lost in transit between areas. This finding increases the significance of a process aimed at improving safe transfer of elderly patients. One approach to improve communications between clinicians and departments, and developed and tested as part of the research reported in this thesis, is the interactive Patient Transition Checklist (iPTC), which will be reported in detail later (Chapters 6 and 7).
2.8.1 Implications for practice

The IIMS and RCA databases provide valuable input into the nature of errors and adverse events, and the recommendations need to be considered and used as a basis for improving the processes and policies for providing safe and effective care. The findings of this study identified six factors that contribute to errors and adverse events in health, and each of these causes can be used as a basis for developing processes to improve practice.

1. The hospital system needs to focus on a system wide approach aimed at developing a culture that focuses on improving patient safety.

2. The focus on reporting incidents and adverse events should be on improving the system rather than blaming an individual clinician.

3. A falls risk assessment should be conducted on each elderly patient admitted to the hospital setting.

4. Processes to ensure structured communication between clinicians and facilities should be integrated into care practices to reduce the risk of errors, and encourage follow-up between clinical teams and departments.

5. Developing and implementing strategies to reduce errors associated with medication ordering and administration should be a priority for each health facility.

6. Near misses are significant occurrences and should be considered in order to improve policies and processes of care.
2.8.2 Limitations of the study

There were limitations of this audit that need to be considered when reviewing the findings.

1. The IIMS database had recently been introduced in 2005–2006 when the errors and adverse events for this audit were captured and staff were in the process of training. Therefore the potential for under-reporting at that time needs to be considered and factored into the significance of the findings.

2. It is important to note that the IIMS database was not designed to be a research tool and some fields were incomplete or information was missing. This may be an oversight given the potential of the data to provide benchmarks for the health system.

3. Data were extracted from the IIMS database at one tertiary metropolitan hospital in NSW, therefore the findings may not be generalised to other hospitals. However, it can be seen that the incidents reported on the IIMS database and investigated by the RCA review process are similar to those reported by large studies in Australia and internationally.
2.9 CONCLUSION

Errors and adverse events are usually inevitable in health care, therefore systems need to be developed and processes established to minimise their occurrence and impact on elderly patients. This study demonstrates that while errors and adverse events such as falls, medication errors and factors associated with clinical management are frequent in the health facility, a commonly identified contributing factor is communication failure between clinicians and facilities. This finding is surprising as there are a plethora of reports in the nursing literature that focus on communication between nurse and patient and nurse and other health professionals. Therefore, there exists a need for the development of a simple structured communication form that promotes communication and assists nurses to abide by policies and procedures. The next chapter is a critical review of the literature, of papers from national and international perspectives.
CHAPTER 3

Literature Review
3.1 INTRODUCTION

Chapter 1 highlighted the need to investigate factors associated with errors and adverse events that occur when elderly patients are being transferred between, and within, facilities. It was noted that the elderly are particularly vulnerable to errors and adverse events which, when investigated, are frequently attributed to human error involving lack of communication and follow-up. The errors often have resulted in an increased length of stay of elderly patients, representation at ED and, in some instances, readmission to acute care facilities (Jack, et al., 2009; Koehler, et al., 2009; Liu, et al., 2009). The previous chapter outlined the significance of investigating errors and adverse events in health care settings by auditing incident reports, analysing contributing factors and monitoring recommendations to reduce the incidence of future occurrences.

This chapter comprehensively reviews the literature to identify and explore elderly patients’ safety during hospital transfer between care sites. The literature provides an in-depth discussion of errors and adverse events in the health sector and identifies approaches that have successfully prevented or reduced their occurrence. The conceptual framework used to underpin this research was developed based on the review of the literature and an audit of IIMS and RCA databases also completed for this thesis. The conceptual framework is presented in Chapter 4.
The topics explored in this literature review are: population ageing – a global perspective; hospitalisation of elderly people; consequences of errors and adverse events in health; research relating to patient safety; errors and adverse events in the elderly; strategies to promote the safe transfer of elderly patients; patient safety culture; patient safety and communication; and clinical governance. Each will be discussed in turn.

### 3.1.1 Population ageing – a global perspectives

The aged population of developing countries is increasing globally. It is projected that two billion people, almost one quarter of the world population, will be aged over 60 years by 2050 (HelpAge International, 2003; World Health Organisation, 2000, 2007). The longevity in this cohort of people has been attributed mainly to improved medical care and education on lifestyle modifications (Australian Institute of Health and Welfare, 2007; Caplan, Williams, Daly, & Abraham, 2004). In Australia, sustained low fertility, longer life expectancy and improved living conditions have contributed to the increasing aged population (Johnstone & Kanitsaki, 2009). Similar aged population growth has been reported in Canada and the USA, which have age population structures similar to Australia (Australian Institute of Health and Welfare, 2007). Countries such as Italy, Greece, Sweden, France and Japan have smaller proportions of children and higher proportions of elderly people than that of Australia (Australian Institute of Health and Welfare, 2007). This transition will be greatly exacerbated by the large post-war generation reaching age 65 years within the current decade, but
also the increasing number of those people aged 85 years or more (Australian Bureau of Statistics, 1999, 2005).

Hence, as shown in Figure 4, the proportion of the population aged 65 years and over has risen from 11% to 13.3% between 1989 and 2009 (Australian Bureau of Statistics, 2009) when compared to any other age groups which has remained relatively stable. Given the increase in these populations, health care professionals need to develop and implement cost effective programs for elderly patients with achievable practical outcomes in hospital settings.

Whilst ageing is not and should not be seen as a national problem, the Productivity Commission (2009) has indicated that population ageing raises major health planning, economic and policy challenges. Elderly people are disproportionate users of health services (Johnstone & Kanitsaki, 2009). As a group they experience ill health, particularly associated with chronicity (McCormack, 2008) and disability (Cheek, Ballantyne, & Roder-Allen, 2005). Despite health care improvement, the majority of elderly people have at least three chronic disorders and other multiple comorbidities such as hypertension, diabetes and obesity (Wolff, et al., 2004). In addition, the most frequently reported causes of mortality in elderly Australians are ischaemic heart diseases, cerebrovascular diseases, lung cancer and heart failure (Australian Institute of Health and Welfare, 2007). The chronic and acute burden of these diseases are exemplified in the frequent hospitalisation to ED and acute wards (Pronovost, et al., 2005). Therefore, any interventions developed to target elderly patient’s
care, should recognise the confounding factors of multiple illnesses (Rivard, et al., 2008).

### 3.1.2 Hospitalisation of elderly people

Elderly people have increased levels of rehospitalisation and lengths of hospital stay compared to the younger population (Trivalle, et al., 2010). Chronic illness, complications resulting from medical or surgical interventions, drug-related adverse events, and injuries are associated with an increased need for health care in general, and hospital admission (Forster, et al., 2003). On average, it is expected that elderly patients experience higher mortality, greater length of stay, and higher costs, independent of adverse events (Rivard, et al., 2008).

Many elderly people admitted to hospital experience complications during their hospital stay. These are known as *iatrogenic complications* and include falls, urinary tract infections and increased confusion (Alvine, 2006). Coleman et al., (2006) indicated that early identification of hospitalised elderly patients who have increased risk of readmission is necessary for an effective and safe discharge program that may include transition to other care facilities. Although the majority of transitions are planned and intended to improve patient's outcomes, they are often associated with high numbers of errors and adverse events (Claflin, 2005a; Crotty, et al., 2004; Ma, Coleman, Fish, Lin, & Kramer, 2004).
3.2 ERRORS AND ADVERSE EVENTS IN THE ELDERLY POPULATION

The increased focus on patient safety is a direct result of the increasing evidence that patients do not always receive optimal care in the health system (Davies, Herbert, & Hoffman, 2003). The Institute of Medicine (IOM) in the USA reported that a significant number of errors and adverse events were occurring within the health system (Leape, 2000; Leape & Berwick, 2005), and affecting patient safety (Kohn, et al., 2000). This report generated legislative and regulatory initiatives to investigate medical and nursing errors and to design systems that address the problems.

Errors and adverse events are common in hospital and community health care settings. The most common type of error is associated with administration of medications (Rozich & Resar, 2001). Medication errors in the clinical setting are related to three main factors: quality of prescribing, dispensing and administration. It has been reported that approximately 60% of adverse drug events occur during transition of patients from hospital to residential aged care facility or home, ED to critical care and from surgical units to rehabilitation facilities (Pronovost, et al., 2003; Rozich & Resar, 2001). These errors and adverse drug events are usually associated with incorrect or incomplete transfer of medication information (Rozich & Resar, 2001). Other adverse events reported among the elderly during care transition include falls (Claflin, 2005b; Conga Armayor & Narvaiza Solis, 2006; Paniagua, et al., 2006), complications resulting from errors in diagnosis (Barber, 2004), post operative wound infection...
(Bartels & Bednash, 2005), disorientation and agitation (Nazareth, et al., 2001), all of which are preventable. Breakdown of communication between clinicians (Institute for Safe Medication Practices, 2005; Rozich & Resar, 2001), failure to decide or act appropriately based on available information or violation of policies (Benner, et al., 2002) are common attributing factors. Errors have also been associated with problems in products and procedures (Australian Pharmaceutical Advisory Council, 2000a).

Practices such as unplanned transfers and inadequate preparation prior to transfers also increases the risk of preventable errors and adverse events, some of which may result in early readmissions for elderly patients (Al-Rashed, Wright, Roebuck, Sunter, & Chrystyn, 2002). Antecedent causes of errors and adverse events have been identified as poor staffing, job overload, high staff turnover, a stressful environment and inadequate supervision from senior staff.

### 3.2.1 Consequences of errors and adverse events in health

Errors and adverse events have a major impact on patients and health services. The consequences to the patient are poor clinical outcomes (Annas, 2006), disruptions to treatment (Crotty, et al., 2004), pain, disability (Seago, Williamson, & Atwood, 2006), loss of functionality, loss of life (Royal, Smeaton, Avery, Hurwitz, & Sheikh, 2006), increased psychological harm (Barach & Small, 2000), and dissatisfaction with services (Coulter, Hurwitz, Aronow, Cassata, & Beck, 1996; Kane, Homyak, Bershadsky, & Flood, 2006), including loss of trust in the health care system (Holland, et al., 2005).
There is also an indirect loss to society from the decreased productivity of patients who have suffered a serious adverse event (Australian Patient Safety Foundation, 2000; Royal, et al., 2006).

The cost of adverse events to health services is related to increased readmission to hospitals and length of stay (Murtaugh & Litke, 2002), legal expenses and compensation for medical errors (Institute of Medicine, 2001). In Australia, approximately 1% of the health care budget ($AUD400 million per year) is spent on costs related to adverse events (Australian Patient Safety Foundation, 2000).

A complex and diverse health care system will inevitably have failures and shortcomings. It is understandable that health care is labour intensive and individuals can, and do, make mistakes (McGoldrick, 2005; Rhodes, 2003). Health care organisations throughout the world support the prevention of errors and adverse events (Fitzpatrick, Hutchinson, Kozlowski, Palmer, & Trahan, 2002). Patient safety is primarily a result of healthcare system design, and not necessarily of individual health care workers. Therefore, identifying systemic vulnerabilities has greater potential for improvement than searching for individual flaws (Akins & Cole, 2005). However, it is important for health care professionals to work within the health care organisation’s policies and procedures and to continually seek evidence based practice to deliver quality care (National Health Service, 2000). According to Bradley & Brasel (2009) when adverse events involve a single clinician’s practice, the issue of individual competence cannot be ignored. In such cases, the management process must
outline strategies to enhance clinical skills and remove blaming and threatening behaviour.

### 3.2.2 Research relating to patient safety

Adverse events known to have severely compromised patient safety have had major effects in the health care systems of these countries United States of America (USA), Britain, Canada and Australia. A milestone Californian study (Mills, et al., 1978) in 1974 randomly sampled 20,864 hospitalisations from 23 hospitals. The findings indicated that 5% of the entire sample had a *potentially compensable event* (PCE), defined as a disability caused by medical management with temporary or permanent impairment to physical or mental function, or economic loss in the absence of impairment. The severity distribution of PCEs showed that 80% were temporary, 10% were permanent disabilities and 10% resulted in death. The occurrences of PCEs were higher in patients 65 years and over compared with those less than 65 years old. This study had a significant impact in the United States of America. Since its release, adverse events have been a priority for health professionals, governments and the society. Nevertheless, adverse events have continued to critically affect the health system.

In another USA study (Mills, Neily, Kinney, Bagian, & Weeks, 2007), a review of root cause analysis (RCA) identified 143 incidents related to *adverse drug events* (ADEs) over a one year period. The causes were errors in medication administration, including “wrong dose”, “wrong medication”, “wrong patient”
and “failure to administer medication”. The major contributing factors to the ADEs were in failure to follow hospital policies or procedures, lack of knowledge or education, problems with administration equipment and medication dispensing issues. Additionally, a lack of communication between nurses and doctors contributed significantly to ADEs. Moreover, recommendations from the RCA demonstrated that training and education on ADEs improved the process of medication ordering by medical physicians, improved the process of checking the patient’s identity, checking medical armbands and allergies at the bedside and adhering to policies and procedures. While this study lacked an in-depth explanation of the methodology undertaken within the RCA team to develop strategic recommendations, it highlighted a significant aspect of ADEs in the elderly and how they can be prevented.

A review of 14,799 randomly selected hospitalisations from 28 randomly selected hospitals (Thomas, et al., 2000) in Utah and Colorado demonstrated that the annual incidence of adverse events was 3% of hospitalisations. Approximately 30% of these adverse events were attributed to negligence. Surgical procedures were responsible for 45% of adverse events and medication errors were the most common non-operative adverse events, comprising 19% of the total. These findings were similar to that of an Australian study (Wilson, et al., 1995) that reviewed 14,179 randomly sampled records from 28 hospitals in two states (New South Wales and South Australia). Adverse events were detected in 17% of hospitalisations. Permanent disability occurred in 14% of cases and death for 5% of patients affected. Failures in technical performance of
a procedure accounted for 35% of incidents, failure to decide or act appropriately based on available information accounted for 16%, failure to investigate or consult resulted in 12%, 11% were for failure to attend, 9% were due to misapplication of a rule, while violation of policies and procedures accounted for 5%. Nevertheless, the studies cannot be compared because the Australian study included various aspects of care such as falls, consents, the overuse, underuse and misuse of drugs and complications of thromboembolism which were not assessed in the USA studies (Thomas, et al., 2000). The studies bring to light the nature and severity of adverse events in the Western world.

### 3.2.3 Strategies for safe transfer of elderly patients

The movement of elderly patients from one healthcare practitioner or setting to another makes them particularly vulnerable to serious lapses in the quality and safety of nursing and medical care (Chugh, Williams, Grigsby, & Coleman, 2009). The problems associated with transfer have been identified by researchers who have found that most health care professionals have little or no training in executing high-quality care transitions in the role of either the sender or the receiver (Bennett, Tuttle, May, Harvell, & Coleman, 2007; Chugh, et al., 2009; Next Step in Care, 2010). Therefore, highest standards of care during the transfer of patients between hospital wards and between hospitals, residential aged care facilities and other care services have not yet been achieved (Kripalani, et al., 2007).
The evidence suggests that poorly designed health care systems have contributed to errors and adverse events that have harmed patients (Leape, et al., 2009). There has been a lack of training of health care professionals to enable them to develop the necessary skills in information management, and understanding of the concepts of organisational management, including the human factors that impact on practices within health facilities (HMO Care Management 2004). A recognised weakness, from the education perspective, is that most medical (Lucian Leape Institute, 2010) and nursing (Seifert, 2009) curricula do not include specific content about procedures and processes to be followed when patients are being transferred. No effort has been made to include this content into mandatory hospital programs.

The HMO Care Management Workgroup (2004) summarised the processes and recommended steps required for the safe transfer of patients. These involved (i) opportunities to implement contemporary strategies to improve the exchange of health information; (ii) recognising the significance of organisational culture and related informal and formal communication processes and networks; (iii) involving clinicians in decision making about how to most effectively adapt and implement policy, regulations and directions from government agencies regulatory bodies, and bodies such as coroner case report recommendations. These recommendations have been applauded by the American Geriatrics Society (2007) and the NSW Garling Report (2008), both of which have identified eight factors to reduce the occurrence of errors and adverse events during transfer of patients.
These are:

1. Preparation and information for patients on what to expect at the next level of care.
2. Adequate coordination between the sending and receiving facilities.
3. A uniform plan of care to facilitate communication and continuity across settings.
4. The advancement of electronic communication or structured documentation to guide and coordinate individual elements of the plan of care and timely transfer.
5. The launch of new quality improvement efforts to address transitions between care settings, in which both the sending and receiving providers of care would be accountable for the success or failure of the patient’s transition.
6. Professional education programs, speciality certification boards, licensing boards and quality improvement programs that seek to improve, evaluate and monitor health professionals’ abilities to collaborate across settings to execute a common plan of care. Patient and family needs are to be incorporated as core competencies.
7. Health care reforms and leaders to develop policies to guide transitional care.
8. Financial incentives to engage quality transitional measures and services in all health care settings.

A recent Joint Commission on National Patient Safety Goals (2010) identified improved communication among health care professionals as a critical area for
improvement at the point of care. It also emphasised the need for medication safety and, in particular, reconciliation of medications across the continuum of care. To do this, communication across health settings must be improved.

There is a substantial body of research in testing the effectiveness of interventions to promote the safe transfer of elderly patients (Boockvar, et al., 2009; Cheng, et al., 2006; Coleman, et al., 2004; Horwitz, et al., 2009; Kaplan, et al., 2009). Introducing a comprehensive plan of care, led by a multidisciplinary team during transfer to wards and discharge to home or residential aged care facilities, has been documented to be effective in reducing errors and adverse events (Chugh, et al., 2009; Coleman, 2009). The availability of well-trained healthcare practitioners for follow-up care (Vira, Colquhoun, & Etchells, 2006) and effective collaboration across health care institutions (Cole, et al., 2002) has also been demonstrated to be effective (Baker & Norton, 2004). Educating patients to improve medication knowledge, promote adherence and prevent poly-pharmacy (Holland, et al., 2005), and to reduce medication related adverse events, has been successfully implemented in hospital settings (Barnsteiner, 2005). Geriatric assessment at admission and prior to discharge has been shown to reduce adverse events, unplanned readmission and overall improved quality of life and patient satisfaction (Cunliffe, et al., 2004). Further, a 12 month pilot study (Coleman, 2009) of patients aged 55 years and over across 10 hospital sites in California, USA, examined the use of care transition intervention (CTI). During the study period, transition occurred from the hospital (sender) to the community care (receiver). The CTI was conducted by nurses (including student
nurses), social workers, experienced community workers and trained layperson volunteers. The intervention included strategies to provide patients with relevant skills and knowledge in preparation for transfers that focused on building self efficacy. The study found medication management was the most frequently reported difficulty experienced at transition. A limitation of the study was that the ongoing cost of the CTI made it difficult to carry out the intervention for the expected 12 month study period. Nevertheless, the major finding was that the hospital facilities were committed to incorporating the CTI into the hospital practices.

Researchers are continuously designing and testing new interventions to reduce the incidence of errors and adverse events associated with the transfer of elderly patients between care settings. However, the effectiveness of these strategies has not been investigated in a systematic review. The systematic review reported in Chapter 5 addresses that health care priority by focusing on the effectiveness of strategies in reducing errors and adverse events during care transition.

### 3.2.4 Patient safety culture

The term patient safety culture refers to an initiative that promotes a culture of safety in the health care environment (Armitage, 2009a). It is important to understanding the organisational structure, improving patient outcomes and recognition of human errors through active failures and latent system conditions (Friesdorf, Buss, & Marsolek, 2007; Watson, Bond, Johnston, & Mearns, 2006).
One major theoretical perspective is the Swiss Cheese Model (Reason, 2000), which claims that when holes in various layers of the organisation’s defence system line up, patients experience errors, some of which may harm the patients. That is, a succession of linked, unchecked errors can lead to an adverse event. If any one of the errors in the chain is blocked, the adverse event may not occur. Therefore, a culture of patient safety requires reporting of errors and near misses when they are recognised so that future errors can be prevented.

The culture of safety foremost indicates the fundamental need for individual clinicians and management to be vigilant for potential errors and adverse events. The error reduction process has to be built into the health care system. Additionally, research and the use of evidence based practice contributes to a quality culture within a health care system (Zegers, et al., 2009). This process ensures that interventions focus on the underlying causes of errors and on redesigning systems to reduce active failures (Zibrowski, et al., 2009).

A cross-sectional study undertaken in western Canada assessed in-patient incidents over a one year period and the views of hospital staff regarding patient safety (Kline, et al., 2008). The study examined individual and unit-level (hospital ward) variables to predict adverse events. The study hypothesised that a hospital with a strong culture of patient safety would have reduced incidence of adverse events. Of the 5,070 incidents obtained from the database, falls accounted for 37% database entries, with contributing factors being loss of a patient’s balance, a language barrier between nursing staff and patients, the
condition of patients and patient disorientation in new surroundings. Medication discrepancy, where patients were not involved, resulted in 3% of incidents, and medications errors involving patients accounted for 39% incidents recorded on the database. Contributing factors were associated with policies and procedures not being adhered to. Consequently these findings suggest that when policies and procedures in the clinical settings are not followed, the potential for errors and adverse events is heightened. The question asked across organisations is why have these policies and procedures not been adhered to in the clinical settings? The same study surveyed 8,163 clinicians in relation to patient safety culture. The results found that wards that had a strong culture of patient safety also had improved communication between staff, policies and procedures were followed and the level of falls was reduced. This establishes that when a patient safety culture evolves within the hospital setting, adverse events are reduced.

A further study undertaken in rural USA (Demiris, Patrick, & Boren, 2004) addressed the issue of patient safety culture in hospitals with the general aims of highlighting healthcare providers’ attitudes towards patient safety, and their expectations of an adverse event reporting system. The specific objective was to provide insight into the organisational culture and the readiness to adopt patient safety strategies in a rural setting. Results found that 93% of health care providers indicated underreporting of errors and adverse events and 71% believed that there was no culture of blaming individuals involved in medical errors. The result has two main effects. Firstly, underreporting of errors and
adverse events is known to be a common barrier to patient safety in hospitals, therefore the results relate practically to the clinical settings and to other studies (Baker & Norton, 2004; Blanco, et al., 2009; Coldiron, et al., 2005; de Vries, Ramrattan, Smorenburg, Gouma, & Boermeester, 2008). Secondly, the study participants indicated that there was minimal culture of blame, which, according to Reason’s theory (2000, 2002, 2004, 2005) is a fundamental approach to improving the reporting of incidents. Therefore, one may think that, where the culture of blame is absent or minimal, there will be reporting of errors and adverse events. However, a finding that posed concern was that 57% of participants surveyed believed that their organisational culture of patient safety was inadequate. This study was a pilot involving only 32 participants, therefore it was not possible to extrapolate the results. However, it brings to light deficiencies in patient safety. The findings were similar to those of an Australian study (Wolff & Bourke, 2002) in which the majority of health care providers surveyed stated that current mechanisms for identifying errors and adverse events were inadequate, and that the organisational structure for managing patient safety in the health care system was poor. These studies demonstrated the need for health care professionals to improve practice by having a commitment to patient safety and its culture in the workplace.

3.2.5 Patient safety and communication

Poor communication and a lack of accountability between healthcare professionals, in particular nurses and doctors, (Kripalani, et al., 2007) can affect safety, quality and outcomes for patient transfers between care settings. Health
care professionals at the receiving end of transfers are often left “flying blind” (Coleman, 2009), without adequate information or direction to guide and provide clinical care (Kripalani, et al., 2007; Pesanka, et al., 2009). A study (McGoldrick, 2005) found that errors and adverse events occurred in three distinct yet related processes during patient transfer. These are (1) lack of communication between clinicians associated with verbal and written documentation, for example, poor nursing handover of patient’s medical condition; (2) poor planning, including inadequate elderly patient assessment, plan of care and follow-up; and (3) illegible writing by nurses or doctors in the elderly patient’s clinical records. In addition, elderly patients were not informed about the care regime. Voight (2009) found that poor communications among staff during the transfer of patients was connected to adverse consequences, sometimes hours later. Greenberg (2007) suggests that interventions that effectively prevent the breakdown of communication include triggers that stimulate and direct communication in a structured process, for situations such as clinical handoffs and transfer protocols, and the standard use of read-backs.

A study in Boston examined the relationship between service quality and the occurrence of adverse events and medical errors (Taylor, et al., 2008). The study methodology was a prospective cohort study of 228 participants, of whom 183 reported deficiencies in the quality of services provided. The most common types of service deficiencies were also poor communication and delays in care. Incidents identified on 52 charts were reviewed and, of these, 34 patients (65%) experienced adverse events, 11 events (21% of charts) were reported as near
misses and seven (13%) were classified as low risks errors. Thirty eight percent (13/34) of the adverse events were definitely or probably preventable. Examples of adverse events included a delay in antibiotic administration of 21 hours while a patient with pyelonephritis awaited a bed assignment; four episodes of over sedation resulting in “stat” discontinuation of medication or reversal orders; and three falls sustained by patients attempting to toilet without assistance. Patients also reported experiencing poor coordination of care by staff (Taylor, et al., 2008). This finding is consistent with previous studies (Conerly, 2007; Hsu, 2007; Patey, et al., 2007; West, Weeks, & Bagian, 2008) showing that communication barriers are significant determinants of patients’ decisions to complain about care provision. On the other hand, whilst patients may have some insight into coordination of care, they may not be the best judge of quality. For instance, assessing the process of care coordination could happen and may be beyond the patient’s ability, for example, assessing coordination of care in the operating theatre. These studies found that poor clinical communication does limit the quality of service that is provided and increases the risk of medical errors and inquiries. Health care professionals must develop the skills of effective communication between themselves and other care providers, and listen and address elderly patient needs.

An approach that has been effective in structuring communication is the use of checklists. The introduction of a standardised checklist has been employed in the operating theatre to prevent errors, including wrong procedure, wrong person and wrong site (World Health Organisation, 2008). Checklists are
commonly used in the ED and intensive care settings to guide set up for procedures, for example lumbar puncture (The Royal Children Hospital, 2009) and as criteria for catheterisation (Pronovost, Needham, et al., 2006). Structured checklists are used to apply standards and mandate and safeguard care practices (Voight, 2009). The aim is to achieve effective communication. As the name “checklist” implies, it is a guide that can be used to “check” performance, with varying effectiveness depending on the initiative that is carried out (Fahimi, et al., 2008). A study by the World Health Organisation (2009) that included sites across six continents (Africa, Asia, Europe, Middle East, North America and Oceania) assessed the use of a simple surgical checklist. The results demonstrated that the use of the checklist during surgical procedures lowered adverse events following surgery, with complications falling from 11% at the baseline assessment to 7% after introduction of the checklist. Subsequently, surgery related deaths also fell from 1.5% to 0.8% when the checklists were initiated. According to Haynes et al., (2009) using checklists during the administration of anaesthesia enables safe, appropriate prophylaxis against infection, effective teamwork among staff members, and other essential facets of peri operative care. This was reinforced in a nursing paper, which found that nursing staff using checklists were more likely to action care and ensure completed tasks in the operating theatre (Seifert, 2009). Checklists have been found to be practical and cost effective interventions in the clinical environment (Laurance, 2009; Voight, 2009). Such approaches could assist nurses to standardise care and reduce errors and adverse events.
The use of information technology to facilitate structured and standardised communications has also been found to successfully streamline services. For example, an electronic clinical records administration system, launched by the NSW Government, enabled clinicians to access patient information including diagnosis, X-ray and bloods results to enhance outcomes of care (Sydney South West Area Health Service, 2008a). This system, called Cerner Clinical Information System (CCIS) Power Chart Millennium, is an information technology system aimed at improving health care efficiency and communication. The benefit of CCIS is that it enables quick delivery of clinical results and progress to ensure a timely manner of treatment (Barber, 2004). Based on the findings of these studies, one can extrapolate the benefits of formal communication processes to the transfer of patients. A tool that encourages transmission of information and two-way dialogue between the transferring and receiving site will reduce the incidents of errors and adverse events, and is a cost effective means to encourage best practice within the health care setting.

3.3 CLINICAL GOVERNANCE

In New South Wales, “safety” has been identified as one of the six dimensions of quality in healthcare. Within the framework for managing the quality of health services, a major objective of any health care system should be the safe progress of patients through all parts of the system (Westbrook, Travaglia, & Braithwaite, 2006). Clinical governance units have been established in each area health service in that state. Clinical governance was designed as an integrated
approach to promote, review, measure and monitor the quality of patient care in a unified and coherent whole to ensure patient safety (Petticrew, Whitehead, Macintyre, Graham, & Egan, 2004).

The literature reports that clinical governance at all levels in clinical practice works effectively by consolidating (Larkin, et al., 2007), codifying (Milne, Krishnasamy, Johnston, & Aranda, 2007), and standardising organisational policies (Wells, Free, & Adams, 2007). The framework of the clinical governance system is the Incident Information Management System, the Root Cause Analysis and development of policies (Jorm, et al., 2006). These processes provide the tools that enable clinicians and administrators to oversee and monitor safety and work quality by ensuring that all incidents are reviewed in a timely fashion, and recommendations by expert panels for quality improvement are implemented (Department of Health, 2009).

According to Plath (2006), clinical governance is the vehicle that drives accountability, responsibility and assurance of patient safety. The aim of clinical governance is for clinicians such as nurses and doctors to audit, improve and enhance their practices (Sydney South West Area Health Service, 2008a). The objectives of clinical governance are to ensure commitment to the provision of high quality health services and to assist in identifying and responding to errors and adverse events. For instance, evidenced-based practice has been used in clinical settings as one of the approaches to improve the quality of clinical care (Stichler, 2007). However, some nurses who use or advocate evidence-based
practice are often shunned and regarded as creating a change that would increase workload and costs. The literature reports that many clinicians are adopting an evidence based approach, it is concerning as in fact, some health care professionals such as nurses and doctors often lack the resources, training and knowledge to implement these strategies in their workplace (Bauer, Fitzgerald, Haesler, & Manfrin, 2009; Rose, 2008; Schedlbauer, et al., 2009).

For clinical governance to be effective, it must involve a clinical audit of performance to measure aspects of health care, focusing on internal comparison, monitoring performance, and external comparison with peer hospitals (Woods, Thomas, Holl, Weiss, & Brennan, 2007). It involves clinical risk management that prevents or reduces adverse events in patients. For example, learning from complaints, completing critical adverse event audits, and identifying and dealing with inadequate professional performance, could all improve patient outcomes by reducing errors (NSW Health, 1996). In addition to improving patient safety, professional development of nurses and doctors has been associated with quality practice and ongoing knowledge and effective standards of practice for staff (Terrell & Miller, 2006). In Australia, for example, it was identified that potassium chloride was being administered ineffectively, leading to deaths. This led the clinical governance unit to advocate for clearer labelling and to make the product less easily available in clinical practice (Crimlisk, et al., 2009).

The state and territorial governments in Australia are tackling patient safety. All states have patient safety strategies and quality councils mandated to further
patient safety initiatives (National Health Priority Action Council, 2006). In New South Wales, each Area Health Service (AHS) has an area quality council. The purpose of these councils is to improve practices and report to patients, clinicians and managers on the quality of services, as well as report to the AHS Board, the Department of Health and Minister for Health (Sydney South West Area Health Service, 2008a).

The RCA review process is used in all hospitals in Australia to analyse incidents to identify the underlying causes and factors that contributed to incidents, and to recommend actions to prevent similar occurrences in the future (McDonald & Leyhane, 2005). The main principles of an RCA investigation are systems and processes, problem solving and a scale of effectiveness to develop recommendations (Sydney South West Area Health Service, 2008a). This process was implemented to investigate and report the causes of serious adverse events, to recommend effective processes to prevent further recurrence and assist in their implementation (Mansah, Griffiths, Fernandez, & Chang, 2007). The IIMS used in New South Wales hospitals has enabled timely access to information technology and provides a framework for reporting and recording of incidents (McDonald & Leyhane, 2005).

The number of errors and adverse events occurring in Australian hospitals is unknown due to underreporting. Nevertheless, the IIMS process does promote efficient ways for errors and adverse events to be recorded and to identify effective processes to improve care (Weingart, et al., 2009). Clinical governance
has led Australians towards patient safety and improvements to practice. However, there is still a need for organisational change that links systems and processes in health facilities, ensures reporting of errors and encourages continuity of care across the health care system.

3.4 CONCLUSION

The Australian population is ageing, and errors and adverse events are prominent among hospitalised elderly patients, particularly when being transferred between care settings. Reducing errors and adverse events by addressing potential and actual threats to patient safety is a priority for health services (Rozich & Resar, 2001). The risks of errors can be reduced by attending to factors operating at the organisation and individual levels. These include improved communications between care providers, adherence to policies and procedures, ongoing systems to review reported errors and education that targets the cause of error (Silen-Lipponen, Tossavainen, Turunen, & Smith, 2005). Communications using a structured process such as checklists have been demonstrated to assist and enhance care planning, follow-up and transfer between ward settings. A clinical culture that promotes patient safety has been used to improve quality care outcomes for patients. The clinical governance units established in hospitals in Australia goal is to achieve best practice in all care settings.
Overall, the information gathered from this literature review will be used as a starting point and reference guide for the proposed study. The reported studies have addressed a contemporary research problem: reducing the errors and adverse events that occur during the transfer of elderly patients between care settings. This thesis will contribute to existing knowledge and thereby go some way toward filling the gap in research. The next chapter reports on the method and conceptual framework of the thesis.
CHAPTER 4

Research Method and Conceptual Framework
4.1 INTRODUCTION

As reported in Chapter 1, the aims of this thesis are to identify the occurrence of errors and adverse events in a hospital setting retrospectively, to describe strategies to minimise errors and adverse events during care transitions of elderly patients, and to conduct a pilot study to assess the feasibility of a strategy to enhance communications between clinical sites transferring and receiving elderly patients. The study was completed in three phases, each designed as a discrete study with method, findings and discussion. This chapter describes the overall research design and presents the conceptual framework of the project.

4.2 OVERALL RESEARCH DESIGN

*Multi-method* research is one of the fastest growing areas in research methodology. Multi-method is the conduct of two or more research methods, each rigorous and complete in itself and in one project, after which the results are considered simultaneously to provide a more complete picture (Almarsdóttir & Traulsen, 2009; Creswell, 2009).

Multi-method design allows multiple directions to solving one problem (Polit & Beck, 2010). In this thesis, three different methods and processes were applied to answer the research questions. The aims and objectives identified in this thesis required multiple techniques to allow understanding, explanation and description of the complex problem from various perspectives. Different
research methods were required to answer and address those problems and questions rather than applying the one-size-fits-all approach (Morse, 2003).

Multi-method research has been used to investigate exercise programs for patients with coronary artery diseases (Fernandez, Davidson, Griffiths, Juergens, & Salamonson, 2007), new medical treatments (Edmondson, Bohmer, & Pisano, 2001) and organisational changes in the workplace (Corner, et al., 2003).

As stated in Chapter 1, the overall aim of the research described in this thesis was to develop and pilot test an intervention to promote the safe transfer of elderly patients across care settings: the STEP Study.

Three research approaches were used:

- Auditing the hospital incidence reporting system (Chapter 2);
- A systematic review of evidence from the literature (Chapter 5);
- Developing and pilot testing an interactive Patient Transition Checklist (iPTC, Chapters 6 and 7).

Each of the three studies was conducted with conceptual congruence and is complete in itself (Creswell, 2009).

An audit of incidents reported in one metropolitan teaching hospital identified the types of errors and adverse events occurring in elderly inpatients, and the contributing factors. The literature investigating errors and adverse events in the elderly, and strategies to promote safe transfer between care settings, was
examined using a systematic review. The findings from the systematic review and the audit of incidents were then used to develop the intervention. An additional review of the literature, an audit of existing clinical forms in the hospital, and consultations with expert clinicians were completed to develop the intervention. The iPTC was tested for content validity. A pilot study to investigate the feasibility of the iPTC intervention was undertaken using a convenience sample, an audit checklist as a tool, and surveys of nurses. Whilst a randomised, controlled trial would have been the preferred method to test the effectiveness of the intervention, this was not feasible owing to a large, integrated project occurring at the study site. Table 2 presents the research designs for each of the studies that constituted this multi-method research. A detailed description of the rationale for each of the studies, the research design and the methods used is presented in Chapters 4, 5, 6 and 7.
### Table 2: Research designs for each of the studies

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### 4.3 CONCEPTUAL FRAMEWORK

A conceptual framework is a structure of concepts, theories (or both) that are linked to provide a plan for the study (Burns & Grove, 2009; Eccles, Grimshaw, & Walker, 2005), which underpins interventions to promote effective professional practice. The conceptual framework for this study is based on human error theory (Reason, 2000) and the concept of planned communication (Windahl, Signitzer, & Olson, 1992). These theories and concepts are based on causal relationships and identifying the timing of events.
4.3.1 Human error theory

Human error theory (Reason, 2000) has been used by high risk industries, such as North Sea oil companies and aviation, to identify causes of errors and to develop strategies to reduce their frequency and consequences. Human error theory can be applied similarly in health care settings, given the high incidence of human errors and adverse events, as reported in *To Err is Human* (Kohn, et al., 2000). Reason’s (2000) theory was used because it focuses on the process that generates the error rather than the individual who commits the error. Health care is a complex environment where human decisions and actions play a fundamental role in nearly all components, hence the relevance of this theory (Reason, 2000). Human error theory (Reason, 2000) argues that human behaviour can be divided into six types of failure that can lead to errors in clinical actions or systems: *latent, active, slips, lapses, mistakes, and violation*.

In this study, latent and active failures were used to develop the conceptual framework. This is because incidents reported at the study site lacked policies to guide the transfer of elderly patients, which is a possible latent failure, and the audit (Chapter 2) showed incidents of errors and adverse events resulting from active failures. There is a mild implication that human theory might serve the organisation as a policy, not just as a means of analysing errors for the study.
- **Latent failures** are often decisions made by the senior management or the head of department through clinical policies that may lead to error in clinical practice. These decisions can have damaging consequences which often cannot be detected for a long time in the system and become evident only when combined with the task or environmental conditions or demonstrated through research (Reason, 2000).

- **Active failures** are unsafe acts or omissions committed by the health care professionals, whose actions can lead to adverse consequences (Reason, 2000). Unsafe acts are often influenced by high workloads, staff shortages, poor supervision, inadequate training and stress (Reason, 2000).

**Non intentional errors**

- Slips, lapses and mistakes are classified as non-intentional errors (Reason, 2000). Slips and lapses, mistakes, and violations are unsafe acts that lead to human errors. Slips and lapses occur when the planned intended actions are appropriate but fail or deviate from the plan.

- **Slips** are errors that can be seen, for example, when the nurse’s plan is to fetch Ceftriaxone from the shelf but Ceftriaxime is picked up instead (Watson, et al., 2006).

- **Lapses** are internal errors that are due to memory failure, for example, the plan is to give a medication script to a patient when discharged but the staff member forgets to do so (Reason, 2000).
Mistakes result from a planned behaviour which is inadequate to achieve the set goal. For example, a pharmacy assistant may recommend an antifungal for the treatment of vaginal itch when the symptoms are due to a sexually acquired infection, not vaginal candidiasis (Watson, et al., 2006).

**Intentional errors**

Violation is an intentional error which occurs when an individual knows the guidelines and procedures that they should follow in a given situation but chooses not to follow this protocol. For instance, a violation could be the nurse explaining medical diagnoses to a patient or giving blood test results to the family of a patient (Reason, 2000).

Overall, human error theory identifies that patterns exist in adverse events and often one of these patterns is evident when an incident is analysed. Reason (2000) notes that in a perfect world, the health system would be insulated from the potential for internal or external environmental factors to lead to adverse events. He uses the analogy of Swiss cheese to explain that the world we live in is not so perfect because we are humans and therefore prone to making errors — the holes in the Swiss cheese. He refers to the Swiss Cheese Model to represent the potential for errors or failures such as communication deficits, poor planning and inappropriate management that can often lead to adverse events across the health system. As Reason (2000) stated, the presence of holes
in one ‘slice’ does not immediately cause a tragic outcome. Rather, over time, poor practices establish and are perpetuated until appearing as a hole in the system when an error or adverse event is identified. Closing holes in the health care system requires strategies, processes and mechanisms be put in place and adhered to by individuals to reduce the incidence of errors and adverse events (Reason, 2000).

Reason used a study (2002) to illustrate how easily human error can occur in our everyday lives. In a survey of photocopying practices, almost all respondents to the survey reported that they failed to remove the last page of the original when they photocopied it. The closed lid of the photocopy concealed the last sheet of the original, so no visible reminder of the need to remove is available. The same study investigated memory aids and found almost all those surveyed indicated that a checklist is an effective reminder (Reason, 2002). This study translates into the clinical field. Anticipating problems and having a system in place, such as a mandatory checklist, could reduce reliance on memory and promote communication actions by stopping or preventing omissions. Reason’s (2002) study is based on human error theory (Reason, 2000) and shows that it is often the people engaged in the task who have the experience to implement an intervention to prevent errors.
4.3.2 The concept of Planned Communication

Planned communication (Windahl, et al., 1992) guided the development of this study. This concept is widely used in mass media and other organisations to achieve effective and standardised communication. Although planned communication is rarely used in clinical practice (McQuail, 2005). Reader et al (2007) found that good communication was crucial for ensuring patient safety and reducing susceptibility to errors in critical care patients. A similar study (Pronovost, Thompson, & Holzmueller, 2006) demonstrated a link between poor communication and critical incidents. Both studies reinforced the need for communication to be structured, documented and followed up (Pronovost, Thompson, et al., 2006; Reader, et al., 2007).

Planned communication (Windahl, et al., 1992) is built around planning practical and normative communication. The concept is based on everyday work patterns, both informal and formal, and developed from the practitioners’ perspectives. Planned communication instructs the practitioner on how to plan communication to achieve a communication goal. It predicts that messages are more likely to be perceived as effective and well received if the practitioners themselves can judge the messages as realistic and can determine the outcomes of the message (Windahl, et al., 1992). Planned communication instructs on a ritual structured approach to communication, which sees communication as the maintenance of society in time, a representation of shared beliefs and not the extension of messages or the act of imparting information (Carey, 2009).
Planned communication is done or achieved by documenting communication actions using a structured process (Windahl, et al., 1992).

Planned communication can be applied in the clinical setting to reduce uncertainty, embrace the practitioners’ views and encourage effective documentation. It also ensures that communication is structured and transmitted without any flaw to the receiver and also ensures that the receiver, who is an active agent in the process, doesn’t misinterpret a message (Windahl, et al., 1992). Because planned communication presupposes that the clinical environment involves complex care, and recognises that human errors occur (Woods, et al., 2007), planned communication incorporates constant observations, problem solving, documentation and overall active sharing of information with one another (Windahl, et al., 1992). Communication should occur between all health care professionals, not just nurse to nurse or physician to physician but rather across multidisciplinary team groups with structured interactions with one another, leading to prevention and reduction in errors and adverse events.

When applying the human error theory (Reason, 2000) and the concept of planned communication (Windahl, et al., 1992), it is important to identify the factors that lead to breakdown in communication and to review current mechanisms. The systematic review of the effectiveness of strategies used to
prevent or reduce errors and adverse events during elderly patients’ transfer (Chapter 5), can enable us to more competently explore unintended effects and other exhausted efforts used to maximise quality outcomes (Dayton & Henriksen, 2007). The human error theory developed by Reason (2000) and the concept of planned communication developed by Windahl et al (1992), ascertained the importance of discriminating between outcomes resulting from the message coming from a communication effort and outcomes resulting from other aspects of the activity or the situation. In others words, how did the problem(s) arise? It was important in this study to audit the Incident Information Management System database to sum up the factors contributing to errors and adverse events. The results of the audit (Chapter 2) provided much insight into the nature of errors and adverse events, whereby falls, medications errors and clinical managements were considerable hindrances to achieving quality care for elderly patients. The recommendations provided by the expert team emphasised structured communication as a fundamental approach in reducing errors and adverse events, likewise reported in the national and international literatures.

Communication between clinicians becomes planned when a standard process of communicating is used in the working environment (Windahl, et al., 1992). The interactive Patient Transition Checklist (iPTC) was developed and piloted as one component of this research, and it was developed based on the perspective of the transferrer and receiver, in this instance the nurse forming the key
component of the form. Hence, in the development of the iPTC form, expert clinicians, including nurses, were invited to offer their insights and views. The conceptual framework of this research, based on Reason’s work (2000) and guided by the Windahl et al (1992) concept of planned communication, is demonstrated diagrammatically in Figure 5.

4.3.3 Conceptual diagram: Human error theory and planned communication

The conceptual framework incorporates Reason’s work (2000) of the Swiss Cheese Model and Windahl’s et al (1992) planned communication. Defensive mechanisms are a means of strategic measure used to prevent errors and adverse events (Reason, 2005). Windahl et al (1992) emphasised the need for communication to be structured, documented and followed-up. The theory (Reason, 2000) and concept (Windahl, et al., 1992) both demonstrated that using checklists for the transfer of elderly patients can serve as an effective mandate and reminder of actions that are required to prevent or minimise the occurrence of incidents or adverse events. As a result, the conceptual diagram Figure 5 was created, utilising the Swiss Cheese Model (Reason, 2000). Firstly, the holes in the diagram symbolise errors during transition, including poor communication and lack of follow-up, normally committed through lapses and active failure. Poor communication is mitigated by the standardised iPTC communication which augments to smooth transition. Finally, implementation of planned communication will reduce errors and adverse events during transfer, facilitated by enhanced communication.
4.4 CONCLUSION

This chapter has described the research design used for the thesis. A detailed description of the conceptual framework based on the human error theory (Reason, 2000) and the concept of planned communication (Windahl, et al., 1992) has also been presented. In the following chapter, the systematic review of the effectiveness of strategies used in transferring elderly patients across care settings will be presented.
CHAPTER 5

Effectiveness of strategies to promote safe transfer of elderly people across care settings
5.1 INTRODUCTION

In this chapter, the method and findings of a systematic review will be presented. The systematic review (SR) was developed based on the framework and standards of the Cochrane Collaboration and the Joanna Briggs Institute (JBI). The handbook of the Cochrane Collaboration was employed to inform the methods used in this review.

5.1.1 Research Question

This SR was undertaken to answer the following question: What is the effectiveness of various strategies to reduce the incidence of errors and adverse events among the elderly during care transition across acute and community health care settings? In this SR, the terms ‘transfer’ and ‘transition’ will be interchangeable.

5.2 SYSTEMATIC REVIEW AS A RESEARCH METHOD

Systematic reviews are undertaken to summarise the evidence and to explain differences among studies on the same issue. They assist clinicians to keep abreast of the large volumes of nursing, medical and allied health literature (Polit & Beck, 2010). A systematic review assists in informing clinical decision making, planning future agendas and establishing clinical policy. Systematic review applications strengthen the link between best practice and theory on clinical care to achieve optimal health care (Higgins, Thompson, Deeks, & Altman, 2003).
The aim of this SR is to identify strategies (interventions) that have been demonstrated to be effective in reducing the incidence of errors and adverse events and promote safe transition of elderly people across care settings.

5.2.1 Criteria for considering studies for review

Randomised controlled trials (RCTs) evaluating the effect of strategies to promote the safe transfer of elderly patients across care settings were eligible for inclusion in this review. Studies undertaken in any country were considered for inclusion; however, publications were limited to the English language.

The review included studies undertaken on participants aged >65 years who were transferred from:

- Ward to ward
- Hospital to hospital
- Hospital to residential aged care facilities
- Hospital to home

Studies that described errors and adverse events not associated with the transfer of elderly patients were excluded. Studies undertaken on elderly patients with psychiatric illness were excluded, as psychiatric illness is an independent factor contributing to errors and adverse events during care transition (Coleman, et al., 2004).
Any interventions that were undertaken to reduce or minimise errors and adverse events and to promote safe transition of the patients from one setting to another were included, for example, discharge planning, pharmacy counselling, comprehensive geriatric assessment and dedicated coordinators. In addition, trials that examined the effect of care in a dedicated transition facility prior to discharge were excluded.

The primary outcome of interest was the effect of the interventions on the use of health care resources. These included: readmission to hospital, the use of hospital services, physician visits and outpatient visits. Secondary outcomes of interest were medications related: quality of prescribing, adverse drug events, knowledge of medication and medication adherence. Other outcomes investigated included: falls, urinary tract infections, pain, confusion, functionality levels, quality of life, patient satisfaction, mortality and cost effectiveness.

5.3 SEARCH STRATEGY FOR IDENTIFICATION OF STUDIES

Prior to commencing the review, databases from the Cochrane Collaboration, the JBI, the National Health Service (NHS), the Centre for Review & Dissemination (CRD) and the Agency for Healthcare Research and Quality (AHRQ), were searched to ensure that a review of the same topic had not been undertaken. The search identified both published and unpublished trials. In consultation with a librarian, the Ovid databases were searched to identify key words used in the
titles and abstracts of research articles. As each database has its own indexing terms, individual search strategies were initiated for each database. During the process of the search strategy, consideration was given to the diverse terminology used and the spelling of keywords, which may influence the identification of relevant trials (Appendix 4).

The following databases were searched: CINAHL (1982–2009); MEDLINE (1966–2009); EMBASE (1980–2009); PsycINFO (Up to 2009); PreMEDLINE and OLDMEDLINE; Cochrane Library (up to and including 2009, Issue 1); Evidence Based Medicine (EBM) Reviews and Database of Abstracts of Reviews of Effects (DARE) (up to 2009). Reference lists and bibliographies of all possible trials and reviews of studies were searched. Conference proceedings were searched; experts in the field were also contacted to identify further trials. Keywords used in research articles guided the search terms used.

5.3.1 Method of the review

The references and abstracts obtained from the search were independently assessed for inclusion eligibility by two reviewers using the Verification of Study tool adapted from a previous review (Fernandez, 2007) (Appendix 5) and the full text was obtained of relevant trials. Studies reported in more than one publication were included only once. Decisions for study eligibility were made and agreed by both reviewers. Any disagreements were resolved by discussion with a third person. All trials were imported into Endnote Bibliography Software.
Each study was critically appraised and its methodological quality assessed using the JBI Critical Appraisal Checklist (Appendix 6). This checklist assessed each trial for the following:

- Detailed inclusion and exclusion criteria used to obtain the study sample
- Evidence illustrating allocation concealment at randomisation
- Validity of methods of outcome assessment
- Details of withdrawals and dropouts
- Potential for bias demonstrated in outcome assessment

The minimum obtainable score was 11 and the maximum obtainable score was 33, with higher scores in the range suggesting higher quality methodology (Appendix 7). To prevent studies of low methodological quality influencing the findings, only studies of high methodological quality were included. Various methods have been used to determine a cut off point for inclusion of trials based on methodological quality, such as mean score, median score or calculating the mean score plus one standard deviation (Sutton, Abrams, Jones, Sheldon, & Song, 1998). For this systematic review, the mean score was used as a cut off point and trials that scored below this value were excluded from the review.

Data were collected independently by two reviewers using a data extraction tool (Appendix 8) that was piloted prior to its use. Any discrepancies between reviewers were resolved by discussion.
The following data were collected: patient inclusion/exclusion criteria, study settings, patients’ demographics, description of the interventions, description of the outcomes, follow-up period and number and reasons for withdrawals and dropouts. Attempts were made to obtain missing data from trial reports by contacting the authors.

5.4 STATISTICAL CONSIDERATIONS

Calculations were made using the Cochrane Statistical Package Review Manager (RevMan) Version 4.4. The studies were assessed for clinical heterogeneity by considering the populations, interventions and outcomes (Higgins, et al., 2003). Statistical heterogeneity (Higgins, et al., 2003) was assessed by using $I^2$ (percentage of total variation across studies). Fixed effects meta-analysis was used for combining study data in the trials that were judged to be sufficiently similar. Relative risks and 95% Confidence Intervals (CI) were calculated for dichotomous data. Analysis of continuous data was undertaken using the mean and standard deviation values to derive Weighted Mean Differences (WMD) and their 95% CI. Where synthesis of the data was inappropriate, a narrative analysis of results is presented (Schneider, Elliott, LoBiondo-Wood, & Haber, 2003).
5.5 DATA ANALYSIS

5.5.1 Description of studies

Approximately 10,000 publication trials were identified from the search strategy. Following removal of publication duplicates, 7,500 papers were potentially eligible. Based on the title and abstract of the citation, a further 7,463 studies were excluded. Full-texts of the remaining 37 trials were deemed eligible for further assessment, of which 19 were excluded (Appendix 9). Six of these 37 trials were below the quality threshold (mean 27). Twelve trials, involving a total of 5,400 participants, were included in the final review (Figure 6). The included trials tested the effectiveness of a multifaceted intervention compared with usual care. A summary description of the individual studies is included in Appendix 10.
Trials included in the review were conducted in the United States of America (Coleman, et al., 2006; Dellasega & Zerbe, 2000; Evans & Hendricks, 1993; Naylor, et al., 1999; Rawl, Easton, Kwiatkowski, Zemen, & Burczyk, 1998) Australia (Caplan, et al., 2004; Crotty, et al., 2004; Hawe & Higgins, 1990; Wen,

5.5.3 Participants

The mean age of the participants in individual trials ranged from 67 years (Evans & Hendricks, 1993) to 84 years (Crotty, et al., 2004; Nazareth, et al., 2001). Twelve trials reported on the gender of the participants, with females ranging from 44% to 90%. In two trials, there were more females than males in both groups (Hawe & Higgins, 1990; Rawl, et al., 1998).

5.5.4 Reasons for hospitalisation


5.5.5 Interventions

All trials involved a dedicated health care coordinator as part of the intervention. These coordinators were registered nurses specialising in aged care (Coleman, et al., 2006; Dellasega & Zerbe, 2000; Naylor, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988; Wen, et al., 2003), social workers (Wen, et al., 2003),

For the purpose of this review, the interventions have been categorised as nurse-led interventions which involve patient assessments (Rawl, et al., 1998), medication follow-ups (Coleman, et al., 2006), home visits (Coleman, et al., 2006; Dellasega & Zerbe, 2000; Naylor, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988), telephone follow-ups (Coleman, et al., 2006; Dellasega & Zerbe, 2000; Naylor, et al., 1999; Rawl, et al., 1998; Wen, et al., 2003), liaison and communication with families (Coleman, et al., 2006; Rawl, et al., 1998) and community services (Rawl, et al., 1998; Wen, et al., 2003). Pharmacist-led interventions mainly focused on medication-related outcomes (Crotty, et al., 2004; Hawe & Higgins, 1990; Nazareth, et al., 2001) and involved families to reduce errors and adverse events in the transition process (Crotty, et al., 2004; Nazareth, et al., 2001), general practitioners (Crotty, et al., 2004; Nazareth, et al., 2001) and community services (Crotty, et al., 2004; Nazareth, et al., 2001). Multidisciplinary team led interventions involved comprehensive geriatric assessment (Caplan, et al., 2004; Nikolaus, et al., 1999), risk screening (Evans & Hendricks, 1993) whilst in hospital, support services by home visits (Caplan, et al., 2004; Evans & Hendricks, 1993; Nikolaus, et al., 1999), or follow-up with patients residing in long-term residential facilities (Caplan, et al., 2004; Evans & Hendricks, 1993), telephone follow-ups (Nikolaus, et al., 1999) and liaisons with general practitioners (Evans & Hendricks, 1993).
5.5.6 Usual care

Patients allocated to usual care groups did not receive any of the care included in the intervention (Caplan, et al., 2004; Coleman, et al., 2006; Crotty, et al., 2004; Dellasega & Zerbe, 2000; Evans & Hendricks, 1993; Hawe & Higgins, 1990; Naylor, et al., 1999; Nazareth, et al., 2001; Nikolaus, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988; Wen, et al., 2003): they were discharged home upon doctor’s assessments and did receive social worker intervention when deemed essential to their care.

5.6 METHODOLOGICAL QUALITY OF THE INCLUDED STUDIES

The methodological quality of the included studies was assessed according to the criteria described in the method section of the review. There was a 95% concordance between the two reviewers and discrepancies were resolved following discussion with the third reviewer. Overall, the methodological quality (Appendix 7) was high and ranged from 27 (Caplan, et al., 2004; Nikolaus, et al., 1999) to 32 (Crotty, et al., 2004; Nazareth, et al., 2001) (maximum obtainable 33).

5.6.1 Randomisation

The method of randomisation in most of the trials was by using computer generated random numbers (Caplan, et al., 2004; Coleman, et al., 2006; Crotty, et al., 2004; Naylor, et al., 1999; Nazareth, et al., 2001; Nikolaus, et al., 1999;
Townsend, et al., 1988; Wen, et al., 2003). One trial allocated by the month (Hawe & Higgins, 1990) and, in three trials, the method of allocation was not stated (Dellasega & Zerbe, 2000; Evans & Hendricks, 1993; Rawl, et al., 1998).

5.6.2 Baseline comparability

5.6.3 Recruitment and follow-up

In all trials, participants were recruited and interventions provided during their hospital admission. Follow-up data for these participants was undertaken in the outpatient rehabilitation centre (Rawl, et al., 1998), long-term aged care facilities (Coleman, et al., 2006; Crotty, et al., 2004; Dellasega & Zerbe, 2000; Evans & Hendricks, 1993; Nikolaus, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988), and participants’ homes (Caplan, et al., 2004; Coleman, et al., 2006; Dellasega & Zerbe, 2000; Evans & Hendricks, 1993; Hawe & Higgins, 1990; Naylor, et al., 1999; Nazareth, et al., 2001; Nikolaus, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988; Wen, et al., 2003).

5.6.4 Outcomes

Outcomes assessed included the use of health care resources, which were measured as readmission to hospital (Coleman, et al., 2006; Evans & Hendricks, 1993; Naylor, et al., 1999; Nazareth, et al., 2001; Nikolaus, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988; Wen, et al., 2003), hospital services usage (Caplan, et al., 2004; Crotty, et al., 2004), number of physician visits (Caplan, et al., 2004; Dellasega & Zerbe, 2000; Nazareth, et al., 2001; Nikolaus, et al., 1999) and outpatient visits (Caplan, et al., 2004; Nazareth, et al., 2001). Medication related outcomes investigated were the incidence of adverse drug events (Crotty, et al., 2004), and adherence to and knowledge of medication (Hawe & Higgins, 1990; Nazareth, et al., 2001). The incidence of falls (Crotty, et al., 2004; Rawl, et al., 1998) and urinary tract infections (Rawl, et al., 1998) were also assessed. Other adverse patient outcomes assessed were pain management
(Crotty, et al., 2004), deterioration of behaviours (Crotty, et al., 2004), mobility status (Crotty, et al., 2004) and confusion (Crotty, et al., 2004). The effect of the intervention on quality of life was investigated in four trials (Dellasega & Zerbe, 2000; Nazareth, et al., 2001; Rawl, et al., 1998; Wen, et al., 2003) and patient satisfaction was reported in two trials (Nazareth, et al., 2001; Townsend, et al., 1988).

Mortality was investigated in three trials (Evans & Hendricks, 1993; Nazareth, et al., 2001; Townsend, et al., 1988) and five trials reported on cost effectiveness of the interventions (Caplan, et al., 2004; Coleman, et al., 2006; Naylor, et al., 1999; Nikolaus, et al., 1999; Wen, et al., 2003).

5.7 RESULTS

The results presented below are grouped under the main categories of: health resources usage, use of hospital services, physician visits, outpatient visits, medication related outcomes, falls and urinary tract infection. Other adverse outcomes included quality of life, patient satisfaction, mortality and cost effectiveness.

5.7.1 Health resources usage

For the purpose of this review, the use of health care resources is considered to be readmission, hospital services usage, physician visits and outpatient visits. Health care resources usage was investigated in eleven trials (Caplan, et al.,
Readmission to hospital was investigated at one month (Coleman, et al., 2006; Naylor, et al., 1999), three months (Coleman, et al., 2006; Naylor, et al., 1999; Nazareth, et al., 2001; Townsend, et al., 1988), four months (Rawl, et al., 1998), six months (Coleman, et al., 2006; Nazareth, et al., 2001; Wen, et al., 2003), nine months (Evans & Hendricks, 1993), and 12 months (Nikolaus, et al., 1999) following completion of the intervention.

Nurse-led intervention versus usual care

Five trials (Coleman, et al., 2006; Naylor, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988; Wen, et al., 2003) investigated the effect of a nurse-led intervention compared to usual care on readmission to hospital at one, three, four and six months. Pooled data demonstrated a 50% reduction (Coleman, et al., 2006; Naylor, et al., 1999) in readmission to hospital at one month (RR 0.53; 95% CI 0.38, 0.74) and a 20% reduction (RR 0.80; 95% CI 0.68, 0.95) (Coleman, et al., 2006; Naylor, et al., 1999; Townsend, et al., 1988) at three months among patients randomised to the nurse led intervention group. However, there was no statistically significant difference in the readmission rates at four months (Rawl, et al., 1998) (RR 1.64; 95% CI 0.69, 3.88) and six months (Coleman, et al., 2006; Wen, et al., 2003) (RR 0.83; 95% CI 0.66, 1.05) (Figure 7).
Figure 6: Readmission to hospital-Nurse-led intervention

Pharmacist-led intervention versus usual care

Only one trial (Nazareth, et al., 2001) (n=340) assessed pharmacist-led intervention on readmission at three and six months. The findings demonstrated no statistically significant difference in the readmission rate between the two groups at any time period (Figure 8).

Figure 7: Readmission to hospital-Pharmacist led intervention
Multidisciplinary team led intervention versus usual care

The effect of a multidisciplinary team led intervention on readmission to hospital was assessed at one (Evans & Hendricks, 1993), nine (Evans & Hendricks, 1993) and 12 months (Nikolaus, et al., 1999). The findings (n=835 participants) demonstrated a 30% reduction at one month, and a 25% reduction at nine months, in the number of readmission to hospital in patients randomised to the multidisciplinary team led intervention group (Evans & Hendricks, 1993) (Figure 9). The trial (Nikolaus, et al., 1999) that reported at 12 months was a three-arm study involving 420 participants, randomised to a comprehensive geriatric assessment and post discharge home intervention, comprehensive geriatric assessment alone or usual care. The results demonstrated no statistically significant difference in the readmission rates between the groups (p=0.44). As the standard deviation of scores was not reported, the data has not been presented in a meta graph.

Figure 8: Readmission to hospital-Multidisciplinary team-led intervention
5.7.3 Use of hospital services

The trials that investigated pharmacist-led and multidisciplinary team led interventions also assessed the use of hospital services.

Pharmacist-led intervention versus usual care

In the only study (Crotty, et al., 2004) (n=88) that undertook this comparison, a significant reduction in hospital usage (p=0.04) at the two-month follow-up was reported in participants randomised to the pharmacist-led intervention, compared to the usual group (RR 0.38; 95% CI 0.15, 0.99) (Figure 10).

Multidisciplinary team led intervention versus usual care

The one study (Caplan, et al., 2004) (n=739) that made this comparison reported a statistically significant reduction in the number of hospital services used by participants who received the multidisciplinary team led intervention (RR 0.77; 95% CI 0.62, 0.96), (Figure 11).
Figure 10: Hospital services usage- Multidisciplinary team-led intervention

5.7.4 Physician visits

Four trials investigated the effects of interventions on the number of visits made to the physician over one month (Caplan, et al., 2004; Dellasega & Zerbe, 2000), three months (Nazareth, et al., 2001), six months (Nazareth, et al., 2001) and 12 months (Nikolaus, et al., 1999) following the intervention.

Nurse-led intervention versus usual care

One four arm trial (Dellasega & Zerbe, 2000) (n=140) that undertook this comparison found that there was no statistically significant difference reported in the number of visits to the physician between the four groups (p=0.520). Insufficient data was provided for a meta graph.

Pharmacist-led intervention versus usual care

In the only trial (Nazareth, et al., 2001) that undertook this comparison at three and six months, there was no statistically significant difference between the groups at any time period follow-up (Figure 12).
Figure 11: Physician visits-Pharmacist-led intervention

Multidisciplinary team led intervention versus usual care

One trial (Caplan, et al., 2004) that investigated the number of visits to the physician at a one month follow-up reported no statistically significant difference in this outcome (RR 1.06; 95% CI 0.97, 1.16) (Figure 13). At a 12 months (Nikolaus, et al., 1999) follow-up, there was no statistical difference between the groups (due to insufficient data, a meta graph has not been presented).
5.7.5 Outpatient visits

The number of outpatient visits were investigated at intervals of one month (Caplan, et al., 2004), three months (Nazareth, et al., 2001) and six months (Nazareth, et al., 2001). None of the trials of nurse-led intervention examined this outcome.

Pharmacist-led intervention versus usual care

One trial (Nazareth, et al., 2001) that investigated the effect of the intervention on outpatient visits at three and six months reported no statistically significant difference in this outcome between the groups at either time period (Figure 14).

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>Pharmacists-led</th>
<th>Usual care</th>
<th>RR (Fixed)</th>
<th>Weight</th>
<th>RR (Fixed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>At three months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nazareth, et al.</td>
<td>78/164</td>
<td>64/176</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>142</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for heterogeneity</td>
<td>Not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect</td>
<td>$Z = 0.27 (P = 0.78)$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At six months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nazareth, et al.</td>
<td>79/172</td>
<td>40/163</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>119</td>
<td>137</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for heterogeneity</td>
<td>Not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect</td>
<td>$Z = 0.30 (P = 0.77)$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 13: Outpatient visits—Pharmacist-led intervention

Multidisciplinary team led intervention versus usual care

Only one trial (Caplan, et al., 2004) that undertook this comparison reported on the number of outpatient visits at one month. The findings demonstrated no statistically significant difference in this outcome between the groups (RR 1.11; 95% CI 0.87, 1.42) (Figure 15).
5.7.6 Medication related outcomes

Medication related outcomes were assessed only in the pharmacist-led intervention. The outcomes investigated included quality of prescribing (Crotty, et al., 2004), patient knowledge of medication (Hawe & Higgins, 1990; Nazareth, et al., 2001), adverse drug events (Crotty, et al., 2004), and medication adherence (Hawe & Higgins, 1990).

Quality of prescribing

Inappropriate prescribing of medications has been associated with adverse drug events during care transition, mainly due to polypharmacy (Cucinotta, et al., 2004; Kopp, Brian, Michelle, Andreas, & Gail, 2006). Quality of prescribing was assessed in one trial (Crotty, et al., 2004) at a two months follow-up using the medication appropriateness index. This trial reported a significant reduction in the inappropriate use of medications prescribed among participants in the pharmacist-led intervention compared with the usual care group (p =0.007).
Knowledge of medication

Educating elderly patients about their medications prior to discharge or transfer from hospital has been demonstrated to improve their knowledge and adherence (Stichler, 2007) and thereby reduce the risk of adverse events (Ekman, Schaufelberger, Kjellgren, Swedberg, & Granger, 2007). Patient knowledge of medications was reported at one month (Hawe & Higgins, 1990), three months (Hawe & Higgins, 1990; Nazareth, et al., 2001) and six months (Nazareth, et al., 2001) following the intervention. The findings demonstrated no statistically significant difference in the knowledge of medication at one (Hawe & Higgins, 1990), three (Hawe & Higgins, 1990; Nazareth, et al., 2001) and six months (Nazareth, et al., 2001) between the pharmacists-led intervention group and the usual care group (Figure 16). As one study (Hawe & Higgins, 1990) did not provide standard deviation, the results could not be presented in a meta graph.

![Figure 15: Knowledge of medication-Pharmacist-led intervention](image)

Medication adherence

Medication adherence was reported at one month (Hawe & Higgins, 1990), three months (Hawe & Higgins, 1990; Nazareth, et al., 2001) and six months (Nazareth, et al., 2001). The findings indicated no statistically significant difference in the
overall mean adherence scores between the two groups at any of the time periods (Figure 17). Due to inadequate reporting of data by Hawe & Higgins (1990), results could not be presented in a meta graph.

<table>
<thead>
<tr>
<th>Comparison Outcome</th>
<th>Adherence to medication</th>
<th>Mean (SD)</th>
<th>N</th>
<th>Mean (SD)</th>
<th>N</th>
<th>NMD (95% CI)</th>
<th>Weight (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study or subcategory</td>
<td>Pharmacist-led intervention</td>
<td>Usual care</td>
<td>Pharmacist-led intervention</td>
<td>Usual care</td>
<td>NMD (95% CI)</td>
<td>Weight (%)</td>
<td>95% CI</td>
<td></td>
</tr>
<tr>
<td>01 At three months</td>
<td>Niazadeh et al.</td>
<td>71</td>
<td>0.75 (0.30)</td>
<td>72</td>
<td>0.78 (0.28)</td>
<td>100.00</td>
<td>0.00</td>
<td>1-0.09, 0.093</td>
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<tr>
<td></td>
<td>Subtotal</td>
<td>71</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for heterogeneity: not applicable</td>
<td>Test for overall effect Z = 0.00 (P = 1.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02 At six months</td>
<td>Niazadeh et al.</td>
<td>63</td>
<td>0.78 (0.30)</td>
<td>58</td>
<td>0.78 (0.30)</td>
<td>100.00</td>
<td>0.00</td>
<td>1-0.11, 0.11</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>63</td>
<td>58</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Test for overall effect Z = 0.00 (P = 1.00)</td>
<td></td>
<td></td>
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</tbody>
</table>

**Figure 16: Adherence to medication-Pharmacist-led intervention**

A sub-group analysis investigating underdosage and overdosage also demonstrated no significant difference in this outcome between the two groups at one and three months (Hawe & Higgins, 1990) (Figure 18). However, sub-group analysis did demonstrate severe non-adherence among patients taking four or more medications who were allocated to the usual care group compared with the intervention group (p =0.03) at three months (Figure 19).
Chapter 5

Figure 17: Adherence to medication at one month-Pharmacist-led intervention

<table>
<thead>
<tr>
<th>Study</th>
<th>Pharmacist-led</th>
<th>Usual care</th>
<th>RR (fixed) 95% CI</th>
<th>Weight</th>
<th>RR (fixed) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=N</td>
<td>n=N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01 Number of patients taking less than the recommended dose of any drug</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heaven et al.</td>
<td>62/114</td>
<td>40/110</td>
<td>1.00 (0.99, 1.00)</td>
<td>1.00 (0.99, 1.00)</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>114</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total events: 42 (Pharmacist-led), 40 (Usual care)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for heterogeneity: not applicable</td>
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<tr>
<td>Test for overall effect: Z = 0.19 (P = 0.05)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 18: Adherence to medication at three months-Pharmacist-led intervention

<table>
<thead>
<tr>
<th>Study</th>
<th>Pharmacist-led</th>
<th>Usual care</th>
<th>RR (fixed) 95% CI</th>
<th>Weight</th>
<th>RR (fixed) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=N</td>
<td>n=N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01 Number of patients taking less than the recommended dose of any drug</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heaven et al.</td>
<td>62/114</td>
<td>40/110</td>
<td>1.00 (0.99, 1.00)</td>
<td>1.00 (0.99, 1.00)</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>114</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total events: 42 (Pharmacist-led), 40 (Usual care)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Test for overall effect: Z = 0.19 (P = 0.05)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Figure 19: Adherence to medication at three months-Pharmacist-led intervention

<table>
<thead>
<tr>
<th>Study</th>
<th>Pharmacist-led</th>
<th>Usual care</th>
<th>RR (fixed) 95% CI</th>
<th>Weight</th>
<th>RR (fixed) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=N</td>
<td>n=N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01 Number of patients taking less than the recommended dose of any drug</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heaven et al.</td>
<td>62/114</td>
<td>40/110</td>
<td>1.00 (0.99, 1.00)</td>
<td>1.00 (0.99, 1.00)</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>114</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total events: 42 (Pharmacist-led), 40 (Usual care)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Test for overall effect: Z = 0.19 (P = 0.05)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chapter 5
Adverse drug events

One trial (Crotty, et al., 2004) investigated the effect of a pharmacist-led intervention on the incidence of adverse drug events at two months and demonstrated no significant results in this outcome between the groups (Figure 20).

![Figure 19: Adverse drug events-Pharmacist-led intervention](image)

### 5.7.7 Falls

The incidence of falls was assessed following the nurse-led and pharmacist-led interventions at two months (Crotty, et al., 2004) and at four months (Rawl, et al., 1998).

#### Nurse-led intervention versus usual care

In the only study (Rawl, et al., 1998) (n=100) that undertook this comparison, there was no statistically significant difference in the incidences of falls between the two groups (RR 0.88; 95% CI 0.44, 1.77)(Figure 21).
Figure 20: Falls-Nurse-led intervention

Pharmacist-led intervention versus usual care

There was no statistically significant difference in the incidence of falls in the only study (Crotty, et al., 2004) that undertook this comparison involving 88 participants (RR 1.19; 95% CI 0.71, 1.99, (Figure 22).

Figure 21: Falls-Pharmacist-led intervention versus usual care

5.7.8 Urinary tract infection

Urinary tract infection (UTI) (Rawl, et al., 1998) was assessed only in the nurse-led interventions (n=100). The findings demonstrated no significant difference in this outcome between the groups (RR 1.46; 95% CI 0.50, 4.28) (Figure 23).
5.7.9 Other adverse outcomes

Other adverse outcomes included worsening pain, behaviour, confusion and mobility (Crotty, et al., 2004), and functional capacities (Nikolaus, et al., 1999) during care transitions. These outcomes were investigated in the pharmacist-led and multidisciplinary team led interventions.

Pharmacist-led intervention versus usual care

One trial (Crotty, et al., 2004) assessed the effectiveness of the pharmacist-led intervention on worsening pain, behaviours, confusion, and mobility at a two months follow-up. The findings demonstrated a 43% reduction in worsening pain ($p = 0.04$) and a 60% reduction in worsening mobility in the pharmacist-led intervention group compared to the usual care group. However, there was no statistically significant difference in worsening behaviour and confusion between the two groups (Figure 24).
In one trial (Nikolaus, et al., 1999), at 12 months, the intervention group had better functional capacities ($p = 0.03$) compared to those randomised to the usual care group. The meta graph was unable to be produced due to lack of raw data.

### 5.7.10 Quality of life

Quality of life was investigated at intervals of one month (Dellasega & Zerbe, 2000; Wen, et al., 2003), three months (Nazareth, et al., 2001), four months (Rawl, et al., 1998), six months (Nazareth, et al., 2001), and 12 months (Nikolaus, et al., 1999) following completion of the intervention.
Nurse-led intervention versus usual care

In one trial (Wen, et al., 2003), participants randomised to the nurse-led intervention group had significantly greater improvement ($p = 0.02$) in the overall quality of life scores at a one month follow-up. Conversely, in the other trial (Dellasega & Zerbe, 2000), there was no statistically significant difference ($p = 0.848$) in this outcome between the groups (a meta graph was not produced due to a lack of data in both trials).

A follow up at four months demonstrated that patients in the nurse-led intervention group exhibited a significantly lower level of anxiety compared to the usual care group (Figure 25).

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>Nurse-led intervention versus usual care</th>
<th>Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>N</td>
<td>WMD (I²% CI)</td>
</tr>
<tr>
<td>Wen (2003)</td>
<td>49</td>
<td>-29.00 (-39.30, -18.70)</td>
</tr>
<tr>
<td>Total (I²%)</td>
<td>49</td>
<td>-66.70 (-82.30, -51.10)</td>
</tr>
</tbody>
</table>

Figure 24: Anxiety-Nurse-led intervention

Pharmacist-led intervention versus usual care

One trial that undertook this comparison investigated quality of life at three and six months (Nazareth, et al., 2001). There was no significant difference between the two periods (Figure 26).
The effect of a multidisciplinary team led intervention on quality of life was reported in one trial (Nikolaus, et al., 1999). The findings indicated that patients who received the multidisciplinary team intervention had, statistically, a significantly higher quality of life ($p = 0.04$) compared to those who received usual care (a meta graph is not presented due to insufficient data).

### 5.7.11 Patient satisfaction

Patient satisfaction was assessed in the nurse-led intervention at one month (Townsend, et al., 1988), and the pharmacist-led intervention at three and six months (Nazareth, et al., 2001). The findings demonstrated that neither the nurse-led intervention nor the pharmacist led intervention showed any significant difference in patient satisfaction when compared to the usual care group (Figure 27).
Figure 26: Patient satisfaction-Pharmacist-led intervention

5.7.12 Mortality

Mortality was investigated at one month (Evans & Hendricks, 1993), three months (Nazareth, et al., 2001; Townsend, et al., 1988), six months (Nazareth, et al., 2001), nine months (Evans & Hendricks, 1993) and 12 months (Townsend, et al., 1988) following completion of the interventions.

Nurse-led intervention versus usual care

One trial (Townsend, et al., 1988) that undertook this comparison investigated its effectiveness on mortality at three and 12 months. The results found no significant difference in mortality rates between the nurse-led intervention and the usual care group at any time period (Figure 28).
Pharmacist-led intervention versus usual care

In the pharmacist-led intervention, only one trial (Nazareth, et al., 2001) assessed mortality at three and six months, with no significance difference between the two periods (Figure 29).

Multidisciplinary team led intervention versus usual care

In one trial (Evans & Hendricks, 1993), participants randomised to the multidisciplinary led team intervention demonstrated no statistically significant
difference in mortality at one month (RR 1.46; 95% CI 0.68, 3.10) and nine months (RR 0.99; 95% CI 0.72, 1.35) (Figure 30).

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>Multidisciplinary n/N</th>
<th>Usual care n/N</th>
<th>RR (fixed) 95% CI</th>
<th>Weight %</th>
<th>RR (fixed) 95% CI</th>
</tr>
</thead>
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<tr>
<td>0. At one month</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Events</td>
<td>16/417</td>
<td>11/418</td>
<td></td>
<td>100.00</td>
<td>1.46 [0.68, 3.10]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>(1.17)</td>
<td>(418)</td>
<td></td>
<td>100.00</td>
<td>1.46 [0.68, 3.10]</td>
</tr>
<tr>
<td>Total events: 16 (Multidisciplinary), 11 (Usual care)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Test for heterogeneity: not applicable</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 0.96 (P = 0.33)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 02 At nine months     |                       |                |                   |          |                  |
| Events                | 66/417                | 67/418         |                   | 100.00   | 0.99 [0.72, 1.35]|
| Subtotal (95% CI)     | (1.17)                | (418)          |                   | 100.00   | 0.99 [0.72, 1.35]|
| Total events: 66 (Multidisciplinary), 67 (Usual care) | | | | | |
| Test for heterogeneity: not applicable |
| Test for overall effect: Z = 0.06 (P = 0.95) |

Figure 29: Mortality-Multidisciplinary team-led intervention

5.7.13 Cost effectiveness

Five trials (Caplan, et al., 2004; Coleman, et al., 2006; Naylor, et al., 1999; Nikolaus, et al., 1999; Wen, et al., 2003) reported on the cost associated with the intervention, readmission and use of hospital services.

Nurse-led intervention versus usual care

There was a reduction in costs associated with readmission at one month (Coleman, et al., 2006), three months (Coleman, et al., 2006; Naylor, et al., 1999) six months (Coleman, et al., 2006; Wen, et al., 2003) and 12 months (Wen, et al., 2003) in patients randomised to the nurse-led intervention. However, these findings were only statistically significant at a three month (p <0.001) (Coleman, et al., 2006; Naylor, et al., 1999) and a six month (p=0.04) (Coleman, et al., 2006) follow-up.
**Multidisciplinary team led intervention versus usual care**

Two trials (Caplan, et al., 2004; Nikolaus, et al., 1999) of a multidisciplinary team intervention reported savings due to reduced readmission, a decreased number of days spent in hospital and long-term institutions and the cost of the intervention was decreased in the long-term. However, only one trial (Nikolaus, et al., 1999) reported a net savings which was found to be US$4,000 per subject per year in the intervention group.

**5.8 DISCUSSION**

This systematic review investigated the effectiveness of interventions to promote the safe transfer of elderly people across care settings. Overall, the trials were of high quality and met the requirements of the CONSORT statement (Moher, Schulz, & Altman, 2001). However, findings were based on single trials with small sample sizes. Interventions delivered by nurses, pharmacists and multidisciplinary teams were measured against readmission, incidences of adverse events, the use of services, quality of life, patient satisfaction and the cost of care to determine the effectiveness of each type of intervention. Nurse-led interventions involved patient education, discharge planning during hospitalisation and follow-up at home. The pharmacist-led interventions focused on the principles of the quality use of medicine, improvement of patient knowledge about medications and assessment for polypharmacy and adherence to medications regimens. Multidisciplinary team led interventions involved
comprehensive geriatric assessments and home follow-ups, including the education of patients and families, home safety and support.

Readmission to hospital following recent discharge remains a significant problem among the elderly. In this systematic review, the evidence suggests that interventions (Evans & Hendricks, 1993; Nikolaus, et al., 1999) that include a structured plan for transfer—including education, discharge planning and follow-up care delivered by a nurse or a multidisciplinary team— is effective in reducing the rates of readmission to hospital within three months of initial discharge. This finding is important for clinical practice as more than a quarter of the elderly patients are readmitted to hospital within the first three months of discharge, with 20% of the readmissions occurring within two weeks of discharge from hospital (Tierney & Worth, 1995). However, there is no evidence (Coleman, et al., 2006; Nikolaus, et al., 1999; Rawl, et al., 1998) of any benefit relating to readmission rates at four, six and 12 months in the elderly who received the nurse-led, pharmacist led or multidisciplinary team led interventions. A possible explanation for this is that the elderly patients have multiple comorbid conditions, so any of these conditions, as opposed to the initial reasons for admission, could be the cause for readmissions to hospitals.

It is evident that elderly Australians access outpatient hospital services and visits their physician frequently for numerous reasons, including follow-up checks, receiving test results and ongoing management (Parrish, et al., 2009). In this review, there was evidence to suggest that interventions provided by a
pharmacist-led (Crotty, et al., 2004) and multidisciplinary led team (Caplan, et al., 2004) reduced the use of outpatient hospital services. In contrast, there was no evidence of any benefit relating to the number of physician visits post discharge (Caplan, et al., 2004; Dellasega & Zerbe, 2000; Nazareth, et al., 2001; Nikolaus, et al., 1999). It could be postulated that the reduction in the use of outpatient hospital services may be due to the education and home visit component of the intervention that directed patients to visit their physician or the outpatient services rather than the hospital. However, it should be noted that the elderly frequently visit their physician and outpatient clinics for a variety of reasons, therefore consultation with a physician or outpatient clinic may be independent of the initial diagnosis and a poor indicator of the effectiveness of the intervention (Forster, Rose, van Walraven, & Stiell, 2007; Gazmararian, Jacobson, Pan, Schmatzer, & Kripalani, 2010).

Elderly patients often take five or more medications (Gallagher, Barry, & O’Mahony, 2007; Planton & Edlund, 2010) for their multiple comorbidities and are at higher risk of having medication related adverse events when admitted to hospital (Molony, 2009; Taylor, et al., 2009; Wong, et al., 2008). The major causes of these medications-related adverse events are errors in administration or administering of multiple doses. This is often attributed to an incomplete medication list accompanying the person during transfer (Annas, 2006; Australian Pharmaceutical Advisory Council, 2000b). In this systematic review, the involvement of a pharmacist (Crotty, et al., 2004) demonstrated a significant reduction in the number of medications taken by the patients at a two month
follow-up. This reduction in the number of medications could be because patients were taking two medications of the same type. It is a common practice for patients to visit the pharmacy and get a new set of medications after discharge and not discard their old medications, which often leads to duplication of medications and consequently adverse events (Annas, 2006; Australian Pharmaceutical Advisory Council, 2000b).

It has been well established that adherence to medications is inversely associated with the number of medications (Australian Pharmaceutical Advisory Council, 2005). The evidence (Hawe & Higgins, 1990) in this systematic review indicates that a follow-up by a pharmacist significantly improves the adherence rates among patients receiving four or more medications, which demonstrates the benefit of ongoing medication reviews. However, these findings should be considered in light of the relatively small sample (n=100).

Another common adverse event that occurs in the elderly is falls (Roe, et al., 2009; Russell, et al., 2009; Spice, et al., 2009). Two studies reported on the influence of nurse-led (Rawl, et al., 1998) and pharmacist-led (Crotty, et al., 2004) interventions to reduce the incidence of falls. There was no decrease in this outcome between the groups, which could be attributed to falls prevention screening, monitoring, environment modification, injury minimisation strategies and education, which have been widely implemented in elderly patient’s homes, residential aged care facilities and hospitals.
Urinary tract infections are a common problem in the elderly. In the only study that investigated the incidence of UTI as one of the outcomes of a nurse-led intervention (Rawl, et al., 1998) there was no significant decrease in the rates of UTI in the control group. The increased rates of UTI in the intervention group could be due to increased assessment, monitoring and recording and follow-up by the nursing team. The increased nursing follow-up led to early detection and treatment, preventing further complications that would require readmission to hospital.

Findings from this systematic review indicate that providing continuity of care resulted in a significant decrease in pain (Crotty, et al., 2004) and improved quality of life (Rawl, et al., 1998; Wen, et al., 2003). In addition, fewer people who received these strategies experienced worsening mobility (Crotty, et al., 2004) and confusion (Crotty, et al., 2004). These findings demonstrate the importance of continuity of care to minimise adverse events as elderly patients move between care sites.

Interventions developed and tested in research are often not translated into practice because of the associated costs and change management required (Beland, et al., 2006; Parrish, et al., 2009). However, this systematic review demonstrates that strategies implemented by nurses (Coleman, et al., 2006; Naylor, et al., 1999; Wen, et al., 2003) and multidisciplinary teams (Caplan, et al., 2004; Nikolaus, et al., 1999) reduced costs relating to readmission, hospital services usage and adverse events. Health services must therefore be cognisant
of the need to implement cost-effective strategies and evidence based care in clinical practice.

Despite the high methodological quality of the trials, findings are based on single trials, some with small samples, which limits generalisation of the results. As all of the interventions were multifaceted, it is difficult to know which components of the interventions made a difference to any of the outcomes assessed. Moreover, in the papers that were reviewed, descriptions of the interventions were brief, and therefore it was difficult to identify the processes. Future research should be undertaken on the process of delivering care in an attempt to identify which components of the intervention work.

5.9 CONCLUSION

5.9.1 Implications for practice

There is evidence of benefits:

1. Strategies that involve structured communication improve outcomes for elderly patients during care transition.

2. Nurse-led interventions and multidisciplinary team interventions were effective in reducing readmission to hospital at one to nine months.

3. Pharmacist-led interventions and multidisciplinary team led interventions reduced the frequency of hospital services utilisation such as emergency visits and the use of long-term institutions and rehabilitation clinics.
4. Pharmacist-led interventions were effective in improving the quality of medications prescribed by physicians. In addition, there was a significantly reduced non-adherence in patients taking four or more medication at three months.

5. Nurse-led interventions effectively improved quality of life in patients receiving the interventions.

6. Nurse-led and multidisciplinary team led interventions reduced costs associated with the interventions.

5.9.2 Implications for research

The review has provided a guide for future research priorities. These include:

1. Larger, randomised controlled trials assessing transitions between hospital and in-patient settings.

2. A comprehensive, standardised method to assess outcomes such as medication adherence.

3. Studies should clearly demonstrate the association between adverse events and transfers.

This chapter has reviewed strategies involving nurse, pharmacist and multidisciplinary teams with demonstrated various effectiveness in elderly patient care during transitions. However, one important finding of this study is that structured transition promoted the safe transfer of elderly patients. The next chapter discusses the interactive Patient Transition Checklist development in a clinical setting.
CHAPTER 6

Development of the interactive Patient Transition Checklist (iPTC)
6.1 INTRODUCTION

Chapter 2 described findings from the audit of the IIMS and RCA databases of errors and adverse events reported in one tertiary hospital and Chapter 5 presented the evidence from a systematic review of the literature investigating interventions to reduce errors and adverse events during the transfer of elderly patients. Findings from these studies suggested that breakdown in communication between clinicians is a significant contributing factor to errors and adverse events. The recommendations from the systematic review indicated that strategies that involve structured interventions facilitated by a nurse, pharmacist or multidisciplinary team approach had some demonstrated benefits in improving outcomes for elderly patients during care transition. The findings from these two studies prompted the development of a structured communication tool called the interactive Patient Transition Checklist (iPTC). Given that human error and lack of communication are the main causes of errors and adverse events during transitions, the human error theory (Reason, 2000) and the concept of planned communication (Windahl, et al., 1992) also guided the development of the iPTC (Chapter 4). In addition, a rigorous consultative process involving a multidisciplinary team was used in developing the single-page, double sided prototype checklist. This chapter presents the development of the iPTC and the process undertaken to ensure its rigour and reliability prior to implementation.
6.1.2 Aim

To develop and pilot test a prototype of an iPTC to be used by clinicians when transferring and receiving elderly patients between care settings in one facility.

6.2 DEVELOPMENT OF THE iPTC

Effective interventions are those that are based on the best available evidence including research literature, expert opinion and testing of the content validity (Polit & Beck, 2010). Therefore, for the development of the iPTC intervention, a four step process was used comprising of: (1) review of recommendations from the IIMS and RCA databases, a systematic review and integration of the conceptual framework; (2) an audit of existing clinical forms in the hospital; (3) consultation with clinical experts from the hospitals and the residential aged care facilities; and (4) assessing the content validity of the iPTC. Ethics approval was granted prior to the commencement of this phase (Chapter 7, see Section 7.5).

6.2.1 Evidence from the IIMS and RCA databases, Systematic Review and Conceptual Framework

Recommendations from three sources were included in the development of the iPTC.

Recommendations from the audit of the IIMS and RCA databases

The findings of events reported on the IIMS and RCA databases indicated that breakdown in communications frequently contributed to errors and adverse
events. Therefore, the inclusion of a simple yet applicable transfer form that required clinicians from both the transferring and receiving ends to document patient information was considered to be a feasible means of improving communications. The findings from the IIMS and RCA review also indicated that completion of a falls risk assessment, and the presence of an updated legible medication chart in the patient’s records, can reduce errors and adverse events (Chapter 2). Both of these requirements are included on the iPTC.

**Recommendations from the Systematic Review**

Strategies that involve structured interventions had some demonstrated benefits in improving elderly patients during care transition (Chapter 5). Therefore, it was indicative that a transition form, that would be widely used, should be applicable to a multidisciplinary team, easy to use and cost effective to produce. In addition to the literature search designed to inform the systematic review, a more general literature search examined various computer databases from 1970 to 2008, including the Cumulative Index of Nursing and the Allied Health Literature, PsychInfo, Embase, and Medline. The keywords included ‘errors and adverse events’, ‘patient safety’, ‘transfer’, ‘transition’ and ‘checklists’. However, very few articles focussed on the development of clinical checklists for the transition of elderly patients.

The literature (Coleman, 2009; Currell & Urquhart, 2007; HMO Care Management 2004) identified that when an elderly patient is transferred, the medical records and patient personal belongings should accompany the patient. In addition,
medical/allied/nursing discharge planning and coordination should be undertaken. This information was recognised as vital to speed the care process and improve outcomes for elderly patients during care transition.

**Integration of the Conceptual Framework**

Human error plays a critical component in nearly all clinical incidents. Likewise, the audit of the IIMS and RCA databases showed errors from active and latent failures (Chapter 2) and the systematic review (Chapter 5) demonstrated that fragmented care exists in elderly people at transitions. The findings of these studies indicated that planned communications were the underlying structure to the improved seamless transfer of care between sites. Therefore, errors and adverse events during transitions are better targeted when the theoretical concept of the human error theory (Reason, 2000) and the concept of planned communication (Windahl, et al., 1992) underpins the intervention in action (Chapter 4).

6.2.2 **Audit of clinical forms and policies**

It is well established that all facilities use different forms when transferring or discharging patients. Therefore all discharge and transfer related forms within the hospital and aged care facilities in the area were obtained. The forms retrieved included an ED flow chart which in turn included a transfer checklist, discharge checklist, residential aged care nursing transfer and allied health screening referrals. Apart from the ED flow chart, no other specific forms used to transfer patients between wards were identified. The policies of the
metropolitan hospitals were reviewed. However, no detailed policies or protocols relating to the transfer of patients were identified.

6.2.3 Consultation with clinical experts

A draft iPTC was developed based on the literature review, the audit and the systematic review. Consultations with multidisciplinary key stakeholders were also completed. The expert group included registered nurses from the hospital and the residential aged care facility (n=8), clinical nurse educators (n=2), clinical nurse specialists (n=2), enrolled nurses (n=2), assistant in nurses (n=2), nursing unit managers (n=2), a director of nursing, a specialist geriatrician, an emergency consultant, a medical registrar, a surgical registrar, a doctoral qualified aged care researcher and three academic staff with patient safety, cardiovascular and aged care backgrounds. Recommendations from the expert team included:

- Dividing the iPTC into two sections: (i) to be completed by the nurses on the transfer ward and (ii) to be completed by the receiving nurse in order for the clinician to promote and validate communication during transfer (Appendix 11).

- Inclusion of (a) a medical/surgical/allied health discharge summary and (b) a selection to direct the organising patient escort that includes a telephone nursing handover, informing next of kin about the transfer, patient orientation to receiving ward and notifying catering services that the patient had been transferred.

- A residential aged care facility section to be completed for elderly patients discharged to the residential aged care facility. Information relating to
patient belongings such as dentures, spectacles, hearing aids and walking frame was also included.

- The mandatory requirement for the elderly patients’ admission form to accompany all transfers within the hospital.

Recommendations from the key stakeholders were implemented and the iPTC was tested for content validity.

### 6.2.4 Content validity of the iPTC

Content validity was assessed using a 4-point Likert scale. Members of the expert group were asked to rate each item on the iPTC from 1 (irrelevant) to 4 (extremely relevant). Space was provided to make comments after each item. Responses from the expert panel were reported according to the percentage of agreement among panel members. Based on this, when an item did not achieve a minimum 80% agreement by the expert group, the panel’s feedback and comments for that item were reviewed and items were revised or eliminated (Burns & Grove, 2009).

Further testing of the iPTC was undertaken with 12 nurses, to assess the usability and sustainability of the iPTC in the clinical setting. Twelve nurses from different wards and with three to eight years’ experience were randomly selected to complete the iPTC as though they were transferring or receiving patients. The nurses also completed a survey questionnaire that was designed to determine clarity of instructions on the iPTC and acceptability of the iPTC. All 12 nurses completed the iPTC. They were generally positive about the iPTC and thought
that it was innovative, useful and acceptable in the clinical setting.
Recommendations were made about the clarity of wording, minor grammatical
considerations and presentation.

Refinement of the iPTC was carried out based on the experts’ opinions and the
12 nurses’ feedback, to determine that the iPTC was reliable, consistent and
applicable to the ward setting of the hospital. The response of their feedback
demonstrated acceptability of the iPTC and an overall recommendation was for a
signature and designation of the nurse completing the form to be incorporated
below the iPTC.

6.2.5 Components of the iPTC
The iPTC is designed to assess four components of care where the failure to
provide information could result in an adverse incident for the patient. The four
components of the iPTC were:

- Documentation
- Assessments
- Patient preparation, and
- Discharge process.

Documentation
Comprehensive and timely communication is a critical part of providing care to
patients (Marshall, et al., 2009). It is also important that all relevant documents
accompany patients when they transfer between care settings (Benn, et al.,
2009; Chugh, et al., 2009; Horwitz, et al., 2009). Documents such as the admission form, clinical records including current and, when relevant, previous reports on medication charts, fluid chart orders, x-rays, intravenous cannula insertions and intravenous cannula records must accompany the patient when they are transferred between care settings. Missing or incomplete documents have frequently been identified as a factor contributing to errors and adverse events in the study site (Chapter 2) and the facility has commenced this project as one strategy to improve documentation.

Assessments
A range of routine assessments are completed during hospitalisation to minimise risk for patients (Anstey, et al., 2006; Bloch, et al., 2009). When elderly patients are transferred between wards or facilities there is the potential for important screening and monitoring to be overlooked (Coleman, 2009). For that reason, the screening tests with particular relevance for elderly patients, namely falls risk, pressure area scale assessment, special requirements such as appropriate mattress and the discharge risk screening were included in the iPTC. Allied health referrals are frequently initiated by the nursing or medical staff (Travaglia, et al., 2006). At the study site, referrals were initiated by completing a request book that was usually located at the ward clerk area or the nurses’ station. Likewise, results of investigations and procedures such as scans and x-rays also need to accompany patients as they move between sites for care and failure to do so may result in serious adverse outcomes for patients (American Geriatrics
Society, 2007; de Vries, et al., 2008; HMO Care Management 2004). These were included to assist in continuity of care following transfer.

**Patient preparation**

Patients are often transferred with little warning and, as a result, activities that may appear to be routine are ignored (Kohn, et al., 2000; Leape, et al., 2009; Leape, et al., 2006). For example, redirecting meals, notifying next of kin, maintaining a patient’s personal belongings, and ensuring orientation to the clinical environment. These were included in the iPTC to reduce inconvenience and anxiety for the patient.

**Discharge process**

Elderly patients may be discharged to home or to another form of care such as a residential aged care facility (Bauer, et al., 2009; Söderback, 2008; Williams, Nolan, & Keady, 2009; Zidén, Scherman, & Wenestam, 2010). Organising support services, for example allied health interventions, meals on wheels, or follow up visits from other care support agencies may be overlooked when attention is focused on freeing beds for new admissions (Bauer, et al., 2009). Patients are known to be discharged with intravenous cannulas in situ (Boockvar, et al., 2004; Briesacher, et al., 2005), which has become a chronic problem for the study site hospital. Other issues associated with discharge have included inappropriate nursing telephone handover, failure to inform the next of kin that a relative has been discharged to the residential aged care facility and failure to provide adequate medications.
6.3 COMPLETING THE iPTC

The iPTC was designed to promote continuity of care and reduce adverse events. The iPTC comprises 75 items, 38 to be completed by the transferring side and 37 by the receiving side (Appendix 11). Nurses completing the iPTC were educated about the need for this form to be included as a required documentation in the transferring and receiving of patients. Nurses receiving patients on their wards could tick ‘to be done’ and then later, after items were attended to, were then able to complete the form and thus selecting ‘done’ on the iPTC. This aspect of ‘to be done’ was incorporated on the iPTC, because on arrival of patients, the nurses indicated they were extremely busy; later, when settled, they completed the paperwork. However, Staunton (2008) advocated for documentation to be completed in real time, even when wards are extremely busy. This allows the true experience of patients or treatment to be captured. Nursing staff who were involved in trialling the iPTC were informed that a survey about their experience with the form would take place at the completion of the study and they would be encouraged to contribute detailed comments and suggestions for amendments to the form.
6.4 DISCUSSION

In developing a specific communication form, it was imperative that information processing is two-way, in which the transmitter and receiver communicate effectively. Therefore, the iPTC was guided by the human error theory and the concept of planned communication (Reason, 2000; Windahl, et al., 1992), which had a theoretical and in-depth knowledge base. Another study (Cortes, Wexler, & Fitzpatrick, 2004) developed a standardised checklist for transition from the hospital to residential aged care facilities. The similarities of that study to this study were that they both recognised the significant need for communication to be structured and standardised across the health system. A recent study (Fernandez, Davidson, Griffiths, Juergens, & Salamonson, 2009) investigating the use of a self help book for lifestyle changes by cardiology patients, found that successful development of the booklet required an evidence based approach. This was based on patient preferences, expert reviews and evidence from the literature. The iPTC development incorporated these measures and ensured that nurses, who were the main users of the form, provided feedback and identified the form as filling a gap in the clinical environment.

Studies by Lingard, Espin & Whyte (2004), the Joint Commission on Accreditation of Healthcare Organisation (The Joint Commission, 2006, 2009) and Greenberg et al, (2007) found that poor communication contributed to adverse events. Nonetheless, similarities between these studies and our study were alarming, in that elderly patients often experienced adverse events due to communication failures. Overall, the aim of the iPTC was to structure communication during the
transfer of elderly patients. Its development was informed by the literature, an audit, and feedback from an expert panel that identified the form to be significant and necessary to improve continuity of care and to reduce or prevent adverse events.

6.5 CONCLUSION

In conclusion, development of the iPTC involved a rigorous process to ensure the form was practical, relevant and underpinned by a theoretical base that included a review of the literature, a systematic review, a clinical audit and expert clinicians’ feedback. The audit and systematic review encompassed the human error theory and the concept of planned communication, which was also evident in the iPTC. Refinement of the iPTC incorporated experts’ opinions, and feedback from nursing staff, to determine reliability, consistency and application to the hospital ward setting. The next chapter presents findings from the pilot testing of the iPTC, undertaken at a tertiary hospital.
CHAPTER 7

Evaluation of the interactive Patient Transition Checklist (iPTC): A Pilot Study
7.1 INTRODUCTION

Chapters 6 presented the development of the iPTC. This chapter will present the results of a pilot study undertaken to evaluate the feasibility of the iPTC. Items such as the need for the pilot study, study setting, sample size, inclusion and exclusion criteria, procedure of the study, data collection and ethics guiding the study are presented. The results, implications, limitations and reforms of the study are presented, followed by the conclusion of the chapter.

7.1.1 The aims of the pilot study

The aims of the pilot study were to:

i. Assess adherence to the iPTC

ii. Identify errors experienced during transfer

iii. Evaluate the sustainability of the intervention in a ward environment

The sustainability of the iPTC was assessed in terms of:

- Usefulness of the iPTC
- Satisfaction with the iPTC
- Barriers and facilitators to using the iPTC

Each of the findings below has been presented according to the aims.

- Adherence to the iPTC was assessed by undertaking an audit of the iPTC.
- Errors experienced during transfer were identified by auditing the medical records.
• The sustainability of the intervention in a ward environment and the barriers and facilitators to the iPTC intervention were identified by undertaking a survey of the nurses.

7.1.2 Purpose of a pilot study

A pilot or feasibility study is a preliminary study undertaken to determine and document a project's viability (Hayward, et al., 2007). The pilot study was conducted to evaluate the proposed study design, sampling techniques, and data collection instrument and data analysis in preparation for a large experimental clinical trial. In addition, the pilot study was used to validate the appropriateness of the study methods and acceptance of the iPTC by nurses. Findings from a pilot study enable improvement in the data collection process (Schneider, et al., 2003). It can provide the researcher with insights, it enhances knowledge and opportunities to plan a large study. Finally, the results of a pilot study can be used to inform decisions about whether to pursue a large study or make changes to the method (Keating, Sealy, Dempsey, & Slater, 2008) by helping to identify problems in the research design, data collection and the trialling of the instruments (Schneider, et al., 2003).
7.2 STUDY SETTING

The pilot study was carried out in a metropolitan tertiary referral hospital in Sydney, Australia. This hospital provides services to patients in an area where the aged population has doubled from 4.8% to 8.7% in the past six years (Commonwealth of Australia, 2008).

7.2.1 Sample size

Following consultations with experts and academics in the field, it was decided that 50 patients would be recruited to the pilot study. The time-frame provided by the Director of Nursing for the study was two weeks. This was largely due to another quality improvement project that was to be commenced after the two weeks. Nurses completed iPTC on all patients, in order to remove confusion with age group. For this study, only elderly patients’ findings were analysed and presented.

7.2.2 Inclusion criteria

Elderly patients aged ≥65 years who were moved from the ED (transferring ward) to the medical and surgical ward (receiving ward), had an iPTC completed and were able to provide informed consent, were included. Patients with cognitive impairment or dementia were included if consent was obtained from the next of kin. Clinical settings included in the studies were ED (n=1), medical (n=3) and surgical (n=2) wards. All Registered, Enrolled and Assistant in Nurses either working morning, afternoon or night shifts, who were employed full time or part
time, were eligible to participate in the study. In addition, casual and agency nurses were also asked to participate to ensure that the iPTC was integrated into the nursing care plan by all nurses irrespective of their designation or employment status.

7.2.3 **Exclusion criteria**

Patients admitted to, and nurses working in, the Aged Care and Psychiatric Units were excluded from the study. The Aged Care Unit was excluded because another quality assurance project was in progress in that unit. Psychiatric Units were excluded because patients are usually cleared of medical illness from the ED prior to transfer to the psychiatric unit. Patients who were transferred to another hospital or discharged home were excluded, because the iPTC was not designed for this population and was beyond the scope of the research. Patients with cognitive impairment or dementia were excluded due to their inability to provide informed consent. In addition, patients who refused consent were also excluded.

7.3 **PROCEDURE OF THE STUDY**

Participation was obtained from key stake holders such as the Director of Nursing, the Nursing Unit Manager and nursing educators. A meeting was scheduled with the Director of Nursing to explain the study and to gain her endorsement.
The Nursing Unit Managers (NUMs) of the wards were informed of the study during the NUMs meeting and emails were sent to them seeking approval for their ward to participate in the study (Appendix 12). Nursing educators in the participating wards were also informed of the study (Appendix 13). Involving nurse leaders at the beginning phase is a strategy recommended in the literature review to ensure that the staff feel supported by their management, which in turn enhances commitment to the project (Mansah, Coulon, & Brown, 2008).

7.3.1 Education of staff relating to the iPTC

In-service sessions to inform nursing and clerical staff about the aims and objectives of the iPTC and directions for completing the form were provided. Two in-service sessions were provided to the staff in each of the wards involved in the study, timed to include both morning and afternoon shifts. The in-services targeted all levels of staff including the NUMs, clinical nurse educators, clinical nurse consultants, registered nurses, enrolled nurses, assistant in nurses and ward clerks. Each in-service lasted for half an hour. These educational sessions were held one week prior to the commencement of the study.

Information booklets about the iPTC study were provided as an additional resource and placed at the front desk and in the tea room of each ward. These were designed for staff who were unable to attend the in-service sessions such as night staff, casual or agency staff, or those who wanted additional information about the study. The information booklets contained details about the iPTC
study background, objectives, and reasons for the intervention and instructions to complete the form (Appendix 14).

Prior to the study commencing, the nurses were provided with a copy of the iPTC, given guidelines on how to complete the iPTC and the role of the researchers during the study period. All nurses were encouraged to complete the iPTC upon transfer and receipt of patients. Due to the nature of the study, the iPTC was structured as part of professional care and quality improvement. The ED ward clerks were informed about the study during the staff team meeting and were asked to attach the iPTC to the patients’ clinical records during patient admission. Ward clerks in the medical and surgical wards were advised to add the iPTC into the admission package for staff. Consent for the inclusion of the iPTC in the patients’ records was obtained from the Clerical Unit of the Hospital.

Posters were placed in the participating wards to remind staff that the iPTC study was in progress (Appendix 15). These posters were placed at each nurse’s station, the ward clerk’s desk, hand washing bays, staff washing rooms and on the walls around the clinical setting. According to Schneider et al (2003), using bright colours in research draws attention to details and prompts nurses to directly engage and read the content. Therefore, posters were presented on yellow paper to maintain continuity with the theme of the iPTC, which was presented on a yellow form.
7.4 DATA COLLECTION

The data collection methods were:

1. An audit of the medical records to identify (a) adherence to the iPTC by nurses and (b) incidence of errors and adverse events as a result of transitions

2. A survey of nurses to identify the (a) sustainability of the iPTC and (b) barriers and facilitators during the study.

The audit was undertaken using a data collection form based on the iPTC (Appendix 16). The survey of nurses was undertaken using a self-administered survey questionnaire that was developed and piloted before use (Appendix 17).

7.4.1 Conducting the audit

An audit form (Appendix 16) was developed based on the iPTC. The medical records were audited by two research assistants, one of whom was not involved in the iPTC study. The researchers visited the ED and identified patients transferred to each participating ward using a computer program from the ED and a log book on the medical and surgical wards (Appendix 18). These included all patients transferred in and out of the ward, and also patients who were discharged to the residential aged care facility. When a patient was transferred from the ED to a medical or surgical ward, the researchers would locate the yellow iPTC in the patient’s medical notes after 48 hours. Forty eight hours was used as the time framework to undertake an audit of the iPTC due to the policies and procedures of the hospital. These policies and procedures ascertained that
upon transfer to a new ward, a patient should have a detailed plan of care, current medications, up to date nursing notes, organised tests and serial blood results and medical plan within 48 hours (Sydney South West Area Health Service, 2005a, 2008c).

When a completed iPTC was identified in the patients’ medical notes, a signed consent was obtained from the patient or next of kin. The patient was informed of the iPTC study and explained that their consent was necessary in order to audit their medical records. For those who were unable to give consent, such as patients who were confused, had dementia, or were non English speaking, consent was obtained from a next of kin.

After informed consent was obtained, the iPTC was removed from the patients’ medical notes and audited. The audit included checking that both transferring and receiving sides of the form had been completed. The research assistant also personally checked that all documentation, x-rays/scans, medication and personal belongings such as dentures, walking frames and hearing aids belonging to the patient were accounted for. In addition, the researchers checked that referrals from all necessary allied health professionals, such as the physiotherapist, occupational therapist, dietician, speech therapist and social worker, were conducted and documented. Assessments such as pressure area and falls risk, if completed, could be identified in the patient’s medical notes. Thus, a patient’s medical notes were audited to determine whether the iPTC
corresponded with the clinical records and had been followed up by nursing staff.

7.4.2 Conducting the survey of nurses

Various methods were implemented to distribute the surveys to staff. A list of the nurses allocated to the ward was obtained from the ward NUM’s nursing rosters. The surveys (Appendix 17) were coded with numbers to ensure anonymity and to ensure all staff received a survey. The surveys were printed on blue paper for visual effect and to encourage completion (Burns & Grove, 2009). Information about the collection box location was included on iPTC survey. The survey was sealed in an envelope with each staff member’s name on the front. The envelopes were given to the educators on each ward for distribution. In the ED, each envelope was taped to the front of the staff member’s locker. For those whose locker could not be located, a box was left in the ward staff tea room, with a noticeable sign for staff to find their names on the envelope and complete the iPTC survey. This method was suggested by the NUMs. Collection boxes were clearly labelled for iPTC surveys. The survey collection boxes were left at the front desk of each ward and in the staff tea room of the ED for two weeks prior to removal.
7.5 ETHICS APPROVAL

Ethics approval was obtained from the Sydney South West Area Health Service Human Research Ethics Committee and the University of Western Sydney Human Research Ethics Committee (Appendices 19 & 20) prior to commencing the study. Consent was also gained from the Nursing Unit Managers of their respective department at the tertiary metropolitan hospital, prior to introducing the study in their facilities or wards. A separate subject information letter and informed consent was developed for the patient and nurses.

7.5.1 Subject Information Sheet and Consent for Patients

The subject information sheet (Appendices 21, 22 and 23) and consent (Appendices 24, 25 and 26) provided a detailed description and explanation of the study. This was considered necessary to ensure privacy and respect for the patients or next of kin. The information letter was read by the patient and on three occasions facilitated by the researchers who read it aloud to the patient. The information letter was also explained to patients who consented for their medical notes to be audited. On the occasion where patients could not consent to the study, their next of kin was contacted. The researchers would contact them by telephone to determine when they were coming to the ward, so that consent could be obtained. In keeping with the regulations of the National Health and Medical Research Council (NH & MRC) guidelines for human research (National Health and Medical Research Council, 2007), patients could withdraw from the study at any time. This was emphasised in the consent form and discussed with each participant. In order to protect the confidentiality of the
patients, all iPTC and iPTC audit forms were de-identified with a code number, with the lists of participant’s names locked separately in a special cabinet as per the NH & MRC guidelines (National Health and Medical Research Council, 2007). A patient’s or next of kin refusal of consent resulted in exclusion from the study and subsequently iPTC audits were terminated. Each patient or next of kin retained the information sheet and the consent form was given to the researchers (Polit & Beck, 2010).

### 7.5.2 Subject Information Sheet and Consent for Nurses

Nurses who completed the iPTC were de-identified on the forms retrieved from the patient’s medical notes. Attached to the survey form was a plain English information statement explaining the purpose of the study (Appendix 27). Consent to participate in the survey was implicit on the return of the survey, as described by the NH & MRC National Statement on ethical conduct in research involving humans (National Health and Medical Research Council, 2007). All surveys were de-identified with a code number, with the list of names locked separately in a special cabinet as per the NH & MRC guidelines (Johnstone, 2002; National Health and Medical Research Council, 2007).

All data were stored in a locked cabinet, according to the NH & MRC guidelines (Johnstone, 2002; National Health and Medical Research Council, 2007), at the Sydney South West Area Health Service Centre for Applied Nursing Research, Liverpool NSW.
7.6 DATA ANALYSIS

Preliminary assessment of the data was conducted prior to analysis to ensure accurate entry and coding of the data. Frequencies were computed to detect incorrect entries. In the instance of incorrect entries, the original questionnaires were examined and the data verified. Likewise, missing responses were also checked against the original questionnaire (Dempsey & Dempsey, 1992). Data were computed, coded and analysed using SPSS version 17. Descriptive analyses (frequencies and percentages, means and standard deviations [SD] as appropriate) were undertaken to assess the characteristics of the patients and nurses. The method of analysis for each outcome is presented below.

Frequencies were computed to assess adherence to the iPTC. The chi square was used to determine differences in adherence to the iPTC by nurses in the ED, medical and surgical ward. Incidence of errors and adverse events was analysed using frequencies. Sustainability of the iPTC was determined by chi square and Student’s t-test. The statistical significance was set at p<0.05 (Schneider, et al., 2003).

The comments received on the survey were coded into themes and specific quotes were used to identify the sustainability of the intervention as well as barriers and limitations of the iPTC intervention. Adherences to each section of the iPTC and the errors identified during transition have been presented together in order to present a complete picture of the significance of the form.
7.7 RESULTS OF THE IPTC AUDIT

7.7.1 Characteristics of the audited sample

There were 54 (83.1%) patients transferred from the ED, with 38 (70.4%) to medical and 16 (29.6%) to surgical wards. The audit showed that there were 30 males (55.6%) and 24 females (44.4%). The mean age of participants was 75 years, ranging from 65 to 90 years. Females were slightly older than males although not statistically significant (p=0.705). The most frequently reported primary diagnoses were cardiac condition (42.6%), unconfirmed diagnoses (25.9%) and cardiovascular accident (CVA) (11.1%) (Table 3). Unconfirmed diagnoses meant the underlying investigation were in progress to determine the cause of a patient’s illness at the time of data collection. Nurses were required to complete the section relating to the discharge process on the iPTC when patients were transferred to a residential aged care facility. However, only two iPTC were completed for the residential aged care facility. As a result, these data were not included in the analyses.

Table 3: Characteristics of participants

<table>
<thead>
<tr>
<th>Gender</th>
<th>Males 30 (55.6%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Females 24 (44.4%)</td>
</tr>
<tr>
<td>Mean Age (SD)</td>
<td>74.5 (6.42); Ranged from 65 to 90 years</td>
</tr>
<tr>
<td>Diagnosis Category</td>
<td>Cardiac Condition 23 (42.6%)</td>
</tr>
<tr>
<td></td>
<td>Unconfirmed Diagnosis 14 (25.9%)</td>
</tr>
<tr>
<td></td>
<td>CVA 6 (11.1%)</td>
</tr>
<tr>
<td></td>
<td>*Others 11 (20.4%)</td>
</tr>
</tbody>
</table>

*Others involved falls, cellulitis, respiratory conditions, laceration, osteoarthritis, epilepsy, and subdural haemorrhage conditions.
7.7.2 Adherence to completion of the clinical records

The clinical records section consisted of admission forms, medical notes, updated nursing documentation, medication charts, fluid chart orders, and intravenous cannula record forms. Overall adherence to the clinical records section of the iPTC by the transferring ward was 48.1% and, by the receiving ward, 80.5%. Adherence to the individual items in this section is presented in Table 4. The admission form is an important document in the patient medical notes, however less than half (48%) of the patients transferred from the ED had this item completed. The clinical records section was completed in less than half (48%) of cases by the transferring ward, while the majority (89%) of the receiving ward completed this section. Only 39% of the cannula record forms were completed by the receiving ward.

Table 4: Adherence to completion of clinical records

<table>
<thead>
<tr>
<th>CLINICAL RECORDS</th>
<th>TRANSFERRING WARD</th>
<th>RECEIVING WARD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=54</td>
<td>N=54</td>
</tr>
<tr>
<td>Admission form</td>
<td>26 (48%)</td>
<td>50 (93%)</td>
</tr>
<tr>
<td>Clinical record</td>
<td>26 (48%)</td>
<td>48 (89%)</td>
</tr>
<tr>
<td>Updated nursing documentation</td>
<td>27 (50%)</td>
<td>47 (87%)</td>
</tr>
<tr>
<td>Medication chart</td>
<td>26 (48%)</td>
<td>48 (89%)</td>
</tr>
<tr>
<td>Fluid chart orders</td>
<td>27 (50%)</td>
<td>47 (87%)</td>
</tr>
<tr>
<td>Intravenous cannula record form</td>
<td>*N/A</td>
<td>21 (39%)</td>
</tr>
</tbody>
</table>

*N/A Adherence to the intravenous cannula record form was not analysed for the transferring ward as they did not use this form.
7.7.3 Errors associated with clinical records during patient transfer

There were no errors relating to medication charts. All medication charts were transferred and present in the patient’s medical notes after the 48 hours. The nurses in the receiving wards indicated that six admission forms did not arrive with the patient during transfer and that they had to follow these up. However, an audit undertaken 48 hours following transfer of the patient revealed that the nurses in the receiving ward had retrieved five of the six missing admission forms. Similarly, the nurses in the receiving ward indicated that only 76% (n=41) of the clinical records were sent with the patients to the ward. The audit indicated that the clinical records for only one patient were missing, which indicates that the nurses in the receiving ward had located the other missing clinical records.

7.7.4 Adherence to completion of the assessment and referral

This section consisted of patient assessment for risk of falls and pressure ulcers and referrals to the allied health services, such as by the social worker, physiotherapist or speech therapist. Overall adherence to the completion of the assessment referral section of the iPTC by the transferring ward was only 40.9% and, by the receiving ward, 78.3%. Adherence to the individual items in this section is presented in Table 5. All patients admitted to the ward required a discharge risk screening, however this section was completed by only 38.8% and 68.5% of the transferring and receiving wards respectively.
Table 5: Adherence to completion of assessment and referral forms

<table>
<thead>
<tr>
<th>ASSESSMENTS AND REFERRALS</th>
<th>TRANSFERRING WARD N=54</th>
<th>RECEIVING WARD N=54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall risk</td>
<td>25 (46.2%)</td>
<td>48 (54%)</td>
</tr>
<tr>
<td>Pressure Ulcer</td>
<td>22 (40.7%)</td>
<td>48 (88.8%)</td>
</tr>
<tr>
<td>Mattress ordered</td>
<td>23 (42.5%)</td>
<td>45 (83.3%)</td>
</tr>
<tr>
<td>Discharge risk screening</td>
<td>21 (38.8%)</td>
<td>37 (68.5%)</td>
</tr>
<tr>
<td>Referrals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Work</td>
<td>23 (42.5%)</td>
<td>42 (77.7%)</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>20 (37.0%)</td>
<td>42 (77.7%)</td>
</tr>
<tr>
<td>Speech Pathologist</td>
<td>22 (40.7%)</td>
<td>39 (77.7%)</td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td>21 (38.8%)</td>
<td>40 (74.0%)</td>
</tr>
</tbody>
</table>

7.7.5 Errors associated with assessment and referrals during patient transfer

The transferring ward did not attend fall risk assessment on any patients. However, an audit of the medical notes demonstrated that falls risk assessment was required for 42 patients. The receiving ward attended those assessments on 35 patients. The transferring ward missed attending pressure ulcer assessment on any patient transferred from their ward. Although 16 patients had been identified by clinicians as requiring an assessment, the receiving ward followed up and completed pressure ulcer assessment on 35 patients. The audit completed 48 hours following discharge demonstrated that eight patients did not have a pressure ulcer assessment completed.
Only one patient had a pressure area specialised mattress. Eight frail, elderly patients who required pressure area mattress based on their pressure area scale, had no “special” mattress present or ordered. The transferring ward did not commence discharge risk screening on any patients. However, an audit showed that the receiving ward only completed discharge risk screening on 16 patients, and failed to attend 31 patients’ discharge risk screenings. Of these, ten were frail, elderly patients who lived on their own.

An audit of the medical notes undertaken 48 hours after the transfer of the patients indicated a total of 22 patients required referral to the social worker services. However, only 12 of these referrals had been made by the receiving ward. Referrals to the physiotherapy service were required for 29 patients. However, only 23 referrals were completed at the 48 hours follow-up audit. Similarly, 17 patients required referral to a speech therapist, yet five patients were not referred at the time of the audit. Although referrals to occupational therapy and the dietician were indicated for 20 and 16 patients respectively, only 12 were referred to the occupational therapist and seven to the dietician.
7.7.6 Adherence to completion of the patient preparation

Overall adherence to completion of the patient preparation section of the iPTC was 45.7% for the transferring ward and 80.3% by the receiving ward. Adherence to the individual items in this section is presented in Table 6.

Table 6: Adherence to completion of patient preparation

<table>
<thead>
<tr>
<th>PATIENT PREPARATION</th>
<th>TRANSFERRING WARD</th>
<th>RECEIVING WARD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=54</td>
<td>N=54</td>
</tr>
<tr>
<td>Electronic meal order (power chart)</td>
<td>26 (48%)</td>
<td>46 (85%)</td>
</tr>
<tr>
<td>Meal given prior to transfer</td>
<td>25 (44%)</td>
<td>46 (85%)</td>
</tr>
<tr>
<td>Organising patient escort</td>
<td>25 (46%)</td>
<td>42 (78%)</td>
</tr>
<tr>
<td>Telephone nursing handover</td>
<td>23 (43%)</td>
<td>43 (80%)</td>
</tr>
<tr>
<td>Informed of transfer and reasons for transfer</td>
<td>25 (46%)</td>
<td>44 (81%)</td>
</tr>
<tr>
<td>Next of kin informed of transfer</td>
<td>25 (46%)</td>
<td>40 (74%)</td>
</tr>
<tr>
<td>Equipment organised</td>
<td>24 (44%)</td>
<td>43 (80%)</td>
</tr>
<tr>
<td>Orientated to receiving ward</td>
<td>*N/A</td>
<td>42 (78%)</td>
</tr>
</tbody>
</table>

* N/A This was only applicable to the receiving ward

Patient preparation was classified into electronic update of diet (power chart), meals given prior to transfer, organising patient escort, telephone nursing handover, patient informed of transfer, next of kin informed of transfer, equipment organised and patient orientated to receiving ward. The audit was not undertaken on these patient preparations as it was not feasible or practical to audit these items as they are not clearly documented in the medical notes.
7.7.7 Errors associated with patient preparation during transfer

The transferring ward indicated that the diet for 10 patients was not electronically updated prior to transfer. The transferring ward indicated that meals were not provided to patients in 10 instances prior to transfer. However, the receiving ward indicated that on arrival to the ward 28 patients did not have meals ordered for them. The transferring ward reported that nurse escort was arranged for 16 patients; however, the receiving ward indicated that five patients who required a nurse escort were transferred without one. Similarly, the receiving ward indicated that four patients were transferred to the ward without a reported nursing handover from the transferring ward. Additionally, six patients were transferred to the receiving ward without necessary equipment with them.

Informing the patients and the next of kin of transfer is important for the ongoing care of the patient. The nurses on the receiving ward indicated that 43 patients were informed and aware of the reasons for transition into the wards. The transferring ward stated that the next of kin of only 14 patients were informed of the transfer. The receiving ward ascertained that next of kin were not aware or informed that 24 patients had been transferred to the ward. However, the receiving nurses informed the next of kin of only three patients. The nurses on the receiving ward indicated that 42 patients were orientated to the ward setting on arrival.
7.7.8 Adherence to completion of the patient belongings

This section reported the transfer of patient belongings including the patient's own medication, x-rays, personal belongings, dentures, spectacles, hearing aids and walking frames. Overall adherence to completing the patient belongings section of the iPTC by the transferring ward was only 42.2% and, by the receiving ward, 77.9%. The adherence rate was much lower for dentures (35%) compared with all the items on the iPTC for the transferring ward. Adherence to the individual items in this section is presented in Table 7.

Table 7: Adherence to completion of patient belongings

<table>
<thead>
<tr>
<th>PATIENT BELONGINGS</th>
<th>TRANSFERRING WARD N=54</th>
<th>RECEIVING WARD N=54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient own medications</td>
<td>27 (50%)</td>
<td>44 (81%)</td>
</tr>
<tr>
<td>X-ray</td>
<td>26 (48%)</td>
<td>47 (87%)</td>
</tr>
<tr>
<td>Patient belongings bagged and labelled</td>
<td>25 (46%)</td>
<td>44 (81%)</td>
</tr>
<tr>
<td>Dentures</td>
<td>19 (35%)</td>
<td>40 (74%)</td>
</tr>
<tr>
<td>Spectacles</td>
<td>21 (39%)</td>
<td>39 (72%)</td>
</tr>
<tr>
<td>Hearing aids</td>
<td>21 (39%)</td>
<td>41 (76%)</td>
</tr>
<tr>
<td>Walking frame</td>
<td>21 (39%)</td>
<td>40 (74%)</td>
</tr>
</tbody>
</table>

7.7.9 Errors associated with patient belongings during patient transfer

The nurses in the receiving wards indicated that patients’ own medications were not sent along to the ward in 17 cases. An audit demonstrated that the receiving ward only followed up on five of the 17 patients and retrieved the medications
from the transferring ward, which meant that 12 (22%) patients’ own medications were missing during care transitions. X-rays have been identified as often not accompanying patient’s transfers. The receiving ward indicated that the x-rays of eight patients from the transferring ward did not accompany the patient when they were transferred. The audit showed that x-rays for 12 patients were not available on the ward. Nurses on the receiving ward emphasised that the personal belongings for 16 patients were not sent to the ward, which the nurses had to follow up.

The nurses in the receiving ward indicated that the dentures for six patients were missing when transferred. The audit showed that the receiving ward was able to follow up and retrieve only one patient’s dentures with investigation continuing into the loss of the remaining dentures. The receiving nurses reported that four patients’ spectacles were missing on arrival to the ward. The audit demonstrated that 22 patients on the receiving ward had their spectacles, three patients’ spectacles were missing and only one was retrieved from the transferring ward. Similarly, the receiving ward specified that the hearing aids for nine patients’ were misplaced or missing on arrival to the ward. The audit confirmed that investigation was being carried out on the nine missing hearing aids. The receiving ward confirmed that on arrival to the ward, only two patients had their walking frame with them, with nine patients’ walking frames considered misplaced. An audit indicated that the receiving ward retrieved one walking frame, with the remaining eight still missing.
7.8 SUMMARY OF iPTC RESULTS

Adherence to the iPTC completion was higher by the receiving ward than the transferring ward. Although medical and clinical records were available, patient’s personal belongings were frequently missing. It could be argued that there was only one transferring ward (ED) and that patients were transferred to medical and surgical wards. However, that should not affect the adherence to the form by the ED staff, as these patients were transferred from their department to the medical and surgical ward. A follow-up of items on the iPTC was undertaken after 48 hours. Errors identified from the transition process were mostly recognised by the nursing staff, with the exception of pressure area mattresses.

7.9 FINDINGS FROM THE NURSES’ SURVEY

All nurses who completed the iPTC, or who cared for patients who had an iPTC, were invited to participate in the survey at the end of the study period. The survey forms were disseminated to the ED, three medical and two surgical wards. The medical and surgical wards were eligible to respond to the surveys, because they received patients from the ED and completed the receiving section of the iPTC. One hundred of the 190 surveys distributed were returned, a response rate of 53%. Ninety six percent (n=96) of nurses who responded to the survey had completed the iPTC themselves and four percent (n=4) by those who had cared for patients with the form. Quantitative and qualitative data have been reported together.
7.9.1 Demographics of nurses who completed the survey

Eighty-one Registered Nurses (RNs), 16 Enrolled Nurses (ENs) and three Assistant in Nurses (AINs) completed the survey. This result reflects the nursing workforce in the clinical setting, with a distribution difference of RNs, ENs and AINs. The number of years of nursing experience ranged from one to 23 years (median four years). Completed surveys were received from 37 staff in the ED, 40 from the medical wards and 23 from the surgical wards.

Table 8: Demographic characteristics of nurses

<table>
<thead>
<tr>
<th>Designation</th>
<th>NUMBER (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Nurses</td>
<td>81 (81%)</td>
</tr>
<tr>
<td>Enrolled Nurses</td>
<td>16 (16%)</td>
</tr>
<tr>
<td>Assistant in Nurses</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Years of nursing</td>
<td></td>
</tr>
<tr>
<td>experience*</td>
<td></td>
</tr>
<tr>
<td>&lt;8 years</td>
<td>74 (74%)</td>
</tr>
<tr>
<td>&gt;8 years</td>
<td>18 (18%)</td>
</tr>
<tr>
<td>Number and percentage of nurses in each study ward</td>
<td>NUMBER (%)</td>
</tr>
<tr>
<td>ED</td>
<td>37 (37%)</td>
</tr>
<tr>
<td>Medical</td>
<td>40 (40%)</td>
</tr>
<tr>
<td>Surgical</td>
<td>23 (23%)</td>
</tr>
</tbody>
</table>

* Missing data.

7.9.2 Sustainability of the iPTC

The sustainability of the iPTC was assessed by the following:

- Usefulness of the iPTC
- Satisfaction with the iPTC
- Barriers and facilitators to using the iPTC
7.9.3 Usefulness of the iPTC

Nurses were asked to comment on the usefulness of the iPTC in preparing documentation, admitting patients and completing intravenous records and assessments. Each of these is presented below.

Preparing documentation and patients for transfer

As transfer occurred only from the ED to the medical and surgical wards, data from the ED nurses (n=37) relating to this question has been reported. The majority of nurses from the ED (31/37, 84%) indicated that the iPTC assisted them in preparing documentation to accompany patients and also to prepare patients for transfer. Analysis of the comments written in the surveys supported the above findings, as nurses frequently mentioned that the iPTC was very useful for transfer. An example of one nurse’s quote:

“It is a great form. What a better idea!”

Admitting patients to medical and surgical wards

The nurses in the medical and surgical wards (n=61) who received patients from the ED were asked to indicate their agreement with the statement: “Did the iPTC assist you to admit patients to the receiving ward?” Of these, 45 (74%) nurses stated that the iPTC assisted them in admitting the patients. A subgroup analysis by the type of ward revealed that a significantly higher proportion of nurses in the medical wards (90%) compared to the surgical wards (45%) perceived that the iPTC assisted them in receiving patients (p=0.000).
The following quote demonstrates the viewpoint of those surveyed.

“Most of us here liked the form; it works well and does the job”

**Completing assessments of patients**

Almost all the nurses in the survey (n=99) completed this section of the questionnaire. The majority of nurses from the ED (n=26, 70%), the medical (n=34; 85%) and surgical (n=15; 65%) wards stated that the iPTC was useful in prompting them to complete assessments. However, 24% (n=24) of nurses indicated otherwise, that the iPTC did not assist them to complete assessments of patients (p=.267).

Quotes provided by one of the nurses illustrated the usefulness of the iPTC:

“The iPTC allowed us to pick up on the work/referrals that were not made by the other ward which was good”

**Completing clinical record form**

Data from all nurses in the medical and surgical wards were used to evaluate this outcome. A large number of nurses (n=40) reported that the iPTC assisted them in completing the intravenous fluid form. Analysis by the two wards demonstrated that more than three quarters of the nurses (84.6%) from the medical wards perceived the iPTC to be a useful guide to completing the intravenous record form. In contrast, only 33.3% of the nurses from the surgical wards felt the same (Table 9). These results were statically significant (p=.000).

One nurse indicated:

“I found the iPTC very useful and it reminded me of things to do”
Transferring and receiving patient belongings

Ninety eight percent of nurses responded to this question. A significantly large proportion of nurses (n=76; 78%) reported that the iPTC reminded them to send and receive patients’ belongings (p =0.002). In contrast, 22% (n=22) of nurses indicated that the iPTC did not prompt or assist them to transfer or receive patient belongings. Of these, 52% (n=12) of nurses were from the surgical ward, and with an equal number of nurses from the ED (n=5; 14%) and the medical ward (n=5; 13%). The comments made by nurses included:

“If [iPTC] is used properly, it will reduce loss of patients’ properties”

Liaising with allied health professionals

Ninety eight nurses provided responses to this question. The nurses in the ED (n=25; 68%), medical (n=31; 79%) and surgical (n=10; 43%) wards stated that the iPTC prompted them to effectively liaise with allied health professionals. On the other hand, more than half (n=13; 57%) of the nurses from the surgical ward reported that the iPTC did not aid in promoting liaison with other members of the multidisciplinary team, in comparison to 32% (n=12) in the ED and only 18% (n=7) from the medical ward (p=.093). Generally, the nurses’ comments indicated the usefulness of the iPTC:

“When the iPTC was used it prompted us to liaise with members of the allied health team”
iPTC as a communication tool

Ninety nine percent of nurses answered this questionnaire. Seventy three (n=72) percent of nurses indicated that the iPTC prompted communication with other nurses. In contrast, 27 (n=27%) nurses did not support this view and reported that the iPTC was not effective in terms of communicating between colleagues. Of these, 12 (52%) nurses were from the surgical ward, 11 (30%) from the ED and only 4 (10%) nurses from the medical ward (p=.023). Nurses provided similar comments, that the iPTC was useful in communicating with other nurses:

“It really helps to validate care, ensure you are doing the right thing. It definitely helped us communicate with each other, and having the two sections [of the form] was a terrific idea”

Table 9, shows the evaluation of the usefulness of the iPTC. As each item has already been discussed, the table provides a visual snapshot of nurses’ perceptions of the iPTC. Overall, staff from ED and medical ward most valued the form as useful, compared to the surgical ward.
Table 9: Nurses’ evaluation of the usefulness of the iPTC form by type of ward

<table>
<thead>
<tr>
<th>iPTC Usefulness</th>
<th>Ward</th>
<th>Agree n (%)</th>
<th>Strongly Agree n (%)</th>
<th>Disagree n (%)</th>
<th>Strongly Disagree n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient admission</td>
<td>ED *</td>
<td>22 (59)</td>
<td>4 (11)</td>
<td>9 (24)</td>
<td>2 (5)</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>28 (72)</td>
<td>7 (18)</td>
<td>3 (8)</td>
<td>1 (3)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>8 (36)</td>
<td>2 (9)</td>
<td>9 (41)</td>
<td>3 (14)</td>
</tr>
<tr>
<td>Patient assessment</td>
<td>ED</td>
<td>26 (67)</td>
<td>8 (21)</td>
<td>5 (13)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>22 (59)</td>
<td>4 (11)</td>
<td>9 (24)</td>
<td>2 (5)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>13 (57)</td>
<td>2 (9)</td>
<td>5 (22)</td>
<td>3 (13)</td>
</tr>
<tr>
<td>Completion of IV form</td>
<td>ED*</td>
<td>29 (74)</td>
<td>4 (10)</td>
<td>6 (15)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>26 (67)</td>
<td>8 (21)</td>
<td>5 (13)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>9 (39)</td>
<td>2 (9)</td>
<td>9 (39)</td>
<td>3 (13)</td>
</tr>
<tr>
<td>Sending patient belongs</td>
<td>ED</td>
<td>21 (58)</td>
<td>10 (28)</td>
<td>5 (14)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>23 (61)</td>
<td>8 (21)</td>
<td>7 (18)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>8 (35)</td>
<td>2 (9)</td>
<td>10 (43)</td>
<td>3 (13)</td>
</tr>
<tr>
<td>Liaison with AHPs</td>
<td>ED</td>
<td>21 (57)</td>
<td>4 (11)</td>
<td>10 (27)</td>
<td>2 (5)</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>23 (61)</td>
<td>8 (21)</td>
<td>7 (18)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>8 (35)</td>
<td>2 (9)</td>
<td>10 (43)</td>
<td>3 (13)</td>
</tr>
<tr>
<td>Nursing communication</td>
<td>ED</td>
<td>21 (57)</td>
<td>5 (14)</td>
<td>10 (27)</td>
<td>1 (3)</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>27 (69)</td>
<td>8 (21)</td>
<td>4 (10)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>10 (43)</td>
<td>1 (4)</td>
<td>9 (39)</td>
<td>3 (13)</td>
</tr>
</tbody>
</table>

ED*: Not applicable

7.9.4 Satisfaction with the iPTC

Satisfaction with the iPTC was used as an indicator of sustainability. All nurses in the survey completed this section. Nurses in the medical ward (n=31; 78%) and ED (n=26; 70%) reported being highly satisfied with the iPTC, while almost half of the surgical nurses (n=11; 48%) reported dissatisfaction with completing the iPTC. There was no difference between the wards for satisfaction with the form (p=.110). While nurses reported being generally satisfied with the form, they also indicated that it increased their workload and took them away from their clinical work.
Instructions on the iPTC

Satisfaction was also dependent on whether the instructions were clearly explained and easy to follow. The majority of participants (n=82; 82%) were satisfied that the instructions provided on the iPTC. There were only a few nurses (n=18; 18%) in the survey who were dissatisfied with instructions provided on the iPTC. The following comment illustrates this point:

“iPTC is a repetition of other forms that already existed. I mean we don’t have a transfer form, but the information being asked for, is common sense and each nurse should know”

There was no significant difference (p=.698) between the ED, and medical and surgical wards nurses on the perception of the instructions provided on the iPTC. The majority of nurses commented that the form was easy to use and reminded them of what needed to be done, as depicted by this quote:

“It was easy to use; can understand what is asking for, and what I need to do; it reflects our daily work routine on transfer”.

Ongoing use of the iPTC

Nurses (n=46/99; 47%) reported that they would use the iPTC again. Sixty one percent (n=22) were from the ED, 45% (n=18) from medical and 26% (n=6) from the surgical ward. However, an almost equal number of nurses from medical (n=11; 28%) and Emergency (n=8; 22%) stated that they would not like to use the iPTC again.
“The iPTC is too time consuming, we are so busy here and more workload”.

Nine nurses (39%) from the surgical ward indicated that they would not use the iPTC again. Comments received from the nurses in the surgical wards supported these results.

“We are not happy about filling out the iPTC for every transfer as our patients would often be transferred in and out of the ward a few times in the same admission”.

The willingness of nurses to use the iPTC again was similarly reported across the three wards (p=.129). The majority of nurses’ (n=55) comments depicted uncertainty in regards to whether they would use the form again.

“This iPTC is very effective for transfer of patients, but whether it will be used by all nurses, requires intensive education and discipline”.

Would you recommend the iPTC to other wards?

One in two nurses surveyed reported that they would recommend the iPTC to other wards (n=54; 55%). One in four nurses stated ‘no’ (n=23; 23%) and one in five indicated ‘maybe’ (n=21; 21%) in recommending the iPTC to other wards. The ED and the medical ward had half of their participants (68% and 55% respectively) indicating that they would recommend the iPTC to other wards, compared to 32% in the surgical wards. The majority of nurses commented that the iPTC was practically useful for all other departments and, if used properly,
had the capacity to reduce associated errors and adverse events. Examples of some of the nurses’ comments are:

“At first it took me some time to get used to it, later on I found it really good, I will recommend to other ward; but will need a lot of positive selling”

“We are very busy here but I think it even saves time in long run when you think about it; it’s good to have a form like this and should be implemented across the hospital”

7.9.5 Barriers to implementing the iPTC

The researchers faced numerous barriers during the implementation of the iPTC. These barriers related to the patients, staff and the organisation.

Patient related barriers

Some elderly patients could not provide informed consent for the iPTC audit. Therefore, consent was required from the next of kin. When the next of kin was contacted, often they stated that they would not be in to visit the patient until the next day. This therefore delayed the process for the researchers as they would have to wait until the next day to undertake the audit. In many instances the elderly patient was discharged home, transferred to another ward that did not participate in the study or transferred to another hospital. Therefore, many elderly patients had to be excluded from the audit.
Nursing staff related barriers

Some nursing staff felt it was not their duty to complete the iPTC when a previous nurse had commenced it. This meant that many forms were not completed. Some nursing staff also felt it was not their role to complete the iPTC if the patient was not transferred during their shift and often stated it was the responsibility of the nurse who actually received the patient. These problems became challenges for the researchers and for the study as the adherence rate for the iPTC were affected. It also demonstrated that nursing staff did not understand that the aim of the iPTC was to ensure continuity of care and could be completed by any member of staff caring for the patient.

Some nursing educators on the wards were unhappy with the project, as they felt their ward was too busy. This may have impacted on adherence rate by their staff. Some staff members saw the iPTC as a negative form and complained about its implementation. Nursing staff often voiced that they did not have time to complete the iPTC as they were too busy. They mentioned that there was already too much paperwork and the iPTC was just another form they had to fill in. The surgical wards voiced their concerns that they were extremely busy, as they have a high turnover of patients from medical wards and intensive care.

Organisational barriers

During this study, a new form, the Adult Admission and Discharge Assessment Form, was introduced by the NSW Department of Health (Sydney South West Area Health Service, 2008b), which may have affected the adherence to the iPTC.
It may be that nursing staff already had the NSW Adult Admission and Discharge Assessment Form on their minds when the iPTC study commenced, which may have contributed to the negative reviews. For example, some staff members thought that the iPTC was the NSW Health form. These challenges required strategies to be developed during the study process to maintain the participation rate.

### 7.9.6 Facilitators to improving adherence to the iPTC

Strategies introduced to maintain rigour and to ensure completion of the study included: (1) contacting family members and obtaining consent; (2) gaining support from ward staff including the education of nurses and clerks; and (3) gaining organisational support.

#### Support from families

The next of kin was contacted and a one-on-one information session to explain the study and obtain consent was scheduled.

#### Support from nursing staff

Gaining support from Clinical Nurse Educators was essential during the study to ensure the cooperation of nursing staff and the completion of the iPTC. Educators were able to notify nursing staff of the iPTC study and those unable to attend ward in-service sessions were informed of the location of information booklets. Clinical Nurse Educators also reminded and encouraged their staff to
complete the iPTC when patients were transferred. This may have increased the numbers of iPTCs completed.

**Support from clerical staff**

Ward clerks in the ED were very supportive and attached the iPTC to each patient’s admission form as a reminder to complete the form. Ward clerks in the medical and surgical wards encouraged the completion of the form by including the iPTC in the wards’ already made ‘package’ of medical notes for admitted patients. Clerical staff also assisted in the collection of forms for discharged patients, removing the form from the patient’s medical notes and giving it to the researchers.

**Organisational support**

Whilst support from the director of nursing was provided, leadership for the study was facilitated by the NUM of each ward. The researchers visited the NUMs’ meeting to provide ongoing input on the study. The Clinical Governance Unit also provided support by providing a link to the study on the hospital intranet and regularly updating nursing staff on the study through the hospital memos.
7.10 SUMMARY OF SURVEY RESULTS

The survey results indicated that nurses in the study were generally satisfied with the iPTC, particularly nurses from the medical and emergency wards. This showed that the form has sustainability in the ward setting and has particular relevance to the medical ward. Although the surgical wards found the iPTC not useful or sustainable, they represented a very small sample in the survey. The iPTC has relevance to the clinical environment and would require in-depth education, training, and all networks working together to make the ingredients of a successful form, that does reduce errors and adverse events during transfer.

The iPTC was regarded as useful and practical, although the perceptions of nurses varied. Challenges experienced during the study are not unusual when undertaking clinical research (Benn, et al., 2009; Chan, Wong, et al., 2008; Lingard, et al., 2006). Resolving the challenges led to a better understanding of the necessity to involve clerical staff in the implementation of the form, and understand that internal factors, in the study surroundings, can reduce or influence adherence to or sustainability of the form. In this study, internal factors included the fact that the nurses felt “anxious”, “worried” and “tired” as they were to have a new, “larger”, unfamiliar form implemented soon. This led to many negative reviews and perceptions of “oh no, not another form”.

However, the pilot iPTC findings had enabled the researchers to understand the complexity and patience required to implement a communication transfer form in the clinical environment. The next section of this chapter presents the discussion of the findings.
7.11 DISCUSSION

The study was undertaken in a tertiary hospital to pilot test the feasibility of an iPTC for patients transferred from the ED to the medical and surgical settings.

The specific aims were: (1) to assess adherence to the iPTC; (2) to identify errors experienced during transfer; (3) to evaluate the sustainability of the intervention in the ward environment; (4) to identify barriers and facilitators to the iPTC; and (5) to identify limitations to the iPTC intervention. Each of these aims has been achieved and is discussed below.

7.11.1 Adherence to completion of the form

There is limited literature on the process of transferring patients between wards, with much of the literature focusing on the discharge of elderly patients from the ED to home or residential aged care settings. The results of adherence determine confirmation and acceptance of the iPTC by nurses, although forms were more likely to be completed in the receiving ward (medical and surgical wards) than the transferring ward (ED). The transferring ward’s adherence to completing the iPTC ranged from 35% to 50%, compared to 39% to 93% by the receiving ward. Although the surgical ward adhered to completing the iPTC, it was not conveyed with satisfaction when compared to the medical wards and ED. Nevertheless, the level of adherence reported in other studies that looked at nurses’ adherence to completing forms varied from 47% to 74% (Terrell, et al., 2009), which was a similar to this study.
Several studies (Pronovost & Faden, 2009; Richman, et al., 2009; Schedlbauer, et al., 2009) found that completion of the necessary documents for the elderly patients by staff in ED were often missed, which had the potential for human error to occur due to fragmented care processes. This is of special concern, because ageing patients, particularly the frail or vulnerable, are often the most medically challenging, time consuming and costly to treat (Valentin, et al., 2009). Here, the first point of contact by elderly patients within a tertiary care setting is the ED. Therefore, there are implications for not assessing falls, discharge planning and allied health referrals in nursing practice. These patients are more likely to have increased presentations of falls (Bolch, et al., 2005) and complications (Fortinsky, et al., 2004; Gill, Zou, Jones, & Speechley, 2009). Failure to complete risk screening prior to discharge can lead to increased readmission to the ED after discharge (Dedhia, et al., 2009; Forster, et al., 2007). Patients not referred to the appropriate allied health services may also experience sub-optimal health outcomes. This event also demonstrates ineffective multidisciplinary teamwork (Fairbanks, Bisantz, & Sunm, 2007; Hart-Hughes, et al., 2004). For instance, a timely and accurate assessment by the speech therapist can assist with swallowing, diet modification, speech and language skills. A vital component of this care is the prevention of aspiration pneumonia (Dunnion & Kelly, 2008). Therefore, undertaking assessments on functional impairment is likely to contribute to effective care and improve outcomes (Arora, et al., 2007).
The audits revealed that although the majority of documents such as admission, clinical records, up to date nursing notes and current medication charts were present in the patient’s medical records, these items were not checked on the iPTC. This finding is consistent with other trials undertaken in nursing documentation (Currell & Urquhart, 2007; Karkkainen & Eriksson, 2005; Pearson, 2003) that suggests nurses are ‘doers’ and often fail to document the work they do. A systematic review (Currell & Urquhart, 2007) provided accounts on the need for nurses to acknowledge documentation as an essential part of nursing practice. Parson’s (2003) agreed and indicated that nursing has an oral tradition of eschewing the written word and over-reliance on memory by handing down both information and knowledge by word of mouth. These have implications on nursing practice and the iPTC could serve to improve adherence to the nursing care plan and clinical guidelines. This means that in the absence of errors and adverse events, there is evidence to demonstrate that these documents accompanied elderly patient’s when they are transferred. According to Johnstone & Kanitsaki (2006 p. 5), there is an “inseparable link between nursing practice and patient safety”.

An intervention study by Kärkkäinen and Eriksson (2005) found that the purpose of documentation is to verify how the decisions involving nursing care and subsequent actions came about. In this study, intravenous cannula record forms were frequently not completed, next of kin were often not informed of patient transition, patients’ own medications were often regarded as lost or misplaced and patients’ belongings were often missing. Each of these items has an effect
on the health care system in response to the quality of nursing care, as well as financial, social and political implications (Duckett, 2008). It also reflects the nature of care in the hospital, which is that some forms are considered more critical than others when it comes to transferring patients to another site. It is unclear that these items would have been picked up if it was not the iPTC.

The effectiveness of the iPTC was illustrated through adherence. Although adherence was not considerably high in the transferring ward, it was important to note that the receiving ward had the means to ensure a follow-up with information and patient care. For example, the receiving ward reported that 11% of patients did not have the necessary equipment with them upon transfer. This aspect of the iPTC was considered innovative as no existing forms in the current tertiary hospital had such a component for verification, check backs and read backs.

During the two week period, the iPTC were completed for only two patients who were transferred from ED to residential aged care facility. Nurses from the medical and surgical wards also failed to complete an iPTC on patients that were discharged to a residential aged care facility. As a result of this poor adherence to the iPTC, analyses of the findings were not presented. The poor adherence to iPTC completion on patients’ discharge to the residential aged care facility has been supported by several other studies (Petridou, Manti, Ntinapogias, Negri, & Szczerbinska, 2009). One particular study (Pronovost, Needham, et al., 2006), which introduced a checklist to decrease catheterisation infection in critical and
surgical patients, found that clinicians were reluctant to use the checklist. They indicated that it would delay care, interfere with care delivery and would not make a difference to the rate of errors and adverse events. However, implementation of that checklist showed a reduction in nosocomial infection from a baseline 0.62 to 0.34 at 16 to 18 months, and reduced associated costs of care for treating infection. Consequently, this shows the potential determinants of adherence to the iPTC: (1) attitudes, social influences and time factor, for example, staff not seeing residential aged care facilities as a critical component of care; (2) the lack of adherence could have been influenced by a major form that was to be implemented after the study duration, as most nurses in the study made negative remarks on the new form; (3) nurses’ willingness for ‘change’ and persistence in retaining their old ways of care could have led to incomplete iPTCs; and (4) the lack of a patient safety culture in the clinical environment would have contributed to low completion rates of the iPTC.

7.11.2 Errors identified in the transfer process

Assessment of a falls risk status is determined as a critical aspect of an elderly patient’s care (Spice, et al., 2009). It was not the intent of this study to evaluate nurses’ work, however, but to determine whether the iPTC promoted structured communication between care sites by reducing the likelihood of errors at transition. In this study falls assessment was not completed for 13% of the patients. This finding is significant because one of the study findings was that the ED did not commence a fall risk assessment or order a pressure area mattress for any of the frail, elderly patients who had been in their care for 24 hours. For
example, pressure area assessments showed that 15% of patients had not been ordered a ‘pressure mattress’ after 48 hours. Pressure area assessments are an effective means of identifying elderly patients who are at risk of developing pressure sores or ulcers. The development of pressure sores are not only expensive to treat, but they also cause an increased burden for the elderly patient and can lead to poor physical and emotional care outcomes. Pressure sores and ulcers are one of the commonest preventable adverse events in elderly hospitalised patients (Keller, Wille, van Ramshorst, & van der Werken, 2002; Lyder, et al., 2001). The nurses in this study were informed by the researcher that a risk assessment had not been done when an assessment demonstrated that patients required a ‘special’ mattress. Although this may not be viewed as an adverse event, it has the potential to compromise patient safety and quality care.

Similar studies (Morandi, et al., 2009; Noland, Rickles, Noland, & Rickles, 2009; Priebe, et al., 2009) highlighted that assessment for risk of falls and pressure ulcers in the ED was crucial for their prevention and management. This finding from the study has prompted the policymakers within the hospital to make an assessment for falls risk and pressure ulcers mandatory in the study ED. In addition, a random audit is currently in place to ensure that these assessments are being carried out.

An interesting finding from this study was that all medication charts were transferred with the patient or received in the ward within 48 hours of transfer.
This is an important finding, as Valentin et al (2009) demonstrated that when a medication chart did not accompany the patient when transferred, that omission frequently resulted in delayed medication administration and the failure to administer medications.

The iPTC was effective in enabling the receiving ward to determine and record what had happened during transition. This was deemed essential to improving elderly patients’ care outcomes and the quality of the health care system (Conerly, 2007). For instance, the receiving ward was able to clearly identify those five elderly patients who required a nurse escort but who arrived at the ward alone with the ward orderly. They were able to follow-up patients transferred without a telephone handover and those who arrived without the necessary equipment. These safety measures of the iPTC facilitated the transferring and receiving ward to work in partnership and to determine what has occurred between transfers. However, this process of continued follow-up could lead to nurses in the receiving ward experiencing poor work satisfaction and related frustration over repetitive tasks. Kowalczyk (2009) stated that the drawback of a checklist is that the procedure could become routine and that nursing staff may go through the motions of checking the form without really confirming each item.

At the time of this study, there was only one Aged Care Service Emergency Team (ASET) nurse in the ED and the nurses in the ED did not consider discharge screening as part of their role for the care of elderly patients. This lack of
awareness could have led to that aspect of care being missed. Allied health referrals were not commencing in the ED, yet these were mentioned on the iPTC and followed up by the receiving ward. This result indicates that the iPTC, if completed, can be a useful communication channel or tool. Recommendations 50, 51 and 52 from the Garling Report on acute care services in NSW public hospitals pinpoint the importance of coordinated care, systems for improving the recording of patient care, structured, simplified care plans for individual patients and for patients to have an understanding and knowledge of treatment and follow-up plans (Garling, 2008). Additionally, the Garling Report recommended the mandatory provision of discharge summaries to general practitioners, and the importance of communicating with patients, carers or next of kin (Garling, 2008). Therefore, the iPTC serves to act as a tool that adheres to the recommendations of the Garling Report, aiming to coordinate care at the transferring and receiving ends.

According to Taylor (2008), for patients to receive quality care, nurses and other health care professionals need access to accurate and pertinent information. Twelve patients’ x-rays were missing during the audit, which could be because they had been taken to another ward for review by a team of experts, or left behind on the previous ward. This result is similar to a study (Cosby, 2006) conducted on x-rays and medical equipment in the hospital.

Patients’ own medications, dentures, spectacles, hearing aids and walking frames were the commonest items misplaced or lost during transfer. It is widely
recognised that most medication errors occur as patients move between the various interfaces of care, such as from the community to the acute hospital (Planton & Edlund, 2010; Pronovost, et al., 2003). Medical practitioners often use a patient’s own medication to find out the medications patients are currently taking at home (Norstrom & Brown, 2002). Medications are to be returned to the patients’ families or be stored in the appropriate storage and returned to patients when they are discharged from the hospital (Sydney South West Area Health Service, 2005b). However, patients’ own medication often does not follow them throughout their hospital journey (Wong, et al., 2008). When patients reach full recovery and are ready for discharge, they find their medications are missing. The problem is that most hospitals do not have a system of tracking medications brought from home by the elderly patients (Murphy, Oxencis, Klauck, Meyer, & Zimmerman, 2009). A study (Chan, Taylor, Marriott, & Barger, 2008) supported this view in which paramedics found it useful for patients to bring their medications along on the transfer to the ED. They stated that it assisted prescribing accuracy and medication reconciliation. However, half of the paramedics indicated they asked patients to leave their medications at home for fear of staff members losing their medications during hospital stay.

Loss of personal belongings is also quite common in the clinical setting. A BBC news report (2008) stated that an 88 year old patient was unable to eat properly for three weeks as her dentures were lost during transfer within a hospital. Another (Slattery, 2007) media report indicated that a 90 year old patient died of
associated malnutrition after his dentures went missing for a number of weeks. The family attributed the death to the loss of the dentures. These patients’ stories are not unique. Many elderly patients are caused considerable distress and are unable to carry on their daily living activities because their assistive devices are missing or misplaced (Mynors-Wallis & Davis, 2004).

What is unknown to many health care practitioners is that dentures take several weeks, even months, to be fitted by a dentist. In addition, the replacement of dentures is costly, and the health care service may agree to cover the cost of missing dentures, but not in all cases. As well, missing dentures could lead to a delay in swallowing, oral intake and the progress to optimal health (Bader, 2009). A study (Kanehisa, Yoshida, Taji, Akagawa, & Nakamura, 2009) showed that patients who had dentures whilst in hospital had adequate oral function and improved nutritional intake. In contrast, patients without their dentures were at a higher risk of hospital acquired malnutrition. Michaeli, Davis and Foxton (2007) highlighted that in their eight month study, 21 patients lost their dentures during their hospital stay and many had had their dentures for over 10 years. The appropriate use of the iPTC might help in preventing the loss of dentures.

Hearing aids, spectacles and walking frames are assistive devices that also assist individual elderly patients to be active in their care (Timehin & Timehin, 2004). Yet these items are included in the list of most common items missed during transfer, and impact on prognosis, well-being and quality of life. This indicates a very deeply situated problem in the health care system and that adequate
measures to rectify or reduce its occurrence have not been put into place. Although in this study approximately 25 items of patient belongings were considered missing, it could be argued that the iPTC assisted in the follow-up of these items. These findings also indicated that the nurses may not have used the iPTC to ensure continuity of care, that is, checking the transferring section of the form and adhering to the principles of the form.

7.11.3 Usefulness of the iPTC

The survey of nurses had an adequate response rate and is therefore a strong indicator of nurses’ perceptions. The iPTC was regarded as useful by the nurses, as it assisted them in communicating during transfer and admission of patients. It also aided in completing documentations, referrals and assessments of patients. The iPTC was highly accepted by staff in the medical wards and ED, compared to the surgical wards. The comments from the surgical wards showed that the iPTC was basically irrelevant to their ward setting due to the multiple admissions of patients. However, the sample was very small and might have captured a biased proportion of shared beliefs. Nonetheless, their feedback served as a catalyst to improving the iPTC for a larger study.

Seventy three percent of nurses in the survey found that the iPTC prompted communication with other nurses. The iPTC, as a measure of continuity of care, was influenced when nurses failed to complete an ‘already started form’ and, as a result, treatment could be delayed or duplicated (Valentin, et al., 2009).
7.11.4  Satisfaction with the iPTC in the ward environment

The sustainability of the intervention was measured using a satisfaction tool. Greenberg et al (2007) indicated that nurses’ satisfaction has a positive correlation to their work environment, culture and ethics. The majority of nurses (69%) in this study were satisfied with the iPTC. Shrank et al (2009) reinforced the need for researchers to examine satisfaction feedback from nurses and to make changes to clinical structures and processes based on it. Therefore, the feedback received on the iPTC — that it was too long and complex — was taken into account and the form will be modified prior to the implementation of the larger study.

Only 47% of nurses indicated that they would use the iPTC again, with the majority of those being nurses from the ED. Half of the nurses in this study expressed the desire to recommend the iPTC to other wards, which illustrated the sustainability of the iPTC. Nurses’ willingness to use the iPTC again was reflected in their comments. Their feedback was that the iPTC was effective and practical, yet the perceived increase in workload and time spent may affect the sustainability of the form in the long term. This finding is congruent with other published studies (Spice, et al., 2009).
7.11.5 Barriers and facilitators

A number of factors were identified that impeded the recruitment process, including the limited timeframe provided to the researchers by the Director of Nursing. Prior to and during the research study, the research team made extensive efforts to develop strong professional relationships, trust and explicit communication strategies with the staff in the participating wards. This was a major facilitator during the recruitment process. In-service sessions about the study were provided by the researchers and were attended by most members of the nursing team. Commitment from the participating wards was obtained, which involved the educator liaising with nursing staff to encourage iPTC completions. This method was advantageous as it ensured that the researchers were not advocating for completion of forms; rather, the iPTC was integrated into the care process as much as possible. The next section will discuss the limitations of the study, its implications and reforms and, finally, the conclusion of the chapter.

7.12 LIMITATIONS OF THE STUDY

As with any pilot project, this study had limitations. Firstly, the timeframe for the study was short, which resulted in recruitment of a small sample size and poor adherence to the completion of the iPTC. Secondly, the effectiveness of the iPTC for promoting communication between nurses was determined based on the nurses’ survey feedback. Perhaps a more statistically measure would have enhanced the correlation of the iPTC to communication. However, given that
the purpose of the pilot study was to test the feasibility of a tool to promote the safe transfer of elderly patients by enhancing communications, the study gives insight into how to focus future studies.

7.13 IMPLICATIONS FOR PRACTICE

Fragmentation of care severely impacts on elderly patients, especially during transfer of care. The iPTC is a comprehensive and structured approach based on the human error theory and the concept of planned communication. Although small, the findings of this study demonstrate that the iPTC was useful in reducing the incidence of errors and adverse events. This promotes the safe transfer of elderly patients.

7.13.1 Implications for the conduct of a larger trial

Suggestions for improvement that will enable the success of a larger multicentre trial include:

1. Comprehensive training and education of all nurses in the hospital about how to use the iPTC for elderly patients and the importance of completing the iPTC.
2. The formation of a surgical nurse’s panel, to explore how the iPTC could be implemented and targeted to their ward environment.
3. The study should be multi-sites involving a large number of nurses.
4. The hospital management department or clinical governance unit should develop policies to promote the safe transfer of elderly patients between care sites.
7.13.2 Reforms based on findings of this study

The hospital involved in this pilot study has reviewed its policy as a result of the study’s findings.

1. Mandatory falls risk and pressure ulcer risk assessments are now completed on patients in the ED.

2. Two ASET nurses have been appointed to the ED to discuss discharge planning with elderly patients and relatives.

7.14 CONCLUSION

The overall aim of this research was to promote the safe transfer of elderly patients across care settings, using a variety of mixed methods. This chapter explored how the iPTC was able to track items transferred with elderly patients, how it encouraged communications between the transferring and receiving ward, and how it identified the nature of errors that occurred during the audit review. As a pilot study, it provides a glimpse of issues for elderly patients who are transferred across the health care system.
SAFE TRANSFER OF ELDERLY PATIENTS ACROSS CARE SETTINGS:

THE STEP STUDY

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A THESIS SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS OF THE DEGREE OF
DOCTOR OF PHILOSOPHY

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School of Nursing & Midwifery
College of Health & Sciences
THESIS CERTIFICATION

I, Martha Mansah hereby declare that the work presented in this thesis submitted in fulfilment of the requirements for the award of Doctor of Philosophy in the School of Nursing and Midwifery, College of Health and Science, University of Western Sydney to the best of my knowledge is wholly my own work except otherwise referenced or acknowledged. I certify that I have not submitted this thesis in part or fully for a degree in this or any other educational institution.

Signature

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Date

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M. Mansah  
26 August 2010
ABSTRACT

Patient safety has become a prime consideration for health care facilities since publication of the report ‘To Err is Human’ in 1999. Elderly patients are recognised as a high-risk group for errors and adverse events during hospitalisation, particularly as they move between settings to receive care for their comorbid and chronic conditions. With the ageing Australian population, incidence of errors and adverse events during hospitalisation remains of major concern and have significant implications for health care providers, individuals and their families. Commonly reported adverse events include errors involving medications and falls. Loss of patient information has been associated with nursing and medical mismanagement. At transition points, poor communication of medical information is responsible for 50% of all medication errors and 20% of adverse drug events in hospitals.

Researchers have developed various strategies to minimise errors and adverse events, with varying results. These strategies include the use of electronic computerised physician order entry, discharge planner and transition coordinators. Despite these strategies, errors and adverse events commonly occur during hospitalisation and the incidence is increasing, particularly for the elderly patients. Therefore, this study seeks to increase knowledge of factors that contribute to errors and adverse events as a result of elderly patients transfer across care sites. It aims to close a gap in the research literature by developing and implementing a practical, low cost strategy that promote communication during care transfer.

The overall aim of this thesis is to develop a strategy that promotes safe transfer of elderly patients across care settings (STEP Study). The study comprises three distinct, yet interrelated phases. An Audit of Errors and Adverse Events in Elderly In-patients at a Metropolitan Hospital was the first phase of study. The audit examined the incidence and types of errors and adverse events occurring in elderly patients admitted to a tertiary hospital between 1 July 2005 to 30 June
2006. This study identified that elderly patients are at high risk of errors and adverse events at that time. Poor communication was recognised as one of the major contributing factors in incidents. Phase two of the research was a systematic review, titled *The Effectiveness of Strategies to Promote Safe Transfer of Elderly People Across Care Settings*. The findings demonstrated that the presence of two factors can significantly reduce errors and adverse events during the transfer of elderly people: a comprehensive plan of care and the availability of well-trained healthcare practitioners for follow-up care and effective collaboration and communication between facilities. The findings from these studies informed phase three, which was the development and pilot testing of the *interactive Patient Transition Checklist (iPTC)*. A structured communication tool designed to improved transfer, monitoring, and planning for ongoing care. The pilot testing demonstrated the feasibility of iPTC intervention within an acute care setting.
ANTHOLOGY OF PAPERS ASSOCIATED WITH THIS THESIS

CONFERENCE PRESENTATIONS


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<td>Area Health Service</td>
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<tr>
<td>CI</td>
<td>Confidence Intervals</td>
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<td>CTI</td>
<td>Care Transition Intervention</td>
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<td>ED</td>
<td>Emergency Department</td>
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<tr>
<td>IIMS</td>
<td>Incident Information Management System</td>
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<tr>
<td>IOM</td>
<td>Institute of Medicine</td>
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<tr>
<td>iPTC</td>
<td>interactive Patient Transition Checklist</td>
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<tr>
<td>NHS</td>
<td>National Health Service</td>
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<tr>
<td>NH&amp;MRC</td>
<td>National Health and Medical Research Council</td>
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<td>NSW</td>
<td>New South Wales</td>
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<td>NSW DoH</td>
<td>NSW Department of Health</td>
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<tr>
<td>PCE</td>
<td>Potentially Compensable Event</td>
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<tr>
<td>RCA</td>
<td>Root Cause Analysis</td>
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<td>RIB</td>
<td>Reportable Incident Brief</td>
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<tr>
<td>RR</td>
<td>Relative Risk</td>
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<tr>
<td>SAC</td>
<td>Severity Assessment Code</td>
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<tr>
<td>SR</td>
<td>Systematic Review</td>
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<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>SSWAHS</td>
<td>Sydney South West Area Health Service</td>
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<tr>
<td>UTI</td>
<td>Urinary Tract Infection</td>
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<tr>
<td>WMD</td>
<td>Weighted Mean Difference</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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<td>Term</td>
<td>Definition</td>
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<tr>
<td>Adverse event</td>
<td>A consequential bad outcome, an injury (harm) to the patient, in response to an error that occurs during the process of care (Sheikh &amp; Hurwitz, 2001).</td>
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<tr>
<td>Care settings or setting</td>
<td>Refers to hospitals, wards within hospitals or residential aged care facilities (Crotty, Rowett, Spurling, Giles, &amp; Phillips, 2004).</td>
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<tr>
<td>Culture</td>
<td>The configuration of attitudes, values, beliefs, meanings, behaviours and practices which together can be seen to be definitive of ‘what people are’ or ‘where people come from’. Culture can be seen as a ‘state’ or something people possess, while it appears more fruitful to regard it as a performance and also a process (Braithwaite, et al., 2006).</td>
</tr>
<tr>
<td>Continuity of care</td>
<td>Describes effective communication in the movement of patients and information across primary secondary and tertiary care boundaries (Ellitt, Brien, Aslani, &amp; Chen, 2009).</td>
</tr>
<tr>
<td>Disability</td>
<td>A temporary or permanent impairment of physical or mental function or economic loss in the absence of impairment (Mills, Boyden, &amp; Rubamen, 1978).</td>
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<tr>
<td>Elderly</td>
<td>Refers to people aged 65 years and over (Australian Bureau of Statistics, 2009).</td>
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<tr>
<td>Error</td>
<td>A failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. It does not have to result in an adverse event (Sheikh &amp; Hurwitz, 2001).</td>
</tr>
<tr>
<td>Fragmented Care</td>
<td>Described as a poorly executed transfer where there is a breakdown in care continuity, conflicted recommendations regarding treatment management and practitioners in different settings operating independently with no common care plan (Coleman, et al., 2004).</td>
</tr>
<tr>
<td>Human Error theory</td>
<td>Is organisation practice to underpin system design and individual performances that aims to prevent errors and adverse events (Armitage, 2009a, 2009b).</td>
</tr>
<tr>
<td>Iatrogenic</td>
<td>An injury caused by medical procedure that was not the natural consequences of the patient’s disease (Steel, Gertman, Crescenzi, &amp; Anderson, 2004).</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>Incident Information Management System (IIMS)</td>
<td>is a database used by health professionals e.g. nurses, doctors to record, review and monitor errors and adverse events (Braithwaite, et al., 2006).</td>
</tr>
<tr>
<td>Incident</td>
<td>An unplanned event resulting in, or having the potential for, injury, damage or other loss (Braithwaite, et al., 2006).</td>
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<tr>
<td>Medical Records</td>
<td>These contain a patient’s progress notes written by clinicians, medications charts, investigation of scans and blood results.</td>
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<tr>
<td>Near miss</td>
<td>When harm is prevented (Conerly, 2007; Kaplan &amp; Rabin Fastman, 2003).</td>
</tr>
<tr>
<td>Patient safety</td>
<td>A practice that prevents unintended harm to patients and uses current scientific evidence, knowledge and patients’ preference to provide best optimal care (Kohn, Corrigan, &amp; Donaldson, 2000).</td>
</tr>
<tr>
<td>Patient safety culture</td>
<td>Approaches that enable individuals and health facilities to develop and emphasises changes or improvement in clinical practice and management (Kline, Willness, &amp; Ghali, 2008).</td>
</tr>
<tr>
<td>RCA</td>
<td>Root Cause Analysis (RCA) – incidents that had, or could have, detrimental outcomes undergo an RCA, whereby in-depth investigations are undertaken on the errors or adverse events and recommendations provided (NSW Department of Health, 2005a).</td>
</tr>
<tr>
<td>SAC</td>
<td>Severity Assessment Code (SAC) – a risk matrix used to stratify the consequence and likelihood of an incident to generate a numerical rating from 1 to 4 (NSW Department of Health and the Clinical Excellence Commission, 2009).</td>
</tr>
<tr>
<td>System approach</td>
<td>This recognises errors and mishaps as consequences, not causes, and deals with failings at an organisational level (de Vries, Hollmann, Smorenburg, Gouma, &amp; Boermeester, 2009; Reason, 2000).</td>
</tr>
<tr>
<td>Tertiary hospital</td>
<td>A tertiary hospital refers to a full complement care services including paediatrics, general medicine, and various branches of surgery and psychiatry (South Western Sydney Health Network, 2004-2008).</td>
</tr>
<tr>
<td>Transfer or transition</td>
<td>The movement of a patient from one setting of care to another e.g. between services in a hospital and other settings.</td>
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CHAPTER 1

Background and significance of the study
1.1 INTRODUCTION

The elderly frequently transfer between health providers as their needs change during the course of a chronic or acute illness. They are at particular risk of errors and adverse events when they move between care settings (Parrish, O'Malley, Adams, Adams, & Coleman, 2009).

This thesis reports on the development of a pilot study intervention to promote the safe transfer or transition of elderly people between care settings. The term transfer or transition in this thesis refers to the movement of elderly patients between health care practitioners and settings. In addition, settings or care settings in this thesis relates to hospitals, wards within hospitals or residential aged care facilities (Crotty, et al., 2004). Throughout the thesis, the term elderly refers to people aged 65 years and over.

This chapter provides the profile of the elderly population living in Australia. It discusses the underlying reasons for elderly patients’ vulnerability during transition. It introduces the reader to the study by providing background to the thesis, describing the study aims and objectives. Further, the significance of the thesis is examined and, in doing so, sets the scene for the following seven chapters.
1.2 PROFILE OF ELDERLY AUSTRALIANS

In August 2010, the Australian population reached 22,415,755 people (Australian Bureau of Statistics, 2010). The population in 2006 included 2.7 million Australians aged 65 years and over, representing 13% of the population (Australian Bureau of Statistics, 2006). Of these, 52% were aged 65 to 74 years, 36% were aged 75 to 84 years and 12% were aged 85 years and over (Australian Government Department of Health and Ageing, 2007). Women made up a greater proportion (55%) of older Australians, and their predominance increases with age. In 2006, the proportion of females aged 65 to 74 years, 75 to 84 years and 85 years and over age were 51%, 56% and 67%, respectively (Figure 1). By 2036, the number of people aged 65 years and over is expected to more than double, from 2.7 million to 6.3 million, and will represent 24% of the Australian population (Australian Bureau of Statistics, 2006; Australian Institute of Health and Welfare, 2007; Australian Patient Safety Foundation, 2000).

![Figure 1: Percentages of age categories of elderly Australians, females and males](chart.png)
The increasing proportion of elderly Australians is a well-recognised demographic change which is projected to have major effects on population health, economic growth and government expenditure (Australian Institute of Health and Welfare, 2007; Australian Pharmaceutical Advisory Council, 2000a).

1.3 PATIENT SAFETY

In October 1999, the Institute of Medicine (IOM) released “To Err is Human: Building a Safer Health System”, which highlighted patient safety as a practice that prevents unintended harm to patients, and uses current scientific evidence, knowledge and patients’ preference to optimise care (Kohn, et al., 2000). The IOM report highlighted the causes and identified the effects of fragmented care, a scenario that is common in the health system (Kohn, et al., 2000). Fragmented care is described as a poorly executed transfer where there is a breakdown in care continuity, conflicted recommendations regarding treatment management and practitioners in different settings operating independently with no common care plan (Coleman, et al., 2004).

International studies identified that up to 98,000 people die in hospitals each year due to medical errors. Many more are seriously harmed (Leape, et al., 1991; Regenstein, 2004; Thomas & Brennan, 2000a; Valentin, et al., 2009). Lack of communication, poor coordination and discontinuity of care between settings were frequently implicated as contributing to errors and adverse events. The report reviewed the literature on the basis of two large population-based chart
review studies, and estimated that adverse events occur in 2.9% (Thomas & Brennan, 2000b) to 3.7% (Leape, et al., 1991) of hospitalised patients. The report ascertained that, despite the errors and adverse events, the health system remains static and has employed few risk management strategies to improve patient safety (Valentin, et al., 2009). These errors and adverse events have been compared to the holes in the various layers of Swiss cheese in which, without defence, errors occur that sometimes harm patients (Reason, 2000). These errors and adverse events have until now been identified as shortcomings of the system rather than the individual clinicians’ responsibility. The *system approach* sees errors and mishaps as consequences, not causes, and deals with failings at an organisational level (de Vries, et al., 2009; Reason, 2000).

*Errors* are defined as the failure of a planned action to be completed as intended or the use of an inappropriate plan to achieve an aim (Sheikh & Hurwitz, 2001). *Adverse events* are defined as a consequential bad outcome, an injury to the patient, in response to an error that occurs during care (Kohn, et al., 2000). Error does not lead to adverse events in all cases. However, for adverse events to take place, an error must have occurred. Errors and adverse events have often been attributed to poor communication of medical information (Institute for Safe Medication Practices, 2005; Rozich & Resar, 2001). Moreover, changes in practice, professional incompetence, a failure to decide or act appropriately on available information and the violation of policies, have regularly occurred, in isolation or in combination (Benner, et al., 2002). Errors and adverse events have also been associated with inadequate numbers of staff or an inappropriate
staff mix, individual work overload, a high staff turnover, a stressful environment and inadequate supervision from senior staff (Kendall-Gallagher & Blegen, 2009; Lang, Hodge, Olson, Romano, & Kravitz, 2004). In addition, errors have been associated with problems in products, procedures, and systems (Australian Pharmaceutical Advisory Council, 2000b).

Following the IOM report, patient safety has become recognised globally as a health care priority (World Health Organisation, 2006), yet the incidence of adverse events encountered during hospital admission, especially in elderly patients, remains high. These events often occur through discontinuity of care, which threatens the safety and quality of patient care (Chu, Brown, & Lukin, 2009). For these reasons, patient safety in the Emergency Department (ED) and during the transfer to other settings is one of the highest risk areas (Beach, Croskerry, & Shapiro, 2003; Smits, Groenewegen, Timmermans, van der Wal, & Wagner, 2009). Elderly people make up the bulk of emergency presentation. Ambivalence in the emergency environment and lack of standardisation in the transition process has been implicated as predisposing factors (Horwitz, et al., 2009). Additionally, ED staff are simultaneously caring for numerous patients with highly variable needs and conditions, which requires a shifting and resetting of the nurses’ cognitive frame and communicative approach (Beach, et al., 2003). The Garling’s report (2008) on acute care services in New South Wales (NSW) public hospitals attested to what had been summarised in the IOM report (Kohn, et al., 2000) that (1) lack of cohesion, (2) continuity of care and (3)
communication breakdown between EDs and the medical and surgical wards are considerable barriers to patient safety.

Studies of hospital patients have demonstrated that errors and adverse events are common. The adverse event rate in hospital admissions has been estimated to range from 3% to 17%. A quarter to a half of the adverse events was considered preventable. These studies (Chapter 3) were conducted in the USA (Brennan, et al., 1991; Brennan, et al., 2004; Thomas, et al., 2000), Australia (Wilson, et al., 1995), the United Kingdom (Vincent, Neale, & Woloshynowycz, 2001), Denmark (Schioler, et al., 2001), New Zealand (Davis, Lay-Yee, Briant, & Scott, 2003; Davis, et al., 2001) and Canada (Baker, et al., 2004; Forster, et al., 2004). These studies have increased the urgency to improve patient safety in the health system. A recent study (Aranaz-Andres, et al., 2008) undertaken in Spain retrospectively examined 24 hospitals, with a total sample of 5,624 medical records, to screen for adverse events. Among patients with adverse events, 18% suffered more than one adverse event, many of whom required an increased hospital stay and readmission. Elderly patients aged 65 years and over demonstrated a higher frequency of experiencing adverse events than younger patients.

It is important to learn from reported incidents. The World Health Organisation and World Alliance for Patient Safety Report noted that the incident information reporting system is in place for clinicians to learn from experience: “...it is important to note that reporting in itself does not improve safety. It is the response to reports that lead to change” (2005 p.12). A plethora of research has
demonstrated that errors are far from being random and instead fall into recurrent patterns. Incidents of the same type that have occurred repeatedly feature the same set of circumstances that provoked the mistakes, regardless of who was involved (National Health Service, 2000). These factors stem from an organisation’s policies and procedures, the culture of the workplace and the approach of management towards risk and continuous improvements processes (Leape & Berwick, 2005; McDonald & Leyhane, 2005).

Human errors in nursing and medical care are usually unavoidable. In some high-risk industries such as aviation, to reduce the rate of serious accident, the Human Error Theory (Reason, 2000) underpins organisational practice and individual performances (Armitage, 2009a, 2009b). The aims are to design systems to prevent errors from leading to adverse events. Errors should be caught and their consequences neutralised before they manifest as adverse events (Chapter 4). Systems are typically developed and operated with the assumption that errors can or will occur. Therefore, health services around the world have introduced various strategies to reduce the incidence of errors and adverse events and to promote clinical patient safety (Aranaz-Andres, et al., 2008; Mendes, et al., 2009; Perez Blanco, et al., 2009). In Australia, many quality assurance programs, including chart audits of clinicians’ work and surveys of patients on their clinical care experiences, have been used to improve work performances (Marshall, Harrison, & Flanagan, 2009). In NSW, the implementation of the Incident Information Management System (IIMS) and the Root Cause Analysis (RCA) databases are strategies used to record, review and monitor errors and adverse
events (Braithwaite, et al., 2006). Identifying the circumstances when the adverse events occur and finding solutions to the identified problems are key approaches to preventing incident occurrence (Runciman, 2002a).

The IIMS records all incidents in four categories: (1) clinical, (2) complaints, (3) property and (4) security and hazards. Each category includes staff, visitors and contractors (Jorm, Braithwaite, & Travaglia, 2006). Incidents entered into IIMS include unplanned events resulting in adverse events, for example ill health, complications from treatment, damage, disability, death, prolonged hospital stay or other loss. Potential errors and near misses — accidents that do not result in patient harm — are also entered into the IIMS database. Incidents that had, or could have, detrimental outcomes undergo an RCA, whereby in-depth investigations are undertaken and recommendations provided (NSW Department of Health, 2005a).

Understanding the causes and effects of incidents will help to identify the actions needed to reduce errors and adverse events, and may also indicate the people or organisations that are best placed to implement those actions (Conley, Jordan, & Ghali, 2009). Interventions as simple as an incident audit can provide useful information to drive quality improvement activities when the theoretical assumptions of human errors are used to underpins clinical practice (Weingart, et al., 2009). In industries in which communication failure can have major adverse consequences, such as rail, aviation and the military, one safety initiative has been the use of standardised transmission of information: a predetermined
structure is used to reduce the omission of important information, and involves an expectation on the part of the recipient of the order in which information will be given (Gardezi, et al., 2009; Lingard, et al., 2005; Long, Pearson, Page, & Jordan, 2008).

Health care needs to be made safer through simplification and standardisation of policies and procedures (Graves, et al., 2009), through the use of human error factors to develop systems that avoid reliance on memory (Farley, et al., 2008) and attention to the effects of human conditions on errors and organisation (Brady, et al., 2009). Such approaches would particularly enable individuals and health facilities to develop a patient safety culture which emphasises changes and improvement in clinical practice and management (Kline, et al., 2008)

1.3.1 Hospitalisation and elderly people

Elderly people are the highest users of all categories of health care (Wolff, Bourke, Campbell, & Leembruggen, 2004) and they are more likely to be admitted to hospital for management of chronic diseases and associated comorbidities (Pronovost, Thompson, Holzmueller, Lubomski, & Morlock, 2005). Consequently, elderly patients are often at risk of care fragmentation. The elderly experience the highest rate of errors and adverse events associated with transfer between care settings (Baker & Norton, 2004), which includes transition between hospitals, wards within hospitals and from hospitals to home and residential aged care facilities (Crotty, et al., 2004). A recent study (Smits, et al., 2009) found that 25% of errors and adverse events occurred in patients
transferred from the ED to other care settings. In Australia, among the elderly, the average number of visits to a physician is 8.6 annually per person, compared with around 4 per person for people aged under 65 years (Australian Government Department of Health and Ageing, 2007). Elderly Australians also have a higher rate of admission to hospitals than the general population. They are admitted for multiple reasons and their stay in hospital is typically longer (National Health Priority Action Council, 2006). Over the period 2005–2006, admissions of Australians aged 65 years or over represented 35% of all hospital admissions and 47% of all occupied bed days, although this age group comprises only 13% of Australia’s population (Australian Government Department of Health and Ageing, 2007).

Errors and adverse events reported involving the elderly are medication errors (Briesacher, Limcangco, Simoni-Wastila, Doshi, & Gurwitz, 2005; Cravens, et al., 2005; Reese, Hicks, McWilliams, Britton, & McKean, 2003); falls (Claflin, 2005b; Paniagua, Malphurs, & Phelan, 2006); medical errors (Barber, 2004); and confusion and agitation (Abdallah, Remington, Melillo, & Flanagan, 2008). Researchers have indicated that 15% of reported adverse events are related to medication errors (Wolff, et al., 2004), with approximately 60% of them occurring at key transitions: from ED to critical care, from residential aged care facility to hospital, from surgical unit to rehabilitation facility (Rozich & Resar, 2001). Likewise, when elderly patients are transferred from one environment (e.g. residential aged care facility) to another (e.g. medical ward), they have been reported increase in the incidence of falls. These are often related to changes in
the health care environment such as timings of medication rounds, types of nursing handovers, staffing ratios and even the patient unfamiliarity with the environment (Oliver, Healey, & Haines, 2010). Studies have reported that up to one third of adults living in the community who are aged 65 or older report at least one fall annually (Blomquist, 2006; Jeske, et al., 2006). Twenty to 30% of patients who suffer falls experience a decrease in functionality and mobility. In addition, half of these patients do not regained their previous level of functioning (Anstey, von Sanden, & Luszcz, 2006; Beland, et al., 2006; von Renteln-Kruse, Krause, Dieckmann, & Vogel, 2006).

Confusion and agitation during care transition are often unrecognised as contributing factors to adverse events. Although these states increase the complexity of care and increase the patient’s risk of poor outcomes during and after acute illness (McGilton, Rivera, & Dawson, 2003). Minimal evidence exists to guide best practice in the management of elderly patients presenting with confusion and agitation, and who are readmitted to hospital post-discharge or transferred between wards in a facility (Bourbonniere & Evans, 2002; Naylor, Stephens, Bowles, & Bixby, 2005). The underlying factors are usually associated with infection, delirium, or both (Bergmann, Murphy, Kiely, Jones, & Marcantonio, 2005; Cotter, 2005). However, inadequate information, failure to explain and give feedback to elderly patients on reasons for their transfer, or poor assistance in planning for discharge to home or care environments contribute to many elderly patients experiencing confusion or agitation (Cohen-Mansfield, Culpepper, & Werner, 1995; Crotty, et al., 2004).
Given the demonstrated association between elderly patient transfers and errors, considerable effort must be directed at making transitions safe. Recommendations to improve transitions include improving team awareness and communication, and exploring systems to facilitate effective transfer of relevant patient data (Beach, et al., 2003).

1.3.2 Reducing errors and adverse events

Barriers to effective care transitions have been identified and strategies to reduce their incidence and impact have been proposed (Coleman, 2003). These strategies are generally based on comprehensive plans of care and the availability of well-trained healthcare practitioners (Cook & Rasmussen, 2005) who have current information about the patient’s clinical status and care plan (Naylor, 2006). Other strategies include collaboration across and between health care institutions and a standard computerised pharmacist intervention. However, most health care facilities and providers function independently, without prior knowledge of previous services provided, treatment attended and recommendations made by other health care providers (Forster, et al., 2005). There is no standardised administration record or computerised database which records elderly patients’ medical history, past and current medications and any further care regime (Coldiron, et al., 2005). Adverse events attributed to poorly executed transfers compromise elderly patients and subsequently their families (Dunnion & Kelly, 2008).
Reviewing the IIMS and RCA are two methods used to examine unintended events or errors that could have harmed or did harm a patient (Smits, et al., 2009). The IIMS is an electronic system, available to all NSW Health employees through the Intranet of the Area Health Service (AHS), for recording all incidents that occur in the public health facilities.

Reducing adverse events and addressing potential and actual threats to elderly patient safety is a priority for health services. Hospitalised elderly patients are a known risk group for falls and medications errors. However, they should be identified and acknowledged as particularly vulnerable during transfer of care across clinical settings. The development of interventions that monitor and improve effective care transitions should involve care coordination, continuity and enhancement of communication between the multidisciplinary team and family members.

1.4 PROBLEM STATEMENT

Elderly patients move within and between facilities. Evidence demonstrates that patient safety can be compromised in the process (Coleman, 2003; Parry, Min, Chugh, Chalmers, & Coleman, 2009) resulting in an extended length of stay and unplanned readmissions (Coleman, Mahoney, & Parry, 2005; Forster, Murff, Peterson, Gandhi, & Bates, 2003). Reducing adverse events and addressing potential and actual threats to elderly patient safety is a priority for health services. However, if the quality of transitional care is to improve, research
needs to target the identified system weaknesses which include continuity of care across settings, identification of patients at risk and promoting collaboration between and within agencies. This study aims to improve the safety of elderly patient transition between care settings.

1.5 AIMS

The four major aims of the thesis are to:

1. Identify the occurrence of errors and adverse events in a tertiary hospital setting over a given period of time.
   - This aim was achieved by undertaking and analysing the IIMS and the RCA databases (Chapter 2).

2. Identify interventions demonstrated to minimise errors and adverse events during transfer of elderly patients between care settings.
   - A systematic review (Chapter 5) was undertaken of the best available evidence of strategies with demonstrated effectiveness to promote safe transfer of elderly patients associated with hospital transfer, discharge and follow-up. It was completed and published on the Joanna Briggs Institute database of systematic reviews (Mansah, Fernandez, Griffiths, & Chang, 2009).

3. Develop an intervention to promote the safe transfer of elderly patients.
   - This development led to a form called the interactive Patient Transition Checklist (iPTC). The iPTC followed extensive scrutiny: reviewing the literature, consulting with experts in the field, content validity and trailing of the form (Chapter 6).
4. Pilot test the iPTC intervention in the ED and medical and surgical wards of a tertiary hospital.

- The pilot study evaluated the feasibility of the iPTC in promoting communication from the ED to the medical and surgical wards (Chapter 7).

1.6 SIGNIFICANCE OF THE STUDY

The combination of complex diagnosis and frequent transfers between multiple care providers presents an increased risk of errors and adverse events for elderly patients. The New South Wales Department of Health, the Sydney South West Area Health Service and recommendations from ‘Final report of the special commission of inquiry: Acute care services in NSW public hospitals’ (Garling, 2008) each identified care fragmentation as one of the challenges compromising elderly persons’ safety in the NSW health care system.

This study provides direct best-practice evidence to reduce errors and adverse events in the elderly care transition. Therefore, the study is significant to the clinical sector and to elderly people across Australia. The study also pilot tested an intervention to improve communication between health care providers and facilities. The pilot test was designed as the basis for a large randomised controlled trial. The study provides a basis for policy change in the health system and assistance in the development of guidelines for the transfer of elderly patients.
The use of *multi methods* research is an innovation which enables many directions and multiple techniques to solve a problem (Almarsdóttir & Traulsen, 2009; Creswell, 2009). The use of combined quantitative (e.g. surveys) and qualitative (e.g. interviews) approaches also known as ‘mixed method’ were implemented (Burns & Grove, 2009). Although the qualitative component was a small part of the thesis, when combined with quantitative methods it provided comprehensive, collaborative evidence and added depth to the study.

### 1.7 STRUCTURE OF THE THESIS

This thesis uses three discrete yet interrelated investigations to add to existing knowledge, identify future strategic directions for stakeholders to explore and to inform new policies for improving elderly patients’ safety. In order to increase cohesion and clarity for the reader, the methodological issues and results are discussed within the chapter in which each study is reported. The contents of each of the eight chapters are listed below.

- **Chapter 1** provides a background and rationale for the study. It provides an overview of the research and how the individual investigations are distinct, yet interrelated.

- **Chapter 2** reports on the findings of an audit on the incidence of errors and adverse events using the IIMS and RCA databases in a tertiary hospital, describes the causes of errors and adverse events, and provides recommendations from nursing and medical staff experts to decrease such events. Chapter 2 was initiated before the literature review because the
main scope of developing an intervention into patient safety in the health care environment was to determine the: (i) most common errors and adverse events, (ii) their contributing factors and (iii) recommendations to prevent or reduce such incidents. The audit findings directed the literature review by providing strategic review of the databases, and a focus to the planned intervention.

- **Chapter 3** presents a comprehensive literature review of national and international research findings and perspectives of elderly patients’ safety during care transitions.

- **Chapter 4** presents the conceptual framework for the study and the overarching research design that was used to achieve each study aim.

- **Chapter 5** presents a systematic review of the best available evidence of interventions to reduce the incidence of errors and adverse events among elderly patients during transition.

- **Chapter 6** presents the steps and process undertaken to develop the iPTC form.

- **Chapter 7** presents results of a pilot test iPTC intervention and presents the survey of nurses’ utilisation of the iPTC.

- **Chapter 8** provides the overall conclusions and describes the strengths and limitations of the research and presents recommendations and implications for utilisation in clinical practice. Future research directions are also presented in this chapter.

Due to the methodological constraints of the thesis, the thesis begins to narrow from chapter two.
1.8 CONCLUSION

This chapter presented the background to the research, including the aims, and significance of the study. Chapter one recognised the importance of patient safety and the embedded nature of elderly patients’ errors and adverse events during transfer of care. Chapter two reports the in-patient errors and adverse events using an audit of the Incident Information Management System and Root Cause Analysis databases. This is to determine the frequently occurring errors and adverse events, their contributing factors and the expert panels’ recommendations to prevent or reduce such incidents in elderly hospitalised patients.
CHAPTER 2

An audit of errors and adverse events among elderly in-patients at a tertiary hospital: a one year report
2.1 INTRODUCTION

An adverse event causes harm, threatens or compromises the safety of a patient. This is either caused from direct patient care or as a consequence from the physical environment (Calder, et al., 2010). Common adverse events that occur as a result of health care delivery include medication errors, falls, wrong site procedures, hospital acquired infection, pressure sores, restraints injuries, incorrect documentations and aggressive disruptive behaviour (Brady, et al., 2009). This often differs from the expectations of patients that they have accesses to the health care system for error free and efficient service (Friedman, Provan, Moore, & Hanneman, 2008). Therefore, screening for adverse events has become a common part of the quality improvement process in Australian hospitals (Iedema, et al., 2006). This chapter reports on findings from an audit of the Incident Information Management System (IIMS) and Root Cause Analysis (RCA) databases in one large tertiary hospital in New South Wales (NSW), Australia. A tertiary hospital refers to a full complement care services, including paediatrics, general medicine, and branches of surgery and psychiatry (South Western Sydney Health Network, 2004-2008).

The records for the financial year 1 July 2005 to 30 June 2006 were reviewed by the researcher. The purpose was to identify errors and adverse events, contributing factors and expert panel recommendations for improvement. The audit results informed the development and pilot test intervention that is presented in Chapters 6 and 7.
2.1.1 Study Aims

There were three major aims in this study:

1. Examine factors associated with errors and adverse events involving elderly patients in a tertiary hospital;
2. Review the recommendations by the expert review panels; and
3. Compare the nature of errors and adverse events reported by staff at the hospital and, as also reported in peer reviewed journals.

2.1.2 Incident Information Management System

The IIMS database was developed as a quality assurance tool based on the Australian Advanced Incident Monitoring System (AIMS) and was designed in Australia by Professor Runciman (Runciman, 2002b). The IIMS was implemented across NSW public health facilities in 2005 as a unique standardised multidisciplinary incident registry (Jorm, et al., 2006). All NSW health employees are required by the IIMS policy (NSW Department of Health, 2005a) to complete mandatory comprehensive training in the use of IIMS and are required to report incidents involving patients, visitors and staff (Braithwaite, et al., 2006). To lodge a report, clinicians and managers need to follow a standard computerised process that requires a detailed description of the incident and the possible contributing factors. Each incident is issued with a unique IIMS identification number which must be recorded and displayed with a red sticker in the patient’s medical records. The IIMS system is regulated by the Health Records and Information Privacy Act 2002 (NSW Department of Health and the Clinical
Excellence Commission, 2009) which means that to access data, clinicians and researchers must agree to maintain confidentiality and de-identified data.

The IIMS objectives are to:

- Record the results of reviews and provide recommendations for future improvement (NSW Department of Health and the Clinical Excellence Commission, 2009).
- Develop an awareness of error and patient safety culture in the clinical setting (NSW Department of Health and the Clinical Excellence Commission, 2009).
- Assist managers to deal with incidents in their area (NSW Department of Health, 2005a).

The Severity Assessment Code (SAC) developed by the Veterans Administration (VA) in America is included in the IIMS database (NSW Department of Health, 2005c). The potential severity of an incident and the likelihood of the event occurring again are coded as a risk numerical matrix rated 1 (most severe) to 4 (minor incident) (NSW Department of Health and the Clinical Excellence Commission, 2009).

- SAC 1: Extreme risk: incidents undergo RCA review. This is an urgent in-depth investigation into an incident that provides recommendations to be implemented to reduce or prevent future similar occurrences (NSW
Department of Health, 2005c). Investigation occurs at the local hospital level and is also reported to the NSW Department of Health (DoH).

- SAC 2: High risk: incident investigation occurs at the local hospital level. Incidents are reported to the NSW DoH only if there is potential for media interest.
- SAC 3: Moderate risk: reviewed at local hospital level with recommendations reviewed by the Patient Safety Committee and the clinical leadership team.
- SAC 4: Low risk: reviewed at local hospital level with recommendations provided to the Patient Safety Committee and the clinical leadership team (NSW Department of Health and the Clinical Excellence Commission, 2009).

All investigations and recommendations are undertaken by a panel of experts involving patient safety officers, nurses, doctors, allied health and the hospital management committee.

**Components of the IIMS database used in the study**

For reporting purposes to Department of Health, incidents are classified into 22 category types (NSW Department of Health, 2005a). In this audit, there were 11 classifications that were displayed in the IIMS database. Each classification is described below.

- A fall is classified as an incident when a patient trips, falls out of bed, is found lying on the ground or by other means. It can be witnessed or not witnessed.
• Medications/IntraVenous (IV) errors include events that are attributed to the process of prescribing, dispensing or administering a drug. For example, medication prescribing errors or incorrect dosage of medication being administered.

• Blood/blood product errors include events that are attributed to the dispensing, administration or quality of blood and blood products. For example, a blood unit is mislabelled, the incorrect blood pack is dispensed from transfusion service or a patient suffers a reaction to the blood transfusion (Travaglia, Hunter, Carroll, & Braithwaite, 2006).

• Clinical management involves actions in the care of patients including investigation, treatment, monitoring, observation and diagnosis. For example, retained instruments during surgery or procedures carried out on the wrong part of the body (NSW Department of Health and the Clinical Excellence Commission, 2009). It can also be attributed to the behaviour of the clinician.

• Documentation errors include any written, typed, drawn or printed text into which information has been entered. For example, a nurse or doctor has written in the wrong patient medical record or a medication chart is filed into another patient’s medical records, or specimens are incorrectly labelled (Jorm, et al., 2006).

• Aggression/aggressor describes a broad mix of situations where threatening behaviours occur. For example, patient to staff aggression or patient to patient aggression.

• Behaviour/human performance involves inappropriate patient or staff member behaviour in the clinical environment. For example, a patient
threatening to self harm; a staff member behaving rudely towards a patient or visitor.

- Medical devices/equipment/property relates to, for example, a faulty patient lifter or procedure, or routine maintenance not performed on the required equipments (Braithwaite, et al., 2006).

- Accidents and Occupational Health and Safety (OHS) are incidents that involve the physical environment or staff member. For example, a patient slips on a wet floor or sustains a burn after spilling a hot drink over his or her arm.

- Nutrition reports include any incident relating to feeding and nutrition, for example, a patient with diabetes receiving the wrong meal or a patient on a naso-gastric feeding program given the wrong rate of administration.

- Pressure ulcer reports on the development of new pressure ulcers, worsening of existing pressure sores or presentation of pressure sores from the patient’s home or residential aged care facility (NSW Department of Health and the Clinical Excellence Commission, 2009).

### 2.1.3 Root Cause Analysis Database

In Australia, all SAC 1 adverse events in hospital settings (Figure 2) are reviewed using RCA and must have a *Reportable Incident Brief (RIB)* prepared. An example of a SAC 1 adverse event is a patient receiving the wrong blood group, and as a result suffered a severe adverse reaction and died (NSW Department of Health and the Clinical Excellence Commission, 2009). A RIB is the method used to report defined health care incidents to the NSW DoH (NSW Department of Health, 2005a). The Area Health Service Executive must approve the RIB before...
the Clinical Governance Unit is notified for further processing and investigation. After initial approval for follow-up, the NSW DoH must be notified within 24 hours. Information from the RIB report must be de-identified and treated as confidential. This information is called *privileged RCA*. The RCA report must be provided to the NSW DoH within 65 days after the Chief Executive of the hospital where the event occurred is notified of the incident. The final RCA report describes the reportable incident, provides a causation statement and recommendations for system changes. Hence, to improve procedures or practices and minimise recurrence of the incident (Hsu, 2007). The recommendations are required to be implemented and evaluated at 3, 6 and 12 months, with follow-up reports to the Area Patient Safety Manager. The majority of RCA recommendations are evaluated for effectiveness and completed within 12 months. The RCA recommendations are made by expert patient safety officers, including nurses, doctors, allied health and management committees (NSW Department of Health and the Clinical Excellence Commission, 2009).
Figure 2: IIMS process of recommendations
(Adapted from NSW Department of Health and the Clinical Excellence Commission 2009).
2.2 METHOD

The retrospective audit included incidents that were reported and entered by clinicians to the IIMS database. Incidents that were notified to the RCA database were based on the IIMS database reviews of SAC ones. A retrospective audit reports data that has occurred over a previous period in time (Burns & Grove, 2009), and this audit was completed in 2007. The audit was undertaken to identify the causes of errors and adverse events and to review expert panel recommendation of strategies to prevent further occurrences. The audit was one component of a larger study to inform an evidence based intervention to reduce the incidence of errors and adverse events involving elderly patients.

2.2.1 Inclusion and exclusion criteria

This study focused on incidents reported in the IIMS and RCA databases from 1 July 2005 to 30 June 2006 that involved patients who were aged 65 years or over. Incidents of patients aged ≤ 64 years and incidents involving visitors, volunteers and contractors were excluded, as they were not the focus of this study.

2.3 DATA COLLECTION

The IIMS and RCA databases were retrieved by the Patient Safety Committee Manager of the Sydney South West Area Health Service (SSWAHS) Clinical Governance Unit and provided to the researcher in an Excel spreadsheet file. All the fields in the Excel documents were already grouped under the classifications
of: incident identification number, patient title, incident location, incident date and time, age band, place of incident, principle incident type, incident description, contributing factor, outcome for the subject, actual SAC, results of incident, and recommendation. These particular fields were all chosen for analysis because they provided comprehensive details about each incident involving elderly patients. Once the data were received from the Patient Safety Committee Manager, data were managed and regrouped using the IIMS audit data collection form developed by the researcher (Appendix 1) to provide a logical sequence for reporting the findings. The RCA data were also provided in an Excel spreadsheet format with the following fields: causation statement of how the incident occurred, outcome of incident, risk category of contributing factor to the incident, and recommendations for procedures or practices to minimise future similar errors or adverse events.

2.4 ETHICS APPROVAL

Ethics clearance was obtained from the Sydney South West Area Health Service Human Research Ethics Committee and the University of Western Sydney (UWS) Human Research Ethics Committee (Appendices 2 and 3). Both committees determined that as only de-identified data were sought by the researcher, there was a low risk to the subjects, therefore patient consent was not required and a waiver of consent was provided. The committees did, however, specify the following requirements for protection of privacy and confidentiality (National Health and Medical Research Council, 2007).
Protection of privacy and confidentiality: A separate list containing each patient code and their corresponding medical record number was stored in a secure location as prescribed by the National Statement on Ethical Conduct in Research involving humans (National Health and Medical Research Council, 2007). This was accessible only by the researcher and the immediate supervisors. Excel spreadsheets and Statistical Package for the Social Sciences™ Version 17 for Windows (SPSS) databases were located on a secure drive with password protection, only accessible by the researcher and the immediate supervisors.

2.5 DATA ANALYSIS

A mixed method (quantitative and qualitative) approach was used to analyse the data.

2.5.1 Analysis of IIMS data

Data were cleaned for spelling errors and inconsistency and typological errors were rectified. The data were then exported to SPSS for analysis. Initially we aimed to code the location of each incident at place of incident level such as bedroom, bathroom or diagnostic procedure room. However, where data at such a level were not available, it was coded as ward area. Continuous data are presented as mean, median and standard deviation (SD). Categorical data are presented as numbers and percentages. Comparison was determined by chi square and student’s t-test.
All of the recommendations by the expert review panel were narrative and there were more than one recommendation for each incident. As a result they were coded, according to the focus of the recommendation, in the following categories: (i) adherence to policies and procedures, (ii) effective communication, (iii) education of clinicians, (iv) close supervision of patient by clinicians, and (v) follow up.

2.5.2 Analysis of RCA data

Content analysis was performed on recommendations recorded in the RCA database. Recommendations were transcribed and themes identified. This included the use of open line-by-line coding, reading and rereading by the researcher, and browsing and validating codes (Strauss & Corbin, 1998). Two coders (the researcher and one research assistant) reviewed the data and coded it to classify the data. There was no disagreement or disparity between the items coded. Roberts and Taylor (2002) have emphasised that analysing qualitative data involves an in-depth examination and interpretation of the data. Further, as the codes developed, themes emerged as the researchers searched for patterns and meaning in the data and arranged them in a way that classified the data (Polit & Beck, 2010). The reporting of the factors contributing to errors and adverse events may exceed 100%, as the majority of incidents had more than one variable that contributed to its occurrence.

Analyses were undertaken on falls, medications, clinical management, documentation and aggression/aggressor behaviour incidents. These topics
were selected by consensus methods of experts in patient safety as events that frequently involve elderly people. The Patient Safety Committee Manager, with experts in the clinical field, entered the reviewed and summarised RCA recommendations.

The next section is the analysis results of data from the IIMS and RCA databases.

2.6 RESULTS

As the IIMS and RCA databases are linked, the results of these sources of data are presented together. The majority of the incidents were reported by nurses (87%) compared to doctors (7%), allied health (3%) and others (3%). Others included catering, cleaning and electrical staff. The most common underlying contributing factors were failure to adhere to policies and procedures, communication breakdown and lack of follow-up.

2.6.1 Patient demographics

A total of 643 incidents involving elderly patients during the period 1 July 2005 to 30 June 2006, were reported in the IIMS database. The mean age of the patients was 77.3 years (SD +6.8; range 65 to 95 years). The incidents involved 57% males (n=368), 39% females (n=250) and four percent (n=25) were missing data and unable to be categorised.
2.6.2 Classification of incidents

The incidents were grouped according to the IIMS classification system. However, as some incidents occurred infrequently, related groups were combined, for example, blood/blood product (n=4) was combined with medication/IV fluids (n=132), accident/OHS (n=11) and medical device/equipment/property (n=19) were combined, and nutrition (n=14) and pressure ulcers (n=3) were combined in a group classified as “others”. Eight major types of incidents were identified: falls (n=309), medications/IV fluids (n=136), clinical management (n=104), medical device/equipment/property (n=30), behaviour/human performance (n=19), documentation (n=17), aggression/aggressor behaviour (n=11; 2%) and others (n=17).

2.6.3 Description of incidents

The reported incidents occurred most frequently in the medical ward, followed by the Aged Care Unit (ACU), and then the surgical and emergency departments (Figure 3).

- Others
- Anaesthesia room
- Radiology
- OT
- Catering Service
- *AH Outpatient Department
- *ICU
- *ED
- Surgical
- *ACU
- Medical

Figure 3: Incident Location
The incidents occurred most frequently during the timeframes 0700 to 1200 hours (30%) and 1300 to 1800 hours (28%), followed by 1900 to 2400 hours (19%) and fewest from 0100 to 0600 (15%); missing data accounted for 8%. The incidents occurred mostly in the patients’ bedroom (n=332; 54%), followed by the ward area (n=153; 25%), bathroom area (n=56; 9%), diagnostic procedure room (n=44; 7%) and other locations (n=31; 5%), which included allied health outpatient room (n=16; 3%), health service clinic (n=12; 2%) and the pharmacy department (n=3; 0.4%).

In the next section, the results relating to falls, medications, clinical management, documentation and aggression/aggressor behaviour incidents are presented. The results for each of these incidents are presented as follows: type of incident, factors contributing to the incident, and recommendations for management.

2.6.4 Falls

Falls were the most frequently reported incident. Just over half were documented for patients aged 75 to 84 years (n=165; 54%), then 65 to 74 years (n=100; 32%), with the age group 85 years and over experiencing the least number of falls (n=44; 14%). Seventy-eight percent of falls were witnessed by other patients or visitors rather than by nursing or medical staff and were
documented as “patient failure”. Falls took place in the bedroom (n=206; 68%), the bathroom (n=55; 18%) and ward area (n=42; 14%). The majority of falls (34%) occurred between 0700 and 1200 (Table 1).

The most common contributing factors were analysed and presented below. For a number of incidents there was more than one variable reported. Therefore the percentage reported relates to a particular contributing factor and not to the overall number of falls.

**Factors contributing to falls adverse events**

**Patient related:** Thirty-six percent (n=110) were related to the elderly patient not using the buzzer to call for assistance, 28% (n=86) were attributed to the elderly patient’s confusion and 14% (n=43) to unsteady gait.

**Communication:** Ten percent (n=30) of falls were caused by a lack of communication between nurses on the patient’s fall risk assessment. Eight percent (n=24) were attributed to a communication barrier between the elderly patient and nurse, particularly where patients were from a non-English speaking background.

**Environmental:** Four percent (n=13) of falls took place due to a wet floor. Only 1% (n=3) of falls were attributed to bedrails not being in place.

**Medications:** Three percent (n=8) were considered to be caused by a side effect of prescribed medications.
Recommendations for management

There was no reported SAC 1 (severe injury or death). However, falls can cause psychosocial damage to the person’s well-being by contributing to low self-esteem and fear of falling again (Russell, et al., 2009; Spice, et al., 2009). Recommendations by the management review panel to reduce the incidence of falls were to provide education to nurses on completing an elderly patient falls risk assessment (n=135; 44%) and the close supervision of at risk elderly patients by nursing staff (n=118; 38%).

2.6.5 Medications/intravenous therapy

There were 136 errors and adverse events relating to medication / IV therapy. There were almost equal numbers of males (n=67; 49%) and females (n=60; 44%), with gender not stated for 7% (n=9). These medication errors were reported more frequently in the age groups 75 to 84 years (n=65; 48%), and 65 to 74 years (n=50; 37%), compared to the 85 years and over (n=21; 15%).

Medications / IV errors took place in the elderly patients’ bedroom (n=61; 45%), ward area (n=48; 40%), and the drug cupboard for scheduled medications (n=12; 9%). Eleven percent (n=15) of incidents had missing and incomplete data. The majority of medications / IV errors occurred within the timeframe of 0700 to 1200 hours, 1300 to 1800 hours and 1900 to 2400 hours respectively (Table 1).
Factors contributing to medications / IV adverse events

Two major factors contributed to medications / IV errors in clinical settings: health care practitioners and ineffective communications.

Health care practitioners: Violation of the policies and procedures involving the “five rights” (right patient, right drug, right route, right dosage and right time) accounted for 88% (n=120) of errors. A doctor’s illegible writing on medication charts contributed to 79% (n=108) of errors, a lack of clinical experience (n=26; 19%) and the stress of increased workload (n=19; 14%) also contributed to medication / IV errors. Only three incidents (2.2%) were related to the pharmacist dispensing wrong medications.

Communication: Failure of communications from nurses to other nurses and nurses to doctors contributed to half the medication errors (n=66; 49%), and a failure to follow-up by nurses when patients moved between wards (n=36; 26%) was also a frequently identified factor.

Recommendations for management

Across the review panels there were three frequently occurring recommendations: (1) nurses must thoroughly revisit the policies and procedures (n=75; 55%); (2) nurses should receive further education relating to the “five rights” of medications administration (n=41; 30%); and (3) strategies should be developed to improve communication between nurses and legible hand writing (n=8; 6%).

There were no recorded SAC 1 incidents relating to medications or IV therapy. However, there is an urgent need for strategies to be developed to mandate
nurses to effectively communicate with each other and across the multidisciplinary team. This is recognised as an important element in reducing medications errors (Conley, et al., 2009; Marres, Bemelman, & Leenen, 2009; Romano, et al., 2009).

2.6.6 Clinical management

The third most frequently occurring incident reported was clinical management. Clinical management encompasses delays in providing care treatment (n=29; 28%), inappropriate procedures (n=25; 24%), poor transfer between wards (n=17; 16%), near misses (n=14; 13%), inappropriate staff behaviour (n=13; 13%) and inadequate discharge planning from hospital (n=6; 6%).

The incidents occurred in the ward area (n=37; 36%), bedroom (n=27; 26%) and diagnostic procedure area (n=25; 25%) and other settings (n=13; 13%); other settings was documented vaguely as hospital (n=5), health service building (n=5) and transit area (n=3). It was reported that these incidents occurred mainly during the timeframes of 1300 to 1800 hours (47%) and 0700 to 1200 hours (31%) (Table 1).
Table 1: Time of incidents occurrence for falls, medication/IV and clinical management

<table>
<thead>
<tr>
<th>Incident time of falls</th>
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<tbody>
<tr>
<td>Time</td>
<td>Number (%)</td>
<td></td>
</tr>
<tr>
<td>0700 to 1200 noon</td>
<td>106 (34%)</td>
<td></td>
</tr>
<tr>
<td>1300 to 1800 hours</td>
<td>70 (23%)</td>
<td></td>
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<tr>
<td>0100 to 0600 hours</td>
<td>68 (22%)</td>
<td></td>
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<tr>
<td>1900 to 2400 hours</td>
<td>64 (21%)</td>
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<tr>
<th>Incident time of Medications/IV</th>
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<tbody>
<tr>
<td>Time</td>
<td>Number (%)</td>
<td></td>
</tr>
<tr>
<td>0700 to 1200 noon</td>
<td>38 (35%)</td>
<td></td>
</tr>
<tr>
<td>1300 to 1800 hours</td>
<td>29 (27%)</td>
<td></td>
</tr>
<tr>
<td>1900 to 2400 hours</td>
<td>27 (25%)</td>
<td></td>
</tr>
<tr>
<td>0100 to 0600 hours</td>
<td>14 (13%)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Incident time of Clinical Management</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Number (%)</td>
<td></td>
</tr>
<tr>
<td>0700 and 1200 noon</td>
<td>28 (31%)</td>
<td></td>
</tr>
<tr>
<td>1300 to 1800 hours</td>
<td>42 (47%)</td>
<td></td>
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<tr>
<td>1900 to 2400 hours</td>
<td>11 (12%)</td>
<td></td>
</tr>
<tr>
<td>0100 to 0600 hours</td>
<td>9 (10%)</td>
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</table>

Table 1 showed that time played a critical role in all the three major incident types in elderly patients’ care. The errors and adverse events occurred most in the mornings, from 0700 to 12 noon and in the afternoons from 1300 to 1800 hours.
Factors contributing to clinical management of adverse events

Adverse events and errors of clinical management were mainly attributed to two factors: health care practitioner and communication breakdown.

Health care practitioners: Twenty-six percent (n=27) of incidents occurred due to a non-adherence to policies and procedures. Staff workload (n=12; 12%), inexperience (n=8; 8%) and lack of skill mix (n=5; 5%) were noted as contributing to these errors and adverse events.

Communication: Thirty-six percent (n=37) of incidents were considered to be associated with poor communication between staff. Lack of follow-up by nurses regarding patient care (n=17; 16%) also contributed to the incidents.

Errors and adverse events included seven deaths (8%), 22 procedural complications (24%) and one potential harmful procedure. There were six SAC 1 scores that required investigation by an RCA multidisciplinary panel (see page 40).

IIMS recommendations for management

General recommendations were provided by the IIMS panel regarding all clinical management incidents. These were: revised education for nursing staff (n=34; 33%), stringent adherence to policies and procedures (n=28; 27%), and improved communication between staff (n=16; 15%).
The six SAC 1 incidents were subjected to RCA review. The factors identified by the review panels as contributing to these incidents are discussed next.

**Factors contributing to RCA adverse events**

Qualitative analysis of the RCA database identified three recurring factors that appear to contribute to errors and adverse events in elderly patients, namely communication breakdown, the absence of follow-up and the failure of staff to identify a patient.

*Breakdown of communications* between nurses to nurses and doctors was identified as a common factor when the sequence of events surrounding an error or adverse event were analysed. For example, a patient who was critically ill had been transferred inappropriately to the ward due to poor communication between the transferring and receiving ward. Another example involved a patient with a perforated bowel, whose condition deteriorated rapidly. Her consultant was not informed and the patient died. These adverse events were considered by the review team to constitute a breakdown in communication between care teams.

The second contributing factor identified was *lack of follow-up care*. For example, a patient who was prescribed anticoagulation medication complained for eight days of hip pain following a fall. The complaint was not investigated and the patient died of a retroperitoneal bleed. The review identified a lack of
follow-up between nurses, the registrar and the consultant surgeon as contributing to the patient’s death.

*Failure to identify a patient* was the third contributing factor. For example, a lumbar puncture was performed on the wrong patient. Lack of communication between teams, poor clinical handover and poor communication with the patient was found to have contributed to this adverse event.

**The recommendations for precautions to reduce and prevent RCA adverse events**

The review panels’ recommendations identified four actions or precautions which, if followed by clinicians, would reduce errors and adverse events, namely: structured communication, follow-up care, and the education of staff and the identification of patients.

*Structured communication* refers to the process of formal documentation and standardised communications. Health professionals are required to document discussions relating to patient care, instructions for care and the care that has been provided. Failure to follow this fundamental requirement contributed to a number of the errors and adverse events. *Follow-up care* refers to the requirement for health professionals to document care plans and also progress against care plans using a reporting format that is approved by the health facility and accessible by all providers. *Ongoing education* that is relevant, evidence based and at an appropriate level for the health professional is a requirement for
professional practice. Education includes findings from research, as well as organisational policies and procedures and knowledge of incidents occurring in the workplace.

The results of this audit indicate that health professionals frequently do not correctly identify the patient prior to any form of interaction between a care provider and patient. Recommendations of the review panels emphasised the need to take precautions and follow policies for identifying patients, including identifying a patient by medical record number, date of birth and name, to ensure the right patient and the right procedure.

2.6.7 Documentation

There were 17 incidents relating to inappropriate and / or absent documentation. Of these, nine had medical notes missing on transfer of patients from the ED to the ward. Six of these incidents were attributed to instructions being written in the medical notes of a different patient to the intended recipient. Urgent referrals were not documented for two patients.

Factors contributing to documentation adverse events

These errors were attributed to health professional error and poor communications.

Health care practitioners: Ten incidents were attributed to the inaccurate identification of patients by health professionals and six to poorly written nursing reports at handover.
Communication: Lack of communication between staff contributed to nine incident reports and lack of follow-up care was considered to be a factor in two incidents.

Recommendations for management

While no documentation related incident resulted in an adverse event classified as SAC 1, errors that occurred had the potential to be ‘harmful’ to the patient. The review panels identified the need to revise particular policies and procedures and improve communications between colleagues.

2.6.8 Aggression/aggressor behaviour

Eleven incidents were attributed to aggressive behaviour by patients or patient’s visitors. Nine of these incidents were aggressive behaviour by patients towards staff and two incidents involved patient’s relatives.

Four incidents were in the ACU, four in a medical ward and three in the ED. Seven incidents took place in the ward area and four in the bedroom. Three occurred in the morning, five in the afternoon and three at night.

Factors contributing to aggression/aggressor

Aggression/aggressor behaviour by patients was related to two main factors: confusion (n=8) and breakdown of communication between nurse and patient (n=1). There was no trigger identified in the remaining two incidents.
**Recommendations for management**

None of the events attributed to aggression were classified as SAC 1, although they were disruptive and distressing to staff. Recommendations by the review panel were that health professionals should be exposed to education on techniques available to manage aggression, and that care plans should reflect specific patient behaviour.

### 2.7 SUMMARY OF RESULTS

In reviewing the IIMS and RCA databases, communication played a central and underlying role in all major incident types, and this information has been used to inform the development of the iPTC. The importance of good communication and the need to improve communication processes and practices between health professionals was established. In the changing health care environment when managing patient’s complex needs, it is essential that care providers communicate effectively with patients, their family and support persons. It is a pivotal element that can reduce or prevent aggression and improve interpersonal relationships.

National and international reports of errors and adverse events demonstrate similarities between the natures of incidents that occur. In fact, in some cases errors and adverse events were almost replicated across the reports (Benn, et al., 2009; NSW Department of Health and the Clinical Excellence Commission, 2009). Many of those incidents could have been avoided if past experiences
were examined and practice change adopted. This is critical to the development of an organisational patient safety culture.

The findings of this audit of the IIMS database identified falls, medications and clinical management as the most frequent cause of incidents that impact on elderly patients’ safety whilst hospitalised. The individual incidents recorded in the database demonstrate the failure by clinicians at all levels and from all disciplines to adhere to hospital policies and procedures. Moreover, the breakdown of written and verbal communication between staff, and lack of knowledge about, and poor follow-up of care are continuing, despite the efforts of facilities to promote a culture of safety (Kline, et al., 2008) and the establishment of bodies such as the Clinical Excellence Commission that have patient safety as their central focus (Armitage, 2009a; Donaldson & Muir-Gray, 1998; Murie & McGhee, 2003).

These common errors and omissions by clinicians lead directly and indirectly to adverse events in hospitals. These factors were also captured in the RCA recommendations which identified improvements in structured communication follow-up, identification of patients and adherence to policies and procedures as interventions which, if practiced by all clinicians, would significantly reduce the incidence of errors and adverse events.

The next section presents in-depth discussion of the results and implications for clinical nursing practice. The discussion will focus on the prevention of falls and
medication errors, the management of aggression and the improvement of clinical management and communication.

2.8 DISCUSSION

In this audit, 643 reported incidents involving elderly patients, during the period 1 July 2005 to 30 June 2006, were retrieved. The IIMS database was a new innovation to the Area Health Service at that time and the process for reporting was being refined. Therefore there may be some under-reporting of errors and adverse events during the study period. Staff education and training was ongoing at the time, and not all staff had completed the mandatory process for authorisation to use the database (Michael, Ryan, & Hughes, 2006). However, education is not the only cause of under-reporting of errors and adverse events. Studies agree that a significant number of incidents are under reported each year, owing to fear of litigation or disciplinary action (Benn, et al., 2009), lack of awareness, complexity in using the incidence reporting system (Kucukarslan & Nadkarni, 2008; Travaglia, et al., 2006) and lack of patient safety culture in the workplace (NSW Department of Health and the Clinical Excellence Commission, 2009). The lack of feedback received on incidents is also a factor influencing staff willingness to report errors and adverse events (Benn, et al., 2009; Kreckler, Catchpole, McCulloch, & Handa, 2008; Travaglia, et al., 2006).

A recent study (NSW Department of Health and the Clinical Excellence Commission, 2009) found that for the three years of the IIMS database (2005 to
reporting of incidents increased by 45%. This suggests that while under-reporting is on-going, the introduction of the IIMS reporting process has improved incident reporting in NSW public health facilities. This is an encouraging indicator of an improved reporting culture and improved awareness of patient safety (Conley, et al., 2009).

In this report, 87% of incidents were reported by a nurse, which is consistent with findings from other studies (Kreckler, et al., 2008; NSW Department of Health, 2005a, 2005b; NSW Department of Health and the Clinical Excellence Commission, 2009). These results indicate that nurses have an increased awareness of the need to report errors and adverse events and, in the case of the IIMS database, have experience in completing the necessary reporting requirements compared to doctors and allied health professionals (NSW Department of Health, 2005a). Previous studies undertaken on the incident reporting system in NSW found doctors’ perceptions of what constitutes an error differ from nurses. Doctors are also less likely to consider that a particular incident warrants reporting, thus discouraging other doctors from reporting (Travaglia, et al., 2006). Incidents that involved allied health professionals mainly occurred on the wards, and were reported by nurses (Jorm, et al., 2006). These findings show the need for education on the requirements for reporting errors and adverse events and the role of each professional in establishing a culture of safety. In addition, the NSW IIMS should be included in facility orientation programs and in the ongoing professional development activities across health sectors.
Worldwide, falls are the major leading cause of unintentional injuries among elderly people (Boyd & Stevens, 2009; Miller, et al., 2009; Russell, et al., 2009). In Australia (NSW Health, 1996; Russell, et al., 2009), inpatient falls are the most common adverse event experienced by elderly patients, and that finding is evident in other studies (Dessypris, et al., 2009; Roe, et al., 2009; Spice, et al., 2009; Weaver, 2008).

Falls are likely to be reported as the event is obvious and is immediately recognised as an incident. Elderly patients often contribute to a fall (Boyd & Stevens, 2009), and in the study reported here 78% of falls were attributed to the actions of the patient. Elderly people are frail (Weaver, 2008), and unsteady when ambulating, which predisposes them to falls (Boyd & Stevens, 2009); they take multiple medications which have side effects (Kreckler, et al., 2008); and they may have impairments caused by confusion (Russell, et al., 2009) and dementia (Mitchell, 2009). In this audit, the majority of falls involved people aged 65 to 84 years, more so than people aged 85 years and over. This was supported by other studies (Rose, 2008; Weaver, 2008) that showed that falls are significantly reduced in elderly patients over the age of 85 years. This finding could be attributed to the reduced mobility among people of this age as they may be bedridden or wheelchair bound (Mitchell, 2009).

Falls are associated with increased morbidity and mortality amongst the elderly, and even where there is no physical injury (Kreckler, et al., 2008; Michael, et al., 2006), the fear of subsequent falls does result in emotional disturbance, loss of
self confidence, increased dependence, and anxiety about falling again (Hart-
Hughes, Quigley, Bulat, Palacios, & Scott, 2004; Lueckenotte & Conley, 2009).
Falls can also precipitate admission to a residential aged care facility. In this
report, it was found that 68% of falls occurred in the proximity of the patient’s
bed during the morning period (0700 to 12 noon), which is similar to other
studies on falls in the elderly (Milisen, et al., 2007; Miller, et al., 2009; Nazarko,
2008). Strategies have been suggested, such as having a ‘special’ or ‘floater’
nurse or ‘volunteer’ personnel in the wards during that peak time. These
personnel would be assigned specialty tasks, such as answering the patients’
 buzzer and attending to them appropriately, whilst other nurses assisted with
other treatments and ward activities, including medications, dressings and
showers (Giles, et al., 2006). This may reduce falls caused by the elderly
attempting to independently get out of or return to bed at this crucial time.

Researchers have recommended improvements in falls risk management
strategies (Kreckler, et al., 2008; Oliver, et al., 2008; Wong, et al., 2004). The
Royal College of Nursing (2005) reinforced that health professionals caring for
elderly patients must maintain basic professional competence by completing a
falls risk assessment for each elderly patient admitted to the ward or emergency
setting. These assessments enable closer supervision, medical interventions and
adequate planning prior to, and after, discharge (Rose, 2008; Russell, et al., 2009;
Spice, et al., 2009; Wachter, 2006). This was supported in this audit, where a
recurring recommendation from the expert review panel was for all nurses to
complete an assessment of elderly patient fall status as routine at admission and reviewed again at discharge.

Medication errors are also common among elderly people (Benn, et al., 2009). The medication errors reported in the IIMS database and included in this audit did not result in serious adverse events. However, these adverse events did cause temporary harm, for example diarrhoea or hypoglycaemia, which, in the elderly patients, has the potential to lead to severe harm such as dehydration and falls (Boockvar, et al., 2009; Coleman, et al., 2004; Feldman, et al., 2009).

The majority of medication incidents involved errors of dosage, prescribing, transcribing and administration. While some of these errors were attributed to human failure such as wrong drug, route, patient, or time, factors relating to the ward processes were also identified as precipitating factors, such as increased workload (Jorm, et al., 2006). The hospital’s policies and procedures for medication administration (Sydney South West Area Health Service, 2006), include the requirement for nurses to communicate with doctors to clarify changes to medication orders, communicate with other nurses about the patient’s medication regime when patients are being transferred to another care setting, and to confirm the patient’s name, date of birth and known allergies prior to administering the medication. More importantly, the policy also requires clinicians to document communication actions in the medical records. Despite the hospital’s policies and procedures, the findings of this audit indicate
that clinicians were not complying with the safety of medications administration (Mannion, Konteh, & Davies, 2009; van Doormaal, et al., 2009).

Confusion, sometimes associated with aggression and aggressive behaviour, is another relatively common factor that contributes to, or is reported to be, an adverse event among elderly patients (Poole, 2003). Aggression and aggressive behaviour reported in the audit led to staff feeling disturbed and overwhelmed and created an unpleasant environment for other elderly patients and visitors. Strategies that have been reported to manage aggression and reduce harm involved orientating the elderly patient to the care setting and softly talking to them (Jones, Borbasi, Nankivell, & Lockwood, 2006). In addition, elderly patients are to be encouraged to engage with and participate in their care, for example, assisting with showering, dressing and feeding. Another study (Allen, 1999) calls for a comprehensive assessment of elderly patients’ behaviour, history and previous interactions with others. It highlights the need for assessment of behaviour to be documented in the care plan and emphasised in the handover report from nurse to nurse. Furthermore, all elderly patients who are confused and are displaying aggression should undergo an in-depth medication review and blood test to determine if there are underlying, confounding factors (Poole, 2003). The recommendations from the expert review panel associated with the incidents reviewed by this audit also included providing ongoing education to champion nursing staff on critical decision-making in managing aggression in elderly patients, visitors or patient’s relatives.
This audit identified that clinical management was the third highest category of events recorded on the IIMS database and some of these events resulted in SAC 1 incidents. Incidents are most frequently reported to have occurred from 0600 to 1200 noon and 1600 to 2000 hours, with the highest peak in the morning between 0800 and 0900 hours (Michael, Ryan and Hughes, 2006). Likewise, the incidents identified by this audit also demonstrated that the most crucial time for falls, medications, and clinical management incidents were the morning (0700 to 12 noon) and afternoon (1300 to 1800) period. This outcome provides important information that must be considered when planning interventions to reduce these incident types in the hospital settings.

These errors and adverse events were primarily associated with the transfer of elderly patients between wards and between facilities and with omissions that should have been included in discharge planning. Both of these activities have been reported as contributing to errors and adverse events in other studies (Coleman, Parry, Chalmers, & Min, 2006). A recent study found the transfer of patients and omissions of discharge planning to be the fourth highest category of incidents in public health facilities and frequently associated with falls, and medication errors (NSW Department of Health and the Clinical Excellence Commission, 2009). The identified contributing factors included failure to provide information during handover of care to another clinical team, lack of care coordination on transferring elderly patients back to the community and failure of patient clinical records to arrive with them at their care destinations. Similar findings emerged in this audit, where nurses recorded poor transition in
16% of cases and 26% were related to lack of follow up of patient’s medication regimes from the previous ward. This was echoed in another report by the National Health Service (2000) which associated poor transition between care sites as a series of adverse events that contributed to a patient’s death. Therefore, comprehensive safe transfer between ward and discharge to a residential aged care facility or home is a necessary requirement to prevent errors and adverse events.

In the audit reported here, the RCA identified breakdown of communication and lack of follow-up as the major contributing factors to incidents. Nurses and doctors failed to document their communications and an inadequate verbal handover of patients resulted in incorrect information. A study by Lingard, Espin & Whyte (2004) found that one third of errors in the operating theatre were the result of a communication breakdown. The Joint Commission on Accreditation of Healthcare Organisations (The Joint Commission, 2006, 2009) also suggested that poor communication contributed to 70% of adverse events, and Greenberg (2007) indicated that communication failures lead to serious adverse events for surgical patients.

The review of the RCA database completed for this study highlighted the need for structured communication, follow-up of care and correct identification of patients to prevent, or at least minimise, the incidence of adverse events. The fact that the RCA expert review groups recommended improvement in communications between clinicians demonstrates that, while clinicians may
acknowledge that good communication is critical to optimal outcomes for all patients, in practice, communication breakdown remains a common vulnerability. Strategies have been developed to improve communications, for example the SBAR tool (situation, background, assessment and recommendation) which was designed to guide clinical practice (Marshall, et al., 2009). This tool was initially developed to standardise important and urgent communication by the United States Navy in nuclear submarines (Haig, Sutton, & Whittington, 2006). This tool was found to improve the content and clarity of communications in the clinical environment (Marshall, et al., 2009). Moreover, a checklist has also been found to reduce errors resulting from poor communication in the operating room (Lingard, et al., 2006).

According to Tuft and Reynolds (1997), the most important structure health care organisations can have in place for their employees are designs to enhance communication of information between individuals, departments, other organisations and, in some cases, with the general public. While research has demonstrated that a structured communication process during patient transfer does improve continuity of care and reduce adverse events (Braithwaite, et al., 2006), the successful implementation of a particular tool requires staff to appreciate the potential for such a process to improve the safety of patients in their care and to improve outcomes (Benn, et al., 2009; Mannion, et al., 2009).

The findings of the audit reported here reinforce findings from other studies (Benn, et al., 2009; National Health Service, 2000) which indicate that near
misses were not being reported in-depth. For example, in this audit only 13% of near misses were reported. This finding suggests that the type of incident and level of harm may influence the likelihood of reporting. An event resulting in patient harm is most likely to be reported. When harm is prevented (near miss), the likelihood of reporting is reduced (Conerly, 2007; Kaplan & Rabin Fastman, 2003). The ability to review a near miss presents a valuable learning opportunity for the identification and rectification of factors that contribute to error before harm occurs (Barach & Small, 2000). This is crucial as it also serves to build on knowledge, education and training.

The IIMS database has some disadvantages, as it did not report incidences of patient belongings being misplaced, such as dentures, walking frames, spectacles and hearing aids (NSW Department of Health and the Clinical Excellence Commission, 2009). This could be considered a system approach failure, that clinicians working in NSW Public Health do not recognise these issues as errors pertaining to elderly patients’ care. Consequently, it can be concluded that nurses who are most likely to report incidents (Kreckler, et al., 2008) do not view missing patient belongings to be an error of care and only see these items as lost in transit between areas. This finding increases the significance of a process aimed at improving safe transfer of elderly patients. One approach to improve communications between clinicians and departments, and developed and tested as part of the research reported in this thesis, is the interactive Patient Transition Checklist (iPTC), which will be reported in detail later (Chapters 6 and 7).
2.8.1 Implications for practice

The IIMS and RCA databases provide valuable input into the nature of errors and adverse events, and the recommendations need to be considered and used as a basis for improving the processes and policies for providing safe and effective care. The findings of this study identified six factors that contribute to errors and adverse events in health, and each of these causes can be used as a basis for developing processes to improve practice.

1. The hospital system needs to focus on a system wide approach aimed at developing a culture that focuses on improving patient safety.

2. The focus on reporting incidents and adverse events should be on improving the system rather than blaming an individual clinician.

3. A falls risk assessment should be conducted on each elderly patient admitted to the hospital setting.

4. Processes to ensure structured communication between clinicians and facilities should be integrated into care practices to reduce the risk of errors, and encourage follow-up between clinical teams and departments.

5. Developing and implementing strategies to reduce errors associated with medication ordering and administration should be a priority for each health facility.

6. Near misses are significant occurrences and should be considered in order to improve policies and processes of care.
2.8.2 Limitations of the study

There were limitations of this audit that need to be considered when reviewing the findings.

1. The IIMS database had recently been introduced in 2005–2006 when the errors and adverse events for this audit were captured and staff were in the process of training. Therefore the potential for under-reporting at that time needs to be considered and factored into the significance of the findings.

2. It is important to note that the IIMS database was not designed to be a research tool and some fields were incomplete or information was missing. This may be an oversight given the potential of the data to provide benchmarks for the health system.

3. Data were extracted from the IIMS database at one tertiary metropolitan hospital in NSW, therefore the findings may not be generalised to other hospitals. However, it can be seen that the incidents reported on the IIMS database and investigated by the RCA review process are similar to those reported by large studies in Australia and internationally.
2.9 CONCLUSION

Errors and adverse events are usually inevitable in health care, therefore systems need to be developed and processes established to minimise their occurrence and impact on elderly patients. This study demonstrates that while errors and adverse events such as falls, medication errors and factors associated with clinical management are frequent in the health facility, a commonly identified contributing factor is communication failure between clinicians and facilities. This finding is surprising as there are a plethora of reports in the nursing literature that focus on communication between nurse and patient and nurse and other health professionals. Therefore, there exists a need for the development of a simple structured communication form that promotes communication and assists nurses to abide by policies and procedures. The next chapter is a critical review of the literature, of papers from national and international perspectives.
CHAPTER 3

Literature Review
3.1 INTRODUCTION

Chapter 1 highlighted the need to investigate factors associated with errors and adverse events that occur when elderly patients are being transferred between, and within, facilities. It was noted that the elderly are particularly vulnerable to errors and adverse events which, when investigated, are frequently attributed to human error involving lack of communication and follow-up. The errors often have resulted in an increased length of stay of elderly patients, representation at ED and, in some instances, readmission to acute care facilities (Jack, et al., 2009; Koehler, et al., 2009; Liu, et al., 2009). The previous chapter outlined the significance of investigating errors and adverse events in health care settings by auditing incident reports, analysing contributing factors and monitoring recommendations to reduce the incidence of future occurrences.

This chapter comprehensively reviews the literature to identify and explore elderly patients’ safety during hospital transfer between care sites. The literature provides an in-depth discussion of errors and adverse events in the health sector and identifies approaches that have successfully prevented or reduced their occurrence. The conceptual framework used to underpin this research was developed based on the review of the literature and an audit of IIMS and RCA databases also completed for this thesis. The conceptual framework is presented in Chapter 4.
The topics explored in this literature review are: population ageing – a global perspective; hospitalisation of elderly people; consequences of errors and adverse events in health; research relating to patient safety; errors and adverse events in the elderly; strategies to promote the safe transfer of elderly patients; patient safety culture; patient safety and communication; and clinical governance. Each will be discussed in turn.

3.1.1 Population ageing – a global perspectives

The aged population of developing countries is increasing globally. It is projected that two billion people, almost one quarter of the world population, will be aged over 60 years by 2050 (HelpAge International, 2003; World Health Organisation, 2000, 2007). The longevity in this cohort of people has been attributed mainly to improved medical care and education on lifestyle modifications (Australian Institute of Health and Welfare, 2007; Caplan, Williams, Daly, & Abraham, 2004). In Australia, sustained low fertility, longer life expectancy and improved living conditions have contributed to the increasing aged population (Johnstone & Kanitsaki, 2009). Similar aged population growth has been reported in Canada and the USA, which have age population structures similar to Australia (Australian Institute of Health and Welfare, 2007). Countries such as Italy, Greece, Sweden, France and Japan have smaller proportions of children and higher proportions of elderly people than that of Australia (Australian Institute of Health and Welfare, 2007). This transition will be greatly exacerbated by the large post-war generation reaching age 65 years within the current decade, but
also the increasing number of those people aged 85 years or more (Australian Bureau of Statistics, 1999, 2005).

Hence, as shown in Figure 4, the proportion of the population aged 65 years and over has risen from 11% to 13.3% between 1989 and 2009 (Australian Bureau of Statistics, 2009) when compared to any other age groups which has remained relatively stable. Given the increase in these populations, health care professionals need to develop and implement cost effective programs for elderly patients with achievable practical outcomes in hospital settings.

Whilst ageing is not and should not be seen as a national problem, the Productivity Commission (2009) has indicated that population ageing raises major health planning, economic and policy challenges. Elderly people are disproportionate users of health services (Johnstone & Kanitsaki, 2009). As a group they experience ill health, particularly associated with chronicity (McCormack, 2008) and disability (Cheek, Ballantyne, & Roder-Allen, 2005). Despite health care improvement, the majority of elderly people have at least three chronic disorders and other multiple comorbidities such as hypertension, diabetes and obesity (Wolff, et al., 2004). In addition, the most frequently reported causes of mortality in elderly Australians are ischaemic heart diseases, cerebrovascular diseases, lung cancer and heart failure (Australian Institute of Health and Welfare, 2007). The chronic and acute burden of these diseases are exemplified in the frequent hospitalisation to ED and acute wards (Pronovost, et al., 2005). Therefore, any interventions developed to target elderly patient’s
care, should recognise the confounding factors of multiple illnesses (Rivard, et al., 2008).

3.1.2 Hospitalisation of elderly people

Elderly people have increased levels of rehospitalisation and lengths of hospital stay compared to the younger population (Trivalle, et al., 2010). Chronic illness, complications resulting from medical or surgical interventions, drug-related adverse events, and injuries are associated with an increased need for health care in general, and hospital admission (Forster, et al., 2003). On average, it is expected that elderly patients experience higher mortality, greater length of stay, and higher costs, independent of adverse events (Rivard, et al., 2008).

Many elderly people admitted to hospital experience complications during their hospital stay. These are known as iatrogenic complications and include falls, urinary tract infections and increased confusion (Alvine, 2006). Coleman et al., (2006) indicated that early identification of hospitalised elderly patients who have increased risk of readmission is necessary for an effective and safe discharge program that may include transition to other care facilities. Although the majority of transitions are planned and intended to improve patient's outcomes, they are often associated with high numbers of errors and adverse events (Claflin, 2005a; Crotty, et al., 2004; Ma, Coleman, Fish, Lin, & Kramer, 2004).
3.2 ERRORS AND ADVERSE EVENTS IN THE ELDERLY POPULATION

The increased focus on patient safety is a direct result of the increasing evidence that patients do not always receive optimal care in the health system (Davies, Herbert, & Hoffman, 2003). The Institute of Medicine (IOM) in the USA reported that a significant number of errors and adverse events were occurring within the health system (Leape, 2000; Leape & Berwick, 2005), and affecting patient safety (Kohn, et al., 2000). This report generated legislative and regulatory initiatives to investigate medical and nursing errors and to design systems that address the problems.

Errors and adverse events are common in hospital and community health care settings. The most common type of error is associated with administration of medications (Rozich & Resar, 2001). Medication errors in the clinical setting are related to three main factors: quality of prescribing, dispensing and administration. It has been reported that approximately 60% of adverse drug events occur during transition of patients from hospital to residential aged care facility or home, ED to critical care and from surgical units to rehabilitation facilities (Pronovost, et al., 2003; Rozich & Resar, 2001). These errors and adverse drug events are usually associated with incorrect or incomplete transfer of medication information (Rozich & Resar, 2001). Other adverse events reported among the elderly during care transition include falls (Claflin, 2005b; Conga Armayor & Narvaiza Solis, 2006; Paniagua, et al., 2006), complications resulting from errors in diagnosis (Barber, 2004), post operative wound infection
(Bartels & Bednash, 2005), disorientation and agitation (Nazareth, et al., 2001), all of which are preventable. Breakdown of communication between clinicians (Institute for Safe Medication Practices, 2005; Rozich & Resar, 2001), failure to decide or act appropriately based on available information or violation of policies (Benner, et al., 2002) are common attributing factors. Errors have also been associated with problems in products and procedures (Australian Pharmaceutical Advisory Council, 2000a).

Practices such as unplanned transfers and inadequate preparation prior to transfers also increases the risk of preventable errors and adverse events, some of which may result in early readmissions for elderly patients (Al-Rashed, Wright, Roebuck, Sunter, & Chrystyn, 2002). Antecedent causes of errors and adverse events have been identified as poor staffing, job overload, high staff turnover, a stressful environment and inadequate supervision from senior staff.

### 3.2.1 Consequences of errors and adverse events in health

Errors and adverse events have a major impact on patients and health services. The consequences to the patient are poor clinical outcomes (Annas, 2006), disruptions to treatment (Crotty, et al., 2004), pain, disability (Seago, Williamson, & Atwood, 2006), loss of functionality, loss of life (Royal, Smeaton, Avery, Hurwitz, & Sheikh, 2006), increased psychological harm (Barach & Small, 2000), and dissatisfaction with services (Coulter, Hurwitz, Aronow, Cassata, & Beck, 1996; Kane, Homyak, Bershadsky, & Flood, 2006), including loss of trust in the health care system (Holland, et al., 2005).
There is also an indirect loss to society from the decreased productivity of patients who have suffered a serious adverse event (Australian Patient Safety Foundation, 2000; Royal, et al., 2006).

The cost of adverse events to health services is related to increased readmission to hospitals and length of stay (Murtaugh & Litke, 2002), legal expenses and compensation for medical errors (Institute of Medicine, 2001). In Australia, approximately 1% of the health care budget ($AUD400 million per year) is spent on costs related to adverse events (Australian Patient Safety Foundation, 2000).

A complex and diverse health care system will inevitably have failures and shortcomings. It is understandable that health care is labour intensive and individuals can, and do, make mistakes (McGoldrick, 2005; Rhodes, 2003). Health care organisations throughout the world support the prevention of errors and adverse events (Fitzpatrick, Hutchinson, Kozlowski, Palmer, & Trahan, 2002). Patient safety is primarily a result of healthcare system design, and not necessarily of individual health care workers. Therefore, identifying systemic vulnerabilities has greater potential for improvement than searching for individual flaws (Akins & Cole, 2005). However, it is important for health care professionals to work within the health care organisation’s policies and procedures and to continually seek evidence based practice to deliver quality care (National Health Service, 2000). According to Bradley & Brasel (2009) when adverse events involve a single clinician’s practice, the issue of individual competence cannot be ignored. In such cases, the management process must
outline strategies to enhance clinical skills and remove blaming and threatening behaviour.

### 3.2.2 Research relating to patient safety

Adverse events known to have severely compromised patient safety have had major effects in the health care systems of these countries United States of America (USA), Britain, Canada and Australia. A milestone Californian study (Mills, et al., 1978) in 1974 randomly sampled 20,864 hospitalisations from 23 hospitals. The findings indicated that 5% of the entire sample had a *potentially compensable event* (PCE), defined as a disability caused by medical management with temporary or permanent impairment to physical or mental function, or economic loss in the absence of impairment. The severity distribution of PCEs showed that 80% were temporary, 10% were permanent disabilities and 10% resulted in death. The occurrences of PCEs were higher in patients 65 years and over compared with those less than 65 years old. This study had a significant impact in the United States of America. Since its release, adverse events have been a priority for health professionals, governments and the society. Nevertheless, adverse events have continued to critically affect the health system.

In another USA study (Mills, Neily, Kinney, Bagian, & Weeks, 2007), a review of root cause analysis (RCA) identified 143 incidents related to *adverse drug events* (ADEs) over a one year period. The causes were errors in medication administration, including “wrong dose”, “wrong medication”, “wrong patient”
and “failure to administer medication”. The major contributing factors to the ADEs were in failure to follow hospital policies or procedures, lack of knowledge or education, problems with administration equipment and medication dispensing issues. Additionally, a lack of communication between nurses and doctors contributed significantly to ADEs. Moreover, recommendations from the RCA demonstrated that training and education on ADEs improved the process of medication ordering by medical physicians, improved the process of checking the patient’s identity, checking medical armbands and allergies at the bedside and adhering to policies and procedures. While this study lacked an in-depth explanation of the methodology undertaken within the RCA team to develop strategic recommendations, it highlighted a significant aspect of ADEs in the elderly and how they can be prevented.

A review of 14,799 randomly selected hospitalisations from 28 randomly selected hospitals (Thomas, et al., 2000) in Utah and Colorado demonstrated that the annual incidence of adverse events was 3% of hospitalisations. Approximately 30% of these adverse events were attributed to negligence. Surgical procedures were responsible for 45% of adverse events and medication errors were the most common non-operative adverse events, comprising 19% of the total. These findings were similar to that of an Australian study (Wilson, et al., 1995) that reviewed 14,179 randomly sampled records from 28 hospitals in two states (New South Wales and South Australia). Adverse events were detected in 17% of hospitalisations. Permanent disability occurred in 14% of cases and death for 5% of patients affected. Failures in technical performance of
a procedure accounted for 35% of incidents, failure to decide or act appropriately based on available information accounted for 16%, failure to investigate or consult resulted in 12%, 11% were for failure to attend, 9% were due to misapplication of a rule, while violation of policies and procedures accounted for 5%. Nevertheless, the studies cannot be compared because the Australian study included various aspects of care such as falls, consents, the overuse, underuse and misuse of drugs and complications of thromboembolism which were not assessed in the USA studies (Thomas, et al., 2000). The studies bring to light the nature and severity of adverse events in the Western world.

3.2.3 Strategies for safe transfer of elderly patients

The movement of elderly patients from one healthcare practitioner or setting to another makes them particularly vulnerable to serious lapses in the quality and safety of nursing and medical care (Chugh, Williams, Grigsby, & Coleman, 2009). The problems associated with transfer have been identified by researchers who have found that most health care professionals have little or no training in executing high-quality care transitions in the role of either the sender or the receiver (Bennett, Tuttle, May, Harvell, & Coleman, 2007; Chugh, et al., 2009; Next Step in Care, 2010). Therefore, highest standards of care during the transfer of patients between hospital wards and between hospitals, residential aged care facilities and other care services have not yet been achieved (Kripalani, et al., 2007).
The evidence suggests that poorly designed health care systems have contributed to errors and adverse events that have harmed patients (Leape, et al., 2009). There has been a lack of training of health care professionals to enable them to develop the necessary skills in information management, and understanding of the concepts of organisational management, including the human factors that impact on practices within health facilities (HMO Care Management 2004). A recognised weakness, from the education perspective, is that most medical (Lucian Leape Institute, 2010) and nursing (Seifert, 2009) curricula do not include specific content about procedures and processes to be followed when patients are being transferred. No effort has been made to include this content into mandatory hospital programs.

The HMO Care Management Workgroup (2004) summarised the processes and recommended steps required for the safe transfer of patients. These involved (i) opportunities to implement contemporary strategies to improve the exchange of health information; (ii) recognising the significance of organisational culture and related informal and formal communication processes and networks; (iii) involving clinicians in decision making about how to most effectively adapt and implement policy, regulations and directions from government agencies regulatory bodies, and bodies such as coroner case report recommendations. These recommendations have been applauded by the American Geriatrics Society (2007) and the NSW Garling Report (2008), both of which have identified eight factors to reduce the occurrence of errors and adverse events during transfer of patients.
These are:

1. Preparation and information for patients on what to expect at the next level of care.

2. Adequate coordination between the sending and receiving facilities.

3. A uniform plan of care to facilitate communication and continuity across settings.

4. The advancement of electronic communication or structured documentation to guide and coordinate individual elements of the plan of care and timely transfer.

5. The launch of new quality improvement efforts to address transitions between care settings, in which both the sending and receiving providers of care would be accountable for the success or failure of the patient’s transition.

6. Professional education programs, speciality certification boards, licensing boards and quality improvement programs that seek to improve, evaluate and monitor health professionals’ abilities to collaborate across settings to execute a common plan of care. Patient and family needs are to be incorporated as core competencies.

7. Health care reforms and leaders to develop policies to guide transitional care.

8. Financial incentives to engage quality transitional measures and services in all health care settings.

A recent Joint Commission on National Patient Safety Goals (2010) identified improved communication among health care professionals as a critical area for
improvement at the point of care. It also emphasised the need for medication safety and, in particular, reconciliation of medications across the continuum of care. To do this, communication across health settings must be improved.

There is a substantial body of research in testing the effectiveness of interventions to promote the safe transfer of elderly patients (Boockvar, et al., 2009; Cheng, et al., 2006; Coleman, et al., 2004; Horwitz, et al., 2009; Kaplan, et al., 2009). Introducing a comprehensive plan of care, led by a multidisciplinary team during transfer to wards and discharge to home or residential aged care facilities, has been documented to be effective in reducing errors and adverse events (Chugh, et al., 2009; Coleman, 2009). The availability of well-trained healthcare practitioners for follow-up care (Vira, Colquhoun, & Etchells, 2006) and effective collaboration across health care institutions (Cole, et al., 2002) has also been demonstrated to be effective (Baker & Norton, 2004). Educating patients to improve medication knowledge, promote adherence and prevent poly-pharmacy (Holland, et al., 2005), and to reduce medication related adverse events, has been successfully implemented in hospital settings (Barnsteiner, 2005). Geriatric assessment at admission and prior to discharge has been shown to reduce adverse events, unplanned readmission and overall improved quality of life and patient satisfaction (Cunliffe, et al., 2004). Further, a 12 month pilot study (Coleman, 2009) of patients aged 55 years and over across 10 hospital sites in California, USA, examined the use of care transition intervention (CTI). During the study period, transition occurred from the hospital (sender) to the community care (receiver). The CTI was conducted by nurses (including student
nurses), social workers, experienced community workers and trained layperson volunteers. The intervention included strategies to provide patients with relevant skills and knowledge in preparation for transfers that focused on building self efficacy. The study found medication management was the most frequently reported difficulty experienced at transition. A limitation of the study was that the ongoing cost of the CTI made it difficult to carry out the intervention for the expected 12 month study period. Nevertheless, the major finding was that the hospital facilities were committed to incorporating the CTI into the hospital practices.

Researchers are continuously designing and testing new interventions to reduce the incidence of errors and adverse events associated with the transfer of elderly patients between care settings. However, the effectiveness of these strategies has not been investigated in a systematic review. The systematic review reported in Chapter 5 addresses that health care priority by focusing on the effectiveness of strategies in reducing errors and adverse events during care transition.

### 3.2.4 Patient safety culture

The term *patient safety culture* refers to an initiative that promotes a culture of safety in the health care environment (Armitage, 2009a). It is important to understanding the organisational structure, improving patient outcomes and recognition of human errors through active failures and latent system conditions (Friesdorf, Buss, & Marsolek, 2007; Watson, Bond, Johnston, & Mearns, 2006).
One major theoretical perspective is the Swiss Cheese Model (Reason, 2000), which claims that when holes in various layers of the organisation’s defence system line up, patients experience errors, some of which may harm the patients. That is, a succession of linked, unchecked errors can lead to an adverse event. If any one of the errors in the chain is blocked, the adverse event may not occur. Therefore, a culture of patient safety requires reporting of errors and near misses when they are recognised so that future errors can be prevented.

The culture of safety foremost indicates the fundamental need for individual clinicians and management to be vigilant for potential errors and adverse events. The error reduction process has to be built into the health care system. Additionally, research and the use of evidence based practice contributes to a quality culture within a health care system (Zegers, et al., 2009). This process ensures that interventions focus on the underlying causes of errors and on redesigning systems to reduce active failures (Zibrowski, et al., 2009).

A cross-sectional study undertaken in western Canada assessed in-patient incidents over a one year period and the views of hospital staff regarding patient safety (Kline, et al., 2008). The study examined individual and unit-level (hospital ward) variables to predict adverse events. The study hypothesised that a hospital with a strong culture of patient safety would have reduced incidence of adverse events. Of the 5,070 incidents obtained from the database, falls accounted for 37% database entries, with contributing factors being loss of a patient’s balance, a language barrier between nursing staff and patients, the
condition of patients and patient disorientation in new surroundings. Medication discrepancy, where patients were not involved, resulted in 3% of incidents, and medications errors involving patients accounted for 39% incidents recorded on the database. Contributing factors were associated with policies and procedures not being adhered to. Consequently these findings suggest that when policies and procedures in the clinical settings are not followed, the potential for errors and adverse events is heightened. The question asked across organisations is why have these policies and procedures not been adhered to in the clinical settings? The same study surveyed 8,163 clinicians in relation to patient safety culture. The results found that wards that had a strong culture of patient safety also had improved communication between staff, policies and procedures were followed and the level of falls was reduced. This establishes that when a patient safety culture evolves within the hospital setting, adverse events are reduced.

A further study undertaken in rural USA (Demiris, Patrick, & Boren, 2004) addressed the issue of patient safety culture in hospitals with the general aims of highlighting healthcare providers’ attitudes towards patient safety, and their expectations of an adverse event reporting system. The specific objective was to provide insight into the organisational culture and the readiness to adopt patient safety strategies in a rural setting. Results found that 93% of health care providers indicated underreporting of errors and adverse events and 71% believed that there was no culture of blaming individuals involved in medical errors. The result has two main effects. Firstly, underreporting of errors and
adverse events is known to be a common barrier to patient safety in hospitals, therefore the results relate practically to the clinical settings and to other studies (Baker & Norton, 2004; Blanco, et al., 2009; Coldiron, et al., 2005; de Vries, Ramrattan, Smorenburg, Gouma, & Boermeester, 2008). Secondly, the study participants indicated that there was minimal culture of blame, which, according to Reason’s theory (2000, 2002, 2004, 2005) is a fundamental approach to improving the reporting of incidents. Therefore, one may think that, where the culture of blame is absent or minimal, there will be reporting of errors and adverse events. However, a finding that posed concern was that 57% of participants surveyed believed that their organisational culture of patient safety was inadequate. This study was a pilot involving only 32 participants, therefore it was not possible to extrapolate the results. However, it brings to light deficiencies in patient safety. The findings were similar to those of an Australian study (Wolff & Bourke, 2002) in which the majority of health care providers surveyed stated that current mechanisms for identifying errors and adverse events were inadequate, and that the organisational structure for managing patient safety in the health care system was poor. These studies demonstrated the need for health care professionals to improve practice by having a commitment to patient safety and its culture in the workplace.

3.2.5 Patient safety and communication

Poor communication and a lack of accountability between healthcare professionals, in particular nurses and doctors, (Kripalani, et al., 2007) can affect safety, quality and outcomes for patient transfers between care settings. Health
care professionals at the receiving end of transfers are often left “flying blind” (Coleman, 2009), without adequate information or direction to guide and provide clinical care (Kripalani, et al., 2007; Pesanka, et al., 2009). A study (McGoldrick, 2005) found that errors and adverse events occurred in three distinct yet related processes during patient transfer. These are (1) lack of communication between clinicians associated with verbal and written documentation, for example, poor nursing handover of patient’s medical condition; (2) poor planning, including inadequate elderly patient assessment, plan of care and follow-up; and (3) illegible writing by nurses or doctors in the elderly patient’s clinical records. In addition, elderly patients were not informed about the care regime. Voight (2009) found that poor communications among staff during the transfer of patients was connected to adverse consequences, sometimes hours later. Greenberg (2007) suggests that interventions that effectively prevent the breakdown of communication include triggers that stimulate and direct communication in a structured process, for situations such as clinical handoffs and transfer protocols, and the standard use of read-backs.

A study in Boston examined the relationship between service quality and the occurrence of adverse events and medical errors (Taylor, et al., 2008). The study methodology was a prospective cohort study of 228 participants, of whom 183 reported deficiencies in the quality of services provided. The most common types of service deficiencies were also poor communication and delays in care. Incidents identified on 52 charts were reviewed and, of these, 34 patients (65%) experienced adverse events, 11 events (21% of charts) were reported as near
misses and seven (13%) were classified as low risks errors. Thirty eight percent (13/34) of the adverse events were definitely or probably preventable. Examples of adverse events included a delay in antibiotic administration of 21 hours while a patient with pyelonephritis awaited a bed assignment; four episodes of over sedation resulting in “stat” discontinuation of medication or reversal orders; and three falls sustained by patients attempting to toilet without assistance. Patients also reported experiencing poor coordination of care by staff (Taylor, et al., 2008). This finding is consistent with previous studies (Conerly, 2007; Hsu, 2007; Patey, et al., 2007; West, Weeks, & Bagian, 2008) showing that communication barriers are significant determinants of patients’ decisions to complain about care provision. On the other hand, whilst patients may have some insight into coordination of care, they may not be the best judge of quality. For instance, assessing the process of care coordination could happen and may be beyond the patient’s ability, for example, assessing coordination of care in the operating theatre. These studies found that poor clinical communication does limit the quality of service that is provided and increases the risk of medical errors and inquiries. Health care professionals must develop the skills of effective communication between themselves and other care providers, and listen and address elderly patient needs.

An approach that has been effective in structuring communication is the use of checklists. The introduction of a standardised checklist has been employed in the operating theatre to prevent errors, including wrong procedure, wrong person and wrong site (World Health Organisation, 2008). Checklists are
commonly used in the ED and intensive care settings to guide set up for procedures, for example lumbar puncture (The Royal Children Hospital, 2009) and as criteria for catheterisation (Pronovost, Needham, et al., 2006). Structured checklists are used to apply standards and mandate and safeguard care practices (Voight, 2009). The aim is to achieve effective communication. As the name “checklist” implies, it is a guide that can be used to “check” performance, with varying effectiveness depending on the initiative that is carried out (Fahimi, et al., 2008). A study by the World Health Organisation (2009) that included sites across six continents (Africa, Asia, Europe, Middle East, North America and Oceania) assessed the use of a simple surgical checklist. The results demonstrated that the use of the checklist during surgical procedures lowered adverse events following surgery, with complications falling from 11% at the baseline assessment to 7% after introduction of the checklist. Subsequently, surgery related deaths also fell from 1.5% to 0.8% when the checklists were initiated. According to Haynes et al., (2009) using checklists during the administration of anaesthesia enables safe, appropriate prophylaxis against infection, effective teamwork among staff members, and other essential facets of peri operative care. This was reinforced in a nursing paper, which found that nursing staff using checklists were more likely to action care and ensure completed tasks in the operating theatre (Seifert, 2009). Checklists have been found to be practical and cost effective interventions in the clinical environment (Laurance, 2009; Voight, 2009). Such approaches could assist nurses to standardise care and reduce errors and adverse events.
The use of information technology to facilitate structured and standardised communications has also been found to successfully streamline services. For example, an electronic clinical records administration system, launched by the NSW Government, enabled clinicians to access patient information including diagnosis, X-ray and bloods results to enhance outcomes of care (Sydney South West Area Health Service, 2008a). This system, called Cerner Clinical Information System (CCIS) Power Chart Millennium, is an information technology system aimed at improving health care efficiency and communication. The benefit of CCIS is that it enables quick delivery of clinical results and progress to ensure a timely manner of treatment (Barber, 2004). Based on the findings of these studies, one can extrapolate the benefits of formal communication processes to the transfer of patients. A tool that encourages transmission of information and two-way dialogue between the transferring and receiving site will reduce the incidents of errors and adverse events, and is a cost effective means to encourage best practice within the health care setting.

3.3 CLINICAL GOVERNANCE

In New South Wales, “safety” has been identified as one of the six dimensions of quality in healthcare. Within the framework for managing the quality of health services, a major objective of any health care system should be the safe progress of patients through all parts of the system (Westbrook, Travaglia, & Braithwaite, 2006). Clinical governance units have been established in each area health service in that state. Clinical governance was designed as an integrated
approach to promote, review, measure and monitor the quality of patient care in
a unified and coherent whole to ensure patient safety (Petticrew, Whitehead,
Macintyre, Graham, & Egan, 2004).

The literature reports that clinical governance at all levels in clinical practice
works effectively by consolidating (Larkin, et al., 2007), codifying (Milne,
Krishnasamy, Johnston, & Aranda, 2007), and standardising organisational
policies (Wells, Free, & Adams, 2007). The framework of the clinical governance
system is the Incident Information Management System, the Root Cause Analysis
and development of policies (Jorm, et al., 2006). These processes provide the
tools that enable clinicians and administrators to oversee and monitor safety and
work quality by ensuring that all incidents are reviewed in a timely fashion, and
recommendations by expert panels for quality improvement are implemented
(Department of Health, 2009).

According to Plath (2006), clinical governance is the vehicle that drives
accountability, responsibility and assurance of patient safety. The aim of clinical
governance is for clinicians such as nurses and doctors to audit, improve and
enhance their practices (Sydney South West Area Health Service, 2008a). The
objectives of clinical governance are to ensure commitment to the provision of
high quality health services and to assist in identifying and responding to errors
and adverse events. For instance, evidenced-based practice has been used in
clinical settings as one of the approaches to improve the quality of clinical care
(Stichler, 2007). However, some nurses who use or advocate evidence-based
practice are often shunned and regarded as creating a change that would increase workload and costs. The literature reports that many clinicians are adopting an evidence based approach, it is concerning as in fact, some health care professionals such as nurses and doctors often lack the resources, training and knowledge to implement these strategies in their workplace (Bauer, Fitzgerald, Haesler, & Manfrin, 2009; Rose, 2008; Schedlbauer, et al., 2009).

For clinical governance to be effective, it must involve a clinical audit of performance to measure aspects of health care, focusing on internal comparison, monitoring performance, and external comparison with peer hospitals (Woods, Thomas, Holl, Weiss, & Brennan, 2007). It involves clinical risk management that prevents or reduces adverse events in patients. For example, learning from complaints, completing critical adverse event audits, and identifying and dealing with inadequate professional performance, could all improve patient outcomes by reducing errors (NSW Health, 1996). In addition to improving patient safety, professional development of nurses and doctors has been associated with quality practice and ongoing knowledge and effective standards of practice for staff (Terrell & Miller, 2006). In Australia, for example, it was identified that potassium chloride was being administered ineffectively, leading to deaths. This led the clinical governance unit to advocate for clearer labelling and to make the product less easily available in clinical practice (Crimlisk, et al., 2009).

The state and territorial governments in Australia are tackling patient safety. All states have patient safety strategies and quality councils mandated to further
patient safety initiatives (National Health Priority Action Council, 2006). In New South Wales, each Area Health Service (AHS) has an area quality council. The purpose of these councils is to improve practices and report to patients, clinicians and managers on the quality of services, as well as report to the AHS Board, the Department of Health and Minister for Health (Sydney South West Area Health Service, 2008a).

The RCA review process is used in all hospitals in Australia to analyse incidents to identify the underlying causes and factors that contributed to incidents, and to recommend actions to prevent similar occurrences in the future (McDonald & Leyhane, 2005). The main principles of an RCA investigation are systems and processes, problem solving and a scale of effectiveness to develop recommendations (Sydney South West Area Health Service, 2008a). This process was implemented to investigate and report the causes of serious adverse events, to recommend effective processes to prevent further recurrence and assist in their implementation (Mansah, Griffiths, Fernandez, & Chang, 2007). The IIMS used in New South Wales hospitals has enabled timely access to information technology and provides a framework for reporting and recording of incidents (McDonald & Leyhane, 2005).

The number of errors and adverse events occurring in Australian hospitals is unknown due to underreporting. Nevertheless, the IIMS process does promote efficient ways for errors and adverse events to be recorded and to identify effective processes to improve care (Weingart, et al., 2009). Clinical governance
has led Australians towards patient safety and improvements to practice. However, there is still a need for organisational change that links systems and processes in health facilities, ensures reporting of errors and encourages continuity of care across the health care system.

### 3.4 CONCLUSION

The Australian population is ageing, and errors and adverse events are prominent among hospitalised elderly patients, particularly when being transferred between care settings. Reducing errors and adverse events by addressing potential and actual threats to patient safety is a priority for health services (Rozich & Resar, 2001). The risks of errors can be reduced by attending to factors operating at the organisation and individual levels. These include improved communications between care providers, adherence to policies and procedures, ongoing systems to review reported errors and education that targets the cause of error (Silen-Lipponen, Tossavainen, Turunen, & Smith, 2005). Communications using a structured process such as checklists have been demonstrated to assist and enhance care planning, follow-up and transfer between ward settings. A clinical culture that promotes patient safety has been used to improve quality care outcomes for patients. The clinical governance units established in hospitals in Australia goal is to achieve best practice in all care settings.
Overall, the information gathered from this literature review will be used as a starting point and reference guide for the proposed study. The reported studies have addressed a contemporary research problem: reducing the errors and adverse events that occur during the transfer of elderly patients between care settings. This thesis will contribute to existing knowledge and thereby go some way toward filling the gap in research. The next chapter reports on the method and conceptual framework of the thesis.
CHAPTER 4

Research Method and Conceptual Framework
4.1 INTRODUCTION

As reported in Chapter 1, the aims of this thesis are to identify the occurrence of errors and adverse events in a hospital setting retrospectively, to describe strategies to minimise errors and adverse events during care transitions of elderly patients, and to conduct a pilot study to assess the feasibility of a strategy to enhance communications between clinical sites transferring and receiving elderly patients. The study was completed in three phases, each designed as a discrete study with method, findings and discussion. This chapter describes the overall research design and presents the conceptual framework of the project.

4.2 OVERALL RESEARCH DESIGN

Multi-method research is one of the fastest growing areas in research methodology. Multi-method is the conduct of two or more research methods, each rigorous and complete in itself and in one project, after which the results are considered simultaneously to provide a more complete picture (Almarsdóttir & Traulsen, 2009; Creswell, 2009).

Multi-method design allows multiple directions to solving one problem (Polit & Beck, 2010). In this thesis, three different methods and processes were applied to answer the research questions. The aims and objectives identified in this thesis required multiple techniques to allow understanding, explanation and description of the complex problem from various perspectives. Different
research methods were required to answer and address those problems and questions rather than applying the one-size-fits-all approach (Morse, 2003).

Multi-method research has been used to investigate exercise programs for patients with coronary artery diseases (Fernandez, Davidson, Griffiths, Juergens, & Salamonson, 2007), new medical treatments (Edmondson, Bohmer, & Pisano, 2001) and organisational changes in the workplace (Corner, et al., 2003).

As stated in Chapter 1, the overall aim of the research described in this thesis was to develop and pilot test an intervention to promote the safe transfer of elderly patients across care settings: the STEP Study.

Three research approaches were used:

- Auditing the hospital incidence reporting system (Chapter 2);
- A systematic review of evidence from the literature (Chapter 5);
- Developing and pilot testing an interactive Patient Transition Checklist (iPTC, Chapters 6 and 7).

Each of the three studies was conducted with conceptual congruence and is complete in itself (Creswell, 2009).

An audit of incidents reported in one metropolitan teaching hospital identified the types of errors and adverse events occurring in elderly inpatients, and the contributing factors. The literature investigating errors and adverse events in the elderly, and strategies to promote safe transfer between care settings, was
examined using a systematic review. The findings from the systematic review and the audit of incidents were then used to develop the intervention. An additional review of the literature, an audit of existing clinical forms in the hospital, and consultations with expert clinicians were completed to develop the intervention. The iPTC was tested for content validity. A pilot study to investigate the feasibility of the iPTC intervention was undertaken using a convenience sample, an audit checklist as a tool, and surveys of nurses. Whilst a randomised, controlled trial would have been the preferred method to test the effectiveness of the intervention, this was not feasible owing to a large, integrated project occurring at the study site. Table 2 presents the research designs for each of the studies that constituted this multi-method research. A detailed description of the rationale for each of the studies, the research design and the methods used is presented in Chapters 4, 5, 6 and 7.
Table 2: Research designs for each of the studies

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<td>Retrospective design audit</td>
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<td>To identify strategies to minimise errors and adverse events during care transitions of elderly patients.</td>
<td>Systematic Review</td>
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<td>Chapter 6</td>
<td>To develop an intervention to promote safe transfer of elderly patients.</td>
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4.3 CONCEPTUAL FRAMEWORK

A conceptual framework is a structure of concepts, theories (or both) that are linked to provide a plan for the study (Burns & Grove, 2009; Eccles, Grimshaw, & Walker, 2005), which underpins interventions to promote effective professional practice. The conceptual framework for this study is based on human error theory (Reason, 2000) and the concept of planned communication (Windahl, Signitzer, & Olson, 1992). These theories and concepts are based on causal relationships and identifying the timing of events.


4.3.1 Human error theory

Human error theory (Reason, 2000) has been used by high risk industries, such as North Sea oil companies and aviation, to identify causes of errors and to develop strategies to reduce their frequency and consequences. Human error theory can be applied similarly in health care settings, given the high incidence of human errors and adverse events, as reported in *To Err is Human* (Kohn, et al., 2000). Reason’s (2000) theory was used because it focuses on the process that generates the error rather than the individual who commits the error. Health care is a complex environment where human decisions and actions play a fundamental role in nearly all components, hence the relevance of this theory (Reason, 2000). Human error theory (Reason, 2000) argues that human behaviour can be divided into six types of failure that can lead to errors in clinical actions or systems: *latent, active, slips, lapses, mistakes, and violation*.

In this study, latent and active failures were used to develop the conceptual framework. This is because incidents reported at the study site lacked policies to guide the transfer of elderly patients, which is a possible latent failure, and the audit (Chapter 2) showed incidents of errors and adverse events resulting from active failures. There is a mild implication that human theory might serve the organisation as a policy, not just as a means of analysing errors for the study.
• **Latent failures** are often decisions made by the senior management or the head of department through clinical policies that may lead to error in clinical practice. These decisions can have damaging consequences which often cannot be detected for a long time in the system and become evident only when combined with the task or environmental conditions or demonstrated through research (Reason, 2000).

• **Active failures** are unsafe acts or omissions committed by the health care professionals, whose actions can lead to adverse consequences (Reason, 2000). Unsafe acts are often influenced by high workloads, staff shortages, poor supervision, inadequate training and stress (Reason, 2000).

**Non intentional errors**

• Slips, lapses and mistakes are classified as non-intentional errors (Reason, 2000). Slips and lapses, mistakes, and violations are unsafe acts that lead to human errors. Slips and lapses occur when the planned intended actions are appropriate but fail or deviate from the plan.

• **Slips** are errors that can be seen, for example, when the nurse’s plan is to fetch Ceftriaxone from the shelf but Ceftriaxime is picked up instead (Watson, et al., 2006).

• **Lapses** are internal errors that are due to memory failure, for example, the plan is to give a medication script to a patient when discharged but the staff member forgets to do so (Reason, 2000).
Mistakes result from a planned behaviour which is inadequate to achieve the set goal. For example, a pharmacy assistant may recommend an antifungal for the treatment of vaginal itch when the symptoms are due to a sexually acquired infection, not vaginal candidiasis (Watson, et al., 2006).

**Intentional errors**

- **Violation** is an intentional error which occurs when an individual knows the guidelines and procedures that they should follow in a given situation but chooses not to follow this protocol. For instance, a violation could be the nurse explaining medical diagnoses to a patient or giving blood test results to the family of a patient (Reason, 2000).

Overall, human error theory identifies that patterns exist in adverse events and often one of these patterns is evident when an incident is analysed. Reason (2000) notes that in a perfect world, the health system would be insulated from the potential for internal or external environmental factors to lead to adverse events. He uses the analogy of Swiss cheese to explain that the world we live in is not so perfect because we are humans and therefore prone to making errors — the holes in the Swiss cheese. He refers to the Swiss Cheese Model to represent the potential for errors or failures such as communication deficits, poor planning and inappropriate management that can often lead to adverse events across the health system. As Reason (2000) stated, the presence of holes
in one ‘slice’ does not immediately cause a tragic outcome. Rather, over time, poor practices establish and are perpetuated until appearing as a hole in the system when an error or adverse event is identified. Closing holes in the health care system requires strategies, processes and mechanisms be put in place and adhered to by individuals to reduce the incidence of errors and adverse events (Reason, 2000).

Reason used a study (2002) to illustrate how easily human error can occur in our everyday lives. In a survey of photocopying practices, almost all respondents to the survey reported that they failed to remove the last page of the original when they photocopied it. The closed lid of the photocopy concealed the last sheet of the original, so no visible reminder of the need to remove is available. The same study investigated memory aids and found almost all those surveyed indicated that a checklist is an effective reminder (Reason, 2002). This study translates into the clinical field. Anticipating problems and having a system in place, such as a mandatory checklist, could reduce reliance on memory and promote communication actions by stopping or preventing omissions. Reason’s (2002) study is based on human error theory (Reason, 2000) and shows that it is often the people engaged in the task who have the experience to implement an intervention to prevent errors.
4.3.2 The concept of Planned Communication

Planned communication (Windahl, et al., 1992) guided the development of this study. This concept is widely used in mass media and other organisations to achieve effective and standardised communication. Although planned communication is rarely used in clinical practice (McQuail, 2005). Reader et al (2007) found that good communication was crucial for ensuring patient safety and reducing susceptibility to errors in critical care patients. A similar study (Pronovost, Thompson, & Holzmueller, 2006) demonstrated a link between poor communication and critical incidents. Both studies reinforced the need for communication to be structured, documented and followed up (Pronovost, Thompson, et al., 2006; Reader, et al., 2007).

Planned communication (Windahl, et al., 1992) is built around planning practical and normative communication. The concept is based on everyday work patterns, both informal and formal, and developed from the practitioners’ perspectives. Planned communication instructs the practitioner on how to plan communication to achieve a communication goal. It predicts that messages are more likely to be perceived as effective and well received if the practitioners themselves can judge the messages as realistic and can determine the outcomes of the message (Windahl, et al., 1992). Planned communication instructs on a ritual structured approach to communication, which sees communication as the maintenance of society in time, a representation of shared beliefs and not the extension of messages or the act of imparting information (Carey, 2009).
Planned communication is done or achieved by documenting communication actions using a structured process (Windahl, et al., 1992).

Planned communication can be applied in the clinical setting to reduce uncertainty, embrace the practitioners’ views and encourage effective documentation. It also ensures that communication is structured and transmitted without any flaw to the receiver and also ensures that the receiver, who is an active agent in the process, doesn’t misinterpret a message (Windahl, et al., 1992). Because planned communication presupposes that the clinical environment involves complex care, and recognises that human errors occur (Woods, et al., 2007), planned communication incorporates constant observations, problem solving, documentation and overall active sharing of information with one another (Windahl, et al., 1992). Communication should occur between all health care professionals, not just nurse to nurse or physician to physician but rather across multidisciplinary team groups with structured interactions with one another, leading to prevention and reduction in errors and adverse events.

When applying the human error theory (Reason, 2000) and the concept of planned communication (Windahl, et al., 1992), it is important to identify the factors that lead to breakdown in communication and to review current mechanisms. The systematic review of the effectiveness of strategies used to
prevent or reduce errors and adverse events during elderly patients’ transfer (Chapter 5), can enable us to more competently explore unintended effects and other exhausted efforts used to maximise quality outcomes (Dayton & Henriksen, 2007). The human error theory developed by Reason (2000) and the concept of planned communication developed by Windahl et al (1992), ascertained the importance of discriminating between outcomes resulting from the message coming from a communication effort and outcomes resulting from other aspects of the activity or the situation. In others words, how did the problem(s) arise? It was important in this study to audit the Incident Information Management System database to sum up the factors contributing to errors and adverse events. The results of the audit (Chapter 2) provided much insight into the nature of errors and adverse events, whereby falls, medications errors and clinical managements were considerable hindrances to achieving quality care for elderly patients. The recommendations provided by the expert team emphasised structured communication as a fundamental approach in reducing errors and adverse events, likewise reported in the national and international literatures.

Communication between clinicians becomes planned when a standard process of communicating is used in the working environment (Windahl, et al., 1992). The interactive Patient Transition Checklist (iPTC) was developed and piloted as one component of this research, and it was developed based on the perspective of the transferrer and receiver, in this instance the nurse forming the key
component of the form. Hence, in the development of the iPTC form, expert clinicians, including nurses, were invited to offer their insights and views. The conceptual framework of this research, based on Reason’s work (2000) and guided by the Windahl et al (1992) concept of planned communication, is demonstrated diagrammatically in Figure 5.

### 4.3.3 Conceptual diagram: Human error theory and planned communication

The conceptual framework incorporates Reason’s work (2000) of the Swiss Cheese Model and Windahl’s et al (1992) planned communication. *Defensive mechanisms* are a means of strategic measure used to prevent errors and adverse events (Reason, 2005). Windahl et al (1992) emphasised the need for communication to be structured, documented and followed-up. The theory (Reason, 2000) and concept (Windahl, et al., 1992) both demonstrated that using checklists for the transfer of elderly patients can serve as an effective mandate and reminder of actions that are required to prevent or minimise the occurrence of incidents or adverse events. As a result, the conceptual diagram Figure 5 was created, utilising the Swiss Cheese Model (Reason, 2000). Firstly, the holes in the diagram symbolise errors during transition, including poor communication and lack of follow-up, normally committed through lapses and active failure. Poor communication is mitigated by the standardised iPTC communication which augments to smooth transition. Finally, implementation of planned communication will reduce errors and adverse events during transfer, facilitated by enhanced communication.
4.4 CONCLUSION

This chapter has described the research design used for the thesis. A detailed description of the conceptual framework based on the human error theory (Reason, 2000) and the concept of planned communication (Windahl, et al., 1992) has also been presented. In the following chapter, the systematic review of the effectiveness of strategies used in transferring elderly patients across care settings will be presented.
CHAPTER 5

Effectiveness of strategies to promote safe transfer of elderly people across care settings
5.1 INTRODUCTION

In this chapter, the method and findings of a systematic review will be presented. The systematic review (SR) was developed based on the framework and standards of the Cochrane Collaboration and the Joanna Briggs Institute (JBI). The handbook of the Cochrane Collaboration was employed to inform the methods used in this review.

5.1.1 Research Question

This SR was undertaken to answer the following question: What is the effectiveness of various strategies to reduce the incidence of errors and adverse events among the elderly during care transition across acute and community health care settings? In this SR, the terms ‘transfer’ and ‘transition’ will be interchangeable.

5.2 SYSTEMATIC REVIEW AS A RESEARCH METHOD

Systematic reviews are undertaken to summarise the evidence and to explain differences among studies on the same issue. They assist clinicians to keep abreast of the large volumes of nursing, medical and allied health literature (Polit & Beck, 2010). A systematic review assists in informing clinical decision making, planning future agendas and establishing clinical policy. Systematic review applications strengthen the link between best practice and theory on clinical care to achieve optimal health care (Higgins, Thompson, Deeks, & Altman, 2003).
The aim of this SR is to identify strategies (interventions) that have been demonstrated to be effective in reducing the incidence of errors and adverse events and promote safe transition of elderly people across care settings.

5.2.1 Criteria for considering studies for review

Randomised controlled trials (RCTs) evaluating the effect of strategies to promote the safe transfer of elderly patients across care settings were eligible for inclusion in this review. Studies undertaken in any country were considered for inclusion; however, publications were limited to the English language.

The review included studies undertaken on participants aged >65 years who were transferred from:

- Ward to ward
- Hospital to hospital
- Hospital to residential aged care facilities
- Hospital to home

Studies that described errors and adverse events not associated with the transfer of elderly patients were excluded. Studies undertaken on elderly patients with psychiatric illness were excluded, as psychiatric illness is an independent factor contributing to errors and adverse events during care transition (Coleman, et al., 2004).
Any interventions that were undertaken to reduce or minimise errors and adverse events and to promote safe transition of the patients from one setting to another were included, for example, discharge planning, pharmacy counselling, comprehensive geriatric assessment and dedicated coordinators. In addition, trials that examined the effect of care in a dedicated transition facility prior to discharge were excluded.

The primary outcome of interest was the effect of the interventions on the use of health care resources. These included: readmission to hospital, the use of hospital services, physician visits and outpatient visits. Secondary outcomes of interest were medications related: quality of prescribing, adverse drug events, knowledge of medication and medication adherence. Other outcomes investigated included: falls, urinary tract infections, pain, confusion, functionality levels, quality of life, patient satisfaction, mortality and cost effectiveness.

5.3 SEARCH STRATEGY FOR IDENTIFICATION OF STUDIES

Prior to commencing the review, databases from the Cochrane Collaboration, the JBI, the National Health Service (NHS), the Centre for Review & Dissemination (CRD) and the Agency for Healthcare Research and Quality (AHRQ), were searched to ensure that a review of the same topic had not been undertaken. The search identified both published and unpublished trials. In consultation with a librarian, the Ovid databases were searched to identify key words used in the
titles and abstracts of research articles. As each database has its own indexing terms, individual search strategies were initiated for each database. During the process of the search strategy, consideration was given to the diverse terminology used and the spelling of keywords, which may influence the identification of relevant trials (Appendix 4).

The following databases were searched: CINAHL (1982–2009); MEDLINE (1966–2009); EMBASE (1980–2009); PsycINFO (Up to 2009); PreMEDLINE and OLDMEDLINE; Cochrane Library (up to and including 2009, Issue 1); Evidence Based Medicine (EBM) Reviews and Database of Abstracts of Reviews of Effects (DARE) (up to 2009). Reference lists and bibliographies of all possible trials and reviews of studies were searched. Conference proceedings were searched; experts in the field were also contacted to identify further trials. Keywords used in research articles guided the search terms used.

5.3.1 Method of the review

The references and abstracts obtained from the search were independently assessed for inclusion eligibility by two reviewers using the Verification of Study tool adapted from a previous review (Fernandez, 2007) (Appendix 5) and the full text was obtained of relevant trials. Studies reported in more than one publication were included only once. Decisions for study eligibility were made and agreed by both reviewers. Any disagreements were resolved by discussion with a third person. All trials were imported into Endnote Bibliography Software.
Each study was critically appraised and its methodological quality assessed using the JBI Critical Appraisal Checklist (Appendix 6). This checklist assessed each trial for the following:

- Detailed inclusion and exclusion criteria used to obtain the study sample
- Evidence illustrating allocation concealment at randomisation
- Validity of methods of outcome assessment
- Details of withdrawals and dropouts
- Potential for bias demonstrated in outcome assessment

The minimum obtainable score was 11 and the maximum obtainable score was 33, with higher scores in the range suggesting higher quality methodology (Appendix 7). To prevent studies of low methodological quality influencing the findings, only studies of high methodological quality were included. Various methods have been used to determine a cut off point for inclusion of trials based on methodological quality, such as mean score, median score or calculating the mean score plus one standard deviation (Sutton, Abrams, Jones, Sheldon, & Song, 1998). For this systematic review, the mean score was used as a cut off point and trials that scored below this value were excluded from the review.

Data were collected independently by two reviewers using a data extraction tool (Appendix 8) that was piloted prior to its use. Any discrepancies between reviewers were resolved by discussion.
The following data were collected: patient inclusion/exclusion criteria, study settings, patients’ demographics, description of the interventions, description of the outcomes, follow-up period and number and reasons for withdrawals and dropouts. Attempts were made to obtain missing data from trial reports by contacting the authors.

5.4 STATISTICAL CONSIDERATIONS

Calculations were made using the Cochrane Statistical Package Review Manager (RevMan) Version 4.4. The studies were assessed for clinical heterogeneity by considering the populations, interventions and outcomes (Higgins, et al., 2003). Statistical heterogeneity (Higgins, et al., 2003) was assessed by using $I^2$ (percentage of total variation across studies). Fixed effects meta-analysis was used for combining study data in the trials that were judged to be sufficiently similar. Relative risks and 95% Confidence Intervals (CI) were calculated for dichotomous data. Analysis of continuous data was undertaken using the mean and standard deviation values to derive Weighted Mean Differences (WMD) and their 95% CI. Where synthesis of the data was inappropriate, a narrative analysis of results is presented (Schneider, Elliott, LoBiondo-Wood, & Haber, 2003).
5.5 DATA ANALYSIS

5.5.1 Description of studies

Approximately 10,000 publication trials were identified from the search strategy. Following removal of publication duplicates, 7,500 papers were potentially eligible. Based on the title and abstract of the citation, a further 7,463 studies were excluded. Full-texts of the remaining 37 trials were deemed eligible for further assessment, of which 19 were excluded (Appendix 9). Six of these 37 trials were below the quality threshold (mean 27). Twelve trials, involving a total of 5,400 participants, were included in the final review (Figure 6). The included trials tested the effectiveness of a multifaceted intervention compared with usual care. A summary description of the individual studies is included in Appendix 10.
5.5.2 Location of the studies

Trials included in the review were conducted in the United States of America (Coleman, et al., 2006; Dellasega & Zerbe, 2000; Evans & Hendricks, 1993; Naylor, et al., 1999; Rawl, Easton, Kwiatkowski, Zemen, & Burczyk, 1998) Australia (Caplan, et al., 2004; Crotty, et al., 2004; Hawe & Higgins, 1990; Wen,

5.5.3 Participants

The mean age of the participants in individual trials ranged from 67 years (Evans & Hendricks, 1993) to 84 years (Crotty, et al., 2004; Nazareth, et al., 2001). Twelve trials reported on the gender of the participants, with females ranging from 44% to 90%. In two trials, there were more females than males in both groups (Hawe & Higgins, 1990; Rawl, et al., 1998).

5.5.4 Reasons for hospitalisation


5.5.5 Interventions

All trials involved a dedicated health care coordinator as part of the intervention. These coordinators were registered nurses specialising in aged care (Coleman, et al., 2006; Dellasega & Zerbe, 2000; Naylor, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988; Wen, et al., 2003), social workers (Wen, et al., 2003),

For the purpose of this review, the interventions have been categorised as nurse-led interventions which involve patient assessments (Rawl, et al., 1998), medication follow-ups (Coleman, et al., 2006), home visits (Coleman, et al., 2006; Dellasega & Zerbe, 2000; Naylor, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988), telephone follow-ups (Coleman, et al., 2006; Dellasega & Zerbe, 2000; Naylor, et al., 1999; Rawl, et al., 1998; Wen, et al., 2003), liaison and communication with families (Coleman, et al., 2006; Rawl, et al., 1998) and community services (Rawl, et al., 1998; Wen, et al., 2003). Pharmacist-led interventions mainly focused on medication-related outcomes (Crotty, et al., 2004; Hawe & Higgins, 1990; Nazareth, et al., 2001) and involved families to reduce errors and adverse events in the transition process (Crotty, et al., 2004; Nazareth, et al., 2001), general practitioners (Crotty, et al., 2004; Nazareth, et al., 2001) and community services (Crotty, et al., 2004; Nazareth, et al., 2001). Multidisciplinary team led interventions involved comprehensive geriatric assessment (Caplan, et al., 2004; Nikolaus, et al., 1999), risk screening (Evans & Hendricks, 1993) whilst in hospital, support services by home visits (Caplan, et al., 2004; Evans & Hendricks, 1993; Nikolaus, et al., 1999), or follow-up with patients residing in long-term residential facilities (Caplan, et al., 2004; Evans & Hendricks, 1993), telephone follow-ups (Nikolaus, et al., 1999) and liaisons with general practitioners (Evans & Hendricks, 1993).
5.5.6 Usual care

Patients allocated to usual care groups did not receive any of the care included in the intervention (Caplan, et al., 2004; Coleman, et al., 2006; Crotty, et al., 2004; Dellasega & Zerbe, 2000; Evans & Hendricks, 1993; Hawe & Higgins, 1990; Naylor, et al., 1999; Nazareth, et al., 2001; Nikolaus, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988; Wen, et al., 2003): they were discharged home upon doctor’s assessments and did receive social worker intervention when deemed essential to their care.

5.6 METHODOLOGICAL QUALITY OF THE INCLUDED STUDIES

The methodological quality of the included studies was assessed according to the criteria described in the method section of the review. There was a 95% concordance between the two reviewers and discrepancies were resolved following discussion with the third reviewer. Overall, the methodological quality (Appendix 7) was high and ranged from 27 (Caplan, et al., 2004; Nikolaus, et al., 1999) to 32 (Crotty, et al., 2004; Nazareth, et al., 2001) (maximum obtainable 33).

5.6.1 Randomisation

The method of randomisation in most of the trials was by using computer generated random numbers (Caplan, et al., 2004; Coleman, et al., 2006; Crotty, et al., 2004; Naylor, et al., 1999; Nazareth, et al., 2001; Nikolaus, et al., 1999;
Townsend, et al., 1988; Wen, et al., 2003). One trial allocated by the month (Hawe & Higgins, 1990) and, in three trials, the method of allocation was not stated (Dellasega & Zerbe, 2000; Evans & Hendricks, 1993; Rawl, et al., 1998).

5.6.2 Baseline comparability

5.6.3 Recruitment and follow-up

In all trials, participants were recruited and interventions provided during their hospital admission. Follow-up data for these participants was undertaken in the outpatient rehabilitation centre (Rawl, et al., 1998), long-term aged care facilities (Coleman, et al., 2006; Crotty, et al., 2004; Dellasega & Zerbe, 2000; Evans & Hendricks, 1993; Nikolaus, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988), and participants’ homes (Caplan, et al., 2004; Coleman, et al., 2006; Dellasega & Zerbe, 2000; Evans & Hendricks, 1993; Hawe & Higgins, 1990; Naylor, et al., 1999; Nazareth, et al., 2001; Nikolaus, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988; Wen, et al., 2003).

5.6.4 Outcomes

Outcomes assessed included the use of health care resources, which were measured as readmission to hospital (Coleman, et al., 2006; Evans & Hendricks, 1993; Naylor, et al., 1999; Nazareth, et al., 2001; Nikolaus, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988; Wen, et al., 2003), hospital services usage (Caplan, et al., 2004; Crotty, et al., 2004), number of physician visits (Caplan, et al., 2004; Dellasega & Zerbe, 2000; Nazareth, et al., 2001; Nikolaus, et al., 1999) and outpatient visits (Caplan, et al., 2004; Nazareth, et al., 2001). Medication related outcomes investigated were the incidence of adverse drug events (Crotty, et al., 2004), and adherence to and knowledge of medication (Hawe & Higgins, 1990; Nazareth, et al., 2001). The incidence of falls (Crotty, et al., 2004; Rawl, et al., 1998) and urinary tract infections (Rawl, et al., 1998) were also assessed. Other adverse patient outcomes assessed were pain management
(Crotty, et al., 2004), deterioration of behaviours (Crotty, et al., 2004), mobility status (Crotty, et al., 2004) and confusion (Crotty, et al., 2004). The effect of the intervention on quality of life was investigated in four trials (Dellasega & Zerbe, 2000; Nazareth, et al., 2001; Rawl, et al., 1998; Wen, et al., 2003) and patient satisfaction was reported in two trials (Nazareth, et al., 2001; Townsend, et al., 1988).

Mortality was investigated in three trials (Evans & Hendricks, 1993; Nazareth, et al., 2001; Townsend, et al., 1988) and five trials reported on cost effectiveness of the interventions (Caplan, et al., 2004; Coleman, et al., 2006; Naylor, et al., 1999; Nikolaus, et al., 1999; Wen, et al., 2003).

5.7 RESULTS

The results presented below are grouped under the main categories of: health resources usage, use of hospital services, physician visits, outpatient visits, medication related outcomes, falls and urinary tract infection. Other adverse outcomes included quality of life, patient satisfaction, mortality and cost effectiveness.

5.7.1 Health resources usage

For the purpose of this review, the use of health care resources is considered to be readmission, hospital services usage, physician visits and outpatient visits. Health care resources usage was investigated in eleven trials (Caplan, et al.,

5.7.2 Readmission to hospital

Readmission to hospital was investigated at one month (Coleman, et al., 2006; Naylor, et al., 1999), three months (Coleman, et al., 2006; Naylor, et al., 1999; Nazareth, et al., 2001; Townsend, et al., 1988), four months (Rawl, et al., 1998), six months (Coleman, et al., 2006; Nazareth, et al., 2001; Wen, et al., 2003), nine months (Evans & Hendricks, 1993), and 12 months (Nikolaus, et al., 1999) following completion of the intervention.

Nurse-led intervention versus usual care

Five trials (Coleman, et al., 2006; Naylor, et al., 1999; Rawl, et al., 1998; Townsend, et al., 1988; Wen, et al., 2003) investigated the effect of a nurse-led intervention compared to usual care on readmission to hospital at one, three, four and six months. Pooled data demonstrated a 50% reduction (Coleman, et al., 2006; Naylor, et al., 1999) in readmission to hospital at one month (RR 0.53; 95% CI 0.38, 0.74) and a 20% reduction (RR 0.80; 95% CI 0.68, 0.95) (Coleman, et al., 2006; Naylor, et al., 1999; Townsend, et al., 1988) at three months among patients randomised to the nurse led intervention group. However, there was no statistically significant difference in the readmission rates at four months (Rawl, et al., 1998) (RR 1.64; 95% CI 0.69, 3.88) and six months (Coleman, et al., 2006; Wen, et al., 2003) (RR 0.83; 95% CI 0.66, 1.05) (Figure 7).
Pharmacist-led intervention versus usual care

Only one trial (Nazareth, et al., 2001) (n=340) assessed pharmacist-led intervention on readmission at three and six months. The findings demonstrated no statistically significant difference in the readmission rate between the two groups at any time period (Figure 8).

Figure 6: Readmission to hospital—Nurse-led intervention

Figure 7: Readmission to hospital—Pharmacist-led intervention
**Multidisciplinary team led intervention versus usual care**

The effect of a multidisciplinary team led intervention on readmission to hospital was assessed at one (Evans & Hendricks, 1993), nine (Evans & Hendricks, 1993) and 12 months (Nikolaus, et al., 1999). The findings (n=835 participants) demonstrated a 30% reduction at one month, and a 25% reduction at nine months, in the number of readmission to hospital in patients randomised to the multidisciplinary team led intervention group (Evans & Hendricks, 1993) (Figure 9). The trial (Nikolaus, et al., 1999) that reported at 12 months was a three-arm study involving 420 participants, randomised to a comprehensive geriatric assessment and post discharge home intervention, comprehensive geriatric assessment alone or usual care. The results demonstrated no statistically significant difference in the readmission rates between the groups (p=0.44). As the standard deviation of scores was not reported, the data has not been presented in a meta graph.

![Figure 8: Readmission to hospital-Multidisciplinary team-led intervention](image-url)
5.7.3 Use of hospital services

The trials that investigated pharmacist-led and multidisciplinary team led interventions also assessed the use of hospital services.

Pharmacist-led intervention versus usual care

In the only study (Crotty, et al., 2004) (n=88) that undertook this comparison, a significant reduction in hospital usage (p=0.04) at the two-month follow-up was reported in participants randomised to the pharmacist-led intervention, compared to the usual group (RR 0.38; 95% CI 0.15, 0.99) (Figure 10).

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>Pharmacist-led</th>
<th>Usual care</th>
<th>RR [fixed]</th>
<th>Weight</th>
<th>RR (fixed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crotty et al.</td>
<td>0/44</td>
<td>10/44</td>
<td></td>
<td></td>
<td>0.38</td>
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<tr>
<td>Total (95% CI)</td>
<td>44</td>
<td>44</td>
<td></td>
<td>100.00</td>
<td>0.38 [0.13, 0.99]</td>
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<tr>
<td>Total events: 5 (Pharmacist-led), 13 (Usual care)</td>
<td></td>
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<tr>
<td>Test for heterogeneity: not applicable</td>
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<tr>
<td>Test for overall effect: Z = 1.98 (P = 0.05)</td>
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</tbody>
</table>

Figure 9: Hospital services usage-Pharmacist-led intervention

Multidisciplinary team led intervention versus usual care

The one study (Caplan, et al., 2004) (n=739) that made this comparison reported a statistically significant reduction in the number of hospital services used by participants who received the multidisciplinary team led intervention (RR 0.77; 95% CI 0.62, 0.96), (Figure 11).
5.7.4 Physician visits

Four trials investigated the effects of interventions on the number of visits made to the physician over one month (Caplan, et al., 2004; Dellasega & Zerbe, 2000), three months (Nazareth, et al., 2001), six months (Nazareth, et al., 2001) and 12 months (Nikolaus, et al., 1999) following the intervention.

Nurse-led intervention versus usual care

One four arm trial (Dellasega & Zerbe, 2000) (n=140) that undertook this comparison found that there was no statistically significant difference reported in the number of visits to the physician between the four groups (p=0.520). Insufficient data was provided for a meta graph.

Pharmacist-led intervention versus usual care

In the only trial (Nazareth, et al., 2001) that undertook this comparison at three and six months, there was no statistically significant difference between the groups at any time period follow-up (Figure 12).
Figure 11: Physician visits—Pharmacist-led intervention

Multidisciplinary team led intervention versus usual care

One trial (Caplan, et al., 2004) that investigated the number of visits to the physician at a one month follow-up reported no statistically significant difference in this outcome (RR 1.06; 95% CI 0.97, 1.16) (Figure 13). At a 12 months (Nikolaus, et al., 1999) follow-up, there was no statistical difference between the groups (due to insufficient data, a meta graph has not been presented).

Figure 12: Physician visits—Multidisciplinary team-led intervention
5.7.5 Outpatient visits

The number of outpatient visits were investigated at intervals of one month (Caplan, et al., 2004), three months (Nazareth, et al., 2001) and six months (Nazareth, et al., 2001). None of the trials of nurse-led intervention examined this outcome.

Pharmacist-led intervention versus usual care

One trial (Nazareth, et al., 2001) that investigated the effect of the intervention on outpatient visits at three and six months reported no statistically significant difference in this outcome between the groups at either time period (Figure 14).

<table>
<thead>
<tr>
<th>Comparison: Pharmacist-led intervention versus usual care</th>
<th>Outcome: Outpatient visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study or sub-category</td>
<td>Pharmacist-led n/N</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>01 At three months</td>
<td>Nazareth et al. 75/164</td>
</tr>
<tr>
<td></td>
<td>Subtotal (95% CI)</td>
</tr>
<tr>
<td>Total events: 158 (Pharmacist-led), 154 (Usual care)</td>
<td>Test for heterogeneity: not applicable</td>
</tr>
<tr>
<td></td>
<td>Test for overall effect: Z = 0.37 (P = 0.71)</td>
</tr>
<tr>
<td>02 At six months</td>
<td>Nazareth et al. 39/157</td>
</tr>
<tr>
<td></td>
<td>Subtotal (95% CI)</td>
</tr>
<tr>
<td>Total events: 79 (Pharmacist-led), 80 (Usual care)</td>
<td>Test for heterogeneity: not applicable</td>
</tr>
<tr>
<td></td>
<td>Test for overall effect: Z = 0.30 (P = 0.77)</td>
</tr>
</tbody>
</table>

Figure 13: Outpatient visits-Pharmacist-led intervention

Multidisciplinary team led intervention versus usual care

Only one trial (Caplan, et al., 2004) that undertook this comparison reported on the number of outpatient visits at one month. The findings demonstrated no statistically significant difference in this outcome between the groups (RR 1.11; 95% CI 0.87, 1.42) (Figure 15).
5.7.6 Medication related outcomes

Medication related outcomes were assessed only in the pharmacist-led intervention. The outcomes investigated included quality of prescribing (Crotty, et al., 2004), patient knowledge of medication (Hawe & Higgins, 1990; Nazareth, et al., 2001), adverse drug events (Crotty, et al., 2004), and medication adherence (Hawe & Higgins, 1990).

Quality of prescribing

Inappropriate prescribing of medications has been associated with adverse drug events during care transition, mainly due to polypharmacy (Cucinotta, et al., 2004; Kopp, Brian, Michelle, Andreas, & Gail, 2006). Quality of prescribing was assessed in one trial (Crotty, et al., 2004) at a two months follow-up using the medication appropriateness index. This trial reported a significant reduction in the inappropriate use of medications prescribed among participants in the pharmacist-led intervention compared with the usual care group (p =0.007).
Knowledge of medication

Educating elderly patients about their medications prior to discharge or transfer from hospital has been demonstrated to improve their knowledge and adherence (Stichler, 2007) and thereby reduce the risk of adverse events (Ekman, Schaufelberger, Kjellgren, Swedberg, & Granger, 2007). Patient knowledge of medications was reported at one month (Hawe & Higgins, 1990), three months (Hawe & Higgins, 1990; Nazareth, et al., 2001) and six months (Nazareth, et al., 2001) following the intervention. The findings demonstrated no statistically significant difference in the knowledge of medication at one (Hawe & Higgins, 1990), three (Hawe & Higgins, 1990; Nazareth, et al., 2001) and six months (Nazareth, et al., 2001) between the pharmacists-led intervention group and the usual care group (Figure 16). As one study (Hawe & Higgins, 1990) did not provide standard deviation, the results could not be presented in a meta graph.

<table>
<thead>
<tr>
<th>Study or subcategory</th>
<th>Comparison</th>
<th>N</th>
<th>Mean (SD)</th>
<th>WMD (95% CI)</th>
<th>Weight</th>
<th>%</th>
<th>WMD (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 At three months</td>
<td>Nazareth et al.</td>
<td>61</td>
<td>0.42 (0.33)</td>
<td>0.52 (0.24)</td>
<td>200.00</td>
<td>0.07 [-0.09, 0.23]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standard (99% CI)</td>
<td>61</td>
<td>0.42 (0.33)</td>
<td>0.52 (0.24)</td>
<td>200.00</td>
<td>0.07 [-0.09, 0.23]</td>
<td></td>
</tr>
<tr>
<td>Test for heterogeneity: not applicable</td>
<td>Test for overall effect: Z = 1.36 (P = 0.17)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02 At six months</td>
<td>Nazareth et al.</td>
<td>61</td>
<td>0.49 (0.35)</td>
<td>0.69 (0.32)</td>
<td>100.00</td>
<td>0.01 [-0.10, 0.22]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standard (99% CI)</td>
<td>61</td>
<td>0.49 (0.35)</td>
<td>0.69 (0.32)</td>
<td>100.00</td>
<td>0.01 [-0.10, 0.22]</td>
<td></td>
</tr>
<tr>
<td>Test for heterogeneity: not applicable</td>
<td>Test for overall effect: Z = 0.37 (P = 0.68)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Figure 15: Knowledge of medication-Pharmacist-led intervention

Medication adherence

Medication adherence was reported at one month (Hawe & Higgins, 1990), three months (Hawe & Higgins, 1990; Nazareth, et al., 2001) and six months (Nazareth, et al., 2001). The findings indicated no statistically significant difference in the
overall mean adherence scores between the two groups at any of the time periods (Figure 17). Due to inadequate reporting of data by Hawe & Higgins (1990), results could not be presented in a meta graph.

Table: Comparison of adherence between Pharmacist-led and usual care groups

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>N</th>
<th>Pharmacist-led Mean (SD)</th>
<th>Usual care Mean (SD)</th>
<th>WMD (95% CI)</th>
<th>Weight %</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 At three months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maizel et al.</td>
<td>71</td>
<td>0.75 (0.30)</td>
<td>0.78 (0.28)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td></td>
<td>71</td>
<td>0.78 (0.28)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for heterogeneity: not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 0.00 (P = 1.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02 At six months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maizel et al.</td>
<td>63</td>
<td>0.78 (0.30)</td>
<td>0.78 (0.30)</td>
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<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td></td>
<td>63</td>
<td>0.78 (0.30)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for heterogeneity: not applicable</td>
<td></td>
<td></td>
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<tr>
<td>Test for overall effect: Z = 0.00 (P = 1.00)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 16: Adherence to medication-Pharmacist-led intervention

A sub-group analysis investigating underdosage and overdosage also demonstrated no significant difference in this outcome between the two groups at one and three months (Hawe & Higgins, 1990) (Figure 18). However, sub-group analysis did demonstrate severe non-adherence among patients taking four or more medications who were allocated to the usual care group compared with the intervention group (p =0.03) at three months (Figure 19).
### Figure 17: Adherence to medication at one month-Pharmacist-led intervention

<table>
<thead>
<tr>
<th>Study</th>
<th>Pharmacist-led</th>
<th>Usual care</th>
<th>RR (fixed) 95% CI</th>
<th>Weight</th>
<th>RR (fixed) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>nFN</td>
<td>nFN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01: Number of patients taking less than the recommended at any drug</td>
<td>Morrow et al.</td>
<td>11/314</td>
<td>8/106</td>
<td>1.00 0.69 1.89</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>Subtotal (95% CI)</td>
<td>114</td>
<td>106</td>
<td>1.00 0.69 1.89</td>
<td>0.23</td>
</tr>
<tr>
<td>Total events: 11 (Pharmacist-led), 8 (Usual care)</td>
<td>Test for heterogeneity: not applicable</td>
<td>Test for overall effect: Z = 0.19 (P = 0.846)</td>
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<td></td>
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</tbody>
</table>

### Figure 18: Adherence to medication at three months-Pharmacist-led intervention

<table>
<thead>
<tr>
<th>Study</th>
<th>Pharmacist-led</th>
<th>Usual care</th>
<th>RR (fixed) 95% CI</th>
<th>Weight</th>
<th>RR (fixed) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>nFN</td>
<td>nFN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01: Number of patients taking less than the recommended at any drug</td>
<td>Morrow et al.</td>
<td>27/314</td>
<td>26/106</td>
<td>1.00 0.65 1.65</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>Subtotal (95% CI)</td>
<td>114</td>
<td>106</td>
<td>1.00 0.65 1.65</td>
<td>0.10</td>
</tr>
<tr>
<td>Total events: 26 (Pharmacist-led), 17 (Usual care)</td>
<td>Test for heterogeneity: not applicable</td>
<td>Test for overall effect: Z = 0.90 (P = 0.371)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Comparison

**Pharmacist-led Intervention versus Usual care**

<table>
<thead>
<tr>
<th>Study</th>
<th>Pharmacist-led</th>
<th>Usual care</th>
<th>RR (fixed) 95% CI</th>
<th>Weight</th>
<th>RR (fixed) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>nFN</td>
<td>nFN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01: Number of patients taking less than the recommended at any drug</td>
<td>Morrow et al.</td>
<td>27/314</td>
<td>26/106</td>
<td>1.00 0.83 1.83</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Subtotal (95% CI)</td>
<td>114</td>
<td>106</td>
<td>1.00 0.83 1.83</td>
<td>0.20</td>
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<tr>
<td>Total events: 26 (Pharmacist-led), 17 (Usual care)</td>
<td>Test for heterogeneity: not applicable</td>
<td>Test for overall effect: Z = 0.90 (P = 0.371)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Other Issues

- Figure 17: Adherence to medication at one month-Pharmacist-led intervention
- Figure 18: Adherence to medication at three months-Pharmacist-led intervention
Adverse drug events

One trial (Crotty, et al., 2004) investigated the effect of a pharmacist-led intervention on the incidence of adverse drug events at two months and demonstrated no significant results in this outcome between the groups (Figure 20).

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>Pharmacist-led n/N</th>
<th>Usual care n/N</th>
<th>RR (fixed)</th>
<th>Weight %</th>
<th>RR (fixed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crotty, et al.</td>
<td>20/44</td>
<td>19/44</td>
<td>1.00</td>
<td>100.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Total (65% CI)</td>
<td>44</td>
<td>44</td>
<td>1.00</td>
<td>100.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Figure 19: Adverse drug events-Pharmacist-led intervention

5.7.7 Falls

The incidence of falls was assessed following the nurse-led and pharmacist-led interventions at two months (Crotty, et al., 2004) and at four months (Rawl, et al., 1998).

Nurse-led intervention versus usual care

In the only study (Rawl, et al., 1998) (n=100) that undertook this comparison, there was no statistically significant difference in the incidences of falls between the two groups (RR 0.88; 95% CI 0.44, 1.77)(Figure 21).
There was no statistically significant difference in the incidence of falls in the only study (Crotty, et al., 2004) that undertook this comparison involving 88 participants (RR 1.19; 95% CI 0.71, 1.99, (Figure 22).

**5.7.8 Urinary tract infection**

Urinary tract infection (UTI) (Rawl, et al., 1998) was assessed only in the nurse-led interventions (n=100). The findings demonstrated no significant difference in this outcome between the groups (RR 1.46; 95% CI 0.50, 4.28) (Figure 23).
Figure 22: Urinary Tract Infection—Nurse-led intervention

5.7.9 Other adverse outcomes

Other adverse outcomes included worsening pain, behaviour, confusion and mobility (Crotty, et al., 2004), and functional capacities (Nikolaus, et al., 1999) during care transitions. These outcomes were investigated in the pharmacist-led and multidisciplinary team led interventions.

Pharmacist-led intervention versus usual care

One trial (Crotty, et al., 2004) assessed the effectiveness of the pharmacist-led intervention on worsening pain, behaviours, confusion, and mobility at a two months follow-up. The findings demonstrated a 43% reduction in worsening pain ($p = 0.04$) and a 60% reduction in worsening mobility in the pharmacist-led intervention group compared to the usual care group. However, there was no statistically significant difference in worsening behaviour and confusion between the two groups (Figure 24).
5.7.10 Quality of life

Quality of life was investigated at intervals of one month (Dellasega & Zerbe, 2000; Wen, et al., 2003), three months (Nazareth, et al., 2001), four months (Rawl, et al., 1998), six months (Nazareth, et al., 2001), and 12 months (Nikolaus, et al., 1999) following completion of the intervention.
Nurse-led intervention versus usual care

In one trial (Wen, et al., 2003), participants randomised to the nurse-led intervention group had significantly greater improvement (p = 0.02) in the overall quality of life scores at a one month follow-up. Conversely, in the other trial (Dellasega & Zerbe, 2000), there was no statistically significant difference (p = 0.848) in this outcome between the groups (a meta graph was not produced due to a lack of data in both trials).

A follow up at four months demonstrated that patients in the nurse-led intervention group exhibited a significantly lower level of anxiety compared to the usual care group (Figure 25).

<table>
<thead>
<tr>
<th>Comparator: Nurse-led intervention versus usual care</th>
<th>Outcome: Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study or sub-category</td>
<td>Nurse-led Mean (SD)</td>
</tr>
<tr>
<td>Wen et al.</td>
<td>49 29.00 (9.30)</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>49</td>
</tr>
</tbody>
</table>

Figure 24: Anxiety-Nurse-led intervention

Pharmacist-led intervention versus usual care

One trial that undertook this comparison investigated quality of life at three and six months (Nazareth, et al., 2001). There was no significant difference between the two periods (Figure 26).
The effect of a multidisciplinary team led intervention on quality of life was reported in one trial (Nikolaus, et al., 1999). The findings indicated that patients who received the multidisciplinary team intervention had, statistically, a significantly higher quality of life ($p = 0.04$) compared to those who received usual care (a meta graph is not presented due to insufficient data).

### 5.7.11 Patient satisfaction

Patient satisfaction was assessed in the nurse-led intervention at one month (Townsend, et al., 1988), and the pharmacist-led intervention at three and six months (Nazareth, et al., 2001). The findings demonstrated that neither the nurse-led intervention nor the pharmacist led intervention showed any significant difference in patient satisfaction when compared to the usual care group (Figure 27).
5.7.12 Mortality

Mortality was investigated at one month (Evans & Hendricks, 1993), three months (Nazareth, et al., 2001; Townsend, et al., 1988), six months (Nazareth, et al., 2001), nine months (Evans & Hendricks, 1993) and 12 months (Townsend, et al., 1988) following completion of the interventions.

Nurse-led intervention versus usual care

One trial (Townsend, et al., 1988) that undertook this comparison investigated its effectiveness on mortality at three and 12 months. The results found no significant difference in mortality rates between the nurse-led intervention and the usual care group at any time period (Figure 28).
In the pharmacist-led intervention, only one trial (Nazareth, et al., 2001) assessed mortality at three and six months, with no significance difference between the two periods (Figure 29).

In one trial (Evans & Hendricks, 1993), participants randomised to the multidisciplinary led team intervention demonstrated no statistically significant
difference in mortality at one month (RR 1.46; 95% CI 0.68, 3.10) and nine
months (RR 0.99; 95% CI 0.72, 1.35) (Figure 30).

<table>
<thead>
<tr>
<th>Study or sub-category</th>
<th>Multidisciplinary nN</th>
<th>Usual care nN</th>
<th>RR (fixed) 95% CI</th>
<th>Weight</th>
<th>RR (fixed) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 At one month</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Events</td>
<td>16/417</td>
<td>11/418</td>
<td></td>
<td>100.00</td>
<td>1.46 [0.68, 3.10]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>417</td>
<td>418</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total events: 16 (Multidisciplinary) , 11 (Usual care)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Test for heterogeneity: not applicable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 0.00 (P = 0.99)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02 At nine months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Events</td>
<td>65/417</td>
<td>67/418</td>
<td></td>
<td>100.00</td>
<td>0.99 [0.72, 1.38]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>417</td>
<td>418</td>
<td></td>
<td></td>
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<tr>
<td>Total events: 65 (Multidisciplinary) , 67 (Usual care)</td>
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<tr>
<td>Test for heterogeneity: not applicable</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 0.04 (P = 0.96)</td>
<td></td>
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</tbody>
</table>

Figure 29: Mortality-Multidisciplinary team-led intervention

5.7.13 Cost effectiveness

Five trials (Caplan, et al., 2004; Coleman, et al., 2006; Naylor, et al., 1999; Nikolaus, et al., 1999; Wen, et al., 2003) reported on the cost associated with the intervention, readmission and use of hospital services.

Nurse-led intervention versus usual care

There was a reduction in costs associated with readmission at one month (Coleman, et al., 2006), three months (Coleman, et al., 2006; Naylor, et al., 1999) six months (Coleman, et al., 2006; Wen, et al., 2003) and 12 months (Wen, et al., 2003) in patients randomised to the nurse-led intervention. However, these findings were only statistically significant at a three month (p <0.001) (Coleman, et al., 2006; Naylor, et al., 1999) and a six month (p=0.04) (Coleman, et al., 2006) follow-up.
Multidisciplinary team led intervention versus usual care

Two trials (Caplan, et al., 2004; Nikolaus, et al., 1999) of a multidisciplinary team intervention reported savings due to reduced readmission, a decreased number of days spent in hospital and long-term institutions and the cost of the intervention was decreased in the long-term. However, only one trial (Nikolaus, et al., 1999) reported a net savings which was found to be US$4,000 per subject per year in the intervention group.

5.8 DISCUSSION

This systematic review investigated the effectiveness of interventions to promote the safe transfer of elderly people across care settings. Overall, the trials were of high quality and met the requirements of the CONSORT statement (Moher, Schulz, & Altman, 2001). However, findings were based on single trials with small sample sizes. Interventions delivered by nurses, pharmacists and multidisciplinary teams were measured against readmission, incidences of adverse events, the use of services, quality of life, patient satisfaction and the cost of care to determine the effectiveness of each type of intervention. Nurse-led interventions involved patient education, discharge planning during hospitalisation and follow-up at home. The pharmacist-led interventions focused on the principles of the quality use of medicine, improvement of patient knowledge about medications and assessment for polypharmacy and adherence to medications regimens. Multidisciplinary team led interventions involved
comprehensive geriatric assessments and home follow-ups, including the education of patients and families, home safety and support.

Readmission to hospital following recent discharge remains a significant problem among the elderly. In this systematic review, the evidence suggests that interventions (Evans & Hendricks, 1993; Nikolaus, et al., 1999) that include a structured plan for transfer—including education, discharge planning and follow-up care delivered by a nurse or a multidisciplinary team— is effective in reducing the rates of readmission to hospital within three months of initial discharge. This finding is important for clinical practice as more than a quarter of the elderly patients are readmitted to hospital within the first three months of discharge, with 20% of the readmissions occurring within two weeks of discharge from hospital (Tierney & Worth, 1995). However, there is no evidence (Coleman, et al., 2006; Nikolaus, et al., 1999; Rawl, et al., 1998) of any benefit relating to readmission rates at four, six and 12 months in the elderly who received the nurse-led, pharmacist led or multidisciplinary team led interventions. A possible explanation for this is that the elderly patients have multiple comorbid conditions, so any of these conditions, as opposed to the initial reasons for admission, could be the cause for readmissions to hospitals.

It is evident that elderly Australians access outpatient hospital services and visits their physician frequently for numerous reasons, including follow-up checks, receiving test results and ongoing management (Parrish, et al., 2009). In this review, there was evidence to suggest that interventions provided by a
pharmacist-led (Crotty, et al., 2004) and multidisciplinary led team (Caplan, et al., 2004) reduced the use of outpatient hospital services. In contrast, there was no evidence of any benefit relating to the number of physician visits post discharge (Caplan, et al., 2004; Dellasega & Zerbe, 2000; Nazareth, et al., 2001; Nikolaus, et al., 1999). It could be postulated that the reduction in the use of outpatient hospital services may be due to the education and home visit component of the intervention that directed patients to visit their physician or the outpatient services rather than the hospital. However, it should be noted that the elderly frequently visit their physician and outpatient clinics for a variety of reasons, therefore consultation with a physician or outpatient clinic may be independent of the initial diagnosis and a poor indicator of the effectiveness of the intervention (Forster, Rose, van Walraven, & Stiell, 2007; Gazmararian, Jacobson, Pan, Schmotzer, & Kripalani, 2010).

Elderly patients often take five or more medications (Gallagher, Barry, & O'Mahony, 2007; Planton & Edlund, 2010) for their multiple comorbidities and are at higher risk of having medication related adverse events when admitted to hospital (Molony, 2009; Taylor, et al., 2009; Wong, et al., 2008). The major causes of these medications-related adverse events are errors in administration or administering of multiple doses. This is often attributed to an incomplete medication list accompanying the person during transfer (Annas, 2006; Australian Pharmaceutical Advisory Council, 2000b). In this systematic review, the involvement of a pharmacist (Crotty, et al., 2004) demonstrated a significant reduction in the number of medications taken by the patients at a two month
follow-up. This reduction in the number of medications could be because patients were taking two medications of the same type. It is a common practice for patients to visit the pharmacy and get a new set of medications after discharge and not discard their old medications, which often leads to duplication of medications and consequently adverse events (Annas, 2006; Australian Pharmaceutical Advisory Council, 2000b).

It has been well established that adherence to medications is inversely associated with the number of medications (Australian Pharmaceutical Advisory Council, 2005). The evidence (Hawe & Higgins, 1990) in this systematic review indicates that a follow-up by a pharmacist significantly improves the adherence rates among patients receiving four or more medications, which demonstrates the benefit of ongoing medication reviews. However, these findings should be considered in light of the relatively small sample (n=100).

Another common adverse event that occurs in the elderly is falls (Roe, et al., 2009; Russell, et al., 2009; Spice, et al., 2009). Two studies reported on the influence of nurse-led (Rawl, et al., 1998) and pharmacist-led (Crotty, et al., 2004) interventions to reduce the incidence of falls. There was no decrease in this outcome between the groups, which could be attributed to falls prevention screening, monitoring, environment modification, injury minimisation strategies and education, which have been widely implemented in elderly patient’s homes, residential aged care facilities and hospitals.
Urinary tract infections are a common problem in the elderly. In the only study that investigated the incidence of UTI as one of the outcomes of a nurse-led intervention (Rawl, et al., 1998) there was no significant decrease in the rates of UTI in the control group. The increased rates of UTI in the intervention group could be due to increased assessment, monitoring and recording and follow-up by the nursing team. The increased nursing follow-up led to early detection and treatment, preventing further complications that would require readmission to hospital.

Findings from this systematic review indicate that providing continuity of care resulted in a significant decrease in pain (Crotty, et al., 2004) and improved quality of life (Rawl, et al., 1998; Wen, et al., 2003). In addition, fewer people who received these strategies experienced worsening mobility (Crotty, et al., 2004) and confusion (Crotty, et al., 2004). These findings demonstrate the importance of continuity of care to minimise adverse events as elderly patients move between care sites.

Interventions developed and tested in research are often not translated into practice because of the associated costs and change management required (Beland, et al., 2006; Parrish, et al., 2009). However, this systematic review demonstrates that strategies implemented by nurses (Coleman, et al., 2006; Naylor, et al., 1999; Wen, et al., 2003) and multidisciplinary teams (Caplan, et al., 2004; Nikolaus, et al., 1999) reduced costs relating to readmission, hospital services usage and adverse events. Health services must therefore be cognisant
of the need to implement cost-effective strategies and evidence based care in clinical practice.

Despite the high methodological quality of the trials, findings are based on single trials, some with small samples, which limits generalisation of the results. As all of the interventions were multifaceted, it is difficult to know which components of the interventions made a difference to any of the outcomes assessed. Moreover, in the papers that were reviewed, descriptions of the interventions were brief, and therefore it was difficult to identify the processes. Future research should be undertaken on the process of delivering care in an attempt to identify which components of the intervention work.

5.9 CONCLUSION

5.9.1 Implications for practice

There is evidence of benefits:

1. Strategies that involve structured communication improve outcomes for elderly patients during care transition.

2. Nurse-led interventions and multidisciplinary team interventions were effective in reducing readmission to hospital at one to nine months.

3. Pharmacist-led interventions and multidisciplinary team led interventions reduced the frequency of hospital services utilisation such as emergency visits and the use of long-term institutions and rehabilitation clinics.
4. Pharmacist-led interventions were effective in improving the quality of medications prescribed by physicians. In addition, there was a significantly reduced non-adherence in patients taking four or more medication at three months.

5. Nurse-led interventions effectively improved quality of life in patients receiving the interventions.

6. Nurse-led and multidisciplinary team led interventions reduced costs associated with the interventions.

5.9.2 Implications for research

The review has provided a guide for future research priorities. These include:

1. Larger, randomised controlled trials assessing transitions between hospital and in-patient settings.

2. A comprehensive, standardised method to assess outcomes such as medication adherence.

3. Studies should clearly demonstrate the association between adverse events and transfers.

This chapter has reviewed strategies involving nurse, pharmacist and multidisciplinary teams with demonstrated various effectiveness in elderly patient care during transitions. However, one important finding of this study is that structured transition promoted the safe transfer of elderly patients. The next chapter discusses the interactive Patient Transition Checklist development in a clinical setting.
CHAPTER 6

Development of the interactive Patient Transition Checklist (iPTC)
6.1 INTRODUCTION

Chapter 2 described findings from the audit of the IIMS and RCA databases of errors and adverse events reported in one tertiary hospital and Chapter 5 presented the evidence from a systematic review of the literature investigating interventions to reduce errors and adverse events during the transfer of elderly patients. Findings from these studies suggested that breakdown in communication between clinicians is a significant contributing factor to errors and adverse events. The recommendations from the systematic review indicated that strategies that involve structured interventions facilitated by a nurse, pharmacist or multidisciplinary team approach had some demonstrated benefits in improving outcomes for elderly patients during care transition. The findings from these two studies prompted the development of a structured communication tool called the interactive Patient Transition Checklist (iPTC). Given that human error and lack of communication are the main causes of errors and adverse events during transitions, the human error theory (Reason, 2000) and the concept of planned communication (Windahl, et al., 1992) also guided the development of the iPTC (Chapter 4). In addition, a rigorous consultative process involving a multidisciplinary team was used in developing the single-page, double sided prototype checklist. This chapter presents the development of the iPTC and the process undertaken to ensure its rigour and reliability prior to implementation.
6.1.2 Aim

To develop and pilot test a prototype of an iPTC to be used by clinicians when transferring and receiving elderly patients between care settings in one facility.

6.2 DEVELOPMENT OF THE iPTC

Effective interventions are those that are based on the best available evidence including research literature, expert opinion and testing of the content validity (Polit & Beck, 2010). Therefore, for the development of the iPTC intervention, a four step process was used comprising of: (1) review of recommendations from the IIMS and RCA databases, a systematic review and integration of the conceptual framework; (2) an audit of existing clinical forms in the hospital; (3) consultation with clinical experts from the hospitals and the residential aged care facilities; and (4) assessing the content validity of the iPTC. Ethics approval was granted prior to the commencement of this phase (Chapter 7, see Section 7.5).

6.2.1 Evidence from the IIMS and RCA databases, Systematic Review and Conceptual Framework

Recommendations from three sources were included in the development of the iPTC.

Recommendations from the audit of the IIMS and RCA databases

The findings of events reported on the IIMS and RCA databases indicated that breakdown in communications frequently contributed to errors and adverse
events. Therefore, the inclusion of a simple yet applicable transfer form that required clinicians from both the transferring and receiving ends to document patient information was considered to be a feasible means of improving communications. The findings from the IIMS and RCA review also indicated that completion of a falls risk assessment, and the presence of an updated legible medication chart in the patient’s records, can reduce errors and adverse events (Chapter 2). Both of these requirements are included on the iPTC.

**Recommendations from the Systematic Review**

Strategies that involve structured interventions had some demonstrated benefits in improving elderly patients during care transition (Chapter 5). Therefore, it was indicative that a transition form, that would be widely used, should be applicable to a multidisciplinary team, easy to use and cost effective to produce. In addition to the literature search designed to inform the systematic review, a more general literature search examined various computer databases from 1970 to 2008, including the Cumulative Index of Nursing and the Allied Health Literature, PsychInfo, Embase, and Medline. The keywords included ‘errors and adverse events’, ‘patient safety’, ‘transfer’, ‘transition’ and ‘checklists’. However, very few articles focussed on the development of clinical checklists for the transition of elderly patients.

The literature (Coleman, 2009; Currell & Urquhart, 2007; HMO Care Management 2004) identified that when an elderly patient is transferred, the medical records and patient personal belongings should accompany the patient. In addition,
medical/allied/nursing discharge planning and coordination should be undertaken. This information was recognised as vital to speed the care process and improve outcomes for elderly patients during care transition.

Integration of the Conceptual Framework

Human error plays a critical component in nearly all clinical incidents. Likewise, the audit of the IIMS and RCA databases showed errors from active and latent failures (Chapter 2) and the systematic review (Chapter 5) demonstrated that fragmented care exists in elderly people at transitions. The findings of these studies indicated that planned communications were the underlying structure to the improved seamless transfer of care between sites. Therefore, errors and adverse events during transitions are better targeted when the theoretical concept of the human error theory (Reason, 2000) and the concept of planned communication (Windahl, et al., 1992) underpins the intervention in action (Chapter 4).

6.2.2 Audit of clinical forms and policies

It is well established that all facilities use different forms when transferring or discharging patients. Therefore all discharge and transfer related forms within the hospital and aged care facilities in the area were obtained. The forms retrieved included an ED flow chart which in turn included a transfer checklist, discharge checklist, residential aged care nursing transfer and allied health screening referrals. Apart from the ED flow chart, no other specific forms used to transfer patients between wards were identified. The policies of the
metropolitan hospitals were reviewed. However, no detailed policies or protocols relating to the transfer of patients were identified.

### 6.2.3 Consultation with clinical experts

A draft iPTC was developed based on the literature review, the audit and the systematic review. Consultations with multidisciplinary key stakeholders were also completed. The expert group included registered nurses from the hospital and the residential aged care facility (n=8), clinical nurse educators (n=2), clinical nurse specialists (n=2), enrolled nurses (n=2), assistant in nurses (n=2), nursing unit managers (n=2), a director of nursing, a specialist geriatrician, an emergency consultant, a medical registrar, a surgical registrar, a doctoral qualified aged care researcher and three academic staff with patient safety, cardiovascular and aged care backgrounds. Recommendations from the expert team included:

- Dividing the iPTC into two sections: (i) to be completed by the nurses on the transfer ward and (ii) to be completed by the receiving nurse in order for the clinician to promote and validate communication during transfer (Appendix 11).

- Inclusion of (a) a medical/surgical/allied health discharge summary and (b) a selection to direct the organising patient escort that includes a telephone nursing handover, informing next of kin about the transfer, patient orientation to receiving ward and notifying catering services that the patient had been transferred.

- A residential aged care facility section to be completed for elderly patients discharged to the residential aged care facility. Information relating to
patient belongings such as dentures, spectacles, hearing aids and walking frame was also included.

- The mandatory requirement for the elderly patients’ admission form to accompany all transfers within the hospital.

Recommendations from the key stakeholders were implemented and the iPTC was tested for content validity.

### 6.2.4 Content validity of the iPTC

Content validity was assessed using a 4-point Likert scale. Members of the expert group were asked to rate each item on the iPTC from 1 (irrelevant) to 4 (extremely relevant). Space was provided to make comments after each item. Responses from the expert panel were reported according to the percentage of agreement among panel members. Based on this, when an item did not achieve a minimum 80% agreement by the expert group, the panel’s feedback and comments for that item were reviewed and items were revised or eliminated (Burns & Grove, 2009).

Further testing of the iPTC was undertaken with 12 nurses, to assess the usability and sustainability of the iPTC in the clinical setting. Twelve nurses from different wards and with three to eight years’ experience were randomly selected to complete the iPTC as though they were transferring or receiving patients. The nurses also completed a survey questionnaire that was designed to determine clarity of instructions on the iPTC and acceptability of the iPTC. All 12 nurses completed the iPTC. They were generally positive about the iPTC and thought
that it was innovative, useful and acceptable in the clinical setting. Recommendations were made about the clarity of wording, minor grammatical considerations and presentation.

Refinement of the iPTC was carried out based on the experts’ opinions and the 12 nurses’ feedback, to determine that the iPTC was reliable, consistent and applicable to the ward setting of the hospital. The response of their feedback demonstrated acceptability of the iPTC and an overall recommendation was for a signature and designation of the nurse completing the form to be incorporated below the iPTC.

6.2.5 Components of the iPTC

The iPTC is designed to assess four components of care where the failure to provide information could result in an adverse incident for the patient. The four components of the iPTC were:

- Documentation
- Assessments
- Patient preparation, and
- Discharge process.

Documentation

Comprehensive and timely communication is a critical part of providing care to patients (Marshall, et al., 2009). It is also important that all relevant documents accompany patients when they transfer between care settings (Benn, et al.,
Documents such as the admission form, clinical records including current and, when relevant, previous reports on medication charts, fluid chart orders, x-rays, intravenous cannula insertions and intravenous cannula records must accompany the patient when they are transferred between care settings. Missing or incomplete documents have frequently been identified as a factor contributing to errors and adverse events in the study site (Chapter 2) and the facility has commenced this project as one strategy to improve documentation.

**Assessments**

A range of routine assessments are completed during hospitalisation to minimise risk for patients (Anstey, et al., 2006; Bloch, et al., 2009). When elderly patients are transferred between wards or facilities there is the potential for important screening and monitoring to be overlooked (Coleman, 2009). For that reason, the screening tests with particular relevance for elderly patients, namely falls risk, pressure area scale assessment, special requirements such as appropriate mattress and the discharge risk screening were included in the iPTC. Allied health referrals are frequently initiated by the nursing or medical staff (Travaglia, et al., 2006). At the study site, referrals were initiated by completing a request book that was usually located at the ward clerk area or the nurses’ station. Likewise, results of investigations and procedures such as scans and x-rays also need to accompany patients as they move between sites for care and failure to do so may result in serious adverse outcomes for patients (American Geriatrics
Society, 2007; de Vries, et al., 2008; HMO Care Management 2004). These were included to assist in continuity of care following transfer.

**Patient preparation**

Patients are often transferred with little warning and, as a result, activities that may appear to be routine are ignored (Kohn, et al., 2000; Leape, et al., 2009; Leape, et al., 2006). For example, redirecting meals, notifying next of kin, maintaining a patient’s personal belongings, and ensuring orientation to the clinical environment. These were included in the iPTC to reduce inconvenience and anxiety for the patient.

**Discharge process**

Elderly patients may be discharged to home or to another form of care such as a residential aged care facility (Bauer, et al., 2009; Söderback, 2008; Williams, Nolan, & Keady, 2009; Zidén, Scherman, & Wenestam, 2010). Organising support services, for example allied health interventions, meals on wheels, or follow up visits from other care support agencies may be overlooked when attention is focused on freeing beds for new admissions (Bauer, et al., 2009). Patients are known to be discharged with intravenous cannulas in situ (Boockvar, et al., 2004; Briesacher, et al., 2005), which has become a chronic problem for the study site hospital. Other issues associated with discharge have included inappropriate nursing telephone handover, failure to inform the next of kin that a relative has been discharged to the residential aged care facility and failure to provide adequate medications.
6.3 COMPLETING THE iPTC

The iPTC was designed to promote continuity of care and reduce adverse events. The iPTC comprises 75 items, 38 to be completed by the transferring side and 37 by the receiving side (Appendix 11). Nurses completing the iPTC were educated about the need for this form to be included as a required documentation in the transferring and receiving of patients. Nurses receiving patients on their wards could tick ‘to be done’ and then later, after items were attended to, were then able to complete the form and thus selecting ‘done’ on the iPTC. This aspect of ‘to be done’ was incorporated on the iPTC, because on arrival of patients, the nurses indicated they were extremely busy; later, when settled, they completed the paperwork. However, Staunton (2008) advocated for documentation to be completed in real time, even when wards are extremely busy. This allows the true experience of patients or treatment to be captured. Nursing staff who were involved in trialling the iPTC were informed that a survey about their experience with the form would take place at the completion of the study and they would be encouraged to contribute detailed comments and suggestions for amendments to the form.
6.4 DISCUSSION

In developing a specific communication form, it was imperative that information processing is two-way, in which the transmitter and receiver communicate effectively. Therefore, the iPTC was guided by the human error theory and the concept of planned communication (Reason, 2000; Windahl, et al., 1992), which had a theoretical and in-depth knowledge base. Another study (Cortes, Wexler, & Fitzpatrick, 2004) developed a standardised checklist for transition from the hospital to residential aged care facilities. The similarities of that study to this study were that they both recognised the significant need for communication to be structured and standardised across the health system. A recent study (Fernandez, Davidson, Griffiths, Juergens, & Salamonson, 2009) investigating the use of a self help book for lifestyle changes by cardiology patients, found that successful development of the booklet required an evidence based approach. This was based on patient preferences, expert reviews and evidence from the literature. The iPTC development incorporated these measures and ensured that nurses, who were the main users of the form, provided feedback and identified the form as filling a gap in the clinical environment.

Studies by Lingard, Espin & Whyte (2004), the Joint Commission on Accreditation of Healthcare Organisation (The Joint Commission, 2006, 2009) and Greenberg et al, (2007) found that poor communication contributed to adverse events. Nonetheless, similarities between these studies and our study were alarming, in that elderly patients often experienced adverse events due to communication failures. Overall, the aim of the iPTC was to structure communication during the
transfer of elderly patients. Its development was informed by the literature, an audit, and feedback from an expert panel that identified the form to be significant and necessary to improve continuity of care and to reduce or prevent adverse events.

6.5 CONCLUSION

In conclusion, development of the iPTC involved a rigorous process to ensure the form was practical, relevant and underpinned by a theoretical base that included a review of the literature, a systematic review, a clinical audit and expert clinicians’ feedback. The audit and systematic review encompassed the human error theory and the concept of planned communication, which was also evident in the iPTC. Refinement of the iPTC incorporated experts’ opinions, and feedback from nursing staff, to determine reliability, consistency and application to the hospital ward setting. The next chapter presents findings from the pilot testing of the iPTC, undertaken at a tertiary hospital.
CHAPTER 7

Evaluation of the interactive Patient Transition Checklist (iPTC): A Pilot Study
7.1 INTRODUCTION

Chapters 6 presented the development of the iPTC. This chapter will present the results of a pilot study undertaken to evaluate the feasibility of the iPTC. Items such as the need for the pilot study, study setting, sample size, inclusion and exclusion criteria, procedure of the study, data collection and ethics guiding the study are presented. The results, implications, limitations and reforms of the study are presented, followed by the conclusion of the chapter.

7.1.1 The aims of the pilot study

The aims of the pilot study were to:

i. Assess adherence to the iPTC

ii. Identify errors experienced during transfer

iii. Evaluate the sustainability of the intervention in a ward environment

The sustainability of the iPTC was assessed in terms of:

- Usefulness of the iPTC
- Satisfaction with the iPTC
- Barriers and facilitators to using the iPTC

Each of the findings below has been presented according to the aims.

- Adherence to the iPTC was assessed by undertaking an audit of the iPTC.
- Errors experienced during transfer were identified by auditing the medical records.
The sustainability of the intervention in a ward environment and the barriers and facilitators to the iPTC intervention were identified by undertaking a survey of the nurses.

7.1.2 Purpose of a pilot study

A pilot or feasibility study is a preliminary study undertaken to determine and document a project's viability (Hayward, et al., 2007). The pilot study was conducted to evaluate the proposed study design, sampling techniques, and data collection instrument and data analysis in preparation for a large experimental clinical trial. In addition, the pilot study was used to validate the appropriateness of the study methods and acceptance of the iPTC by nurses. Findings from a pilot study enable improvement in the data collection process (Schneider, et al., 2003). It can provide the researcher with insights, it enhances knowledge and opportunities to plan a large study. Finally, the results of a pilot study can be used to inform decisions about whether to pursue a large study or make changes to the method (Keating, Sealy, Dempsey, & Slater, 2008) by helping to identify problems in the research design, data collection and the trialling of the instruments (Schneider, et al., 2003).
7.2 STUDY SETTING

The pilot study was carried out in a metropolitan tertiary referral hospital in Sydney, Australia. This hospital provides services to patients in an area where the aged population has doubled from 4.8% to 8.7% in the past six years (Commonwealth of Australia, 2008).

7.2.1 Sample size

Following consultations with experts and academics in the field, it was decided that 50 patients would be recruited to the pilot study. The time-frame provided by the Director of Nursing for the study was two weeks. This was largely due to another quality improvement project that was to be commenced after the two weeks. Nurses completed iPTC on all patients, in order to remove confusion with age group. For this study, only elderly patients’ findings were analysed and presented.

7.2.2 Inclusion criteria

Elderly patients aged ≥65 years who were moved from the ED (transferring ward) to the medical and surgical ward (receiving ward), had an iPTC completed and were able to provide informed consent, were included. Patients with cognitive impairment or dementia were included if consent was obtained from the next of kin. Clinical settings included in the studies were ED (n=1), medical (n=3) and surgical (n=2) wards. All Registered, Enrolled and Assistant in Nurses either working morning, afternoon or night shifts, who were employed full time or part
time, were eligible to participate in the study. In addition, casual and agency nurses were also asked to participate to ensure that the iPTC was integrated into the nursing care plan by all nurses irrespective of their designation or employment status.

7.2.3 Exclusion criteria

Patients admitted to, and nurses working in, the Aged Care and Psychiatric Units were excluded from the study. The Aged Care Unit was excluded because another quality assurance project was in progress in that unit. Psychiatric Units were excluded because patients are usually cleared of medical illness from the ED prior to transfer to the psychiatric unit. Patients who were transferred to another hospital or discharged home were excluded, because the iPTC was not designed for this population and was beyond the scope of the research. Patients with cognitive impairment or dementia were excluded due to their inability to provide informed consent. In addition, patients who refused consent were also excluded.

7.3 PROCEDURE OF THE STUDY

Participation was obtained from key stakeholders such as the Director of Nursing, the Nursing Unit Manager and nursing educators. A meeting was scheduled with the Director of Nursing to explain the study and to gain her endorsement.
The Nursing Unit Managers (NUMs) of the wards were informed of the study during the NUMs meeting and emails were sent to them seeking approval for their ward to participate in the study (Appendix 12). Nursing educators in the participating wards were also informed of the study (Appendix 13). Involving nurse leaders at the beginning phase is a strategy recommended in the literature review to ensure that the staff feel supported by their management, which in turn enhances commitment to the project (Mansah, Coulon, & Brown, 2008).

7.3.1 **Education of staff relating to the iPTC**

In-service sessions to inform nursing and clerical staff about the aims and objectives of the iPTC and directions for completing the form were provided. Two in-service sessions were provided to the staff in each of the wards involved in the study, timed to include both morning and afternoon shifts. The in-services targeted all levels of staff including the NUMs, clinical nurse educators, clinical nurse consultants, registered nurses, enrolled nurses, assistant in nurses and ward clerks. Each in-service lasted for half an hour. These educational sessions were held one week prior to the commencement of the study.

Information booklets about the iPTC study were provided as an additional resource and placed at the front desk and in the tea room of each ward. These were designed for staff who were unable to attend the in-service sessions such as night staff, casual or agency staff, or those who wanted additional information about the study. The information booklets contained details about the iPTC
study background, objectives, and reasons for the intervention and instructions to complete the form (Appendix 14).

Prior to the study commencing, the nurses were provided with a copy of the iPTC, given guidelines on how to complete the iPTC and the role of the researchers during the study period. All nurses were encouraged to complete the iPTC upon transfer and receipt of patients. Due to the nature of the study, the iPTC was structured as part of professional care and quality improvement. The ED ward clerks were informed about the study during the staff team meeting and were asked to attach the iPTC to the patients’ clinical records during patient admission. Ward clerks in the medical and surgical wards were advised to add the iPTC into the admission package for staff. Consent for the inclusion of the iPTC in the patients’ records was obtained from the Clerical Unit of the Hospital.

Posters were placed in the participating wards to remind staff that the iPTC study was in progress (Appendix 15). These posters were placed at each nurse’s station, the ward clerk’s desk, hand washing bays, staff washing rooms and on the walls around the clinical setting. According to Schneider et al (2003), using bright colours in research draws attention to details and prompts nurses to directly engage and read the content. Therefore, posters were presented on yellow paper to maintain continuity with the theme of the iPTC, which was presented on a yellow form.
7.4 DATA COLLECTION

The data collection methods were:

1. An audit of the medical records to identify (a) adherence to the iPTC by nurses and (b) incidence of errors and adverse events as a result of transitions.

2. A survey of nurses to identify the (a) sustainability of the iPTC and (b) barriers and facilitators during the study.

The audit was undertaken using a data collection form based on the iPTC (Appendix 16). The survey of nurses was undertaken using a self-administered survey questionnaire that was developed and piloted before use (Appendix 17).

7.4.1 Conducting the audit

An audit form (Appendix 16) was developed based on the iPTC. The medical records were audited by two research assistants, one of whom was not involved in the iPTC study. The researchers visited the ED and identified patients transferred to each participating ward using a computer program from the ED and a log book on the medical and surgical wards (Appendix 18). These included all patients transferred in and out of the ward, and also patients who were discharged to the residential aged care facility. When a patient was transferred from the ED to a medical or surgical ward, the researchers would locate the yellow iPTC in the patient’s medical notes after 48 hours. Forty eight hours was used as the time framework to undertake an audit of the iPTC due to the policies and procedures of the hospital. These policies and procedures ascertained that
upon transfer to a new ward, a patient should have a detailed plan of care, current medications, up to date nursing notes, organised tests and serial blood results and medical plan within 48 hours (Sydney South West Area Health Service, 2005a, 2008c).

When a completed iPTC was identified in the patients’ medical notes, a signed consent was obtained from the patient or next of kin. The patient was informed of the iPTC study and explained that their consent was necessary in order to audit their medical records. For those who were unable to give consent, such as patients who were confused, had dementia, or were non English speaking, consent was obtained from a next of kin.

After informed consent was obtained, the iPTC was removed from the patients’ medical notes and audited. The audit included checking that both transferring and receiving sides of the form had been completed. The research assistant also personally checked that all documentation, x-rays/scans, medication and personal belongings such as dentures, walking frames and hearing aids belonging to the patient were accounted for. In addition, the researchers checked that referrals from all necessary allied health professionals, such as the physiotherapist, occupational therapist, dietician, speech therapist and social worker, were conducted and documented. Assessments such as pressure area and falls risk, if completed, could be identified in the patient’s medical notes. Thus, a patient’s medical notes were audited to determine whether the iPTC
corresponded with the clinical records and had been followed up by nursing staff.

7.4.2 Conducting the survey of nurses

Various methods were implemented to distribute the surveys to staff. A list of the nurses allocated to the ward was obtained from the ward NUM’s nursing rosters. The surveys (Appendix 17) were coded with numbers to ensure anonymity and to ensure all staff received a survey. The surveys were printed on blue paper for visual effect and to encourage completion (Burns & Grove, 2009). Information about the collection box location was included on iPTC survey. The survey was sealed in an envelope with each staff member’s name on the front. The envelopes were given to the educators on each ward for distribution. In the ED, each envelope was taped to the front of the staff member’s locker. For those whose locker could not be located, a box was left in the ward staff tea room, with a noticeable sign for staff to find their names on the envelope and complete the iPTC survey. This method was suggested by the NUMs. Collection boxes were clearly labelled for iPTC surveys. The survey collection boxes were left at the front desk of each ward and in the staff tea room of the ED for two weeks prior to removal.
7.5 ETHICS APPROVAL

Ethics approval was obtained from the Sydney South West Area Health Service Human Research Ethics Committee and the University of Western Sydney Human Research Ethics Committee (Appendices 19 & 20) prior to commencing the study. Consent was also gained from the Nursing Unit Managers of their respective department at the tertiary metropolitan hospital, prior to introducing the study in their facilities or wards. A separate subject information letter and informed consent was developed for the patient and nurses.

7.5.1 Subject Information Sheet and Consent for Patients

The subject information sheet (Appendices 21, 22 and 23) and consent (Appendices 24, 25 and 26) provided a detailed description and explanation of the study. This was considered necessary to ensure privacy and respect for the patients or next of kin. The information letter was read by the patient and on three occasions facilitated by the researchers who read it aloud to the patient. The information letter was also explained to patients who consented for their medical notes to be audited. On the occasion where patients could not consent to the study, their next of kin was contacted. The researchers would contact them by telephone to determine when they were coming to the ward, so that consent could be obtained. In keeping with the regulations of the National Health and Medical Research Council (NH & MRC) guidelines for human research (National Health and Medical Research Council, 2007), patients could withdraw from the study at any time. This was emphasised in the consent form and discussed with each participant. In order to protect the confidentiality of the
patients, all iPTC and iPTC audit forms were de-identified with a code number, with the lists of participant’s names locked separately in a special cabinet as per the NH & MRC guidelines (National Health and Medical Research Council, 2007). A patient’s or next of kin refusal of consent resulted in exclusion from the study and subsequently iPTC audits were terminated. Each patient or next of kin retained the information sheet and the consent form was given to the researchers (Polit & Beck, 2010).

7.5.2 Subject Information Sheet and Consent for Nurses

Nurses who completed the iPTC were de-identified on the forms retrieved from the patient’s medical notes. Attached to the survey form was a plain English information statement explaining the purpose of the study (Appendix 27). Consent to participate in the survey was implicit on the return of the survey, as described by the NH & MRC National Statement on ethical conduct in research involving humans (National Health and Medical Research Council, 2007). All surveys were de-identified with a code number, with the list of names locked separately in a special cabinet as per the NH & MRC guidelines (Johnstone, 2002; National Health and Medical Research Council, 2007).

All data were stored in a locked cabinet, according to the NH & MRC guidelines (Johnstone, 2002; National Health and Medical Research Council, 2007), at the Sydney South West Area Health Service Centre for Applied Nursing Research, Liverpool NSW.
7.6 DATA ANALYSIS

Preliminary assessment of the data was conducted prior to analysis to ensure accurate entry and coding of the data. Frequencies were computed to detect incorrect entries. In the instance of incorrect entries, the original questionnaires were examined and the data verified. Likewise, missing responses were also checked against the original questionnaire (Dempsey & Dempsey, 1992). Data were computed, coded and analysed using SPSS version 17. Descriptive analyses (frequencies and percentages, means and standard deviations [SD] as appropriate) were undertaken to assess the characteristics of the patients and nurses. The method of analysis for each outcome is presented below.

Frequencies were computed to assess adherence to the iPTC. The chi square was used to determine differences in adherence to the iPTC by nurses in the ED, medical and surgical ward. Incidence of errors and adverse events was analysed using frequencies. Sustainability of the iPTC was determined by chi square and Student’s t-test. The statistical significance was set at p<0.05 (Schneider, et al., 2003).

The comments received on the survey were coded into themes and specific quotes were used to identify the sustainability of the intervention as well as barriers and limitations of the iPTC intervention. Adherences to each section of the iPTC and the errors identified during transition have been presented together in order to present a complete picture of the significance of the form.
7.7 RESULTS OF THE IPTC AUDIT

7.7.1 Characteristics of the audited sample

There were 54 (83.1%) patients transferred from the ED, with 38 (70.4%) to medical and 16 (29.6%) to surgical wards. The audit showed that there were 30 males (55.6%) and 24 females (44.4%). The mean age of participants was 75 years, ranging from 65 to 90 years. Females were slightly older than males although not statistically significant (p=0.705). The most frequently reported primary diagnoses were cardiac condition (42.6%), unconfirmed diagnoses (25.9%) and cardiovascular accident (CVA) (11.1%) (Table 3). Unconfirmed diagnoses meant the underlying investigation were in progress to determine the cause of a patient’s illness at the time of data collection. Nurses were required to complete the section relating to the discharge process on the IPTC when patients were transferred to a residential aged care facility. However, only two IPTC were completed for the residential aged care facility. As a result, these data were not included in the analyses.

Table 3: Characteristics of participants

<table>
<thead>
<tr>
<th>Gender</th>
<th>Males 30 (55.6%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Females 24 (44.4%)</td>
</tr>
<tr>
<td>Mean Age (SD)</td>
<td>74.5 (6.42); Ranged from 65 to 90 years</td>
</tr>
<tr>
<td>Diagnosis Category</td>
<td>Cardiac Condition 23 (42.6%)</td>
</tr>
<tr>
<td></td>
<td>Unconfirmed Diagnosis 14 (25.9%)</td>
</tr>
<tr>
<td></td>
<td>CVA 6 (11.1%)</td>
</tr>
<tr>
<td></td>
<td>*Others 11 (20.4%)</td>
</tr>
</tbody>
</table>

*Others involved falls, cellulitis, respiratory conditions, laceration, osteoarthritis, epilepsy, and subdural haemorrhage conditions.
7.7.2 Adherence to completion of the clinical records

The clinical records section consisted of admission forms, medical notes, updated nursing documentation, medication charts, fluid chart orders, and intravenous cannula record forms. Overall adherence to the clinical records section of the iPTC by the transferring ward was 48.1% and, by the receiving ward, 80.5%. Adherence to the individual items in this section is presented in Table 4. The admission form is an important document in the patient medical notes, however less than half (48%) of the patients transferred from the ED had this item completed. The clinical records section was completed in less than half (48%) of cases by the transferring ward, while the majority (89%) of the receiving ward completed this section. Only 39% of the cannula record forms were completed by the receiving ward.

Table 4: Adherence to completion of clinical records

<table>
<thead>
<tr>
<th>CLINICAL RECORDS</th>
<th>TRANSFERRING WARD</th>
<th>RECEIVING WARD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=54</td>
<td>N=54</td>
</tr>
<tr>
<td>Admission form</td>
<td>26 (48%)</td>
<td>50 (93%)</td>
</tr>
<tr>
<td>Clinical record</td>
<td>26(48%)</td>
<td>48 (89%)</td>
</tr>
<tr>
<td>Updated nursing documentation</td>
<td>27 (50%)</td>
<td>47 (87%)</td>
</tr>
<tr>
<td>Medication chart</td>
<td>26(48%)</td>
<td>48 (89%)</td>
</tr>
<tr>
<td>Fluid chart orders</td>
<td>27 (50%)</td>
<td>47 (87%)</td>
</tr>
<tr>
<td>Intravenous cannula record form</td>
<td>*N/A</td>
<td>21 (39%)</td>
</tr>
</tbody>
</table>

*N/A Adherence to the intravenous cannula record form was not analysed for the transferring ward as they did not use this form.
7.7.3 Errors associated with clinical records during patient transfer

There were no errors relating to medication charts. All medication charts were transferred and present in the patient’s medical notes after the 48 hours. The nurses in the receiving wards indicated that six admission forms did not arrive with the patient during transfer and that they had to follow these up. However, an audit undertaken 48 hours following transfer of the patient revealed that the nurses in the receiving ward had retrieved five of the six missing admission forms. Similarly, the nurses in the receiving ward indicated that only 76% (n=41) of the clinical records were sent with the patients to the ward. The audit indicated that the clinical records for only one patient were missing, which indicates that the nurses in the receiving ward had located the other missing clinical records.

7.7.4 Adherence to completion of the assessment and referral

This section consisted of patient assessment for risk of falls and pressure ulcers and referrals to the allied health services, such as by the social worker, physiotherapist or speech therapist. Overall adherence to the completion of the assessment referral section of the iPTC by the transferring ward was only 40.9% and, by the receiving ward, 78.3%. Adherence to the individual items in this section is presented in Table 5. All patients admitted to the ward required a discharge risk screening, however this section was completed by only 38.8% and 68.5% of the transferring and receiving wards respectively.
Table 5: Adherence to completion of assessment and referral forms

<table>
<thead>
<tr>
<th>ASSESSMENTS AND REFERRALS</th>
<th>TRANSFERRING WARD N=54</th>
<th>RECEIVING WARD N=54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall risk</td>
<td>25 (46.2%)</td>
<td>48 (54%)</td>
</tr>
<tr>
<td>Pressure Ulcer</td>
<td>22 (40.7%)</td>
<td>48 (88.8%)</td>
</tr>
<tr>
<td>Mattress ordered</td>
<td>23 (42.5%)</td>
<td>45 (83.3)</td>
</tr>
<tr>
<td>Discharge risk screening</td>
<td>21 (38.8%)</td>
<td>37 (68.5%)</td>
</tr>
<tr>
<td>Referrals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Work</td>
<td>23 (42.5%)</td>
<td>42 (77.7%)</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>20 (37.0%)</td>
<td>42 (77.7%)</td>
</tr>
<tr>
<td>Speech Pathologist</td>
<td>22 (40.7%)</td>
<td>39 (77.7%)</td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td>21 (38.8%)</td>
<td>40 (74.0%)</td>
</tr>
</tbody>
</table>

7.7.5 Errors associated with assessment and referrals during patient transfer

The transferring ward did not attend fall risk assessment on any patients. However, an audit of the medical notes demonstrated that falls risk assessment was required for 42 patients. The receiving ward attended those assessments on 35 patients. The transferring ward missed attending pressure ulcer assessment on any patient transferred from their ward. Although 16 patients had been identified by clinicians as requiring an assessment, the receiving ward followed up and completed pressure ulcer assessment on 35 patients. The audit completed 48 hours following discharge demonstrated that eight patients did not have a pressure ulcer assessment completed.
Only one patient had a pressure area specialised mattress. Eight frail, elderly patients who required pressure area mattress based on their pressure area scale, had no “special” mattress present or ordered. The transferring ward did not commence discharge risk screening on any patients. However, an audit showed that the receiving ward only completed discharge risk screening on 16 patients, and failed to attend 31 patients’ discharge risk screenings. Of these, ten were frail, elderly patients who lived on their own.

An audit of the medical notes undertaken 48 hours after the transfer of the patients indicated a total of 22 patients required referral to the social worker services. However, only 12 of these referrals had been made by the receiving ward. Referrals to the physiotherapy service were required for 29 patients. However, only 23 referrals were completed at the 48 hours follow-up audit. Similarly, 17 patients required referral to a speech therapist, yet five patients were not referred at the time of the audit. Although referrals to occupational therapy and the dietician were indicated for 20 and 16 patients respectively, only 12 were referred to the occupational therapist and seven to the dietician.
7.7.6 Adherence to completion of the patient preparation

Overall adherence to completion of the patient preparation section of the iPTC was 45.7% for the transferring ward and 80.3% by the receiving ward. Adherence to the individual items in this section is presented in Table 6.

### Table 6: Adherence to completion of patient preparation

<table>
<thead>
<tr>
<th>PATIENT PREPARATION</th>
<th>TRANSFERRING WARD</th>
<th>RECEIVING WARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic meal order (power chart)</td>
<td>26 (48%)</td>
<td>46 (85%)</td>
</tr>
<tr>
<td>Meal given prior to transfer</td>
<td>25 (44%)</td>
<td>46 (85%)</td>
</tr>
<tr>
<td>Organising patient escort</td>
<td>25 (46%)</td>
<td>42 (78%)</td>
</tr>
<tr>
<td>Telephone nursing handover</td>
<td>23 (43%)</td>
<td>43 (80%)</td>
</tr>
<tr>
<td>Informed of transfer and reasons for transfer</td>
<td>25 (46%)</td>
<td>44 (81%)</td>
</tr>
<tr>
<td>Next of kin informed of transfer</td>
<td>25 (46%)</td>
<td>40 (74%)</td>
</tr>
<tr>
<td>Equipment organised</td>
<td>24 (44%)</td>
<td>43 (80%)</td>
</tr>
<tr>
<td>Orientated to receiving ward</td>
<td>*N/A</td>
<td>42 (78%)</td>
</tr>
</tbody>
</table>

* N/A This was only applicable to the receiving ward

Patient preparation was classified into electronic update of diet (power chart), meals given prior to transfer, organising patient escort, telephone nursing handover, patient informed of transfer, next of kin informed of transfer, equipment organised and patient orientated to receiving ward. The audit was not undertaken on these patient preparations as it was not feasible or practical to audit these items as they are not clearly documented in the medical notes.
7.7.7 Errors associated with patient preparation during transfer

The transferring ward indicated that the diet for 10 patients was not electronically updated prior to transfer. The transferring ward indicated that meals were not provided to patients in 10 instances prior to transfer. However, the receiving ward indicated that on arrival to the ward 28 patients did not have meals ordered for them. The transferring ward reported that nurse escort was arranged for 16 patients; however, the receiving ward indicated that five patients who required a nurse escort were transferred without one. Similarly, the receiving ward indicated that four patients were transferred to the ward without a reported nursing handover from the transferring ward. Additionally, six patients were transferred to the receiving ward without necessary equipment with them.

Informing the patients and the next of kin of transfer is important for the ongoing care of the patient. The nurses on the receiving ward indicated that 43 patients were informed and aware of the reasons for transition into the wards. The transferring ward stated that the next of kin of only 14 patients were informed of the transfer. The receiving ward ascertained that next of kin were not aware or informed that 24 patients had been transferred to the ward. However, the receiving nurses informed the next of kin of only three patients. The nurses on the receiving ward indicated that 42 patients were orientated to the ward setting on arrival.
7.7.8 Adherence to completion of the patient belongings

This section reported the transfer of patient belongings including the patient’s own medication, x-rays, personal belongings, dentures, spectacles, hearing aids and walking frames. Overall adherence to completing the patient belongings section of the iPTC by the transferring ward was only 42.2% and, by the receiving ward, 77.9%. The adherence rate was much lower for dentures (35%) compared with all the items on the iPTC for the transferring ward. Adherence to the individual items in this section is presented in Table 7.

Table 7: Adherence to completion of patient belongings

<table>
<thead>
<tr>
<th>PATIENT BELONGINGS</th>
<th>TRANSFERRING WARD</th>
<th>RECEIVING WARD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=54</td>
<td>N=54</td>
</tr>
<tr>
<td>Patient own medications</td>
<td>27 (50%)</td>
<td>44 (81%)</td>
</tr>
<tr>
<td>X-ray</td>
<td>26 (48%)</td>
<td>47 (87%)</td>
</tr>
<tr>
<td>Patient belongings bagged and labelled</td>
<td>25 (46%)</td>
<td>44 (81%)</td>
</tr>
<tr>
<td>Dentures</td>
<td>19 (35%)</td>
<td>40 (74%)</td>
</tr>
<tr>
<td>Spectacles</td>
<td>21 (39%)</td>
<td>39 (72%)</td>
</tr>
<tr>
<td>Hearing aids</td>
<td>21 (39%)</td>
<td>41 (76%)</td>
</tr>
<tr>
<td>Walking frame</td>
<td>21 (39%)</td>
<td>40 (74%)</td>
</tr>
</tbody>
</table>

7.7.9 Errors associated with patient belongings during patient transfer

The nurses in the receiving wards indicated that patients’ own medications were not sent along to the ward in 17 cases. An audit demonstrated that the receiving ward only followed up on five of the 17 patients and retrieved the medications
from the transferring ward, which meant that 12 (22%) patients’ own medications were missing during care transitions. X-rays have been identified as often not accompanying patient’s transfers. The receiving ward indicated that the x-rays of eight patients from the transferring ward did not accompany the patient when they were transferred. The audit showed that x-rays for 12 patients were not available on the ward. Nurses on the receiving ward emphasised that the personal belongings for 16 patients were not sent to the ward, which the nurses had to follow up.

The nurses in the receiving ward indicated that the dentures for six patients were missing when transferred. The audit showed that the receiving ward was able to follow up and retrieve only one patient’s dentures with investigation continuing into the loss of the remaining dentures. The receiving nurses reported that four patients’ spectacles were missing on arrival to the ward. The audit demonstrated that 22 patients on the receiving ward had their spectacles, three patients’ spectacles were missing and only one was retrieved from the transferring ward. Similarly, the receiving ward specified that the hearing aids for nine patients’ were misplaced or missing on arrival to the ward. The audit confirmed that investigation was being carried out on the nine missing hearing aids. The receiving ward confirmed that on arrival to the ward, only two patients had their walking frame with them, with nine patients’ walking frames considered misplaced. An audit indicated that the receiving ward retrieved one walking frame, with the remaining eight still missing.
7.8 SUMMARY OF iPTC RESULTS

Adherence to the iPTC completion was higher by the receiving ward than the transferring ward. Although medical and clinical records were available, patient’s personal belongings were frequently missing. It could be argued that there was only one transferring ward (ED) and that patients were transferred to medical and surgical wards. However, that should not affect the adherence to the form by the ED staff, as these patients were transferred from their department to the medical and surgical ward. A follow-up of items on the iPTC was undertaken after 48 hours. Errors identified from the transition process were mostly recognised by the nursing staff, with the exception of pressure area mattresses.

7.9 FINDINGS FROM THE NURSES’ SURVEY

All nurses who completed the iPTC, or who cared for patients who had an iPTC, were invited to participate in the survey at the end of the study period. The survey forms were disseminated to the ED, three medical and two surgical wards. The medical and surgical wards were eligible to respond to the surveys, because they received patients from the ED and completed the receiving section of the iPTC. One hundred of the 190 surveys distributed were returned, a response rate of 53%. Ninety six percent (n=96) of nurses who responded to the survey had completed the iPTC themselves and four percent (n=4) by those who had cared for patients with the form. Quantitative and qualitative data have been reported together.
7.9.1 Demographics of nurses who completed the survey

Eighty-one Registered Nurses (RNs), 16 Enrolled Nurses (ENs) and three Assistant in Nurses (AINs) completed the survey. This result reflects the nursing workforce in the clinical setting, with a distribution difference of RNs, ENs and AINs. The number of years of nursing experience ranged from one to 23 years (median four years). Completed surveys were received from 37 staff in the ED, 40 from the medical wards and 23 from the surgical wards.

Table 8: Demographic characteristics of nurses

<table>
<thead>
<tr>
<th></th>
<th>NUMBER (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designation</td>
<td></td>
</tr>
<tr>
<td>Registered Nurses</td>
<td>81 (81%)</td>
</tr>
<tr>
<td>Enrolled Nurses</td>
<td>16 (16%)</td>
</tr>
<tr>
<td>Assistant in Nurses</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>Years of nursing</td>
<td></td>
</tr>
<tr>
<td>experience*</td>
<td></td>
</tr>
<tr>
<td>&lt;8 years</td>
<td>74 (74%)</td>
</tr>
<tr>
<td>&gt;8 years</td>
<td>18 (18%)</td>
</tr>
<tr>
<td>Number and percentage of nurses in each study ward</td>
<td></td>
</tr>
<tr>
<td>ED</td>
<td>37 (37%)</td>
</tr>
<tr>
<td>Medical</td>
<td>40 (40%)</td>
</tr>
<tr>
<td>Surgical</td>
<td>23 (23%)</td>
</tr>
</tbody>
</table>

* Missing data.

7.9.2 Sustainability of the iPTC

The sustainability of the iPTC was assessed by the following:

- Usefulness of the iPTC
- Satisfaction with the iPTC
- Barriers and facilitators to using the iPTC
7.9.3 Usefulness of the iPTC

Nurses were asked to comment on the usefulness of the iPTC in preparing documentation, admitting patients and completing intravenous records and assessments. Each of these is presented below.

Preparing documentation and patients for transfer

As transfer occurred only from the ED to the medical and surgical wards, data from the ED nurses (n=37) relating to this question has been reported. The majority of nurses from the ED (31/37, 84%) indicated that the iPTC assisted them in preparing documentation to accompany patients and also to prepare patients for transfer. Analysis of the comments written in the surveys supported the above findings, as nurses frequently mentioned that the iPTC was very useful for transfer. An example of one nurse’s quote:

“It is a great form. What a better idea!”

Admitting patients to medical and surgical wards

The nurses in the medical and surgical wards (n=61) who received patients from the ED were asked to indicate their agreement with the statement: “Did the iPTC assist you to admit patients to the receiving ward?” Of these, 45 (74%) nurses stated that the iPTC assisted them in admitting the patients. A subgroup analysis by the type of ward revealed that a significantly higher proportion of nurses in the medical wards (90%) compared to the surgical wards (45%) perceived that the iPTC assisted them in receiving patients (p=0.000).
The following quote demonstrates the viewpoint of those surveyed.

“Most of us here liked the form; it works well and does the job”

Completing assessments of patients

Almost all the nurses in the survey (n=99) completed this section of the questionnaire. The majority of nurses from the ED (n=26, 70%), the medical (n=34; 85%) and surgical (n=15; 65%) wards stated that the iPTC was useful in prompting them to complete assessments. However, 24% (n=24) of nurses indicated otherwise, that the iPTC did not assist them to complete assessments of patients (p=.267).

Quotes provided by one of the nurses illustrated the usefulness of the iPTC:

“The iPTC allowed us to pick up on the work/referrals that were not made by the other ward which was good”

Completing clinical record form

Data from all nurses in the medical and surgical wards were used to evaluate this outcome. A large number of nurses (n=40) reported that the iPTC assisted them in completing the intravenous fluid form. Analysis by the two wards demonstrated that more than three quarters of the nurses (84.6%) from the medical wards perceived the iPTC to be a useful guide to completing the intravenous record form. In contrast, only 33.3% of the nurses from the surgical wards felt the same (Table 9). These results were statically significant (p=.000). One nurse indicated:

“I found the iPTC very useful and it reminded me of things to do”
Transferring and receiving patient belongings

Ninety eight percent of nurses responded to this question. A significantly large proportion of nurses (n=76; 78%) reported that the iPTC reminded them to send and receive patients’ belongings (p =0.002). In contrast, 22% (n=22) of nurses indicated that the iPTC did not prompt or assist them to transfer or receive patient belongings. Of these, 52% (n=12) of nurses were from the surgical ward, and with an equal number of nurses from the ED (n=5; 14%) and the medical ward (n=5; 13%). The comments made by nurses included:

“If [iPTC] is used properly, it will reduce loss of patients’ properties”

Liaising with allied health professionals

Ninety eight nurses provided responses to this question. The nurses in the ED (n=25; 68%), medical (n=31; 79%) and surgical (n=10; 43%) wards stated that the iPTC prompted them to effectively liaise with allied health professionals. On the other hand, more than half (n=13; 57%) of the nurses from the surgical ward reported that the iPTC did not aid in promoting liaison with other members of the multidisciplinary team, in comparison to 32% (n=12) in the ED and only 18% (n=7) from the medical ward (p=.093). Generally, the nurses’ comments indicated the usefulness of the iPTC:

“When the iPTC was used it prompted us to liaise with members of the allied health team”
iPTC as a communication tool

Ninety nine percent of nurses answered this questionnaire. Seventy three (n=72) percent of nurses indicated that the iPTC prompted communication with other nurses. In contrast, 27 (n=27%) nurses did not support this view and reported that the iPTC was not effective in terms of communicating between colleagues. Of these, 12 (52%) nurses were from the surgical ward, 11 (30%) from the ED and only 4 (10%) nurses from the medical ward (p=.023). Nurses provided similar comments, that the iPTC was useful in communicating with other nurses:

“It really helps to validate care, ensure you are doing the right thing. It definitely helped us communicate with each other, and having the two sections [of the form] was a terrific idea”

Table 9, shows the evaluation of the usefulness of the iPTC. As each item has already been discussed, the table provides a visual snapshot of nurses’ perceptions of the iPTC. Overall, staff from ED and medical ward most valued the form as useful, compared to the surgical ward.
Table 9: Nurses’ evaluation of the usefulness of the iPTC form by type of ward

<table>
<thead>
<tr>
<th>iPTC Usefulness</th>
<th>Ward</th>
<th>Agree n (%)</th>
<th>Strongly Agree n (%)</th>
<th>Disagree n (%)</th>
<th>Strongly Disagree n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient admission</td>
<td>ED *</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>28 (72)</td>
<td>7 (18)</td>
<td>3 (8)</td>
<td>1 (3)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>8 (36)</td>
<td>2 (9)</td>
<td>9 (41)</td>
<td>3 (14)</td>
</tr>
<tr>
<td>Patient assessment</td>
<td>ED</td>
<td>22 (59)</td>
<td>4 (11)</td>
<td>9 (24)</td>
<td>2 (5)</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>26 (67)</td>
<td>8 (21)</td>
<td>5 (13)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>13 (57)</td>
<td>2 (9)</td>
<td>5 (22)</td>
<td>3 (13)</td>
</tr>
<tr>
<td>Completion of IV</td>
<td>ED*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>form</td>
<td>Medical</td>
<td>29 (74)</td>
<td>4 (10)</td>
<td>6 (15)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>4 (19)</td>
<td>3 (14)</td>
<td>10 (48)</td>
<td>4 (19)</td>
</tr>
<tr>
<td>Sending patient</td>
<td>ED</td>
<td>21 (58)</td>
<td>10 (28)</td>
<td>5 (14)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>belongs</td>
<td>Medical</td>
<td>26 (67)</td>
<td>8 (21)</td>
<td>5 (13)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>9 (39)</td>
<td>2 (9)</td>
<td>9 (39)</td>
<td>3 (13)</td>
</tr>
<tr>
<td>Liaison with AHPs</td>
<td>ED</td>
<td>21 (57)</td>
<td>4 (11)</td>
<td>10 (27)</td>
<td>2 (5)</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>23 (61)</td>
<td>8 (21)</td>
<td>7 (18)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>8 (35)</td>
<td>2 (9)</td>
<td>10 (43)</td>
<td>3 (13)</td>
</tr>
<tr>
<td>Nursing communication</td>
<td>ED</td>
<td>21 (57)</td>
<td>5 (14)</td>
<td>10 (27)</td>
<td>1 (3)</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>27 (69)</td>
<td>8 (21)</td>
<td>4 (10)</td>
<td>0 (0)</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>10 (43)</td>
<td>1 (4)</td>
<td>9 (39)</td>
<td>3 (13)</td>
</tr>
</tbody>
</table>

ED*: Not applicable

7.9.4 Satisfaction with the iPTC

Satisfaction with the iPTC was used as an indicator of sustainability. All nurses in the survey completed this section. Nurses in the medical ward (n=31; 78%) and ED (n=26; 70%) reported being highly satisfied with the iPTC, while almost half of the surgical nurses (n=11; 48%) reported dissatisfaction with completing the iPTC. There was no difference between the wards for satisfaction with the form (p=.110). While nurses reported being generally satisfied with the form, they also indicated that it increased their workload and took them away from their clinical work.
Instructions on the iPTC

Satisfaction was also dependent on whether the instructions were clearly explained and easy to follow. The majority of participants (n=82; 82%) were satisfied that the instructions provided on the iPTC. There were only a few nurses (n=18; 18%) in the survey who were dissatisfied with instructions provided on the iPTC. The following comment illustrates this point:

“iPTC is a repetition of other forms that already existed. I mean we don’t have a transfer form, but the information being asked for, is common sense and each nurse should know”

There was no significant difference (p=.698) between the ED, and medical and surgical wards nurses on the perception of the instructions provided on the iPTC. The majority of nurses commented that the form was easy to use and reminded them of what needed to be done, as depicted by this quote:

“It was easy to use; can understand what is asking for, and what I need to do; it reflects our daily work routine on transfer”.

Ongoing use of the iPTC

Nurses (n=46/99; 47%) reported that they would use the iPTC again. Sixty one percent (n=22) were from the ED, 45% (n=18) from medical and 26% (n=6) from the surgical ward. However, an almost equal number of nurses from medical (n=11; 28%) and Emergency (n=8; 22%) stated that they would not like to use the iPTC again.
“The iPTC is too time consuming, we are so busy here and more workload”.

Nine nurses (39%) from the surgical ward indicated that they would not use the iPTC again. Comments received from the nurses in the surgical wards supported these results.

“We are not happy about filling out the iPTC for every transfer as our patients would often be transferred in and out of the ward a few times in the same admission”.

The willingness of nurses to use the iPTC again was similarly reported across the three wards (p=.129). The majority of nurses’ (n=55) comments depicted uncertainty in regards to whether they would use the form again.

“This iPTC is very effective for transfer of patients, but whether it will be used by all nurses, requires intensive education and discipline”.

**Would you recommend the iPTC to other wards?**

One in two nurses surveyed reported that they would recommend the iPTC to other wards (n=54; 55%). One in four nurses stated ‘no’ (n=23; 23%) and one in five indicated ‘maybe’ (n=21; 21%) in recommending the iPTC to other wards. The ED and the medical ward had half of their participants (68% and 55% respectively) indicating that they would recommend the iPTC to other wards, compared to 32% in the surgical wards. The majority of nurses commented that the iPTC was practically useful for all other departments and, if used properly,
had the capacity to reduce associated errors and adverse events. Examples of
some of the nurses’ comments are:

“At first it took me some time to get used to it, later on I found it really
good, I will recommend to other ward; but will need a lot of positive
selling”

“We are very busy here but I think it even saves time in long run when you
think about it; it’s good to have a form like this and should be
implemented across the hospital”

7.9.5 Barriers to implementing the iPTC

The researchers faced numerous barriers during the implementation of the iPTC.

These barriers related to the patients, staff and the organisation.

Patient related barriers

Some elderly patients could not provide informed consent for the iPTC audit.

Therefore, consent was required from the next of kin. When the next of kin was
contacted, often they stated that they would not be in to visit the patient until
the next day. This therefore delayed the process for the researchers as they
would have to wait until the next day to undertake the audit. In many instances
the elderly patient was discharged home, transferred to another ward that did
not participate in the study or transferred to another hospital. Therefore, many
elderly patients had to be excluded from the audit.
Nursing staff related barriers

Some nursing staff felt it was not their duty to complete the iPTC when a previous nurse had commenced it. This meant that many forms were not completed. Some nursing staff also felt it was not their role to complete the iPTC if the patient was not transferred during their shift and often stated it was the responsibility of the nurse who actually received the patient. These problems became challenges for the researchers and for the study as the adherence rate for the iPTC were affected. It also demonstrated that nursing staff did not understand that the aim of the iPTC was to ensure continuity of care and could be completed by any member of staff caring for the patient.

Some nursing educators on the wards were unhappy with the project, as they felt their ward was too busy. This may have impacted on adherence rate by their staff. Some staff members saw the iPTC as a negative form and complained about its implementation. Nursing staff often voiced that they did not have time to complete the iPTC as they were too busy. They mentioned that there was already too much paperwork and the iPTC was just another form they had to fill in. The surgical wards voiced their concerns that they were extremely busy, as they have a high turnover of patients from medical wards and intensive care.

Organisational barriers

During this study, a new form, the Adult Admission and Discharge Assessment Form, was introduced by the NSW Department of Health (Sydney South West Area Health Service, 2008b), which may have affected the adherence to the iPTC.
It may be that nursing staff already had the NSW Adult Admission and Discharge Assessment Form on their minds when the iPTC study commenced, which may have contributed to the negative reviews. For example, some staff members thought that the iPTC was the NSW Health form. These challenges required strategies to be developed during the study process to maintain the participation rate.

7.9.6 Facilitators to improving adherence to the iPTC

Strategies introduced to maintain rigour and to ensure completion of the study included: (1) contacting family members and obtaining consent; (2) gaining support from ward staff including the education of nurses and clerks; and (3) gaining organisational support.

Support from families

The next of kin was contacted and a one-on-one information session to explain the study and obtain consent was scheduled.

Support from nursing staff

Gaining support from Clinical Nurse Educators was essential during the study to ensure the cooperation of nursing staff and the completion of the iPTC. Educators were able to notify nursing staff of the iPTC study and those unable to attend ward in-service sessions were informed of the location of information booklets. Clinical Nurse Educators also reminded and encouraged their staff to
complete the iPTC when patients were transferred. This may have increased the numbers of iPTCs completed.

**Support from clerical staff**

Ward clerks in the ED were very supportive and attached the iPTC to each patient’s admission form as a reminder to complete the form. Ward clerks in the medical and surgical wards encouraged the completion of the form by including the iPTC in the wards’ already made ‘package’ of medical notes for admitted patients. Clerical staff also assisted in the collection of forms for discharged patients, removing the form from the patient’s medical notes and giving it to the researchers.

**Organisational support**

Whilst support from the director of nursing was provided, leadership for the study was facilitated by the NUM of each ward. The researchers visited the NUMs’ meeting to provide ongoing input on the study. The Clinical Governance Unit also provided support by providing a link to the study on the hospital intranet and regularly updating nursing staff on the study through the hospital memos.
7.10 SUMMARY OF SURVEY RESULTS

The survey results indicated that nurses in the study were generally satisfied with the iPTC, particularly nurses from the medical and emergency wards. This showed that the form has sustainability in the ward setting and has particular relevance to the medical ward. Although the surgical wards found the iPTC not useful or sustainable, they represented a very small sample in the survey. The iPTC has relevance to the clinical environment and would require in-depth education, training, and all networks working together to make the ingredients of a successful form, that does reduce errors and adverse events during transfer.

The iPTC was regarded as useful and practical, although the perceptions of nurses varied. Challenges experienced during the study are not unusual when undertaking clinical research (Benn, et al., 2009; Chan, Wong, et al., 2008; Lingard, et al., 2006). Resolving the challenges led to a better understanding of the necessity to involve clerical staff in the implementation of the form, and understand that internal factors, in the study surroundings, can reduce or influence adherence to or sustainability of the form. In this study, internal factors included the fact that the nurses felt “anxious”, “worried” and “tired” as they were to have a new, “larger”, unfamiliar form implemented soon. This led to many negative reviews and perceptions of “oh no, not another form”.

However, the pilot iPTC findings had enabled the researchers to understand the complexity and patience required to implement a communication transfer form in the clinical environment. The next section of this chapter presents the discussion of the findings.
7.11 DISCUSSION

The study was undertaken in a tertiary hospital to pilot test the feasibility of an iPTC for patients transferred from the ED to the medical and surgical settings.

The specific aims were: (1) to assess adherence to the iPTC; (2) to identify errors experienced during transfer; (3) to evaluate the sustainability of the intervention in the ward environment; (4) to identify barriers and facilitators to the iPTC; and (5) to identify limitations to the iPTC intervention. Each of these aims has been achieved and is discussed below.

7.11.1 Adherence to completion of the form

There is limited literature on the process of transferring patients between wards, with much of the literature focusing on the discharge of elderly patients from the ED to home or residential aged care settings. The results of adherence determine confirmation and acceptance of the iPTC by nurses, although forms were more likely to be completed in the receiving ward (medical and surgical wards) than the transferring ward (ED). The transferring ward’s adherence to completing the iPTC ranged from 35% to 50%, compared to 39% to 93% by the receiving ward. Although the surgical ward adhered to completing the iPTC, it was not conveyed with satisfaction when compared to the medical wards and ED. Nevertheless, the level of adherence reported in other studies that looked at nurses’ adherence to completing forms varied from 47% to 74% (Terrell, et al., 2009), which was a similar to this study.
Several studies (Pronovost & Faden, 2009; Richman, et al., 2009; Schedlbauer, et al., 2009) found that completion of the necessary documents for the elderly patients by staff in ED were often missed, which had the potential for human error to occur due to fragmented care processes. This is of special concern, because ageing patients, particularly the frail or vulnerable, are often the most medically challenging, time consuming and costly to treat (Valentin, et al., 2009). Here, the first point of contact by elderly patients within a tertiary care setting is the ED. Therefore, there are implications for not assessing falls, discharge planning and allied health referrals in nursing practice. These patients are more likely to have increased presentations of falls (Bolch, et al., 2005) and complications (Fortinsky, et al., 2004; Gill, Zou, Jones, & Speechley, 2009). Failure to complete risk screening prior to discharge can lead to increased readmission to the ED after discharge (Dedhia, et al., 2009; Forster, et al., 2007). Patients not referred to the appropriate allied health services may also experience sub-optimal health outcomes. This event also demonstrates ineffective multidisciplinary teamwork (Fairbanks, Bisantz, & Sunm, 2007; Hart-Hughes, et al., 2004). For instance, a timely and accurate assessment by the speech therapist can assist with swallowing, diet modification, speech and language skills. A vital component of this care is the prevention of aspiration pneumonia (Dunnion & Kelly, 2008). Therefore, undertaking assessments on functional impairment is likely to contribute to effective care and improve outcomes (Arora, et al., 2007).
The audits revealed that although the majority of documents such as admission, clinical records, up to date nursing notes and current medication charts were present in the patient’s medical records, these items were not checked on the iPTC. This finding is consistent with other trials undertaken in nursing documentation (Currell & Urquhart, 2007; Karkkainen & Eriksson, 2005; Pearson, 2003) that suggests nurses are ‘doers’ and often fail to document the work they do. A systematic review (Currell & Urquhart, 2007) provided accounts on the need for nurses to acknowledge documentation as an essential part of nursing practice. Parson’s (2003) agreed and indicated that nursing has an oral tradition of eschewing the written word and over-reliance on memory by handing down both information and knowledge by word of mouth. These have implications on nursing practice and the iPTC could serve to improve adherence to the nursing care plan and clinical guidelines. This means that in the absence of errors and adverse events, there is evidence to demonstrate that these documents accompanied elderly patient’s when they are transferred. According to Johnstone & Kanitsaki (2006 p. 5), there is an “inseparable link between nursing practice and patient safety”.

An intervention study by Kärkkäinen and Eriksson (2005) found that the purpose of documentation is to verify how the decisions involving nursing care and subsequent actions came about. In this study, intravenous cannula record forms were frequently not completed, next of kin were often not informed of patient transition, patients’ own medications were often regarded as lost or misplaced and patients’ belongings were often missing. Each of these items has an effect
on the health care system in response to the quality of nursing care, as well as financial, social and political implications (Duckett, 2008). It also reflects the nature of care in the hospital, which is that some forms are considered more critical than others when it comes to transferring patients to another site. It is unclear that these items would have been picked up if it was not the iPTC.

The effectiveness of the iPTC was illustrated through adherence. Although adherence was not considerably high in the transferring ward, it was important to note that the receiving ward had the means to ensure a follow-up with information and patient care. For example, the receiving ward reported that 11% of patients did not have the necessary equipment with them upon transfer. This aspect of the iPTC was considered innovative as no existing forms in the current tertiary hospital had such a component for verification, check backs and read backs.

During the two week period, the iPTC were completed for only two patients who were transferred from ED to residential aged care facility. Nurses from the medical and surgical wards also failed to complete an iPTC on patients that were discharged to a residential aged care facility. As a result of this poor adherence to the iPTC, analyses of the findings were not presented. The poor adherence to iPTC completion on patients’ discharge to the residential aged care facility has been supported by several other studies (Petridou, Manti, Ntinapogias, Negri, & Szczerbinska, 2009). One particular study (Pronovost, Needham, et al., 2006), which introduced a checklist to decrease catheterisation infection in critical and
surgical patients, found that clinicians were reluctant to use the checklist. They indicated that it would delay care, interfere with care delivery and would not make a difference to the rate of errors and adverse events. However, implementation of that checklist showed a reduction in nosocomial infection from a baseline 0.62 to 0.34 at 16 to 18 months, and reduced associated costs of care for treating infection. Consequently, this shows the potential determinants of adherence to the iPTC: (1) attitudes, social influences and time factor, for example, staff not seeing residential aged care facilities as a critical component of care; (2) the lack of adherence could have been influenced by a major form that was to be implemented after the study duration, as most nurses in the study made negative remarks on the new form; (3) nurses’ willingness for ‘change’ and persistence in retaining their old ways of care could have led to incomplete iPTCs; and (4) the lack of a patient safety culture in the clinical environment would have contributed to low completion rates of the iPTC.

7.11.2 Errors identified in the transfer process

Assessment of a falls risk status is determined as a critical aspect of an elderly patient’s care (Spice, et al., 2009). It was not the intent of this study to evaluate nurses’ work, however, but to determine whether the iPTC promoted structured communication between care sites by reducing the likelihood of errors at transition. In this study falls assessment was not completed for 13% of the patients. This finding is significant because one of the study findings was that the ED did not commence a fall risk assessment or order a pressure area mattress for any of the frail, elderly patients who had been in their care for 24 hours. For
example, pressure area assessments showed that 15% of patients had not been ordered a ‘pressure mattress’ after 48 hours. Pressure area assessments are an effective means of identifying elderly patients who are at risk of developing pressure sores or ulcers. The development of pressure sores are not only expensive to treat, but they also cause an increased burden for the elderly patient and can lead to poor physical and emotional care outcomes. Pressure sores and ulcers are one of the commonest preventable adverse events in elderly hospitalised patients (Keller, Wille, van Ramshorst, & van der Werken, 2002; Lyder, et al., 2001). The nurses in this study were informed by the researcher that a risk assessment had not been done when an assessment demonstrated that patients required a ‘special’ mattress. Although this may not be viewed as an adverse event, it has the potential to compromise patient safety and quality care.

Similar studies (Morandi, et al., 2009; Noland, Rickles, Noland, & Rickles, 2009; Priebe, et al., 2009) highlighted that assessment for risk of falls and pressure ulcers in the ED was crucial for their prevention and management. This finding from the study has prompted the policymakers within the hospital to make an assessment for falls risk and pressure ulcers mandatory in the study ED. In addition, a random audit is currently in place to ensure that these assessments are being carried out.

An interesting finding from this study was that all medication charts were transferred with the patient or received in the ward within 48 hours of transfer.
This is an important finding, as Valentin et al (2009) demonstrated that when a medication chart did not accompany the patient when transferred, that omission frequently resulted in delayed medication administration and the failure to administer medications.

The iPTC was effective in enabling the receiving ward to determine and record what had happened during transition. This was deemed essential to improving elderly patients’ care outcomes and the quality of the health care system (Conerly, 2007). For instance, the receiving ward was able to clearly identify those five elderly patients who required a nurse escort but who arrived at the ward alone with the ward orderly. They were able to follow-up patients transferred without a telephone handover and those who arrived without the necessary equipment. These safety measures of the iPTC facilitated the transferring and receiving ward to work in partnership and to determine what has occurred between transfers. However, this process of continued follow-up could lead to nurses in the receiving ward experiencing poor work satisfaction and related frustration over repetitive tasks. Kowalczyk (2009) stated that the drawback of a checklist is that the procedure could become routine and that nursing staff may go through the motions of checking the form without really confirming each item.

At the time of this study, there was only one Aged Care Service Emergency Team (ASET) nurse in the ED and the nurses in the ED did not consider discharge screening as part of their role for the care of elderly patients. This lack of
awareness could have led to that aspect of care being missed. Allied health referrals were not commencing in the ED, yet these were mentioned on the iPTC and followed up by the receiving ward. This result indicates that the iPTC, if completed, can be a useful communication channel or tool. Recommendations 50, 51 and 52 from the Garling Report on acute care services in NSW public hospitals pinpoint the importance of coordinated care, systems for improving the recording of patient care, structured, simplified care plans for individual patients and for patients to have an understanding and knowledge of treatment and follow-up plans (Garling, 2008). Additionally, the Garling Report recommended the mandatory provision of discharge summaries to general practitioners, and the importance of communicating with patients, carers or next of kin (Garling, 2008). Therefore, the iPTC serves to act as a tool that adheres to the recommendations of the Garling Report, aiming to coordinate care at the transferring and receiving ends.

According to Taylor (2008), for patients to receive quality care, nurses and other health care professionals need access to accurate and pertinent information. Twelve patients’ x-rays were missing during the audit, which could be because they had been taken to another ward for review by a team of experts, or left behind on the previous ward. This result is similar to a study (Cosby, 2006) conducted on x-rays and medical equipment in the hospital.

Patients’ own medications, dentures, spectacles, hearing aids and walking frames were the commonest items misplaced or lost during transfer. It is widely
recognised that most medication errors occur as patients move between the various interfaces of care, such as from the community to the acute hospital (Planton & Edlund, 2010; Pronovost, et al., 2003). Medical practitioners often use a patient’s own medication to find out the medications patients are currently taking at home (Norstrom & Brown, 2002). Medications are to be returned to the patients’ families or be stored in the appropriate storage and returned to patients when they are discharged from the hospital (Sydney South West Area Health Service, 2005b). However, patients’ own medication often does not follow them throughout their hospital journey (Wong, et al., 2008). When patients reach full recovery and are ready for discharge, they find their medications are missing. The problem is that most hospitals do not have a system of tracking medications brought from home by the elderly patients (Murphy, Oxencis, Klauck, Meyer, & Zimmerman, 2009). A study (Chan, Taylor, Marriott, & Barger, 2008) supported this view in which paramedics found it useful for patients to bring their medications along on the transfer to the ED. They stated that it assisted prescribing accuracy and medication reconciliation. However, half of the paramedics indicated they asked patients to leave their medications at home for fear of staff members losing their medications during hospital stay.

Loss of personal belongings is also quite common in the clinical setting. A BBC news report (2008) stated that an 88 year old patient was unable to eat properly for three weeks as her dentures were lost during transfer within a hospital. Another (Slattery, 2007) media report indicated that a 90 year old patient died of
associated malnutrition after his dentures went missing for a number of weeks. The family attributed the death to the loss of the dentures. These patients’ stories are not unique. Many elderly patients are caused considerable distress and are unable to carry on their daily living activities because their assistive devices are missing or misplaced (Mynors-Wallis & Davis, 2004).

What is unknown to many health care practitioners is that dentures take several weeks, even months, to be fitted by a dentist. In addition, the replacement of dentures is costly, and the health care service may agree to cover the cost of missing dentures, but not in all cases. As well, missing dentures could lead to a delay in swallowing, oral intake and the progress to optimal health (Bader, 2009). A study (Kanehisa, Yoshida, Taji, Akagawa, & Nakamura, 2009) showed that patients who had dentures whilst in hospital had adequate oral function and improved nutritional intake. In contrast, patients without their dentures were at a higher risk of hospital acquired malnutrition. Michaeli, Davis and Foxton (2007) highlighted that in their eight month study, 21 patients lost their dentures during their hospital stay and many had had their dentures for over 10 years. The appropriate use of the iPTC might help in preventing the loss of dentures.

Hearing aids, spectacles and walking frames are assistive devices that also assist individual elderly patients to be active in their care (Timehin & Timehin, 2004). Yet these items are included in the list of most common items missed during transfer, and impact on prognosis, well-being and quality of life. This indicates a very deeply situated problem in the health care system and that adequate
measures to rectify or reduce its occurrence have not been put into place. Although in this study approximately 25 items of patient belongings were considered missing, it could be argued that the iPTC assisted in the follow-up of these items. These findings also indicated that the nurses may not have used the iPTC to ensure continuity of care, that is, checking the transferring section of the form and adhering to the principles of the form.

7.11.3 Usefulness of the iPTC

The survey of nurses had an adequate response rate and is therefore a strong indicator of nurses’ perceptions. The iPTC was regarded as useful by the nurses, as it assisted them in communicating during transfer and admission of patients. It also aided in completing documentations, referrals and assessments of patients. The iPTC was highly accepted by staff in the medical wards and ED, compared to the surgical wards. The comments from the surgical wards showed that the iPTC was basically irrelevant to their ward setting due to the multiple admissions of patients. However, the sample was very small and might have captured a biased proportion of shared beliefs. Nonetheless, their feedback served as a catalyst to improving the iPTC for a larger study.

Seventy three percent of nurses in the survey found that the iPTC prompted communication with other nurses. The iPTC, as a measure of continuity of care, was influenced when nurses failed to complete an ‘already started form’ and, as a result, treatment could be delayed or duplicated (Valentin, et al., 2009).
7.11.4 Satisfaction with the iPTC in the ward environment

The sustainability of the intervention was measured using a satisfaction tool. Greenberg et al (2007) indicated that nurses’ satisfaction has a positive correlation to their work environment, culture and ethics. The majority of nurses (69%) in this study were satisfied with the iPTC. Shrank et al (2009) reinforced the need for researchers to examine satisfaction feedback from nurses and to make changes to clinical structures and processes based on it. Therefore, the feedback received on the iPTC — that it was too long and complex — was taken into account and the form will be modified prior to the implementation of the larger study.

Only 47% of nurses indicated that they would use the iPTC again, with the majority of those being nurses from the ED. Half of the nurses in this study expressed the desire to recommend the iPTC to other wards, which illustrated the sustainability of the iPTC. Nurses’ willingness to use the iPTC again was reflected in their comments. Their feedback was that the iPTC was effective and practical, yet the perceived increase in workload and time spent may affect the sustainability of the form in the long term. This finding is congruent with other published studies (Spice, et al., 2009).
7.11.5 Barriers and facilitators

A number of factors were identified that impeded the recruitment process, including the limited timeframe provided to the researchers by the Director of Nursing. Prior to and during the research study, the research team made extensive efforts to develop strong professional relationships, trust and explicit communication strategies with the staff in the participating wards. This was a major facilitator during the recruitment process. In-service sessions about the study were provided by the researchers and were attended by most members of the nursing team. Commitment from the participating wards was obtained, which involved the educator liaising with nursing staff to encourage iPTC completions. This method was advantageous as it ensured that the researchers were not advocating for completion of forms; rather, the iPTC was integrated into the care process as much as possible. The next section will discuss the limitations of the study, its implications and reforms and, finally, the conclusion of the chapter.

7.12 LIMITATIONS OF THE STUDY

As with any pilot project, this study had limitations. Firstly, the timeframe for the study was short, which resulted in recruitment of a small sample size and poor adherence to the completion of the iPTC. Secondly, the effectiveness of the iPTC for promoting communication between nurses was determined based on the nurses’ survey feedback. Perhaps a more statistically measure would have enhanced the correlation of the iPTC to communication. However, given that
the purpose of the pilot study was to test the feasibility of a tool to promote the safe transfer of elderly patients by enhancing communications, the study gives insight into how to focus future studies.

7.13 IMPLICATIONS FOR PRACTICE

Fragmentation of care severely impacts on elderly patients, especially during transfer of care. The iPTC is a comprehensive and structured approach based on the human error theory and the concept of planned communication. Although small, the findings of this study demonstrate that the iPTC was useful in reducing the incidence of errors and adverse events. This promotes the safe transfer of elderly patients.

7.13.1 Implications for the conduct of a larger trial

Suggestions for improvement that will enable the success of a larger multicentre trial include:

1. Comprehensive training and education of all nurses in the hospital about how to use the iPTC for elderly patients and the importance of completing the iPTC.

2. The formation of a surgical nurse’s panel, to explore how the iPTC could be implemented and targeted to their ward environment.

3. The study should be multi-sites involving a large number of nurses.

4. The hospital management department or clinical governance unit should develop policies to promote the safe transfer of elderly patients between care sites.
7.13.2 Reforms based on findings of this study

The hospital involved in this pilot study has reviewed its policy as a result of the study’s findings.

1. Mandatory falls risk and pressure ulcer risk assessments are now completed on patients in the ED.

2. Two ASET nurses have been appointed to the ED to discuss discharge planning with elderly patients and relatives.

7.14 CONCLUSION

The overall aim of this research was to promote the safe transfer of elderly patients across care settings, using a variety of mixed methods. This chapter explored how the iPTC was able to track items transferred with elderly patients, how it encouraged communications between the transferring and receiving ward, and how it identified the nature of errors that occurred during the audit review. As a pilot study, it provides a glimpse of issues for elderly patients who are transferred across the health care system.
CHAPTER 8

Discussion and Conclusion
8.1 INTRODUCTION

The findings from each of the three investigations that constitute this thesis have been discussed in the relevant chapters (Chapters 2, 5, 6 and 7). This chapter consolidates the findings then integrates them into the overall conclusions that address the research problem stated at the commencement of the thesis. Findings are interpreted at a conceptual level, with reference to the existing literature to demonstrate how the research builds on current knowledge. Practical implications from the findings are advanced, offering evidence-based advice to hospitals about how they could reduce adverse events during the transfer of elderly patients between care settings. Methodological limitations of the three studies are discussed, followed by recommendations for future research. Concluding statements argue that structured communication can reduce errors and adverse events that occur as elderly patients are transferred between care settings.

The thesis investigated the incidence and nature of adverse events that occur as elderly patients are transferred between care settings; it reviewed the effectiveness of interventions that have been used to improve safety for this group, and culminated in the development and feasibility testing of an intervention, the interactive Patient Transition Checklist (iPTC), to promote formal and structured communication between nurses. The intervention was accomplished using three discrete yet related phases.
The first phase, as reported in Chapter 2, was an audit of errors and adverse events involving elderly in-patients at a tertiary hospital. Results indicated that poor communication, failure to abide by policy and procedures and a lack of follow-up contributed to many of the reported clinical incidents.

The second phase was a systematic review of the literature, presented in Chapter 5, which investigated interventions to reduce errors and adverse events during the transfer of care. The review provided evidence that a transition coordinator for elderly patients, whether a nurse, pharmacist or multidisciplinary team, promoted a safer transfer from hospital to home.

The third phase, a communication strategy, the iPTC, was developed and pilot-tested with elderly patients transferred from the ED to the medical and surgical wards in a tertiary hospital. Although the sample used for this feasibility study was insufficient to demonstrate statistically significant results, the data suggest that the structured communication plan could reduce errors and adverse events. A description of the development of the iPTC study was presented in Chapter 6, and results and discussion in Chapter 7.
8.2 KEY FINDINGS

8.2.1 Phase one: Audit of the Incident Information Management System

The findings from the IIMS and RCA (Chapter 2) audit were consistent with previous studies (Miller et al., 2009; Molony, 2009; NSW Department of Health and the Clinical Excellence Commission, 2009; Travaglia, Hunter, Carroll, & Braithwaite, 2006), namely, that falls, medications and clinical management were the highest occurring incidents in the elderly. The contributing factors were mainly lack of communication between staff, violation of policy and procedures, and follow up care. Nonetheless, it is important to consider that when errors and adverse events occur, it is necessary to examine systemic design factors rather than hold individual clinicians responsible or blame the individual person (Aranaz-Andres, et al., 2008). Recommendations from the IIMS and RCA expert review panel highlighted structured communication as vital to reducing errors and adverse events. However, recommendations from the expert review panel did not explore systemic factors such as the reasons behind clinicians’ failure to abide by the policies and procedures. According to Reason (2000), health care is a complex environment where human actions play a role in nearly all incidents, hence the importance for organisations to examine incident reports and to determine whether latent failures are an underlying cause or contributing factor. Such analysis is required if organisations are committed to preventing the incidents.
The audit findings illustrated that elderly patients are vulnerable while hospitalised. They are placed at additional risk when moved from one area to another (Chugh, et al., 2009; Coleman, 2009). The loss of patient belongings were not classified as incidents, and were not documented in the IIMS database by nurses. This was evident also in the results of the pilot test of the iPTC, where the majority of errors that occurred involved elderly patient’s belongings. Up to 48 hours lapsed between the patient being transferred and their belongings being either returned to them or considered as missing. As studies (Kanehisa, et al., 2009; Michaeli, et al., 2007; Timehin & Timehin, 2004) have reported, dentures, spectacles, hearing aids and walking frames are essential items that equip elderly patients to maintain adequate function and well-being. Therefore, precautions need to be taken, such as documentation and processes put in place including structured communication, follow-up, and involving next of kin in care to ensure that transfers are completed with as little disruption to the patient as possible.

The findings of the audits identified clear areas for improvement, and are thus clinically significant. Thus, near misses were not reported in-depth. The lessons that can be learned from near misses are necessary to the development of policy and design of procedures. These lessons served as a catalyst for reflection, knowledge development and creation of positive changes in the working environment (Benn, et al., 2009; National Health Service, 2000).
8.2.2 Phase two: Systematic Review

The systematic review (Chapter 5) examined the best available evidence of the effectiveness of strategies that have been implemented to ensure the safe transfer of elderly patients as they move from one site of care to another. The trials included in the systematic review were of high quality and met the requirements of the CONSORT statement (Moher, Schulz, & Altman, 2001).


There was evidence that nurse-led interventions (Coleman, et al., 2006; Naylor, et al., 1999; Townsend, et al., 1988) and multidisciplinary team interventions (Evans & Hendricks, 1993) were effective in reducing readmission to hospital up to nine months following the index admission.
There was also evidence that a pharmacist-led intervention improved adherence to medication at three months (Crotty, et al., 2004). The nurse-led (Rawl, et al., 1998) and that pharmacist-led (Crotty, et al., 2004) interventions reduced the incidence of falls. The interventions were based on strategies such as falls prevention screening, monitoring and educating patients of their medication regime, actions and side effects. In addition education of nurses on medication safety. There was also evidence that the pharmacist-led intervention (Crotty, et al., 2004) reduced pain and improved mobility.

There was no evidence of benefit relating to the number of physician visits post discharge in pharmacist and multidisciplinary team led interventions (Caplan, et al., 2004; Dellasega & Zerbe, 2000; Nazareth, et al., 2001; Nikolaus, et al., 1999). Quality of life was improved in the nurse-led (Wen, et al., 2003) and multidisciplinary team (Nikolaus, et al., 1999) interventions. These interventions were cost effective (Caplan, et al., 2004; Coleman, et al., 2006; Naylor, et al., 1999; Nikolaus, et al., 1999; Wen, et al., 2003).

Few primary studies investigated the effectiveness of interventions to promote the safe transfer of elderly patients, so the ability to aggregate the data increased the strength of the evidence. The underlying theme of each of the effective interventions was that structured communication between nurses, pharmacists and multidisciplinary health care teams was integral to effective transition. These findings informed development of the iPTC, which was the third phase of this program of research.
8.2.3 Phase three: Development and pilot testing of the iPTC

Many elderly patients who are admitted to acute care facilities present first to the ED and are then transferred to other wards or facilities (Koehler, et al., 2009). Therefore, for this study, the iPTC commenced at the ED, with follow-up to the medical or surgical wards. Results of the pilot test demonstrated that the iPTC did improve continuity of care and communication between nurses. The idea of a checklist is not new in health facilities. In the operating theatre, using checklists before, during and after operations was deemed effective in reducing errors and adverse events, so that it has become mandatory across hospitals (Benn et al., 2009; Brady & Brady, 2009; Kreckler, Catchpole, McCulloch, & Handa, 2008). Studies that included the use of checklists in the operating and surgical theatre have revealed positive findings similar to those of the iPTC pilot study (Crimlisk, et al., 2009; Gardezi, et al., 2009; Romano, et al., 2009).

As with any new intervention, some nurses were reluctant to use the iPTC, and that was captured in the survey. In part, that finding presents a challenge for researchers to consider how the iPTC could be modified to encourage its use or how the nurses could be encouraged to use it. Nurses report that completing the various forms and documentation requirements takes considerable time and is taking them from clinical work. Therefore, if the iPTC is to be effective, a clear distinction needs to be made. As to whether more clinicians will need to contribute to the content and design of the tool, and agree to test it over an extended period in their wards or as part of a larger trial to measures the iPTC
and develop strategies to improve nurses’ attitudes on completing the form. The next sections present implication for practice, limitations and conclusions.

### 8.3 IMPLICATIONS FOR PRACTICE

The expectations of the community and health professionals are that patients will receive care that is timely, effective and, most importantly, error-free (Wilson et al., 1995). The health system is a large, busy, complex aggregation of diverse components with services loosely linked (Rhodes, 2003), a situation that creates the potential for errors. The findings reported in this thesis have major implications for clinical practice. The audit revealed that a lack of communication was commonly implicated as contributing to errors and adverse events. It highlighted the need for communication to be structured, involving a documentation process that is directed appropriately from clinician to clinician. The process would track referrals and follow-up care and would require information that is concise and comprehensively documented and included a clear medical plan to avoid information overload. The systematic review suggested that an approach tailored specifically to each elderly patient is necessary for the transfer from hospital to home, and that the plan should be facilitated by a nurse, pharmacist or multidisciplinary team through structured communication initiated by documenting care actions. The iPTC is a two way communication tool that informs the transferring ward of measures required prior to transfer, for example, clinical documentations, referrals and assessments. It also gives the receiving wards the ability to counter check and
follow up. The iPTC meets the above requirements of an effective method for clinicians to communicate as they move patients between care settings. In this study, the focus was the elderly. However, the iPTC could be used in any clinical setting and with any category of patient needing relocation. Overall, this thesis has provided innovation in understanding that a lack of communication, a failure to abide by policies and procedures and a lack of follow-up are some of the factors that contribute to errors and adverse events in health care settings.

8.4 STRENGTHS OF THE PROJECT

The key strengths of this study are:

- The development and testing of an empirically derived, conceptually congruent intervention, involving multiple approaches underpinned by human error theory and planned communications.

- The audit of the IIMS and RCA databases identified and described major factors contributing to errors and adverse events at a tertiary hospital in NSW. The audit captured fundamental needs of in-patient elderly whilst in hospital by highlighting errors and adverse events affecting elderly patients.

- The systematic review of primary research reports employed rigorous methodology and provided comprehensive findings of clinical relevance.

- The iPTC development was based on a stringent process and was developed with the input of clinicians and experts in the field, as well as navigating and reading the literature and compiling and pilot testing the communication tool. The iPTC results demonstrated that the
communication tool has potential benefits, although it does need to be tested by further research.

- The study brought about major reform in the tertiary hospital, including the mandatory risk assessment of falls, of pressure ulcer assessment and the ordering of mattresses across the ED.

- The study identified the need for policy related to the transfer of elderly patients to be implemented across health care facilities.

### 8.5 LIMITATIONS OF THE PROJECT

The chapters in this thesis have identified specific limitations in terms of study design, data analysis and results relating to each of the three studies undertaken. However, it is important to identify the limitations of the overall project.

- The audit database focused on one tertiary hospital over a period of one year. The IIMS system was, at that time, in the process of a staged rollout across the state, which could have led to the underreporting of incidents. Nevertheless, trends identified by this data were consistent with the published literature, which in turn supports the integrity of the findings.

- The use of single trials in the systematic review has the potential to inhibit quality findings, which limits generalisation of the data.

- The iPTC as a pilot study was based on a small sample size, and therefore it cannot be generalised.
8.6 RECOMMENDATIONS FOR FUTURE RESEARCH

Findings from this study have provided the following implications for further research:

- Trials should concentrate on the effect of structured communication between clinicians when planning safety measures for elderly patients.
- A large, randomised, controlled trial should be conducted to investigate the usefulness of the iPTC, in particular its ability: (i) to ensure safe transition between the transferring and receiving wards; (ii) to reduce errors and adverse events during transition; and (iii) to improve nurses’ satisfaction and the sustainability of the iPTC.

8.7 CONCLUSION

Based on the findings of these three studies, it was determined that elderly patient transfers are critically important and strategies to promote the safe transfer of elderly patients should include structured communication between nurses or care teams.
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APPENDICES
APPENDIX 1: IIMS AUDIT DATA COLLECTION FORM

1. Patient Medical Record Number (MRN) _______________________

2. Date of Birth ________________________

3. Age Band __________________________

4. Gender
   Female ☐ Male ☐

5. Primary Diagnosis (please state) ________________________

6. Secondary Diagnosis (please state) ________________________

7. Date of Incident ________________________

8. Time of Incident ________________________

9. Time range of the Incident ________________________

10. Location of Incident (please state) ________________________

11. Place of Incident (please state) ________________________

12. Incident Related type
   Medication ☐ (Go to question 14)
   Falls ☐ (Go to question 15)
   Clinical Management ☐ (Go to question 16)
   Other (please state) ☐ (Go to question 17)
   (More than one box can be tick)

13. Principal Incident Type____________________________

14. Description of the Medication Incident
   Wrong route administration ☐
   Wrong drug administered ☐
   Wrong time administered ☐
   Wrong drug prescribed ☐
   Wrong dosage prescribed ☐
   Wrong patient identification ☐
   Medication not prescribed ☐
   Incomplete medication ☐
<table>
<thead>
<tr>
<th>Category</th>
<th>Action</th>
<th>Checked</th>
</tr>
</thead>
<tbody>
<tr>
<td>documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to administer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>medication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient self medicated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extravasation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please state)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15. Description of the Falls Incident

<table>
<thead>
<tr>
<th>Category</th>
<th>Action</th>
<th>Checked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climbed over bedrails</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Found on the floor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall with assistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of consciousness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please state)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. Description of the Clinical Management Incident

<table>
<thead>
<tr>
<th>Category</th>
<th>Action</th>
<th>Checked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inappropriate treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inappropriate procedure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate follow up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff incompetence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procedure complication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please state)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. Description of Other Incident (please state)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
18. Contributing factors

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsteady on feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visually impaired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hearing impaired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dementia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delirium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes (Type I)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes (Type II)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non English Background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please state)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

19. Outcome for Subjects

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injury</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please state)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20. How could the Incident have been prevented? (please state)

- 
- 
- 

21. Severity Assessment Code (SAC) level

<table>
<thead>
<tr>
<th>Level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAC 1 (see question 23)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAC 2 (see question 22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAC 3 (see question 22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAC 4 (see question 22)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
22. Recommendation for SAC 2 or 3 or 4.

________________________________________________________________________________________________________________________________________________
________________________________________________________________________________________________________________________________________________
________________________________________________________________________________________________________________________________________________
________________________________________________________________________________________________________________________________________________
________________________________________________________________________________________________________________________________________________

23. If SAC 1, was Root Cause Analysis (RCA) undertaken?
   Yes ☐ No ☐

24. If so what was the Recommendation from the RCA? (please state)

________________________________________________________________________________________________________________________________________________
________________________________________________________________________________________________________________________________________________
________________________________________________________________________________________________________________________________________________
________________________________________________________________________________________________________________________________________________
________________________________________________________________________________________________________________________________________________
Dear Ms Mansah,

Project No 2006/112 - Safe Transfer of Elderly Patients (STEP) Across care Setting

The SSWAHS Human Research Ethics Committee wishes to acknowledge receipt of your correspondence with regards to the above project.

Formal approval is hereby granted for this study to be conducted with waiver of informed consent from patients and to proceed as a Category A Project. The Committee would like to re-iterate that all information reviewed by the research team is to be de-identified for both staff and patients.

Ethics clearance is granted for periods of up to twelve months. This project will be due for renewal on 31st October, 2007 and you must provide a Progress Report (attached) or final report by this date. If no report is supplied, ethics clearance for this project may be cancelled.

Your attention is drawn to the attached document Guidelines for Investigators which sets out not only the principles under which research should be conducted, but also the conditions under which Ethics approval is granted by the Committee. Also enclosed for your information, is a copy of the document Guidelines for Responsible Practice in Research and Dealing with Problems of Research Misconduct.

Please note that the Committee must be notified IMMEDIATELY of any untoward or unexpected complications or side effects arising during the project or of any ethical or medico-legal problems that may arise. Also, any changes to the original protocol must be submitted to the Committee for approval.

Would you please quote the above project number in all future correspondence relating to this project.

Yours sincerely,

PROFESSOR MICHAEL FROMMER
Chairperson
SSWAHS Human Research Ethics Committee

For: Mr Mike Wallace
Chief Executive, SSWAHS

Category A: Projects with limited risk potential, including quality assurance surveys.
Category B: Projects with significant patient risks.
Category C: Drug trials (international/national) sponsored by drug companies and already covered for risk evaluation and monitoring of adverse reactions.
APPENDIX 3: UWS HUMAN RESEARCH ETHICS COMMITTEE (AUDIT STUDY)

Locked Bag 1797
Penrith South DC NSW 1797 Australia

15 March 2007

Ms Martha Mansah
CANRE
Liverpool Hospital
Locked Bag 7103

Dear Martha,

UWS Registration number HREC 07/035 Safe Transfer of elderly Patients (STEP) across care settings

The UWS Human Research Ethic Committee has accepted the external approval granted by the Sydney South West Area Health Service Human Research Ethics Committee, Protocol No. 2006/112 for the abovementioned project. The project is noted to conclude 31 October 2007.

You are advised that the Committee should be notified of any change/s to the research methodology should there be any in the future. You will be required to provide annual reports on the ethical aspects of your project during its progress and at the completion.

The Registration Number HREC 07/035 should be quoted in all future correspondence about this project which should be forwarded to the Executive Officer, Kay Buckley.

Yours sincerely,

[Signature]

Associate Professor Christine Halse
Chairperson
UWS Human Research Ethics Committee
CC Professor Rhonda Griffiths (Supervisor)
APPENDIX 4: SEARCH STRATEGIES

CINAHL SEARCH STRATEGY

1. exp patient discharge/ or discharg$.mp.
2. (postdischarg$ or post discharg$).mp.
3. (predischarg$ or pre discharg$).mp.
4. (posthospital$ or post hospital$).mp.
5. transfer, intrahospital/ or transfer$.mp.
6. subacute care/ or ((subacute adj2 care) or (sub-acute adj2 care) or (postacute adj2 care) or (post-acute adj2 care)).mp.
7. nursing homes/ or nursing home$.mp.
8. or/1-7
9. "aged, 80 and over"/ or aged/
10. 8 and 9
11. ((aged adj2 home$) or (aged adj2 facilit$) or (elder$ adj2 home$) or (elder$ adj2 facilit$)).mp.
12. 10 or 11
13. after care/ or (aftercare or after care).mp.
14. ((followup adj2 care) or (follow up adj2 care)).mp.
15. (intermediate adj3 care).mp.
16. exp continuity of patient care/ or (continu$ adj3 care).mp.
17. patient centered care/ or ((patient center$ adj3 care) or (patient centre$ adj3 care)).mp.
18. transitional programs/ or (transition$ adj3 care).mp.
19. ((coordinat$ adj2 care) or (co-ordinat$ adj2 care)).mp.
20. health care delivery, integrated/ or (integrat$ adj3 care).mp.
21. Shared Services, Health Care/ or (shar$ adj3 care).mp.
22. case management/ or exp managed care programs/ or (managed care or (case adj2 manag$)).mp.
23. or/13-22
24. 12 and 23
25. exp adverse health care event/ or adverse$.mp. or ae.fs.
26. Accidental Falls/ or fall$.mp.
27. "wounds and injuries"/ or accidents/ or (injur$ or wound$ or accident$).mp.
28. Dehydration/ or (dehydrat$ or de-hydrat$).mp.
29. exp confusion/ or agitation/ or (confus$ or disorient$ or dis-orient$ or agitat$ or restless$).mp.
30. pressure ulcer/ or (bedsore$ or bed sore$ or pressure ulcer$ or pressure sore$ or decubitus).mp.
31. cross infection/ or (cross infect$ or (hospital adj2 infect$) or nosocomial infect$).mp.
32. ((drug adj2 error$) or (medicat$ adj2 error$) or (prescri$ adj2 error$)).mp.
33. ((medical adj2 error$) or (healthcare adj2 error$) or (health care adj2 error$)).mp.
34. ((diagnos$ adj2 error$) or misdiagnos$ or mis-diagnos$ or (diagnos$ adj2 fail$)).mp.
35. (treat$ adj2 delay$).mp.
36. ((treat$ or therap$) adj2 error$).mp.
37. (fragment$ adj3 care).mp.
38. or/25-37
39. 24 and 38

MEDLINE SEARCH STRATEGY

1. Patient Discharge/ or discharg$.mp.
2. (postdischarg$ or post discharg$).mp.
3. (predischarg$ or pre discharg$).mp.
4. (posthospital$ or post hospital$).mp.
5. patient transfer/ or transfer$.mp.
6. subacute care/ or ((subacute adj2 care) or (sub-acute adj2 care) or (postacute adj2 care) or (post-acute adj2 care)).mp.
7. nursing homes/ or nursing home$.mp.
8. or/1-7
9. "aged, 80 and over"/ or aged/
10. 8 and 9
11. homes for the aged/ or ((aged adj2 home$) or (aged adj2 facilit$) or (elder$ adj2 home$) or (elder$ adj2 facilit$)).mp.
12. 10 or 11
13. aftercare/ or (aftercare or after care).mp.
14. ((followup adj2 care) or (follow up adj2 care)).mp.
15. (intermediate adj3 care).mp.
16. continuity of patient care/ or (continu$ adj3 care).mp.
17. patient-centered care/ or ((patient center$ adj3 care) or (patient centre$ adj3 care)).mp.
18. (transition$ adj3 care).mp.
19. ((coordinat$ adj2 care) or (co ordinat$ adj2 care)).mp.
20. exp "Delivery of Health Care, Integrated"/ or (integrat$ adj3 care).mp.
21. hospital shared services/ or (shar$ adj3 care).mp. [mp=title, original title, abstract, name of substance word, subject heading word]
22. case management/ or exp managed care programs/ or (managed care or (case adj2 manag$)).mp.
23. or/13-22
24. 12 and 23
25. adverse$.mp. or ae.fs. [mp=title, original title, abstract, name of substance word, subject heading word]
26. accidental falls/ or fall$.mp.
EMBASE SEARCH STRATEGY

1. hospital discharge/ or discharg$.mp.
2. (postdischarg$ or post discharg$).mp.
3. (predischarg$ or pre discharg$).mp.
4. (posthospital$ or post hospital$).mp.
5. transfer$.mp.
6. ((subacute adj2 care) or (sub-acute adj2 care) or (postacute adj2 care) or (post-acute adj2 care)).mp.
7. nursing home/ or nursing home$.mp.
8. or/1-7
9. aged/
10. 8 and 9
11. home for the aged/ or ((aged adj2 home$) or (aged adj2 facilit$) or (elder$ adj2 home$) or (elder$ adj2 facilit$)).mp.
12. 10 or 11
13. aftercare/ or (aftercare or after care).ti.
14. ((followup adj2 care) or (follow up adj2 care)).mp.
15. (intermediate adj3 care).mp.
17. ((patient center$ adj3 care) or (patient centre$ adj3 care)).mp.
18. (transition$ adj3 care).mp.
19. ((coordinat$ adj2 care) or (co-ordinat$ adj2 care)).mp.
22. exp managed care/ or (managed care or (case adj2 manag$)).mp.
23. or/13-22
24. 12 and 23
25. adverse$.mp. or ae.fs.
26. falling/ or fall$.mp.
27. injury/ or wound/ or accident/ or (injur$ or wound$ or accident$).mp.
28. dehydration/ or (dehydrat$ or de-hydrat$).mp.
29. confusion/ or disorientation/ or agitation/ or restlessness/ or (confus$ or disorient$ or dis-orient$ or agitat$ or restless$).mp.
30. decubitus/ or (bedsore$ or bed sore$ or pressure ulcer$ or pressure sore$ or decubitus).mp.
31. hospital infection/ or (cross infect$ or (hospital adj2 infect$) or nosocomial infect$).mp.
32. exp medical errors/ or ((medical adj2 error$) or (healthcare adj2 error$) or (health care adj2 error$)).mp.
33. ((drug adj2 error$) or (medicat$ adj2 error$) or (prescri$ adj2 error$)).mp.
34. ((diagnos$ adj2 error$) or misdiagnos$ or mis-diagnos$ or (diagnos$ adj2 fail$)).mp.
35. (treat$ adj2 delay$).mp.
36. ((treat$ or therap$) adj2 error$).mp.
37. (fragment$ adj3 care).mp.
38. or/25-37
39. 24 and 38

PsycInfo SEARCH STRATEGY

1. exp hospital discharge/ or facility discharge/ or discharg$.mp.
2. (postdischarg$ or post discharg$).mp.
3. (predischarg$ or pre discharg$).mp.
4. (posthospital$ or post hospital$).mp.
5. client transfer/ or transfer$.mp.
6. ((subacute adj2 care) or (sub-acute adj2 care) or (postacute adj2 care) or (post-acute adj2 care)).mp.
7. nursing homes/ or nursing home$.mp.
8. or/1-7
9. limit 8 to ("380 aged " or "390 very old ")
10. 8 and 9
11. ((aged adj2 home$) or (aged adj2 facilit$) or (elder$ adj2 home$) or (elder$ adj2 facilit$)).mp.
12. 10 or 11
13. aftercare/ or (aftercare or after care).mp.
14. ((followup adj2 care) or (follow up adj2 care)).mp.
15. (intermediate adj3 care).mp.
16. continuum of care/ or (continu$ adj3 care).mp.
17. ((patient center$ adj3 care) or (patient centre$ adj3 care)).mp.
18. (transition$ adj3 care).mp.
19. ((coordinat$ adj2 care) or (co-ordinat$ adj2 care)).mp.
20. integrated services/ or (integrat$ adj3 care).mp.
22. exp case management/ or managed care/ or (managed care or (case adj2 manag$)).mp.
23. or/13-22
24. 12 and 23
25. adverse$.mp.
26. falls/ or fall$.mp.
27. injuries/ or wounds/ or accidents/ or (injur$ or wound$ or accident$).mp.
28. dehydration/ or (dehydrat$ or de-hydrat$).mp.
29. mental confusion/ or agitation/ or restlessness/ or (confus$ or disorient$ or dis-orient$ or agitat$ or restless$).mp.
30. (bedsore$ or bed sore$ or pressure ulcer$ or pressure sore$ or decubitus).mp.
31. (cross infect$ or (hospital adj2 infect$) or nosocomial infect$).mp.
32. ((medical adj2 error$) or (healthcare adj2 error$) or (healthcare adj2 error$)).mp.
33. ((drug adj2 error$) or (medicat$ adj2 error$) or (prescri$ adj2 error$)).mp.
34. misdiagnosis/ or ((diagnos$ adj2 error$) or misdiagnos$ or mis-diagnos$ or (diagnos$ adj2 fail$)).mp.
35. (treat$ adj2 delay$).mp.
36. ((treat$ or therap$) adj2 error$).mp.
37. (fragment$ adj3 care).mp.
38. or/25-37
39. 24 and 38
PreMEDLINE and Old MEDLINE SEARCH STRATEGY

1. Patient Discharge/ or discharg$.mp.
2. (postdischarg$ or post discharge$).mp.
3. (predischarg$ or pre discharge$).mp.
4. (posthospital$ or post hospital$).mp.
5. patient transfer/ or transfer$.mp.
6. subacute care/ or ((subacute adj2 care) or (sub-acute adj2 care) or (postacute adj2 care) or (post-acute adj2 care)).mp.
7. nursing homes/ or nursing home$.mp.
8. or/1-7
9. "aged, 80 and over"/ or aged/ or (aged or elder$).mp.
10. 8 and 9
11. homes for the aged/ or ((aged adj2 home$) or (aged adj2 facilit$) or (elder$ adj2 home$) or (elder$ adj2 facilit$)).mp.
12. 10 or 11
13. aftercare/ or (aftercare or after care).mp.
14. ((followup adj2 care) or (follow up adj2 care)).mp.
15. (intermediate adj3 care).mp.
16. continuity of patient care/ or (continui$ adj3 care).mp.
17. patient-centered care/ or ((patient center$ adj3 care) or (patient centre$ adj3 care)).mp.
18. (transition$ adj3 care).mp.
19. ((coordinate$ adj2 care) or (co-ordinate$ adj2 care)).mp.
20. exp "Delivery of Health Care, Integrated"/ or (integrat$ adj3 care).mp.
21. hospital shared services/ or (shar$ adj3 care).mp. [mp=ti, ot, ab, nm, hw]
22. case management/ or exp managed care programs/ or (managed care or (case adj2 manag$)).mp.
23. or/13-22
24. 12 and 23

COCHRANE LIBRARY SEARCH STRATEGY

1. MeSH descriptor Patient Discharge, this term only
2. (discharg*)
3. (postdischarg* or "post discharge*" or post-discharg*)
4. (predischarg* or "pre discharge*" or pre-discharg*)
5. (posthospital* or "post hospital*" or post-hospital*)
6. MeSH descriptor Subacute Care, this term only
7. (subacute near/2 care) or ("sub acute" near/2 care) or (sub-acute near/2 care) or (postacute near/2 care) or ("post acute" near/2 care) or (post-acute near/2 care)
8. MeSH descriptor Nursing Homes, this term only
9. "nursing home*"
10. (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9)
11. (aged or elder*)
12. (#10 AND #11)
13. MeSH descriptor Homes for the Aged, this term only
14. (aged near/2 home*) or (aged near/2 facilit*) or (elder* near/2 home*) or 
   (elder* near/2 facilit*)
15. (#12 OR #13 OR #14)
16. MeSH descriptor Aftercare, this term only
17. (aftercare or "after care" or after-care)
18. (followup near/2 care) or ("follow up" near/2 care) or (follow-up near/2 
   care)
19. (intermediat* near/3 care)
20. MeSH descriptor Continuity of Patient Care, this term only
21. (continu* near/3 care)
22. MeSH descriptor Patient-Centered Care, this term only
23. ("patient center*" near/3 care) or (patient-center* near/3 care) or 
   ("patient centre*" near/3 care) or (patient-centre* near/3 care)
24. (transition* near/3 care)
25. (coordinat* near/2 care) or (co-ordinat* near/2 care)
26. MeSH descriptor Delivery of Health Care, Integrated explode all 
   trees
27. (integrat* near/3 care)
28. MeSH descriptor Hospital Shared Services, this term only
29. (shar* near/3 care)
30. MeSH descriptor Case Management, this term only
31. MeSH descriptor Managed Care Programs explode all trees
32. #"managed care" or (case near/2 manag*)
33. (#16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 
   OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32)
34. (#15 AND #33)
35. (adverse*)
36. Any MeSH descriptor with qualifier: AE
37. MeSH descriptor Accidental Falls, this term only
38. (fall*)
39. MeSH descriptor Wounds and Injuries, this term only
40. MeSH descriptor Accidents, this term only
41. (injur* or wound* or accident*)
42. MeSH descriptor Dehydration, this term only
43. (dehydrat* or de-hydrat*)
44. MeSH descriptor Confusion explode all trees
45. MeSH descriptor Psychomotor Agitation, this term only
46. (confus* or disorient* or dis-orient* or agitat* or restless*)
47. MeSH descriptor Pressure Ulcer, this term only
48. (bedsore* or "bed sore*" or "pressure ulcer*" or "pressure sore*" or 
   decubitus)
49. MeSH descriptor Cross Infection, this term only
50. "cross infect*" or (hospital near/2 infect*) or "nosocomial infect*"

51. MeSH descriptor Medical Errors explode all trees

52. (medical near/2 error*) or (healthcare near/2 error*) or ("health care" near/2 error*) or (health-care near/2 error*)

53. (drug near/2 error*) or (medicat* near/2 error*) or (prescri* near/2 error*)

54. MeSH descriptor Diagnostic Errors explode all trees

55. (diagnos* near/2 error*) or misdiagnos* or mis-diagnos* or (diagnos* near/2 fail*)

56. (treat* near/2 delay*)

57. (treat* or therap*) near/2 error*

58. (fragment* near/3 care)

59. (#35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR ( #52 AND or#53 ) OR #54 OR #55 OR #56 OR #57 OR #58)

60. (#34 AND #59)
APPENDIX 5: VERIFICATION OF STUDY ELIGIBILITY

AUTHOR AND YR _____________________________________________________

JOURNAL ___________________________________________________________

TITLE - __________________________________________________________________

<table>
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<tr>
<th>INCLUSION CRITERIA</th>
<th>Study Design</th>
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**Intervention:** Does the study describe an intervention to reduce errors and adverse events during transfer of care? Yes ☐ No ☐

**Outcome:** Does the study evaluate the effect of the intervention on

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You should answer Yes to at least 1 question in each of the above four groups. If not please do not complete the rest.
### APPENDIX 6: JBI CRITICAL APPRAISAL CHECKLIST FOR EXPERIMENTAL STUDIES

Reviewer _____________________________  Date ____________
Author _______________________________ Year___________
Record Number_________________________

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<td>2. Were participants blinded to treatment allocation?</td>
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<td>3. Was allocation to treatment groups concealed from the allocator</td>
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<td>4. Were the outcomes of people who withdrew described and included in the analysis?</td>
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<td>5. Were those assessing outcomes blind to the treatment allocation?</td>
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<td>6. Were the control and treatment groups comparable at entry?</td>
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<td>7. Were groups treated identically other than for the named interventions?</td>
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<td>8. Were outcomes measured in the same way for all groups?</td>
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<td>9. Were outcomes measured in a reliable way?</td>
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<td>10. Was there adequate follow-up (&gt;80%)</td>
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<td>11. Was appropriate statistical analysis used?</td>
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**Overall appraisal:**
- Include □
- Exclude □
- Seek further info □

**Comments (Including reasons for exclusion):**

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

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## APPENDIX 7: QUALITY ASSESSMENT OF INCLUDED TRIALS

### NURSE-LED INTERVENTION

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<th>Reviewer</th>
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<th>Allocation to groups concealed from allocator</th>
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<th>Those assessing outcomes blind to the treatment</th>
<th>Groups comparable at entry</th>
<th>Groups treated identically other than the intervention</th>
<th>Outcomes measured in the same way for all groups</th>
<th>Outcomes measured in a reliable way</th>
<th>Adequate follow up &gt;80%</th>
<th>Appropriate statistical analysis used</th>
<th>Total</th>
<th>Method of allocation</th>
<th>Sample-size calculation stated</th>
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<td>Outcome measured the same way for all groups</td>
<td>Outcomes treated identically other than the intervention at entry</td>
<td>Adequate follow-up</td>
<td>Outcome analysis</td>
<td>Described and measured</td>
<td>Allocation to groups concealed from those assessing outcome</td>
<td>Participants blinded to treatment</td>
<td>Reviewer</td>
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<tr>
<td>Caplan et al.</td>
<td>DT</td>
<td>Yes</td>
<td>3</td>
<td>3</td>
<td>1</td>
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<tr>
<td>Nikolaus et al.</td>
<td>DT</td>
<td>Yes</td>
<td>3</td>
<td>3</td>
<td>2</td>
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<tr>
<td>Evans et al.</td>
<td>DT</td>
<td>No</td>
<td>2</td>
<td>2</td>
<td>3</td>
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</tbody>
</table>

MULTIDISCIPLINARY TEAM LED INTERVENTION
APPENDIX 8: DATA EXTRACTION SHEET

AUTHOR AND YR
__________________________________________________

JOURNAL
_________________________________________________________

TITLE/COUNTRY STUDY UNDERTAKEN
________________________________________________________________________
________________________________________________________________________

Please identify the groups and complete the following for each group
* If more than 3 groups, please add an extra column.

<table>
<thead>
<tr>
<th>Group</th>
<th>Group</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PARTICIPANTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number in each group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender F / M</td>
<td></td>
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<tr>
<td>Principal diagnosis</td>
<td></td>
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</tr>
<tr>
<td>Participants excluded from the study</td>
<td>Number:____</td>
<td>Number :_____</td>
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<td>Reason:_________</td>
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</tbody>
</table>

**INTERVENTION**

<p>| | |
| | |
|---|---|---|
| Description of intervention | | |
| Intervention delivered by (eg Nurse, Dr ) | | |
| Frequency of delivery | | |
| Length of time for delivery of Intervention | | |</p>
<table>
<thead>
<tr>
<th></th>
<th>Group</th>
<th>Group</th>
<th>Group</th>
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</thead>
<tbody>
<tr>
<td><strong>Method of delivery (eg</strong></td>
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<tr>
<td><strong>face to face contact,</strong></td>
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<tr>
<td><strong>telephone)</strong></td>
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</tr>
<tr>
<td><strong>No. of follow-ups</strong></td>
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<tr>
<td><strong>Duration of follow-ups</strong></td>
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</tr>
<tr>
<td><strong>Schedule of follow-up</strong></td>
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<tr>
<td>(eg 3 months, 6 months)</td>
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<tr>
<td><strong>OUTCOMES</strong></td>
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<tr>
<td><strong>Medications Management</strong></td>
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<tr>
<td>Incidence of hospital readmissions</td>
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</tr>
<tr>
<td>Falls</td>
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<tr>
<td>Disorientation</td>
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<tr>
<td>Medical mismanagement</td>
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<td>Functional Level</td>
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<td>Quality of Life</td>
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<td>Patient satisfaction</td>
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<td>Mortality</td>
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<td>Morbidity</td>
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<tr>
<td>Cost effectiveness</td>
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</tbody>
</table>

**Other Relevant Comments**

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
The following were excluded as they did not involve the transfer of elderly patients


The following publications were excluded as they were descriptive studies


**This was excluded due to the age group of participant**


**The following were excluded because they did not meet mean quality threshold**


# APPENDIX 10: SUMMARY TABLE

## NURSE-LED INTERVENTION

<table>
<thead>
<tr>
<th>Author/Country</th>
<th>Study type</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Method of allocation</td>
<td></td>
<td>Transition coach who provided: (1) assistance with medication self-management, (2) a patient-centered record owned and maintained by the patient to facilitate cross-site information transfer, (3) timely follow-up with primary or specialty care, and (4) a list of &quot;red flags&quot; indicative of a worsening condition and instructions on how to respond to them, (5) a personal health record and (6) a series of visits and telephone calls with a transition coach, (7) Caregivers received support and encouragement</td>
<td>Readmission to hospital at 1 month, IG 31/379, CG 44/371, P value = 0.048</td>
<td>Blinded outcome analysis</td>
</tr>
<tr>
<td>USA</td>
<td>Random number generator</td>
<td></td>
<td>Control Group (CG) (n=371)</td>
<td>Readmission to hospital at 3 months, IG 63/379, CG 83/371, P value = 0.04</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Readmission to hospital at 6 months, IG 97/379, CG 114/371, P value = 0.28</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Cost effectiveness, Non elective hospital costs at 1 month, IG $784 (USD), CG $918 (USD), P value = 0.06</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Non elective hospital costs at 3 months</td>
<td></td>
</tr>
</tbody>
</table>
mellitus, spinal stenosis, hip fracture, peripheral vascular disease, deep venous thrombosis, and pulmonary embolism.

Baseline characteristics
No significant differences in baseline age, gender, marital status, educational level, ethnicity and health status.

<table>
<thead>
<tr>
<th></th>
<th>months</th>
<th>IG</th>
<th>CG</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>$1519 (USD)</td>
<td>$2016 (USD)</td>
<td>0.02 (USD)</td>
</tr>
</tbody>
</table>

Non elective hospital costs at 6 months
IG  $2058 (USD)
CG  $2546 (USD)
P value = 0.04 (USD)
<table>
<thead>
<tr>
<th>Author/ Country</th>
<th>Study type</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Rawl et al (1998) USA | RCT Method of Allocation Not stated | 100 patients discharged from an inpatient rehabilitation unit. | Intervention Group (IG) (n=49)  
The intervention group received:  
(1) Advanced Practice Nurse (APN) follow-up three in person contact and one telephone contact, (2) Telephone contact was made within, 48 hours after discharge to discuss their immediate, transitional concerns, (3) the last two in-person contacts were made face to face at approximately 30 days and 4 months after discharge, (4) at the 30 day and 4 month contacts, the APN performed a physical examination, assessed complications, and addressed patient and family concerns related to the transition from hospital to home, provided emotional support and counseling, provided information about community resources, and provided both general and rehabilitation-specific education and consultation to the patient and family, as needed.  
Control Group (CG)- (n=51)  
Usual care-usual hospital discharge planning and follow-up care (i.e. A single telephone call from a lay volunteer person regarding a survey). | Use of health care resources  
Readmission to hospital at 4 months  
IG 11/49  
CG 7/51  
P value =0.26  
| Falls at 4 months  
IG 11/49  
CG 13/51  
P value = 0.72  
| Urinary tract infection at 4 months  
IG 7/49  
CG 5/51  
P value =0.49  
| Anxiety levels at 4 months  
IG 29.0 (SD 9.9)  
CG 44.7 (SD 15.3)  
P value <0.001  
<p>| Anxiety was measured using the State-Trait Anxiety Inventory (STAI). |</p>
<table>
<thead>
<tr>
<th>Author/ Country</th>
<th>Study type</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Wen et al (2003) Australia</td>
<td>RCT</td>
<td>654 patients who were discharged and required community services after discharge. Inclusion Criteria (1)Patients were 65 years and over, in an acute ward for over 48 hours and were discharged home, (2) patients were expected to live at least one month post-discharge, (3) patients and carers were able to give informed consents, (4) the patient was likely to have a mobility or self-care management problems or met two or more of the following: the patient lived alone; the patient had responsibilities for caring for others at home; or the patient used community services before hospital admission, (5) the patient required community services on discharge Baseline characteristics There were no significant differences between the groups in age, gender, ethnicity, social class.</td>
<td>Intervention Group (IG) (n=311) Patients received Post Acute Care (PAC) program led by a coordinator which included: (1) Telephone follow-up, (2) available for patients in the event of a crisis, (3) liaised and coordinated service providers, (4) ensuring adequate referrals before discharge from the PAC program (e.g. to councils or community health centres. Control Group (CG) (n=287) Usual Care-usual hospital discharge planning, provided by ward nursing staff and the social work department.</td>
<td>Use of health care resources Mean Number of Readmission to hospital at 6 months IG 0.4 (0.3-0.5) CG 0.5 (0.4-0.5) P value = 0.19 Cost effectiveness Total cost including cost of the intervention at 6 months IG $2,843 168 (AUD) CG $3, 067 169 (AUD) P value 0.048 Quality of life at 1 month IG had significant improvement in independent living (P= 0.002) and quality of life (P= 0.02).</td>
<td>Blinded outcome assessed.</td>
</tr>
<tr>
<td>Author/ Country</td>
<td>Study type</td>
<td>Participants</td>
<td>Intervention</td>
<td>Results</td>
<td>Notes</td>
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<tr>
<td>Naylor et al (1999) USA</td>
<td>RCT</td>
<td>363 elderly patients living in an urban area of Philadelphia.</td>
<td>Intervention Group (IG) (n=177) The intervention patients received (1) Advanced Practice Nurse follow up, (2) comprehensive discharge planning and home follow-up protocol, (3) hospitals visits, (4) home visits, (5) telephone availability, (6) outreach, (7) discharge summaries. Control Group (CG) (n=186) Usual care- patients received standard home care consistent with Medicare regulations.</td>
<td>Use of health care resources Readmission to hospital at 1 month IG 17/177 CG 47/186 P value &lt;0.001 Readmission to hospital at 3 months IG 32/177 CG 60/186 P value 0.02 Cost effectiveness Total cost of readmission IG $427 217 (AUD) CG $1024 218 (AUD) P value &lt;0.001 Total cost of acute care visits (physician’s office, emergency department, home visits, nurses and other visits) IG $6,42 595 (USD) CG $1,238 928 (USD) P value &lt;0.001 Costs per patient IG $3630 (USD) CG $6661 (USD) P value &lt;0.001</td>
<td>Research assistants blinded to study groups and hypotheses.</td>
</tr>
<tr>
<td>Author/Country</td>
<td>Study type</td>
<td>Participants</td>
<td>Intervention</td>
<td>Results</td>
<td>Notes</td>
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<tr>
<td>Dellasega et al (2000) USA</td>
<td>Four arm RCT</td>
<td>140 rural patients discharged home.</td>
<td>Intervention Group (IG) (n 97)</td>
<td>Use of health care resources</td>
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<tr>
<td></td>
<td>Method of Allocation Not stated</td>
<td>Inclusion Criteria (1) Admitted to one of the study-site hospitals, (2) scheduled for discharge home, (3) frail (cognitively and or functionally impaired or a complex case).</td>
<td>The intervention involved Advanced Nurse Practice (APN): (1) A predischarge visit by an APN, who met with the participant (and caregiver when possible), (2) reviewed the hospital medical record, and began planning for discharge (3) after discharge, the APN visited twice, at 24 to 48 hours and again 2 weeks later (4) between visits, the APN or participant could initiate additional telephone contacts and visits if needed.</td>
<td>Mean Number of Hospital visits at 1 month</td>
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<tr>
<td></td>
<td></td>
<td>Baseline Characteristics Mean age 74.81. No significant differences in baseline age, gender and number of medications.</td>
<td>Usual Care (n=43)-No follow-up nursing support</td>
<td>No Care 0.15</td>
<td>Use of health care resources</td>
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<td></td>
<td>RN &amp; APN 0.23</td>
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<td>APN only 0.19</td>
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<td>RN only 0.37</td>
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<td>P value 0.404</td>
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<td>Mean Number of physician visits</td>
<td>No Care 2.30</td>
<td>Use of health care resources</td>
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<td>RN &amp; APN 2.10</td>
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<td>APN only 2.81</td>
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<td>RN only 2.41</td>
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<td>P value 0.520</td>
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<td>Mean Number of medication changes</td>
<td>No Care 0.67</td>
<td>Use of health care resources</td>
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<td>RN &amp; APN 1.22</td>
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<td>APN only 0.50</td>
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<td>RN only 0.29</td>
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<td>P value 0.339</td>
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<td></td>
<td>Mean Number of Quality of Life at 1 month after discharge</td>
<td>No Care 2.96</td>
<td>Use of health care resources</td>
</tr>
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<td>RN &amp; APN 3.13</td>
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<td>APN only 3.10</td>
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<td>RN only 2.94</td>
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<td>P value 0.848</td>
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<tr>
<td>Author/Country</td>
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<td>Intervention</td>
<td>Results</td>
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<tr>
<td>Townsend et al</td>
<td>RCT</td>
<td>903 patients discharged from a district hospital.</td>
<td>Intervention Group (IG) (n=464)</td>
<td>Use of Health Care Resources</td>
<td></td>
</tr>
<tr>
<td>(1988) United</td>
<td>Method of Allocation</td>
<td>Inclusion Criteria: Patients who were (1) 75 years or over, (2) admitted</td>
<td>Patient received (1) Community based hospital discharge scheme, (2) support</td>
<td>Readmissions at 3 months</td>
<td></td>
</tr>
<tr>
<td>Kingdom</td>
<td>Computer-generated</td>
<td>from a defined area of central Harrow, (3) discharge within the demographic</td>
<td>from care attendants on first day at home and for up to 12 hours a week for</td>
<td>IG 105/464</td>
<td></td>
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<tr>
<td></td>
<td>numbers</td>
<td>service area of the hospital, (4) going home</td>
<td>two weeks</td>
<td>CG 102/439</td>
<td>P value Not significant</td>
</tr>
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<td></td>
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<td>Control Group (CG) (n=439)</td>
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<td></td>
<td></td>
<td>Baseline characteristics: There were no significant differences in age,</td>
<td>Usual care-assessed before discharge at two weeks, and three months</td>
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<td></td>
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<td>gender, ethnicity, social class. score.</td>
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<td>Use of Health Care Resources</td>
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<td>Readmissions at 3 months</td>
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<td>IG 105/464</td>
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<td>CG 102/439</td>
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<td></td>
<td></td>
<td></td>
<td>P value Not significant</td>
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</table>

**Cost effectiveness**

The significantly lower hospital readmission in the intervention group, the care intervention program showed an average reduction cost compared with the usual care group both short-term and long-term.

**Mortality**

At 3 months

IG 34/464
CG 25/439
P value Not significant

At 12 months

IG 91/464
CG 81/439
P value Not significant
<table>
<thead>
<tr>
<th>Author/Country</th>
<th>Study type</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crotty et al (2004) Australia</td>
<td>RCT</td>
<td>110 of elderly patients from metropolitan hospitals</td>
<td>The Intervention Group (IG) (n=56)</td>
<td></td>
<td>Independent pharmacists were blinded to study group allocation assessed patients’ medication charts and case notes. The elderly in both groups had multiple comorbidities and taking a large number of drugs. 12 patients in the intervention group died or did not complete the study for other reasons. 10 patients in the control group died or did not complete the study for other reasons. Follow up data were available for 44 patients.</td>
</tr>
<tr>
<td></td>
<td>Method of allocation</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Computer-generated numbers</td>
<td>Inclusion Criteria Patient who were (1) 65 years or older, (2) care giver given consent, (3) had a life expectancy of ≥1 month as assessed by their medical team, (4) making a first time transition from a hospital to a long term residential care facility.</td>
<td>The intervention group received: (1) Pharmacist transition coordinator, (2) medication-management transfer summaries from hospitals to the long term facility, (3) timely coordinated medication reviews by accredited community pharmacists, (4) case conferences with family, physicians and pharmacists</td>
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<tr>
<td></td>
<td></td>
<td>Base line Characteristics No significant differences in baseline age, gender, and health status.</td>
<td>Control Group (CG) (n=54) Usual care-received the usual hospital discharge process.</td>
<td>Use of health care resources Hospital usage IG 5/44 CG 13/44 P value 0.035 Medication Appropriateness Index (MAI) at two months follow up P value 0.007 Adverse drug event at 2 months IG 20/44 CG 19/44 P value 0.830 Falls at 2 months IG 19/44 CG 16/44 P value 0.514 Worsening pain at 2 months IG 13/44 CG 23/44 P value 0.023 Worsening behaviours at 2 months IG 8/44 CG 15/44 P value 0.077</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increased confusion at 2 months</td>
<td>Worsening mobility at 2 months</td>
<td></td>
<td></td>
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<td>---------------</td>
<td>---------------------------------</td>
<td>-------------------------------</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>IG  6/44</td>
<td>IG  4/44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CG  11/44</td>
<td>CG  10/44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P value  0.160</td>
<td>P value  0.072</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Author/Country</td>
<td>Study type</td>
<td>Participants</td>
<td>Intervention</td>
<td>Results</td>
<td>Notes</td>
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</tr>
<tr>
<td>Nazareth et al (2001) England</td>
<td>RCT Method of allocation</td>
<td>362 elderly patients from three acute and general and one long stay hospital.</td>
<td>Intervention Group (IG) (n=181) The intervention group received (1) Pharmacist discharge Plan included assessment of the patients’ medication; provision of information on their current drugs; liaison with carers; community professionals when appropriate; discharge, medication information review, (2) medication support required by patient, (3) community pharmacy visit post discharge, (4) counselling patients or carers on the purpose and appropriate doses of the medication; disposing of excess medicines, (5) liaising with general practitioners, (6) arrange further community visit as needed by patients.</td>
<td>Use of health care resources Readmission at 3 months IG 64/164 CG 69/176 P value Not significant Readmission at 6 months IG 38/136 CG 43/151 P value Not significant Physician visits at 3 months IG 101/130 CG 108/144 P value Not significant Physician visits at 6 months IG 76/107 CG 82/116 P value Not significant Outpatient department visits at 3 months IG 75/164 CG 84/176 P value Not significant</td>
<td>All patients were screened for cognitive impairment using the Mini-Mental State Examination Questionnaire. Research Assistant was blinded to study allocation. 189 hospital pharmacy discharge plans were available on 145 patients due to misplacement and data not available for analysis.</td>
</tr>
</tbody>
</table>
| Control Group (CG) (n=181) | Usual Care-discharged from hospital following standard procedures—these included a discharge letter to the general practitioner which indicated the diagnosis, investigations and current medications. | Outpatient department visits at 6 months
IG 39/137
CG 40/151
P value Not significant

Medications related outcomes
Knowledge about medication at 3 months
IG  N=86 Mean value 0.69 (SD 0.33)
CG N=83 Mean value 0.62 (SD 0.34)
P value Not significant

Knowledge about medication at 6 months
IG N=65 Mean value 0.69 (SD 0.35)
CG N=68 Mean value 0.68 (SD 0.32)
P value Not significant

Adherence to medication at 3 months
IG  N=79 Mean value 0.75 (SD 0.3)
CG N=72 Mean value 0.75 (SD 0.28)
P value Not significant

Adherence to medication at 6 months
IG N=60 Mean value 0.78 (SD 0.3)
CG N=58 Mean value 0.78 (SD 0.3)
P value Not significant

Patient Satisfaction at 3 months
IG N=76 Mean value 3.3 (SD 0.6)
CG N=73 Mean value 3.3 (SD 0.6)
P value Not significant |
Patient Satisfaction at 6 months
IG  N=62 Mean value 3.4 (SD 0.6)
CG N= 61 Mean value 3.2 (SD 0.6)
P value Not significant

Quality of life at 3 months
IG  N= 76 Mean value 2.4 (SD 0.7)
CG  N=73 Mean value 2.4 (SD 0.6)
P value Not significant

Quality of life at 6 months
IG  N= 62 Mean value 2.5 (SD 0.6)
CG N=61 Mean value 2.4 (SD 0.7)
P value Not significant

Mortality at 3 months
IG 10/164
CG  5/176
P value Not significant

Mortality at 6 months
IG  22/137
CG  19/151
P value Not significant
<table>
<thead>
<tr>
<th>Author/ Country</th>
<th>Study type</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawe et al (1990) Australia</td>
<td>RCT Method of Allocation By month</td>
<td>268 patients admitted to the study between the period of 17 months. Inclusion Criteria Patients were (1) 55 years or more, (2) English speaking, (3) not living in a nursing home prior to hospital admission, (4) not considered by staff to be confused</td>
<td>Intervention Group (IG) (n=149) Patients were given ED MED Program (Education about Medication) which consisted of (1) Pharmacist-led medication program, (2) education, (3) pre-discharge counseling, (4) individual medication record Control Group (CG) (n=119) -Usual care Receive a “dummy” intervention conducted on alternate months to the medication program. “Getting Older, Feeling Better” an education program led by a Nurse Educator. It covered such topics as care of the feet, the importance of exercise, good nutrition.</td>
<td>Medication related outcomes Mean score on knowledge of drug purpose (perfect score is 100) at 1 month IG 85.3 CG 86.6 P value Not significant Percentage of Mean adherence for all drugs at 1 month IG 95.9 CG 92.9 P value Not significant Percentage of patients taking less than recommended of any drug at 1 month IG 40.4 CG 38.5 P value Not significant Percentage of patients taking more than recommended of any drug at 1 month IG 9.7 CG 7.7 P value Not significant Percentage of patients severely non-adherent with any drug at 1 month IG 34.2 CG 34.6</td>
<td>The research assistant who conducted interviews with patients was unaware that the study was an experimental hypothesis. That is she did not know which was the intervention or control group.</td>
</tr>
<tr>
<td>Parameter</td>
<td>IG</td>
<td>CG</td>
<td>P value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of patients severely non-adherent with an essential drug at 1 month</td>
<td>22.0</td>
<td>26.0</td>
<td>Not significant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean score on knowledge of drug purpose (perfect score is 100) at 3 months</td>
<td>85.6</td>
<td>87.3</td>
<td>Not significant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of Mean adherence for all drugs at 3 months</td>
<td>92.7</td>
<td>88.9</td>
<td>Not significant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of patients taking less than recommended of any drug at 3 months</td>
<td>52.6</td>
<td>51.4</td>
<td>Not significant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of patients taking more than recommended of any drug at 3 month</td>
<td>9.2</td>
<td>7.0</td>
<td>Not significant</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IG</td>
<td>CG</td>
<td>P value</td>
<td></td>
<td></td>
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<td>---------------</td>
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<td>------</td>
<td>---------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of patients severely non-adherent with any drug at 3 months</td>
<td>44.7</td>
<td>41.4</td>
<td>Not significant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of patients severely non-adherent with an essential drug at 3 months</td>
<td>26.0</td>
<td>39.0</td>
<td>Not significant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe non-adherent with patients taking four drugs or more drugs at 1 month</td>
<td>18/83</td>
<td>25/73</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe non-adherent with patients taking four drugs or more drugs at 3 month</td>
<td>18/56</td>
<td>24/55</td>
<td>0.03</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## MULTIDISCIPLINARY LED INTERVENTION

<table>
<thead>
<tr>
<th>Author/ Country</th>
<th>Study type</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
<th>Notes</th>
</tr>
</thead>
</table>
The intervention group received:  
(1) Comprehensive Geriatric Assessment (CGA), (2) multidisciplinary team involvement such as nurses, doctors, physiotherapist, occupational therapist, GP and the geriatrician with follow up at home or hostel  
**Control Group (CG)** (n=369)  
Usual Care-were allowed to go home after randomisation with no alteration to the discharge plan formulated by the medical officer in ED. | **Use of health care resources**  
Physician visits  
IG  281/370  
CG  264/399  
P value 0.155  
Outpatient clinics  
IG  99/370  
CG  89/399  
P value 0.399  
Mortality at 18 months  
IG 55/370  
CG  53/399  
P value 0.765 | |
<table>
<thead>
<tr>
<th>Author/Country</th>
<th>Study type</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nikolaus et al (1999) Germany</td>
<td>Three arm RCT Method of allocation Computer-generated random numbers</td>
<td>545 patients admitted to the geriatric centre at the University Hospital of Heidelberg. Inclusion Criteria Patients who: Who were 65 years or over (2) who lived at home (3) who had terminal illness or severe dementia were not included, (4) live too far away (&gt;15km) for the home intervention team to make regular visits were not included, (5) had to be in a stable condition prior to assessment Baseline Characteristics The participants in the intervention, assessment and control groups were similar. The patients included had a higher mean age (81.4 years). Women made up 73.4% of the group; 27.2% lived with spouse or partner.</td>
<td>Two Intervention Groups (1) Comprehensive geriatric assessment and home intervention (CGA &amp; HI) received (n=140): (1) Home intervention consisting of nurses, physiotherapist, an occupational therapist and social worker (2) training in washing, eating, dressing and/or walking (3) assessment of patient’s home (e.g. for safety hazards) to prescribe technical aids, as necessary (3) home services (4) home visits (5) telephone follow up. (2) Comprehensive Geriatric Assessment alone (CGAA) (n=139) Control Group (CG) (n=141) Usual Care-not stated</td>
<td>Use of Health Care Resources Readmission at 12 months CGA &amp; HI 59/140 CGAA 64/139 CG 65/141 P value Not significant Physician visits (mean no. of visits/person/month) CGA &amp; HI 1.23 CGAA 1.11 CG 1.08 P value Not significant Long term care institution CGA &amp; HI 30/140 CGAA 33/139 CG 42/141 P value Not significant</td>
<td>Blinded outcome assessment Cognition was assessed with the Mini-Mental-State Examination</td>
</tr>
<tr>
<td>Author/Country</td>
<td>Study type</td>
<td>Participants</td>
<td>Intervention</td>
<td>Results</td>
<td>Notes</td>
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</tbody>
</table>
| Evans et al (1993) USA | RCT | 835 study participants identified as at ‘risk’ for frequent health care resource use. | **Intervention Group (IG)** (n=417)  
Patient who received  
(1) Early discharge planning,  
(2) referral to community agencies  
(3) nursing home placements,  
(4) counseling,  
(5) health education,  
(6) planning home health care,  
(7) financial planning,  
(8) living arrangements,  
(9) environmental modifications,  
(10) assistance with medical follow up  
**Control Group (CG)** (n=418)  
Usual care-receive discharge planning only if there was a written physician request | **Use of Health Care resources**  
Readmission at 1 month  
IG 103/417  
CG 147/418  
P value 0.001  
Readmission at 9 month  
IG 229/417  
CG 305/418  
P value 0.08  
Long-term institution at 1 month  
IG 61/417  
CG 91/418  
P value  
Long-term institution at 9 month  
IG 79/417  
CG 109/418  
P value  
Mortality at 1 month  
IG 16/417  
CG 91/418  
P value Not significant  
Mortality at 9 months  
IG 66/417  
CG 67/418  
P value Not significant | **Notes** |

**Method of allocation** Not stated

**Inclusion Criteria**  
(1) Patients who were Screened for risk factors that would likely increase risk of length of stay, (2) readmission, or discharge to a nursing home

**Baseline characteristics**  
Mean age 67 years.  
There were no significant difference between the intervention group and the control group on age, marital status, diagnosis, risk measurement scores, and income. However, there were more males in the intervention and control groups than females; the difference was not statistically significant.  

| Method of allocation | Not stated | **Inclusion Criteria** | (1) Patients who were Screened for risk factors that would likely increase risk of length of stay, (2) readmission, or discharge to a nursing home | **Baseline characteristics** | Mean age 67 years. | There were no significant difference between the intervention group and the control group on age, marital status, diagnosis, risk measurement scores, and income. However, there were more males in the intervention and control groups than females; the difference was not statistically significant. | **Notes** |
### APPENDIX 11: iPTC Form

**interactive PATIENT TRANSITION CHECKLIST (iPTC)**

This form should be completed to ensure that patients are safely transferred across care settings

#### TRANSFER DETAILS
1. Patient transferring from (name of ward) to (name of ward)
2. Date of transfer Time of Transfer

#### TO BE COMPLETED IF THE PATIENT IS TRANSFERRED WITHIN THE HOSPITAL

<table>
<thead>
<tr>
<th>DOCUMENTS</th>
<th>To be completed by Transferring Ward</th>
<th>To be completed by Receiving Ward</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Has the following been sent with the patient?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>a) Admission Form</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
<tr>
<td>b) Clinical Records</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
<tr>
<td>c) Up to date Nursing Notes</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
<tr>
<td>d) Current Medication Chart</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
<tr>
<td>e) Fluid chart orders</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
<tr>
<td>f) Patient’s own medications</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
<tr>
<td>g) X-rays</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
</tbody>
</table>

If no, where are documents located

| 4. Does the patient have an intravenous cannula inserted? If yes when was it inserted? | YES NO N/A |
| and State insertion site? | □ □ □ |

| 5. Has Intravenous Cannula Record completed? | YES NO N/A |
| | □ □ □ |

#### ASSESSMENTS

<table>
<thead>
<tr>
<th>6. Has the following been completed?</th>
<th>To be completed by Transferring Ward</th>
<th>To be completed by Receiving Ward</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Falls Risk Assessment</td>
<td>DONE</td>
<td>TO BE</td>
</tr>
<tr>
<td>b) Waterlow Scale Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Mattress ordered if necessary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Discharge Risk Screening form</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. Have referrals to the following being made?</th>
<th>To be completed by Transferring Ward</th>
<th>To be completed by Receiving Ward</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Social Worker</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
<tr>
<td>b) Physiotherapy</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
<tr>
<td>c) Speech Pathologist</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
<tr>
<td>d) Occupational Therapist</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
<tr>
<td>e) Dietician</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. Is the patient scheduled for investigation/scans?</th>
<th>DONE</th>
<th>TO BE</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ □ □</td>
<td>□ □ □</td>
<td>□ □ □</td>
</tr>
</tbody>
</table>
### TO BE COMPLETED IF THE PATIENT IS TRANSFERRED WITHIN THE HOSPITAL OR NURSING HOME

**PATIENT PREPARATION**

<table>
<thead>
<tr>
<th>9. Has the following been attended?</th>
<th>To be completed by Transferring Ward</th>
<th>To be completed by Receiving Ward or Nursing Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Diet updated on Power Chart?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>b) Meal given prior to transfer (if appropriate)?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>c) Organising patient escort (if required)?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>d) Telephone Nursing handover?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>e) Patient informed of transfer and reasons for transfer?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>f) Next of Kin informed of transfer?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>g) Patient’s belongings bagged and labelled?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>h) Equipments organised e.g. oxygen cylinder</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>i) Patient orientated to receiving ward?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
</tbody>
</table>

10. Have the following personal belongings been sent with patient?

| a) Dentures | YES NO N/A |
| b) Eye Glasses | YES NO N/A |
| c) Hearing Aids | YES NO N/A |
| d) Walking Frame | YES NO N/A |

### TO BE COMPLETED IF THE PATIENT IS TRANSFERRED TO NURSING HOME

**DISCHARGE PROCESS**

<table>
<thead>
<tr>
<th>11. Has the following been completed?</th>
<th>To be completed by Transferring Ward</th>
<th>To be completed by Receiving Nursing Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Early Discharge Planning?</td>
<td>DONE TO BE N/A</td>
<td>DONE TO BE N/A</td>
</tr>
<tr>
<td>b) Patient Discharge Checklist?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>c) Intravenous cannula removed?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
</tbody>
</table>

12. Has the following been sent with patient?

| a) Patient Transfer Form to Residential Care Facility | YES NO N/A |
| b) Medical/Surgical/ Allied Health Discharge Summary | YES NO N/A |
| c) Is the Facility informed about patient discharge? | YES NO N/A |
| d) Has medications sent with patient (If needed) Comments | YES NO N/A |

---

**Signature and designation**

Transferring Ward

Receiving Ward
Dear NUMs

Re: Initiation of Patient Transition Checklist Study
The Centre for Applied Nursing Research (CANR) is seeking your participation on a new project entitled Initiation of Patient Transition Checklist Study.

The aim of this study is to reduce errors and adverse events through improved communication between nurses during transfer of patients. We will be trialling a special checklist form called the interactive Patient Transition Checklist (iPTC) which we hypothesis will improve patient care during transfer. Your ward has been nominated by the Director of Nursing to participate in the study and I am seeking your approval. This trial is only for 2 weeks.

All nurses rostered morning, afternoon and night shifts employed as permanent, part-time, casuals, casual pool and agency staff are required to complete the iPTC when transferring and receiving patients. At the completion of the study, the nurses will be given a survey to complete about the satisfaction with the iPTC form. Completion of the survey is optional. The nurse researchers will visit the ward each day for the period of two weeks to collect data from the medical records. Consent from patient will be obtained prior to accessing the medical records.

Commencement date for the study
- 10-14 March 2008 -an in-service about the study for 1/2 hour at 1430 hours, Information Booklet will be available in the ward for all nurses
- Each ward will be provided with two in-service
- 17-31 March 2008-commence using the iPTC form for all patients transferred to and received by the ward.

Ethics Approval No: 2007/151
Please contact Martha or Rhonda for further questions.
Your ward participation in the study will be highly appreciated.

Best Regards

Ms. Martha Mansah
Registered Nurse
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Fax + 61 2 9612 0676
Mob 0423 671 198
Email: Martha.Mansah@sswahs.nsw.gov.au

Professor Rhonda Griffiths AM
Professor of Nursing
Ph + 61 2 96120675
Fax + 61 2 96120676
Website:www.sswahs.nsw.gov.au/SSWAHS/CANR/
Dear Educators

Re: Initiation of Patient Transition Checklist Study

The Centre for Applied Nursing Research (CANR) will be trialling a special form called the interactive Patient Transition Checklist (iPTC). Your ward has been nominated by the Director of Nursing to participate in the study. **This trial is only for 2 weeks.**

The aim of this study is to reduce errors and adverse events through improved communication between nurses during transfer of patients.

All nurses rostered morning, afternoon and night shifts employed as permanent, part-time, casuals, casual pool and agency staff are required to complete the iPTC when transferring and receiving patients. At the completion of the study, the nurses will be given a survey to complete about the satisfaction with the iPTC form. Completion of the survey is optional.

The nurse researchers will visit the ward each day for the period of two weeks to collect data from the medical records. Consent from patient will be obtained prior to accessing the medical records.

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Please contact Martha or Rhonda for further questions.

Best Regards

Ms. Martha Mansah
Registered Nurse
Ph + 61 2 9612 0679
Fax + 61 2 9612 0676
Mob 0423 671 198
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Liverpool Hospital Vision

To develop a teaching and referral health service of high quality, which is sensitive to the needs of the people of South Western Sydney.

Liverpool Hospital Mission

The mission of the Liverpool Health Service is to improve the health of the people of Liverpool and of other people referred for specialist services.

**DURATION OF RESEARCH: 17 MARCH – 31 MARCH**

**2008**
NURSE RESEARCHERS
Ms. Martha Mansah
Professor Rhonda Griffiths
Professor Esther Chang
Ms. Ritin Fernandez

CONTACTS
Ms. MARTHA MANSAH
Business Hours 612 9828-6549
Fax 98286519

Ms. TIEN LUU
Business Hours 612 9828-6549
Fax 98286519

PROFESSOR RHONDA GRIFFITHS
Business Hours 612 9612-0675
Fax 98286519

SSWAHS ETHICS APPROVAL PROJECT NO: 2007/151
BACKGROUND

Patient safety is highly important to improve the current health care system. Transferring patients between ward settings may be essential for patients to receive optimal care delivery.

WHY ARE WE DOING THIS STUDY?

A literature review indicated that the causes of errors and adverse events that occur during transfer of patients between care settings are frequently related to break-down of communication between clinicians and inadequate follow-up of patients.

Data from the IIMS database demonstrates that adverse events that occur during transfer of patients between care settings are attributed to:

- Unplanned transfers
- Break-down of communication
- Patient belongings, x-rays and own medications not accompanying transfer
PROJECT DESCRIPTION

The aim of this study is to test if interactive Patient Transition Checklist (iPTC) reduces errors and adverse events during care transfer.

Objectives

To determine whether the iPTC:

- Improves communication between nurses
- Ensures patient documentations and belongings accompany transfers
- Ensures appropriate referrals are undertaken
- Facilitate appropriate follow-up of patients
- Reduces the incidence of errors and adverse events associated with transition of patients between care settings

The study will only be done for 2 weeks
WHAT THE NURSE SHOULD DO?

1. The iPTC form (yellow form) to be completed by all nurses (RNs, ENs, AINs) working morning, afternoon and night shifts Monday to Sunday who are employed as permanent full time, part-time, casual, casual pool and agency staff.

Transferring Wards:

2. Complete the iPTC form (yellow form) and send the form with the patients when transferring to other wards.

Receiving Wards:

3. Locate the iPTC form (yellow form) and complete it when you receive patients from the other wards.

4. For patients transferring to a nursing home, complete the iPTC form and attached the iPTC form with the patient transfer summaries that accompany the patient.

5. Participate in a short survey (5 minutes) at the end of the two weeks period.

Please do not complete the iPTC form for patients transferring to the Aged Care Unit and Psychiatric Unit at Liverpool Hospital.
WHAT THE RESEARCHER WILL DO?

1. The researcher will visit the participating wards each morning and access the ward records (log book) to identify patients who have been transferred to another ward or discharged to a nursing home.

Wards:

2. Informed Consent will be obtained from the patients to access their medical records.

Audit:

3. The medical notes of patients transferred within the hospital after 48 hours of transfer will be audited to determine whether the iPTC is present and completed.

Nursing home:

4. The nursing home will be visited once each week, to audit their medical notes.

Please do not complete the iPTC form for patients transferring to the Aged Care Unit and Psychiatric Unit at Liverpool Hospital

Remember this Study is only for 2 weeks
FREQUENTLY ASKED QUESTIONS

1. Will I be identified by participating in the study?
   No, information collected by the research team will be de-identified.

2. Would I receive incentive/payment for participating in the study?
   There will be no incentive/payment for participation in this study, participation in this study is regarded as part of professional development.

3. How will information, in all forms, be disposed?
   The iPTC forms and survey forms will be shredded and destroyed after fifteen years as per the NHMRC guidelines.

4. Am I able to access the findings of the study?
   Yes, findings will be published in journals, presented at conferences and in-services in the wards.

5. If I decide not to participate, what are the consequences?
   You have to complete the iPTC form as part of the process of caring for your patients. After two weeks of study completion, the nurses’ survey is optional. Your decision whether or not to complete the nurses’ survey will not prejudice present or future relationship with Sydney South West Area Health Service or any other institution cooperating in this study.
APPENDIX 15: iPTC INFORMATION POSTERS

iPTC STUDY IN PROGRESS

iPTC
EDUCATION
BOOKLET
LOCATED
HERE

For further information contact Martha 9612 0679 or 0423 671 198

NOTE: TRANSFERS TO AGED CARE UNIT & PSYCHIATRIC UNIT IS EXCLUDED
iPTC STUDY IN PROGRESS

COMPLETE iPTC
(YELLOW FORM)
WHEN PATIENT IS TRANSFERRED AND WHEN RECEIVED

For further information contact Martha 9612 0679 or 0423 671 198

NOTE: TRANSFERS TO AGED CARE UNIT & PSYCHIATRIC UNIT ARE EXCLUDED
iPTC STUDY IN PROGRESS

interactive
PATIENT
TRANSITION
CHECKLIST (iPTC)
FORMS ARE
LOCATED HERE

For further information contact Martha 9612 0679 or 0423 671 198

NOTE: TRANSFERS TO AGED CARE UNIT & PSYCHIATRIC UNIT ARE EXCLUDED
APPENDIX 16: iPTC AUDIT DATA COLLECTION FORM

1. Patient Medical Record Number (MRN) _______________________
2. Date of Birth ________________________
3. Age Band ________________________
4. Gender
   Female ☐
   Male ☐
5. Primary Diagnosis (please state) ________________________
6. Secondary Diagnosis (please state) ________________________
7. History of previous illness (please state)_________________________
8. Has the following **documentation** been sent with patient and can be located?

<table>
<thead>
<tr>
<th>WARDS</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission Form</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Clinical Records</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Up to date Nursing Notes</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Current Medication Chart</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Fluid chart orders</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Patient’s own medications</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>X-rays</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Does the patient have an intravenous cannula inserted?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>If yes, does it indicate when was it inserted?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Does it state insertion site?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Has Intravenous Cannula Record completed?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
9. Description of **assessments** completed?

<table>
<thead>
<tr>
<th>FALLS RISK ASSESSMENT</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterlow Scale Assessment</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Mattress ordered</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Discharge Risk Screening Form</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

10. Description of **referrals** been made and documented?

<table>
<thead>
<tr>
<th>SOCIAL WORKER</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiotherapy</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Speech Pathologist</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Dietician</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other (please state)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Is the patient scheduled for investigations/scans</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
WARDS OR NURSING HOME

11. Has it been **ticked** by receiving ward that:

<table>
<thead>
<tr>
<th>Diet updated on Power Chart</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Meal given prior to transfer (if appropriate)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient escorted (if appropriate)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone Nursing Handover?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient informed of transfer?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient informed of reasons of transfer?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Next of Kin informed of transfer?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient’s belongings begged and labelled?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipments organised e.g. oxygen cylinder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient orientated to receiving ward?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. Has it been **ticked** by receiving ward that:

<table>
<thead>
<tr>
<th>Dentures</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Glasses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hearing aids</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking frame</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NURSING HOME

13. Has the following been **ticked** and **completed**?

<table>
<thead>
<tr>
<th>Early Discharge Planning</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Discharge Checklist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intravenous cannula removed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. Has the following been **sent** with the patient discharged to a nursing home?

<table>
<thead>
<tr>
<th>Patient Transfer Form</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical/Surgical/Allied Health Discharge Summary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the facility informed about patient discharge?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has medications sent with patient (if needed)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15. What where the comments made?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Dear Nurses

The Pilot PTC study has now been completed, we would like to know if the PTC form was useful and effective for transferring and receiving patients as was well as for the ongoing care of the patients. All information provided will be de-identified. Please tick the box which corresponded with your experience of using the PTC form. Your cooperation in completing this form is appreciated.

Ward/Facility____________________ Designation RN □ EN □ AIN □
Duration of working in current ward_______ Number of years nursing experience_____

1. Have you been involved in: YES NO
   a) completing the iPTC form for transferring and receiving patients □ □
   b) caring for a patient who had the PTC form □ □

2. Did the iPTC assist you to:
   a) prepare documentation to accompany patient transfer? □ □ □ □
   b) prepare patients for transfer to a ward/facility? □ □ □ □
   c) admit patients to receiving ward? □ □ □ □
   d) complete the intravenous record form? □ □ □ □

3. Did the iPTC prompt you to:
   a) complete assessments of patients? □ □ □ □
   b) communicate with other nurses? □ □ □ □
   c) liaise with other allied health professionals? □ □ □ □
   d) ensure patient belongings were sent to ward? □ □ □ □
4. **How would you rate your satisfaction with the iPTC form?**

- [ ] Excellent
- [ ] Very Good
- [ ] Good
- [ ] Fair
- [ ] Poor

5. **Were the instructions provided on the iPTC form clearly explained?**

- [ ] Excellent
- [ ] Very Good
- [ ] Good
- [ ] Fair
- [ ] Poor

6. **Were the instruction provided on the iPTC form easy to follow?**

- [ ] Excellent
- [ ] Very Good
- [ ] Good
- [ ] Fair
- [ ] Poor

7. **Would you use the iPTC form again?**

- [ ] Yes
- [ ] No
- [ ] Maybe

8. **Would you recommend the iPTC form to other wards?**

- [ ] Yes
- [ ] No
- [ ] Maybe

9. **Are there any comments/suggestions you would like to make on the iPTC form?**

_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

**THANK YOU VERY MUCH FOR PARTICIPATING IN THIS SURVEY**

Please return the questionnaire to the survey box located at the Nurses’ Station

If you have any questions, please contact
Ms Martha Mansah, Centre for Applied Nursing Research
South Western Sydney Area Health Service, Locked Bag 7103
LIVERPOOL BC 1870
Phone: (02) 9612 0679
Email: martha.mansah@sswahs.nsw.gov.au
APPENDIX 18: iPTC GUIDE TO THE STUDY

iPTC Guide for the Wards

Welcome to the iPTC Study, this is a Pilot Study occurring in Liverpool Hospital for two weeks. The following is a guide to use to collect data. Please see me if you require clarification or have question.

1. Each morning visit the participating wards, check the transfer/discharge log book to determine any transfer to the wards or nursing home.

2. Make a list of all patients transferred in to the ward and transfer out of the ward (the log book is usually located at the front desk of the nurses station or in the NUMS office).

3. Locate patient file and locate iPTC form. If iPTC form is completed, ask the Nurse if you can see the patient, go to the patient and obtain Informed Consent, explain the study, give information letter and get them to sign the Informed Consent.

4. If consent is obtained, then you can audit the patient medical record.

5. Use the data collection form to abstract information regarding the completion of the iPTC form and check to make sure it corresponds with the audit.

6. When finished, remove the iPTC form from the file as it belongs to CANR, allocate a code number.
iPTC guide for the Nursing Homes

Please follow these guidelines for patients discharge to a nursing home

1. Each morning visit the participating wards, check the transfer/discharge log book to determine any transfer to the nursing home

2. Make a list of all patients transferred in to the ward and transfer out of the ward (the log book is usually located at the front desk of the nurses station or in the NUMS office)

3. Contact the nursing home DON to gain access to visit the nursing home, on the phone, explain the study and fax a copy of the Ethics Approval

4. Visit the nursing home once each week to obtain Consent from the resident to access the medical records

5. Explain to the nurses you are going to check the patient medical notes

6. Use the data collection form to abstract information regarding the completion of the iPTC form

7. When finished, remove the iPTC form from the file as it belongs to CANR, allocate a code number.
<table>
<thead>
<tr>
<th>PATIENT FULL NAME</th>
<th>TRANSFER IN</th>
<th>iPTC COMPLETED</th>
<th>TRANSFER OUT</th>
<th>iPTC COMPLETED</th>
<th>DISCHARGE TO NH</th>
<th>CONSENTED</th>
</tr>
</thead>
</table>

DATE & DAY

iPTC Guide-TRANSFERRING AND RECEIVING PATIENTS
Dear Mrs Mansah,

Project No 2007/151 - Initiation of a Patient Transition checklist in a Metropolitan Hospital.

The SSWAHS Human Research Ethics Committee wishes to acknowledge receipt of your correspondence with regards to the above project.

As all of the issues raised by the Committee have now been satisfactorily addressed, formal approval is hereby granted for this study to proceed as a Category A Project. The committee has approved the following amended documentation:

- Participant Information Statement – Version 1 17-1-08
- Consent Form for patients – Version Date 1 17-1-08
- Participant Information Statement for residents – Version 1 17-1-08
- Consent Form for residents – Version 1 Date 17-1-08
- Participant information statement for Person Responsible – Version 1 17 Jun 08
- Consent Form for Person Responsible – (no identifying footer)
- Patient Transition Checklist (PTC)

Ethics clearance is granted for periods of up to twelve months. This project will be due for renewal on 30th November, 2008 and you must provide a Progress Report (attached) or final report by this date. If no report is supplied, ethics clearance for this project may be cancelled.

Your attention is drawn to the attached document Guidelines for Investigators which sets out not only the principles under which research should be conducted, but also the conditions under which Ethics approval is granted by the Committee. Also enclosed for your information, is a copy of the document Guidelines for Responsible Practice in Research and Dealing with Problems of Research Misconduct.

Please note that the Committee must be notified IMMEDIATELY of any untoward or unexpected complications or side effects arising during the project or of any ethical or medico-legal problems that may arise. Also, any changes to the original protocol must be submitted to the Committee for approval.

Would you please quote the above project number in all future correspondence relating to this project.

Yours sincerely,

PROFESSOR MICHAEL FROMMER
Chairperson
SSWAHS Human Research Ethics Committee

For: Mr Mike Wallace
Chief Executive, SSWAHS

Category A: Projects with limited risk potential, including quality assurance surveys.
Category B: Projects with significant patient risks.
Category C: Drug trials (international/national) sponsored by drug companies and already covered for risk evaluation and monitoring of adverse reactions.
Office of Research Services
Martha Mansah
8 Plum Close
Casula
NSW 2170

9th April 2008

Dear Martha

I’m writing to advise you that the Human Research Ethics Committee Executive has reviewed the following application at its meeting on 3 March 2008 and has agreed to approve the project.

TITLE: Initiation of a patient transition checklist in a Metropolitan Hospital

The Protocol Number for this project is HREC 08/025. Please ensure that this number is quoted in all relevant correspondence and on all information sheets, consent forms and other project documentation.

Please note the following:

1) The approval will expire on 30 November 2008. If you require an extension of approval beyond this period, please ensure that you notify the Human Ethics Officer (humanethics@uws.edu.au) prior to this date.

2) Please ensure that you notify the Human Ethics Officer of any future change to the research methodology, recruitment procedure, set of participants or research team.

3) If anything unexpected should occur while carrying out the research, please submit an Adverse Event Form to the Human Ethics Officer. This can be found at http://uws.edu.au/about/adminorg/devint/ors/ethics/humanethics/endproject

4) Once the project has been completed, a report on its ethical aspects must be submitted to the Human Ethics Officer. This can also be found at http://uws.edu.au/about/adminorg/devint/ors/ethics/humanethics/endproject

Finally, please contact the Human Ethics Officer, Susannah Wilcox on (02) 4736 0883 or at s.wilcox@uws.edu.au if you require any further information.

The Committee wishes you well with your research.

Yours sincerely

Susannah Wilcox
Human Ethics Officer
Dear patient

You are invited to participate in a study, which is testing a new method to improve the care for patients when they are transferred within the hospital or to a nursing home. The new method involves the nurses completing a specialised form for patients during transferring and receiving patients. As part of the research, we are required to audit your medical records to determine whether the form has been completed. We therefore require you to give us permission to access your medical records. You were selected as a possible participant in this study because you receive care within the Liverpool hospital.

It is anticipated that you will not incur any additional costs if you participate in this study. You will not receive any payment for participating in this study. There are no risks in this study; information provided in this study will remain confidential. The forms will be coded and all data will be de-identified. You are free to refuse or withdraw from the study at any time, without giving a reason or without any negative consequences to your treatment. Findings from this study will be presented at conference papers and published in peer reviewed journals.

If you have any questions, please feel free to ask us. If you have additional questions later your study researcher Martha Mansah will be pleased to answer them (phone: 9612 0679, email martha.mansah@sswhs.nsw.gov.au). Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service, locked bag 7017, Liverpool BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, email jennie.grech@sswhs.nsw.gov.au).

This form is for you to keep.

Yours sincerely

Martha Mansah (principal researcher)
Dear resident

You are invited to participate in a study, which is testing a new method to improve the care for patients when they are transferred within the hospital or to a nursing home. The new method involves the nurses completing a specialised form for patients during transferring and receiving patients. As part of the research, we are required to audit your medical records to determine whether the form has been completed. We therefore require you to give us permission to access your medical records. You were selected as a possible participant in this study because you receive care within the Liverpool hospital.

It is anticipated that you will not incur any additional costs if you participate in this study. You will not receive any payment for participating in this study. There are no risks in this study, information provided in this study will remain confidential. The forms will be coded and all data will be de-identified. You are free to refuse or withdraw from the study at any time, without giving a reason or without any negative consequences to your treatment. Findings from this study will be presented at conference papers and published in peer reviewed journals.

If you have any questions, please feel free to ask us. If you have additional questions later your study researcher Martha Mansah will be pleased to answer them (phone: 9612 0679, email martha.mansah@sswahs.nsw.gov.au). Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service, locked bag 7017, Liverpool BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, email jennie.grech@sswahs.nsw.gov.au).

This form is for you to keep.

Yours sincerely

Martha Mansah (principal researcher)
Dear Principal Carer

We are testing a new method to improve the care for patients when they are transferred within the hospital or to a nursing home. This new method involves the nurses completing a specialised form when transferring and receiving patients. As part of the research, we are required to audit your family member medical records to determine whether the form has been completed. We therefore require you to give us permission to access your family member’s medical records.

It is anticipated that you and your family member will not incur any additional costs for participating in this study. In addition, no payments will be made for participating in this study. Information provided in this study will remain confidential. The forms will be coded and all data will be de-identified. You are free to refuse or withdraw from the study at any time, without giving a reason or without any negative consequences to your family member’s treatment or your relationship with the hospital. Findings from this study will be presented at conference papers and published in peer reviewed journals.

If you have any questions, please feel free to ask us. If you have additional questions later your study researcher Martha Mansah will be pleased to answer them (02 9612 0679, email martha.mansah@sswahs.nsw.gov.au).

Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service, Locked Bag 7017, LIVERPOOL BC, NSW, (phone 9612 0614, fax 9612 0611, email jennie.grech@swsahs.nsw.gov.au).

This form is for you to keep.

Yours sincerely

Martha Mansah (principal researcher)
INITIATION OF A PATIENT TRANSITION CHECKLIST (iPTC) IN A METROPOLITAN HOSPITAL

1. I, .................................................................................. of .........................................
........................................................................, aged ......................................years,
agree to participate as a subject in the study described in the participant information
statement set out above (or: attached to this form).

2. I acknowledge that I have read the Participant Information Statement, which explains why I
have been selected, the aims of the study and the nature and the possible risks of the
investigation, and the statement has been explained to me to my satisfaction.

3. I have been given the opportunity to ask any questions relating to any possible physical and
mental harm I might suffer as a result of my participation. I have received satisfactory
answers to any questions that I have asked.

4. My decision whether or not to participate will not prejudice my present or future treatment
or my relationship with South Western Sydney Area Health Service or any other institution
cooperating in this study. If I decide to participate, I am free to withdraw my consent and to
discontinue my participation at any time without prejudice.

5. I agree that research data gathered from the results of the study may be published, provided
that I cannot be identified.

6. I understand that if I have any questions relating to my participation in this research, I may
contact the study researcher Ms Martha Mansah on telephone (02) 9612 0679, who will be
happy to answer them.

7. I acknowledge receipt of a copy of the Participant Information Statement.

Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service,
Locked Bag 7017, LIVERPOOL BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, email
jennie.grech@sswahs.nsw.gov.au).

Signature of Participant ________________ Signature of witness ________________
Please PRINT name ________________ Please PRINT Name ________________
Date ___________________________ Date ___________________________

Signature of investigator ___________________________
Please PRINT Name ________________ Martha Mansah ________________
Date: ___________________________
INITIATION OF A PATIENT TRANSITION CHECKLIST (PTC) IN A METROPOLITAN HOSPITAL

1. I, .................................................................................. of .........................................
   ........................................................................, aged ......................................years,
   agree to participate as a subject in the study described in the subject information statement
   set out above (or: attached to this form).

2. I acknowledge that I have read the Subject Information Statement, which explains why I
   have been selected, the aims of the study and the nature and the possible risks of the
   investigation, and the statement has been explained to me to my satisfaction.

3. I have been given the opportunity to ask any questions relating to any possible physical and
   mental harm I might suffer as a result of my participation. I have received satisfactory
   answers to any questions that I have asked.

4. My decision whether or not to participate will not prejudice my present or future treatment
   or my relationship with South Western Sydney Area Health Service or any other institution
   cooperating in this study. If I decide to participate, I am free to withdraw my consent and to
   discontinue my participation at any time without prejudice.

5. I agree that research data gathered from the results of the study may be published, provided
   that I cannot be identified.

6. I understand that if I have any questions relating to my participation in this research, I may
   contact the study researcher Ms Martha Mansah on telephone (02) 9612 0679, who will be
   happy to answer them.

7. I acknowledge receipt of a copy of the Subject Information Statement.

Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service,
Locked Bag 7017, LIVERPOOL BC, NSW, 1871 (phone 9612 0614, fax 9612 0611,
Email:jennie.grech@swsahs.nsw.gov.au).

Signature of subject ________________________ Signature of witness ________________________
Please PRINT name ________________________ Please PRINT name ________________________
Date ________________________ Date ________________________
Signature(s) of investigator(s) ________________________
Please PRINT Name ________________________
Date: ________________________
INITIATION OF A PATIENT TRANSITION CHECKLIST (IPTC) IN A METROPOLITAN HOSPITAL

1. I, ............................................. (Principal carer) of ............................................. on behalf of ............................................. aged ...................................... years, agree for my family member to participate as a subject in the study described in the principal carer information statement set out above (or: attached to this form).

2. I acknowledge that I have read the Principal Carer Information Statement, which explains why my family member have been selected, the aims of the study and the nature and the possible risks of the investigation, and the statement has been explained to me to my satisfaction.

3. I have been given the opportunity to ask any questions relating to any possible physical and mental harm my family member might suffer as a result of participation in the study. I have received satisfactory answers to any questions that I have asked.

4. My decision whether or not my family member participation will not prejudice my family member present or future treatment or my relationship with South Western Sydney Area Health Service or any other institution cooperating in this study. If I decide for my family member to participate, I am free to withdraw my consent and to discontinue my family member participation at any time without prejudice.

5. I agree that research data gathered from the results of the study may be published, provided that my family member cannot be identified.

6. I understand that if I have any questions relating to my family member participation in this research, I may contact the study researcher Ms Martha Mansah on telephone (02) 9612 0679, who will be happy to answer them.

7. I acknowledge receipt of a copy of the Principal Carer Information Statement.

Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service, Locked Bag 7017, LIVERPOOL BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, Email jennie.grech@swsahs.nsw.gov.au).

Signature of subject ___________________________ Signature of witness ___________________________
Please PRINT name ___________________________ Please PRINT name ___________________________
Date ________________ Date ________________

Signature(s) of investigator(s)______________________________
Please PRINT Name Martha Mansah ___________________________
Date: ___________________________
Dear Colleague

You are invited to participate in a pilot study, which is evaluating a new method to reduce errors and adverse events when patients are transferred between care settings. This study will be conducted in Liverpool hospital in the period of two weeks.

As part of the study, you will be required to complete an interactive Patient Transition Checklist (iPTC) form when transferring patients to the wards and nursing homes. The iPTC form should also be completed when patients are transferred to your ward. At the completion of the study, you are required to complete an iPTC survey seeking information about the usefulness and satisfaction of the iPTC form. That information will assist in developing and improving the iPTC form. It is anticipated that this survey will take five minutes to complete. Findings from this study will assist in the development of strategies for the reduction of errors and adverse events during care transition and assist in future implementation of a larger study.

It is anticipated that you will not incur any costs if you participate in this study. You will not receive any payment for participation in this study. Information provided in this study will remain confidential. Survey forms will be coded and all data will be de-identified. You are free to refuse or withdraw from the study at any time, without giving a reason or without any negative consequences to your employment. Findings from this study will be presented at conferences and published peer reviewed journals.

If you have any questions, please feel free to ask us. If you have additional questions later your study researcher Martha Mansah will be pleased to answer them (phone: 9612 0679, email martha.mansah@sswhs.nsw.gov.au).

complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service, locked bag 7017, Liverpool BC, NSW, 1871 (phone 9612 0611, fax 9612 0614, email jennie.grech@sswhs.nsw.gov.au).

This form is for you to keep.

Your participation is highly valued.

Yours sincerely

Martha Mansah
Principal Researcher

APPENDIX 27: PARTICIPANT INFORMATION STATEMENT FOR NURSES
REFERENCES


Barber, N. (2004). Designing information technology to support prescribing decision making. Quality & Safety in Health Care, 13(6), 450-454.


in Canada: results from a randomized controlled trial. Journals of Gerontology Series A Biological Sciences & Medical Sciences, 61(4), 367-373.


tool for prediction of falls in hospital patients: how well does it work? Age & Ageing, 37(6), 621-627.


Sydney South West Area Health Service. (2005a). Admission of Patients (No. P1.01). NSW: Sydney South West Area Health Service.


Westbrook, M. T., Travaglia, J. F., & Braithwaite, J. (2006). Evaluation of the incident information management system in New South Wales: study no 5- assessment of the satisfaction of IIMS users with the system. Faculty of Medicine, University of New South Wales: Centre for Clinical Governance Research in Health.


APPENDIX 1: IIMS AUDIT DATA COLLECTION FORM

1. Patient Medical Record Number (MRN) _______________________
2. Date of Birth ________________________
3. Age Band __________________________
4. Gender Male □  Female □

5. Primary Diagnosis (please state) __________________________
6. Secondary Diagnosis (please state) __________________________
7. Date of Incident ________________________
8. Time of Incident ________________________
9. Time range of the Incident ________________________
10. Location of Incident (please state) ________________________
11. Place of Incident (please state) ________________________

12. Incident Related type
   Medication □ (Go to question 14)
   Falls □ (Go to question 15)
   Clinical Management □ (Go to question 16)
   Other (please state) □ (Go to question 17)
   (More than one box can be tick)

13. Principal Incident Type __________________________

14. Description of the Medication Incident
   Wrong route administration □
   Wrong drug administered □
   Wrong time administered □
   Wrong drug prescribed □
   Wrong dosage prescribed □
   Wrong patient identification □
   Medication not prescribed □
   Incomplete medication □
<table>
<thead>
<tr>
<th>Documentation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to administer medication</td>
<td></td>
</tr>
<tr>
<td>Patient self medicated</td>
<td></td>
</tr>
<tr>
<td>Extravasation</td>
<td></td>
</tr>
<tr>
<td>Other (please state)</td>
<td></td>
</tr>
</tbody>
</table>

15. Description of the Falls Incident

<table>
<thead>
<tr>
<th>Event</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Climbed over bedrails</td>
<td></td>
</tr>
<tr>
<td>Found on the floor</td>
<td></td>
</tr>
<tr>
<td>Fall with assistance</td>
<td></td>
</tr>
<tr>
<td>Loss of consciousness</td>
<td></td>
</tr>
<tr>
<td>Other (please state)</td>
<td></td>
</tr>
</tbody>
</table>

16. Description of the Clinical Management Incident

<table>
<thead>
<tr>
<th>Event</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inappropriate treatment</td>
<td></td>
</tr>
<tr>
<td>Inappropriate procedure</td>
<td></td>
</tr>
<tr>
<td>Inadequate follow up</td>
<td></td>
</tr>
<tr>
<td>Staff incompetence</td>
<td></td>
</tr>
<tr>
<td>Procedure complication</td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td></td>
</tr>
<tr>
<td>Other (please state)</td>
<td></td>
</tr>
</tbody>
</table>

17. Description of Other Incident (please state)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
18. Contributing factors

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsteady on feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visually impaired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hearing impaired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dementia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delirium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes (Type I)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes (Type II)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non English Background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please state)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

19. Outcome for Subjects

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injury</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please state)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20. How could the Incident have been prevented? (please state)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

21. Severity Assessment Code (SAC) level

<table>
<thead>
<tr>
<th>SAC Level</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAC 1 (see question 23)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAC 2 (see question 22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAC 3 (see question 22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAC 4 (see question 22)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
22. Recommendation for SAC 2 or 3 or 4.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

23. If SAC 1, was Root Cause Analysis (RCA) undertaken?
Yes ☐ No ☐

24. If so what was the Recommendation from the RCA? (please state)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Ms Martha Mansah
CANRE
Liverpool Hospital
Locked Bag 7103
LIVERPOOL BC 1871

Dear Ms Mansah,

Project No: 2006/112 - Safe Transfer of Elderly Patients (STEP) Across care Setting

The SSWAHS Human Research Ethics Committee wishes to acknowledge receipt of your correspondence with regards to the above project.

Formal approval is hereby granted for this study to be conducted with waiver of informed consent from patients and to proceed as a Category A Project. The Committee would like to reiterate that all information reviewed by the research team is to be de-identified for both staff and patients.

Ethics clearance is granted for periods of up to twelve months. This project will be due for renewal on 31st October, 2007 and you must provide a Progress Report (attached) or final report by this date. If no report is supplied, ethics clearance for this project may be cancelled.

Your attention is drawn to the attached document Guidelines for Investigators which sets out not only the principles under which research should be conducted, but also the conditions under which Ethics approval is granted by the Committee. Also enclosed for your information, is a copy of the document Guidelines for Responsible Practice in Research and Dealing with Problems of Research Misconduct.

Please note that the Committee must be notified IMMEDIATELY of any untoward or unexpected complications or side affects arising during the project or of any ethical or medico-legal problems that may arise. Also, any changes to the original protocol must be submitted to the Committee for approval.

Would you please quote the above project number in all future correspondence relating to this project.

Yours sincerely,

PROFESSOR MICHAEL FROMMER
Chairperson
SSWAHS Human Research Ethics Committee

For: Mr Mike Wallace
Chief Executive, SSWAHS

Category A: Projects with limited risk potential, including quality assurance surveys.
Category B: Projects with significant patient risks.
Category C: Drug trials (international/national) sponsored by drug companies and already covered for risk evaluation and monitoring of adverse reactions.
APPENDIX 3: UWS HUMAN RESEARCH ETHICS COMMITTEE (AUDIT STUDY)

Locked Bag 1797
Penrith South DC NSW 1797 Australia

15 March 2007

Ms Martha Mansah
CANRE
Liverpool Hospital
Locked Bag 7103

Dear Martha

UWS Registration number HREC 07/035 Safe Transfer of elderly Patients (STEP) across care settings

The UWS Human Research Ethic Committee has accepted the external approval granted by the Sydney South West Area Health Service Human Research Ethics Committee, Protocol No. 2006/112 for the abovementioned project. The project is noted to conclude 31 October 2007.

You are advised that the Committee should be notified of any change/s to the research methodology should there be any in the future. You will be required to provide annual reports on the ethical aspects of your project during its progress and at the completion.

The Registration Number HREC 07/035 should be quoted in all future correspondence about this project which should be forwarded to the Executive Officer, Kay Buckley.

Yours sincerely

[Signature]

Associate Professor Christine Halse
Chairperson
UWS Human Research Ethics Committee
CC Professor Rhonda Griffiths (Supervisor)
APPENDIX 4: SEARCH STRATEGIES

CINAHL SEARCH STRATEGY

1. exp patient discharge/ or discharg$.mp.
2. (postdischarg$ or post discharg$).mp.
3. (predischarg$ or pre discharg$).mp.
4. (posthospital$ or post hospital$).mp.
5. transfer, intrahospital/ or transfer$.mp.
6. subacute care/ or ((subacute adj2 care) or (sub-acute adj2 care) or (postacute adj2 care) or (post-acute adj2 care)).mp.
7. nursing homes/ or nursing home$.mp.
8. or/1-7
9. "aged, 80 and over"/ or aged/
10. 8 and 9
11. ((aged adj2 home$) or (aged adj2 facilit$) or (elder$ adj2 home$) or (elder$ adj2 facilit$)).mp.
12. 10 or 11
13. after care/ or (aftercare or after care).mp.
14. ((followup adj2 care) or (follow up adj2 care)).mp.
15. (intermediate adj3 care).mp.
16. exp continuity of patient care/ or (continu$ adj3 care).mp.
17. patient centered care/ or ((patient center$ adj3 care) or (patient centre$ adj3 care)).mp.
18. transitional programs/ or (transition$ adj3 care).mp.
19. ((coordinat$ adj2 care) or (co-ordinat$ adj2 care)).mp.
20. health care delivery, integrated/ or (integrat$ adj3 care).mp.
21. Shared Services, Health Care/ or (shar$ adj3 care).mp.
22. case management/ or exp managed care programs/ or (managed care or (case adj2 manag$)).mp.
23. or/13-22
24. 12 and 23
25. exp adverse health care event/ or adverse$.mp. or ae.fs.
26. Accidental Falls/ or fall$.mp.
27. "wounds and injuries"/ or accidents/ or (injur$ or wound$ or accident$).mp.
28. Dehydration/ or (dehyrat$ or de-hydrat$).mp.
29. exp confusion/ or agitation/ or (confus$ or disorient$ or dis-orient$ or agitat$ or restless$).mp.
30. pressure ulcer/ or (bedsore$ or bed sore$ or pressure ulcer$ or pressure sore$ or decubitus).mp.
31. cross infection/ or (cross infect$ or (hospital adj2 infect$) or nosocomial infect$).mp.
32. ((drug adj2 error$) or (medicat$ adj2 error$) or (prescri$ adj2 error$)).mp.
33. ((medical adj2 error$) or (healthcare adj2 error$) or (health care adj2 error$)).mp.
34. ((diagnos$ adj2 error$) or misdiagnos$ or mis-diagnos$ or (diagnos$ adj2 fail$)).mp.
35. (treat$ adj2 delay$).mp.
36. ((treat$ or therap$) adj2 error$).mp.
37. (fragment$ adj3 care).mp.
38. or/25-37
39. 24 and 38

MEDLINE SEARCH STRATEGY

1. Patient Discharge/ or discharg$.mp.
2. (postdischarg$ or post discharg$).mp.
3. (predischarg$ or pre discharg$).mp.
4. (posthospital$ or post hospital$).mp.
5. patient transfer/ or transfer$.mp.
6. subacute care/ or ((subacute adj2 care) or (sub-acute adj2 care) or (postacute adj2 care) or (post-acute adj2 care)).mp.
7. nursing homes/ or nursing home$.mp.
8. or/1-7
9. "aged, 80 and over"/ or aged/
10. 8 and 9
11. homes for the aged/ or ((aged adj2 home$) or (aged adj2 facilit$) or (elder$ adj2 home$) or (elder$ adj2 facilit$)).mp.
12. 10 or 11
13. aftercare/ or (aftercare or after care).mp.
14. ((followup adj2 care) or (follow up adj2 care)).mp.
15. (intermediate adj3 care).mp.
16. continuity of patient care/ or (continu$ adj3 care).mp.
17. patient-centered care/ or ((patient center$ adj3 care) or (patient centre$ adj3 care)).mp.
18. (transition$ adj3 care).mp.
19. ((coordinat$ adj2 care) or (co-ordinat$ adj2 care)).mp.
20. exp "Delivery of Health Care, Integrated"/ or (integrat$ adj3 care).mp.
21. hospital shared services/ or (shar$ adj3 care).mp. [mp=title, original title, abstract, name of substance word, subject heading word]
22. case management/ or exp managed care programs/ or (managed care or (case adj2 manag$)).mp.
23. or/13-22
24. 12 and 23
25. adverse$.mp. or ae.fs. [mp=title, original title, abstract, name of substance word, subject heading word]
26. accidental falls/ or fall$.mp.
27. "wounds and injuries"/ or accidents/ or (injur$ or wound$ or accident$).mp.
28. dehydration/ or (dehydrat$ or de-hydrat$).mp.
29. exp confusion/ or psychomotor agitation/ or (confus$ or disorient$ or dis-orient$ or agitat$ or restless$).mp.
30. pressure ulcer/ or (bedsore$ or bed sore$ or pressure ulcer$ or pressure sore$ or decubitus).mp.
31. cross infection/ or (cross infect$ or (hospital adj2 infect$) or nosocomial infect$).mp.
32. exp medical errors/ or ((medical adj2 error$) or (healthcare adj2 error$) or (health care adj2 error$)).mp.
33. ((drug adj2 error$) or (medicat$ adj2 error$) or (prescri$ adj2 error$)).mp.
34. exp diagnostic errors/ or ((diagnos$ adj2 error$) or misdiagnos$ or mis-diagnos$ or (diagnos$ adj2 fail$)).mp.
35. (treat$ adj2 delay$).mp.
36. ((treat$ or therap$) adj2 error$).mp.
37. (fragment$ adj3 care).mp.
38. or/25-37
39. 24 and 38

EMBASE SEARCH STRATEGY

1. hospital discharge/ or discharg$.mp.
2. (postdischarg$ or post discharg$).mp.
3. (predischarg$ or pre discharg$).mp.
4. (posthospital$ or post hospital$).mp.
5. transfer$.mp.
6. ((subacute adj2 care) or (sub-acute adj2 care) or (postacute adj2 care) or (post-acute adj2 care)).mp.
7. nursing home/ or nursing home$.mp.
8. or/1-7
9. aged/
10. 8 and 9
11. home for the aged/ or ((aged adj2 home$) or (aged adj2 facilit$) or (elder$ adj2 home$) or (elder$ adj2 facilit$)).mp.
12. 10 or 11
13. aftercare/ or (aftercare or after care).ti.
14. ((followup adj2 care) or (follow up adj2 care)).mp.
15. (intermediate adj3 care).mp.
17. ((patient center$ adj3 care) or (patient centre$ adj3 care)).mp.
18. (transition$ adj3 care).mp.
19. ((coordinat$ adj2 care) or (co-ordinat$ adj2 care)).mp.
22. exp managed care/ or (managed care or (case adj2 manag$)).mp.
23. or/13-22
24. 12 and 23
25. adverse$.mp. or ae.fs.
26. falling/ or fall$.mp.
27. injury/ or wound/ or accident/ or (injur$ or wound$ or accident$).mp.
28. dehydration/ or (dehydrat$ or de-hydrat$).mp.
29. confusion/ or disorientation/ or agitation/ or restlessness/ or (confus$ or disorient$ or dis-orient$ or agitat$ or restless$).mp.
30. decubitus/ or (bedsore$ or bed sore$ or pressure ulcer$ or pressure sore$ or decubitus).mp.
31. hospital infection/ or (cross infect$ or (hospital adj2 infect$) or nosocomial infect$).mp.
32. exp medical errors/ or ((medical adj2 error$) or (healthcare adj2 error$) or (health care adj2 error$)).mp.
33. ((drug adj2 error$) or (medicat$ adj2 error$) or (prescri$ adj2 error$)).mp.
34. ((diagnos$ adj2 error$) or misdiagnos$ or mis-diagnos$ or (diagnos$ adj2 fail$)).mp.
35. (treat$ adj2 delay$).mp.
36. ((treat$ or therap$) adj2 error$).mp.
37. (intermediate adj3 care).mp.
38. or/25-37
39. 24 and 38

PsycInfo SEARCH STRATEGY

1. exp hospital discharge/ or facility discharge/ or discharg$.mp.
2. (postdischarg$ or post discharg$).mp.
3. (predischarg$ or pre discharg$).mp.
4. (posthospital$ or post hospital$).mp.
5. client transfer/ or transfer$.mp.
6. ((subacute adj2 care) or (sub-acute adj2 care) or (postacute adj2 care) or (post-acute adj2 care)).mp.
7. nursing homes/ or nursing home$.mp.
8. or/1-7
9. limit 8 to ("380 aged " or "390 very old ")
10. 8 and 9
11. ((aged adj2 home$) or (aged adj2 facilit$) or (elder$ adj2 home$) or (elder$ adj2 facilit$)).mp.
12. 10 or 11
13. aftercare/ or (aftercare or after care).mp.
14. ((followup adj2 care) or (follow up adj2 care)).mp.
15. (intermediate adj3 care).mp.
16. continuum of care/ or (continu$ adj3 care).mp.
17. ((patient center$ adj3 care) or (patient centre$ adj3 care)).mp.
18. (transition$ adj3 care).mp.
19. ((coordinat$ adj2 care) or (co-ordinat$ adj2 care)).mp.
20. integrated services/ or (integrat$ adj3 care).mp.
22. exp case management/ or managed care/ or (managed care or (case adj2 manag$)).mp.
23. or/13-22
24. 12 and 23
25. adverse$.mp.
26. falls/ or fall$.mp.
27. injuries/ or wounds/ or accidents/ or (injur$ or wound$ or accident$).mp.
28. dehydration/ or (dehydrat$ or de-hydrat$).mp.
29. mental confusion/ or agitation/ or restlessness/ or (confus$ or disorient$ or dis-orient$ or agitat$ or restless$).mp.
30. (bedsore$ or bed sore$ or pressure ulcer$ or pressure sore$ or decubitus).mp.
31. (cross infect$ or (hospital adj2 infect$) or nosocomial infect$).mp.
32. ((medical adj2 error$) or (healthcare adj2 error$) or (healthcare adj2 error$)).mp.
33. ((drug adj2 error$) or (medicat$ adj2 error$) or (prescri$ adj2 error$)).mp.
34. misdiagnosis/ or ((diagnos$ adj2 error$) or misdiagnos$ or mis-diagnos$ or (diagnos$ adj2 fail$)).mp.
35. (treat$ adj2 delay$).mp.
36. ((treat$ or therap$) adj2 error$).mp.
37. (fragment$ adj3 care).mp.
38. or/25-37
39. 24 and 38
PreMEDLINE and Old MEDLINE SEARCH STRATEGY

1. Patient Discharge/ or discharg$.mp.
2. (postdischarg$ or post discharge$).mp.
3. (predischarg$ or pre discharge$).mp.
4. (posthospital$ or post hospital$).mp.
5. patient transfer/ or transfer$.mp.
6. subacute care/ or ((subacute adj2 care) or (sub-acute adj2 care) or (postacute adj2 care) or (post-acute adj2 care)).mp.
7. nursing homes/ or nursing home$.mp.
8. or/1-7
9. "aged, 80 and over"/ or aged/ or (aged or elder$).mp.
10. 8 and 9
11. homes for the aged/ or ((aged adj2 home$) or (aged adj2 facilit$) or (elder$ adj2 home$) or (elder$ adj2 facilit$)).mp.
12. 10 or 11
13. aftercare/ or (aftercare or after care).mp.
14. ((followup adj2 care) or (follow up adj2 care)).mp.
15. (intermediate adj3 care).mp.
16. continuity of patient care/ or (continu$ adj3 care).mp.
17. patient-centered care/ or ((patient center$ adj3 care) or (patient centre$ adj3 care)).mp.
18. (transition$ adj3 care).mp.
19. ((coordinat$ adj2 care) or (co-ordinat$ adj2 care)).mp.
20. exp "Delivery of Health Care, Integrated"/ or (integrat$ adj3 care).mp.
21. hospital shared services/ or (shar$ adj3 care).mp. [mp=ti, ot, ab, nm, hw]
22. case management/ or exp managed care programs/ or (managed care or (case adj2 manag$)).mp.
23. or/13-22
24. 12 and 23

COCHRANE LIBRARY SEARCH STRATEGY

1. MeSH descriptor Patient Discharge, this term only
2. (discharg*)
3. (postdischarg* or "post discharge*" or post-discharg*)
4. (predischarg* or "pre discharge*" or pre-discharg*)
5. (posthospital* or "post hospital*" or post-hospital*)
6. MeSH descriptor Subacute Care, this term only
7. (subacute near/2 care) or ("sub acute" near/2 care) or (sub-acute near/2 care) or (postacute near/2 care) or ("post acute" near/2 care) or (post-acute near/2 care)
8. MeSH descriptor Nursing Homes, this term only
9. "nursing home*"
10. (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9)
11. (aged or elder*)
12. (#10 AND #11)
13. MeSH descriptor Homes for the Aged, this term only
14. (aged near/2 home*) or (aged near/2 facilit*) or (elder* near/2 home*) or (elder* near/2 facilit*)
15. (#12 OR #13 OR #14)
16. MeSH descriptor Aftercare, this term only
17. (aftercare or "after care" or after-care)
18. (followup near/2 care) or ("follow up" near/2 care) or (follow-up near/2 care)
19. (intermediat* near/3 care)
20. MeSH descriptor Continuity of Patient Care, this term only
21. (continu* near/3 care)
22. MeSH descriptor Patient-Centered Care, this term only
23. ("patient center*" near/3 care) or (patient-center* near/3 care) or ("patient centre*" near/3 care) or (patient-centre* near/3 care)
24. (transition* near/3 care)
25. (coordinat* near/2 care) or (co-ordinat* near/2 care)
26. MeSH descriptor Delivery of Health Care, Integrated explode all trees
27. (integrat* near/3 care)
28. MeSH descriptor Hospital Shared Services, this term only
29. (shar* near/3 care)
30. MeSH descriptor Case Management, this term only
31. MeSH descriptor Managed Care Programs explode all trees
32. #"managed care" or (case near/2 manag*)
33. (#16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32)
34. (#15 AND #33)
35. (adverse*)
36. Any MeSH descriptor with qualifier: AE
37. MeSH descriptor Accidental Falls, this term only
38. (fall*)
39. MeSH descriptor Wounds and Injuries, this term only
40. MeSH descriptor Accidents, this term only
41. (injur* or wound* or accident*)
42. MeSH descriptor Dehydration, this term only
43. (dehydrat* or de-hydrat*)
44. MeSH descriptor Confusion explode all trees
45. MeSH descriptor Psychomotor Agitation, this term only
46. (confus* or disorient* or dis-orient* or agitat* or restless*)
47. MeSH descriptor Pressure Ulcer, this term only
48. (bedsore* or "bed sore*" or "pressure ulcer*" or "pressure sore*" or decubitus)
49. MeSH descriptor Cross Infection, this term only
50. "cross infect*" or (hospital near/2 infect*) or "nosocomial infect*"
51. MeSH descriptor Medical Errors explode all trees
52. (medical near/2 error*) or (healthcare near/2 error*) or ("health care" near/2 error*) or (health-care near/2 error*)
53. (drug near/2 error*) or (medicat* near/2 error*) or (prescri* near/2 error*)
54. MeSH descriptor Diagnostic Errors explode all trees
55. (diagnos* near/2 error*) or misdiagnos* or mis-diagnos* or (diagnos* near/2 fail*)
56. (treat* near/2 delay*)
57. (treat* or therap*) near/2 error*
58. (fragment* near/3 care)
59. (#35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR ( #52 AND or#53 ) OR #54 OR #55 OR #56 OR #57 OR #58)
60. (#34 AND #59)
APPENDIX 5: VERIFICATION OF STUDY ELIGIBILITY

AUTHOR AND YR _____________________________________________________
JOURNAL ___________________________________________________________
TITLE - _____________________________________________________________

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Intervention: Does the study describe an intervention to reduce errors and adverse events during transfer of care?
Yes ☐ No ☐

Outcome: Does the study evaluate the effect of the intervention on
Medications management   Yes ☐ No ☐
Incidence of hospital readmissions Yes ☐ No ☐
Falls                    Yes ☐ No ☐
Disorientation           Yes ☐ No ☐
Medical mismanagement    Yes ☐ No ☐
Missed diagnosis          Yes ☐ No ☐
Functional level          Yes ☐ No ☐
Quality of Life           Yes ☐ No ☐
Patient satisfaction      Yes ☐ No ☐
Mortality                 Yes ☐ No ☐
Morbidity                 Yes ☐ No ☐
Cost effectiveness        Yes ☐ No ☐

You should answer Yes to at least 1 question in each of the above four groups.
If not please do not complete the rest.
### APPENDIX 6: JBI CRITICAL APPRAISAL CHECKLIST FOR EXPERIMENTAL STUDIES

Reviewer _____________________________  Date ____________ __
Author _______________________________ Year________________
Record Number________________________

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<td>3. Was allocation to treatment groups concealed from the allocator</td>
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<td>4. Were the outcomes of people who withdrew described and included in the analysis?</td>
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<td>5. Were those assessing outcomes blind to the treatment allocation?</td>
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<td>6. Were the control and treatment groups comparable at entry?</td>
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<td>7. Were groups treated identically other than for the named interventions?</td>
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<td>8. Were outcomes measured in the same way for all groups?</td>
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<td>10. Was there adequate follow-up (&gt;80%)</td>
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<td>11. Was appropriate statistical analysis used?</td>
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Overall appraisal:  
Include □  Exclude □  Seek further info □
Comments (Including reasons for exclusion)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

247
### APPENDIX 7: QUALITY ASSESSMENT OF INCLUDED TRIALS

#### NURSE-LED INTERVENTION

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APPENDIX 8: DATA EXTRACTION SHEET

AUTHOR AND YR ____________________________________________________________
JOURNAL ________________________________________________________________
TITLE/COUNTRY STUDY UNDERTAKEN
__________________________________________________________________________

Please identify the groups and complete the following for each group
* If more than 3 groups, please add an extra column.

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**OUTCOMES**

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**Other Relevant Comments**

________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
The following were excluded as they did not involve the transfer of elderly patients


The following publications were excluded as they were descriptive studies


This was excluded due to the age group of participant


The following were excluded because they did not meet mean quality threshold


<table>
<thead>
<tr>
<th>Author/ Country</th>
<th>Study type</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coleman et al (2006) USA</td>
<td>RCT Method of allocation Random number generator</td>
<td>750 community-dwelling admitted to the hospital. Inclusion Criteria: Patients who were (1) 65 years or older, (2) admitted for a non-psychiatric condition, (3) resided within a predefined geographic radius of the hospital, (4) had a telephone, (5) spoke English, (6) did not have dementia, (7) had no plans to enter hospice, (8) were not participating in another research, (9) had at least 1 of the following diagnoses, stroke, congestive heart failure, coronary artery disease, cardiac arrhythmias, chronic obstructive pulmonary disease, diabetes</td>
<td>Intervention Group (IG) (n=379) Transition coach who provided: (1) assistance with medication self-management, (2) a patient-centered record owned and maintained by the patient to facilitate cross-site information transfer, (3) timely follow-up with primary or specialty care, and (4) a list of &quot;red flags&quot; indicative of a worsening condition and instructions on how to respond to them, (5) a personal health record and (6) a series of visits and telephone calls with a transition coach, (7) Caregivers received support and encouragement</td>
<td>Use of health care resources Readmission to hospital at 1 month IG 31/379 CG 44/371 P value = 0.048</td>
<td>4-item cognitive screening test to assess cognition. Blinded outcome analysis</td>
</tr>
</tbody>
</table>

Control Group (CG) (n=371) Usual Care-Not stated | Use of health care resources Readmission to hospital at 3 months IG 63/379 CG 83/371 P value = 0.04 | Readmission to hospital at 6 months IG 97/379 CG 114/371 P value = 0.28 |

Cost effectiveness Non elective hospital costs at 1 month IG $784 (USD) CG $918 (USD) P value = 0.06 | Non elective hospital costs at 3 |
mellitus, spinal stenosis, hip fracture, peripheral vascular disease, deep venous thrombosis, and pulmonary embolism.

Baseline characteristics
No significant differences in baseline age, gender, marital status, educational level, ethnicity and health status.

<table>
<thead>
<tr>
<th></th>
<th>months</th>
<th>IG $1519 (USD)</th>
<th>CG $2016 (USD)</th>
<th>P value = 0.02 (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non elective hospital costs at 6 months</td>
<td>IG $2058 (USD)</td>
<td>CG $2546 (USD)</td>
<td>P value = 0.04 (USD)</td>
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</tr>
<tr>
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<tr>
<td>Rawl et al (1998) USA</td>
<td>RCT Method of Allocation Not stated</td>
<td>100 patients discharged from an inpatient rehabilitation unit.</td>
<td>Intervention Group (IG) (n=49) The intervention group received: (1) Advanced Practice Nurse (APN) follow-up-three in person contact and one telephone contact, (2) Telephone contact was made within, 48 hours after discharge to discuss their immediate, transitional concerns, (3) the last two in-person contacts were made face to face at approximately 30 days and 4 months after discharge, (4) at the 30 day and 4 month contacts, the APN performed a physical examination, assessed complications, and addressed patient and family concerns related to the transition from hospital to home, provided emotional support and counseling, provided information about community resources, and provided both general and rehabilitation-specific education and consultation to the patient and family, as needed. Control Group (CG)- (n=51) Usual care-usual hospital discharge planning and follow-up care (i.e. A single telephone call from a lay volunteer person regarding a survey).</td>
<td>Use of health care resources Readmission to hospital at 4 months IG 11/49 CG 7/51 P value =0.26 Falls at 4 months IG 11/49 CG 13/51 P value = 0.72 Urinary tract infection at 4 months IG 7/49 CG 5/51 P value =0.49 Anxiety levels at 4 months IG 29.0 (SD 9.9) CG 44.7 (SD 15.3) P value &lt;0.001</td>
</tr>
<tr>
<td>Author/ Country</td>
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<td>Intervention</td>
<td>Results</td>
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<tr>
<td>Wen et al (2003)</td>
<td>RCT</td>
<td>654 patients who were discharged and required community services after discharge.</td>
<td>Intervention Group (IG) (n=311) Patients received Post Acute Care (PAC) program led by a coordinator which included: (1) Telephone follow-up, (2) available for patients in the event of a crisis, (3) liaised and coordinated service providers, (4) ensuring adequate referrals before discharge from the PAC program (e.g. to councils or community health centres.</td>
<td>Use of health care resources Mean Number of Readmission to hospital at 6 months IG 0.4 (0.3-0.5) CG 0.5 (0.4-0.5) P value = 0.19</td>
</tr>
<tr>
<td>Australia</td>
<td>RCT</td>
<td>654 patients who were discharged and required community services after discharge.</td>
<td>Control Group (CG) (n=287) Usual Care-usual hospital discharge planning, provided by ward nursing staff and the social work department.</td>
<td>Cost effectiveness Total cost including cost of the intervention at 6 months IG $2,843 168 (AUD) CG $3, 067 169 (AUD) P value 0.048</td>
</tr>
<tr>
<td>Author/Country</td>
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<tr>
<td></td>
<td>Method of allocation</td>
<td>Inclusion criteria: Patients who (1) were 65 years or older, (2) telephone access at home after discharge, (3) reside in the geographic service area, (4) had one of the following: inadequate support system, had multiple, active, chronic health problems, had history of depression, had moderate to severe functional impairment, had multiple hospitalization during prior 6 months, had hospitalization in the past 30 days; fair or poor self-rating of health; or history of non-adherence to the therapeutic regime. Baseline characteristics: No significant differences in baseline age, gender, marital status, educational level, ethnicity and health status.</td>
<td>The intervention patients received (1) Advanced Practice Nurse follow up, (2) comprehensive discharge planning and home follow-up protocol, (3) hospitals visits, (4) home visits, (5) telephone availability, (6) outreach, (7) discharge summaries. Control Group (CG) (n=186) Usual care- patients received standard home care consistent with Medicare regulations.</td>
<td>Readmission to hospital at 1 month IG 17/177 CG 47/186 P value &lt;0.001 Readmission to hospital at 3 months IG 32/177 CG 60/186 P value 0.02 Cost effectiveness Total cost of readmission IG $427 217 (AUD) CG $1024 218 (AUD) P value &lt;0.001 Total cost of acute care visits (physician’s office, emergency department, home visits, nurses and other visits) IG $6,42 595 (USD) CG $1,238 928 (USD) P value &lt;0.001 Costs per patient IG $3630 (USD) CG $6661 (USD) P value &lt;0.001</td>
</tr>
<tr>
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<tr>
<td>Dellasega et al (2000) USA</td>
<td>Four arm RCT Method of Allocation Not stated</td>
<td>140 rural patients discharged home. Inclusion Criteria (1) Admitted to one of the study-site hospitals, (2) scheduled for discharge home, (3) frail (cognitively and or functionally impaired or a complex case). Baseline Characteristics Mean age 74.81. No significant differences in baseline age, gender and number of medications.</td>
<td>Intervention Group (IG) (n 97) The intervention involved Advanced Nurse Practice (APN): (1) A predischarge visit by an APN, who met with the participant (and caregiver when possible), (2) reviewed the hospital medical record, and began planning for discharge (3) after discharge, the APN visited twice, at 24 to 48 hours and again 2 weeks later (4) between visits, the APN or participant could initiate additional telephone contacts and visits if needed. Usual Care (n=43)-No follow-up nursing support</td>
<td>Use of health care resources Mean Number of Hospital visits at 1 month No Care 0.15 RN &amp; APN 0.23 APN only 0.19 RN only 0.37 P value 0.404 Mean Number of physician visits No Care 2.30 RN &amp; APN 2.10 APN only 2.81 RN only 2.41 P value 0.520 Mean Number of medication changes No Care 0.67 RN &amp; APN 1.22 APN only 0.50 RN only 0.29 P value 0.339 Mean Number of Quality of Life at 1 month after discharge No Care 2.96 RN &amp; APN 3.13 APN only 3.10 RN only 2.94 P value 0.848</td>
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<tr>
<td>Townsend et al (1988) United Kingdom</td>
<td>RCT</td>
<td>903 patients discharged from a district hospital. Inclusion Criteria Patients who were (1) 75 years or over, (2) admitted from a defined area of central Harrow, (3) discharge within the demographic service area of the hospital, (4) going home</td>
<td>Intervention Group (IG) (n=464) Patient received (1) Community based hospital discharge scheme, (2) support from care attendants on first day at home and for up to 12 hours a week for two weeks Control Group (CG) (n=439) Usual care-assessed before discharge at two weeks, and three months</td>
<td>Use of Health Care Resources Readmissions at 3 months IG 105/464 CG 102/439 P value Not significant Cost effectiveness The significantly lower hospital readmission in the intervention group, the care intervention program showed an average reduction cost compared with the usual care group both short-term and long-term. Mortality At 3 months IG 34/464 CG 25/439 P value Not significant At 12 months IG 91/464 CG 81/439 P value Not significant</td>
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<tr>
<td>Author/Country</td>
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<tr>
<td>Crotty et al (2004) Australia</td>
<td>RCT</td>
<td>Method of allocation Computer-generated numbers</td>
<td>110 of elderly patients from metropolitan hospitals Inclusion Criteria Patient who were (1) 65 years or older, (2) care giver given consent, (3) had a life expectancy of ≥1 month as assessed by their medical team, (4) making a first time transition from a hospital to a long term residential care facility. Base line Characteristics No significant differences in baseline age, gender, and health status.</td>
<td>The Intervention Group (IG) (n=56) The intervention group received: (1) Pharmacist transition coordinator, (2) medication-management transfer summaries from hospitals to the long term facility, (3) timely coordinated medication reviews by accredited community pharmacists, (4) case conferences with family, physicians and pharmacists Control Group (CG) (n= 54) Usual care-received the usual hospital discharge process.</td>
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<td>Increased confusion at 2 months</td>
<td>Worsening mobility at 2 months</td>
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<td></td>
<td>IG 6/44</td>
<td>IG 4/44</td>
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<td></td>
<td>CG 11/44</td>
<td>CG 10/44</td>
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<td></td>
<td>P value 0.160</td>
<td>P value 0.072</td>
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<tr>
<td>Nazareth et al (2001) England</td>
<td>RCT</td>
<td>362 elderly patients from three acute and general and one long stay hospital.</td>
<td>Intervention Group (IG) (n=181)</td>
<td>Use of health care resources Readmission at 3 months IG 64/164 CG 69/176 P value Not significant Readmission at 6 months IG 38/136 CG 43/151 P value Not significant Physician visits at 3 months IG 101/130 CG 108/144 P value Not significant Physician visits at 6 months IG 76/107 CG 82/116 P value Not significant</td>
</tr>
<tr>
<td></td>
<td>Method of allocation</td>
<td></td>
<td>The intervention group received (1) Pharmacist discharge Plan included assessment of the patients’ medication; provision of information on their current drugs; liaison with carers; community professionals when appropriate; discharge, medication information review, (2) medication support required by patient, (3) community pharmacy visit post discharge, (4) counselling patients or carers on the purpose and appropriate doses of the medication; disposing of excess medicines, (5) liaising with general practitioners, (6) arrange further community visit as needed by patients.</td>
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<td>Computer-generated random numbers, blocked randomisation, stratified by trial center to ensure equal numbers of participants in each group.</td>
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<td>Base line Characteristics No significant differences in baseline age, gender, ethnicity, social class and mean number of chronic illnesses, drugs prescribed on discharge and cognitive impairment on discharge.</td>
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</table>
Control Group (CG)  
(n=181)  
Usual Care-discharged from hospital following standard procedures-these included a discharge letter to the general practitioner which indicated the diagnosis, investigations and current medications.

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<thead>
<tr>
<th></th>
<th>Outpatient department visits at 6 months</th>
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<tbody>
<tr>
<td></td>
<td>IG 39/137</td>
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<tr>
<td></td>
<td>CG  40/151</td>
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<tr>
<td></td>
<td>P value Not significant</td>
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</tbody>
</table>

Medications related outcomes

Knowledge about medication at 3 months

|                                | IG  N=86 Mean value 0.69 (SD 0.33)       |
|                                | CG  N=83 Mean value 0.62 (SD 0.34)       |
|                                | P value Not significant                   |

Knowledge about medication at 6 months

|                                | IG  N=65 Mean value 0.69 (SD 0.35)       |
|                                | CG  N=68 Mean value 0.68 (SD 0.32)       |
|                                | P value Not significant                   |

Adherence to medication at 3 months

|                                | IG  N=79 Mean value 0.75 (SD 0.3)        |
|                                | CG  N=72 Mean value 0.75 (SD 0.28)       |
|                                | P value Not significant                   |

Adherence to medication at 6 months

|                                | IG  N=60 Mean value 0.78 (SD 0.3)        |
|                                | CG  N=58 Mean value 0.78 (SD 0.3)        |
|                                | P value Not significant                   |

Patient Satisfaction at 3 months

<p>|                                | IG N=76 Mean value 3.3 (SD 0.6)          |
|                                | CG N=73 Mean value 3.3 (SD 0.6)          |
|                                | P value Not significant                   |</p>
<table>
<thead>
<tr>
<th></th>
<th>IG</th>
<th>CG</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Satisfaction at 6 months</td>
<td>N=62 Mean value 3.4 (SD 0.6)</td>
<td>N= 61 Mean value 3.2 (SD 0.6)</td>
<td>Not significant</td>
</tr>
<tr>
<td>Quality of life at 3 months</td>
<td>N= 76 Mean value 2.4 (SD 0.7)</td>
<td>N=73 Mean value 2.4 (SD 0.6)</td>
<td>Not significant</td>
</tr>
<tr>
<td>Quality of life at 6 months</td>
<td>N= 62 Mean value 2.5 (SD 0.6)</td>
<td>N=61 Mean value 2.4 (SD 0.7)</td>
<td>Not significant</td>
</tr>
<tr>
<td>Mortality at 3 months</td>
<td>10/164</td>
<td>5/176</td>
<td>Not significant</td>
</tr>
<tr>
<td>Mortality at 6 months</td>
<td>22/137</td>
<td>19/151</td>
<td>Not significant</td>
</tr>
<tr>
<td>Author/ Country</td>
<td>Study type</td>
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<tr>
<td>Hawe et al (1990) Australia</td>
<td>RCT</td>
<td>268 patients admitted to the study between the period of 17 months.</td>
<td>Intervention Group (IG) (n=149)</td>
</tr>
<tr>
<td></td>
<td>Method of Allocation By month</td>
<td>Inclusion Criteria Patients were (1) 55 years or more, (2) English –speaking, (3) not living in a nursing home prior to hospital admission, (4) not considered by staff to be confused</td>
<td>Patients were given ED MED Program (Education about Medication) which consisted of (1) Pharmacist-led medication program, (2) education, (3) pre-discharge counseling, (4) individual medication record</td>
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<td>Base line characteristics Mean age 68 years</td>
<td>Control Group (CG) (n=119)</td>
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<td>In the ED MED (Education about Medication) group 62% were female compared to the control group where 53% were female.</td>
<td>-Usual care Receive a “dummy” intervention conducted on alternate months to the medication program. “Getting Older, Feeling Better” an education program led by a Nurse Educator. It covered such topics as care of the feet, the importance of exercise, good nutrition.</td>
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</table>
P value Not significant

Percentage of patients severely non-adherent with an essential drug at 1 month
IG  22.0
CG  26.0
P value Not significant

Mean score on knowledge of drug purpose (perfect score is 100) at 3 months
IG  85.6
CG  87.3
P value Not significant

Percentage of Mean adherence for all drugs at 3 months
IG  92.7
CG  88.9
P value Not significant

Percentage of patients taking less than recommended of any drug at 3 months
IG  52.6
CG  51.4
P value Not significant

Percentage of patients taking more than recommended of any drug at 3 month
IG  9.2
CG  7.0
P value Not significant
<table>
<thead>
<tr>
<th></th>
<th>Percentage of patients severely non-adherent with any drug at 3 months</th>
<th>Percentage of patients severely non-adherent with an essential drug at 3 months</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>IG 44.7</td>
<td>IG 26.0</td>
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<tr>
<td></td>
<td>CG 41.4</td>
<td>CG 39.0</td>
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<tr>
<td></td>
<td>P value Not significant</td>
<td>P value Not significant</td>
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<tr>
<td></td>
<td>Severe non-adherent with patients taking four drugs or more drugs at 1 month</td>
<td>Severe non-adherent with patients taking four drugs or more drugs at 3 month</td>
</tr>
<tr>
<td></td>
<td>IG 18/83</td>
<td>IG 18/56</td>
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<tr>
<td></td>
<td>CG 25/73</td>
<td>CG 18/56</td>
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<tr>
<td></td>
<td>P value 0.08</td>
<td>P value 0.03</td>
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### MULTIDISCIPLINARY LED INTERVENTION

<table>
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<tr>
<th>Author/Country</th>
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<th>Results</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Caplan et al (2004) Australia</td>
<td>RCT</td>
<td>739 patients discharged home from the Emergency Department.</td>
<td>Intervention Group (IG) (n= 370) The intervention group received: (1) Comprehensive Geriatric Assessment (CGA), (2) multidisciplinary team involvement such as nurses, doctors, physiotherapist, occupational therapist, GP and the geriatrician with follow up at home or hostel</td>
<td>Use of health care resources Physician visits IG 281/370 CG 264/399 P value 0.155</td>
<td>Outpatient clinics IG 99/370 CG 89/399 P value 0.399</td>
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<td></td>
<td>Method of allocation Computer-generated random numbers</td>
<td></td>
<td>Control Group (CG) (n=369) Usual Care-were allowed to go home after randomisation with no alteration to the discharge plan formulated by the medical officer in ED.</td>
<td>Mortality at 18 months IG 55/370 CG 53/399 P value 0.765</td>
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Inclusion Criteria

Patients who were:
1. 75 years and older,
2. were fit for discharge,
3. did not live in a nursing home,
4. live in the local area, at home or in a hostel,
5. ability to give consent or from next of kin

Baseline characteristics

There were no significances between treatment and control groups in age, gender, living arrangements, self-perceived health, ADL, IADL, or mental status.
<table>
<thead>
<tr>
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<th>Intervention</th>
<th>Results</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Nikolaus et al (1999)</td>
<td>Three arm RCT</td>
<td>545 patients admitted to the geriatric centre at the University Hospital of Heidelberg.</td>
<td>Two Intervention Groups</td>
<td>Use of Health Care Resources</td>
<td>Blinded outcome assessment</td>
</tr>
<tr>
<td>Germany</td>
<td>Method of allocation Computer-generated random numbers</td>
<td>Inclusion Criteria Patients who: Who were 65 years or over (2) who lived at home (3) who had terminal illness or severe dementia were not included, (4) live too far away (&gt;15km) for the home intervention team to make regular visits were not included, (5) had to be in a stable condition prior to assessment</td>
<td>(1) Comprehensive geriatric assessment and home intervention (CGA &amp; HI) received (n=140): (1) Home intervention consisting of nurses, physiotherapist, an occupational therapist and social worker (2) training in washing, eating, dressing and/or walking (3) assessment of patient’s home (e.g. for safety hazards) to prescribe technical aids, as necessary (3) home services (4) home visits (5) telephone follow up.</td>
<td>Readmission at 12 months</td>
<td>Cognition was assessed with the Mini-Mental-State Examination</td>
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<td>Baseline Characteristics The participants in the intervention, assessment and control groups were similar. The patients included had a higher mean age (81.4 years). Women made up 73.4% of the group; 27.2% lived with spouse or partner.</td>
<td>(2) Comprehensive Geriatric Assessment alone (CGAA) (n=139)</td>
<td>CGA &amp; HI 59/140</td>
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<td></td>
<td></td>
<td>Control Group (CG)</td>
<td>CGA AA 64/139</td>
<td>CG 65/141</td>
<td>P value Not significant</td>
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<tr>
<td></td>
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<td>Physician visits (mean no. of visits/person/month)</td>
<td>CGA &amp; HI 1.23</td>
<td>P value Not significant</td>
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<tr>
<td></td>
<td></td>
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<td>CGA A 1.11</td>
<td>CG 1.08</td>
<td>P value Not significant</td>
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<td>Long term care institution</td>
<td>CGA &amp; HI 30/140</td>
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<td>CGAA 33/139</td>
<td>CG 42/141</td>
<td>P value Not significant</td>
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<tr>
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<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>Evans et al (1993) USA</td>
<td>RCT</td>
<td>835 study participants identified as at 'risk' for frequent health care resource use.</td>
<td><strong>Intervention Group (IG)</strong> (n=417) Patient who received (1) Early discharge planning, (2) referral to community agencies (3) nursing home placements, (4) counseling, (5) health education, (6) planning home health care, (7) financial planning, (8) living arrangements, (9) environmental modifications, (10) assistance with medical follow up <strong>Control Group (CG)</strong> (n=418) Usual care-receive discharge planning only if there was a written physician request</td>
<td><strong>Use of Health Care resources</strong> Readmission at 1 month IG 103/417 CG 147/418 P value 0.001 Readmission at 9 month IG 229/417 CG 305/418 P value 0.08 Long-term institution at 1 month IG 61/417 CG 91/418 P value Long-term institution at 9 month IG 79/417 CG 109/418 P value Mortality at 1 month IG 16/417 CG 91/418 P value Not significant Mortality at 9 months IG 66/417 CG 67/418 P value Not significant</td>
<td>Method of allocation Not stated</td>
</tr>
</tbody>
</table>
**APPENDIX 11: iPTC Form**

---

**Interactive PATIENT TRANSITION CHECKLIST (iPTC)**
This form should be completed to ensure that patients are safely transferred across care settings.

### TRANSFER DETAILS
1. Patient transferring from (name of ward) _______ to _______ (name of ward)
2. Date of transfer _______ Time of transfer _______

### TO BE COMPLETED IF THE PATIENT IS TRANSFERRED WITHIN THE HOSPITAL

#### DOCUMENTS

<table>
<thead>
<tr>
<th>Has the following been sent with the patient?</th>
<th>To be completed by Transferring Ward</th>
<th>To be completed by Receiving Ward</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Admission Form</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>b) Clinical Records</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Up to date Nursing Notes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Current Medication Chart</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Fluid chart orders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Patient’s own medications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) X-rays</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If no, where are documents located _______

<table>
<thead>
<tr>
<th>Does the patient have an intravenous cannula inserted? If yes when was it inserted? and State insertion site?</th>
<th>To be completed by Transferring Ward</th>
<th>To be completed by Receiving Ward</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Has Intravenous Cannula Record completed?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
</tbody>
</table>

### ASSESSMENTS

<table>
<thead>
<tr>
<th>Has the following been completed?</th>
<th>To be completed by Transferring Ward</th>
<th>To be completed by Receiving Ward</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Falls Risk Assessment</td>
<td>DONE TO BE N/A</td>
<td>DONE TO BE N/A</td>
</tr>
<tr>
<td>b) Waterlow Scale Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Mattress ordered if necessary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Discharge Risk Screening form</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 7. Have referrals to the following being made?

| a) Social Worker                 |                                     |                                  |
| b) Physiotherapy                 |                                     |                                  |
| c) Speech Pathologist            |                                     |                                  |
| d) Occupational Therapist        |                                     |                                  |
| e) Dietician                     |                                     |                                  |

### 8. Is the patient scheduled for investigation/scans?

---
# TO BE COMPLETED IF THE PATIENT IS TRANSFERRED WITHIN THE HOSPITAL OR NURSING HOME

<table>
<thead>
<tr>
<th>PATIENT PREPARATION</th>
<th>To be completed by Transferring Ward</th>
<th>To be completed by Receiving Ward or Nursing Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Has the following been attended?</td>
<td>YES NO N/A</td>
<td>YES NO N/A</td>
</tr>
<tr>
<td>a) Diet updated on Power Chart?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>b) Meal given prior to transfer (if appropriate)?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>c) Organising patient escort (if required)?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>d) Telephone Nursing handover?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>e) Patient informed of transfer and reasons for transfer?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>f) Next of Kin informed of transfer?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>g) Patient’s belongings bagged and labelled?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>h) Equipments organised e.g. oxygen cylinder</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>i) Patient orientated to receiving ward?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. Have the following personal belongings been sent with patient?</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Dentures</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>b) Eye Glasses</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>c) Hearing Aids</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>d) Walking Frame</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
</tbody>
</table>

# TO BE COMPLETED IF THE PATIENT IS TRANSFERRED TO NURSING HOME

<table>
<thead>
<tr>
<th>DISCHARGE PROCESS</th>
<th>To be completed by Transferring Ward</th>
<th>To be completed by Receiving Nursing Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Has the following been completed?</td>
<td>DONE TO BE N/A</td>
<td>DONE TO BE N/A</td>
</tr>
<tr>
<td>a) Early Discharge Planning?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>b) Patient Discharge Checklist?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>c) Intravenous cannula removed?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. Has the following been sent with patient?</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Patient Transfer Form to Residential Care Facility</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>b) Medical/Surgical/ Allied Health Discharge Summary</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>c) Is the Facility informed about patient discharge?</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
<tr>
<td>d) Has medications sent with patient (If needed)</td>
<td>☐ ☐ ☐</td>
<td>☐ ☐ ☐</td>
</tr>
</tbody>
</table>

Comments | | |
|---------|---------|---------|

Signature and designation
Transferring Ward

Signature and designation
Receiving Ward
Dear NUMs

Re: Initiation of Patient Transition Checklist Study

The Centre for Applied Nursing Research (CANR) is seeking your participation on a new project entitled Initiation of Patient Transition Checklist Study.

The aim of this study is to reduce errors and adverse events through improved communication between nurses during transfer of patients. We will be trialling a special checklist form called the interactive Patient Transition Checklist (iPTC) which we hypothesize will improve patient care during transfer. Your ward has been nominated by the Director of Nursing to participate in the study and I am seeking your approval. **This trial is only for 2 weeks.**

All nurses rostered morning, afternoon and night shifts employed as permanent, part-time, casuals, casual pool and agency staff are required to complete the iPTC when transferring and receiving patients. At the completion of the study, the nurses will be given a survey to complete about the satisfaction with the iPTC form. Completion of the survey is optional. The nurse researchers will visit the ward each day for the period of two weeks to collect data from the medical records. Consent from patient will be obtained prior to accessing the medical records.

**Commencement date for the study**
- 10-14 March 2008 - an in-service about the study for 1/2 hour at 1430 hours, Information Booklet will be available in the ward for all nurses
- Each ward will be provided with two in-service
- **17-31 March 2008-commence using the iPTC form for all patients transferred to and received by the ward.**

Ethics Approval No: 2007/151
Please contact Martha or Rhonda for further questions.
Your ward participation in the study will be highly appreciated.

Best Regards

Ms. Martha Mansah
Registered Nurse
Ph +61 2 9612 0679
Fax +61 2 9612 0676
Mob 0423 671 198
Email: Martha.Mansah@sswahs.nsw.gov.au

Professor Rhonda Griffiths AM
Professor of Nursing
Ph +61 2 96120675
Fax +61 2 96120676
Website: www.sswahs.nsw.gov.au/SSWAHS/CANR/
Dear Educators

Re: Initiation of Patient Transition Checklist Study

The Centre for Applied Nursing Research (CANR) will be trialling a special form called the interactive Patient Transition Checklist (iPTC). Your ward has been nominated by the Director of Nursing to participate in the study. This trial is only for 2 weeks.

The aim of this study is to reduce errors and adverse events through improved communication between nurses during transfer of patients.

All nurses rostered morning, afternoon and night shifts employed as permanent, part-time, casuals, casual pool and agency staff are required to complete the iPTC when transferring and receiving patients. At the completion of the study, the nurses will be given a survey to complete about the satisfaction with the iPTC form. Completion of the survey is optional.

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Your ward participation in the study will be highly appreciated. Please contact Martha or Rhonda for further questions.

Best Regards

Ms. Martha Mansah
Registered Nurse
Ph + 61 2 9612 0679
Fax + 61 2 9612 0676
Mob 0423 671 198
Email: Martha.Mansah@sswahs.nsw.gov.au

Professor Rhonda Griffiths AM
Professor of Nursing
Ph + 61 2 96120675
Fax + 61 2 96120676
Website: www.sswahs.nsw.gov.au/SSWAHS/CANR/
Liverpool Hospital Vision

To develop a teaching and referral health service of high quality, which is sensitive to the needs of the people of South Western Sydney.

Liverpool Hospital Mission

The mission of the Liverpool Health Service is to improve the health of the people of Liverpool and of other people referred for specialist services.

**DURATION OF RESEARCH: 17 MARCH – 31 MARCH 2008**
NURSE RESEARCHERS
Ms. Martha Mansah
Professor Rhonda Griffiths
Professor Esther Chang
Ms. Ritin Fernandez

CONTACTS
Ms. MARTHA MANSAH
Business Hours 612 9828-6549
Fax 98286519

Ms. TIEN LUU
Business Hours 612 9828-6549
Fax 98286519

PROFESSOR RHONDA GRIFFITHS
Business Hours 612 9612-0675
Fax 98286519

SSWAHS ETHICS APPROVAL PROJECT NO: 2007/151
BACKGROUND

Patient safety is highly important to improve the current health care system. Transferring patients between ward settings may be essential for patients to receive optimal care delivery.

WHY ARE WE DOING THIS STUDY?

A literature review indicated that the causes of errors and adverse events that occur during transfer of patients between care settings are frequently related to break-down of communication between clinicians and inadequate follow-up of patients.

Data from the IIMS database demonstrates that adverse events that occur during transfer of patients between care settings are attributed to:

- Unplanned transfers
- Break-down of communication
- Patient belongings, x-rays and own medications not accompanying transfer
PROJECT DESCRIPTION

The aim of this study is to test if interactive Patient Transition Checklist (iPTC) reduces errors and adverse events during care transfer.

Objectives

To determine whether the iPTC:

- Improves communication between nurses
- Ensures patient documentation and belongings accompany transfers
- Ensures appropriate referrals are undertaken
- Facilitate appropriate follow-up of patients
- Reduces the incidence of errors and adverse events associated with transition of patients between care settings

The study will only be done for 2 weeks
WHAT THE NURSE SHOULD DO?

1. The iPTC form (yellow form) to be completed by all nurses (RNs, ENs, AINs) working morning, afternoon and night shifts Monday to Sunday who are employed as permanent full time, part-time, casual, casual pool and agency staff.

Transferring Wards:

2. Complete the iPTC form (yellow form) and send the form with the patients when transferring to other wards.

Receiving Wards:

3. Locate the iPTC form (yellow form) and complete it when you receive patients from the other wards.

4. For patients transferring to a nursing home, complete the iPTC form and attached the iPTC form with the patient transfer summaries that accompany the patient.

5. Participate in a short survey (5 minutes) at the end of the two weeks period.

Please do not complete the iPTC form for patients transferring to the Aged Care Unit and Psychiatric Unit at Liverpool Hospital.
WHAT THE RESEARCHER WILL DO?

1. The researcher will visit the participating wards each morning and access the ward records (log book) to identify patients who have been transferred to another ward or discharged to a nursing home.

Wards:

2. Informed Consent will be obtained from the patients to access their medical records.

Audit:

3. The medical notes of patients transferred within the hospital after 48 hours of transfer will be audited to determine whether the iPTC is present and completed.

Nursing home:

4. The nursing home will be visited once each week, to audit their medical notes.

Please do not complete the iPTC form for patients transferring to the Aged Care Unit and Psychiatric Unit at Liverpool Hospital.

Remember this Study is only for 2 weeks.
FREQUENTLY ASKED QUESTIONS

1. **Will I be identified by participating in the study?**
   No, information collected by the research team will be de-identified.

2. **Would I receive incentive/payment for participating in the study?**
   There will be no incentive/payment for participation in this study, participation in this study is regarded as part of professional development.

3. **How will information, in all forms, be disposed?**
   The iPTC forms and survey forms will be shredded and destroyed after fifteen years as per the NHMRC guidelines.

4. **Am I able to access the findings of the study?**
   Yes, findings will be published in journals, presented at conferences and in-services in the wards.

5. **If I decide not to participate, what are the consequences?**
   You have to complete the iPTC form as part of the process of caring for your patients. After two weeks of study completion, the nurses’ survey is optional. Your decision whether or not to complete the nurses’ survey will not prejudice present or future relationship with Sydney South West Area Health Service or any other institution cooperating in this study.
APPENDIX 15: iPTC INFORMATION POSTERS

iPTC STUDY IN PROGRESS

iPTC EDUCATION BOOKLET LOCATED HERE

For further information contact Martha 9612 0679 or 0423 671 198

NOTE: TRANSFERS TO AGED CARE UNIT & PSYCHIATRIC UNIT IS EXCLUDED
COMPLETE iPTC
(YELLOW FORM)
WHEN PATIENT IS
TRANSFERRED AND
WHEN RECEIVED

For further information contact Martha 9612 0679 or 0423 671 198

NOTE: TRANSFERS TO AGED CARE UNIT &
PSYCHIATRIC UNIT ARE EXCLUDED
interactive PATIENT TRANSITION CHECKLIST (iPTC) FORMS ARE LOCATED HERE

For further information contact Martha 9612 0679 or 0423 671 198

NOTE: TRANSFERS TO AGED CARE UNIT & PSYCHIATRIC UNIT ARE EXCLUDED
APPENDIX 16: iPTC AUDIT DATA COLLECTION FORM

1. Patient Medical Record Number (MRN) _______________________
2. Date of Birth ________________________
3. Age Band ________________________
4. Gender Female ☐ Male ☐

5. Primary Diagnosis (please state) ________________________
6. Secondary Diagnosis (please state) ________________________
7. History of previous illness (please state) ________________________

8. Has the following documentation been sent with patient and can be located?

<table>
<thead>
<tr>
<th>Documentation</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARDS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admission Form</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Clinical Records</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Up to date Nursing Notes</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Current Medication Chart</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Fluid chart orders</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Patient’s own medications</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>X-rays</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Does the patient have an intravenous cannula inserted?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>If yes, does it indicate when was it inserted?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Does it state insertion site?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Has Intravenous Cannula Record completed?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

9. Description of assessments completed?

<table>
<thead>
<tr>
<th>Assessment</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falls Risk Assessment</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Waterlow Scale Assessment</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Mattress ordered</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Discharge Risk Screening Form</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

10. Description of referrals been made and documented?

<table>
<thead>
<tr>
<th>Referral</th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Worker</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Speech Pathologist</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Dietician</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other (please state)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Is the patient scheduled for investigations/scans</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
**WARDS OR NURSING HOME**

11. Has it been **ticked** by receiving ward that:

<table>
<thead>
<tr>
<th>Task</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet updated on Power Chart</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meal given prior to transfer (if appropriate)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient escorted (if appropriate)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone Nursing Handover?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient informed of transfer?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient informed of reasons of transfer?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Next of Kin informed of transfer?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient’s belongings begged and labelled?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipments organised e.g. oxygen cylinder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient orientated to receiving ward?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. Has it been **ticked** by receiving ward that:

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dentures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye Glasses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hearing aids</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking frame</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NURSING HOME**

13. Has the following been **ticked** and **completed**?

<table>
<thead>
<tr>
<th>Task</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Discharge Planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Discharge Checklist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intravenous cannula removed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. Has the following been **sent** with the patient discharged to a nursing home?

<table>
<thead>
<tr>
<th>Task</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Transfer Form</td>
<td></td>
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<tr>
<td>Medical/Surgical/Allied Health Discharge Summary</td>
<td></td>
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<td></td>
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<tr>
<td>Was the facility informed about patient discharge?</td>
<td></td>
<td></td>
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<tr>
<td>Has medications sent with patient (if needed)</td>
<td></td>
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</tbody>
</table>

15. What where the comments made?

___________________________________________________________________________
___________________________________________________________________________
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___________________________________________________________________________
Dear Nurses

The Pilot PTC study has now been completed, we would like to know if the PTC form was useful and effective for transferring and receiving patients as was well as for the ongoing care of the patients. All information provided will be de-identified. Please tick the box which corresponded with your experience of using the PTC form. Your cooperation in completing this form is appreciated.

Ward/Facility________________ Designation __________ RN □ EN □ AIN □
Duration of working in current ward_________ Number of years nursing experience_______

1. Have you been involved in: YES NO
   a) completing the iPTC form for transferring and receiving patients □ □
   b) caring for a patient who had the PTC form □ □

2. Did the iPTC assist you to:
   a) prepare documentation to accompany patient transfer? .......................................................... □ □ □ □ □ □ □ □ □
   b) prepare patients for transfer to a ward/facility? .......................... □ □ □ □ □ □ □ □ □
   c) admit patients to receiving ward?.......................... □ □ □ □ □ □ □ □ □
   d) complete the intravenous record form? .......................... □ □ □ □ □ □ □ □ □

3. Did the iPTC prompt you to:
   a) complete assessments of patients? ......................... □ □ □ □ □ □ □ □ □
   b) communicate with other nurses? .......................... □ □ □ □ □ □ □ □ □
   c) liaise with other allied health professionals? .............. □ □ □ □ □ □ □ □ □
   d) ensure patient belongings were sent to ward? .............. □ □ □ □ □ □ □ □ □
4. **How would you rate your satisfaction with the iPTC form?**
- Excellent
- Very Good
- Good
- Fair
- Poor

5. **Were the instructions provided on the iPTC form clearly explained?**
- Excellent
- Very Good
- Good
- Fair
- Poor

6. **Were the instruction provided on the iPTC form easy to follow?**
- Excellent
- Very Good
- Good
- Fair
- Poor

7. **Would you use the iPTC form again?**
- Yes
- No
- Maybe

8. **Would you recommend the iPTC form to other wards?**
- Yes
- No
- Maybe

9. **Are there any comments/suggestions you would like to make on the iPTC form?**

_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

**THANK YOU VERY MUCH FOR PARTICIPATING IN THIS SURVEY**

Please return the questionnaire to the survey box located at the Nurses’ Station
If you have any questions, please contact
Ms Martha Mansah, Centre for Applied Nursing Research
South Western Sydney Area Health Service, Locked Bag 7103
LIVERPOOL BC 1870
Phone: (02) 9612 0679
Email: martha.mansah@sswahs.nsw.gov.au
APPENDIX 18: iPTC GUIDE TO THE STUDY

iPTC Guide for the Wards

Welcome to the iPTC Study, this is a Pilot Study occurring in Liverpool Hospital for two weeks. The following is a guide to use to collect data. Please see me if you require clarification or have question.

1. Each morning visit the participating wards, check the transfer/discharge log book to determine any transfer to the wards or nursing home.

2. Make a list of all patients transferred in to the ward and transfer out of the ward (the log book is usually located at the front desk of the nurses station or in the NUMS office).

3. Locate patient file and locate iPTC form, If iPTC form is completed, ask the Nurse if you can see the patient, go to the patient and obtain Informed Consent, explain the study, give information letter and get them to sigh the Informed Consent.

4. If consent is obtained, then you can audit the patient medical record.

5. Use the data collection form to abstract information regarding the completion of the iPTC form and check to make sure it corresponds with the audit.

6. When finished, remove the iPTC form from the file as it belongs to CANR, allocate a code number.
iPTC guide for the Nursing Homes

Please follow these guidelines for patients discharge to a nursing home

1. Each morning visit the participating wards, check the transfer/discharge log book to determine any transfer to the nursing home

2. Make a list of all patients transferred in to the ward and transfer out of the ward (the log book is usually located at the front desk of the nurses station or in the NUMS office)

3. Contact the nursing home DON to gain access to visit the nursing home, on the phone, explain the study and fax a copy of the Ethics Approval

4. Visit the nursing home once each week to obtain Consent from the resident to access the medical records

5. Explain to the nurses you are going to check the patient medical notes

6. Use the data collection form to abstract information regarding the completion of the iPTC form

7. When finished, remove the iPTC form from the file as it belongs to CANR, allocate a code number.
<table>
<thead>
<tr>
<th>PATIENT FULL NAME</th>
<th>TRANSFER IN</th>
<th>iPTC COMPLETED</th>
<th>TRANSFER OUT</th>
<th>iPTC COMPLETED</th>
<th>DISCHARGE TO NH</th>
<th>CONSENTED</th>
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Dear Mrs Mansah,

Project No 2007/151 - Initiation of a Patient Transition checklist in a Metropolitan Hospital.

The SSWAHS Human Research Ethics Committee wishes to acknowledge receipt of your correspondence with regards to the above project.

As all of the issues raised by the Committee have now been satisfactorily addressed, formal approval is hereby granted for this study to proceed as a Category A Project. The committee has approved the following amended documentation:

- Participant Information Statement – Version 1 17-1-08
- Consent form for patients – Version Date 1 17-1-08
- Participant Information Statement for residents – Version 1 17-1-08
- Consent Form for residents – Version 1 Date 17-1-08
- Participant information statement for Person Responsible – Version 1 17 Jan 08
- Consent Form for Person Responsible – (no identifying footer)
- Patient Transition Checklist (PTC)

Ethics clearance is granted for periods of up to twelve months. This project will be due for renewal on 30th November, 2008 and you must provide a Progress Report (attached) or final report by this date. If no report is supplied, ethics clearance for this project may be cancelled.

Your attention is drawn to the attached document Guidelines for Investigators which sets out not only the principles under which research should be conducted, but also the conditions under which Ethics approval is granted by the Committee. Also enclosed for your information, is a copy of the document Guidelines for Responsible Practice in Research and Dealing with Problems of Research Misconduct.

Please note that the Committee must be notified IMMEDIATELY of any untoward or unexpected complications or side effects arising during the project or of any ethical or medico-legal problems that may arise. Also, any changes to the original protocol must be submitted to the Committee for approval.

Would you please quote the above project number in all future correspondence relating to this project.

Yours sincerely,

PROFESSOR MICHAEL FROMMER
Chairperson
SSWAHS Human Research Ethics Committee

For: Mr Mike Wallace
Chief Executive, SSWAHS

Category A: Projects with limited risk potential, including quality assurance surveys.
Category B: Projects with significant patient risks.
Category C: Drug trials (international/national) sponsored by drug companies and already covered for risk evaluation and monitoring of adverse reactions.
Office of Research Services

Martha Mansah
8 Plum Close
Casula
NSW 2170

9th April 2008

Dear Martha,

I'm writing to advise you that the Human Research Ethics Committee Executive has reviewed the following application at its meeting on 3 March 2008 and has agreed to approve the project.

TITLE: Initiation of a patient transition checklist in a Metropolitan Hospital

The Protocol Number for this project is HREC 08/025. Please ensure that this number is quoted in all relevant correspondence and on all information sheets, consent forms and other project documentation.

Please note the following:

1) The approval will expire on 30 November 2008. If you require an extension of approval beyond this period, please ensure that you notify the Human Ethics Officer (humanethics@uws.edu.au) prior to this date.

2) Please ensure that you notify the Human Ethics Officer of any future change to the research methodology, recruitment procedure, set of participants or research team.

3) If anything unexpected should occur while carrying out the research, please submit an Adverse Event Form to the Human Ethics Officer. This can be found at http://uws.edu.au/about/adminorg/devint/ors/ethics/humanethics/endproject

4) Once the project has been completed, a report on its ethical aspects must be submitted to the Human Ethics Officer. This can also be found at http://uws.edu.au/about/adminorg/devint/ors/ethics/humanethics/endproject

Finally, please contact the Human Ethics Officer, Susannah Willcox on (02) 4736 0883 or at s.willcox@uws.edu.au if you require any further information.

The Committee wishes you well with your research.

Yours sincerely,

Susannah Willcox
Human Ethics Officer
INITIATION OF A PATIENT TRANSITION CHECKLIST (IPTC) IN A METROPOLITAN HOSPITAL

Dear patient

You are invited to participate in a study, which is testing a new method to improve the care for patients when they are transferred within the hospital or to a nursing home. The new method involves the nurses completing a specialised form for patients during transferring and receiving patients. As part of the research, we are required to audit your medical records to determine whether the form has been completed. We therefore require you to give us permission to access your medical records. You were selected as a possible participant in this study because you receive care within the Liverpool hospital.

It is anticipated that you will not incur any additional costs if you participate in this study. You will not receive any payment for participating in this study. There are no risks in this study; information provided in this study will remain confidential. The forms will be coded and all data will be de-identified. You are free to refuse or withdraw from the study at any time, without giving a reason or without any negative consequences to your treatment. Findings from this study will be presented at conference papers and published in peer reviewed journals.

If you have any questions, please feel free to ask us. If you have additional questions later your study researcher Martha Mansah will be pleased to answer them (phone: 9612 0679, email martha.mansah@sswahs.nsw.gov.au). Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service, locked bag 7017, Liverpool BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, email jennie.grech@sswahs.nsw.gov.au).

This form is for you to keep.

Yours sincerely

Martha Mansah (principal researcher)
Dear resident

You are invited to participate in a study, which is testing a new method to improve the care for patients when they are transferred within the hospital or to a nursing home. The new method involves the nurses completing a specialised form for patients during transferring and receiving patients. As part of the research, we are required to audit your medical records to determine whether the form has been completed. We therefore require you to give us permission to access your medical records. You were selected as a possible participant in this study because you receive care within the Liverpool hospital.

It is anticipated that you will not incur any additional costs if you participate in this study. You will not receive any payment for participating in this study. There are no risks in this study, information provided in this study will remain confidential. The forms will be coded and all data will be de-identified. You are free to refuse or withdraw from the study at any time, without giving a reason or without any negative consequences to your treatment. Findings from this study will be presented at conference papers and published in peer reviewed journals.

If you have any questions, please feel free to ask us. If you have additional questions later your study researcher Martha Mansah will be pleased to answer them (phone: 9612 0679, email martha.mansah@sswahs.nsw.gov.au). Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service, locked bag 7017, Liverpool BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, email jennie.grech@sswahs.nsw.gov.au).

This form is for you to keep.

Yours sincerely

Martha Mansah (principal researcher)
INITIATION OF A PATIENT TRANSITION CHECKLIST (iPTC) IN A METROPOLITAN HOSPITAL

Dear Principal Carer

We are testing a new method to improve the care for patients when they are transferred within the hospital or to a nursing home. This new method involves the nurses completing a specialised form when transferring and receiving patients. As part of the research, we are required to audit your family member medical records to determine whether the form has been completed. We therefore require you to give us permission to access your family member’s medical records.

It is anticipated that you and your family member will not incur any additional costs for participating in this study. In addition, no payments will be made for participating in this study. Information provided in this study will remain confidential. The forms will be coded and all data will be de-identified. You are free to refuse or withdraw from the study at any time, without giving a reason or without any negative consequences to your family member’s treatment or your relationship with the hospital. Findings from this study will be presented at conference papers and published in peer reviewed journals.

If you have any questions, please feel free to ask us. If you have additional questions later your study researcher Martha Mansah will be pleased to answer them (02 9612 0679, email martha.mansah@sswahs.nsw.gov.au).

Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service, Locked Bag 7017, LIVERPOOL BC, NSW, (phone 9612 0614, fax 9612 0611, email jennie.grech@sswahs.nsw.gov.au).

This form is for you to keep.

Yours sincerely

Martha Mansah (principal researcher)
INITIATION OF A PATIENT TRANSITION CHECKLIST (IPTC) IN A METROPOLITAN HOSPITAL

1. I, ................................................................................................................................ of ........................................,
   ........................................................................, aged ......................................years,
   agree to participate as a subject in the study described in the participant information
   statement set out above (or: attached to this form).

2. I acknowledge that I have read the Participant Information Statement, which explains why I
   have been selected, the aims of the study and the nature and the possible risks of the
   investigation, and the statement has been explained to me to my satisfaction.

3. I have been given the opportunity to ask any questions relating to any possible physical and
   mental harm I might suffer as a result of my participation. I have received satisfactory
   answers to any questions that I have asked.

4. My decision whether or not to participate will not prejudice my present or future treatment
   or my relationship with South Western Sydney Area Health Service or any other institution
   cooperating in this study. If I decide to participate, I am free to withdraw my consent and to
   discontinue my participation at any time without prejudice.

5. I agree that research data gathered from the results of the study may be published, provided
   that I cannot be identified.

6. I understand that if I have any questions relating to my participation in this research, I may
   contact the study researcher Ms Martha Mansah on telephone (02) 9612 0679, who will be
   happy to answer them.

7. I acknowledge receipt of a copy of the Participant Information Statement.

Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service,
Locked Bag 7017, LIVERPOOL BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, email
jennie.grech@sswahs.nsw.gov.au).

Signature of Participant __________________ Signature of witness____________________
Please PRINT name __________________ Please PRINT Name____________________
Date_____________________________ Date________________________
Signature of investigator ________________________
Please PRINT Name Martha Mansah
Date: ______________________________
INITIATION OF A PATIENT TRANSITION CHECKLIST (PTC) IN A METROPOLITAN HOSPITAL

1. I, .................................................................................. of .........................................
   ........................................................................, aged ......................................years,
   agree to participate as a subject in the study described in the subject information statement
   set out above (or: attached to this form).

2. I acknowledge that I have read the Subject Information Statement, which explains why I
   have been selected, the aims of the study and the nature and the possible risks of the
   investigation, and the statement has been explained to me to my satisfaction.

3. I have been given the opportunity to ask any questions relating to any possible physical and
   mental harm I might suffer as a result of my participation. I have received satisfactory
   answers to any questions that I have asked.

4. My decision whether or not to participate will not prejudice my present or future treatment
   or my relationship with South Western Sydney Area Health Service or any other institution
   cooperating in this study. If I decide to participate, I am free to withdraw my consent and to
   discontinue my participation at any time without prejudice.

5. I agree that research data gathered from the results of the study may be published, provided
   that I cannot be identified.

6. I understand that if I have any questions relating to my participation in this research, I may
   contact the study researcher Ms Martha Mansah on telephone (02) 9612 0679, who will be
   happy to answer them.

7. I acknowledge receipt of a copy of the Subject Information Statement.

Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service,
Locked Bag 7017, LIVERPOOL BC, NSW, 1871 (phone 9612 0614, fax 9612 0611,
Email jennie.grech@swsahs.nsw.gov.au).

Signature of subject ___________________________ Signature of witness ___________________________
Please PRINT name ___________________________ Please PRINT name ___________________________
Date ___________________________ Date ___________________________
Signature(s) of investigator(s) ___________________________
Please PRINT Name ___________________________
Date: ___________________________
APPENDIX 26: CONSENT FORM FOR PRINCIPAL CARERS

INITIATION OF A PATIENT TRANSITION CHECKLIST (IPTC) IN A METROPOLITAN HOSPITAL

1. I, ............................................. (Principal carer) of ...............................................on behalf of .........................................................., aged .....................................years, agree for my family member to participate as a subject in the study described in the principal carer information statement set out above (or: attached to this form).

2. I acknowledge that I have read the Principal Carer Information Statement, which explains why my family member have been selected, the aims of the study and the nature and the possible risks of the investigation, and the statement has been explained to me to my satisfaction.

3. I have been given the opportunity to ask any questions relating to any possible physical and mental harm my family member might suffer as a result of participation in the study. I have received satisfactory answers to any questions that I have asked.

4. My decision whether or not my family member participation will not prejudice my family member present or future treatment or my relationship with South Western Sydney Area Health Service or any other institution cooperating in this study. If I decide for my family member to participate, I am free to withdraw my consent and to discontinue my family member participation at any time without prejudice.

5. I agree that research data gathered from the results of the study may be published, provided that my family member cannot be identified.

6. I understand that if I have any questions relating to my family member participation in this research, I may contact the study researcher Ms Martha Mansah on telephone (02) 9612 0679, who will be happy to answer them.

7. I acknowledge receipt of a copy of the Principal Carer Information Statement.

Complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service, Locked Bag 7017, LIVERPOOL BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, Email jennie.grech@swsahs.nsw.gov.au).

<table>
<thead>
<tr>
<th>Signature of subject</th>
<th>Signature of witness</th>
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<td>Please PRINT name</td>
<td>Please PRINT name</td>
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<td>Date</td>
<td>Date</td>
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Signature(s) of investigator(s)

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<tr>
<th>Please PRINT Name</th>
<th>Martha Mansah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td></td>
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</tbody>
</table>
Dear Colleague

You are invited to participate in a pilot study, which is evaluating a new method to reduce errors and adverse events when patients are transferred between care settings. This study will be conducted in Liverpool hospital in the period of two weeks.

As part of the study, you will be required to complete an interactive Patient Transition Checklist (iPTC) form when transferring patients to the wards and nursing homes. The iPTC form should also be completed when patients are transferred to your ward. At the completion of the study, you are required to complete an iPTC survey seeking information about the usefulness and satisfaction of the iPTC form. That information will assist in developing and improving the iPTC form. It is anticipated that this survey will take five minutes to complete. Findings from this study will assist in the development of strategies for the reduction of errors and adverse events during care transition and assist in future implementation of a larger study.

It is anticipated that you will not incur any costs if you participate in this study. You will not receive any payment for participation in this study. Information provided in this study will remain confidential. Survey forms will be coded and all data will be de-identified. You are free to refuse or withdraw from the study at any time, without giving a reason or without any negative consequences to your employment. Findings from this study will be presented at conferences and published peer reviewed journals.

If you have any questions, please feel free to ask us. If you have additional questions later your study researcher Martha Mansah will be pleased to answer them (phone: 9612 0679, email martha.mansah@sswahs.nsw.gov.au).

complaints may be directed to the Ethics Secretariat, South Western Sydney Area Health Service, locked bag 7017, Liverpool BC, NSW, 1871 (phone 9612 0611, fax 9612 0614, email jennie.grech@sswahs.nsw.gov.au).

This form is for you to keep.

Your participation is highly valued.

Yours sincerely

Martha Mansah
Principal Researcher