

## FROM THE EDITOR - Jackie Jones

### POLITICAL SCHOLARSHIP: NURSING, KNOWLEDGE, EVIDENCE AND PATIENT CARE

Nurses are now considered 'knowledge workers'. How our knowledge is developed and perpetuated to new generations of nurses and the discipline is the cause of ongoing concern (DEST 2002). From within an international context (Australia and Canada), Borbasi and Caelli, in our guest editorial, debate the nexus between a research agenda and academia (knowledge production) and the risks that having such a road map can have on practice. These matters are of importance to the image nursing portrays to the public and policy makers, and the capacity nurses have for participating in the larger health agenda of a nation. The recent challenges faced by nurses in Queensland in speaking out against poor medical practice (BRNM 2005), for example, highlight the complexities of participation and the potential consequences of inaction.

However, journalist Suzanne Gordon, in conversation with Armstrong (2005) argues that nurses need to move beyond their current 'protest narrative' of difficulties with staffing and workloads and move toward telling 'practice narratives'. These practice narratives suggest that nurses are really 'rescue workers' who 'rescue patients from the risks and consequences of illness, and the risks and consequences of treatment of illness' (p.15). Communication, negotiation, advocacy and collective action are promoted as solutions to dysfunctional power driven health care teams and systems deterioration. Failure to hear what nurses are saying may be a language issue, or as Gordon points out, it may be that others 'must be helped to understand that they are missing the point', that 'its not a power issue it's a patient care issue' (Armstrong 2005, p.17).

Scholarship in the articulation of practice knowledge, its context and its data are vital to the development and documentation of potent practice and health narratives that show nurses make a difference in the lives of people who need their care; and how nurses also facilitate the enhancement of individuals' capacity for self management in chronic illness and disability trajectories. In this issue, examples of how nurses can challenge existing knowledge for the patients' advantage and how knowledge and education impact on patient outcomes are explored.

Ryan reports on a pilot trial of a 23-hour care centre at a principal referral hospital in Sydney. Its primary aim was to provide efficient and high quality care to patients requiring a brief stay in hospital for surgical or medical procedures within one coordinated unit.

Blay and Donoghue describe a randomised controlled study that sought to determine if pre-admission patient education affects post-operative pain levels, domiciliary self-care capacity and patient recall following a laparoscopic cholecystectomy. They found that pre-admission education intervention helps reduce

postoperative pain levels and significantly increases patients' knowledge of self-care and complication management.

McMurray et al investigate recovery from total hip replacement over a three-year period on the basis of patient perceptions of: health-related quality of life, demographic and clinical characteristics; use of and satisfaction with health services; unmet health needs; and, social re-engagement. Recovery after hip replacement surgery is dramatic, especially in alleviation of pain, but for older patients, there is a subsequent decline in general health concomitant with others in this demographic group.

Campbell and Torrance explore self-reported changes in coronary risk factors by patients three to nine months following coronary artery angioplasty. Although the majority of patients had altered their lifestyle and reduced at least one risk factor, 40% of patients in this study had a recurrence of chest pain and 42% believed their condition had been cured. Diet modification, increased exercise and stress reduction were the top three changes in lifestyle reported. The findings suggest there is a major need for better health education and follow-up for patients after coronary artery angioplasty.

In order to influence how we measure and determine practice knowledge Fisher and colleagues challenge the construct validity of critical care competency standards as a tool for assessing the clinical practice of specialist level critical care nurses in Australia.

Pelletier et al sought to determine the frequency and time of day that documentation and transfer of clinical information activities occurred for nurses of all skill levels in two aged care facilities in Australia. Over 16,000 observations of nursing activities were recorded. While documentation may take up less time than perceived by nurses these authors emphasise the need to re-structure the workday in terms of documentation to achieve greater efficiencies or effective use of nursing time.

Finally, Wang and Moyle provide a critical review of contemporary literature published between 1992 and 2003 on the use of physical restraints with residents in long-term care. They argue that despite nurses' desire to use physical restraint for protection, there is no scientific evidence that physical restraint actually protects residents against injuries.

## REFERENCES

- Armstrong, F. 2005. Advocating nursing. *Australian Nursing Journal*. May 12(10):14-15, 17.
- DEST, 2002. *National review of nursing education: Our duty of care*. Commonwealth Department of Science Education and Training: Canberra. [www.dest.gov.au](http://www.dest.gov.au).
- Bundaberg and Region News Mail (BRNM). 2005, Hospital horror stories were avoidable: Nurse. 18 April. [www.newsmail.com.au](http://www.newsmail.com.au).

## GUEST EDITORIAL - Dr Sally Borbasi, RN, PhD, Australia, and Kate Caelli, RN, RM, PhD, Canada

### NURSING'S ACADEMIC FUTURE IN AUSTRALIA: IS IT DEPENDENT ON SETTING A NATIONAL NURSING RESEARCH AGENDA?

#### Sally Borbasi argues it does

Recently the Australian Council of Deans held a commemorative dinner to celebrate 20 years since the education of all registered nurses was transferred to the higher education sector in Australia. While there is a lot to be celebrated in our achievements, we must guard against complacency.

In such uncertain times it would be unwise to assume nursing's place in the academy is guaranteed. Ask yourself, what are the cornerstones of academic endeavour? You would agree they are teaching, research and scholarship. Teaching, of course, we are good at - if you consider how many hours the average nursing academic spends in the classroom, or on the wards teaching, it will amount to plenty. More especially, consider the hours spent preparing new topics for new curricula! But what about the other half of the equation: the R&D? Have we spent the equivalent time and effort in research and scholarship? Is nursing up to par with other disciplines in the research stakes, and how would we fare, for example, in any research assessment exercise?

Headlines on the front page of the *Sydney Morning Herald* on 9 June last year stated 'Top uni dumps nurse training'. More recent headlines this time in *The Australian Higher Education Supplement* assert 'sterile nursing schools limit research' and the author goes on to propose the move to university education has been largely geographical that there is a dearth of research and scholarship in many schools of nursing (Russell 2004, p.32). There is even a suggestion that due to its lack of emphasis on developing quality research programs, nursing should not be located within the university sector! Perhaps it was that the University of Sydney harboured similar sentiments! Consider too, while it reviews the requirement that all universities undertake research as well as teaching, the Australian Government is currently making moves to significantly liberalise higher education. Its research quality framework initiative is already underway and 1 July - when the Government takes control of the Senate - is looming. For nursing, which is not yet fully established as a research oriented discipline, what will it mean for our place in academe? As we sit here celebrating our 20th anniversary, can we be sure there will be a 40th?

If ever the time was right for nursing to take a long hard look at its R&D agenda - and most importantly *set it* - I believe it is now. There is an urgent need for a

nationally coordinated approach to developing and implementing research policy and this should be brought about by a strong and cohesive group of academic and clinical nursing professionals. This venture would be founded on three components:

1. The establishment of an Australian Institute of Nursing Research (AINR) to clarify our research objectives and enhance collaboration and coordination of nursing's research agenda.
2. The compilation of a comprehensive profile/database of existing nursing research.
3. The development of a set of national nursing research priorities.

To cement our place in the academy, nursing has to demonstrate it is serious about ensuring maximum outcomes for the Australian public. Articulating nursing's research agenda through a powerful national body (plus its advisory council); identifying existing areas of research strength and setting national nursing research priority areas and programs to promote the implementation of research findings are strategic approaches to assist this endeavour. The aim would be to build communities of scholars that include clinicians, academics and higher degree students around programs of (multidisciplinary) research in priority areas who would have the capacity to respond quickly to research opportunities, build track records and network internationally.

To do this successfully, however, we have to look to the future as a united front. We have a much greater chance of influencing the nation's health agenda and ultimately the health of its constituents as a collective. One final word to the lingering skeptics among you, if we do this right, it need not be exclusive/divisive nor will it deny investigator driven research.

#### REFERENCE

Russell, S. 2004. Sterile nursing schools limit research. *The Australian Higher Education Supplement*. November 24:32.

#### Kate Caelli, RN, RM, PhD, argues it doesn't

The assertions thus far infer that nursing will not be able to maintain its place within universities unless the research agenda is controlled, that nursing is somehow at risk. But is it? Nursing practice has become

increasingly more complex and its practices more expert. There is little research evidence to support a return to a hospital-based or TAFE (technical college) style of nursing education, and much evidence that shows clearly that the more educated the nurses, the better the outcomes for patients in their care. Nor is it the case that Australian nursing does not have a strong and vital research culture, whatever some detractors might claim. What is the case is that competing for research monies implies rivalry, antagonism, challenge, opposition and contention, a situation that calls into question any allegations against the nursing research culture.

I do *not* argue against the establishment of a set of guiding principles for nursing research nationally. In fact, the identification of key research areas is part of the role of discipline committees within funding bodies. However, an agenda is *not* a set of principles or guidelines, nor is it a filter for what can be funded. An agenda is a program, a schedule, a plan, or set of items to be addressed. Thus, setting a nursing research agenda would, of necessity, mean that some things would be included and others excluded. The separatist nature of such an agenda is hotly denied by its advocates, but the reality is that even an elected group of nurse researchers would not be able to include all the possible research ideas and approaches necessary for it to be fully inclusive. Nursing practice varies extraordinarily widely, and one practice-based research question can have little meaning to someone based in another type of practice altogether.

The most common solution to heavy teaching loads in high-content university programs, where teaching impacts research outcomes, is to 'divide and conquer'; many disciplines employ this strategy. Disciplines like engineering, medicine, psychology, and computer science, to name just a few, employ an unwritten policy of graded appointments; some focused heavily toward research with a minor teaching component, and some the reverse. Unquestionably, this strategy fits well with the notion of academic freedom, and has been successful. The reasons

behind nursing's failure to propose this commonly used and less divisive solution are a mystery to me. It is true that those appointments with a predominantly teaching focus do not generally reach the status of full professor, however it is also the case that not every academic ardently wants to be a researcher, or to take on the responsibility of professorial status either.

Hitler showed us that a set research agenda is a dangerous and unpredictable thing. His regime caused the research agenda in WWII Germany to be re-focused entirely toward achieving war readiness. *En masse*, scientists were diverted from current work and redirected towards the agenda. In the process, a number of abstract, highly experimental research efforts were abandoned. At the time, a German company, Telefunken, led the world in radar developments. Germany abandoned work on abstract calculations about radar and focused their efforts entirely on refining ship radar. Robert Watson-Watt, a Scottish scientist, continued the abstract work and, using ideas about frequency initiated in Germany during a visit to Telefunken in the mid 1930s, got the Doppler radar system to work. The Doppler radar system is credited for the Allied victory in WWII! The moral of this story - a set research agenda can exclude the very things you most want and need to know!

Abraham Lincoln's assertion that 'a house divided cannot stand' has been a well-accepted axiom for almost 150 years. A set research agenda is a divisive tactic that will cause alienation and division among nurse academics. Giving people a choice is always a better option than division or force. Creating an agenda for nursing research will do little to advance the cause of nursing research, and may, in fact, discourage new and exciting research ideas even more than heavy teaching loads have managed to do. Controlling the creative mind should not be an option. Indeed, it would be totally unacceptable in any other discipline. Nurturing nursing's creative minds via a reduction in teaching loads is the only proven way forward to increase research outcomes.

# 23-HOUR CARE CENTRE: CHANGING THE CULTURE OF CARE

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## ABSTRACT

### **Aim:**

A 23-hour Care Centre was created at a principal referral hospital in Sydney in 2003. Its primary aim was to provide efficient and high quality care to patients requiring a brief stay in hospital for surgical or medical procedures, within one coordinated unit.

### **Design:**

The features underlying the 23-hour Care Centre as an innovative model of care were the clinical guideline driven approach and nurse-initiated discharge.

### **Sample:**

All patients, emergency and elective as well as surgical and medical, who fitted the following criteria were admitted as '23-hour patients' to the Centre. The criteria were: absolute expectation of discharge within 24 hours; pre-admission screening by a nurse screener (if elective admission); agreed clinical guideline in place; and, agreement to protocol-based, nurse-initiated discharge.

### **Results:**

Following the first three months of the 23-hour Care Centre, 1601 patients utilised the 23-hour Care Centre as follows: 593 day only patients, 410 DOSA (day of surgery admission) patients and 598 23-hour patients. Excluding inappropriate admissions, overall discharge compliance was 83%.

### **Conclusion:**

From the results generated throughout the trial it has become evident that the new clinical area offers a

workable system of health care delivery for patients who require a brief stay in hospital, as it promotes an efficient use of hospital beds and services without compromising patient outcomes. However, further research is required to compare the efficiency and outcomes of care directly with that provided by the traditional inpatient hospital system.

## INTRODUCTION

In the face of rising health care costs in Australia, the search for effective means to reduce a patient's length of stay while maintaining high quality care have continued. There has been a progressive move toward increased efficiency in the management of patients requiring admission to hospital for short stay procedures. This trend has also been driven by the demand for services and the requirement to decrease cancellation rates due to lack of beds.

In January 2003, a 23-hour Care Centre was opened at Royal North Shore Hospital, a principal referral hospital in Sydney, Australia. In this move, the surgical bed base was remodelled, resulting in consolidation of flexibly available beds for one 25-bed ward. A key feature of the 23-hour Care Centre was that it catered for surgical and medical elective and emergency admissions, through the use of established clinical guidelines and nurse-initiated discharge protocols. Each clinical guideline was department and procedure specific with each member of the relevant department having to agree to the guidelines.

This paper describes the evolution, structure and process encountered in opening the 23-hour Care Centre. The results of a three-month pilot project are presented.



## 23-HOUR CARE CONCEPT

The 23-hour Care Centre is based on the concept that the episode of surgical care for the majority of patients should be managed within the confines of a single physical unit within a 24 hour time period. At the end of that time period most patients should be able to be discharged home. Those requiring ongoing care would be discharged to an inpatient ward, with those patients requiring intensive or high dependency care being managed within the process.

The fundamental principles underpinning the 23-hour Care Centre are:

- The majority of patients undergoing elective or emergency procedures (surgical and medical) require only pain relief and monitoring in a supervised setting until fit for discharge.
- The majority of surgical and some medical patients can be managed completely within the confines of one single unit.
- clinical guideline driven approach.
- Absolute expectation that the patient will be discharged within 24 hours.
- Nurse-initiated discharge with no need for routine medical review prior to discharge for patients who fulfil the clinical guidelines.
- Facility for elective and emergency admissions requiring overnight care.

While various literature supports the introduction of either a surgical (Romano 2001) or medical (Burgess 1998; Abenhaim et al 2000) short stay or observation unit, there is little published information about combining the two specialties together. These studies reported a shorter length of stay, lower rates of in-hospital complications and lower rates of readmission for patients from short stay units, compared to patients admitted to the general ward areas.

A pure surgical ward has the potential to have fluctuating occupancy levels - due to operating room availability - and therefore not be a cost-effective model of care. Establishing a unit that manages surgical and medical admissions addresses this issue. A 23-hour Care Centre has the potential to generate significant cost savings and efficiencies for an organisation, with decreased length of stay, streamlined admission and discharge process and a more efficient use of staffing and hospital facilities.

The introduction of observation units within emergency departments (ED) is a trend that has evolved in recent years. In general these units have been aligned to their ED and managed by the emergency physicians. The establishment of such units has assisted in reducing the number of patients who have required a ward bed.

Patients have been admitted to the observation unit if it is anticipated that discharge will occur within 48 hours. Organisations who have established such systems have utilised a 90% discharge compliance to measure the success of their respective units. Similarly, a 90% discharge compliance benchmark was established for the 23-hour Care Centre to allow for direct comparisons with other hospital units

The staff due to work within the 23-hour Care Centre were concerned that the introduction of such a model may lead to a decrease in the clinical expertise of nursing staff as speciality skills are overtaken by the need for generalist skills. From our pilot project, however, we have found that the 23-hour Care Centre provides an opportunity for the exploration of a new speciality and culture within nursing. There has been a flow on effect throughout other wards within the hospital, who are now receiving fewer outlier patients and predominantly higher acuity patients related to their speciality. This provides a different challenge for effective patient management.

A key factor in the successful implementation has been the use of clinical guidelines with nurse-initiated discharge practices. Clinical guidelines incorporate the managed care concept of utilising collaborative and multidisciplinary health care delivery in the pursuit of total patient care (Scott 1994). The procedure specific clinical guidelines, is a structured double-sided document that allocates patient care into six-hourly time periods. These time periods allow for the documentation of care by all members of the health care team with the nursing staff coordinating the patient management and monitoring outcomes. It allows for variances to be highlighted as early as possible so review and possible intervention can occur, thereby not unnecessarily increasing length of stay. The strength of the concept is its ability to address and outline the essential components of care in a coordinated manner (Scott and Scott 1998), whilst providing cost-effective and accessible care to patients (Apker and Fox 2002) in a time-orientated manner.

Nurse-initiated discharge provides a unique opportunity for effective patient management provided by nursing staff, while maintaining a multi-disciplinary team oriented approach. Current practice throughout Australia is very limited in nurse-initiated discharge. Incorporated within the nurse-initiated discharge system is the Modified Post Anaesthetic Discharge Scoring System (MPADSS). The MPADSS system provides an assessment tool for nursing staff to see where the patient is post anaesthetic (Chung et al 1996), as it has five components reflecting:

- vital signs,
- ambulation,
- nausea/vomiting,
- pain, and,
- surgical bleeding.

The combination of procedure specific and anaesthetic related discharge criteria allows clinicians to make decisions regarding patients' readiness for discharge based on a structured reliable guide.

## METHOD

### Patient selection

Once the hospital accepted a request for admission form, it was assessed by the nurse screener (in the pre-admission clinic) to determine the patient's suitability for the 23-hour Care Centre. Suitability was dependent on the documented admission criteria of the 23-hour Care Centre. If the request for admission form was not a surgical patient, then the clinical bed manager would determine the patient's suitability for the 23-hour Care Centre or an inpatient ward bed. The nurse screener would review the patient's health questionnaire to determine their pre-admission requirements. If a pre-admission clinic appointment was required then the nurse screener coordinates this process in liaison with administrative staff and all pre-operative requirements for the patient are attended. Patients suitable for admission into the 23-hour Care Centre included day only patients, screened day of surgery admissions and 23-hour patients.

### Clinical guidelines

Clinical guidelines were developed for each admission type, encompassing both elective and emergency admissions, as well as surgical and medical conditions. Each guideline provided for protocol-based, nurse-initiated discharge, subject to fulfilling agreed criteria. Each clinical guideline was department and procedure specific with each member of the relevant department having to agree to the guidelines. Patients were not accepted into the 23-hour Care Centre unless an agreed clinical guideline was in place.

### Patient management

On day of surgery, a patient will have a nursing assessment and pre-operative checklist completed by a member of the nursing staff. The patient waits in the pre-operative waiting area until called for surgery, at which time they change into a hospital gown, ready for escort to operating rooms. The purpose of keeping the patients in the waiting area for as long as possible is to keep them in their own clothes and allow them independence until the time of their procedure.

Following completion of the procedure, day only patients are transferred to stage 1 recovery, (located within the operating room complex), until such time as their clinical condition is assessed as stable. At this point, the patient is brought back to the 23-hour Care Centre for stage 2 recovery. Once a day only patient is considered to have stable haemodynamic observations and they are neurologically alert and orientated, the patient is assisted to change into their own clothes and then progress to the recliner chairs in the stage 3 recovery/discharge lounge

area. The patient continues to be observed in this area until they are discharged.

23-hour patients are managed in a similar fashion to the day only patients. The main exception is that all these patients have a clinical guideline, which outlines the specific care they need to receive in the post-operative period. The stage 3 recovery/discharge lounge area is also utilised once the patient has been assessed by the nursing staff as ready for discharge. The patients do not sleep in the stage 3 area and are considered discharged once they have left the stage 3 recovery/discharge lounge area. Those patients who present to hospital for procedures which require a post-operative length of stay beyond 23-hours, are transferred from stage 1 recovery to a suitable inpatient ward area for the remainder of their hospitalisation.

All 23-hour patients are given a follow up phone call on the day following discharge to see if they have any specific questions and to check on their recovery. This is an excellent tool for assessing if some patients have had delayed responses to any medications and provides a personal touch for the patients regarding their stay in hospital.

## RESULTS

Throughout the three month pilot project, 1601 patients utilised the 23-hour Care Centre, comprising 593 day only, 598 23-hour and 410 day of surgery admission (DOSA) patients. The departments of: hand surgery; ear, nose and throat; and, gastrointestinal surgery, managed greater than 50% of their patients as 23-hour patients, which reduces the pressure on bed managers to find ward beds for these patients. The significance of the pilot project results is the representation of nine specialties that were able to manage more than 25% of their patient admissions through the 23-hour concept.

Throughout the introduction of the 23-hour Care Centre, it was imperative to ensure that day only and DOSA patient numbers did not reduce as a result of the changes to the structure of surgical beds. Throughout the pilot project, 27 day only patients required admission overnight. For these patients the predominant reason for the extended length of stay was clinical grounds where additional procedures were required due to the findings at time of the original procedure.

The percentage of day only surgical admissions in general has increased from the corresponding time period in the previous year. The trend for the year 2003 of continually having a DOSA rate above 80% is a significant improvement from the previous year. The introduction of the 23-hour Care Centre will further enhance the ability of the hospital to manage patients as DOSA.

Emergency admissions accounted for 47% of 23-hour patients. The ability of the Centre to manage fluctuating workloads within short time periods and assist with relieving the pressure on the ED is crucial to its function

and long term viability. The 23-hour Care Centre must always be open every day, all day in order to manage the large numbers of patients who present to hospital at short notice for either surgical intervention or medical care.

Activity within the 23-hour Care Centre varied throughout the week. From review of the total activity, average patient numbers were taken for each day of the week. Wednesday was found to have the highest day of total patient activity with an average of 29 patients (table 1).

The review of 23-hour patient activity is important because it assists in identifying the volume of patients that will be in the Centre on any given day, thereby assisting in roster planning, allocation of staff throughout the area and the coordination of shift times.

On weekends the volume of patients does diminish, however, there is still a need for this service on weekends and the potential is there for a further improvement of patient numbers as the service expands with an increase in the number and range of clinical guidelines.

Table 2 demonstrates compliance among departments with the 90% discharge benchmark. Whilst only three departments achieved the discharge compliance benchmark, there were a further seven departments whose percentage of discharge compliance was above the Centre's average of 77%. Further encouragement from the data is the fact that there were 61 patients whose discharge occurred between 0-4 hours after the designated 23-hour benchmark. These 61 patients represented 10% of all 23-

hour patients. In total, 136 patients stayed longer than 23-hours post-operatively, as shown in figures 1 and 2.

While the inability to achieve the benchmarked 90% discharge within 23-hours post-operative across the entire service is disappointing, the significance of the results obtained must be acknowledged. The introduction of the 23-hour concept has been a significant cultural shift for the organisation as previously patient management and discharge instructions were always dependent on medical orders and post-operative review. Several factors throughout the pilot project have impacted on the ability of the 23-hour Care Centre to operate to its full potential.

These factors included the inability of medical staff to complete discharge prescriptions and summaries at the time of procedure, thereby creating the need for medical review of patients by default for the completion of paperwork. There was also reluctance by some nursing staff to discharge the patients, based solely on the documented discharge criteria because it was a change in practice and previously they had not had the autonomy and authority to action their patient assessments against a specific discharge criteria.

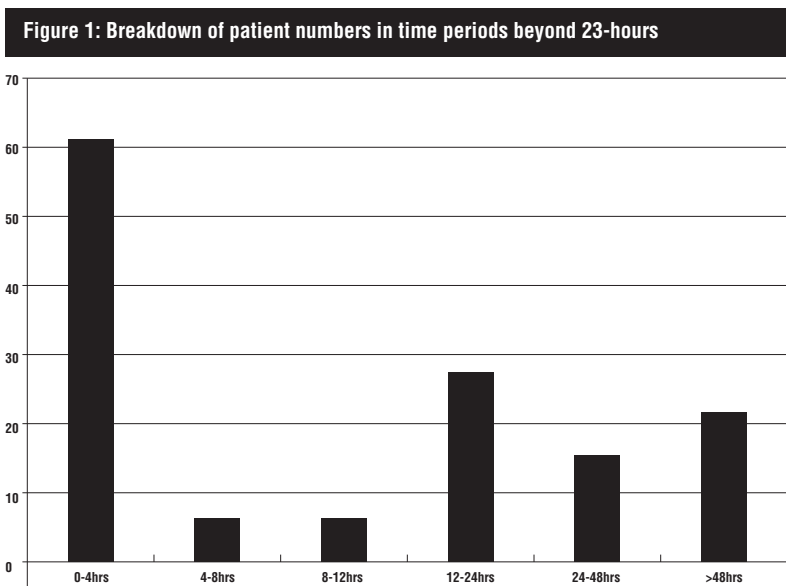
Of the 136 patients with a post-operative stay greater than 23 hours, there were 35 inappropriate admissions to the 23-hour Care Centre. Inappropriate admissions were those patients who did not have a clinical guideline in place, an essential feature outlined in the admission policy for the Centre. These patients were often admitted to the 23-hour Care Centre after hours when the after hours nurse

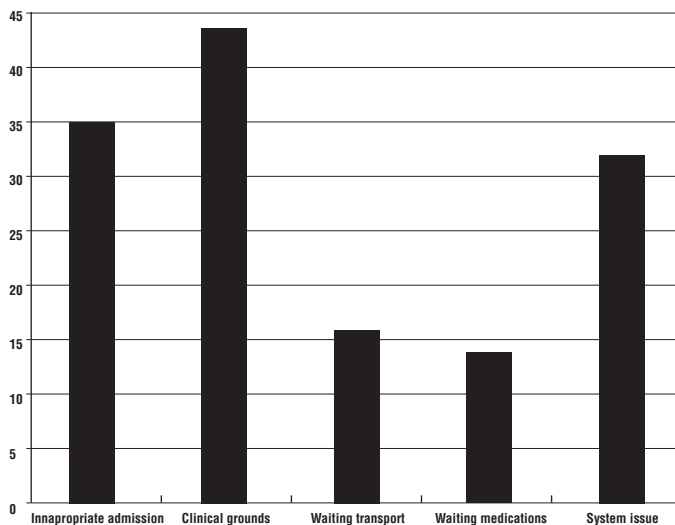
**Table 1: 23-hour Care Centre activity average patient numbers per day of week**

Patient numbers	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
23-hour	8	7	10	8	7	3	4
Day only	8	11	12	7	7	1	1
DOSA	8	7	7	4	6	0	0
<b>Total</b>	<b>24</b>	<b>25</b>	<b>29</b>	<b>19</b>	<b>20</b>	<b>4</b>	<b>5</b>

**Table 2: Discharge compliance from 23-hour Care Centre for 23-hour patients**

Specialty	% Discharge within 23-hours
Cardiothoracic	92%
Endocrine	78%
Ear, nose and throat	90%
Gastroenterology	100%
Hand surgery	87%
Neurosurgery	86%
Ophthalmology	78%
Orthopaedics	58%
Plastic surgery	86%
Radiology	100%
Gastrointestinal surgery	64%
Urology	70%
Vascular	83%



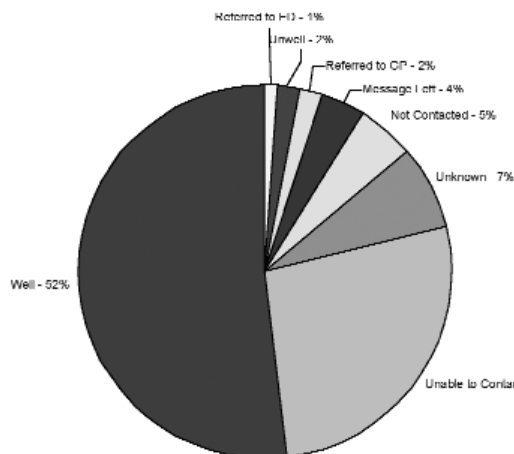
**Figure 2: Breakdown of patient numbers in time periods beyond 23-hours**

manager had difficulty obtaining inpatient ward beds. Excluding these inappropriate admissions increases the overall discharge compliance rate to 83%. In discussions with the after hours nurse managers it was revealed that inappropriate admissions resulted from a lack of awareness regarding the specifics of the admission policy of the 23-hour Care Centre and the pressure for beds within the hospital at various times. Some of these issues can be addressed through further education and publicity about the admission policy of the 23-hour Care Centre and distribution of the results from the pilot project. Further work remains to be done on addressing system issues, which include notification and referral to community nursing, coordination of adequate staffing and skill mix on shifts.

Throughout the pilot project, the 23-hour Care Centre has accepted patients from the day surgery centre and ED. Two hundred and fortythree 23-hour patients have been admitted to the 23-hour Care Centre from the ED. This is a reflection of the nature of admissions to the hospital and supports the operating principles of the Centre to accept elective and emergency admissions. In addition to these patients there have also been 12 patients admitted through the ED, then later discharged the same day from the 23-hour Care Centre.

The ability of the 23-hour Care Centre to be open on weekends has also assisted in managing more appropriately those patients who present as day only admissions. There were also 20 patients who had their surgical procedure performed in the stand-alone day surgery centre then transferred to the 23-hour Care Centre for stage 2 recovery. Through accepting patients from the day surgery centre it assisted in enhancing operating room utilisation of both the main operating rooms and the day surgery centre.

An essential component of the clinical guidelines and the 23-hour concept was patients receiving follow up phone calls the day following discharge to determine if any

**Figure 3: Patients' condition 24-hours post discharge on follow up phone call**

adverse outcomes had occurred as well as to maintain connection with the service. From a review of 365 clinical guidelines the results illustrated in figure 3 were achieved. Only 3% of patients required referral back to the ED or their general practitioner for ongoing clinical issues. 27% did not return phone messages left. With 52% of patients well on follow up phone call is a positive reflection of the quality of care received within the 23-hour Care Centre.

The telephone survey provided an opportunity to review all components of the hospital admission from a patient's perspective. In reviewing patient feedback, the emphases of all comments were positive reflections on the excellent nursing care received and the friendly nature of the staff. Other issues identified by patients included the limited space around trolleys, and a delay in waiting for discharge medications.

Through the introduction of the 23-hour Care Centre it was anticipated there would be a reduction in the number of cancelled operating room cases because of no post-operative ward beds. In reviewing the cancelled cases log compiled by the operating suite, the data showed five cases cancelled during February-April 2002, compared to four cases cancelled during the similar time period in 2003. While the data does demonstrate a reduction, the small volume of patient numbers has minimal impact on hospital services. It must be noted, however, that there has also been a decrease in the surgical bed-base in 2003, due to the consolidation of surgical beds in late 2002, so further review of this data over a longer time period would be beneficial.

The introduction of the 23-hour Care Centre has contributed to a decrease in length of stay for certain procedures. Table 3 provides representation of episode length of stay, comparing data obtained throughout the pilot project to data obtained from the previous financial year. Until DRG (Diagnosis Related Group) data has been calculated for the pilot period by the casemix



**Table 3: Comparative length of stay data**

Procedure	2001/02	Patient numbers	Jan 28-Apr 27 2003	Patient numbers
Laparoscopic cholecystectomy	2.8 days	103	2.2 days	25
Hysterectomy	4.3 days	67	4.0 days	8
Inguinal and femoral hernia	1.7 days	80	1.7 days	32

and statistical unit it is difficult to make comparisons for all procedures.

### Staff feedback

Due to the significant change in practice within the organisation with the introduction of the new service, the potential for differing feedback among staff existed. The staff highlighted the limited space within the area as a key issue impacting on patient care delivery. The pilot project has received positive comments from the staff within the hospital community and the impact that the Centre has had on other clinical areas.

The introduction of the clinical guideline has highlighted changes in work practice for nursing staff. Whilst the clinical guideline was designed to ensure staff spent less time documenting notes and more time on direct patient care, it has been a practice which has taken time to change. In response to staff feedback regarding the clinical guideline, modifications were made to the template.

Other hospital departments have also been affected by the introduction of the Centre. There has been an increase in the workload for pharmacy, food services, laboratory service, linen supply and cleaning services as a direct result of the increased throughput in the area and increase in operating hours. From an administrative perspective there has been the streamlining of work practices and greater emphasis placed on improving data integrity, without a significant increase in the workload volume.

In summary, the feedback from patients reinforces that the 23-hour Care Centre is a concept that is able to adequately address their needs and provide excellent patient care within an efficient system.

### CONCLUSION

In evaluating all the data obtained from the pilot project, the introduction of the 23-hour Care Centre has been a success for the organisation and patients. Positive feedback from patients and reductions in length of stay for particular procedures has enabled the streamlining of patient admission and reductions in episode length of stay. The 243 23-hour patients that have been admitted directly from the ED is indicative of the Centre's ability to assist in reducing pressure within the ED by providing access to beds for

patients who are requiring an overnight hospital admission. The link established with the day surgery centre has assisted in enhancing operating room utilisation, which in turn assists in managing and reducing more effectively waiting lists.

In summary, the 23-hour Care Centre has created and defined an innovative model of care, which can be adapted for other organisations. The results also indicate several areas where the service can be further improved and increased efficiencies obtained. This innovative model of care is developing the opportunity for changes in nursing care delivery, creating its own specialty as unique nursing knowledge, skills and competencies are required. The development of a nurse practitioner role could be seriously considered in the future of the 23-hour Care Centre.

The success of the 23-hour Care Centre was directly related to the hard work and dedication of all the staff within the Centre who were able to implement the change and continued to provide excellence in patient care, within an autonomous working environment. The large number of specialties, the autonomy to facilitate nurse-initiated discharge and the variety of clinical skills utilised within the 23-hour Care Centre establish it as an exciting place to work. These attractions offered by the 23-hour Care centre can be utilised to compete with the recruitment and retention of nursing staff during the existing shortages.

### REFERENCES

- Abenhaim, H.A., Kahn, S.R., Raffoul, J. and Becker, M.R. 2000. Program description: A hospitalist-run, medical short-stay unit in a teaching hospital. *Canadian Medical Association Journal*. 163(11):1477-80.
- Apker, J. and Fox, D.H. 2002. Communication: Improving RN's organizational and professional identification in managed care hospitals. *Journal of Nursing Administration*. 32(2):106-114.
- Burgess, C.D. 1998. Are short-stay admissions to an acute general medical unit appropriate? Wellington Hospital experience. *New Zealand Medical Journal*. 111(1072):314-5.
- Chung, F., Un, V. and Su, J. 1996. Postoperative symptoms 24hr after ambulatory anaesthesia. *Canadian Journal of Anaesthesia*. 43:1121-7.
- Romano, M. 2001. The latest surgery suite, and a room with a view. Short-stay surgical hospitals boast hotel like amenities. *Modern Healthcare*. 31(9):26-8.
- Scott, J.C. 1994. *Collaboration: A managed care experience*. Proceedings of the Fifth Annual Conference of the Australian Association for Quality in Health Care Inc. Canberra: 21-22 April 1994.
- Scott, J.C. and Scott, J.W. 1998. Clinical pathways and Casemix: Collaborative health care delivery models for integration and co-ordination of care. In Courtney, M. (ed.). *Financial Management in Health Service*. Sydney: MacLennan and Petty.

# THE EFFECT OF PRE-ADMISSION EDUCATION ON DOMICILIARY RECOVERY FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY

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**Key words:** post-operative self-care, information recall, education intervention

## ABSTRACT

### Objectives:

The objectives of this randomised controlled study were to determine if pre-admission patient education affects post-operative pain levels, domiciliary self-care capacity and patient recall following a laparoscopic cholecystectomy (LC). Participants were randomised to receive the standard preadmission program (SP) or an individualised, education intervention (EI).

### Design:

A pre-operative questionnaire was administered in the pre-admission clinic to determine participants' knowledge of LC and post-operative management. Telephone follow-up and post-operative questionnaire were conducted approximately 14 days post discharge.

### Setting:

Preadmission clinic of a Sydney, Australia, tertiary referral hospital.

### Sample:

Ninety-three elective LC patients.

### Results:

EI participants experienced lower pain levels and had significantly greater recall of provided information. However, no significant differences were found between the control and intervention groups for domiciliary self-care.

### Conclusion:

Pre-admission education intervention helps reduce post-operative pain levels following LC and significantly increases patients' knowledge of self-care and complication management.

## INTRODUCTION

As the length of hospital stay continues to reduce for laparoscopic cholecystectomy (Hobbs et al 2004) with many now performed as day-only (Fleming et al 2000), it is imperative that patients are self-caring in the domiciliary setting. Knowledge of usual post-operative outcomes and management is essential for patient self-care and to enable patients to recognise when professional intervention and/or advice is required. It is the nurse's role to ensure that pre-admission education is directed at patient domiciliary self-care capacity.

## OBJECTIVE

The main objective was to determine if a pre-admission education intervention reduced pain intensity scores, increased domiciliary self-care capacity and resulted in fewer reported post-operative symptoms following LC by comparison with patients who received the standard pre-admission program. A secondary objective was to ascertain patients' ability to recall provided information and the adequacy of information to meet their care requirements.

## LITERATURE REVIEW

Much literature has been published regarding the benefits of health education for patients and their carers (Paff and Fox 2002). These include the reduction in patient anxiety (Hughes 2002; Shuldham 2001; Malkin 2000; Lee and Lee 2000; Dunn 1998; Mitchell 1997; Nelson 1996) and an improvement in post-operative outcomes (Dunn 1998; Nelson 1996). Systematic reviews indicate, however, that pre-admission education is more effective than pre-operative education (Hodgkinson et al 2000), although no significant correlations between pre-operative education, knowledge and enhanced self-care capacity have been demonstrated (Scherer and Bruce 2001; Oetker-Black et al 1997). Teaching methods employed have been shown to affect patients' knowledge (Forster et al 2002; Posel 1998; Dunn 1998; Nelson 1996).

Patients' informational needs generally relate to post-operative expectations (Mordiffi et al 2003) about pain management, wound care and food and fluid intake (Henderson and Zernike 2001; Young and O'Connell 2001). Nurses' perceptions of informational needs often differ to those of patients (Mordiffi et al 2003; Burney et al 2002; Lee and Lee 2000). Consequently, standard educational programs provided by nurses may not address individual patients' needs.

Further, patient adherence with post-operative instructions is related to information comprehension, recall ability (Correa et al 2001) and attitude (Scherer and Bruce 2001). Information recall is affected by attention span, memory capacity (Kriwanek et al 1998), age, past experiences, educational level (Posel 1998; Dunn 1998), stress (Mitchell 1997), and, individual coping styles (Malkin 2000; Mitchell 1997). Poor recall is more likely in patients following uneventful surgery indicating information selectivity (Kriwanek et al 1998). As these factors are 'givens' in patients coming to hospital for surgical treatments health professionals should consider these factors during information provision.

Pre discharge, patients are generally satisfied with delivered information about self-care (Henderson and Zernike 2001; Gillies and Baldwin 2001; Malkin 2000; Kriwanek et al 1998; Dunn 1998; Nelson 1996). However, the need for additional information to support self-care capacity in an optimal way may only arise post-discharge (Scott 2001; Mitchell 1997).

It is known that much of the research evidence is not experimental and of questionable validity. What is known is that information provided during preadmission is preferable to that provided pre-operatively. Nurses should not assume patients' information needs, but ensure that existing knowledge is individually assessed and built upon. These issues lead to further research being conducted based on this status.

## METHOD

### Design

This study used a two-group randomised, comparative design to compare post-operative self-reported measures of patients having inpatient LC. Patients who attended the pre-admission clinic (PAC) for LC were invited to consent to participate in the study, allocated a study number and randomly assigned (using randomisation tables) to the standard pre-admission program (provided by PAC staff) or standard program plus education intervention. Telephone follow-up by questionnaire of all participants was conducted approximately two weeks post-operatively. The area health human research ethics committee gave ethics approval for this project.

### Subjects

One hundred and twenty-eight LC patients who attended the surgical PAC at a Sydney tertiary referral

hospital, between June 2000 and February 2002 were recruited for the study. Exclusion criteria included day-only bookings and age younger than 14 years. Non-English speaking patients were included if a registered interpreter or proficient English-speaking companion was present while interpreters were utilised for the post-operative telephone follow-up where necessary. Fourteen participants were part of the pre-operative questionnaire pilot study and excluded from final analyses.

Ninety-three participants were followed up post-operatively. Twelve participants were lost to follow-up (minimum of three telephone attempts), eight were withdrawn while one remained on the surgical waiting list. Study withdrawals were due to surgical cancellation (patient or hospital initiated, n=6), self-withdrawal (n=1) and conversion to open cholecystectomy (n=1).

### Instruments

The pre-operative questionnaire, consisting of 42 questions, aimed to determine participants' knowledge of post-operative pain management (including pharmaceutical alternatives), control of nausea and vomiting, post-operative diet, self-care and complication management. A pilot study with 14 patients was conducted to assess the instrument's content validity.

The post-operative questionnaire, consisting of 43 questions was designed to identify participants' recall of information (delivered at pre-admission) on pain management, wounds, diet, elimination and whether the participant believed they received sufficient information for self-care post discharge. The instruments with established face validity were used previously to assess day surgery patients' outcomes pre and post operatively (Donoghue et al 1998, 1997). The reliability of the instruments have not been determined due to the mixed response format. In this study, the instruments were modified to include a question that asked participants' capacity to self-care following discharge from hospital.

### Pain intensity score

The standard 0-10 visual numerical pain intensity scale with verbal anchors was used to record post-operative pain scores 12 hours post-operatively and post discharge.

### Procedure

Pre-admission clinic staff informed the nurse researchers when people were attending clinic prior to LC. Consenting participants were randomly allocated to the standard pre-admission procedure (SP) or an additional, individually determined education intervention (EI). The researchers administered the pre-operative questionnaire to all participants to determine their knowledge of LC self-care and post-operative symptom management. EI participants were provided with verbal and written information on pain management, wound care, diet and elimination. For Non-English speaking persons an interpreter was present and written

information was provided in the relevant language. The intervention took approximately 30 minutes.

### Education intervention

Following assessment of participants' knowledge of LC and related self-care, verbal education covering wound care, diet, activity, bowel management and management of medical complications was given with opportunity for participants to ask questions. The researchers' contact details and printed literature on LC were provided.

### Follow-up

Most participants were seen within a day of surgery by one of the nurse researchers and post-operative pain intensity questions administered. Participants were telephoned at home within two weeks of surgery (range 3-83 days, standard deviation 13.7 days) and the post-operative questionnaire repeated.

### Analysis

Fisher's Exact test was used to compare recall information and post-operative behaviours. Repeated measures were utilised to analyse post-operative pain scores using Microsoft Access and SPSS version 10 software packages.

## RESULTS

Ninety-three participants completed the post-operative follow-up questionnaires with 52 participants receiving the SP and 41 the EI. The sample consisted of 78 females and 15 males. Males were significantly older ( $p=0.037$ ) with an average age of 60 years (range 29-86) compared to females who averaged 49 years (range 14-80) (table 1).

Fifty-nine percent of participants lived with a spouse or partner, 35% lived alone and 6% did not specify. Thirty-four participants had dependents living with them (dependents' age ranged from one month to 80 years). Sixty two percent ( $n=58$ ) were English speaking while 37.6% ( $n=35$ ) spoke a language other than English; 7.5%

were bi or tri-lingual in the home. Sixteen languages were reported.

The duration from pre-admission to surgery was on average 24.4 days (range 1-167, standard deviation 29.6 days). There was no significant difference between the SP and EI groups in terms of gender, age, and hospital length of stay or initial knowledge levels.

### Post-operative pain intensity

EI participants recorded lower mean pain intensity scores during post-operative hospitalisation and domiciliary recovery when compared to SP participants, however these were not significantly different (refer to table 2).

### Pain management

Following discharge from hospital, 79.6% ( $n=74$ ) preferred analgesics for pain management whilst 67.7% ( $n=63$ ) complemented medications with rest. Although alternative methods of pain relief (relaxation, hot packs, gentle walking) were discussed with the EI group there was no significant difference between the groups in the use of alternative methods.

### Experience of other post-operative symptoms

Post-operative symptoms were experienced by 60.2% ( $n=56$ ) of participants post-discharge. These ranged from common LC related symptoms of nausea, vomiting and elimination problems (Barthelsson et al 2003; Coloma et al 2002; Talamini et al 1999) to chest pain and depression. In this study, 34.4% (EI  $n=12$ , SP  $n=20$ ) of participants experienced nausea but only 7.5% ( $n=7$ ) vomited. Nausea management was not significantly different between groups with the majority ( $n=23$ ) preferring distraction therapy and/or food restriction while nine used anti-emetic medications. Ten participants experienced constipation (EI  $n=6$ , SP  $n=4$ ) while five had diarrhoea (EI  $n=2$ , SP  $n=3$ ).

Eleven participants (11.8%) developed wound infections (EI =1, SP =10).

**Table 1: Post-operative participants' characteristics by group**

	Standard pre-admission (n)	Education intervention (n)
Mean age (range)	49.1 (14-80)	60.0 (29-86)
Females	46	32
Males	6	9

**Table 2: Comparison of mean VAS pain intensity scores between SP and EI groups during the post-operative stage in hospital, following discharge and following treatment ( $p=0.079$ )**

Pre-admission education	Mean inpatient pain intensity scores	Mean post-discharge pain intensity scores	Mean score following pain management
SP ( $n=47$ )	6.66	4.80	2.38
EI ( $n=35$ )	5.05	4.19	1.90

**Table 3: Significant comparisons between standard pre-admission education and education intervention groups for recall of pain and nausea management advice (p=0.000)**

Type of pre-admission education	Recall of pain management advice (n=47)	No recall of pain management advice (n=43)	Recall of nausea advice (n=40)	No recall of nausea advice (n=53)
SP	17 (32.6%)	32 (61.5%)	11 (21.2%)	41 (78.8%)
EI	30 (73.2%)	11 (26.8%)	29 (70.7%)	12 (29.3%)

**Table 4: Comparison between standard pre-admission program and education intervention groups for adequacy of self-care and symptom management information**

Pre-admission education	Adequate self-care advice (n=66)	Inadequate self-care advice (n=27)	Adequate symptom management advice (n=55)	Inadequate symptom management advice (n=38)
SP	30 (57.7%)	22 (42.3%)	22 (42.3%)	30 (57.7%)
EI	36 (87.8%)	5 (12.2%)	33 (80.5%)	8 (19.5%)

Findings demonstrated that most participants in both groups could manage their own symptoms. Seventeen participants (37%) required additional professional health care post-discharge, however there was no significant difference (p=0.22) between EI (n=6) and SP (n=11) participants.

### Information recall

There was a significant difference (p=0.000) in the two groups for recall of self-care information. The majority (n=32, 61.5%) of SP participants did not recall being given any pain management advice. In comparison, 30 (73.2%) EI participants recalled receiving pain management advice although 11 (26.8%) could not remember any information being given despite researchers' documentation of information provision (refer to table 3).

There was a significant difference (p=0.000) between the groups for provision of nausea management advice. Most SP participants (n=41, 78.8%) could not recall any nausea management advice while the majority (n=29, 70.7%) of EI participants stated they received this.

### Adequacy of information

A significant difference was reported between the groups for information adequacy to support domiciliary self-care capacity (p=0.002) and symptom management (0.000). Thirty (57.7%) SP participants and 36 (87.8%) EI participants stated they received adequate information for self-care while 22 SP participants and five EI participants said self-care advice was insufficient. Twenty-two (42.3%) SP participants and 33 (80.5%) EI participants received adequate information to manage post-operative pain, nausea, diarrhoea or constipation (see table 4).

### Additional information

Participants were asked what additional information to support self-care efficacy would have been advantageous. Sixty participants (65%) indicated they received adequate

information on all aspects of this experience. Thirty-three participants (35%), (EI n=10; SP n=23) required more information (p=0.05) however, some requests for health related information were outside the scope of this procedure (see table 5).

**Table 5: Requested information topics and the numbers of participants by groups**

Information topics requested	SP (n=23)	EI (n=10)
General information	8	1
Wound related	5	2
Pain management	7	0
Dietary advice	4	2
Bowel management	2	3
Nausea and vomiting	2	0
Activity	2	0
Medications	2	0

Footnote: Some participants selected information from more than one category

## DISCUSSION

In this study there were a greater number of women compared to men than is usual with a ratio of 5:1. Clinical information on LC from the hospital demonstrated the usual ratio of women to men was 2:1, and women were significantly younger than men (p<0.05) (Donoghue et al 2002). Investigation of the high proportion of females in the sample identified no selection bias.

Intervention group participants reported lower pain intensity scores during post-operative hospitalisation than SP participants. These findings are consistent with literature that suggests effective pain education lowers pain intensity scores and patient anxiety (Dunn 1998). Post-discharge pain intensity scores remained surprisingly high for all participants although LC pain is reported to



last seven days (Watt-Watson et al 2004; Cason et al 1996). Pain is exacerbated by increased domiciliary activity when carers return to work (Young and O'Connell 2001), while LC patients with young children face particular difficulty (Barthelsson et al 2003). This may explain the high post-discharge pain scores, as some participants were caring for children within three days of surgery while others confirmed walking to the shops.

EI participants reported lower pain intensity scores following personal management of pain than SP participants. Most participants preferred oral analgesics with few using adjunct therapy despite these options being discussed with EI participants. This finding, consistent with other research (Watt-Watson et al 2004), is not surprising considering that discharge prescriptions for analgesics are routinely provided.

In this study, the overall incidence of common post-operative symptoms was lower than that reported by Dunn (1998) and Margovsky (2000). The incidence of nausea, vomiting and dietary problems was significantly lower in EI participants compared to SP participants. All participants were treated similarly in terms of surgical procedures, indicating that information provision shapes patient expectations, increases patient confidence to self-care effectively and helps them manage likely symptoms. It is believed that specific dietary advice to EI participants contributed to their lower incidence of post-operative nausea as three SP participants reported feeling nauseous after consuming oily or acidic foods.

The number of participants with elimination problems was similar between the EI (n=8) and SP (n=7) groups. However, SP participants were more likely to utilise medication for elimination problems and again demonstrated limited dietary knowledge. This was evidenced by one participant's consumption of fruit and fizzy drinks despite having diarrhoea.

The findings demonstrate that pre-admission intervention significantly increased participants' ability to recall information on self-care and symptom management. One EI participant who experienced a serious complication (biliary leakage) recalled that she acted on information provided by the researcher to contact a health professional if pain was persistent, severe and not alleviated by analgesics.

Literature indicates that formal, individualised education programs (Mordiffi et al 2003; Forster et al 2002; Guruge and Sidani 2002) have a more positive effect on patient knowledge than informal education provision. The provision of information to SP participants was likely to be less formal due to pre-admission rostering practices, variable in content limiting information being provided and conducted in conjunction with routine assessments due to time constraints. In addition, there was no guarantee that SP participants were provided with written information. All of these factors

would impact upon participant knowledge, comprehension and recall ability.

The researchers attempted to identify why some EI participants could not recall information that had been documented as provided. Analysis demonstrated that 12 individuals consistently 'forgot' if information was provided on two or more topics. Pre-operative anxiety levels were not assessed, so reasons for poor recall cannot be fully explained, but multiple factors may be implicated. The 'forgetful' participants were (with one exception) female, slightly older (average 56.5yrs) and generally experienced a longer delay from pre-admission to surgery (average 30.3 days, range 1-106 days) giving weight to literature recommendations to conduct education within one week of surgery (Dunn 1998; Mitchell 1997; Cupples 1991). In all instances, surgical outcomes were optimal possibly supporting the selective recall theory (Kriwanek et al 1998).

Standard pre-admission participants although satisfied overall with information received, were significantly more likely to request additional information about symptom management in comparison to EI participants. Additional information required by study participants was similar to that previously identified including general post-operative expectations (Mitchell 1997) wound care, pain management, dietary advice and bowel management. The provision of such self-care information is mainly the responsibility of nurses. Initially patients may be satisfied with the information given. However, if patients do not know how to manage a situation that arises following discharge, initial satisfaction will change. This result in conjunction with the significantly better recall of the EI group indicates it is worthwhile for health professionals to provide surgical patients with relevant and adequate verbal and written information at PAC to improve their self-care.

## LIMITATIONS

Many studies that identify the importance of patient education do not randomise patients to conditions or compare outcomes. This study focused on patients having the same surgical procedure, attending the same PAC and having the same researchers deliver the informational intervention. The major limitation was a reduction in LC numbers due to the introduction of day-only LC at this hospital and one surgeon on extended leave. This resulted in fewer patients being recruited than planned in the research time frame. In addition, there was an over-representation of women in the study (5:1) relative to that usually reported for this procedure (2:1).

## CONCLUSION

LC patients who received education intervention reported lower pain intensity scores and had significantly lower incidences of post-operative symptoms than patients

who did not receive this intervention. These patients also had significantly greater recall of information to support their self-care capacity and symptom management following discharge from hospital, while reporting that the provided information was adequate to support their needs.

The current method of managing many surgical patients by admitting them on the day of surgery combined with shortened length of post-operative hospital stays leads to expectations that patients will be self-caring on discharge. It is therefore imperative that information provision at pre-admission is individually tailored and helps patients achieve optimal self-care capacity in relation to the experience.

## REFERENCES

- Barthelsson, C., Lutzen, K., Anderberg, B.O. and Nordstrom, G. 2003. Patients' experiences of laparoscopic cholecystectomy in day surgery. *Journal of Clinical Nursing*. 12(2):253-259.
- Burney, M., Purden, M. and McVey, L. 2002. Patient satisfaction and nurses' perceptions of quality in an inpatient cardiology population. *Journal of Nursing Care Quality*. 16(4):56-67.
- Cason, C., Seidel, L. and Bushmaier, M. 1996. Recovery from laparoscopic cholecystectomy procedures. *AORN Journal*. 6:1099-1116. Cited in: Barthelsson, C., Lutzen, K., Anderberg, B.O. and Nordstrom, G. 2003. Patients' experiences of laparoscopic cholecystectomy in day surgery. *Journal of Clinical Nursing*. 12(2):253-259.
- Coloma, M., White, P.F., Markowitz, S.D., Whitten, C.W., Macaluso, A.R., Berrisford, S.B. and Thornton, K.C. 2002. Dexamethasone in combination with Dolasetron for prophylaxis in the ambulatory setting: Effect on outcome after laparoscopic cholecystectomy. *Anaesthesiology*. 96(6):1346-1350.
- Correa, R., Menezes, R.B., Wong, J., Yogendran, S., Jenkins, K. and Chung, F. 2001. Compliance with postoperative instructions: A telephone survey of 750 day surgery patients. *Anaesthesia*. 56(5):481-484.
- Cupples, S.A. 1991. Effects of timing and reinforcement of preoperative education on knowledge and recovery of patients having coronary artery bypass graft surgery. *Heart and Lung*. 20(6):654-660.
- Donoghue, J., Blay, N. and Mitten-Lewis, S. 2002. Using clinical information to support the provision of day surgery laparoscopic cholecystectomy in a public hospital in NSW. *Day Surgery Australia*. 1(3):4-6.
- Donoghue, J., Pelletier, D., Duffield, C. and Torres, M. 1997. Australian men's experiences of cystoscopic day surgery. *Ambulatory Surgery*. 5(1):15-19.
- Donoghue, J., Pelletier, D., Duffield, C. and Torres, M. 1998. Australian men's experiences of cystoscopic day surgery part 2. *Ambulatory Surgery*. 6(4):189-196.
- Dunn, D. 1998. Preoperative assessment criteria and patient teaching for ambulatory surgery patients. *Journal of Perianaesthesia Nursing*. 13(5):274-91.
- Fleming, W.R., Michell, I. and Douglas, M. 2000. Audit of outpatient laparoscopic cholecystectomy. *Australian and New Zealand Journal of Surgery*. 70(6):423-427.
- Forster, A., Smith, J., Young, J., Knapp, P., House, A. and Wright, J. 2002. Information provision for stroke patients and their caregivers. Cochrane Review. In: *The Cochrane Library*. Issue 3, Oxford: Update Software.
- Gillies, M.A. and Baldwin, F.J. 2001. Do patient information booklets increase perioperative anxiety? *European Journal of Anaesthesiology*. 18(9):620-622.
- Guruge, S. and Sidani S. 2002. Effects of demographic characteristics on preoperative teaching outcomes: A meta-analysis. *Canadian Journal of Nursing Research*. 34(4):25-33.
- Henderson, A. and Zernike, W. 2001. A study of the impact of discharge information for surgical patients. *Journal of Advanced Nursing*. 35(3):435-441.
- Hobbs, M.S., Mai, Q., Fletcher, D.R., Ridout, S.C. and Knuiman, M.W. 2004. Impact of laparoscopic cholecystectomy on hospitalisation. *ANZ Journal of Surgery*. 74(4):222-228.
- Hodgkinson, B., Evans, D. and O'Neill, S. 2000. *Knowledge retention from pre-operative patient information*. The Joanna Briggs Institute for Evidence Based Nursing and Midwifery. Evidence Based Practice Information Sheet. 6:1-6.
- Hughes, S. 2002. The effects of giving patients pre-operative information. *Nursing Standard*. 16(28):33-37.
- Kriwanek, S., Armbruster, C., Beckerhinn, P., Blauensteier, W. and Gschwantler, M. 1998. Patients' assessment and recall of surgical information after laparoscopic cholecystectomy. *Digestive Surgery*. 15:669-673.
- Lee, D.S. and Lee, S.S. 2000. Pre-operative teaching: How does a group of nurses do it? *Contemporary Nurse*. 9(1):80-88.
- Malkin, K.F. 2000. Patients' perceptions of a pre-admission clinic. *Journal of Nursing Management*. 8:107-113.
- Margovsky, A. 2000. Unplanned admissions in day-case surgery as a clinical indicator for quality assurance. *Australian and New Zealand Journal of Surgery*. 70:216-220.
- Mitchell, M. 1997. Patients' perceptions of pre-operative preparation for day surgery. *Journal of Advanced Nursing*. 26(2):356-363.
- Mordiffi, S.Z., Tan, S.P. and Wong M.K. 2003. Information provided to surgical patients versus information needed. *AORN Online*. 77(3):546-549, 552-554, 556-558, 561-562.
- Nelson, S. 1996. Pre-admission education for patients undergoing cardiac surgery. *British Journal of Nursing*. 5(6):335-340.
- Oetker-Black, S.L., Teeters, D.L., Cukr, P.L. and Rininger, S.A. 1997. Self-efficacy enhanced preoperative instruction. *AORN Journal*. 66(5):854-864.
- Paff, L. and Fox, R. 2002. Educating the pre-operative patient. *Nursing.Aust*. 17-19. July.
- Posel, N. 1998. Preoperative teaching in the preadmission clinic. *Journal of Nursing Staff Development*. 14(1):52-56.
- Scherer, Y.K. and Bruce, S. 2001. Knowledge, attitudes, and self-efficacy and compliance with medical regimen, number of emergency department visits, and hospitalisations in adults with asthma. *Heart and Lung*. 30(4):250-257.
- Scott, A. 2001. How much information is too much information for patients? *Journal of Integrated Care Pathways*. 5(3):119-125.
- Shuldham, C.M. 2001. Pre-operative education for the patient having coronary artery bypass surgery. *Patient Education and Counselling*. 43:129-137.
- Talamini, M.A., Coleman, J., Sauter, P., Stanfield, C. and Fleisher, L.A. 1999. Outpatient laparoscopic cholecystectomy: Patient and nursing perspective. *Surgical Laparoscopy, Endoscopy and Percutaneous Techniques*. 9(5):333-337.
- Watt-Watson, J., Chung, F., Chan, V.W. and McGillion, M. 2004. Pain management following discharge after ambulatory same-day surgery. *Journal of Nursing Management*. 12(3):153-161.
- Young, J. and O'Connell, B. 2001. Recovery following laparoscopic cholecystectomy in either a 23 hour or an eight hour facility. *Journal of Quality Clinical Practice*. 21:2-7.

# MAPPING RECOVERY AFTER TOTAL HIP REPLACEMENT SURGERY: HEALTH-RELATED QUALITY OF LIFE AFTER THREE YEARS

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**Key words:** total hip replacement, health-related quality of life, continuity of care, discharge planning, community care

## ABSTRACT

### *Objective:*

To investigate recovery from total hip replacement over a three-year period on the basis of patient perceptions of health-related quality of life, demographic (age, gender, family support) and clinical characteristics (co-morbidities, hospital admissions), use of and satisfaction with health services, unmet health needs and social re-engagement.

### *Design:*

Telephone survey of patients' scores on the the 36 item Short Form health survey (SF 36) at three-years as a basis for comparison with scores 12 weeks after discharge; analysis of survey responses on demographic and clinical variables, health services use and satisfaction, unmet health needs and resumption of pre-operative social activities.

### *Setting:*

One tertiary hospital in South East Queensland, Australia.

### *Participants:*

Sixty-two total hip replacement patients from an original cohort of 95 participants in a study three years previously to investigate these variables at one, two, four, eight and 12 weeks post-discharge.

### *Main outcome measures:*

SF36 scores, survey responses on number and type of co-morbidities, age, family support, type and frequency of health services used, satisfaction

with services, hospital admissions, resumption of social activities.

### *Results:*

No significant differences were found on any SF-36 scores, but General Health had declined. Women's Physical Functioning scores fell below population norms, men's remained above the norms. Physical composite scores showed a decline with age, and the Mental Composite Scores increased with age. The number of co-morbidities had increased over three years, with 58% being admitted to hospital. Half reported unmet health needs, related primarily to non-hip problems. Only general practitioner services were used monthly or more, with satisfaction ratings remaining high for all services used. Participation in social activities was increased from prior to surgery for 42% of participants.

### *Conclusions:*

Recovery after hip replacement surgery is dramatic, especially in alleviation of pain, but for older patients, there is a subsequent decline in general health concomitant with others in this demographic group. Differences in men's and women's patterns of recovery suggests differential planning to provide more realistic expectations for recovery and aftercare.

## INTRODUCTION

The study reported here was designed to follow a cohort of total hip replacement (THR) patients over a three-year period as they made adjustments back into their home and community life. Patient perspectives of

their health-related quality of life (HRQOL) five times (one, two, four, eight and 12 weeks) post-discharge revealed that psychosocial recovery preceded physical recovery, which steadily improved over the three month period (McMurray et al 2002). The current study followed the same cohort of patients to see whether these findings were stable after three years, and to investigate: clinical changes in co-morbidities or admissions to hospital; use of and satisfaction with health services; unmet health needs; and, the extent to which they had re-engaged with their community/social networks. Mapping long term outcomes after THR is important for nurses, patients and carers to ensure that discharge planning and aftercare services are responsive to patient-identified needs throughout the home recovery period.

## LITERATURE REVIEW

From a medical perspective, THR has been identified as one of the most successful and cost-effective surgical interventions (Nilsson et al 2003; Knutsson and Bergbom Engberg 1999; March et al 1999). Nursing studies of THR patients have also addressed cost-effectiveness and quality outcome indicators, primarily focusing on clinical pathways and other strategies for improving short-term patient outcomes and reducing the length of stay (Weaver et al 2003; Wammack and Mavrey 1998).

Because many THR patients are older people they are vulnerable to the same factors that place other older people at risk following hospital discharge, some of which persist beyond the immediate post-discharge period. These include age: (<75); gender (m); cognitive impairment; problems with medication regimes; chronic illness; frailty; severe co-morbidities; economic constraints; and, the difficulties of coping without support at home (Nilsson et al 2003; Bull 2000; Naylor 2000; Armitage and Kavanagh 1995, 1998; Bours et al 1998; Lough 1996). Many of these problems are addressed in discharge planning processes that anticipate the particular needs of the client population as transitions are made from hospital to residential care or home (Richards and Coast 2003; Parker et al 2002; Naylor 2000).

Throughout the past two decades there has been renewed interest in discharge planning and aftercare, as nurses have witnessed faster throughput through the health care system (Parker et al 2002). Patients are now being discharged home 'quicker and sicker', many with unmet needs because of variability in access to community services. A review of international nursing studies of orthopaedic patients by Matt-Hensrud et al (2001) and the Cochrane Review of discharge planning by Parkes and Shepperd (2001) reaffirm the pivotal role of nurses in effective discharge planning that can result in decreasing costs, improving patient outcomes and satisfaction, reducing readmission rates and enhancing continuity of care.

The majority of researchers in this area contend that good discharge planning can help maintain continuity of care by ensuring integrated, accessible health services (Bull 2000; McKenna et al 2000; Naylor 2000, Russell 2000; Armitage and Kavanagh 1998; Balla and Jamieson 1994). Three main areas of focus have been identified as improving continuity of care throughout the recovery period, including interprofessional communication, co-ordination of services and provision of information to patients and their families (Johnson et al 2003; Henderson and Zernike, 2001; McKenna et al 2000; Knutson and Bergbom Engbert 1999).

Sparbel and Anderson's (2000b) review of the continuity of care literature indicates a need for greater conceptual clarification. They argue for further study of the linkages and relationships patients make in their transitions across the health-illness trajectory. This concurs with Naylor's (2000) conclusions from a review of transitional care throughout the 1990's. She suggests the need for refinement in the selection and measurement of outcome variables and for incorporating a risk management approach for those at risk for poor post-discharge outcomes, including readmission to hospital. Her secondary analysis of data found a number of variables to be significant independent predictors of time to first readmission. These included self-health rating, functional status, emergency versus elective admission, and the number of comorbid conditions, previous hospitalisations, and prescribed daily medications (Naylor 2000). Although confined to those having cardiac events, her research reveals some issues applicable to all surgical patients, whose needs emerge from the physiologic domain, predominantly common responses to symptoms such as pain.

Little research has been done on the long term effects of an acute care episode across the care continuum (Sparbel and Anderson 2000a, b; Hughes et al 1999). To some extent, this is related to the difficulties of measuring both clinical outcomes and continuity of care across a wide range of individual circumstances once people return home from hospital. To be meaningful, continuity of care studies should be designed to capture not only measures of efficiency and effectiveness in health services, but the extent to which care is accessible, culturally appropriate and satisfactory to patients in relation to their former health status (McMurray et al 2004; McKenna et al 2000; Armitage and Kavanagh 1998). Measures such as the 36 item Short Form health survey (SF 36) (Ware et al 1993) are widely used to capture patients' perceptions of their health status and, in some cases, these are taken to reflect HRQOL (Rapley 2003; Garratt et al 2002; Anderson et al 1999; Jaarsma and Kasternans, 1997). Previous research with the SF-36 has shown it to be easily understood and readily acceptable to most patient groups, even for telephone administration (McHorney et al 1994; Ware 1993; Watson et al 1996). Measuring other influences on recovery is more elusive, and most researchers gather this



information by open-ended questions that provide complementary qualitative data from which to glean a more balanced understanding of HRQOL.

In an attempt to benchmark HRQOL in a cohort of THR patients, our research used the SF-36 to measure their post-discharge scores at one, two, four, eight and 12 weeks. The findings revealed dramatic changes to mental health scores concomitant with pain relief, accompanied by gradual improvement in physical health scores over three months post-discharge (McMurray et al 2002). This differed from a study conducted by Swedish nurse researchers who found that when HRQOL scores were compared at six weeks and six months, the latter scores showed a decline in HRQOL (Knutsson and Bergbom Engberg 1999). The Swedish study analysed telephone interview data that revealed no significant improvements between the pre-operative period and six weeks postoperatively, with the major psychosocial improvement occurring at six months. Most patients reported that pain alleviation (measured separately) was more important than any increase in QOL.

A Canadian study compared a group of THR and total knee replacement patients pre and post-operatively, using the SF-36 and the Western Ontario and McMaster Universities (WOMAC) Osteoarthritis Index (Allyson Jones et al 2001). They found that although patients did not achieve the same level of overall physical health as the general population, matched for age and gender, age was not a significant determinant of pain or function. This lies in contrast to another Swedish study, which used both the SF-36 and WOMAC to study THR patients prospectively, finding a significantly high correlation between older age and poor outcome scores (including pain) over a three year period (Nilsson et al 2003). We were interested in investigating whether there was a similar decline in the Australian cohort over a three year period, and whether the significant post-discharge gender difference found in the previous study (females taking longer to recover than males), remained the case at three years post-discharge.

## METHOD

The study sample was drawn from the group of 95 patients who participated in the original study following THR surgery (McMurray et al 2002). Approval was given by the ethical review committees of Griffith University and the Gold Coast Health Services District. Following signed consent to participate, telephone interviews were conducted by the same clinical nurses from the orthopaedic ward who gathered the initial data.

Data were collected at a median interval of 37 months since the last interview. Included were the questions of the SF-36, questions pertaining to number and type of comorbidities, age, family support (residential support, no support), type and frequency of health services used (weekly/fortnightly/monthly/less often) and satisfaction

with services (very unsatisfactory/unsatisfactory/satisfactory/very satisfactory). The SF-36 survey was administered first so that questions about other health problems would not influence how the patient responded to the survey (Ware et al 1993). Participants were also asked to report any hospital admissions since their last survey and to describe the extent to which they had re-engaged with their former (pre-operative) community/social lifestyle. Two further questions addressed the medical needs of patients for either hip problems, or other health needs.

## Data analysis

Responses on the SF-36 were analysed using SPSS version 10. The SF-36 provides indicators across eight dimensions of health and wellbeing as follows: Physical functioning - typical range of physical activities; Role physical - effects of physical health on performance of daily activities; Bodily pain - severity of pain and its effect on normal activities; General Health - self-assessed health status according to expectations and perceptions of health; Vitality - energy and fatigue levels; Social functioning - impact of health or emotional problems on social functioning; Role emotional - effects of emotional problems on performance of daily activities; Mental health - amount of time nervousness, anxiety, depression and happiness is experienced. Two summary measures based on the eight scales, constitute the Physical Component Summary (PCS) and the Mental Component Summary (MCS) (ABS 1995).

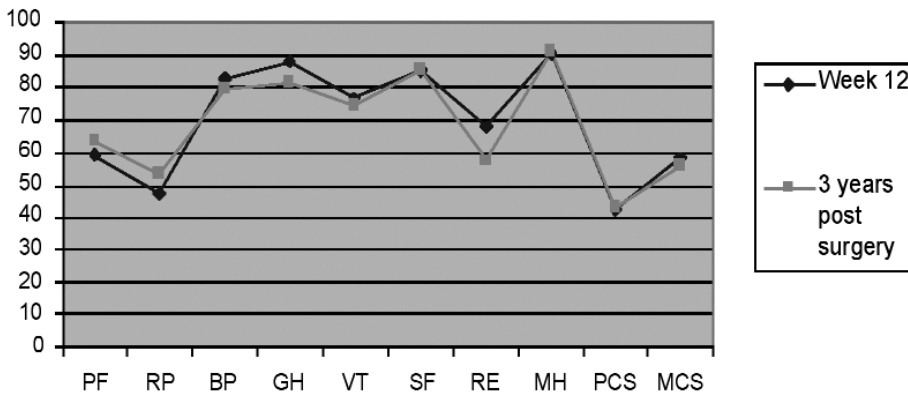
Descriptive statistics (frequencies, cross-tabulations, multiple response tables) were used to analyse demographic (age, gender, type of support) and clinical data (co-morbidities, hospital admissions), use of and satisfaction with services. Inferential statistics included independent and paired samples t-tests to test for between group and within group differences at the 0.005 level of significance. This level was achieved using a Bonferroni Correction to reduce the probability of making a Type I error when performing multiple tests. For single tests, the level of significance was set at  $p < 0.05$ . SF-36 scores were analysed according to gender, age and family support and compared with previous scores at 12 weeks post-discharge. Type and frequency of service utilisation were categorised according to GP, specialist, home and community nursing, physiotherapist, complementary health services, hospital and other (domestic and other informal care). Open-ended responses to the questions on health needs and social engagement were categorised according to frequency.

## FINDINGS

Of a possible 91 participants (four participants had died since the original study), 62 (68%) consented to participate. Others had moved residence or were unavailable. Using data from the original study, t-test and chi-square results indicated that the non-participants in



Figure 1: SF-36 scores at 12 weeks and three years post-discharge for THR surgery



the follow-up study did not differ significantly from the original cohort on the basis of demographic and clinical factors (age, gender, level of support). Within group comparisons indicated no significant differences on demographic or clinical factors, although some variations were found.

The gender composition was almost equivalent (females: 51.6%). However, most participants were aged in the over 75 category (59.7%), compared to those aged 65-74 (35.5%) and 55-64 (4.8%), and were receiving some degree of support (residential = 58.1%; non-residential = 22.6%; no support = 19.4%). Further chi-square analysis showed no gender differences in relation to age and type of support. A surprisingly low number of co-morbidities was reported by the study group in the original analysis, however independent samples t tests revealed a significant increase in total co-morbidities three years later. Most notable were increases in cardiovascular, diabetes/endocrine and musculoskeletal co-morbidities.

Independent samples t-tests were conducted to test for differences in HRQOL scores over time and to analyse gender differences. No significant differences were found in comparing the three year follow-up scores with those at 12 weeks post-discharge on any of the SF-36 measures. General Health scores did, however, show a decline approaching significance ( $t=2.574$ ,  $df=153$ ,  $p=0.011$ ), while Physical Functioning and Role Physical scores were the only ones to show an improvement, albeit non-significant (see figure 1). The three year follow-up scores showed a significant gender difference in the Physical Functioning scores. Women scored considerably lower than men ( $t=-3.437$ ,  $df=60$ ,  $p=0.001$ ), and fell below Australian population norms, whereas men's Physical Functioning scores were above the population norms. This is consistent with the scores at week 12, when again women scored significantly below men's scores and remained below the population norms for Physical Functioning. No significant differences were found in SF-36 scores in relation to age and level of support, although

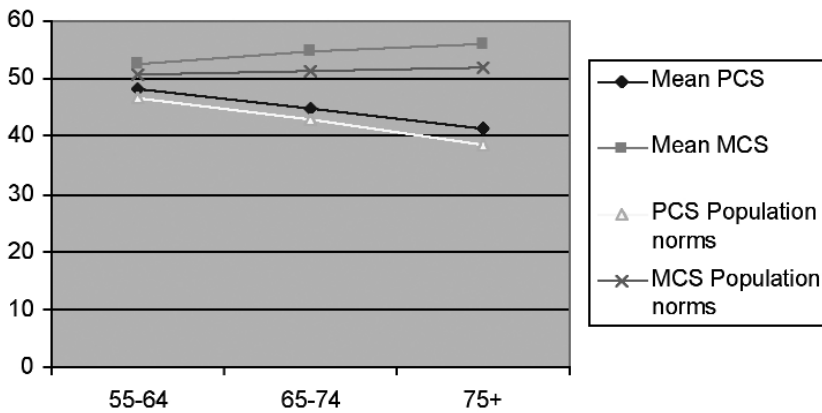
the composite scores showed a distinct trend: the mean PCS scores declined with age, while the mean MCS scores increased with age (see figure 2).

Thirty-six patients had one or more admission to hospital since THR surgery, with 15 having two or more hospital stays. One third of the group continued to see their general practitioner (GP) at least monthly. Specialist, physiotherapy and nursing services were used infrequently. As in the initial study, satisfaction ratings remained high for all services used. Half the participants reported having unmet health needs. As indicated in table 1 the majority of health problems were related to non-hip pain. Eight complained of persisting problems and pain associated with their hip replacement.

In relation to social engagement, 26 (42%) reported better participation in social activities than prior to surgery. For eight participants, the level of social activity remained unchanged. Seven reported a decline in social activity, but only one attributed this to the THR surgery. Four others stated their activity level had not changed because of the surgery.

## DISCUSSION OF FINDINGS

The major focus of this study was to see whether there is an ongoing role for nurses in facilitating continuity of care and HRQOL over a three-year period of recovery. One of the most interesting findings was the relatively different pattern of recovery for men and women which will be of interest to nurses preparing them for hospital discharge. At week 12, women's Mental Health Scores (MCS) were significantly higher than men's and by the three-year follow-up, men's MCS scores had become relatively similar. This could indicate that men's psychosocial recovery from THR takes longer than women's; an hypothesis for future investigation. Further study could also address the gender difference in women's Physical Functioning, which was significantly lower than

**Figure 2: Comparison of PCS and MCS scores with Australian population norms at three year follow-up post THR surgery****Table 1: Frequency of unmet health needs**

None	29
Other pain (back, shoulder, leg, ankle)	14
General problems (vision, skin, low HB etc)	12
Persisting problems/pain relating to hip replacement	8
Respiratory	3
Cancer	3
Cardiovascular	2
Prostate problems	2

men's across the entire period of three year recovery. It is important to note however, that this study did not capture the pre-surgical scores in Physical Functioning and our findings may therefore reflect a pre-existing gender difference in functional level. A study by Karlson et al (1997) noted that, given a choice, women opted for joint surgery later in the process of functional decline than men. Our findings may therefore reflect gender differences in help seeking as well as different patterns of physical recovery.

As expected, our sample revealed a clear trend for PCS (physical) scores to deteriorate with age and MCS (mental) scores to improve with age, which is consistent across the Australian population of older persons (ABS 1995). Older age also explains the increase in co-morbidities. Overall, our sample showed a significantly higher level of general health than the population, but this may have been related to selecting patients for surgery on the basis of their chances for improvement, or the way THR patients view their HRQOL. Although the SF-36 has known sensitivity to a range of clinical conditions and patient groups, including THR patients (Hopman-Rock et al 1999; March et al 1999; Kiebzak et al 1997; Lieberman et al 1997; Stucki et al 1995; McHorney et al 1994; Ware

1993), responses may not reflect how people view the quality of their lives in relation to the general population. Instead, they may be the product of a number of influences, including patients benchmarking the quality of their life after surgery according to their previous state of health (McMurray et al 2004). This may also explain the significantly higher MCS ratings than the Australian population.

As medical researchers have found, patients' high satisfaction ratings may indicate the dramatic improvements ensuing from THR surgery (Nilsdotter et al 2003; March et al 1999). Patients' open ended comments revealed few unmet needs related to their hip problems. Indeed, many spoke of their new health status as similar to 'winning the lottery'. This may be related primarily to pain relief, as other researchers have also found (Allyson Jones et al 2001; Knutsson and Bergbom Engberg 1999). Nearly half of our group reported improved social engagement, which is congruent with the high MCS scores and a cause for optimism for those seeking to promote social participation among this age group. For a smaller number, other illnesses continued to limit social participation.

Our results suggest there is a role for nurses in assisting these patients through the period of recovery, albeit one that changes over time. In the early period following recovery, nursing services were seen by the patients as very important. Their use of nursing services declined around four weeks post-discharge, however at three years, the most important role played by nurses seemed to be the telephone advice given in the context of gathering survey data. Anecdotal reports by the nurse researchers indicated that the telephone interviews provided opportunities for this group of patients to access information on a range of health issues, including the timing of using other health services. We interpret this in terms of improving the lines of communication between patients and their health service providers and it is an

indication of the importance of telephone advice during recovery from any type of surgery, which was also one of Naylor's (2000) conclusions.

## CONCLUSION

Despite the limitations of size and a single category of patients, this research can help inform the evidence base for discharge planning, particularly in relation to tailoring plans to differential needs of men and women in various age groups. This, in turn, can help inform appropriate and cost-effective decision-making in relation to health services use (Ridge and Goodson 2000).

## REFERENCES

- Allyson Jones, C., Voaklander, D., Johnston, W. and Suarez-Almazor, M. 2001. The effect of age on pain, function, and quality of life after total hip and knee arthroplasty. *Archives of Internal Medicine*. 161(3):454-451.
- Anderson, G., Feleke, E. and Perski, A. 1999. Patient-perceived quality of life after coronary bypass surgery. *Scandinavian Journal of Caring Sciences*. 13(1):11-17.
- Armitage, S. and Kavanagh, K. 1995. Continuity of care: Discharge planning and community nurses. *Contemporary Nurse*. 4:148-155.
- Armitage, S. and Kavanagh K. 1998. Discharge planning: An exploratory study. *Journal of Clinical Nursing*. 9:594-601.
- Australian Bureau of Statistics. 1995 *National health survey, SF-36 Population norms*. ABS Cat. No. 4299.0: Canberra.
- Balla, J. and Jamieson, W. 1994. Improving the continuity of care between general practitioners and public hospitals. *Medical Journal of Australia*. 161:656-659.
- Benroth, R. and Gawande, S. 1999. Patient-reported health status in total joint replacement. *The Journal of Arthroplasty*. 14(5):576-580.
- Bours, G., Ketelaars, C., Frederiks, C., Abu-Saad, H. and Wouters, E. 1998. The effects of aftercare on chronic patients and frail elderly patients when discharged from hospital: A systematic review. *Journal of Advanced Nursing*. 27:1076-1068.
- Bull, M. 2000. Discharge planning for older people: A review of current research. *British Journal of Community Nursing*. 5(2):70-74.
- Garratt, A., Schmidt, L., Mackintosh, A. and Fitzpatrick, R. 2002. Quality of life measurement: Bibliographic study of patient assessed health outcome measures. *British Medical Journal*. 324(7351):1417-1424.
- Henderson A. and Zernike W. 2001. A study of the impact of discharge information for surgical patients. *Journal of Advanced Nursing*. 35(3):435-441.
- Hopman-Rock, M., De Bock, G., Bijlsma, J., Springer, M., Hofman, A. and Kraamaat, F. 1997. The pattern of health care utilization of elderly people with arthritic pain in the hip or knee. *International Journal for Quality in Health Care*. 9(2):129-137.
- Hughes, S., Giobbie-Hurder, A., Weaver, F., Kubal, J. and Henderson, W. 1999. Relationships between caregiver burden and health-related quality of life. *The Gerontologist*. 39:534-545.
- Jaarsma, T. and Kastermans, M. 1997. Recovery and quality of life one year after coronary artery bypass grafting. *Scandinavian Journal of Caring Science*. 11:21-27.
- Johnson, A., Sandford, J. and Tyndall, J. 2003. Written and verbal information versus verbal information only for patients being discharged from acute hospital settings to home (Cochrane Review). In: The Cochrane Library, 4. Oxford: Update Software. CD003716.
- Karlson, E., Daltroy, L., Liang, M., Eaton, H. and Katz, J. 1997. Gender differences in patient preferences may underlie differential utilization of elective surgery. *American Journal of Medicine*. 102:524-530.
- Kiebzak, G., Vain, P., Gregory, A., Mokris, J. and Mauerhan, D. 1997. SF-36 General health status survey to determine patient satisfaction at short-term follow-up after total hip and knee arthroplasty. *Journal of the Southern Orthopaedic Association*. 6(3):169-172.
- Knutsson, S. and Bergbom Engberg, I. 1999. An evaluation of patients' quality of life before, 6 weeks and 6 months after total hip replacement surgery. *Journal of Advanced Nursing*. 30(6):1349-1359.
- Lieberman, J., Dorey, F., Shekelle, P., Schumacher, L., Kilgus, D., Thomas, B. and Finerman, G. 1997. Outcome after total hip arthroplasty. *Journal of Arthroplasty* 12(6):639-645.
- Lough, M. 1996. Ongoing work of older adults at home after hospitalization. *Journal of Advanced Nursing*. 23:804-809.
- March, L., Cross, M., Lapsley, H., Brnabic, A., Tribe, K., Bachmeier, C., Courtenay, B. and Brooks, P. 1999. Outcomes after hip or knee replacement surgery for osteoarthritis. *Medical Journal of Australia*. 171:235-238.
- Matt-Hensrud, N., Severson, M., Hansen, D. and Holland, D. 2001. A discharge planning program in orthopaedics: Experiences in implementation. *Orthopaedic Nursing*. 20(1):59-66.
- McHorney, C.A., Kosinski, M. and Ware, J.E. 1994. Comparisons of the costs and quality of norms for the SF-36 health survey collected by mail versus telephone interviews: Results from a national survey. *Medical Care*. 32:551-567.
- McKenna, H., Keeney, S., Glenn, A. and Gordon, P. 2000. Discharge planning: An exploratory study. *Journal of Clinical Nursing*. 9:594-601.
- McMurray, A., Grant, S., Griffiths, S. and Letford, A. 2002. Health related quality of life and health service use following total hip replacement surgery. *Journal of Advanced Nursing*. 40(6):663-672.
- McMurray, A., Theobald, K. and Chaboyer, W. 2004. Researching continuity of care: Can quality of life outcomes be linked to nursing care? *Contemporary Nurse*. 16(1-2):51-57.
- Naylor, M. 2000. A decade of transitional care research with vulnerable elders. *Journal of Cardiovascular Nursing*. 14(3):1-14.
- Nilsdotter, A., Petersson, I., Roos E. and Lohmander, L. 2003. Predictors of patient relevant outcome after total hip replacement for osteoarthritis: A prospective study. *Annals of Rheumatic Disease*. 62:923-930.
- Parker S., Peet, S., McPherson, A., Cannaby, A., Abrams, K., Baker, R., Wilson, A., Lindesay, J., Parker, G. and Jones, D.R. 2002. A systematic review of discharge arrangements for older people. *Health Technology Assessment*. 6(4):1-183.
- Parkes, J. and Shepperd, S. 2001. Discharge planning from hospital to home (Cochrane Review). In: The Cochrane Library, 3. Oxford: Update Software CD000313.
- Proctor, E., Morrow-Howell, N. and Kaplan, S. 1996. Implementation of discharge plans for chronically ill elders discharged home. *Health and Social Work*. 21(1):30-40.
- Rapley, M. 2003. *Quality of life research: A critical introduction*. London: Sage.
- Richards, S. and Coast, J. 2003. Interventions to improve access to health and social care after discharge from hospital: A systematic review. *Journal of Health Services Research and Policy*. 8(3):171-179.
- Ridge, R. and Goodson, A. 2000. The relationship between multidisciplinary discharge outcomes and functional status after total hip replacement. *Orthopaedic Nursing*. 9(1):71-82.
- Russell, S. 2000. Continuity of care after discharge from ICU. *Professional Nurse*. 15(8):497-500.
- Sparbel, K. and Anderson, M. 2000a. Integrated literature review of continuity of care: Part 1: Conceptual issues. *Journal of Nursing Scholarship*. 32(1):17-29.
- Sparbel, K. and Anderson, M. 2000b. A continuity of care integrated literature review, Part 2: Methodological issues. *Journal of Nursing Scholarship*. 32(2):131-137.
- Stucki, G., Liang, M., Phillips, C. and Katz, J. 1995. The Short Form-36 is preferable to the SIP as a generic health status measure in patients undergoing elective total hip arthroplasty. *Arthritis Care Research*. 8:174-181.
- Wammack L. and Mavrey J. 1998. Outcomes assessment of total hip and total knee arthroplasty: Critical pathways, variance analysis, and continuous quality improvement. *Clinical Nurse Specialist*. 12:122-129.
- Ware, J.E., Snow, K.K., Kosinski, M. and Gandek, B. 1993. SF-36 Health Survey Manual and Interpretation Guide. The Health Institute. New England Medical Centre: Boston.
- Watson, E., Firman, D., Baade, P. and Ring, I. 1996. Telephone administration of the SF-36 health survey: Validation studies and population norms for adults in Queensland. *Australian and New Zealand Journal of Public Health*. 20(4):359-363.
- Weaver, F., Hughes, S., Almagor, O., Wixson, R., Manheim, L., Fulton, B. and Singer, R. 2003. Comparison of two home care protocols for total joint replacement. *Journal of the American Geriatric Society*. 51:523-528.

# CORONARY ANGIOPLASTY: IMPACT ON RISK FACTORS AND PATIENTS' UNDERSTANDING OF THE SEVERITY OF THEIR CONDITION

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**Key words: coronary artery disease, survey, HPLP II**

## ABSTRACT

### *Objective:*

To explore self-reported changes in coronary risk factors by patients three to nine months following coronary artery angioplasty.

### *Design:*

Descriptive survey.

### *Subjects:*

Two hundred and thirty four patients, three to nine months after elective angioplasty. Patients were self-selected from a convenience sample of all patients undergoing angioplasty within a six-month period in two major metropolitan hospitals in Melbourne.

### *Main outcome measure:*

Self-reported responses to questions exploring patient's risk factor reduction and understanding of their condition.

### *Results:*

Two hundred and thirty four (41.7%) out of 560 questionnaires were returned. Forty percent of subjects reported the recurrence of chest pain and 42% believed they no longer had coronary artery disease. 85% of respondents reported making at least one modification to their risk factors and stress was the most common risk factor identified.

### *Conclusion:*

Coronary artery angioplasty is one of the most common elective interventions for coronary artery disease. It restores blood flow in the diseased vessel but cannot treat the underlying disease processes. Although the majority of patients had altered their lifestyle and reduced at least one risk factor, 40% of patients in this study had a recurrence of chest pain

and 42% believed their condition had been cured. Diet modification, increased exercise and stress reduction were the top three changes in lifestyle reported. The findings suggest there is a major need for better health education and follow-up for patients after coronary artery angioplasty.

## INTRODUCTION

Cardiovascular disease is a major cause of morbidity and mortality in Australia. In 1999, it was responsible for 29% of all deaths. Coronary artery disease (CAD) is the leading cardiovascular cause of death accounting for 27, 825 deaths or 22% of all deaths in Australia (National Heart Foundation 2001).

Cardiovascular disease is closely linked to lifestyle and by modifying cardiac risk factors an individual can significantly reduce their risk of developing the disease or reduce the severity of an existing condition. The National Heart Foundation released the most recent data on risk factors in the Australian population in 1999. More than 10 million Australians (over 80% of the adult population) had at least one of the following cardiovascular risk factors: tobacco smoking, physical inactivity, high blood pressure, or overweight, and about 80% of men and 75% of women had at least one of these risk factors.

### *Percutaneous transluminal coronary angioplasty (PTCA)*

PTCA was first performed on a human in 1977 and by 1980 two units in Australia had performed 11 procedures. In 1985 there were 13 units in Australia performing the procedure and 1,244 PTCA's had been carried out. The number of units performing the procedure continued to grow with 4,904 procedures performed by 20 units in 1990 and 13, 854 PTCA's performed by 42 units in 1998. Davies and Senes (2002) have identified the following trends in PTCA in Australia. By 1999 there were:



- 57 interventional cardiology units in Australia.
- 19,444 PTCA procedures were performed, 7% more than the previous year. This compares with 14% increase between 1997-1998 and 15% increase from 1996-1997.
- A total of 122 physicians performed the procedure in the 57 cardiology units.
- The most common age for a male patient to have the procedure is 60-64 (15.5%) and 65-69 (15.1%). The most common age for females is 70-74 (19.8%) followed by 65-69 (16.7%).
- The average length of stay was 3.8 days, with a median length of stay of 2.0 days.
- Twenty percent of the procedures were repeats and in 45% of these cases these repeats occurred within 12 months.
- Stents were inserted in 92% of PTCA patients, up from 87% of patients in 1998 and only 54% of patients in 1996.

Coronary artery angioplasty and stenting are among the most common interventions for established CAD. Technological, clinical and organisational advances means that angioplasty can be offered as a safe, relatively atraumatic short-stay procedure. However, it is clear that the procedure cannot alter the underlying causes of CAD and health education is an essential component of treatment. Angioplasty patients currently spend only a short time as an in-patient and it is not clear if health promotion activities are a significant element of the hospital stay. Without a focus on health education and lifestyle modification there is a risk that coronary artery angioplasty may appear to some patients to offer a 'quick fix' to the problem of coronary artery disease. This study was designed to explore patients understanding of their disease and if they reduced cardiovascular disease risk factors by lifestyle modification.

## METHODOLOGY

### *Purpose*

The primary purpose of this study was to determine if patients reported a modification in their coronary risk factors and lifestyle three to nine months after undergoing PTCA for CAD. Perceived limitations/complications following the PTCA were also investigated, along with the patients' knowledge and understanding of the long-term nature of their CAD.

### *Research design*

A descriptive survey design was selected for this study, using a questionnaire for data collection. This approach was appropriate to the purpose as little was known about the perceptions, attitudes, knowledge and experiences of patients undergoing PTCA in Melbourne hospitals for the treatment of CAD.

### *Population and sampling*

A convenience sample was used; patients were eligible for inclusion into the study if they had undergone an elective PTCA at either of two large public metropolitan teaching hospitals in Melbourne, Victoria, Australia. One hospital was located to the north of the city, the other to the south. These two hospitals were chosen as they perform the greatest number of PTCA procedures in Victoria.

### *Sample size*

In this study, 560 questionnaires were sent in the mail to patients who met the selection criteria. The sample size of 560 represents the total number of patients who had undergone the procedure from 1 December 2000 to 31 May 2001. Two hundred and thirty-four questionnaires were returned to the researcher, a response rate of 41.7%. Twenty envelopes were returned to the researcher where the person was not known at the address. Three spouses returned questionnaires stating their partner had died since the procedure.

### *The questionnaire*

Part 1 of the questionnaire was designed by the researcher to collect demographic data and to ask questions specifically related to the patient's experience of PTCA.

Items in Part 1 collected data related to quality of life, risk factors, smoking, cholesterol and anxiety, and benefits and limitations associated with the procedure.

Items in Part 2 of the questionnaire collected data about healthy lifestyle in relation to nutrition, exercise, stress, relationships, and health promoting lifestyle. The term healthy lifestyle has been described in the literature in various ways; sometimes narrowly as simply the avoidance of bad habits, and sometimes broadly as all behaviours that have a positive impact on health status. Pender (1996) in her Health Promotion Model (HPM) suggested that health as a positive life process may be experienced and expressed through lifestyle patterns, person/environment interactional patterns that become increasingly complex throughout the lifespan.

Part 2 of the questionnaire is the 'Health-Promoting Lifestyle Profile II' (HPLP II) developed by Walker et al (1987). HPLP was developed to test Pender's HPM, and has been used in a number of studies. The HPLP II measures health-promoting lifestyle, conceptualised by a 'multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualisation, and fulfilment of the individual' (Walker et al 1987, p.77).

A revised and updated version, the HPLP II was released in 1995. This 52-item instrument uses a four-point ordinal response format to measure the frequency of self-reported health-promoting behaviours. The scale assesses the frequency with which individuals report



engaging in activities directed towards increasing their level of health and well-being. A high score indicates a higher health-promoting level of behaviour in all instances. Responses range from 1, 'never' to 4, 'routinely'.

The HPLP II measures the following six dimensions of health-promoting lifestyle:

- health responsibility;
- physical activity;
- nutrition;
- spiritual growth;
- interpersonal relationships; and,
- stress management.

### Reliability and validity

Part 1 of the questionnaire in this study was constructed by the researcher and was tested for reliability and face validity. Frank-Stromborg and Olsen (1997) reported that Part 2 of this questionnaire (HPLP II) was evaluated in a sample of 712 adults. Construct, convergent and criterion-related validity have all been reported. Test-retest reliability for the HPLP II questionnaire has been reported as Pearson's  $r$  correlation coefficient where  $r=0.892$  (Frank-Stromborg and Olsen 1997).

### Data analysis

Part 1 of the tool was analysed in SPSS using descriptive statistics of percentages, means and standard deviations. For Part 2, a score for overall health promoting lifestyle was obtained by calculating a mean of the individual's responses to all items: the sub-scale scores are obtained similarly by calculating a mean of the responses to sub-scale items.

### Ethical considerations

Permission to conduct the study was obtained from the human research ethics committees at the two participating hospitals where the patients were recruited. Consent was assumed if the patients returned the questionnaire. Patients were informed that anonymity and confidentiality would be maintained at all times.

## RESULTS

The majority of the respondents were male (166 or 71%), 65 (28%) were female. In three cases the respondent did not indicate their gender. Table 1 summarises the age of the respondents; the highest numbers were in the 61-80 age group with relatively few angioplasties being performed on those under 40 years of age or over 80 years of age.

The majority of the respondents were married (table 2) and lived in the metropolitan area (table 3).

When asked if they understood they had CAD prior to having the PTCA, 176 (75%) said yes whereas

**Table 1: Age of respondents**

Age	n	%
31-40	5	2
41-50	23	10
51-60	47	20
61-70	86	37
71-80	63	27
81-90	5	2
Missing	5	2

**Table 2: Marital status**

Marital status	n	%
Single	19	8
Married	150	64
Partner	7	3
Widowed	30	13
Divorced	25	11
Missing	3	1

**Table 3: Residential location**

Location	n	%
Metropolitan	126	54
Rural	95	40
Other	7	3
Missing	6	3

**Table 4: Age and chest pain after PTCA**

60%	patients 31-40 years
48%	patients 41-50 years
43.5%	patients 51-60 years
39.5%	patients 61-70 years
32%	patients 71-80 years
20%	patients 81-90 years

23% (53) did not seem to know the nature of their condition. Five people (3%) failed to answer the question. When asked if they still had CAD after having the angioplasty the majority (128 or 54%) understood that they still had the disease but a substantial group (97 or 43%) believed the procedure had 'cured' the condition. Nine people (4%) failed to answer this question.

This perception may be a result of a short hospital stay, a quick recovery time, and a procedure conducted with little discomfort compared to coronary artery grafts. Gaw-Ens and Laing (1994) speculated that these patients

**Table 5: Risk factors identified**

Age	Stress	Blood pressure	Lack of exercise	Smoking	Poor diet
31-40	3	7	1	2	2
41-50	16	14	11	8	13
51-60	25	24	13	16	21
61-70	43	24	13	20	24
71-80	27	2	11	10	15
81-90	1	3	2	0	1
<b>TOTAL</b>	<b>115</b>	<b>74</b>	<b>51</b>	<b>56</b>	<b>76</b>

may consider PTCA to be curative of their coronary artery disease. Cronin et al (2000) and Gaw (1992) also postulated that patients in their studies did not feel the need to make changes to their behaviours because they felt they had been cured by the PTCA.

These studies hypothesised, postulated or speculated that patients felt they had been cured. No studies could be located that expressly asked this question. This current study did just that by asking the question 'do you believe you still have coronary artery disease following coronary angioplasty?'

Ninety-two (40%) of the patients reported experiencing chest pain in the months after the PTCA. Chest pain was reported by 35% of women compared with 40% of men while five people (2%) failed to answer this question. Table 4 demonstrates the occurrence of chest pain in the different age groups. It is clear that the younger respondents experienced more recurrence of chest pain after PTCA. Of the 92 patients experiencing chest pain, 29 had no understanding they still had CAD.

The recurrence of chest pain is a major finding of this study although similar recurrence rates have been reported elsewhere in the literature. These results are comparable to the study on restenosis by Levine et al (1995) who report the incidence of restenosis as 40% following PTCA. The chest pain described by patients in this study may be due to restenosis or may be new lesions in the coronary arteries.

The higher recurrence of chest pain in the younger patient is interesting, as it has not previously been reported in the literature on PTCA. The number of young patients in this study is small accounting for only 12% of the total population group but 48%-60% of these younger patients did experience further chest pain.

Patients were asked to identify the risk factors they felt put them at risk of coronary artery disease. The results by age group are shown in table 5. Stress was the most common risk factor identified followed by poor diet, high blood pressure, smoking and lack of exercise. When asked about modifications to their lifestyle with regard to risk factors, 123 reported improving their diet, 98 increasing exercise, 83 reducing stress and 40 said they

had stopped smoking (more than one factor could be listed). Fourteen people reported no modification of lifestyle. Although stress was the most common risk factor identified better diet was the most frequently reported modification.

A score for overall health-promoting lifestyle is obtained by calculating a mean of the individual's response to all 52 items; the six sub-scale scores are the means of responses to sub-scale questions. The use of mean scores retains the 1-4 measurement of item responses and allows meaningful comparisons of scores across sub-scales. The overall mean score for the HPLP II was 2.55 with a standard deviation of 0.50. The scores for the individual subscales are listed in table 6. The findings for each subscale are discussed in more detail below.

**Table 6: Health promotion lifestyle scores for the six subscales**

HPLP II sub-scales	Mean	Standard deviation
Health responsibility	2.35	.57
Physical activity	2.29	.73
Nutrition	2.95	.56
Spiritual growth	2.69	.65
Interpersonal relations	2.73	.55
Stress management	2.63	.58

### **Nutrition**

Even though the greatest number of patients reported modifying and improving their diet as the most common way of reducing risk factors, poor diet was listed as the second most common coronary artery risk factor for the patients in this research. It was evident that the patients in this study found it easier to modify and change their diet than to implement any of the other behaviour modifications related to risk factors. Supporting this finding, part 2 of the questionnaire (HPLP II) found nutrition to have the highest health promoting rating.

### **Stress management:**

In part 1 of the questionnaire stress was the most commonly identified risk factor but ranked third in terms of risk modification. In the HPLP II section of the

questionnaire stress management was rated fourth out of the six subscales. Patients in this current study commonly experienced stress and have indicated they were not confident in their ability to manage the stress in their lives. The finding that patients believed stress to be a major contributing factor for their CAD was unexpected. Few authors' address stress in relation to PTCA in their research, and the Heart Foundation of Australia does not list stress as a risk factor.

### ***Interpersonal relations***

This part of the questionnaire explored the issue of feelings and relationships with others. The finding here is that interpersonal relations was reported as the second highest rating of health promoting lifestyle. This indicated that having someone to care for them was very important in the lives of the patients. Many patients reported they had meaningful relationships with someone. The high rating of relationships by patients in this study stressed the significance of having family and friends available, especially as many of the patients did not feel they had a supportive relationship with anyone during their recovery from PTCA.

### ***Spiritual growth***

Spiritual growth was rated third in the health promoting lifestyle scale. This section explored patient's feelings about themselves. There is little research on spiritual growth and awareness in cardiac patients, although their life experiences, both before and after an acute cardiac event, would make an intriguing area of study. In this current study, many patients reported 'often' incorporating behaviours that characterised spiritual growth into their daily lives. Three quarters of the patients felt they had made positive changes to the way they are living following PTCA.

### ***Health responsibility***

Health responsibility was the fifth rated HPLP II sub-scale. This section of the instrument explores how patients manage their own health by ascertaining if they seek medical assistance for symptoms or ask for advice from health professionals. When asked if they reported chest pain to a health professional, less than half of the patients reported they would always do so, with a surprising 10% who reported they would never report chest pain. Only 27% would always question a doctor in order to understand their instructions, with 11% stating they would never question instructions.

### ***Physical activity***

Despite the benefits associated with regular exercise, patients in this study reported the lowest ranking in relation to incorporation of physical activity into their lifestyle. Forty-eight percent of patients never exercised in leisure activities, with 23% never following an exercise program. Too little exercise was the least reported risk factor in part 1 of the questionnaire and increasing the amount of daily exercise was the second highest

modification reported. The AIHW (2000) reported that only 57% of the Australian adult population take sufficient physical activity for health.

## **DISCUSSION**

PTCA has been conducted in Australian hospitals for many years as one of the treatment options for patients with potentially life threatening CAD, with the number of cases dramatically increasing each year. As CAD is potentially preventable in many people, the challenge for nurses and other health care professionals is to implement strategies, which best assist patients to make lifestyle choices that involve modification of their cardiac risk factors.

The most frequently reported complication following PTCA was chest pain, occurring in nearly 40% of patients. This chest pain may be related to restenosis of the coronary artery that has been stented, or it may be indicative of new coronary artery disease in other vessels. Despite the potential seriousness of this chest pain, few patients responded appropriately and reported chest pain to their doctor.

Another important finding identified by this study is that many patients do not understand they still have CAD. Nearly half the patients in this study believed their coronary artery disease has been cured by the PTCA. Even though the culprit lesion has been repaired, the chance is high that without modification of risk factors, patients will develop further chest pain indicating the presence of coronary artery disease.

Surprisingly, stress was the most commonly reported risk factor. Stress management was rated fourth in the HPLP II tool, and it was the third ranked risk factor to be modified in part 1 of the data collection tool. Clearly, stress management techniques need to be better addressed in pre procedure education programs and in cardiac rehabilitation programs.

## **CONCLUSION**

This study has added to the body of research using the HPLP II tool to gather information on health promoting lifestyles in different groups of patients. Although the HPLP I tool has been used once previously on PTCA patients (Song and Lee 2001), the HPLP II tool has not been used with the PTCA patient population group prior to this study, nor has it been used in an Australian population group.

Even though the use of a convenience sample and the low response rate may limit generalisation, this study has raised some key issues and supports the suggestion that PTCA while providing a 'technical fix' is failing in its current form to meet the needs of patients with CAD.

Results from this study suggest that patients do not consistently include health-promoting behaviours into

their lifestyle following PTCA. Nurses working with these patients need to better address their educative requirements in relation to modification of cardiac risk factors. This study highlights that advanced nursing practice lies more in assisting patients to make informed choices and less in mastering the technology of modern health care.

## REFERENCES

- AIHW. 2000. *Australia's health 2000: The seventh biennial health report of the Australian Institute of Health*. Australian Institute of Health and Welfare. Canberra.
- Cronin, S., Freeman, L., Ryan, G. and Drake, D. 2000. Recovery after percutaneous transluminal coronary angioplasty: Assessment after discharge. *Critical Care Nurse*. 20(2):70.
- Davies, J. and Senes, S. 2002. *Coronary angioplasty in Australia 1999*. Vol. 19. Canberra: Australian Institute of Health and Welfare and National Heart Foundation of Australia.
- Frank-Stromborg, M. and Olsen, S. 1997. *Instruments for clinical health care research*. Massachusetts: Jones and Bartlett.
- Gaw, B. 1992. Motivation to change lifestyle following PTCA. *Dimensions of Critical Care Nursing*. 11(2):68-74.
- Gaw-Ens, B. and Laing, G. 1994. Risk factor reduction behaviour in coronary angioplasty and myocardial infarction patients. *Canadian Journal of Cardiovascular Nursing*. 5(1):4-12.
- Levine, G., Chodos, A. and LosCalzo, J. 1995. Restenosis following coronary angioplasty: Clinical presentations and therapeutic options. *Clinical Cardiology*. 18:693-703.
- National Heart Foundation. 2001. *Recommendations for cardiac rehabilitation*.
- Pender, N. 1996. *Health promotion in nursing practice*. Philadelphia: Appleton and Lange.
- Song, R. and Lee, H. 2001. Effects of a 12-week cardiac rehabilitation exercise program on motivation and health-promoting lifestyle. *Heart and Lung: The Journal of Acute and Critical Care*. 30(3):200-209.
- Walker, S., Sechrist, K. and Pender, N. 1987. The health-promoting lifestyle profile: Development and psychometric characteristics. *Nursing Research*. 36(2):76-81.

# COMPETENCY STANDARDS FOR CRITICAL CARE NURSES: DO THEY MEASURE UP?

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**Key words:** competencies, competency standards, construct validity, critical care

## ABSTRACT

### Objective:

To determine the construct validity of the Australian College of Critical Care Nurses (ACCCN) competency standards as a tool for assessing the clinical practice of specialist level critical care nurses in Australia.

### Design:

A comparative descriptive design was used to examine the relationship between the domains, competencies and elements of the ACCCN competency standards. Participants were sent a questionnaire and asked to describe on a 7-point Likert scale how closely each competency statement and related elements reflected their level of critical care nursing practice.

### Subjects:

A systematic sampling method was used to randomly select 1000 critical care nurses from a prelisting of members of ACCCN. A total of 532 completed questionnaires were returned.

### Main outcome measure:

The purpose of this study was to determine the construct validity of the ACCCN competency standards by examining two structural models. The first examined how well the descriptive elements fit with their respective competency standard. The second model examined how well the competency standards group together under specific domains.

### Results:

Statistically there was no support for the current structure for the ACCCN competencies because the elements did not fit uniquely to a single competency, but were multidimensional and loaded across several competencies. Competency statements also loaded across several domains. Modification of the current model resulted in the identification of a four-factor competency model, which demonstrated reasonable model fit.

### Conclusion:

Several issues are highlighted, resulting in concerns regarding the validity of the ACCCN Competency Elements and Standards as a tool with which to assess the practice of critical care nurses.

## INTRODUCTION

In 1996 ACCCN developed competency standards for Australian specialist level critical care nurses (ACCCN competency standards 1996) from a multicentre observational study (Confederation of Australian Critical Care Nurses 1996). This development was in keeping with a move toward competency-based standards for industry and professions in addition to growing debate that beginning level competencies did not adequately capture more advanced nursing practice (McMillan et al 1997; Nursing Competencies Assessment Project 1990).

The structure of the ACCCN competency standards is three-tiered and includes elements, competencies and domains. ACCCN defines elements as related aspects of



performance that collectively provide evidence for a specific competency. All elements of a competency must be considered before inferences about the competency of an individual can be made. The competencies are attributes of a specialist nurse who functions at a high level of performance. Competency statements are grouped according to related facets of specialist practice known as domains. These domains include enabling, clinical problem solving, professional practice, reflective practice, teamwork and leadership (see figure 1) (ACCCN 2002).

The content validity of these standards has recently been examined (Greenwood et al 2001), however the construct validity has not been determined. Construct validity examines how well the conceptual theoretical definition, or in this case the structure of the competency standards, fits with the operational definition of measured variables. That is, do the elements and competency statements adequately measure the construct we call competence? While the ACCCN competency standards were not developed as a tool to measure clinical practice directly, many hospitals (Liverpool Health Service 2003), universities (University of Sydney 2001) and professional bodies (Underwood et al 1999) use them as a framework for the assessment of clinical performance (Fisher and Parolin 2000). To date, little research has been undertaken to examine the suitability of competency standards for use in the assessment of clinical practice (Williams et al 2001; Fisher and Parolin 2000) despite an articulated need for this to occur (Kendrick et al 2000). Without determining the construct validity the claim that the ACCCN competency standards can be used to measure clinical

competence of specialist level critical care nurses must at best be viewed as problematic.

The purpose of this study was to determine the construct validity of the ACCCN competency standards as a tool for assessing the clinical practice of specialist level critical care nurses in Australia. It was hypothesised that a structural model using Confirmatory Factor Analysis should represent the theoretical construct of the ACCCN competency standards. This testing of the structural model of the ACCCN Competency Standards will in turn inform further development and refinement of tools for assessing the clinical competence of critical care nurses.

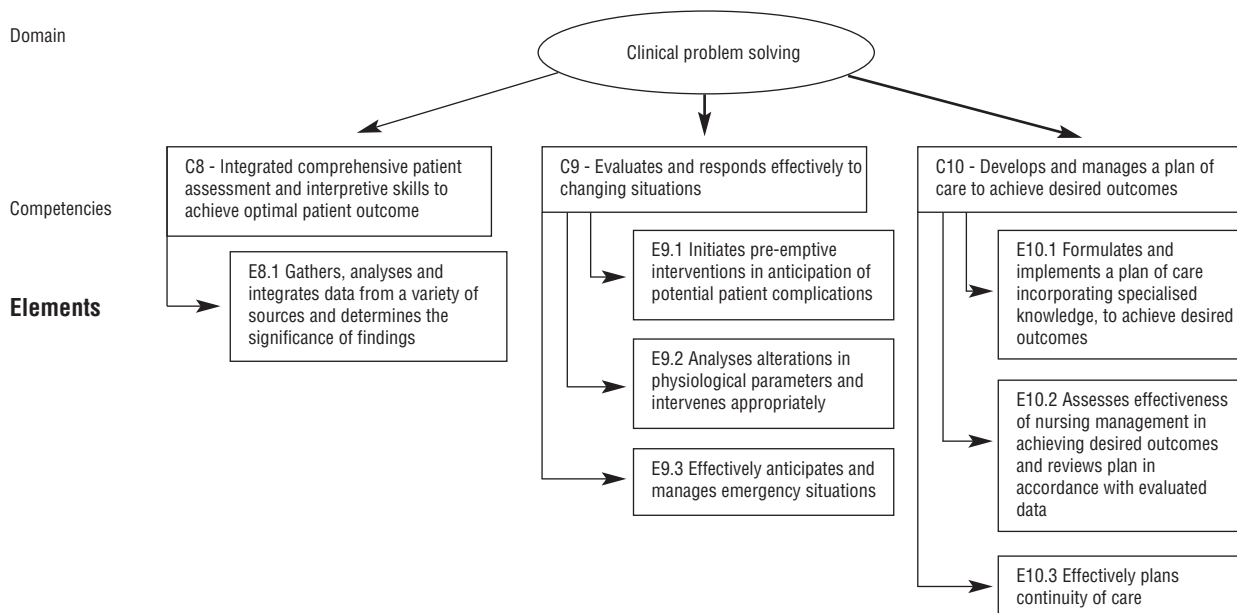
## METHOD

A comparative descriptive design was used to examine relationships between the domains, competencies and elements of the ACCCN competency standards. This study examined two structural models. Model one examined the theoretical construct of the elements within the ACCCN competency standards by determining the degree of fit these elements have with their respective competency factor within the sample. Model two examined the degree of fit of the ACCCN competency standards with their respective domains. The Human Ethics Committee of the University of Sydney granted ethics approval.

## Participants

The sampling procedure was designed to establish a representative sample of 1000 Australian critical care nurses. Thus a systematic sampling technique was used to

**Figure 1: The relationship between elements, competencies and domains of the ACCCN competency standards**



identify participants from the ACCCN membership database. Coded questionnaires were then mailed to the identified sample. A follow-up letter and replacement questionnaire was sent to non-respondents to maximise the response rate. This procedure achieved a response rate of 54% (n=540). Direct comparisons between the respondents and all Australian critical care nurses could not be established as no central repository of demographic data for Australian critical care nurses is held outside the ACCCN membership database. Consequently, the representativeness of the sample was unable to be determined, however the use of a random sampling technique coupled with a response rate of over 50% is considered sufficient to achieve adequate representation of the ACCCN membership.

### Instrument

The initial section of the questionnaire asked subjects for demographic information. The second section listed 58 elements of ACCCN competencies and 20 competency statements. Participants were asked to describe on a 7-point Likert scale (where 1 = never or almost never true and 7 = always or almost always true) how closely each competency statement and the related elements reflected their view of their level of critical care nursing practice.

### Data analysis

Both exploratory factor analyses (EFA) and confirmatory factor analyses (CFA) were performed to test the two independent 'a priori' models. These analyses were conducted firstly, to determine if the elements of each competency fit their proposed competency factor and secondly, the degree to which the competency statements load to particular domains and thus the construct of competence. Model fits were determined by utilising the Tucker Lewis Index (TLI), the Relative Non-Centrality Index (RNI) and the Root Mean Square Error of Approximation (RMSEA). An acceptable model fit utilising the TLI and RNI as fit indices is supported by results  $>0.90$ . The RMSEA is accepted as reasonable if  $<0.07$  and good if  $<0.05$  (Holmes-Smith 2002). By examining correlation coefficients and modification indices the researchers are able to make recommendations for model (competency) re-specifications.

Principal Component Analysis (PCA) with Varimax rotation procedure and Principal Axis Factoring (PAF) with an Oblimin rotation method were used to search for groups of items that have variance in common. To determine internal consistency, Cronbach's coefficient alphas were also calculated at the item and scale levels.

Exploratory factor analyses and reliability of the scales were examined using SPSS version 10 (SPSS Inc 2000). LISREL 8.0, (Jöreskog and Sörbom 1993) and AMOS version 4.0 (Arbuckle 1997) were used to conduct the confirmatory factor analyses.

## RESULTS

### Model 1: The Elements Model

Model one examined the theoretical construct of the 58 elements by determining the degree of fit these elements have with the 20 competency factors.

#### *Descriptive statistics at item and factor level for the elements model*

The results of a descriptive analysis at the element and competency level for the element's model revealed a narrow dispersion range suggesting non-normality in the data. Internal consistency (reliability) analyses demonstrated good scores ( $\alpha 0.6$ ) for all factors that contained more than one item.

#### *Correlation analysis at the element item and factor level*

A Pearson's correlation coefficient generated for each item and proposed factor revealed that a number of elements correlated more with other competencies than their own. Due to the propensity of elements to correlate more with non-theoretically determined factors, it was impossible to determine any factor structure from the results of the correlation matrix. Therefore, both exploratory and confirmatory factor analyses were undertaken.

#### *Exploratory factor analysis of the elements model*

An exploratory factor analysis using PCA with a Varimax rotation, revealed 10 factors with eigenvalues over one. The 10-factor model accounted for 64% of the variance. The exploratory factor analysis did not support the 20 theoretically proposed competency factors for the elements model. All element items loaded onto the first factor ( $>0.3$ ) and were split across the other nine factors in a random pattern. No factor structure was discernable.

#### *Confirmatory Factor Analysis (CFA) of the elements model*

A CFA of the elements was conducted by allowing each element to load only onto the hypothesised latent factor (competency) (table 1). Results based on the CFA demonstrate that the factor loadings were generally greater than 0.6. Six elements demonstrated target loadings less than 0.6, indicating that a significant portion of the variance of these elements is not accounted for by their respective competency factor.

The confirmatory factor analysis revealed high correlations between competency factors (Table 2). A third of competency factors were correlated greater than 0.70 with other competency factors, suggesting there is little difference between the competency factors. For example, C1 was highly correlated with C2 ( $>0.90$ ) suggesting that there is no statistical difference between C1 and C2. Confirmatory factor analysis testing of the ACCCN element model in this sample showed

unacceptable fit ( $\chi^2=4436.02$ ,  $df=1405$ ;  $TLI=0.81$ ;  $RNI=0.84$ ;  $RMSEA=0.06$ ).

**Model 2: The competency model**

Model two (figure 2) examined the degree of fit of the twenty ACCCN competency standards with the six domains: enabling, clinical problem solving, professional practice, reflective practice, teamwork and leadership (Australian College of Critical Care Nurses 2002).

**Descriptive statistics at item and factor level for the competency model**

In a similar manner to the Elements Model, the item (competency) means fell within a narrow range (6.12 to 6.77). Standard deviations were at a low and narrow range for both competencies (0.49 to 1.0) and domains (0.49 to

0.67). Cronbach's alpha was examined at competency item and domain levels. Only those domains with three or more competencies produced item estimations. The results at competency level reveal consistent results within the proposed domain. Those domains with only two competency items demonstrated the lowest alpha scores. The domain 'Reflective Practice' (C15 and C16) revealed a low alpha score ( $\alpha=0.34$ ) demonstrating unacceptable internal consistency for this factor.

**Results of a correlation analysis at competency item and factor level**

Pearson's coefficients generally demonstrated acceptable correlation for each competency and domain: Enabling - 0.31 to 0.56; Clinical Problem Solving - 0.52 to 0.61; Professional Practice - 0.38 to 0.49; Teamwork -

**Table 1: Results of the Confirmatory Factor Analysis for the ACCCN competency element subscales (n=532)**

	ACCCN Competency element subscale factor loadings																			
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20
E1.1	0.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E1.2	0.69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E1.3	0.74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E1.4	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E2.1	0	0.63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E2.2	0	0.69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E2.3	0	0.73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E2.4	0	0.77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E3.1	0	0	0.91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E4.1	0	0	0	0.91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E5.1	0	0	0	0	0.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E5.2	0	0	0	0	0.81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E5.3	0	0	0	0	0.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E5.4	0	0	0	0	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E6.1	0	0	0	0	0	0.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E6.2	0	0	0	0	0	0.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E7.1	0	0	0	0	0	0	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0
E7.2	0	0	0	0	0	0	0.81	0	0	0	0	0	0	0	0	0	0	0	0	0
E8.1	0	0	0	0	0	0	0	0.90	0	0	0	0	0	0	0	0	0	0	0	0
E9.1	0	0	0	0	0	0	0	0	0.79	0	0	0	0	0	0	0	0	0	0	0
E9.2	0	0	0	0	0	0	0	0	0.80	0	0	0	0	0	0	0	0	0	0	0
E9.3	0	0	0	0	0	0	0	0	0.77	0	0	0	0	0	0	0	0	0	0	0
E10.1	0	0	0	0	0	0	0	0	0	0.79	0	0	0	0	0	0	0	0	0	0
E10.2	0	0	0	0	0	0	0	0	0	0.77	0	0	0	0	0	0	0	0	0	0
E10.3	0	0	0	0	0	0	0	0	0	0.73	0	0	0	0	0	0	0	0	0	0
E11.1	0	0	0	0	0	0	0	0	0	0	0.72	0	0	0	0	0	0	0	0	0
E11.2	0	0	0	0	0	0	0	0	0	0	0.76	0	0	0	0	0	0	0	0	0
E11.3	0	0	0	0	0	0	0	0	0	0	0.69	0	0	0	0	0	0	0	0	0
E11.4	0	0	0	0	0	0	0	0	0	0	0.69	0	0	0	0	0	0	0	0	0
E11.5	0	0	0	0	0	0	0	0	0	0	0.66	0	0	0	0	0	0	0	0	0
E12.1	0	0	0	0	0	0	0	0	0	0	0	0.76	0	0	0	0	0	0	0	0
E12.2	0	0	0	0	0	0	0	0	0	0	0	0.79	0	0	0	0	0	0	0	0
E13.1	0	0	0	0	0	0	0	0	0	0	0	0	0.64	0	0	0	0	0	0	0
E13.2	0	0	0	0	0	0	0	0	0	0	0	0	0.64	0	0	0	0	0	0	0
E13.3	0	0	0	0	0	0	0	0	0	0	0	0	0.69	0	0	0	0	0	0	0
E14.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.69	0	0	0	0	0	0
E14.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.75	0	0	0	0	0	0
E14.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.66	0	0	0	0	0	0
E14.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0.59	0	0	0	0	0	0
E15.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.68	0	0	0	0	0
E15.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.72	0	0	0	0	0
E16.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0	0	0	0
E16.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.87	0	0	0	0
E16.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0	0	0	0
E16.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0	0	0	0
E17.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0	0	0
E17.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.75	0	0	0
E17.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.59	0	0	0
E17.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78	0	0	0
E18.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.91	0	0
E19.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.77	0
E19.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.75	0
E19.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.68	0
E19.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.77	0
E19.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.36	0
E19.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.63	0
E20.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78
E20.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.54

0.51 and Leadership - 0.48. However, the two competencies that theoretically constitute the Reflective Practice domain were only weakly correlated at 0.25. A number of competencies had higher correlations with domains other than their own, specifically those competencies in Reflective Practice, Teamwork and Leadership.

All domains demonstrated significant correlations (<0.001). Overall, all the competency standards correlated more with their current assigned domain than with any other domain. The Enabling and Clinical Problem Solving domains revealed the highest correlation value of 0.78 whilst other correlations ranged from 0.49 to 0.72. In a similar manner to the elements model, there is a propensity of competencies to correlate with non-theoretically determined factors, causing some difficulty in determining an overall item to factor structure for the competency model.

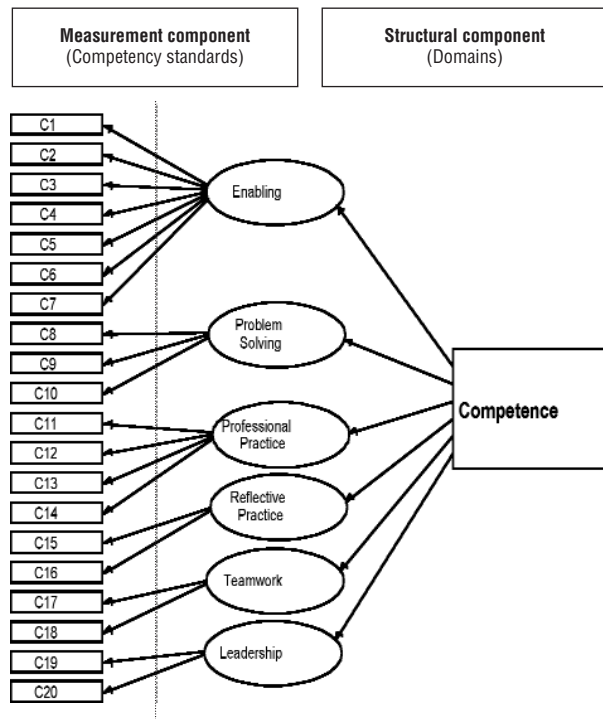
**Results of an exploratory factor analysis of the competency model**

The competency items were entered into a factor analysis (PCA with Varimax rotation) to assess any theoretically derived factor structure. The factor analysis revealed three factors with eigenvalues >1.0 accounting for 56% of the variance. The competency model, which is constructed from the elements model, theoretically consists of six factors (domains); however these are not supported in this analysis. Item factor loadings greater than 0.3 were distributed evenly throughout the three factors, however a number of item loadings (competencies 4, 8, 14, 15 and 17) were split across all three factors. No clear factor structure was discernable.

A further factor analysis was undertaken in an attempt to clarify the factor structure. By utilising Principal Axis Factoring (PAF) with an Oblimin rotation method and by fixing items to their theoretically designated factors, the

results determined that the theoretical factors are not supported in this analysis. Target loadings were modest to substantial ranging from 0.32 to 0.93; however, the competency standards did not load into pre-defined factors representing their respective domains. Cross loadings occurred for eight of the 20 competency standards. The PAF results do not support the theoretical structure of the ACCCN competency standards and their domains. The ACCCN competency standards were therefore further examined using confirmatory factor analysis.

**Figure 2: Competency construct components**



Note: C = Competency standards

**Table 2: Confirmatory Factor Analysis Phi Index of competency factors (φ)**

	Factor correlations (φ)																			
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20
C1	1																			
C2	0.91	1																		
C3	0.66	0.68	1																	
C4	0.64	0.50	0.49	1																
C5	0.56	0.56	0.50	0.58	1															
C6	0.71	0.73	0.66	0.68	0.81	1														
C7	0.63	0.67	0.59	0.50	0.65	0.85	1													
C8	0.44	0.49	0.47	0.42	0.48	0.62	0.79	1												
C9	0.63	0.64	0.58	0.65	0.71	0.89	0.85	0.69	1											
C10	0.70	0.76	0.60	0.61	0.73	0.91	0.86	0.69	0.82	1										
C11	0.61	0.67	0.56	0.54	0.54	0.72	0.70	0.50	0.66	0.74	1									
C12	0.68	0.76	0.60	0.54	0.54	0.75	0.66	0.45	0.68	0.78	0.87	1								
C13	0.53	0.52	0.62	0.62	0.59	0.76	0.70	0.52	0.76	0.72	0.73	0.79	1							
C14	0.65	0.76	0.58	0.51	0.54	0.67	0.65	0.49	0.60	0.81	0.91	0.87	0.71	1						
C15	0.65	0.64	0.60	0.52	0.56	0.73	0.72	0.53	0.69	0.73	0.72	0.71	0.80	0.76	1					
C16	0.43	0.41	0.37	0.37	0.43	0.42	0.58	0.46	0.44	0.53	0.59	0.53	0.46	0.67	0.61	1				
C17	0.66	0.68	0.56	0.63	0.64	0.73	0.69	0.54	0.71	0.79	0.67	0.77	0.79	0.74	0.76	0.59	1			
C18	0.45	0.50	0.40	0.38	0.57	0.62	0.58	0.43	0.52	0.62	0.63	0.61	0.53	0.61	0.62	0.45	0.64	1		
C19	0.64	0.66	0.55	0.55	0.66	0.77	0.75	0.55	0.69	0.82	0.78	0.75	0.75	0.81	0.88	0.70	0.81	0.75	1	
C20	0.50	0.54	0.46	0.56	0.61	0.71	0.68	0.56	0.71	0.71	0.70	0.67	0.73	0.76	0.71	0.70	0.74	0.59	0.93	1

Note: All coefficients are presented in standardised format. All factor correlations greater than 0.2 are statistically significant (p<0.01)



### Confirmatory factor analysis of the competency model

The results of the CFA demonstrated target loadings greater than 0.5 for most competency standards (table 3). The target loadings are highest for the domain of Clinical Problem Solving (0.74 to 0.75) although no proposed factor revealed consistently high loadings of >0.75. The domain of Reflective Practice revealed low target loadings ranging from 0.43 to 0.58.

The correlations among the domains as seen in the Phi Index (table 4), represent a concerning array of results. All domains appear correlated >0.79 with several over 0.90, suggesting that there is no statistical differences between these factors. Again, the results have not supported the proposed factor structure of the ACCCN competency factors.

The domain of Reflective Practice was highly problematic, revealing correlations to other domains greater than one. Given that a factor cannot correlate greater than one, the Phi Index results represent an improper solution. It is possible that the two-competency domains are problematic, although they may not necessarily result in improper solutions. In order to counteract this difficulty, the factor loadings for two-competency domains can be constrained to be equal in the initial analysis or the problematic domains may be collapsed into larger domains.

Confirmatory Factor Analysis testing of the ACCCN Competency Model in this sample showed borderline model fit ( $\chi^2=567.31$ ,  $df=155$ ;  $TLI=0.89$ ;  $RNI=0.91$ ;  $RMSEA=0.071$ ). The effects of an improper solution from the Phi Index for the factor of Reflective Practice may or may not have influenced the results of model fit that is below accepted standards. There is now strong evidence for the attempt of model respecification based on these results.

### Re-specification of the competency model

After careful assessment of the previous competency model and specifically taking into account correlation results at item and factor level as well as modification indices in Structural Equation Modelling (SEM), a decision was made to collapse the six-factor model into four domains. The domains of Reflective Practice and Team Work were collapsed, with competency items 15 and 17 moving to the factor of Clinical Problem Solving, and competency items 16 and 18 moving to Leadership. The following results assess the viability of the re-specified model using internal consistency scores, factor analyses and model fit indices. At this point, in order to test the re-specified model a new sample would be valuable.

### Internal consistencies for the four-factor model

After collapsing the model, reliability analysis was performed on all competencies and domains. The results reveal an improvement in overall reliabilities for the new domains. Alpha scores were reasonable and demonstrated good internal consistency at both the competency (ranging from 0.62 to 0.82) and domain (ranging from 0.76 for Leadership to 0.84 for Enabling and Clinical Problem Solving) levels.

### Factor analyses

An EFA (PAF with Oblimin rotation) revealed that most competencies still show a tendency to load onto the first factor rather than into the four proposed factors. The four-factor model accounted for 50% of the variance, which is a slight drop from the 56% of the current six-factor model.

The results of the CFA revealed reasonable target loadings (>0.5) for all of the competency standards (table 5). Two competency standards (1 and 16) demonstrated factor loadings <0.6. The factor loading for item 15 has

**Table 3: Confirmatory Factor Analysis for the ACCCN Competency Standards**

	Factor Loadings					
	Enabling	Clinical Problem Solving	Professional Practice	Reflective Practice	Teamwork	Leadership
C1	0.56	0	0	0	0	0
C2	0.61	0	0	0	0	0
C3	0.66	0	0	0	0	0
C4	0.69	0	0	0	0	0
C5	0.64	0	0	0	0	0
C6	0.67	0	0	0	0	0
C7	0.73	0	0	0	0	0
C8	0	0.75	0	0	0	0
C9	0	0.75	0	0	0	0
C10	0	0.74	0	0	0	0
C11	0	0	0.63	0	0	0
C12	0	0	0.70	0	0	0
C13	0	0	0.68	0	0	0
C14	0	0	0.68	0	0	0
C15	0	0	0	0.58	0	0
C16	0	0	0	0.43	0	0
C17	0	0	0	0	0.72	0
C18	0	0	0	0	0.71	0
C19	0	0	0	0	0	0.74
C20	0	0	0	0	0	0.66

Note: All coefficients are presented in standardised format. All factor correlations greater than 0.2 are statistically significant ( $p<0.01$ )

risen from the previous Reflective Practice loading of 0.58 to the current 0.64. The other Reflective Practice competency (16) added to the Leadership factor demonstrated an improved factor loading from a previous score of 0.43 to 0.50 in the current model.

The results of factor correlations from the Phi Index of the CFA for the re-specified four-factor model still demonstrated high correlations, most factors reveal scores >0.80 (table 6).

While the revised model has determined improved correlations to the previous six-factor model where an improper solution was revealed, the high scores demonstrate that statistically there is little difference between domains.

Model fit indices for the re-specified model revealed a TLI score of 0.91, a RNI score of 0.92, a RMSEA of 0.068 and a  $\chi^2$  of 564.46 with 164 df. The new model is a substantial improvement from the previous six-factor model based on these results. Overall, the results of SEM have provided good evidence for the re-specified model.

## CONCLUSION

The sampling strategy used in this study has created the effect of non-normal data distribution. The use of the

ACCCN membership database for the sampling frame has led to high item scores and low item variance. This reflects the high level of experience (mean = 11.54 years; SD=6.05) and critical care qualifications (92.3%) of the sample. As the purpose of data analyses was to examine the statistical model, non-normal data has a minimal effect on these results. In light of this, it is recommended that another study using a more diverse sample be conducted to determine if the re-specified model can be substantiated.

Exploratory and confirmatory factor analyses for the elements model revealed no discernable pattern between elements at the competency level. The elements are not discrete and linear where an element fits uniquely to one competency but are multidimensional and load across several competencies. These results are of considerable concern as they provide strong statistical evidence that there is no match with the proposed theoretical structure.

An assessment of the competency model results has revealed a number of difficulties relating to the ‘a priori’ model. Specifically, the two item domains (Reflective Practice and Team Work) have proven to be problematic in exploratory and confirmatory factor analyses. The factor of Reflective Practice performed poorly in all analyses. Firstly, correlations between the items and item to factor were low. CFA factor loadings for the

**Table 4: Competency factor correlations in CFA Phi Index**

Phi Index	ACCCN four factors					
	Enabling	Clinical Problem Solving	Professional Practice	Reflective Practice	Teamwork	Leadership
EN	1					
CPS	0.96	1				
PP	0.90	0.86	1			
RP	0.95	1.01	1.01	1		
TW	0.88	0.89	0.90	1.09	1	
Lead	0.79	0.84	0.82	1.14	0.96	1

Note: EN=Enabling; CPS =Clinical Problem Solving; PP= Professional Practice; RP= Reflective Practice; TW= Teamwork; Lead= Leadership.

**Table 5: Confirmatory factor analysis for the four-factor model**

	ACCCN four factors			
	Enabling	Clinical Problem Solving	Professional Practice	Leadership
C1	0.56	0	0	0
C2	0.61	0	0	0
C3	0.66	0	0	0
C4	0.69	0	0	0
C5	0.64	0	0	0
C6	0.67	0	0	0
C7	0.73	0	0	0
C8	0	0.74	0	0
C9	0	0.73	0	0
C10	0	0.73	0	0
C15	0	0.64	0	0
C17	0	0.71	0	0
C11	0	0	0.63	0
C12	0	0	0.70	0
C13	0	0	0.68	0
C14	0	0	0.69	0
C16	0	0	0	0.50
C18	0	0	0	0.74
C19	0	0	0	0.76
C20	0	0	0	0.67

**Table 6: Competency factor correlations Phi Index for the re-specified model**

Phi Index	Enabling	Clinical Problem Solving	Professional Practice	Leadership
Enabling	1			
Clinical Problem Solving	0.96	1		
Professional Practice	0.90	0.90	1	
Leadership	0.78	0.85	0.81	1

competencies within Reflective Practice were also low (<0.6). Lastly, factor correlations between Reflective Practice and the other domains led to an improper solution with correlations >1.00. These results are of concern, as they provided no statistical support for the model.

Problematic statistical issues have improved somewhat with the re-specified model. However, the issue of high correlations between proposed domains continue, albeit less than the theoretical model of six domains. Another important issue that should not become subsumed by the results of the statistical analyses is the fact that as yet there is no theoretical support for a four-domain model. In the original study (CACCN 1996) the domains were configured based on version 1 of the National Competency Standards for the Registered Nurse (Nursing Competencies Assessment Project 1990). None of the competency standards developed for nurses in Australia have had their construct validity established so it may be that the problems highlighted in the current study are present in all.

The competency model, be it six or four domains, as a higher order model remains dependent on the model performance at the elements level. Given that construct validity support at the statistical level was poor for the elements model, it is not surprising that difficulties continue to arise with the current educational reliance on the competency model as a framework for the purposes of assessment. Having said this, the analyses for the respecified model with four domains do represent an improvement at the statistical level.

The elements model and competency model have been examined for internal consistency, item and factor correlations, factor structure and model fit with the data. Several issues have been highlighted, resulting in concerns regarding the validity of the ACCCN Competency Elements and Standards as a tool with which to assess nurses' work skills and knowledge. Marsh points out that 'theory building and instrument construction are inexorably intertwined and that each will suffer if the two are separated' (1987, p.19). Marsh's warnings are specifically applicable here. It is acknowledged that the development of these competencies standards is based on the direct observation of clinical practice. While this is important for their development, empirical research such as described here should be included in the development process. Furthermore the content and construct validity of

competency standards should not be static, but should be in a constant state of development and refinement.

The competencies do not appear to lend themselves readily to statistical assessment and any changes to the competency factor structure based on construct validity and reliability analyses present a danger of being conducted without theoretical substantiation. Similarly, it would be unwise to continue with the use of these and similar competency standards to measure clinical performance without the exploration of their construct validity. It is strongly recommended that all future work in developing competency standards for nurses include SEM prior to being used to assess clinical practice.

## REFERENCES

- Arbuckle, J.A. 1997. *AMOS users' guide: Version 4*. Chicago: Smallwaters.
- Australian College of Critical Care Nurses Inc. (ACCCN) 2002. *Competency standards for specialist critical care nurses*. 2nd edn. Carlton: ACCCN.
- Confederation of Australian Critical Care Nurses (CACCN). 1996. *Competency standards for specialist critical care nurses*. Subiaco: Inkpress.
- Fisher, M. and Parolin, M. 2000. The reliability of measuring nursing clinical performance using a competency based assessment tool: A pilot Study. *Collegian*. 7(3):21-27.
- Greenwood, M., Kendrick, T., Gill, F., Hale, N., Birkett, K. and Porter, J. Sydney. 2001 World Federation of Societies of Intensive and Critical Care Medicine. 8th World Congress of Intensive and Critical Care Medicine. *Competency standards for specialist critical care nurses validation project*.
- Holmes-Smith, P. 2002. *Introduction to structural equation modelling using Lisrel*. Canberra: Australian Consortium for Social and Political Research Inc.
- Jöreskog, K. and Sörbom, D. 1993. *New features in LISREL 8*. Chicago: Scientific Software.
- Kendrick, T., Greenwood, M., Grech, C., Gill, F., Birkett, K. and Porter, J. 2000. Credentialing Australian critical care nurses: The pilot study. *Australian Critical Care*. 13(3):113-116.
- Liverpool Health Service. 2003. *Graduate certificate in specialty nursing core curriculum*. Sydney: Liverpool Health Service.
- Marsh, H.W. 1987. The hierarchical structure of self-concept: An application of hierarchical confirmatory factor analysis. *Journal of Educational Measurement*. 24:17-39.
- McMillan, M., Keatinge, D., Little, P., Madjar, I., Bujack, E., Andrews, J. and Johnson, R. 1997. *Competency Standards for the Advanced Nurse*. Melbourne: Australian Nursing Federation.
- Nursing Competencies Assessment Project. 1990. *Report to the Australian nurse registering authorities conference*. Adelaide: Nurses Board of South Australia.
- SPSS Inc 1999. *SPSS version 10.0.5*. Chicago: SPSS Inc.
- The University of Sydney. 2001. *Clinical assessment tools workbook*. Sydney: University of Sydney.
- Underwood, M., Elliott, D., Aitken, L., Austen, D., Currey, J., Field, T., Grech, C., Kiegaldie, D., Marshall, A., Pittard, M. and Worrall-Carter, L. 1999. Australian College of Critical Care Nurses Ltd.: Position statement on postgraduate critical care nursing education. October 1999. *Australian Critical Care*. 12(4):160-164.
- Williams, A., Wellard S.J. and Bethune E. 2001. Assessing Australian undergraduate clinical learning. *Collegian*. 8(4):9-13.

# DOCUMENTATION AND THE TRANSFER OF CLINICAL INFORMATION IN TWO AGED CARE SETTINGS

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**Key words:** work sampling, documentation, transfer of clinical information, aged care

## BACKGROUND:

Increasingly, documentation, both formal and informal, is being undertaken by nurses using a range of modalities. In Australia there is a sense that the demand for this in the aged care sector is increasing in line with requirements of funding agencies. However, the scope of this activity and its impact on nursing workload in aged care facilities has not been rigorously investigated. Funding of aged care facilities in the public hospital system in Australia is dependent on documentation of care.

### *Objective:*

The purpose of this study was to determine the frequency and time of day that documentation and transfer of clinical information activities occurred for nurses of all skill levels in two aged care facilities in New South Wales, Australia.

### *Design:*

Work sampling of direct care, indirect care, unit-related activities and personal time.

### *Setting:*

Two hospitals with aged care facilities near Sydney, Australia

### *Subjects:*

One hundred and six nurses.

### *Results:*

16,395 observations of nursing activities were recorded. The transfer of clinical information between

health care professionals comprises a large part of the nurse's working day. It comprised between 37 and 38% in this study, but the time of day in which it took place differed between the two hospitals.

### *Conclusion:*

Documentation needs to be seen as an integral part of care by managers and clinicians. Both would wish to ensure that it is undertaken in the most efficient and effective manner to allow the necessary time for direct care. More detailed understanding may allow clinical unit managers to re-structure the workday in terms of documentation to achieve greater efficiencies or effective use of nursing time.

## INTRODUCTION

Nursing roles in Australia are continuing to evolve and expand into more specialised clinical practice areas, requiring skills that are increasingly more complex. As the Australian health care system focuses more on outcomes, greater accountability for patient care is being expected of nurses. More comprehensive documentation is then required because the care documented is defined as the nursing care given (Malek and Oliveri 1996).

The explosion of information technology and continuing budgetary constraints are also influencing clinical documentation and health care information systems. In Australian aged care institutions it is even more important to document treatment plans and care needs because levels of funding are determined from these (Meiner 1999). Added to this is the need to provide a legal record across a continuum of care that meets the expectations of the health care system, clinicians and



consumers (Savy 1999). Therefore, understanding patterns of documentation - the frequency and time taken - is vital to sustaining the integrity not only of the nursing services, but of the quality of the services provided overall.

This paper describes a study to determine the frequency and time of day that documentation and transfer of clinical information activities occurred for nurses of all skill levels in two aged care facilities in New South Wales, Australia. The facilities were chosen as a convenience sample and represent institutional aged care facilities not the nursing home sector. More documentation, both formal and informal, is now undertaken by nurses using more modalities (written methods, tape recorders and computers).

## LITERATURE REVIEW

Nurses in aged care sense that increasing documentation demands are drawing them further away from direct care. The scope of this activity and its impact on nursing workload in aged care facilities, and more importantly the time 'left over' for direct patient care with older people who have more complex care needs (Palmar and Short 1994) has not been rigorously investigated.

While there has been some recent attention to this area in Australia (Moyle et al 2002; Pelletier et al 2002), the Australian literature provides little insight into the proportion of time nurses (of all skill levels) spend in this activity. One study was conducted in Australia but the report was not widely disseminated (Hovenga and Hindmarsh 1996). Their research found nurses spent 21% of their time handling written information and a further 28% of their time engaged in verbal communication among themselves or with patients, other health professionals or visitors. Overseas estimates indicate nurses spend as much as 60% of their time manually documenting or charting the various components of the nursing process (Windel 1994). Other estimates range from 13.7% through to 50% (Pabst et al 1996). None of these studies focused on the aged care setting.

However, Martin et al (1999) found the average time nurses spent on documentation in certain units of a 1000-bed long-term care facility in Canada was 56 minutes per shift, or 12% of the working day.

In Australia, an instrument termed the Resident Classification Scale (RCS) must be completed on all long term care patients to allocate a care category, which with the individual's financial status, influences the funding given by the Australian Government (Commonwealth Department of Health and Family Services 1998). The care classification appraisal must be based on written evidence about the care needs and care interventions provided for the resident over a period of at least 21 days. To achieve accurate classification, the documentation must be of good quality and quite detailed

and as such requires considerable nursing time. This again takes staff away from direct care.

While the value of nursing documentation is recognised as being critical to quality professional care (Hoban 2003), it is still an unpopular activity, particularly in long-term care facilities (Martin et al 1999). It is a source of job dissatisfaction according to Buelow and Crujssen (2002). Savy (1999) posited that traditional nursing work takes precedence over writing notes. Consequently, this activity is undertaken at the end of the shift after direct patient care activities are completed. Furthermore, she argues that this leads to inadequate attention being given to documentation tasks with serious implications for nurses in aged care settings in terms of professional standing, patient outcomes and funding. A Scandinavian study endeavoured to establish the link between documentation and the quality of care given and noted that while 73% of care plans were up to date there were substantial gaps in recording cognitive states and functional ability and that further educational efforts and specific forms were needed (Voutilainen et al 2004).

Many health care providers, including many nurses themselves, do not see nursing documentation as important, especially as nursing documentation is often lost or discarded after discharge (Meuth 1999). Furthermore, documentation is perceived to take time away from nursing care (Buelow and Crujssen 2002) rather than being perceived as an integral part of nursing practice and care. As Moloney and Maggs (1999, p.51) pointed out, however, 'the fundamental importance of record keeping as a foundation of care cannot be emphasised too strongly. Accurate, complete and up-to-date records represent a vital component of high quality care'. Moreover, nursing documentation is the evidence of the bearing nurses have on recovery relative to the intervention by doctors or physiotherapists; therefore incomplete or inaccurate record-keeping impacts on the survival of the profession as a whole (Sibbald 1998). Alford (2003), taking a legal perspective, argues that while documenting completely and accurately is deemed to be standard nursing practice, many nurses do not seem to understand that it is critical to the quality of care and that failure to document can have consequences both lethal and legal (Sullivan 2000).

## METHODOLOGY

Work sampling has been widely used to determine how nurses spend their time (Gagnon and Waghorn 1996; Urden and Roode 1997; Upenieks 1998; Pelletier et al 2003; Duffield et al 2003; Korst et al 2003). A large number of observations of staff work are taken at random intervals - during a sample of hours, shifts or days - and classified into a pre-defined set of categories (Pelletier et al 2003; Korst et al 2003). While the exact time spent in activities is not recorded, exact activities are (Urden and Roode 1997), the assumption being that a small number

of events will follow the same distribution for a longer time period as for a shorter one.

### Setting

The research was undertaken in two hospitals, selected because of their aged care facilities, in and near Sydney, Australia. Hospital (A) comprised three-inpatient aged care wards. Two wards (each 35 beds) were for older patients requiring rehabilitation following, for example, a stroke or a motor vehicle accident. Hospital (B) comprised two aged care wards (63 beds), one for rehabilitation care (30 beds) and the other for sub-acute medical care (33 beds). Ethics approval was granted by the university and both area health services.

### Instrument

The instrument used was adapted for the Australian context by Wood (1999) based on Urden and Roode's (1997) tool, with their consent. Within the instrument there are four major pre-defined categories: direct care, indirect care, unit-related activities and personal time. Activities in these major categories are itemised in table 1.

### Procedure

Data collectors were trained during a one-hour didactic training session (consisting of a general overview of work sampling and detailed training in definitions and specific activity codes), followed by a two-hour practice run. Inter-rater reliability (IRR) was checked (83.3% at Hospital A and 85.6% at Hospital B). At various times throughout the data collection period, random and informal IRR checks were conducted between two collectors when one observer was finishing a two-hour block and another commencing, with perfect concurrence resulting.

All data collectors were nurses which the researchers felt would enable more effective coding of activities as nursing is complex and the actual activity may be 'hidden'. Rarely was it necessary for the observers to clarify an activity with the staff member being observed. The skill level of the staff was noted at the time of observation.

Observation of nursing activities on each ward took place over several months at randomly allocated sessions, each in two-hour time slots. During the times 7am to 5pm

Monday to Friday four weeks of data were collected for Hospital A and two weeks for Hospital B. Hospital A had fewer nursing staff than Hospital B. Daytime hours were selected as the maximum range of activities occurs during day shifts.

Observations were categorised into specified activity categories (see table 1) and recorded on specially designed data collection sheets. Data collection commenced on the hour and at 10-minute intervals thereafter as per the protocol used by Urden and Roode (1997) and Wood (1999). Many activities in direct and indirect care would automatically have a documentation component, for example, administering a medication. Yet the nurse may not actually have been signing for the drug at the time observed. To give more detailed information on the actual incidence of nurses 'putting pen to paper' the documentation component itself was recorded as supplementary information in terms of place and time as a separate coded entry. For example, a nurse might be observed writing a patient care plan at 10am by the patient's bedside. This would be coded as co-ordination of care/care planning with a side note - bedside. Following the data collection, the results were entered and analysed using the Statistical Package for Social Sciences (SPSS).

All nursing staff working at any time on any of the ward areas in the study were invited to consent to take part. Interactive information sessions about the nature and purpose of the study were held at each hospital prior to the start of data collection and a participant information sheet was circulated. Further participants were recruited on a day by day basis as the study progressed. Interaction between researchers and participants was kept to a minimum except where clarification was required regarding the whereabouts of a staff member or activity categories.

## RESULTS

A total of 51 nurses at Hospital A (94.9% of the observations) and 55 nurses at Hospital B (91.0% of the observations) consented to participate in the study. Skill mix differed in both hospitals. For example, Hospital A comprised a nursing unit manager in each ward, registered nurses and enrolled nurses, and occasionally, trainee enrolled nurses and assistants in nursing (unregulated

**Table 1: Activity codes by category (direct care, indirect care, unit-related activities and personal time)**

DIRECT CARE	INDIRECT CARE	UNIT-RELATED	PERSONAL
Admission/assessment	Coordination of care: Care planning/Critical pathways	Clerical	Personal time
Assisting with procedures	Coordination of care: Rounds, team meetings	Errands off-unit	
Hygiene	Communication/information	Environmental cleaning	
Medication/IV administration	Computer: Data entry/retrieval	Meetings and administration	
Nutrition/elimination	Medication/IV preparation	Supplies, check, re-stock	
Patient mobility	Progress notes/discharge notes	Teaching/in-service	
Patient/family interaction	Room/equipment setup/cleaning		
Procedures	Verbal report/handover		
Specimen collection/testing			
Transporting patient			

personnel). In Hospital B, no-one was in the assistant in nursing category, but there were clinical nurse specialists on each ward.

A total of 16,395 observations (9,570 in Hospital A and 6,825 in Hospital B) of nursing activities were recorded. These are presented by category in figure 1. The percentage of observed pen-to-paper documentation of these activities for each category is presented in figure 2. These occurred at approximately the same rate - 7.5% for Hospital A and 6.8% for Hospital B. While their proportions of direct care documentation were very similar, differences arose with the proportions of documentation observed in indirect care (with Hospital B spending approximately 12% more than Hospital A) and in unit-related care (where the reverse was true). The spread of observed documentation in the various categories of care over the day can be seen in figures 3, 4, and 5.

Documentation peaked in direct care activities (figure 3) in the late morning for Hospital A, and mid-afternoon (towards the end of the day shift) for Hospital B. Interestingly, observed documentation decreases rapidly in Hospital A at the time it increases in Hospital B.

In indirect care (figure 4), observed documentation for the most part increased throughout the morning and peaked at both hospitals in the early afternoon.

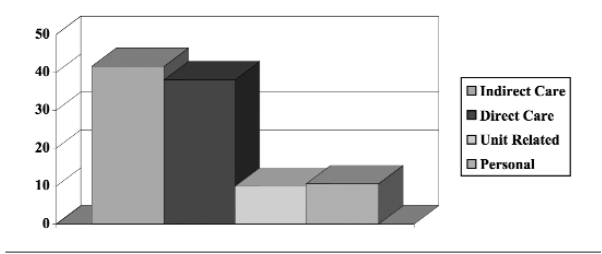
The percentage of documentation related to unit-related care activities was higher in Hospital B between 7-8am with smaller peaks between 9-10am and 1-2pm (figure 5). Both hospitals showed a decrease in unit-related documentation in the middle of the day, with both rising in the early-to-mid afternoon.

What is interesting to note in these graphs is how observed documentation decreases sharply at Hospital A at 1pm (during the lunch break), while at Hospital B, it hardly dips at all during this period (with the exception of unit-related documentation which was not observed between 11am and 1pm) and, in the case of indirect care documentation, actually rises. This is related to differences in approach to staffing. Hospital B has staff who work 'short shifts' and thus commence at different times during the day while Hospital A has the traditional three shifts (7am-3pm, 3pm-11pm and 11pm-7am).

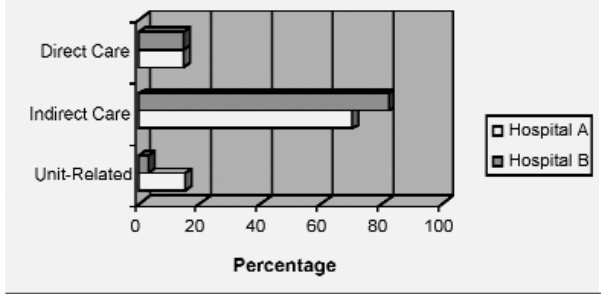
Observations were made of verbal communication and other methods of transferring clinical information. In figure 6, a comparison of the various forms of transfer of clinical information is depicted. It is clear that verbal communication with professional staff dominated the other forms of communication of information about patients, including handover and care planning.

The location where written documentation took place was also recorded on the instruments (figure 7). The nurses' station was by far the most frequently utilised site for both hospitals for recording patient information. Hospital A's greater use of the nursing unit manager's office is indicative of more unit-related documentation being done there than in Hospital B. High use of nursing unit desk areas for charting and general discussion as staff congregate there has raised issues of patient privacy and it may be a practice to overtly move away from for that reason. Hospital B's greater use of the bedside areas may be explained by one of its wards being sub-acute care. The documentation observed in the dining room of both institutions reflected the practice of medication administration in that area.

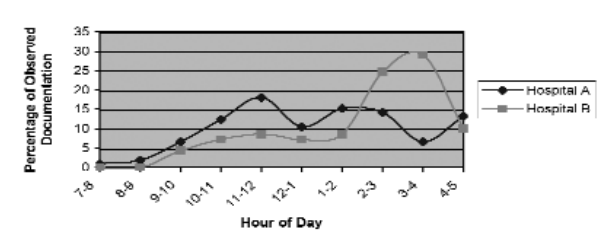
**Figure 1: Percentage of total observations by category**



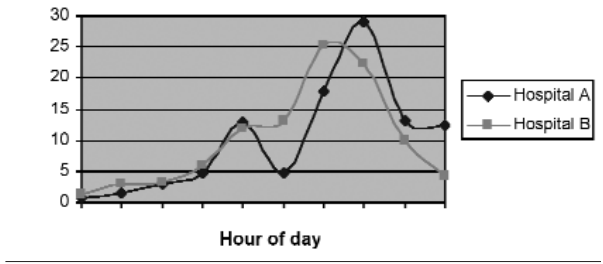
**Figure 2: Percentage of observed documentation for each category of care**



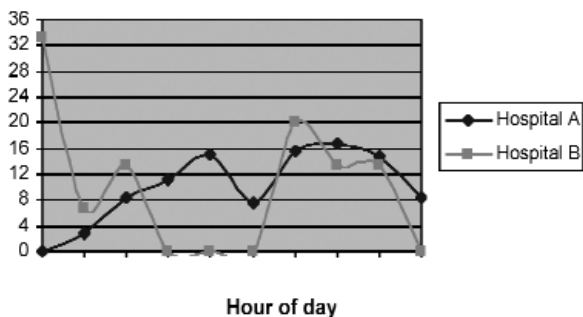
**Figure 3: Comparison of % of observed direct care documentation by hour of day by hospital**



**Figure 4: Comparison of % of observed indirect care documentation by hour of day by hospital**



**Figure 5: Comparison of % of observed unit-related documentation by hour of day by hospital**



## DISCUSSION

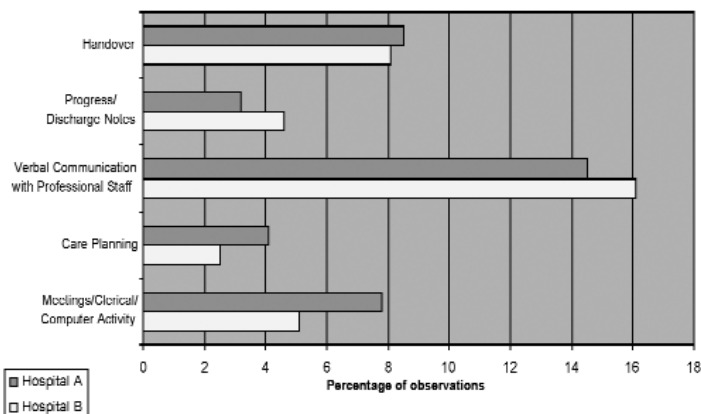
This paper is reporting on documentation observed by the data collectors when completing the tool which recorded all nursing activities. The finding that written (pen to paper) documentation occurred in only 7% of observations was lower than that found for documentation in other studies (Moody and Synder 1995; Wyatt 1995; Mann et al 1999). It should be noted that documentation of nursing activities was also embedded in other activities within the instrument, for example the administration of medications. Figure 7 is an attempt to demonstrate this. If the activities denoted there are included in the overall calculation of documentation and transference of clinical information, then Hospital A recorded rates of 38.1%, and Hospital B 37.6% of activities overall spent in the transfer of clinical information. These are perhaps more valid figures for imparting clinical information, as they incorporate substantially more than observed, pen-to-paper written documentation. Indeed, according to Deeny and McKenna (1994), written documentation is undervalued by nurses, who place greater emphasis on the contribution of verbal communication to quality patient care. This may be because they feel uneasy about their

written ideas being the subject of scrutiny by those more critical (House and Bailey 1992).

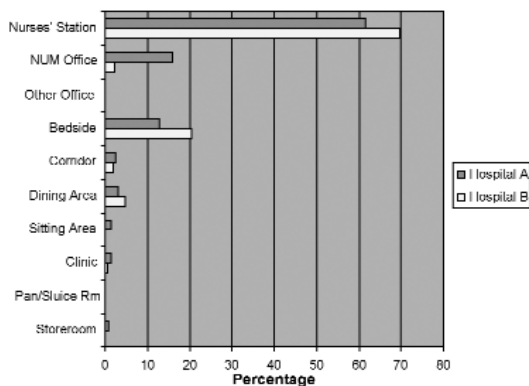
The image of written documentation as secondary to more direct patient care activities has to some extent been validated by this research. The level of time in documentation in these settings is not much different to that of other studies. These findings may therefore be heartening for those nurses who felt their direct care time was being eroded significantly. The patterns warrant some analysis by nurse unit managers who may wish, with clinicians, to plan some re-structuring of shift patterns or physical facilities, especially if computerised clinical systems are being considered. For example, the likely reason for the preponderance of observed documentation taking place in late morning and/or mid-afternoon is that patients' personal care requirements were less at these times. Nurses were able to attend to their documentation activities, but were still liable to be called to a patient's bedside during these times. In the afternoon, what is perceived as a 'traditional' time for nurses to attend to progress notes and care plans occurred during recognised shift overlaps. Figures 2, 3 and 4 also indicate that documentation is established as an activity taking place after patient contact activities have occurred or during the quieter times of the day. Documentation occurred whenever opportunities arose rather than as a structured part of a nurse's working day. However, this needs to be seen from the perspective that, while some other professions within the hospital setting perform their documentation away from the clinical areas, without disruption, nurses are on call and frequently interrupted.

These more traditional patterns of charting activities are in contrast to recent trends in some settings to chart activities immediately, in effect almost in real time. This is particularly true in areas using computerised information systems. Such 'real time' charting may be more applicable to acute care settings where there is likely to be more multidisciplinary activity and movement of patients to and from the ward areas.

**Figure 6: Transfer of clinical information**



**Figure 7: Location of observed written documentation**





## LIMITATIONS

Limitations of this study include some differences in staffing which may have impacted on the type of nursing activities undertaken. For example, Hospital A had a high concentration of physiotherapists who undertook rehabilitation tasks, leaving nurses to carry out the more traditional nursing activities. Ward differences in terms of geographical layout, organisation of charts and of ward routines, such as, medication dispensing practices and patient meal times were also apparent. Additionally, there were differences in staff skill mix and one ward was undergoing structural change.

As for the 'Hawthorne effect' discussed in the work-sampling literature (Finkler et al 1993; Urden and Roode 1997; Pelletier et al 2003), it did not take long for the data collectors to 'fade into the background', so to speak. One nurse told a researcher that the team was now a 'part of the furniture', a sign that the researchers' presence may not have affected that nurse's behaviour, and this was presumably the case more widely.

## CONCLUSION

Nursing documentation has grown markedly, both in breadth and complexity, in the past decade, and an analysis of both its scope and the time spent in this activity, especially in the Australian context, has been lacking until now. This research has aimed to ascertain the proportion of time nurses of all skill levels spend in documenting and imparting clinical information to other health care professionals and to determine if this was outside the norms as shown in other studies (most of which are not aged care settings). While the observed written documentation may not be as high as the nurses themselves anticipated, the transfer of clinical information between health care professionals constitutes a large portion of a nurse's working day. The proportion is in line with other studies and the value of communication of information well recognised as critical to patient care. When documentation is perceived as taking nurses away from their patients, it is devalued. This study indicates that the time spent in documentation as an element in the overall of professional transfer of information is not excessive and this realisation may help practitioners accept it as both a necessity and an integral part of their patient care.

## REFERENCES

Alford, D. 2003. The clinical record: Recognizing its value in litigation. *Geriatric Nursing*. 24(4):228-230.

Buelow, J.R. and Crujssen, M.H.A.F. 2002. Long-term care nurses speak out. *Long Term Care Management*. 51(3):50-53.

Commonwealth Department of Health and Family Services. 1998. *The Resident Classification Scale Training Workbook*. The Commonwealth Department of Health and Family Services: Canberra.

Deeny, P. and McKenna, H. 1994. Care plan sham. *Nursing Standard*. 11:42-43.

Finkler, S.A., Knickman, JR., Hendrikson, G., Lipkin, M.Jr. and Thompson, WG. 1993. A comparison of work-sampling and time-motion techniques for studies in health services research. *Health Services Research*. (28)5:577-602.

Gagnon, A.J. and Waghorn, K.1996. Supportive care by maternity nurses: A work sampling study in an intrapartum unit. *Birth*. 23(1):1-6.

Hoban, V. 2003. How to improve your record keeping. *Nursing Times*. 99(42):78-79.

Hovenga, E.J.S. and Hindmarsh, C. 1996. *Queensland Health PAIS Validation study: Report of commissioned research to Queensland Health*. Central Queensland University. Rockhampton: Australia.

Korst, L M., Eusebio-Angeja, A C., Chamorro, T., Aydin,CE. and Gregory, K.D. 2003. Nursing documentation time during implementation of an electronic medical record. *Journal of Nursing Administration*. 33(1):24-30.

Malek, C.J. and Olivieri, R.J. 1996. Pain management: Documenting the decision-making process. *Nursing Case Management*. 1(2):64-74.

Martin, A., Hinds, C. and Felix, M. 1999. Documentation practices of nurses in long-term care. *Journal of Clinical Nursing*. 8(4):345-352.

Meiner, S.E. 1999. Documentation in extended and long-term care nursing. In Meiner, S.E. (ed.). *Nursing documentation legal focus across practice settings*. Thousand Oaks, CA. Sage Publications: 197-210.

Moloney, R. and Maggs, C. 1999. A systematic review of the relationships between written manual nursing care planning, record-keeping and patient outcomes. *Journal of Advanced Nursing*. 30(1):51-57.

Moody, L. and Snyder, P.E. 1995. Hospital provider satisfaction with a new documentation system. *Nursing Economics*. 13(1):24-31.

Moyle, W., Skinner, J., Rowe, G. and Gork, C. 2002. Views of job satisfaction and dissatisfaction in Australian long-term care. *Journal of Clinical Nursing*. 12(2):168-176.

Mueth, E.C. 1999. Computer-based patient records. In Meiner, S.E. (ed.). *Nursing documentation legal focus across practice settings*. Thousand Oaks CA. Sage Publications: 29-39.

Pabst, M.K., Scherubel, J.C. and Minnick, A.F. 1996. The impact of computerized documentation on nurses' use of time. *Computers in Nursing*. 14(1):25-30.

Palmer, G.R. and Short, S.D. 1994. *Health care and public policy: An Australian analysis*. (2nd ed.) Melbourne, Australia: Macmillan.

Pelletier, D., Duffield, C., Gietzelt, D. and Larkin, P. 2002. The complexities of information documentation in aged care settings in Australia. *The Journal of Gerontological Nursing*. 28(5):8-11.

Pelletier, D., Duffield, C. and Gietzelt, D. 2003. Work sampling: Valuable methodology to define nursing practice patterns *Nursing and Health Sciences* 5(1):31-38.

Savy, P. 1999. *Accounting for care: Documenting residential aged care nursing*. In Richmond, J. (ed.). *Nursing documentation: Writing what we do*. Australia. Hyde Park Press: 7-17.

Sibbald, B. 1998. Canada's pioneer of nursing informatics. *The Canadian Nurse*. 94:59-60.

Sullivan, G. 2000. *Keep your charting on course*. RN. 63(5):75-80.

Upenieks, V.V. 1998. Work sampling: Assessing nursing efficiency. *Nursing Management*. 29(4):27-29.

Urden, L.D. and Roode, J.L. 1997. Work sampling: A decision-making tool for determining resources and work redesign. *Journal of Nursing Administration*. 27(9):34-41.

Voutilainen, P L., Isola, A. and Muurinen, S. 2004. Nursing documentation in nursing homes: State-of-the-art and implications for quality improvement. *Scandinavian Journal of Caring Sciences*. 18(1):72-81.

Windle, P.E. 1994. Critical pathways: An integrated documentation tool. *Nursing Management*. 25(9):80F-80P.

Wood, L.M. 1999. *An exploratory study examining the time that nursing unit managers, clinical nurse specialists, registered and enrolled nurses spend teaching other nurses in the clinical environment*. Unpublished Master's thesis, University of Technology, Sydney, Australia.

Wyatt, J.C. 1995. Hospital information management: The need for clinical leadership. *British Medical Journal*. 311(6995):175-178.

# PHYSICAL RESTRAINT USE ON PEOPLE WITH DEMENTIA: A REVIEW OF THE LITERATURE

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**Key words:** physical restraint, dementia, long term care, aged care

## ABSTRACT:

### *Objective:*

To provide a critical review of contemporary literature published between 1992 and 2003 on the use of physical restraints on residents with dementia in long-term care.

### *Design:*

Forty-two manuscripts related to dementia (cognitive impairment) and physical restraint in long-term care settings were examined.

### *Results:*

Four dominant themes were identified in the literature: relationship between restraint use and cognitive decline; falls/related injuries and associated mortality; reduction/removal/alternatives to use; and, nurses' attitudes to restraints. It appears that despite nurses' desire to use physical restraint for protection there is no scientific evidence that physical restraint actually protects residents against injuries. A discussion of the methodological issues arising in the literature and recommendations for further research and implications for nursing practice are outlined.

### *Conclusion:*

To curb the practice of restraint use the concentrated assistance of Australia federal and state governments and peak geriatric and dementia organisations may be required.

## INTRODUCTION

Physical restraint is defined as any device attached or adjacent to the patient's body, which the patient is unable to remove easily and that restricts freedom of movement as well as access to one's body (Miles and Meyers 1994). Physical restraint use has had a long history in the management of aggressive patients and, in particular, the institutionalised mentally ill (Burton et al 1992b; Evans and Strumpf 1989). Although the restraint of the mentally ill was declared unnecessary, and never justifiable in the early part of the nineteenth century (Psychiatric Services 2002, p.661), it was not until psychotropic medications were introduced in the 1960s that the practice dropped dramatically in psychiatric institutions (Burton et al 1992b). However, the use of restraints has remained popular for frail older people, and a range of physical restraints have been used, at least since the 1900s, in long-term aged care (Castle and Mor 1998). The justification for this practice rests mainly in 'prevention', for example of falls, patient interference with treatments, injury to self and others, and aggressive behaviour and wandering.

In the 1960s the use of restraint was challenged as it was suggested that restraint use intensified the disorganized behaviour of patients (Castle and Mor 1998; Evans and Strumpf 1989). In 1979 the use of restraint on patients with a diagnosis of dementia was not recommended (Evans and Strumpf 1989). Throughout the 1980s restraint use was influenced by a number of external factors that focused on the potential negative consequences and the unethical nature of the practice. For example, a number of European countries issued a challenge to the practice of restraint as they commenced restraint-free care. In North America, legislation declared the right of residents to be free from restraint imposed as a disciplinary measure, or for convenience purposes. At the same time there was a general advocacy movement towards patient autonomy and a restraint-free environment, proposing alternative methods, and spearheaded by consumer groups such as National

Citizens Coalition for Nursing Home Reform (Castle and Mor 1998; Burton et al 1992b).

Most authors agree that cognitively impaired older persons are more dependent, less able to care for themselves and, therefore, at risk of falling and disturbing other residents and staff. Such factors place the person with dementia at an increased risk of being physically restrained. However, it is not clear to what extent restraint is used to protect the person, other residents or staff. As the person with dementia is unable to give their consent, or assent to such procedures, it is imperative for the protection of the rights of the person, as well as their health and safety, that physical restraint is used appropriately. This paper sets out to explore physical restraint use on people with dementia in long-term aged care.

## LITERATURE REVIEW

A review of research literature published in English between 1992 and 2003 is presented in this paper. Papers included or excluded in this review were chosen according to the following criteria:

### ***Inclusion criteria***

- Main focus on physical restraint use on people with dementia;
- Explicit research methodology was articulated within the paper;
- The research was based in long-term aged care.

### ***Exclusion criteria***

Papers excluded from the review were papers that meet the following criteria:

- Paper focused mainly on other forms of restraint (eg chemical restraint);
- Research did not focus on people with a diagnosis of dementia;
- Anecdotal and discussion papers, narrative reviews and papers with non-explicit methodology.

### ***Search strategy***

Three major databases, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Proquest and Medline were searched using the search terms 'dementia', 'physical restraint', 'cognitive', 'nursing home', 'long-term care', and 'nursing attitudes' within the time period of 1992-2003. A manual search of the reference list of the identified articles was also used to uncover further relevant articles.

The search found 42 papers related to dementia (cognitive impairment) and physical restraint in nursing homes or long-term care settings. Each paper was checked against the inclusion criteria and this resulted in 22 papers that are discussed in this paper.

## FINDINGS

Nurses, doctors, occupational therapists and researchers undertook the 22 studies. An interdisciplinary approach was adopted by 11 researchers (Capezuti et al 2002; Hantikainen and Kappeli, 2000; Karlsson et al 2000; Sullivan-Marx et al 1999a; Capezuti et al 1998; Capezuti et al 1996; Bradley et al 1995; Sundel et al 1994; Burton et al 1992a; Burton et al 1992b; Schnelle et al 1992); five papers were multidisciplinary (Middleton et al 1999; Ryden et al 1999; Sullivan-Marx et al 1999b; Cohen et al 1996; Werner et al 1994), and another six were undertaken by either doctors or nurses (Hantikainen 2001; Koch and Lyon 2001; Mayhew et al 1999; Hantikainen 1998; Hardin et al 1994; Miles and Irvine 1992).

The papers were published in a mixture of academic and professional journals. Seventeen studies were primarily quantitative and one of these included some qualitative data. The remainder used qualitative methods.

The papers were read and subsequently placed under the four dominant themes identified in the literature: relationship between restraint use and cognitive decline; falls/related injuries and associated mortality; reduction/removal/alternatives to use; and nurses' attitudes to restraints.

### **Relationship between restraint use and cognitive decline**

A limited number of studies considered the relationship between the use of restraint and the cognitive status of residents. Burton et al conducted two studies (1992a, 1992b). In their 1992a study they were able to establish an association between restraint use, the use of both restraints and neuroleptics, and cognitive decline: a finding significantly different from other studies, which identified cognitive impairment as a major predictor (Evans and Strumpf 1989). In their 1992b study, Burton et al also found that an inability to transfer from bed to chair, and the combination of difficulty with ADLs and severe cognitive impairment were significant predictors for restraint use. Similarly, Ryden et al (1999) highlighted the complexity of restraint use when examining aggressive behaviour in cognitively impaired residents. Ryden and colleagues found that residents, who were functionally dependent, cognitively impaired, and restrained, were more aggressive than non-restrained residents. Those residents on anti-psychotic medication exhibited a greater level of physical aggression than those who were not on such medication, and less physical aggression was noted in residents receiving antidepressant medication. Residents in secured units exhibited higher levels of physical aggression than those not secured, were more cognitively impaired, and tended to be on anti-psychotic medications. These three studies were unable to establish the direction of the effect nor fully examine the negative consequences of restraint.

## Falls/related injuries and associated mortality

A number of researchers examined the relationship between restraint reduction and injuries/death among nursing home residents. In 1996, 1998 and 2002 Capezuti et al undertook secondary analyses of data from a longitudinal study trial of moderately to severely cognitively impaired and functionally dependent residents. Capezuti et al (1996) found that non-confused ambulatory residents were rarely restrained while confused ambulatory residents were restrained. After controlling for the use of psychoactive medication, restraint use was not associated with lower fall risk among confused ambulatory residents. Despite strong evidence linking fall-risk and cognitive impairment the relationship was not linear. Confused residents with moderate functioning (ambulatory) had a greater risk of falling/injuries compared to the confused and non-ambulatory (most severely impaired) residents. The researchers did not demonstrate that restraint use in this confused ambulatory group of residents was associated with a lower risk of falls, recurrent falls or injuries.

Capezuti et al (1998) explored further the issue of restraint and injuries/death, but did not find a statistically significant association between removal of restraints and increased falls or injuries from falls. Approximately 25% of falls occurred on transfer of a resident from a bed, chair or toilet, and resulted in a minor injury. In older people such injuries had significant implications for morbidity and mortality. They also found that, although cognitive status contributes significantly to fall-risk, the impaired judgement of people with dementia is also a contributory factor. Ambulatory status and use of antidepressants were not associated with increased fall-risk, and restraint removal was associated with a lower fall rate. Capezuti et al (1998, 1996) failed to establish a causal link between restraint use and fall-risk.

In a later study Capezuti et al (2000) established that the use of bedrails did not reduce the likelihood of falls, serious injuries or recurrent falls. The researchers proposed that this could be attributed to the physical and cognitive impairment of residents over time, as well as nurses' awareness of falls, resulting in the use of preventative measures such as bedrails. However, bedrails add further challenges as they may lead to injuries and even to death (Capezuti et al 2002).

Miles and Irvine (1992) investigated the morbidity and mortality resulting from fall-related minor injury in older persons. A retrospective analysis of 122 deaths caused by vest and strap restraints found that the majority of the victims were older women (median age of 81) with dementia and most deaths (85%) occurred in nursing homes. Most of the deaths resulted from restraining residents in a chair or bed, and cognitively impaired residents were more likely to have been restrained and less likely to recognize the danger and negative consequence of removing the restraint.

Rather than definitive conclusions, the studies outlined offer directions to well-designed studies, causal links, and standard inquests providing finer detail, description of types of deaths or serious injuries caused directly by physical restraints, and evaluations of events where the restraint may have contributed to an injury or death. However, it appears that physical restraint use should not be used as a safety mechanism as there is no scientific evidence that physical restraints protect residents against injuries and in fact they may cause injuries.

## Reduction/removal/alternatives to use

Restraint reduction on cognitively impaired residents is particularly difficult. Researchers agree that cognitively impaired residents were viewed by nurses as a fall-risk and were most likely to be restrained (Mayhew et al 1999; Sullivan-Marx et al 1999a, 1999b). Age, health status, education, marital status, gender, ethnicity, former occupation and payment status, depression and occurrence of falls were not significantly associated with continued restraint use (Sullivan-Marx et al 1999a, 1999b; Mayhew et al 1999). Consistent with the findings of Middleton et al (1999), Mayhew et al found that an initial decrease in restraint reduction was accompanied by a higher level of nursing care/contact/assistance than that provided to non-restrained residents. Following the implementation of a restraint reduction program, the level of restraint use decreased over time.

Mayhew et al (1999) adopted a research-based approach to restraint reduction that involved a multidisciplinary team. Mayhew et al suggested using evidence-based education of staff and families, and encouraging staff to promote dignity and quality of life. Efforts to reduce or eliminate restraint use in nursing homes were found to be associated with existing government regulations, staff education and education with consultation from gerontological clinical nurse specialists (Sullivan 1999a, 1999b).

Werner et al (1994) demonstrated that the removal of physical restraints and implementation of care alternatives is a complex and costly process. Restraints were successfully removed in their study for over 90% of residents (n=63). Severely cognitively impaired residents required fewer care alternatives to physical restraint. Werner et al identified five different forms of care alternatives: environmental; nursing interventions; activities; physiological; and, psychosocial. They found a small number of residents required no restraints or alternative care provision. The most common alternatives to restraint use in rank order were: environmental (eg wheelchair adaptations and seating); nursing interventions (eg additional supervision and assistance); psychosocial (eg reality orientation); physiological (eg treatment of infection); and, activities (eg participation in structured activities). However, these findings must be viewed with caution, as it is not uncommon in aged care for environmental devices such as wheelchairs and chairs to be used to restrain older people.



Cohen et al (1996) and Koch and Lyon (2001) determined that, with the provision of alternative care, physical restraints could be safely and drastically reduced. Successful removal was grounded in staff education, commitment of staff, residents and families, and in alternative equipment. Cohen et al acknowledged that physical restraints were often used in the belief that they were for the safety of residents. However, they suggest physical restraints are not able either to guarantee against nor prevent serious injury. In a restraint-free environment, care plans became more individualised and led to increased communication and interaction between staff and residents. Information gained from family members and their cooperation assisted greatly in the removal of bedrails, and the development of a new and individualised care plan that focused on relaying issues of concern to management. Adequacy of the care plan was maintained through ongoing communication with the family and commitment from all in the partnership of care. Contrary to Werner et al (1994), Cohen et al (1996) and Koch and Lyon (2001) found most alternatives were inexpensive and additional staff were not required when physical restraint use was removed.

Koch and Lyon (2001) argued that success for a restraint-free environment was facilitated through the commitment of senior staff. However, in spite of the commitment to be restraint-free they found that over 65% of residents remained restrained in some way, mainly through the use of bedrails in response to the staff's perception that bedrails were necessary for the maintenance of residents' safety.

Schnell et al (1992) found that a simple management system, designed to improve staff adherence to a restraint-release government regulation, was effective in improving consistency in the provision of care. From an inappropriate baseline of restraint use for longer than two hours, restrained residents were released and repositioned every two hours. The management program made it impossible for staff to ignore the regulation and the documentation of release times on resident's charts by supervisory nurses supported the management system.

Education programs to improve staff awareness and knowledge of alternatives to physical restraint have been found to effectively change established work practices (Middleton et al 1999; Bradley et al 1995). However, further research is needed to empirically test well-developed programs and nurses need to have regular access to these programs if work practices are to change.

### **Nurses' attitudes**

Some studies considered the relationship between nurses' attitudes and restraint use. All researchers allowed for a previous history of concern about the use of physical restraints and the responsibilities confronting nurses when deciding to apply the restraint. Hardin et al (1994) showed moderately positive but ambivalent attitudes existed toward restraint use. Nurses were involved in all decisions

to restrain, but were happier when the decision was made in association with other health care professionals. Sundel et al (1994) administered a 16-item closed-ended questionnaire. They found restraint use in-service training assisted nurses to distinguish between bedrails as restraints and as enablers, and between their use as a convenience and a positive restraint for residents. However, even following in-service education over 50% of the nurses still believed there were no alternatives to bedrails as a restraint mechanism. It is not clear in these studies whether organisational policies influenced nurses' use of restraint.

Hantikainen (1998; 2001) questioned nurses caring for older people with physical frailties and/or moderate cognitive impairments. Rank-ordered reasons for restraint-use were protection and safety; preventing injury and harm to other residents; restlessness/aggressiveness; resistance to treatments; and confusion. Another reason for the application of restraint was as a sanction to control a situation perceived by nurses to be unacceptable behaviour, or a deliberate attempt to cause distress to the staff member. Nurses held differing views of restraint use and what it involves and exhibited both positive and conflicting attitudes toward its use. They likened the decision-making task of restraint use to walking a moral and ethical tightrope. Yet, often restraint decisions were largely based on nurses' rights and environmental considerations rather than the well-being of residents. As a way of absolving themselves from the responsibility of decision-making, staff believed that residents' behaviour would need to change before staff could limit restraint use.

Karlsson et al (2000) also found that it was unclear whether nurses were confronting the dilemma of ethics or merely absenting themselves from the decision-making process. They asked nursing staff to read a clinical vignette to measure nurses' reasoning in a hypothetical situation. The nurses found 'caring' to be a complicated task and requested more contextual detail before making a decision to apply restraint. Their decision to apply restraint was made from a disease perspective: for example, the resident had dementia and did not comprehend what was good for them. Removal of a restraint was closely linked with resident autonomy, or to reduce residents' suffering and to make them feel good. The nurses found the decision-making process was complicated and the majority stated they would change their decision under different circumstances.

Hantikainen and Kappeli (2000) also found resident safety was stated as a justifiable reason for restraint use. Most nurses agreed that there were both negative and positive aspects of restraint, and many saw physical restraint as a protection of staff members from liability. Restraint use was also seen as a legitimate means of controlling aggressive/disrupting behaviour and maintaining the peace and harmony of the environment for the well-being of all residents. Nurses were broadly in

agreement that the decision to apply restraint was one for the nurse handling the situation rather than an institutional policy. Because restraint was understood in a variety of ways, decisions were often based on 'routines, emotions and attitudes rather than empirical facts' (Hantikainen and Kappeli 2000, p.1200).

## METHODOLOGICAL ISSUES

Several methodological issues arise from the literature reviewed. Literature reviews in one-quarter of the studies were of a high quality and provided comprehensive background information (Hantikainen 2001; Hantikainen and Kappeli 2000; Karlsson et al 2000; Middleton et al 1999; Sullivan-Marx et al 1996b; Bradley et al 1995; Hardin et al 1994; Burton et al 1992b) and some others provided limited background information (Hantikainen 1998; Werner et al 1994; Schnelle et al 1992). References quoted in the studies surveyed ranged from nine (Koch and Lyon 2001; Sundel et al 1994) to 89 (Hantikainen 2001).

Sampling issues included a failure to calculate the number of subjects required to establish significant differences, if they did exist. The presence of power calculations would have enabled the reader to correctly identify if an effect was there (Polit and Hungler, 1999). Sample sizes in the studies ranged widely from 20-335 nurses and 63-633 residents. Although there is no simple formula for sample size in quantitative studies, it is acknowledged that the larger the better for representativeness of the total population, and that small samples create sampling error (Polit and Hungler 1999, p.289). Qualitative studies adopted a phenomenological approach with an appropriate sample size of 20 (Hantikainen 2001; Hantikainen and Kappeli 2000).

Sample settings involved long-term care facilities and the study populations included a mixture of residents, registered nurses (RNs), training staff and nursing assistants. Overall, resident subjects were people who were physically restrained. Most of the studies used physically restrained residents (eg Sullivan-Marx et al 1999a; Werner et al 1994; Schnelle et al 1992); another used both restrained and non-restrained residents (Capezuti et al 1996); and only one study used non-restrained residents (Sullivan-Marx et al 1999b). Information on the characteristics of the sample varied, with some studies providing a detailed socio-demographic profile (eg Hardin et al 1994; Hantikainen, 1998; Capezuti et al 1998, 2002), while others provided limited detail, making comparisons between studies difficult.

Very few studies included an explicit statement regarding inclusion/exclusion criteria (eg Ryden et al 1999; Burton et al 1992a); others provided few details (eg Capezuti et al 1996); and some others failed to provide any details (eg Bradley et al 1995). Age range was not a criterion for inclusion in any of the study populations

and the differential effect of age could not always be considered.

Sampling procedures were also an issue of concern. Generally, the researchers failed to mention sampling methods and strategy. This knowledge is important because the type and appropriateness of the strategy 'are crucial elements in the analysis and interpretation of data' (Haber 1998 p.271). It would appear that the majority chose the relative ease of non-probability sampling. Purposive sampling was used by Hantikainen and Kappeli (2000) and Hantikainen (2001). Hantikainen (1998) used convenience sampling, and Cohen et al (1996) used random sampling. In the absence of a stated sampling strategy, it is difficult to evaluate the degree of possible selection bias and the disadvantages of individual sampling methods that could affect the rigour of the studies.

Very few researchers mentioned the study design (eg Capezuti et al 2002; Sullivan-Marx 1999a, 1999b; Capezuti et al 1996, Sundel et al 1994; Schnelle et al 1992; Burton et al 1992b). Three of the studies used a one-group pre-test post-test design (Sullivan-Marx 1999a, 1999b; Sundel et al 1994); one used a cross-over design (a multiple base line-delayed intervention) (Schnelle et al 1992); three studies were longitudinal (analysing secondary data) (Capezuti et al 2002 1996; Burton et al 1992b); and one was a pilot study (Sullivan-Marx 1999b). All of these designs appear to be appropriate for the situations described.

Psychometric tools used in the studies had been well-validated and details of their reliability and validity were included. Questionnaires were either created by the author (eg Karlsson et al 2000), or developed by others and replicated (eg Middleton et al 1999). Interview schedules were both semi-structured and unstructured (eg Hantikainen 2001; Karlsson et al 2000). In one study data were extracted from government databases (Miles and Irvine 1992), and another used patient charts and institutional reports (Werner et al 1994). Trustworthiness for qualitative data was complete and demonstrated by the authors (Karlsson et al 2000; Hantikainen 2001).

The majority of the researchers discussed issues of reliability and validity, but only five of the studies reviewed addressed study limitations. Identified limitations of study designs included: causal effects (Capezuti et al 1998, 1996); sample size (Sullivan-Marx 1999b); participant bias created by a focus on residents who are consistently aggressive (Werner et al 1994); and staffing factors limiting whether staff would participate. Factors identified were difficulties with participant anonymity, unavailability of staff at designated times when research was being conducted, and unwillingness to participate in longitudinal studies (Bradley et al 1995).

The methodological issues addressed above raise concerns of generalisability and rigour in the majority of the studies. Whilst acknowledging study limitations, the

authors recommend that the reader proceed with caution when interpreting the findings of these studies, and that future research requires larger samples to ensure representativeness. Studies ranged from descriptive/survey/phenomenological to longitudinal studies making comparison of data difficult. Causal modelling techniques were not used in the studies and the non-experimental designs did not permit researchers to manipulate the independent variable(s), or to establish a cause/relationship effect. However, this might be related to the ethics of manipulating restraint as an intervention, given the concerns with its use.

## RECOMMENDATIONS FOR PRACTICE

This literature review raises questions about the use of physical restraints on people with dementia. Although it may be premature to make specific practice recommendations, several suggestions that may be beneficial to nursing practice can be derived from this literature. However, the authors are mindful that this review has been limited by an exploration of three major databases and that there may be research that has not been uncovered or reviewed in this appraisal. Thus, the reader is cautioned to be mindful that the following recommendations are based only on the literature reviewed for this paper.

The papers reviewed are inconclusive in their findings and it appears that in spite of nurses' desire to use physical restraint as a form of protection for residents there is no scientific evidence that physical restraint actually protects residents against injuries. It appears in fact that physical restraint may actually cause injury (Capezuti et al 2002, 1998, 1996, 1998; Miles and Irvine 1992). Thus, to avoid the potential for injury and resident discomfort an adequate assessment of the resident and their environment must be taken into account prior to physical restraint being considered. To assist with this, employers need to supply ongoing education in restraint use, including creative alternatives. Such education should encourage nurses to consider different behaviour patterns of residents to identify ways to reduce and prevent resident agitation, rather than to act upon it once it occurs. Nurses are also encouraged to reflect on whether their current practice is evidence-based and to work towards a restraint-free environment.

One of the challenges for aged care is the growing number of unlicensed care workers (ie assistants in nursing and personal carers) (Richardson and Martin 2004) in the industry whose limited health education encourages a focus on reaction rather than assessment and evaluation of care as a means of preventing resident agitation. Although all levels of staff should be involved in restraint education, it is ultimately the RN who must be accountable for both assessment and evaluation of restraint use. If physical restraint use is deemed appropriate then the resident's safety must be placed at the forefront of this decision so that restraint is not used

for staff convenience, is not left in place and is removed as soon as practical. Thus, the RN must ensure that institutional policies and state laws on the use of restraint are adhered to prevent inappropriate restraint use.

Another challenge that affects restraint use is the shortage of RNs (Richardson and Martin 2004). At times shifts will need to be worked by agency staff, whose lack of knowledge about residents may influence both the frequency and accuracy of restraint assessments. At times, such as when there is a shortage of staff on a shift, physical restraint may be used as a staff convenience to prevent, for example, residents' wandering or physical aggression. Ultimately, in order to dramatically remove or curb the practice of using restraint for staff convenience the concentrated assistance of federal and state governments and peak geriatric and dementia organisations may be required.

This review of literature indicates that further research on physical restraint use is important and should continue, and in particular, attention needs to be given to alternatives to the routine practice of restraint (Best Practice 2002). At the same time, there is a need to encourage a focus on issues of relative paucity in the literature, such as the efficacy of restraints (including bedrails) versus interventions; alternative to uses involving policy, institutional guidelines and legislation; and the precise nature and direction of changes in attitudes and practices of nurses over time.

Finally, this review of literature allows the opportunity for discussion and illustration of the use of restraint and may serve to strengthen nurses' understanding of the use of physical restraint in people with dementia. Nurses are in an ideal position to promote changes in practice and to ensure that such practice is evidence-based.

## REFERENCES

- Best Practice. 2002. Physical restraint-part 1: Use in acute and residential care facilities. Evidence based practice information sheets for health professionals: Joanna Briggs Institute. 6(3):1-6.
- Bradley, L., Siddique, C.M and Dufton, B. 1995. Reducing the use of physical restraints in long-term care facilities. *Journal of Gerontological Nursing*. 21(9):21-34.
- Burton, L.C., German, P.S., Rovner, B.W. and Brant, L.J. 1992a. Physical restraint use and cognitive decline among nursing home residents. *Journal of the American Geriatrics Society*. 40(8):811-816.
- Burton, L.C., German, P.S., Rovner, B.W., Brant, L.J. and Clark, R.D. 1992b. Mental illness and the use of restraints in nursing homes. *The Gerontologist*. 32(2):164-170.
- Castle, N.G. and Mor, V. 1998. Physical restraints in nursing homes: A review of the literature since the Nursing Home Reform Act of 1987. *Medical Care Research and Review*. 55(2):139-170.
- Capezuti, E., Evans, L., Strumpf, N. and Maislin, G. 1996. Physical restraint use and falls in nursing home residents. *Journal of the American Geriatrics Society*. 44(6):627-633.
- Capezuti, E., Strumpf, N.E., Evans, L.K., Grisso, J.A. and Maislin, G. 1998. The relationship between physical restraint removal and falls and injuries among nursing home residents. *The Journal of Gerontology*. 53A(1):M47-M52.
- Capezuti, E., Maislin, G., Strumpf, N., and Evans, L.K. 2002. Side rail use and bed-related fall outcomes among nursing home residents. *Journal of the American Geriatrics Society*. 50(1):90-96.

- Cohen, C., Neufeld, R., Dunbar, J., Pflug, L. and Breuer, B. 1996. Old problem, different approach: Alternatives to physical restraints. *Journal of Gerontological Nursing*. 22(2):23-29.
- Evans, L.K. and Strumpf, N.E. 1989. Tying down the elderly: A review of the literature on physical restraint. *Journal of the American Geriatrics Society*. 37(1):65-74.
- Haber, J. 1998. Sampling: Nursing research. In LoBiondo-Wood, G. and Haber, J. (eds.). *Methods, critical appraisal, and utilization* (4th ed). New York: Mosby: 247-274.
- Hantikainen, V. 1998. Physical restraint: A descriptive study in Swiss nursing homes. *Nursing Ethics*. 5(4):330-346.
- Hantikainen, V and Kappeli, S. 2000. Using restraint with nursing home residents: A qualitative study of nursing staff perceptions and decision-making. *Journal of Advanced Nursing*. 32(5):1196-1205.
- Hantikainen, V. 2001. Nursing staff perceptions of the behaviour of older nursing home residents and decision making on restraint use: A qualitative and interpretative study. *Journal of Clinical Nursing*. 10:246-256.
- Hardin, S.B., Magee, R., Stratmann, D., Vinson, M.H., Owen, M. and Hyatt, E. C. 1994. Extended care and nursing home staff attitudes toward restraints: Moderately positive attitude exist. *Journal of Gerontological Nursing*. 20(3):23-31.
- Karlsson, S., Bucht, G., Rasmussen, B.H. and Sandman, P.O. 2000. Restraint use in elder care: Decision making among registered nurses. *Journal of Clinical Nursing*. 9:842-850.
- Koch, S. and Lyon, C. 2001. Case study approach to removing physical restraint. *International Journal of Nursing Practice*. 7(3):156-161.
- Mayhew, P.A., Christy, K., Berkebile, J., Miller, C. and Farrish, A. 1999. Restraint reduction: Research utilization and case study with cognitive impairment. *Geriatric Nursing*. 20(6):305-308.
- Middleton, H., Keene, R.G., Johnson, C., Elkins, A.D. and Lee, A.E. 1999. Physical and pharmacologic restraints: In long-term care facilities. *Journal of Gerontological Nursing*. 25(7):26-33.
- Miles, S. H and Irvine, P. 1992. Deaths caused by physical restraint. *The Gerontologist*, 32(6):762-766.
- Miles, S.H. and Meyers, R. (1994). *Untying the elderly*. Clinics in Geriatric Medicine. 10 (3):513-525.
- Polit, D.F. and Hungler, B.P. 1999. *Nursing research: Principles and methods* (6th ed). New York: Lippincott.
- Psychiatric Services. 2002. Departments: This month's highlights. 55(6):661, Retrieved 10 December 2003, from <http://psychservices.psychiatryonline.org/cgi/content/full/53/6/661>.
- Richardson, S. and Martin, B. 2004. The care of older Australians: A picture of the residential aged care workforce. National Institute of Labour Studies. Adelaide: Flinders University.
- Ryden, M.B., Feldt, K.S., Oh, H.L., Brand, K., Warne, M., Weber, E., Nelson, J. and Gross, C. 1999. Relationships between aggressive behaviour in cognitively impaired nursing home residents and use of restraints, psychoactive drugs, and secured unit. *Archives of Psychiatric Nursing*. 13(4):170-178.
- Schnelle, J.F., Newman, D.R., White, M., Volner, T.R., Burnett, J., Cronqvist, A. and Ory, M. 1992. Reducing and managing restraints in long-term-care facilities. *Journal of the American Geriatrics Society*. 40(4):381-385.
- Sullivan-Marx, E.M., Strumpf, N.E., Evans, L.K., Baumgarten, M. and Maislin, G. 1999a. Predictors of continued physical restraint use in nursing home residents following restraint reduction efforts. *Journal of the American Geriatric Society*. 47(3):342-348.
- Sullivan-Marx, E.M., Strumpf, N.E., Evans, L.K., Baumgarten, M. and Maislin, G. 1999b. Initiation of physical restraint in nursing home residents following restraint reduction efforts. *Research in Nursing and Health*. 22(5):369-379.
- Sundel, M., Garrett, R.M. and Horn, R.D. 1994. Restraint reduction in a nursing home and its impact on employee attitudes. *Journal of the American Geriatrics Society*. 42(4):381-387.
- Werner, P., Cohen-Mansfield, J., Koroknay, V. and Braun, J. 1994. Reducing restraints: Impact on staff attitudes. *Journal of Gerontological Nursing*. 20(12):19-24.