Development and Trial of Best Practice Protocol for Management of Urinary Retention in Elderly Patients in Acute and Sub-Acute Settings

Final report

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Glossary of terms

Acute care setting - refers to a hospital that provides acute care services.

Patient – for the purposes of this guideline, the term patient describes individuals in receipt of inpatient care in acute and sub-acute care settings.

Post-void residual (PVR) urine - the volume of urine left in the bladder at the end of micturition (Abrams et al., 2002).

Sub-acute care setting – refers to rehabilitation hospitals, geriatric and evaluation management units, step-down, transition and interim care units.

Trial of void - a procedure to assess a patients' ability to void after a urinary catheter is removed (Thees & Dreblow, 1999).

Urinary retention is defined as failure to empty the bladder totally (American Urological Association, 2004) and is clinically diagnosed as either acute or chronic.

Executive summary

Introduction

Research has identified urinary retention is a commonly experienced problem among many elderly patients in both acute and sub-acute care hospitals (Borrie, Campbell, Arcese, Bray, Hart, Labate, Hesch, 2001). Acute urinary retention has been identified as a condition that significantly increases with age affecting approximately 1 in 3 men 80 years or older (Emerton and Anson, 1999).

The condition of urinary retention has implications for patient well-being, length of stay and for the ability of the patient to return to independent living. Left untreated urinary retention may result in: recurrent or chronic urinary tract infection, overflow urinary incontinence inability of the bladder to contract, and damage to the upper urinary tract (Tanagho & Schmidt, 1992). Research into the hospitalized elderly by Simforoosh, Dadkhah, Hosseini, Asgari, Nasseri and Safarinejad (1997) and Smith and Albazzaz (1996) has identified that urinary retention is associated with poor outcomes including urinary tract infection, overly distended bladder and higher hospital mortality rates. The aim of this project is to identify best practice for the nursing assessment and management of urinary retention in hospitalised older adults.

Objectives

1) Develop a best practice protocol for the management and treatment of urinary retention in older adults in acute and sub acute settings. This protocol will be referred to as a **clinical guideline** which is consistent with contemporary healthcare language (The National Institute for Clinical Excellence, 2004).

2) Provide a resource for nurses to better understand and manage urinary retention issues for elderly hospitalised individuals that will lead to:
   - increased nurse awareness of identification, management and treatment of urinary retention;
   - improved identification of the condition of urinary retention during in-patient stay in an acute or sub acute care facility;
   - improved management of the condition of urinary retention in elderly and/or disabled patients as they transect the continuum of care; and

- improved discharge outcomes for elderly and/or disabled individuals who have experienced the condition of urinary retention during the period of their hospitalisation.

3) Report on the strengths and limitations of the protocol including any difficulties experienced in the development and implementation of the clinical guideline.

Methods

This project was conducted over four stages. Stage 1 involved conducting a review of literature, a review of the Incontinence Outcomes Measurements Suite Report and a survey of current practice for identifying and managing urinary retention in older adults admitted to a sub-acute care setting. Stage 2 involved the development of a clinical guideline based on the review of literature and expert opinion. Stage 3 involved implementing the clinical guideline and Stage 4 involved evaluating the clinical guideline.

Summary of Findings

Stage 1

Review of literature

Key points from the review of literature were as follows:

- there are many factors that affect bladder emptying, including both environmental factors and pathophysiological disease;
- urinary retention or incomplete bladder emptying manifests either acutely or chronically and is a common finding in hospitalised older adults;
- whilst acute urinary retention is generally characterised by pain, symptoms associated with chronic urinary retention may be limited to urinary incontinence and hence the condition may be difficult to detect. This has particular relevance for the care of patients with cognitive impairment and for individuals with urinary incontinence;
- initial assessment procedures should include: taking a brief patient history, reviewing the patients risk for urinary retention, conducting a physical examination of the lower abdomen, attending a urinalysis and estimating the post-void residual (PVR) urine volume;

- there is conflicting evidence on the clinical significance of the finding of a PVR urine volume in older adults; with normative PVR urine volumes ranging from 20-300mL;
- the PVR urine volume is one of many factors to be considered in determining treatment options. Other factors include: the person's preferences for treatment, psychosocial status and quality of life, the potential for upper tract damage, the type and severity of symptoms, the results of investigations, comorbidities, prognosis and underlying pathology;
- outcomes associated with acute urinary retention are poor in terms of morbidity and mortality; and
- a search of national and international peak bodies' websites revealed a lack of guidelines for the assessment and management of urinary retention.

The Incontinence Outcomes Measurement Suite Report

- The outcomes measurement suite report identified a wide range of reviews of urinary and faecal incontinence outcome measures and very little consensus as to which instruments and tools should be employed in the measurement of outcomes of interventions for incontinence. As urinary retention may or may present with urinary incontinence symptoms, use of an outcome measure that focuses on urinary incontinence symptoms is not specific enough for use as an outcome measure for urinary retention.

Survey of current practice

Key points from the staff survey in the sub-acute care facility are as follows:

- the majority of nurses and medical staff reported that they sometimes identify patients with previously undetected urinary retention as well as patients who have the condition but who do not have abdominal pain as a defining feature;
- the condition is sometimes detected during random bladder scanning;
- few nurses and medical staff report having a standard protocol for the management of patients with urinary retention;
- ward practices in response to the finding of PVR in the sub-acute care facility suggest a high degree of variability in practice; and
- the most commonly reported outcome of patients' failure to regain bladder function (i.e. appropriately empty the bladder) whilst an inpatient of the sub-acute care facility was to be discharged with a urinary catheter inserted.

Stage 2

Development of the Clinical Guideline

- **Use of Delphi technique to develop a clinical guideline**

The first draft of the clinical guideline (see Appendix B) and a draft clinical resource guide for the nursing assessment and management of urinary retention in hospitalised older adults were developed based on the information from the review of literature and from information obtained from the multidisciplinary expert panel. Using the Delphi technique, members of the expert panel were consulted on three separate occasions (see acknowledgments section for list of names). The guideline was developed and refined based on this information. Where consensus from the multidisciplinary expert panel was unable to be reached, the research team referred to the literature.

The expert panel provided input into the development of:

- a definition of urinary retention;
- the associated risk factors;
- the assessment and management of a person who presents with signs and symptoms of urinary retention and
- the interpretation of post-void residual urine volume.

The panel strongly recommended that the guideline should target a particular profession and that this target should be nurses rather than doctors.

Stage 3

Implementation of the clinical guideline

Educational workshops were conducted prior to the implementation of the clinical guideline. All nurses who attended were given a clinical resource guide and the guideline poster (see separate documents). These nurses were asked to place the poster on an easily visible area of the ward. The implementation of the guideline in ward areas was supported by the presence of a clinical nurse consultant who assisted staff with their enquiries.

- **Educational workshops**

A series of workshops were convened by the research team. Local clinical experts from the fields of continence and/or urology participated as facilitators. The

workshops were attended by approximately 52 nurses who worked in both the acute and sub-acute care hospitals. They provided comprehensive information on the condition of urinary retention, prevalence, risk factors, impact, assessment considerations and management options.

- **Clinical facilitation**

Following the workshops, a continence clinical nurse consultant (CNC) was employed to work on the trial wards, providing nurses with advice and support on the clinical application of the guideline. This initiative was promoted and supported by nursing management in both organisations. This CNC's expertise was utilised more by nurses in the sub-acute care hospital than by nurses in the acute care hospital.

- **Evaluation of the workshop**

The nurses who attended the workshop were asked to complete a urinary retention knowledge questionnaire prior to and post attending the workshop. Evaluation data revealed that the nurses' knowledge on this topic improved following the workshop. Nurses rated their knowledge on urinary retention higher than it had been prior to their participation in the workshop (i.e. increasing from an average score of 4.5 to an average of 8.5 on a scale of 1 to 10).

Stage 4

Evaluation of clinical use of guideline

The effectiveness of the clinical guideline was evaluated in terms of nurses' perspectives of its clinical usefulness. Two groups of nurses from the two participating sites were invited to complete this survey. These included Division 1 Registered Nurses who worked in unit management roles and Division 1 and 2 Registered Nurses who worked in clinical nursing roles. The main findings of this survey are as follows:

- the guidelines were perceived as helpful by 90% of acute and 91% of sub-acute care clinical nurses;
- 78% of acute and 82% of sub-acute clinical nurses rated their confidence in their ability to manage urinary retention higher as a consequence of the guidelines;
- the majority of respondents believed that the guidelines had assisted them in the assessment of urinary retention and had also increased their knowledge on the condition;

- participants who were unable to attend the educational workshops commented that they would have benefited from participating in the workshops; and
- all nurses (100%) in acute and sub-acute care reported that urinary retention was managed well in their wards and most reported that this was a direct result of introduction of the guidelines.

Difficulties experienced in the development and implementation of the clinical guideline.

The project team encountered a number of difficulties in the development and implementation of the clinical guideline.

Development issues

The literature did not reveal a clear and consistent definition of the term 'urinary retention'. Additionally, the expert panel commented on the limitations of currently used definitions as the condition presents with variable signs and symptoms and there is no clear delineation between acute and chronic urinary retention. Therefore the research team defined urinary retention in terms of its most commonly experienced signs and symptoms.

Difficulties were also experienced in defining normative values for PVR urine volumes. Information from the review of literature and opinions from the expert panel confirmed a lack of consensus on what constitutes a significant PVR compared with a normal PVR for older adults. Therefore normal values of a PVR urine volume were not listed on the clinical guideline.

Implementation and evaluation issues

The research team were unable to implement the clinical guideline at the proposed acute care site. Specifically, staff at this site found it difficult to commit to the project due to unforseen staff changes and shortages. The research team organised an alternative site within the health network. Organising an alternative site was time consuming and delayed the project by several weeks.

The research team were unable to compare pre and post intervention incidence levels of urinary retention, management procedures (i.e. frequency and duration of trial of voids; duration of catheterisation; the frequency of bladder scanning and the

type and frequency of medical assessment) and patient discharge outcomes. There were two key reasons for this. The first was based on the advice from staff within the Eastern Health Information Services Department who stated that the documentation on these issues was inconsistent and unreliable and that the research team would be unable to draw any worthwhile conclusions from this analysis. Additionally, the research team were unable to obtain ethics approval to review patient records without obtaining patient written consent. As some patients were discharged, this task was considered difficult and would cause patients undue concern. In order to overcome this barrier, the staff surveys at Stages 1 and 4 included additional questions that provide information on these topics.

Despite using a number of implementation strategies for the use of the guideline within the clinical environments that were supported by management, the findings from Stage 4 data indicated that approximately half of the nurses on the study sites were unaware of the existence of the clinical guideline. Future studies may need to consider extending the time frame allocated for implementation and to use an action research approach to the implementation and evaluation of any guidelines.

As the evaluation of the project was primarily based on nurses' perceptions of the clinical usefulness of the clinical guideline and not on their specific clinical practice and patient outcomes, these findings should be interpreted cautiously till further in-depth evaluation studies using field observations are conducted.

Conclusion

This project resulted in the development of a clinical guideline for nurses to better understand urinary retention issues for elderly hospitalised adults. It was anticipated that this would result in improved identification of the condition, improved management and improved discharge outcomes. Whilst a number of strategies were implemented to support the uptake of the clinical guidelines into clinical practice, evaluation data suggests that further work is required to improve the level of its use. The challenges encountered by the research team in implementing and evaluating the clinical guidelines echo the findings of other research teams' experience of implementing clinical guidelines. The Scottish Intercollegiate Guidelines Network (2001), have identified a number of facilitators and barriers to the implementation of clinical practice guidelines and/or evidence, including; structural factors (i.e. financial disincentives), organisational factors (i.e. inappropriate skill mix, lack of facilities or equipment), peer group (i.e. local standards of care not in line with desired practice),

individual factors (i.e. knowledge, attitudes, skills) and professional-patients interaction (i.e. problems with information processing).

The research team put in place a number of strategies that were aimed at addressing some of these barriers, including providing a series of educational workshops for nurses at the participating sites, providing financial reimbursement to enable nurses to be replaced so that they could attend the workshops and employing a clinical facilitator with expertise in the assessment and management of urinary retention to provide on-site advice and support on the clinical application of the guideline. This clinical facilitator's expertise was utilised more in the sub-acute care hospital than by the nurses in the acute care hospital. One explanation for this could be that the nurses working in the acute care clinical environment, with higher levels of patient acuity, were more focussed on more important and other aspect of care and had no time to focus on the clinical guideline.

In summary, the research team did not locate any specific urinary retention guidelines from peak national and international organisations with expertise in incontinence and urology. Additionally, none of the measures and instruments identified in the Continence Outcomes Measurement Suite Project were specifically designed to detect urinary retention (Thomas, Moore, Nay, Fonda & Marosszeky, 2003). Based on advice from the expert panel, the project was limited to the development of a clinical guideline for the assessment and management of urinary retention for use by nurses. This was considered to be an important foundational starting point. It may be worthwhile to consider further developing this clinical guideline to incorporate a multidisciplinary approach that can be used across a range of health and aged care settings. As urinary retention can result in increased morbidity and mortality, further research and development on the assessment and management of urinary retention in older adults is required.

Main report

Background

Under normal circumstances, the bladder empties completely following a voluntary contraction. Urinary retention is the term used to describe incomplete bladder emptying. It is a common urological condition of older age that manifests either acutely or chronically. In its acute form, urinary retention affects 1 in 3 men over the age of 80 (Emberton & Anson 1999) and is a common reason for individuals to seek emergency treatment in hospital (Lim, Wong & Foo, 1999). Chronic urinary retention is also a common condition in hospitalised older adults (Grosshans, Passadori & Peter, 1993), in older people who are resident in long-term care (Resnick, Yalla & Laurino, 1989) and in people receiving rehabilitation after stroke (Dormerick & Reding, 1994; Gebler, Good, Laven & Verhulst, 1993). By contrast to those individuals with acute urinary retention, people with chronic urinary retention usually have minimal symptoms and for this reason, the condition can be difficult to detect. A recent Australian study undertaken in a general rehabilitation unit found that asymptomatic urinary retention was common in patients admitted to this setting (Wu & Baguley, 2005).

The health outcomes associated with acute urinary retention are significant and include; high hospital mortality rates, urinary tract infection, overly distended bladder (Smith & Albazzaz 1996), overflow urinary incontinence Soane & Baum 1988), inability of the bladder to contract and damage to the upper urinary tract (Tanagho & Schmidt, 1992). The health outcomes associated with chronic urinary retention by contrast are less clear as the evidence is conflicting.

Despite the large numbers of individuals experiencing urinary retention and its associated complications, it is difficult to diagnose particularly when other conditions coexist, like cognitive impairment and/or neurological conditions. The difficulties experienced in diagnosing this condition is confounded with a lack of definition and a lack of consensus about what constitutes this condition i.e. symptomatology. There is wide variability in expert opinion regarding the clinical significance of post-void residual urine volume and about what constitutes normal or pathological bladder volumes and the diagnosis of urinary retention (Grosshans et al, 1993).

Due to the clinical ambiguity associated with the assessment and management of urinary retention, there are no structured clinical guidelines currently available for the

diagnosis and management of this condition. This study is significant therefore as it addresses gaps in knowledge regarding current methods for identifying and managing hospitalised older adults with urinary retention and it has developed, implemented and evaluated a clinical guideline that can be used by nurses in acute and sub acute care settings.

Objectives

1) Develop a clinical guideline for management and treatment of urinary retention in older adults in acute and sub acute care.

2) Provide a resource for nurses to better understand and manage urinary retention issues for elderly hospitalised individuals that will lead to
   - increased nurse awareness of identification, management and treatment of urinary retention;
   - improved identification of the condition of urinary retention during in-patient stay in an acute or sub acute care facility;
   - improved management of the condition of urinary retention in elderly and/or disabled patients as they transect the continuum of care; and
   - improved discharge outcomes for elderly and/or disabled individuals who have experienced the condition of urinary retention during the period of their hospitalisation.

3) Report on the strengths and limitations of the protocol including any difficulties experienced in the development and implementation of the clinical guideline.

Method

This project was conducted over four stages. Stage 1 involved (a) a survey of current practice for identifying and managing urinary retention in older adults admitted to a sub-acute care settings and (b) a review of literature. Stage 2 involved the development of a clinical guideline based on the review of literature and expert consensus opinion. Stage 3 involved implementing the clinical guideline and stage 4 involved an evaluation of the guideline.

The project commenced once ethics approval was granted from both Deakin University and Eastern Health. All participants were assured confidentiality and anonymity and no names are mentioned in the report. All data is maintained in a locked storage cabinet at Deakin University and is accessible only to the research team. All data gathered from the surveys, knowledge evaluation and clinical facilitation notes were grouped for analysis and reporting. No information identifying the participants or their organisation is contained in this final report nor will any identifying information be contained in any scientific or academic journal articles that may be written from the study.

The procedures are described here in greater detail.

Stage 1

Stage 1 Objective

To establish current methods for identifying and managing urinary retention in older adults admitted to a sub acute care facility.

Stage 1 Method

There were three strategies used to collected data. These included 1) a review of literature, 2) a review of the Incontinence Outcomes Measurement Suite Report and 3) a survey of staff involved in the care of older adults with urinary retention.

Review of literature

A review of literature was conducted to identify current evidence on the assessment and management of urinary retention in older adults. This information was used as the basis to the development of a clinical guideline that was considered by the expert panel in stage 2. The review process also involved checking the websites of peak

national and international organisations with expertise in continence or urology to specifically search for definitions, management recommendations and evidence based guidelines pertaining to urinary retention. This review of literature was continually updated throughout the project.

Review of Incontinence Outcomes Measurement Suite Report

The report from The Incontinence Outcomes Measurement Suite project, commissioned by the Australian Commonwealth Department of Health and Ageing National Continence Management Strategy Research Program, was reviewed as part of this literature review to identify outcome measures that are sensitive to the condition of urinary retention.

Staff Survey

In order to establish nurses and medical staffs' perspectives of the current management practices for urinary retention in older hospitalised adults, a survey of current practice was conducted. This was targeted to medical staff and Division 1 and Division 2 Registered Nurses from rehabilitation wards at a sub acute care facility. Only staff that had experience in caring for patients with urinary retention were invited to participate in the survey.

Participants were recruited through advertising flyers that were placed in the staff rooms of the wards and a member of the research team visited each ward to explain the project in groups and to seek staff participation and to distribute plain language statements. Staff were asked to complete a questionnaire (refer to Appendix A) that contained a number of questions about their perceptions of the current management of urinary retention. Demographic data that was collected was limited to the participant's professional discipline and the type of nursing registration (i.e. either Division 1 or Division 2). They were asked not to write any identifying information on the questionnaire and there was no participant identification data collected on staff surveys. Questionnaires and return envelopes were placed in the relevant ward staff meeting rooms with instructions on how to complete the form and return to the research team.

Stage 1 Review of literature

- **Introduction**

Urinary retention is a common condition in older people and affects a disproportionately higher number of men than women. The health outcomes associated with the condition are significant and include urinary tract infections, overly distended bladder, renal complications and high hospital mortality rates. Whilst the most common cause of urinary retention in men is an enlarged prostate, numerous risk factors have been identified for both genders.

Urinary retention is clinically diagnosed as either acute or as chronic. Recognition of this difference is crucial for appropriate management. Minimally invasive methods to identify and diagnose urinary retention include a physical examination, an assessment of urinary frequency and voided volumes and an estimation of PVR. This latter method plays an important role in the detection of chronic urinary retention in particular as patients suffering from this condition do not usually experience symptoms of pain and/or abdominal discomfort and hence, the condition can remain undetected.

Post-void residual urine volume is cited as the most important indicator in any evaluation of the function of the lower urinary tract (Al-Shahrani & Lovatsis, 2005; Lewis, 1995; Teng, Huang, Kuo & Bih, 2005). However, whilst there is agreement that urinary retention is associated with a significant PVR, to date the normative values associated with voiding for older adults remain unclear. More specifically, there is an absence of an established clinically significant PVR (Fonda, DuBeau, Harari, Ouslander, Palmer & Roe, 2005). This presents a dilemma for health clinicians when selecting the most appropriate form of management.

This review of the literature provides an overview of the evidence on the diagnosis and management of acute and chronic urinary retention with a view to the development of a clinical guideline for these conditions in older adults in acute and sub acute care settings.

- **Defining urinary retention**

Urinary retention is defined as failure to empty the bladder totally (American Urological Association, 2004) and is clinically diagnosed as either acute or chronic. The International Continence Society (ICS) defines acute urine retention as "a painful, palpable or percussable bladder, when the patient is unable to pass any

urine" (Abrams et al., 2002. p.176). It requires immediate medical and frequently surgical intervention (Boyle, 1998). Chronic urinary retention by contrast is defined as "a non-painful bladder, which remains palpable or percussable after the patient has passed urine" (Abrams et al, 2002, p.176). Gray (2000a) states that chronic urinary retention is best described as the "ongoing inability to completely evacuate urine from the bladder" (p.41). It is also important to note that patients with chronic urinary retention can develop acute-on-chronic retention. This may be precipitated by factors such as urinary tract infection or constipation. (See Table 1 for the results of a search for definitions for acute and chronic urinary retention from peak national and international bodies with expertise in the areas of urology and continence).

Whilst urinary retention is the inability to completely empty the bladder, it is important to understand the physiology of normal voiding in order to understand why urinary retention occurs. Firstly, the bladder is able to distend and contract. When empty the bladder wall, which measures 5 to 8 cm thick, collapses and folds. As urine enters the bladder the detrusor muscle of the bladder wall stretches making the wall thinner as the cells in the mucosal lining slide over one another (Gosling, 2005). In this way the amount of space in the bladder increases allowing for the volume of urine to increase.

- **The prevalence of urinary retention**

Acute urinary retention is a common urological condition which disproportionately affects males more than females and frequently results in individuals seeking emergency admissions to hospital (Lim, Wong & Foo, 1999. p.516). It is particularly common in older men, affecting 2.6 in 1,000 males in their 40s and up to 34.7 per 1,000 men aged in their 70s (Jacobsen et al., 1997). For men over the age of 80 there is a 1 in 3 chance of experiencing an episode of acute urinary retention (Borrie et al., 2001; Emberton & Anson 1999). Post-operative urinary retention is also a common phenomenon, affecting up to 20% of individuals regardless of age (Stricker & Steiner, 1991). Frail elderly patients who undergo surgery are especially susceptible to delirium and immobility post-operatively and at high risk of urinary retention because of immobility, anaesthesia effects and narcotic analgesics (Fonda, et al., 2005).

Chronic urinary retention is also a common condition and particularly so in hospitalised older people (Grosshans et al., 1993), older people who are resident in long-term care (Resnick et al., 1989) and in people receiving rehabilitation after

Table 1. Definitions of urinary retention from peak bodies with expertise in urology and/or incontinence

Organization	Definition of urinary retention	Definition of acute urinary retention	Definition of chronic urinary retention
American Urological Association	Failure to empty the bladder totally	Acute often means urgent. An acute disease happens suddenly. It lasts a short time.	Lasting a long time.
American Foundation for Urological Disease	No definitions		
Association for Continence Advice	Notes on good practice available– none specific to urinary retention. Free to members		
Australasian Urological Nurses Society Inc	No definitions		
Australian Nurses for Continence	No definitions		
British Urological Institute	No definitions		
Canadian Continence Foundation	No definitions		
Continence Foundation of Australia	No definitions		
Canadian Urological Association	Patient information brochures available but none specific to urinary retention		
European Association of Urology	Guidelines on a range of urological topics – none specific to urinary retention. Free to members		
International Consultation on Incontinence	No definitions		
International Continence Society		A painful, palpable or percussable bladder, when the patient is unable to pass urine	A non-painful bladder, which remains palpable or percussable after the patient has passed urine.
National Association for Continence	No definitions		
Society Internationale d'Urologie	No definitions		
Society of Urological Nurses and Associates	No definitions		
The Continence Foundation (UK)	No definitions		
Urological Sciences Research Foundation	No definitions		
Urological Society of Australasia	No definition		
Wound, Ostomy and Continence Nurses Society	No definition		

stroke (Dormerick & Reding, 1994; Gebler et al., 1993). The incidence of this condition following stroke is estimated at between 25-37% (Dormerick & Reding, 1994; Gebler et al., 1993). One study reported that up to one third of hospitalised elderly patients had a PVR of more than 50 ml (Tan et al, 2001). Among older adults, a large PVR is common even when there is no underlying physical obstruction (Gray, 2000a).

A considerable proportion of patients experiencing urinary retention are "asymptomatic" which raises a number of significant public health issues as undetected urinary retention can lead to renal impairment, urinary incontinence and recurrent urinary tract infections (Tan, Lieu & Ding, 2001; Tengh et al., 2005)). For example, Wu and Baguley (2005) found 22% of patients in a general rehabilitation unit had PVRs of 150ml or more and were asymptomatic. These patients were more likely to have urinary infection on admission, have incontinence on discharge and to be discharged with referrals to community services for personal care or to residential care.

- **Risk factors for urinary retention**

As noted above, urinary retention is far more common amongst elderly men. This reflects the increased incidence of urethral obstruction caused by an enlarged prostate with advancing age. Whilst this is a common risk factor for acute urinary retention in men, the cause is most likely multifactorial (Tubaro, Artibani, Bartram, Delancey, Dietz, Khullar, Zimmern & Umek, 2005). Risk factors for urinary retention include:

- urethral obstruction, which may be caused by congenital urethral stricture, prostate cancer or tumours (Gilbert, 2005);
- advanced age, (Borrie et al., 2001; Meigs et al., 1999; Tan et al., 2001),
- impaired mobility (Tan et al., 2001);
- diabetes, constipation or faecal impaction (Borrie et al., 2001; Tan et al., 2001);
- urinary tract infection, past history of urinary tract infection (Tan et al., 2001; Meigs et al., 1999);
- neurological disorder/injury preventing the detrusor muscle from contracting effectively (Gilbert, 2005) e.g. stroke (Tan et al., 2001) (Dormerick & Reding, 1994; Gebler et al., 1993);
- psychogenic factors – believed to be more common in women than in men (Goodwin et al, 1998; Wesslemann, 1997);

- anticholinergic medication, (Borrie et al., 2001; Meigs et al., 1999) and other drugs such as methyldopa, hydralazine (antihypertensives), levodopa (antiparkinsonian), antihistamines, (atropine and belladonna), antispasmodics, sedatives and anaesthesia; and
- operative risk factors (i.e. pre-operative medication including atropine and sedatives, anaesthesia – general and spinal, supine position after surgery, low fluid intake and the effects of surgical manipulation of the bladder nerves during surgery) (Gilbert, 2005).

The International Continence Society draws attention to voiding dysfunction, including urinary retention and/or urinary incontinence that are associated with neurological pathology (Madersbacher et al., 2002). For example "a significant number of new stroke patients develop urinary retention for several weeks before detrusor hyperreflexia occurs. "This stage of detrusor areflexia may be named cerebral shock much alike the classic spinal shock stage immediately after a spinal cord injury" (Madersbacher et al., 2002. p. 699). Also worthy of consideration is the fact that Parkinson's disease has been identified as one of the most common neurological entities causing voiding dysfunction, classically resulting in detrusor hyperreflexia, detrusor bradykinesia and an impairment of relaxation of the striated sphincter.

- **The impact of urinary retention**

The health outcomes associated with urinary retention are significant and include:

- high hospital mortality rates (Simoforoosh et al., 1997., Smith & Albazzaz, 1996);
- urinary tract infections (Simoforoosh et al., 1997., Smith & Albazzaz, 1996);
- overly distended bladder (Simoforoosh et al., 1997., Smith & Albazzaz, 1996);
- overflow urinary incontinence (Soane & Baum, 1988); and
- inability of the bladder to contract and damage to the upper urinary tract (Tanagho & Schmidt, 1992).

Lim and colleagues identified the fact that "large volumes of retained urine causes over-distension of the bladder and loss of detrusor tone" and stated that "prolonged bladder distension may result in ischaemia and axonal degeneration which eventually leads to bladder failure" (1999, p. 517). "Very large PVRs (>300mls) may be associated with an increased risk of upper urinary tract dilation and renal insufficiency" (Kelly 2004, p.S34).

Because urinary retention is frequently managed with urinary catheterisation (Simforoosh et al., 1997), infection is a common complication. A small but significant percentage of these patients will develop the life-threatening condition of bacteraemia. These conditions increase hospital length of stay resulting in a substantial increase in health care costs. One estimate suggests that the cost associated with each hospital-acquired urinary tract infection adds approximately $US675 to the cost of hospitalization and when this develops into bacteraemia, this additional cost increases to at least $US2,800 (Saint, 2000). To date, no figures are available based on the Australian population, and this fact alone suggests that investigations into the diagnosis, treatment and management of urinary retention should be further researched and examined in detail.

- **Age related changes in bladder function**

Most research to date to establish normative values for voiding have focused on young adults. This presents particular challenges as norms that are derived from this population may not apply to older adults. Fonda et al. (2005) reported that understanding aged-related bladder changes is problematic due to a paucity of longitudinal data, varying definitions of "normal", polypharmacy, and use of potentially biased and (and symptomatic) referral populations.

Despite this, it is known that bladder sensation changes as a normal consequence of ageing. Rule et al. (2005) followed 529 men (40-79 years old) over a 12 year period with a sonagraphic PVR and concluded that there is a progressive bladder dysfunction in community dwelling men as they age. Bladder capacity is diminished, the quantity of residual urine is increased, bladder contractions become uninhibited (detrusor hyperreflexia overactive bladder), detrusor contractility declines, the desire to urinate is delayed and the majority of urine production occurs at rest (Fonda et al., 2005). Therefore, instead of perceiving the sensation of the bladder filling at about half capacity (as do younger people), many older adults first feel the need to void at, or near, bladder capacity.

In the right (or wrong) circumstances, anyone can develop urinary retention, but the condition is rare below the age of 60. Similarly, normal older adults are more likely to have a combination of an overactive bladder as well as a bladder that has impaired bladder contractility (Resnick, 1987). This latter condition has been coined detrusor

overactivity with impaired contractility (Resnick, 1987) and may provide a partial explanation for the high prevalence of PVR in older adults. In such cases, the bladder contraction does not empty fully, leaving a large PVR. To highlight the commonality of high PVR in older adults, Bonde and colleagues (1996) identified that in a normative sample of 140 older adults (i.e. aged over 75 years), PVRs ranged from 0-1502mls and averaged 45mls for women and 90mls for men.

- **Gender and bladder function**

Urinary retention does not discriminate between the sexes, however the symptoms in ageing men have been found to be somewhat exaggerated compared to older women (Madersbacher, Pycha, Schatzl, Mian, Klingler, Marberger, 1998). In a urodynamic study of 436 men and women, both sexes demonstrated that PVR increased and peak flow rate decreased with age (Madersbacher et al., 1998). As women age, flow rate, voided volume and bladder capacity decrease and PVR increases. Further, it has been noted that among older women large cystoceles may also contribute to elevated PVR (Fonda et al., 2005). These findings indicate that along with increasing age there is increasing fibrosis of the bladder wall, which has been found to be more extensive in men, and which results in a loss of functional capacity (Siroky, 2004).

- **Diagnosing urinary retention**

In approaching the diagnosis of urinary retention, it is important to differentiate between acute and chronic urinary retention. A subcommittee of The International Continence Society further emphasize the need to distinguish between the condition of chronic urinary retention and that of transient voiding difficulty in older adults (Fonda et al, 2002). Further, Fonda et al. (2005) recommend that basic urinary tract assessment in frail elderly people should be inclusive of assessment of PVR in order to identify potentially treatable conditions. Methods for identifying and diagnosing urinary retention include a clinical assessment, an assessment of urinary frequency and voided volumes and an estimation of PVR.

  - Clinical assessment

Clinical symptoms that are generally considered in association with urinary retention include; a sensation of bladder fullness or distension; small and infrequent voiding or absence of urine output; a PVR; dysuria and/or overflow incontinence (Mosby's Medical, Nursing and Allied Health Dictionary, 1990). It is important to note that whilst acute urinary retention is readily detected on the basis of sudden painful inability to void with a tender palpable bladder on clinical examination (Wong & Foo,

1999), the diagnosis of chronic urinary retention may be difficult as individuals may be asymptomatic and unaware that they have a problem (Gray 2000a; Gray 2000b). PVRs of up to 150mls in elderly females can be asymptomatic and this can be a consequence of the normal ageing process (Tan et al., 2001).

For individuals who have concurrent conditions such as dementia and/or delirium, urinary retention may be further masked and undetected. One study draws attention to a possible association of delirium and urinary obstruction in the elderly as none of the patients in their study complained of pain, and none seemed in distress other than being in an acute confusional state (Blackburn & Dunn, 1990). This condition and its diagnosis have major implications on health care systems, as elderly patients account for a large proportion of hospital admissions.

Differences in the way in which urinary retention presents provides an explanation for the observation that whereas "acute urinary retention typically presents as a medical emergency, chronic retention may present as an incidental finding during routine evaluation or as a causative factor in urinary tract infection or upper urinary tract distress" (Gray, 2000a; Gray 2000b).

- Assessment of urinary frequency and voided volume

Because individuals with voiding dysfunction and/or urinary retention usually experience low voided volumes and infrequent voiding or absent urine output, the assessment of urinary frequency and voided volumes is an important component of diagnosis. Voiding records are tools that enable this data to be collected. Limitations are noted with voiding records, however, as the accuracy of the information depends upon accurate completion. As noted by Zorzitto and colleagues (1986. p. 138), "quantitative and accurate recording of incontinence and voiding behaviour is difficult, particularly in patients who are unable to self-report or who are unaware of their voiding patterns".

Adding to the complexity of accurately assessing PVR is that PVRs are inherently variable (Bates, Sugiono, James, Stott & Pocock, 2003). Test-retest reliability is known to be poor (Dunsmuir, Fenely, Cory, Bryan & Kirby, 1996) and several studies have reported a poor correlation between bladder volume as measured by catheterisation and by ultrasonography (Alnaif & Drutz, 1999; Pallis & Wilson, 2003; Teng et al., 2005).

- Estimation of PVR

In-out catheterisation

Methods used to detect PVR include a clinical examination to detect a palpable distended bladder, in-out catheterisation and/or a bladder scan. Traditionally, physical examination is the first-hand method to detect any sign of urinary retention, however it has been noted that there are limitations associated with relying on this method, with claims that it is notoriously unreliable (Coombes & Millard, 1994) and inaccurate (Tan et al., 2001). In-out catheterisation remains the gold-standard for identifying PVR (Wyndaele, Castro, Madersbacher, Chartier-Kastler, Igwaw, Kovindha, Radziszewski, Stone & Wiesel, 2005). Despite this, in-and-out catheterisation can be uncomfortable for elderly people, especially following hip fracture, stroke or cognitive impairment and can challenge nursing staff (Borrie et al., 2001). If the person performing the catheterisation is not fully instructed as to the procedures and techniques to assure complete emptying (i.e. moving the catheter in and out slowly, twisting it, suctioning with syringe and suprapubic pressure), this method is subject to inaccuracies (Tubaro, et al., 2005).

Bladder scanning

A more contemporary approach to diagnosing urinary retention involves the use of ultrasonography. Bladder scanning is now challenging urethral catheterisation as the best method of confirming PVR (Fader & Craggs, 2005; Gilbert, 2005). A bladder scanner enables an accurate and simple method of detecting PVR. Resnick (1995) identified that a bladder scanner would be beneficial in the geriatric rehabilitation setting as nurses would be able to manage urinary problems in the elderly by performing a more complete assessment bladder function in a non-invasive and comfortable way. The advantages associated with ultrasonography include the facts that it is non-invasive thus reduces the incidence of nosocomial infections, is time efficient, minimises medical waste and supplies and determines when catheterisation is medically appropriate (Sparks et al., 2004; Stevens, 2005). Obtaining immediate data is beneficial to nursing staff as it has the potential to reduce the medical cost (Teng et al., 2005). Further, Frederickson and colleagues (2000) found that the use of the ultrasound resulted in 38% fewer catheterisations overall, 9% fewer urinary tract infections, significant cost savings and high patient provider satisfaction when compared with standard catheterisation.

By contrast, a disadvantage of bladder scanning compared to in-out catheterisation is that no urine specimen can be obtained during the procedure (Kelly, 2004). Another

consideration pertains to the finding that the time of day needs to be taken into account when discussing/evaluating urinary retention. There is high intra-individual variability even within a 24 hour period as denoted by the fact that the PVRs are higher in the morning than at other times during the day (Tubaro et al., 2005). To demonstrate this point, Griffiths, Harrison, Moore & McCracken (1996) measured residual urine in geriatric patiens at three different times of day, on each of two visits separated by 2-4 weeks. Analysis of variance revealed large within-patient variability due to the variation of time of day (SD 128 ml).

A crucial factor to take into account in interpreting the results of bladder scanning is the fact that threshold values for normal PVRs have not been established. More specifically, there is a lack of consensus on what constitutes a significant residual volume compared with a normal volume and how these relate to the diagnosis of urinary retention (Grosshans et al., 1993). A review of the literature identified a range of values that have been used in research (see Table 2).

Despite variability in opinion on threshold clinical values associated with PVRs, most urologists agree that volumes of 50mls to 100mls constitute the lower threshold defining abnormal PVR (Kelly, 2004). A review of the literature undertaken by Tan and colleagues (2001) did not identify a specific maximum PVR that would be considered normal. In addition, Gray (2000b) states that "unfortunately, there is no specific residual volume that reliably predicts the presence of clinically significant chronic urinary retention in every patient" (p.37) and suggests that adults experiencing residual volumes of 150 - 200mls or greater require further assessment and investigations. Grosshans and colleagues state that "further investigations are needed in order to better define what may constitutes a normal value of PVR among elderly persons and to determine its significance" (1993. p.637) and maintain that no one value is considered significant as a normal or pathological value, "It appears that proper bladder emptying is the result of many internal and external factors and that it varies from one person to the next" (Grosshans et al., 1993 p. 636). The absence of an established clinically significant PVR presents a clinical dilemma for the detection and management of urinary retention and, more particularly, when the condition is otherwise asymptomatic. Gray proposes that an active approach to chronic urinary retention is indicated "when it causes bothersome voiding dysfunction or when it leads to complications such as acute retention, recurrent urinary tract infection, urinary or bladder calculi (stones) pyelonephritis, hydronephrosis, vesicourethral reflux or renal insufficiency" (2000a, p.3).

Table 2. Clinically significant PVRs cited in the literature

STUDY	CLINICALLY SIGNIFICANT PVR	STUDY POPULATION
Agency for Health Care Policy and Research (1996)	>200ml	Elderly
Fantl et al. (1996)	Repeated PVR's of 100 – 200mls or >	Not stated
Fonda et al. (2005)	>100ml for men >200ml for women	Elderly and frail
Gray (2000b)	150 – 200mls or >	Not stated
Hilton & Standton (1981)	20 – 300mls	Elderly
Ouslander (1981)	20 – 300mls	Elderly
Resnick (1984)	20 – 300mls	Elderly
Starer & Libow (1987)	300mls	Elderly incontinence nursing home residents

- **Management**

Management options for urinary retention range from surgical approaches to pharmaceutical, catheterisation, behavioural therapies such as bladder reflex triggering and regular monitoring and bladder expression. "Choice of management depends on urodynamic testing, clinical assessment, the level of patient's cognition and ability to perform specific management techniques" (Loyd, 1993, p. 330-1). These factors have led to a high variability in the management of urinary retention within and among countries, which is further been exacerbated by a lack of consensus on the best way to proceed (Fitzpatrick & Roger, 2006). An extensive search of the websites of peak national and international organizations with expertise in urology and incontinence and in evidence-based healthcare did not identify best practice guidelines on the management of urinary retention (see Tables 3 & 4). The absence of management or evidence based guidelines may partly reflect the fact that urinary retention is classified as a symptom rather than as a diagnosis. Best practice guidelines tend to focus on diagnostic entities. Examples include the Guidelines on Benign Prostatic Hyperplasia (United States Agency for Health Care Policy and Research Clinical Practice, 1994) or the Guidelines on the Management of Unstable Angina (National Heart Foundation of Australia and The Cardiac Society of Australia and New Zealand, 2000).

- Surgical options for urinary retention

Surgery has an important role in the management of acute urinary retention that is related to a physiological obstruction such as in the case of a congenital urethral stricture, prostate cancer or tumour. There is a limited role however for surgery in the management of urinary retention that is associated with neurological conditions. Nevertheless, considerable advances have been made in recent years in the area of neuromodulation (Scheepens et al., 2002) or with continent urinary diversions.

- Pharmaceutical options for urinary retention

There is an emergent role for medication for the management of an enlarged prostate with or without associated urinary retention. Contemporary drugs that are employed for this condition include Alpha blockers and 5-alpha-reductase inhibitors. Medication for the management of urinary retention of neurogenic aetiology is however limited.

- Urinary catheterisation

Urinary catheterisation remains the mainstay of treatment for urinary retention. Drainage of urine from an overly distended and painful bladder is a paramount consideration where immediate relief from symptoms is required. The main aim of catheterisation is to empty the bladder and to prevent bladder over-distension in order to avoid complications and to improve urological conditions (Wyndaele et al., 2005). Until recently, secondary management for acute urinary retention consisted almost exclusively of surgery however, the associated morbidity and mortality has lead to an increase use of trial of catheter i.e. catheter removal after 1-3 days (Fitzpatrick & Roger, 2006).

Three forms of catheterisation apply; indwelling urethral catheterisation, indwelling suprapubic catheterisation and intermittent catheterisation. Each of these has it advantages and disadvantages. Regardless of the form of catheterisation, insertion of a urinary catheter causes patient discomfort, increases psychological stress in patients and carries a risk of urethral trauma and infection (Lewis, 1995). It is also reported to be "time consuming and may not be necessary" (Kelly, 2004, p.S34).

Table 3. Recommendations for the management of urinary retention

Organization	Acute urinary retention	Chronic urinary retention	Trial of void	Comments
American Foundation for Urological Disease	No management recommendations			
American Urological Association				"Catheters are an integral part of managing bladder dysfunction in persons with both urinary retention & UI".
Association for Continence Advice	Notes on good practice available – none specific to urinary retention. Free to members			
Australian Nurses for Continence	No management recommendations			
Australasian Urological Nurses Society inc	No management recommendations			
British Urological Institute	No management recommendations			
Canadian Continence Foundation	No management recommendations			
Continence Foundation of Australia	No management recommendations			
Canadian Urological Association	No management recommendations			
European Association of Urology	No management recommendations			
International Consultation on Incontinence	No management recommendations			
International Continence Society	No management recommendations			
National Association for Continence	No management recommendations			
Society of Urological Nurses and Associates	No management recommendations			
Society Internationale d'Urologie	No management recommendations			
The Continence Foundation (UK)	No management recommendations			
Urological Sciences Research Foundation	No management recommendations			
Urological Society of Australasia	No management recommendations			
Wound, Ostomy and Continence Nurses Society	No management recommendations			

Table 4. Best practice guidelines on urinary retention

Organization	Guidelines
The Cochrane Library & database of systematic reviews http://www.nelh.nhs.uk/cochrane.asp	None specific to urinary retention
The Joanna Briggs Institute for Evidence-based nursing and midwifery http://www.joannabriggs.edu.au	None specific to urinary retention
The Database of abstracts or reviews of effectiveness http://www.york.ac.uk/inst/crd/darehp.htm	None specific to urinary retention
Netting the Evidence: A ScHARR Introduction to Evidence Based Practice http://www.shef.ac.uk/scharr/ir/netting/	None specific to urinary retention
Centre for Evidence Based Medicine http://cebm.jr2.ox.ac.uk/docs/otherebmgen.html	None specific to urinary retention
Evidence-Based Medicine WEBsites http://dfcm18.med.utoronto.ca/wrkshp/ebm.htm	None specific to urinary retention
McMaster University, Canada http://hiru.hirunet.mcmaster.ca/ebm/	None specific to urinary retention
University of Pittsburgh Health Sciences Library System: Practice Guidelines & EBM http://www.hsls.pitt.edu/intres/health/practice.html	None specific to urinary retention

Both forms of indwelling catheterisation raise concerns, especially when they are used for an extended period of time. For example, there is an increased risk of bladder cancer when catheterisation is used as a long-term management strategy (West et al., 1999). Modi and colleagues report that "prolonged catheter drainage carries considerable morbidity, with 72% experiencing some complication. Most patients feel they lose dignity, 69% consider it uncomfortable and more than 50% complain of burning sensations, bladder spasms and a persistent desire to micturate" (Modi et al., 2000. p.334).

In comparison, intermittent catheterisation is known to be more "user friendly". For example intermittent self-catheterisation is an established intervention (Addison, 2001) and is recognised as a safe and effective procedure (Moore, 1995). In a retrospective audit of patients who had been taught intermittent self-catheterisation, Naish (2003) identified that patients were happy to become self-caring and use this method of management for urinary retention and that they were able to return to a normal voiding pattern. Further, patients who perform intermittent self-catheterisation require less nursing care and are able to remain sexually active which promotes well-being and a positive body image (Winder, Doherty, Bennet & Buckley, 1997).

- Trial of void

The duration of catheterisation is an important consideration and is contingent on a number of factors, including the success or otherwise of a trial of void. Trial of void is a procedure to assess a patients' ability to void after a urinary catheter is removed (Thees, & Dreblow, 1999). Upon removal of a catheter, the patient is monitored closely to ascertain whether or not their bladder has resumed normal function. Whilst a range of clinical signs and symptoms may indicate the need for the catheter to be reinserted or not, measurement of voided volumes compared with PVR is an important consideration. There is a paucity of evidence-based information on the practice of trial of voids and our search of national and international peak bodies in urology and continence did not identify any consensus or authoritative management algorithms or best practice guidelines on this topic (see Table 3).

- Behavioural therapies

Behavioural therapies that have been recommended by the International Continence Society Standardization committee (Madersbacher et al., 2002) include bladder reflex triggering (suprapubic tapping, thigh scratching) and/or bladder expression (abdominal straining, Valsalva's manoeuvres and Crede manoeuvres). Triggered reflex voiding and bladder expression should however be limited to situations where is proven to be urodynamically safe and stable (Madersbacher et al., 2002). Another important consideration is that they largely rely on the active engagement of the individual concerned. This requirement limits the application of these therapies to individuals with concurrent cognitive impairment.

- Monitoring and review

Whilst some individuals with chronic urinary retention require intervention aimed at emptying the bladder, others are managed with ongoing urologic monitoring and regular reviews. This approach involves weighing up the risks associated with passive management compared with active intervention.

- **Conclusion**

An extensive review of the literature and a search of the internet for evidence-based databases and peak professional healthcare bodies that focus on continence and urology care, did not identify guidelines for the identification and management of urinary retention. Similarly, there is clearly an absence of consensus in relation to the

clinical finding of a PVR. These factors pose particular problems for clinicians in terms of clinical decision making.

Whilst the therapeutic management of acute urinary retention is somewhat self-evident in that relief of bladder distension is a paramount consideration, the management of chronic urinary retention is less clear. This raises a number of questions:

- Is the adoption of a passive watchful waiting approach better than an active intervention approach?
- If an active intervention approach is taken, at what threshold point should this be initiated?
- What type of intervention should be taken and does this approach differ for different groups of individuals?

It is clear that gaps in knowledge persist regarding the diagnosis and management of urinary retention in older adults and more specifically, in older adults in acute and sub acute care settings.

Major findings from this literature review are:

- there is a high prevalence of urinary retention in older adults across acute care, rehabilitation, community and residential care is high;
- asymptomatic urinary retention is common in older adults and poses challenges for health care professionals to accurately diagnose;
- there are a large number of risk factors associated with developing urinary retention;
- outcomes associated with acute urinary retention are poor in terms of morbidity and mortality. Outcomes associated with chronic urinary retention are less well established; and
- there is conflicting evidence as to what constitutes a clinically significant PVR in older adults.

In conclusion, it is evident that that there is a need for a clinical guideline for the nursing assessment and management of urinary retention, and it is imperative that therapeutic decision-making for the identification and treatment of urinary retention is based on the best available evidence.

Stage 1: Review of The Incontinence Outcomes Measurement Suite Report

The report from The Incontinence Outcomes Measurement Suite project, commissioned by the Australian Commonwealth Department of Health and Ageing National Continence Management Strategy Research Program was reviewed as part of this literature review. This report focused on the psychometric properties of the many tools that have been developed to measure incontinence symptoms and quality of life and drew its recommendations from a series of data gathering activities including: consultations with clinical experts; reviews of the associated literature; and deliberations by an expert panel of measurement specialists.

Within the report, two bodies, (i.e. the ICS and the Urodynamic Society) were found to include PVR as a standard to assess and report on the efficacy for therapy for urinary incontinence therapy. For example, the minimal standards proposed by the Urodynamic Society were described by Groutz et al. (2000) as:

- The patient's opinion of treatment outcome
- Micturition questionnaire
- Voiding diary
- Pad-test
- Physical examination
- Uroflowmetry, and
- Estimation of PVR.

Two questionnaires were found to include a form of measurement of urinary retention: The International Continence Society (ICS) Male Short Form (incomplete emptying) and the Kings Health questionnaire (difficulty in voiding). Both of these instruments are subjective measures which have sound psychometric properties. The (ICS) Male Short Form contains 11 questions concerning urinary incontinence symptoms for male respondents. This tool was developed to measure the symptomatology and "bothersomeness" of lower urinary tract problems for men with prostatic disease. The ICS male VS voiding sub-score comprising five questions (hesitancy, straining, reduced stream, intermittency, incomplete emptying), and the ICS male IS incontinence sub-score comprising six questions (urge, stress, unpredictable and nocturnal incontinence, urgency, postmicturition dribble. The scores are obtained by summing of the ratings for each item. Donovan et al (2000) reported the psychometric properties of the tool components VS and IS. Cronbach alpha for VS was .76 and .78 for IS. Responsiveness was also satisfactory.

The Kings Health questionnaire was developed by Kelleher and Cardozo's group at King's College Hospital in the United Kingdom (Kelleher, Cardozo, Khullar & Salvatore, 1997). It contains 21 items and was designed to measure symptoms and quality of life for males and females with urinary incontinence. The 21 items are allocated across 3 parts three parts: Part 1 (general health perception, incontinence impact), Part 2 (role limitations, physical limitations, social limitations, personal relationships, emotions, and severity measures), and Part 3 (frequency, nocturia, urgency, urge, stress, nocturnal enuresis, intercourse incontinence, infections, pain, and difficulty in voiding). A four point rating system is used and these yield 8 subscales ("domains") scored between 0 and 100, with 100 indicating greater impact upon health related quality of life. Kelleher, Reese, Pleil, Okano (2002), used the King's Health Questionnaire and the Short Form-36 to assess outcomes for patients with over-active bladder receiving immediate release from Tolterodine. The two questionnaires were administered at baseline and also at the end of treatment twelve weeks later in a randomised controlled trial intervention study. The KHQ measures showed significant improvement. Interestingly, the SF-36 did not detect any changes in the study sample.

The review of this report did not identify any suitable outcome measures that can be recommended for use in the assessment and management of urinary retention. Additionally, the report indicated that although "there is a wide range of reviews of urinary and faecal incontinence outcome measures, there seems to be very little consensus as to which instruments and tools should be employed in the measurement of outcomes of interventions for incontinence (Thomas et al., 2003. p. 114).

Additionally, the Outcomes Project Team focussed their review of outcome measure on urinary incontinence rather than urinary retention. Whilst individuals who experience urinary retention may also present with symptoms of urinary incontinence, these two conditions are distinctively different and need to be assessed and managed using different outcome measures. As urinary retention may or may present with urinary incontinence symptoms, use of an outcome measure that focuses on urinary incontinence symptoms is not specific enough for use as an outcome measure for urinary retention.

Stage 1 Findings from staff survey

A survey involving 58 healthcare professionals from a sub-acute care facility was undertaken (see Appendix A). The professional status of respondents was as follows;

- 3 (6%) respondents were medical staff;
- 48 (94%) respondents were nurses. Of these: 26 (54%) were Division 1 nurses & 15 (31%) were Division 2 nurses (enrolled nurses);
- 7 (15%) did not answer the question

The following data relate to current medical and nursing staff perceptions of management practice of urinary retention. Frequencies and percentages (parenthesized) are reported, and the emerging trends and any additional comments made by participants are reported.

- **Timing of bladder scans**

Frequencies (and percentages) of responses to question 2: 'When are bladder scans performed on your patients?'

Table 5. Timing of bladder scans

	Yes	No	Missing
Routinely on admission	2 (3.9)	43 (84.3)	6 (11.8)
Routinely following removal of a catheter	47 (92.2)	4 (7.8)	-
Routinely as a component of a trial void	47 (92.2)	4 (7.8)	-
Routinely as a component of a continence assessment	40 (78.4)	10 (19.6)	1 (2)
When they have a history of urinary retention	46 (90.2)	5 (9.8)	-
When they have signs and symptoms of retention	50 (98)	1 (2)	-
Randomly	6 (11.8)	35 (68.6)	10 (19.6)

Emerging trends

- Routine bladder scans are done the majority of times if patient is at risk of or has been diagnosed with urinary retention
- Not done routinely as a part of admission or randomly

Additional participant comments

- 'When there are other indicators (i.e. urinary tract infection, diseases that pre-dispose patient to urinary retention)
- 'Helpful when assessing reason for anxiety in confused patient or cognitively impaired patient'

- **Ward practices for different PVR volumes**

Frequencies (and percentages) of responses to question 3: 'When patients have the following post void volumes, please indicate your ward's usual practice/s.'

Table 6. Ward practices for different PVR volumes

	PVR of 50-100ml	PVR of 100-250ml	PVR of 250-400ml	PVR of 400ml or >	Missing
We notify medical staff	11 (21.6)	4 (7.8)	15 (29.4)	21 (41.2)	-
We monitor the patient's urine output and repeat the bladder scan following next voluntary void	3 (5.9)	17 (33.3)	20 (39.2)	6 (11.8)	5 (9.8)
We monitor the patient's urine output and repeat bladder scan according to a schedule	2 (3.9)	9 (17.6)	11 (21.6)	9 (17.6)	20 (39.2)
We insert a urinary catheter	-	6 (11.8)	-	35 (68.6)	10 (19.6)
We institute a program of intermittent clean catheterisation	-	2 (3.9)	3 (5.9)	18 (35.3)	28 (54.9)
We teach the patient to self-catheterise	-	1 (2.0)	2 (3.9)	11 (21.6)	37 (72.5)
No action is taken	18 (35.3)	-	-	2 (3.9)	31 (60.8)

Emerging trends

- The data suggests variable practices
- Procedures are commonly initiated if PVR is at 400ml or greater

Additional participant comments

- 'Depends on the doctors orders for patient. Every patient's situation is different'
- 'If patient prone to urinary retention, we will encourage to do double voiding.'
- 'Depends on the patients medical history and various variable factors.'
- 'Catheterisation depends on patient's clinical diagnosis, the temporary or permanent nature of the problem. Teaching the patient depends on patients capabilities.'

- **Ward protocols following urinary catheter removal**
  - 31 respondents (60.8%) answered that they had a standard protocol following urinary catheter removal.
  - 13 (25.5%) indicated that they did not have a standard protocol.
  - 7 (13.7%) responses were missing.

Frequencies (and percentages) of responses to question 4: 'When a catheter is removed, please indicate your ward's standard protocol' (see Table 7).

Table 7. Ward protocol following catheter removal

	Agree	Disagree	Missing
We monitor patient's urine output by using a bladder chart	45 (88.2)	1 (2.0)	5 (9.8)
We rely on patient reports to monitor the patient's urine output	4 (7.8)	33 (64.7)	14 (27.5)
We rely on nursing observations to monitor the patient's urine output	31 (60.8)	6 (11.8)	14 (27.5)
We perform bladder scans after each void	20 (39.2)	21 (41.2)	10 (19.6)
We perform bladder scans according to a predefined schedule	27 (52.9)	6 (11.8)	18 (35.3)
We observe the patient for signs and symptoms of retention	41 (80.4)	1 (2.0)	9 (17.6)

Emerging trends

28 of the 47 respondents (59.6%) who indicated that scans were routinely performed following removal of a catheter in question 2 also indicated that they had a standard protocol that was followed.

- Bladder charts and observations were the most common component of a protocol following removal of catheter.
- Bladder scans were more commonly performed according to a predefined schedule rather than following each void.
- Patient reports were rarely used to monitor urine output.

- **Nurses perceptions of the frequency of patients with undetected urinary retention**

Participants were asked to indicate the frequency of their experience in caring for patients whose condition of urinary retention had not been detected prior to their admission to the sub-acute care facility.

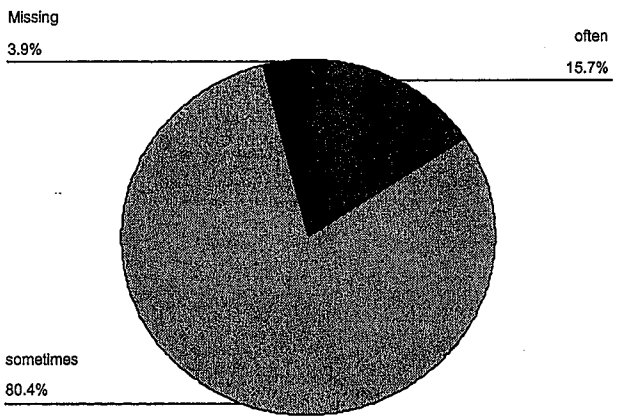

Figure 1. Nurses perceptions of the frequency of undetected urinary retention

- **Nurses perceptions of the frequency of patients with asymptomatic urinary retention**

Participants were asked to indicate the frequency of their experience in caring for patients with urinary retention who did not have associated abdominal pain.

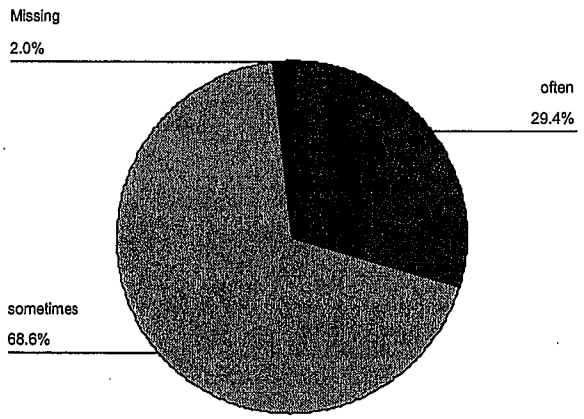

Figure 2. Nurses perceptions of the frequency of asymptomatic urinary retention

- **Nurses perceptions of the frequency of patients who are diagnosed during random bladder scanning.**

Participants were asked to indicate the frequency of their experience in caring for patients with urinary retention whose condition was identified during a random bladder scan.

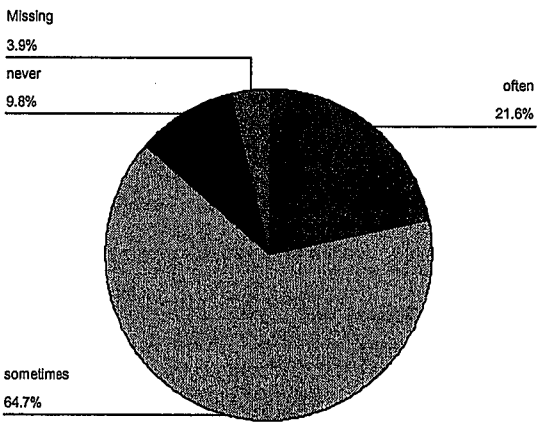

Figure 3. Nurses perceptions of the frequency of diagnosis of urinary retention by random bladder scanning

Summary of responses to questions 5, 6 & 7 (see Figures 1, 2 & 3).

- Responses indicate that the diagnosis of urinary retention is commonly made following admission.
- Question 6 shows that abdominal pain may not always be present in conjunction with urinary retention.
- Responses to question 7 indicate that random bladder scans may be useful in diagnosing urinary retention. Only 11.8% of respondents indicated that the bladder scans were done randomly in question 2.

- **Nurses perceptions of discharge procedures for patients who do not regain normal bladder function**

Frequencies (and percentages) of responses to question 8: 'If patients with urinary retention do not regain normal bladder function by the time they are due to be discharged, they are:'

Table 8. Nurses perceptions of discharge outcomes for patients with urinary retention

	Often	Sometimes	Never	Missing
Discharged with a urinary catheter in-situ	28 (54.9)	20 (39.2)	1 (2.0)	2 (3.9)
Discharged after being taught how to perform intermittently self-catheterisation	4 (7.8)	29 (56.9)	15 (29.4)	3 (5.9)
Discharged with a referral for follow-up by a medical or surgical specialist	21 (41.2)	27 (52.9)	2 (3.9)	1 (2.0)
Discharged with a referral for follow up by a urology or continence nurse consultant	21 (41.2)	30 (58.8)	-	-
Discharged with a referral for follow up by a community nursing agency	20 (39.2)	22 (43.1)	5 (9.8)	4 (7.8)
No action is taken	4 (7.8)	6 (11.8)	36 (70.6)	5 (9.8)

Emerging trends:

- Patients being discharged with catheter in-situ had the highest 'often' response rate.
- Patients being discharged with referrals to either a specialist, nurse consultant or community nursing agency had similar response rates.

- 7.8% or respondents suggest that 'no action being taken on discharge occurs often.
- Patients being educated how to self-catheterise was done less often than other actions. In conjunction with question 3, where the majority of respondents (72.3%) did not indicate when self-catheterisation was performed, these results indicate that this procedure is not often done in the wards.

- **Ward protocols for patients with urinary retention**
  - 19 (37.3%) respondents indicated that the ward they worked on had a standard protocol for the management of patients with urinary retention.
  - 24 (47.1%) respondents indicated that they did not have a standard protocol.
  - 8 (15.6%) respondents did not answer the question.

Of the 19 respondents who answered that their ward had a standard protocol, only four gave details about the protocol. Their responses were:

- 'Monitor bowels; urinalysis; post void documentation.'
- 'Not constipated, drinking adequately, no urinary tract infection, detected full ward test.'
- 'Check for constipation, urinary tract infection, limited water intake.'
- 'Check when patient has had bowels opened and if patient is constipated as this could impair bladder emptying. Do bladder ultrasound. Notify Nurse Unit Manager and doctor if bladder residual >400. Monitor patient on fluid balance chart. Ask patient if any abdominal discomfort and observe for any distension.'

There was also a comment from one participant who indicated that there was no ward protocol, but expressed some uncertainty about it:

- 'Trial of voids are normally done followed by bladder scans but I do not know if this is protocol. Not sure whether they are done on every patient as routine.'

Of those respondents who indicated that they had a ward protocol:

- 6 (31.6%) thought that it was 'very helpful' in managing urinary retention.
- 10 (52.6%) respondents found the protocol to be 'somewhat helpful.'
- 3 (15.8) respondents did not answer the question.

- **Opinion on wards management of patients with urinary retention**
  - 9 (17.6%) respondents thought that their ward managed urinary retention extremely well.
  - 39 (76.5%) respondents though that their ward managed patient with urinary retention 'reasonably well'.
  - 1 (2%) respondent answered that their ward managed urinary retention 'poorly.'
  - 2 (3.9%) respondents did not answer the question.

Stage 1: Summary of findings

Review of literature

Key points from the review of literature were as follows:

- there are many factors that affect bladder emptying, including both environmental factors and pathophysiological disease;
- urinary retention or incomplete bladder emptying manifests either acutely or chronically and is a common finding in hospitalised older adults;
- whilst acute urinary retention is generally characterised by pain, symptoms associated with chronic urinary retention may be limited to urinary incontinence and hence, the condition may be difficult to detect. This has particular relevance for the care of patients with cognitive impairment and for individuals with urinary incontinence;
- initial assessment procedures should include: taking a brief patient history, reviewing the patients risk for urinary retention, conducting a physical examination of the lower abdomen, attending a urinalysis and estimating the PVR urine volume;
- there is conflicting evidence on the clinical significance of the finding of a PVR urine volume in older adults; with normative PVR urine volumes ranging from 20-300mL;
- the PV R urine volume is one of many factors to be considered in determining treatment options. Other factors include: the person's preferences for treatment, psychosocial status and quality of life, the potential for upper tract damage, the type and severity of symptoms, the results of investigations, comorbidities, prognosis and underlying pathology;
- outcomes associated with acute urinary retention are poor in terms of morbidity and mortality; and

- a search of national and international peak bodies' websites revealed a lack of guidelines for the assessment and management of urinary retention.

The Incontinence Outcomes Measurement Suite Report

- The outcomes measurement suite report identified a wide range of reviews of urinary and faecal incontinence outcome measures and very little consensus as to which instruments and tools should be employed in the measurement of outcomes of interventions for incontinence. As urinary retention may or may present with urinary incontinence symptoms, use of an outcome measure that focuses on urinary incontinence symptoms is not specific enough for use as an outcome measure for urinary retention.

Survey of current practice

Key points from the staff survey in the sub-acute care facility are as follows:

- the majority of nurses and medical staff reported that they sometimes identify patients with previously undetected urinary retention as well as patients who have the condition but who do not have abdominal pain as a defining feature;
- the condition is sometimes detected during random bladder scanning;
- few nurses and medical staff report having a standard protocol for the management of patients with urinary retention;
- ward practices in response to the finding of a PVR urine volume in the sub-acute care facility suggest a high degree of variability in practice; and
- the most commonly reported outcome of patients' failure to regain bladder function (i.e.: appropriately empty the bladder) whilst an inpatient of the sub-acute care facility was to be discharged with a urinary catheter inserted.

Stage 2

Stage 2 Objective

To develop a clinical guideline for the identification, management and treatment of urinary retention in hospitalised older adults.

Stage 2 Method

The National Health and Medical Research Council (NH&MRC) guidelines on the development, implementation and evaluation of clinical practice guidelines (1998) were used to inform the process for developing the clinical guideline on the nursing assessment and management of urinary retention in hospitalised older adults.

Consistent with these guidelines, a multidisciplinary expert panel was established. The panel comprised the following health care experts.

➢ Dr Craig Clarke	Consultant Geriatrician, Eastern Health
➢ Dr David Bouchier–Hayes	Urologist, The Royal Melbourne Hospital
➢ Ms Keren Day	Continence Nurse Advisor, Queen Elizabeth Centre, Ballarat
➢ Professor David Fonda	Consultant Geriatrician, Cabrini Health
➢ Ms Lynda Hardy	Urology Nurse Consultant, Box Hill Hospital
➢ Mr Uri Hanegbi	Urologist, Box Hill Hospital
➢ Ms Bronwyn Hughes	Continence Nurse Advisor, Peter James Centre
➢ Ms Pamela McMahon	Urology Nurse Consultant, Box Hill Hospital
➢ Ms Michelle McLean	Urology Nurse Consultant, Cabrini Health
➢ Dr Michael Murray	Geriatrician, St Vincent's Health
➢ Ms Jenny Radnell	Urology Nurse Consultant, Cabrini Health
➢ Dr Michael Whishaw	Consultant Geriatrician, Royal Melbourne Hospital
➢ Dr Mark Yates	Clinical Director Aged Care and Rehabilitation Medicine, Ballarat Health Services / Queen Elizabeth Centre, Ballarat

A method referred to as the Delphi technique was used to collect information from the expert panel. The purpose of the Delphi technique is to elicit information and judgements from participants to facilitate problem-solving, planning and decision-making (Dunham, 1998) The method is based on a structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with a controlled opinion feedback (Adler & Ziglio, 1996). The report collated in Stage 1 (i.e. survey data and information from the review of literature) was presented to the expert panel. They were invited to complete a series of questionnaires designed to seek their opinion about key issues that need to be considered in the development of a clinical guideline on the assessment and management of urinary retention in hospitalised older adults. This information was analysed and re-presented to the expert advisors for further consideration. This process occurred on three occasions until a level of consensus was reached. Where there was no consensus, the research team referred back to the literature.

Stage 2 Findings from expert panel consultation process

- **Agreement on definitions**

The expert panel noted limitations with the definitions of acute and chronic urinary retention that had been obtained from our review of literature. Exceptions to the definitions were cited. For example, the proposed definition of acute urinary retention as 'a non-painful bladder, which remains palpable or percussable after the patient has passed urine' or 'as the 'ongoing inability to completely evacuate urine from the bladder' (Abrams et al., 2002. p.176) does not take account of those individuals with acute urinary retention, who have no pain, and who are able to pass some urine. It was also noted that it can be difficult to palpate or percuss a distended bladder in some individuals.

The research team adopted the definition of chronic urinary retention as 'a non-painful bladder, which remains palpable or percussable after the patient has passed urine' or 'as the 'ongoing inability to completely evacuate urine from the bladder' (Gray, 2000a. p. 41). The expert panel pointed out limitations with this definition, highlighting the fact that the condition is not necessarily identified by a palpable or percussable bladder.

Another point made by the expert panel in relation to definitions was the need to acknowledge the fact that individuals with acute urinary retention can develop chronic urinary retention. Similarly, they advised that individuals with chronic urinary retention can develop acute urinary retention.

- **Agreement on risk factors**

Most of the expert panel agreed that the clinical guideline should include all of the risk factors that had been identified from the review of literature. At the same time, it was agreed that these risk factors should not be differentiated for the different presentations of urinary retention.

- **Agreement on assessment factors**

Most of the expert panel supported the inclusion of agreed assessment factors in the clinical guideline and that they should not be differentiated for the different ways in which urinary retention presents.

- **Agreement on when to estimate PVR**

There was 100% agreement that routine assessment of PVR for all patients who are admitted to hospital should not be recommended. Some commented that this should be conducted on the basis of symptoms and/or to those at risk (i.e. such as for individuals with stroke and delirium)

- **Agreement on indicators for relief of bladder distension**

There was no consistency in the data on a significant PVR. The expert panel were consistent however in terms of advising that there are a range of other factors that are just as relevant as the PVR. These factors include the presence of symptoms such as pain or bladder discomfort, patient' bladder capacity, renal function, quality of life considerations and whether the patient has high or low bladder pressure and the risk of upper tract damage.

- **Agreement on protocols for estimating PVR**

There was no consistency in the data on the number of PVR checks for individuals' with either acute or chronic urinary retention, on the data on time of day for estimating PVR or on specific recommendations or protocols for estimating PVR
As such, the expert panel advised that the clinical guideline should avoid making any recommendations about a clinical significant PVR, commenting that 'it is nonsense to put a figure onto it – or for that matter – a range'. 'This is because it is so individualised as to be unreasonable to do this'. Another person commented that 'the decision is underpinned by specialised individualised clinical decision making and is context specific'. Other comments relating to protocols for estimating PVR

- 'I would have thought that >=500 ml (somewhat arbitrary) is a reasonable volume to always declare clinically significant. However, a smaller volume may be very significant in some patients, especially those with a spinal basis, and those with recurrent urinary tract infections'. 'Those of neurogenic basis should have specialist medical referral'
- 'Whilst nurses need to have an understanding of when to alert medical staff or obtain specialised advice, I would avoid giving them a clinically significant PVR or a range for that matter as nurses on the ward do not have the knowledge that is required to interpret this and the figure/range may be used prescriptively'. 'As nurses with specialised information, we work from a range but this is underpinned by other knowledge'.
- 'You could put a cluster of symptoms and a range together (i.e. PVR > 250ml + pain)'.

- **Agreement on indications for further investigations.**
  - Abdominal or renal ultrasound, uroflowmetry and urodynamics do not represent routine assessment procedures.

- **Agreement on initial management options**
  - The clinical guideline should include all of the agreed initial management options
  - Agreed initial management options should not be differentiated by type of retention
  - Agreed initial management options should not be listed in hierarchical order in terms of levels of agreement
  - The protocol should caution the use of indwelling urethral catheters as an initial management strategy for chronic urinary retention

- **Agreement on specialised management options**
  - The clinical guideline should include all of the agreed specialised management options
  - Agreed initial management options should not be differentiated by type of retention.

- **Agreement on bladder triggers and bladder expression**
  - Bladder triggers have a limited and/or poorly established role in treatment.
  - Manual expression plays a limited role in the management of urinary retention but may be useful in individuals with spinal injury.

- **Agreement on protocols for voiding trials and catheter use**
  - The decision to commence a trial of void varies between patients
  - The number of times that an individual undergoes a trial of void varies between patients
  - Recommendations regarding the number of times that an individual undergoes a trial of void are underpinned by specialized knowledge
  - The frequency with which a person should intermittently catheterise varies between patients
  - Recommendations regarding the frequency with which a person should intermittently catheterise are underpinned by specialized knowledge.
  - The volume at which a person should intermittently catheterise varies between patients

- Recommendations regarding the volume at which a person should intermittently catheterise are underpinned by specialized knowledge.

- **Agreement on further recommendations**

  The guidelines should be targeted to nurses working in acute and sub-acute care settings

Stage 2: Summary of findings

Development of the Clinical Guideline

- **Use of Delphi technique to develop a clinical guideline**

The first draft of the clinical guideline (see Appendix B) and a draft clinical resource guide for the nursing assessment and management of urinary retention in hospitalised older adults were developed based on the information from the review of literature and from information obtained from the multidisciplinary expert panel. Using the Delphi technique, members of the expert panel were consulted on three separate occasions (see acknowledgments section for list of names). The guideline was developed and refined based on this information. Where consensus from the multidisciplinary expert panel was unable to be reached, the research team referred to the literature.

The expert panel provided input into the development of:

- a definition of urinary retention;
- the associated risk factors;
- the assessment and management of a person who presents with signs and symptoms of urinary retention and
- the interpretation of PVR urine volume.

The panel strongly recommended that the guideline should target a particular profession and that this target should be nurses rather than doctors.

Stage 3

Stage 3 Objective

To implement the clinical guideline

Stage 3 Method

The primary targets for the clinical guideline were nurses who were working on rehabilitation wards at a sub-acute care facility and medical and surgical wards at an acute care hospital. The implementation stage of the study was informed by theory on change management and by the NH&MRC guidelines on the development, implementation and evaluation of clinical practice guidelines (1998). This theory acknowledges that guidelines and/or protocols do not simply implement themselves (Field & Lohr, 1990) and that they need to be implemented on the basis of an informed and evidence based implementation strategy. Two key strategies were employed to implement the clinical guideline; 1) educational workshops and 2) follow-up clinical facilitation. The implementation process was facilitated by the Directors of Nursing and Nursing Education committees of the relevant sites.

Educational workshops

A series of 4-hour educational workshops on the nursing assessment and management of urinary retention in hospitalised older adults were held at each site. Attendance at the workshops was encouraged by the nursing executive committees of each organisation, however this attendance was voluntary. Availability of time is a significant factor for nurses. This was addressed by providing the financial resources to release interested nurses to attend the workshops thus ensuring that the wards were adequately staffed and that the hospitals did not experience any financial disincentive.

Involving credible charismatic clinicians to act as local champions is also emphasized as a key strategy for enhancing the uptake of guidelines and/or research findings (Dopson et al 1997). To this end, key respected clinical leaders from each site were invited to participate in the implementation of the guidelines in facilitating the workshops and in endorsing the clinical guideline

The educational content of these workshops addressed all aspects of the assessment and management of urinary retention in older adults in acute and sub-acute care settings, identified from stages 1 & 2. The draft of the clinical guideline was presented to participants at the completion of the workshops and copies given to

the relevant ward areas (see Appendix B). Participants and representative wards also received a draft version of a clinical resource guide on the nursing assessment and management of urinary retention in hospitalised older adults.

Data was collected on the number of participants at each workshop. Further to this was an evaluation of participants' knowledge on issues related to urinary retention. Participants of the workshops were invited to complete a purpose designed questionnaire prior to and at the completion of the workshops. For the purpose of comparing nurse urinary retention knowledge before and after the workshops, the pre and post surveys were exactly the same. The surveys consisted of one question which requested nurses to indicate their level of knowledge on management of urinary retention, ten multiple choice questions on general facts about urinary retention and the management of, and three multiple answer questions. For example, "List four common risk factors for chronic urinary retention in hospitalised older adults". (See Appendix C. for a copy of the pre and post knowledge questionnaire).

Clinical facilitation

The NH&MRC guidelines also recommend arranging for a credible health care provider to visit practitioners in the clinical setting to support and reinforce the implementation of guidelines (1998). For this reason, clinical facilitation from a nurse with clinical expertise in continence/urology was provided to six wards at the acute care hospital and three wards at the sub-acute care hospital for up to 8 hours per week for a period of 1 month following the completion of workshops. As this Clinical Nurse Consultant (CNC) was already employed by the health network in a clinical role, she was both familiar with organisational processes within each hospital and with the health networks policies on patient's rights to privacy and confidentiality.

The hours worked by the CNC were negotiated in consultation with Nurse Unit Managers and other administrative staff. This took account of nurses shift work hours and times of peak availability. Nurse Unit Managers were informed of the availability of the CNC to provide them with information on the guideline and to provide one-on-one consultations to nurses on its clinical application. On the invitation of the Nurse Unit Managers, the CNC attended nursing team meetings where this information was disseminated to other nurses. Nurses were encouraged to place the guideline poster and Resource Guide in prominent locations in the ward and to utilize the availability of the CNC.

The CNC maintained a journal of clinical consultations. This was reviewed by the research team and data collected on the number of clinical consultations provided at each of the participating sites.

Stage 3 Findings from educational workshops

A total of fifty-two nurses attended the workshops. Twenty-nine of these attended the workshops conducted at the sub-acute care facility and 23 nurses attended the workshops that were facilitated at the acute care facility. The surveys provided categorical data which was coded, and analyses were performed using SPSS© version12. T-test, chi^2 and frequencies were used to analyse the data. Data were analysed comparing pre and post test responses.

Results

A paired sample t-test was conducted on question one, which invited nurses to rate their level of knowledge on the management of urinary retention in hospitalised older adults. A significant increase in nurse perceptions of their urinary retention knowledge $t(51) = -11.22$, $p = .001$ was found in the post-workshop survey responses compared to pre-workshop responses. A 10-point Likert scale was used as the response format (0=lowest and 10=highest), answers ranged from 0 to 8 with an average of 4.5 in the pre-workshop data and from 5 to 10 with an average of 7.5 in the post-workshop data.

Multiple Choice Questions

Multiple choice questions were analysed using the Chi-square statistic to identify any differences between nurse urinary retention knowledge pre and post the workshop. The Phi Coefficient was also used to determine the strength of these associations.

A significant difference was identified, $\chi^2(1, n=52) = 9.15$, $p = .001$;$\Phi = .32$, between the number of correct responses when identifying volume at which the first sensation to void occurs in people with normal health bladder function. The percentage of correct answers increased in the post workshops 90% compared to 63% in the pre-workshop. A Phi of .32 demonstrated a moderate relationship between having had the workshop and correct identification of void volume in normal bladder function.

Significantly more correct answers, $\chi^2(1, n=52) = 21.13$, $p < .001$;$\Phi = .47$, to identifying the incidence of acute urinary retention in men over the age of 80 was

found in the post-workshop data, 83% compared to pre-workshop data, 37%. A moderate to strong association was identified in nurse knowledge post-workshops.

Even though more nurses answered correctly in the post-workshop survey 27% compared to pre-workshop 42%; to identifying that "rapid onset of upper urinary tract distress" is characteristically associated with acute urinary retention, a statistically non-significant result was achieved, $\chi^2(1, n=52) = 2.08$, $p > .05$;$\Phi = .16$.

For correct identification of incidence of urinary retention following stroke, again a statistically non-significant result was found, $\chi^2(1, n=52) = .66$, $p > .05$;$\Phi = .09$, although the number of correct responses increased post-workshop 38% from 42% pre-workshop.

Significantly more nurses, $\chi^2(1, n=52) = 39.52$, $p < .001$;$\Phi = .64$, identified the correct upper threshold for a post void residual urine volume on the post-workshop surveys, 85% compared to 21% of correct responses on the pre-workshop surveys. A strong association was identified by Phi, between having attended the workshop and correct identification of the upper threshold post void residual volume.

Correct identification of whether patients with a post void residual volume of 600ml require bladder decompression produced a significant result, $\chi^2(1, n=52) = 2.51$, $p = .05$;$\Phi = .18$, with a low association. Nurse knowledge improved post urinary retention workshop.

A statistically significant result, $\chi^2(1, n=52) = 31.86$, $p < .001$;$\Phi = .58$, with a strong relationship between correctly identifying that herpes zoster as a cause for urinary retention and post-survey data, 94% compared to 40% of correct responses on the pre-workshop surveys.

Because the majority of patients answered correctly to questions 12 and 14 on the pre- and post workshop surveys, non-significant results were found. For question 12, Infrequent voiding can lead to?, 73% of nurses answered correctly (chronic bladder over-distension) on the pre-workshop surveys and 71% answered correctly on the post-workshop surveys. For question 14, A patients total bladder capacity is equal to?, 85% of answers were correct pre-workshops compared to 90% correct post-workshop.

For question 13,' Which of these measures would be the most effective in assisting in the diagnosis of urinary retention, five multiple choice answers were provided'. The non-significant result would most likely be explained as more than one valid response was present in the multi-choice answers for assisting in the diagnosis of urinary retention, however the question was asking which measure would be *most* effective. A number of nurses circled more than one response, these were coded as incorrect.

Chi-square was performed on the total number of correct responses for all multiple choice questions for pre and post-workshops. Overall a statistically significant association was found, $^{2}(1, n=52) = 29.83$, $p < .001$; = .54, between the total number of correct multiple choice answers pre-workshop compared to total number of correct answers post workshop. As can be seen in the Cross Tabulation (see Table 9), nurses' knowledge improved considerably post-workshop i.e. the total number of correct multiple choice answers increased in the post-workshops compared to pre-workshops.

Table 9. Nurses' knowledge on urinary retention: percentage correct/incorrect multiple choice questions

	Correct responses				Total
	2-3	**4-5**	**6-7**	**8-9**	
Pre-workshop Responses	21%	52%	21%	6%	100%
Post-workshop responses	2%	21%	40%	37%	100%

Multiple Response Questions

Questions requiring a multiple responses were interpreted using frequencies to compare the number of correct responses pre- and post-urinary retention workshops.

Table 10, demonstrates improved levels of nurse knowledge in response to the question,' List three non-pathological factors that can influence normal bladder emptying'. Nearly all nurses gave 3 correct responses (89%) on the post-workshop surveys compared to only 15% on the pre-workshop surveys. A range of incorrect responses were supplied on the pre-workshop surveys. The most frequently cited incorrect responses were; 'urinary tract infection' and 'enlarged prostate'. There were marked as incorrect because they are disease related causes of urinary retention rather than non-pathological causes/factors.

Table 10. Nurses knowledge of non-pathological factors that can influence normal bladder emptying

	Frequency (%) of correct responses pre-workshop	Frequency (%) of correct responses post-workshop
0 Correct responses	13 (25%)	1 (2%)
1 Correct response	21 (41%)	1 (2%)
2 Correct responses	10 (19%)	4 (7%)
3 Correct responses	8 (15%)	46 (89%)
Total	52 (100%)	52 (100%)

In response to the question, 'List four common risk factors for chronic urinary retention in hospitalised older adults', 75% of nurses provided either no or one correct response prior to attending the workshop, whilst the majority of nurses were able to supply three or four correct answers post-workshop attendance (see Table 11). Again a wide range of incorrect responses were provided by nurses, the most common were; indwelling catheter and kidney problems.

Table 11. Nurses knowledge of common risk factors for chronic urinary retention

	Frequency (%) of correct responses pre-workshop	Frequency (%) of correct responses post-workshop
0 Correct responses	23 (44%)	2 (4%)
1 Correct response	16 (31%)	10 (19%)
2 Correct responses	7 (14%)	12 (23%)
3 Correct responses	6 (11%)	14 (27%)
4 Correct responses	0	14 (27%)
Total	52 (100%)	52 (100%)

Table 12 demonstrates significantly improved knowledge of neurological conditions associated with urinary retention, with 29% of nurses supplying three correct responses pre-workshop compared to 85% who offered 3 correct responses post-workshop. Very few incorrect responses were given, rather no response was offered by the majority of nurses before attending the workshops.

Table 12. Nurses' knowledge of neurological conditions associated with urinary retention

	Frequency (%) of correct responses pre-workshop	Frequency (%) of correct responses post-workshop
0 Correct responses	9 (17%)	2 (4%)
1 Correct response	17 (33%)	2 (4%)
2 Correct responses	11 (21%)	4 (7%)
3 Correct responses	15 (29%)	44 (85%)
Total	52 (100%)	52 (100%)

Stage 3 Findings from clinical consultations

The CNC received 40 referrals and requests for advice and support relating to the application of the guidelines from nurses in the sub-acute care setting. There were no requests or referrals from nurses from the acute care hospital. The nature of the requests primarily related to the application of the guideline to the assessment and management of urinary retention in individual patient. There were a number of requests for further education on the guideline and more specifically, for education on the clinical management of patients with urinary catheters and on intermittent catheterisation.

Stage 3: Summary of findings

Educational workshops were conducted prior to the implementation of the clinical guideline. All nurses who attended were given a clinical resource guide and the guideline poster (see separate documents). These nurses were asked to place the poster on a highly visible area of the ward. The implementation of the guideline in ward areas was supported by the presence of a clinical nurse consultant who assisted staff with their enquiries.

- **Educational workshops**

A series of workshops were convened by the research team. Local clinical experts from the fields of continence and/or urology participated as facilitators. The workshops were attended by approximately 52 nurses who worked in both the acute and sub-acute care hospitals. Information was provided on the condition of urinary retention, prevalence, risk factors, impact, assessment considerations and management options.

- **Clinical facilitation**

Following the workshops, a continence clinical nurse consultant (CNC) was employed to work on the trial wards, providing nurses with advice and support on the clinical application of the guideline. This initiative was promoted and supported by nursing management in both organisations. This CNC's expertise was utilised more by nurses in the sub-acute care hospital than by nurses in the acute care hospital.

- **Evaluation of the workshop**

The nurses who attended the workshop were asked to complete a urinary retention knowledge questionnaire prior to and post attending the workshop. Evaluation data revealed that the nurses' knowledge on this topic improved following the workshop. Nurses rated their knowledge on urinary retention higher than it had been prior to their participation in the workshop (i.e. increasing from an average score of 4.5 to an average of 8.5 on a scale of 1 to 10).

Stage 4

Stage 4 Objective

To evaluate the clinical use of the guideline

Stage 4 Method

The effectiveness of the clinical guideline was evaluated in terms of nurses' perspectives of its usefulness and uptake. Two different groups of nurses were targeted in this survey. The first group were Division 1 and 2 Registered Nurses who worked in clinical roles on the wards. They were invited to comment on the ease of implementation of the guideline and whether or not it assisted them to assess, identify and manage urinary retention in hospitalised older adults as well as whether or not it had improved their knowledge of the condition. The other group were Division 1 Registered Nurses who worked in Nurse Unit Management roles and who had direct responsibility for the clinical nurses' practice. They were invited to comment on their observations of the update of the guideline by clinical nurses.

The surveys were distributed to participating wards at both the acute and sub-acute care sites 1 month after the introduction of the guidelines. Recruitment strategies that were used in Stage 1 were repeated to conduct the survey. As staff turnover was difficult to predict, individuals within this sample set may have differed from those who participated in the baseline survey. See Appendix D. for a copy of the

questionnaire to clinical nurses and Appendix E. for a copy of the questionnaire to Nurse Unit Managers.

Stage 4 Findings from staff survey

Findings from the survey of clinical nurses

A total of 68 nurses responded to the stage 4 survey targeted to clinical nurses. Thirty-one of these worked in an acute care setting and 37 were based in a sub-acute care facility.

- **Awareness of guideline**

Despite each ward within each of these facilities having received the poster guideline of the assessment and management of urinary retention in hospitalised older adults, when asked whether their ward had the poster, 28 responded "no" and 3 responded "don't know". This left a sample size of 36 clinical nurses, who were aware of the presence of the poster guideline. Eleven of these worked in the acute care setting and 25 were based in the sub-acute care setting. For some of the areas involved in the survey, it was later determined that some clinical nurses were unaware of the guidelines because the poster had been placed in areas of low visibility. The poster was subsequently moved to a more prominent position in the ward. The remaining data derives from the 36 nurses who were aware of the poster guideline on their ward.

- **Guideline use**

Forty-five percent (n=5) of the respondents from the acute care setting stated that they had referred to the guidelines to assess and manage elderly patients with urinary retention. In comparison, 72% (n=18) of respondents in the sub-acute hospital reported having referred to the guidelines. Of those who had referred to the guidelines, 71% (n=5) of acute care and 94% (n=15) of sub-acute care clinical nurses thought that they were 'easy to use'. Of those clinical nurses that did not think they were easy to use, most commented that placing the poster in a more suitable place would be beneficial.

- **Helpfulness of guideline**

In terms of 'How helpful were the guidelines in assisting clinical nurses to assess and manage elderly patients with urinary retention', only 2 clinical nurses from the sub-acute care clinical nurses answered 'not helpful'. Forty-eight percent of clinical nurses from the sub-acute setting and 55% of clinical nurses from the acute care setting reported that the guidelines were "somewhat helpful", whilst 43% of those in

sub-acute care and 45% of those in acute care reported that the guidelines "very helpful".

- **Confidence levels**

In reference to 'feeling more confident about assessing urinary retention compared to prior to the guidelines being available', 82% (n=9) of acute care clinical nurses and 78% (n=18) of sub-acute care clinical nurses reported feeling more confident. Table 13 reports clinical nurse's levels of confidence for assessing urinary retention on a scale of 1-5. The majority of nurses rated their assessment confidence as either a 3 or 4 out of 5.

Table 13. Clinical nurses levels of confidence in assessing patients with urinary retention

Type of nursing care	Level of confidence (1-5)				
	1	2	3	4	5
Acute care	0	3(27%)	3(27%)	4(37%)	1(9%)
Sub-acute care	0	0	10(55%)	7(39%)	1(6%)

- **Usefulness as a prompt**

The survey also questioned clinical nurses about whether the guidelines had assisted them to perform a number of assessment tasks. Table 14 suggests that from the perspectives of these nurses, the guidelines were useful as a prompt for them to engage in these tasks.

Table 14. Usefulness of the guideline as a prompt

Urinary retention specific tasks	Acute care			Sub-acute care		
	Yes	No	Don't know	Yes	No	Don't know
Take a brief patient history	9(82%)	2(18%)	0	18(90%)	1(5%)	1(5%)
Review urinary retention risk factors	10(91%)	1(9%)	0	19(90%)	1(5%)	1(5%)
Conduct a physical assessment of lower abdomen	9(82%)	2(18%)	0	11(61%)	5(28%)	2(11%)
Do a urinalysis	8(73%)	2(18%)	1(9%)	15(75%)	4(20%)	1(5%)
Perform a bladder scan	10(91%)	1(9%)	0	16(80%)	3(15%)	1(5%)

- **Usefulness of the guideline in managing patients with varying degrees of PVR**

Clinical nurses were invited to indicate if the guidelines had assisted them to better manage patients with varying degrees of PVR and, pain or no pain. For both acute and sub-acute clinical nurses, the guidelines were perceived as more helpful when the patients also had the associated symptom of pain (see Table 16).

Table 15. Clinical nurses perceptions of the helpfulness of the guidelines in managing patients with varying degrees of PVR

Patient PVR & pain or no pain	Acute care		Sub-acute care	
	Yes	No	Yes	No
Medium to high post-void & pain	8(80%)	2(20%)	15(68%)	7(32%)
Low to medium post-void & no pain	4(40%)	6(60%)	8(53%)	7(47%)
High post-void & no pain	4(44%)	5(56%)	8(53%)	7(47%)

- **Discharge outcomes**

In response to the question, "Have the guidelines made any difference to the discharge outcomes of patients found to have an elevated PVR?" the majority of clinical nurses in the acute care setting, 73%, answered "don't know" and only 9% answered "yes", whereas the majority of clinical nurses in the sub-acute care setting were split between "don't know" (35%) and "yes" (35%). Of those who responded "yes" some examples were also offered such as

- "less concerned about increased residual",
- "less likely to be discharged to high level residential care",
- "catheterisation has been avoided" and
- "patients are able to self-manage (e.g. pads or indwelling catheter").

- **Clinical nurses' knowledge**

Seventy-three percent of clinical nurse in the acute care setting reported that their knowledge had increased in all listed areas of urinary retention as a result of introduction of the guidelines. In sub-acute care over half of all clinical nurses stated their knowledge of urinary retention had increased (see Table 17).

Table 16. Clinical nurses perceptions of the guidelines in enhancing their knowledge of urinary retention

Area of urinary retention knowledge	Acute care		Sub-acute care	
	Yes	No	Yes	No
Risk factors for urinary retention	8(73%)	3(27%)	13(65%)	7(35%)
Presenting symptoms for urinary retention	8(73%)	3(27%)	10(53%)	9(47%)
How to assess urinary retention	8(73%)	3(27%)	11(58%)	8(42%)
How to manage urinary retention	8(73%)	3(27%)	12(57%)	9(43%)
Bladder emptying	8(73%)	3(27%)	14(67%)	7(33%)

- **Ward management of urinary retention**

When respondents were asked how well they believed the condition of urinary retention was managed in their ward, 81% of those from the acute care setting and 90% of those from the sub-acute setting responded "reasonably well". Nineteen percent of respondents from the acute care setting and 10% from the sub-acute care setting responded "extremely well". The third response of "poorly" managed was not selected. Seventy percent of respondents from the acute setting and 63% from the sub-acute setting stated that improved management of urinary retention in wards was a direct result of introduction of the guidelines.

- **Barriers or limitations to the guidelines**

Only 10% of acute and 55% of sub-acute care nurses who responded to the survey thought there were some limitations to the guidelines. Examples offered by nurses were as follows:

- "few people read them",
- "we need a policy on amounts",
- "lectures are better",
- "low education" and
- "too much information on the chart".

As a result of the feedback the amount of information on the poster was reduced, posters were moved and the information on volume was revised to highlight the fact that "pain" and a PVR are key indicators for identifying patients with urinary retention assessment rather than PVR alone.

- **Participation in educational workshop**

Eighteen percent of acute care clinical nurses and 33% of sub-acute care clinical nurses who completed the survey reported having attended any of the educational workshops on the guidelines.

- **Use of clinical facilitator**

Of the 36 nurses who completed the survey, two had consulted with the Clinical facilitator. Both were from the sub-acute care hospital.

- **Comments**

Along with the comments made above, nurses also made a number of positive comments throughout the survey such as,

- "excellent information, easy to read",
- "good to have the guideline to refer to if needed",
- "very confident in my ability to assess for urinary retention now"

The comment "catheterisation has been avoided" was mentioned numerous times throughout the survey.

Findings from the Nurse Unit Manager Surveys (n=5)

Of the 3 wards at the sub-acute care facility, Nurse Unit Managers from two wards completed the survey. Of the 6 participating wards at the acute care facility, Nurse Unit Managers from 3 wards completed the survey.

- **Helpfulness of guideline**

When invited to indicate the extent to which the guidelines had helped clinical nurses to assess and manage the condition of urinary retention in hospitalised older adults one (50%) sub-acute Nurse Unit Manager and two (67%) acute care Nurse Unit Managers responded "very helpful". The remaining Nurse Unit Managers, one from each care facility, responded "Don't know".

- **Observations of usefulness of guideline**

Table 18 displays whether Nurse Unit Managers had observed any situations on their ward where clinical nurses had used the guidelines to assist them to perform a set of key assessment components. The guidelines were reported as having assisted clinical nurses' ability to assess patients with urinary retention in the sub-acute care environment. This contrasts with the results of this question to clinical nurses, the majority of who reported that the guidelines had assisted them in these tasks.

Table 17. Nurse Unit Managers' observations of guideline assistance for nurse assessment performance

Clinical situation	Acute care			Sub-acute care		
	Yes	No	Don't know	Yes	No	Don't know
Take a brief patient history	0	2(67%)	1(33%)	1(50%)	0	1(50%)
Review urinary retention risk factors	0	2(67%)	1(33%)	1(50%)	0	1(50%)
Conduct a physical assessment of lower abdomen	0	2(67%)	1(33%)	1(50%)	0	1(50%)
Do a urinalysis	0	2(67%)	1(33%)	1(50%)	0	1(50%)
Perform a bladder scan	0	2(67%)	1(33%)	1(50%)	0	1(50%)

For the remaining survey questions responses were only recorded for 2 Nurse Unit Managers from the acute care site and 2 from the sub-acute site due to missing data.

- **Practices related to PVR**

Nurse Unit Managers were invited to indicate if they perceived that the guidelines had assisted clinical nurses to better manage the care of patients with varying degrees of PVR with or without pain (see Table 19).

Table 18. Nurse Unit Manager's perceptions of whether the guidelines better assisted nurses' management of patients

Patient PVR & pain or no pain	Acute care			Sub-acute care		
	Yes	No	Don't know	Yes	No	Don't know
Medium to high post-void & pain	0	1(50%)	1(50%)	1(50%)	0	1(50%)
Low to medium post-void & no pain	1(50%)	1(50%)	0	1(50%)	0	1(50%)
High post-void & no pain	0	1(50%)	1(50%)	1(50%)	0	1(50%)

- **Discharge outcomes**

Nurse Unit Managers were invited to comment on whether the guidelines had made any difference to the discharge outcomes of patients with PVR. The data on this provided no consistency in that one responded "yes" and one reported that this had not been the case. The other two responses were "don't know".

- **Nurses' knowledge**

Table 20 displays Nurse Unit Managers' perceptions of the extent to which the guidelines had increased clinical nurses' knowledge on urinary retention. Both Nurse Unit Managers from the acute care site responded that this was the case. In the sub-acute care site, one Nurse Unit Manager perceived that all areas of clinical nurses' knowledge of urinary retention had improved, whilst the other Nurse Unit Manager replied "don't know" for all areas. For clinical nurse's responses to the same question, the majority of acute and sub-acute nurses who participated in the survey reported that the guidelines had increased their knowledge of the condition.

Table 19. Nurse Unit Managers' perceptions of whether the guidelines increased nurses' knowledge of urinary retention

Area of urinary retention knowledge	Acute care			Sub-acute care		
	Yes	No	Don't know	Yes	No	Don't know
Risk factors for urinary retention	1(50%)	1(50%)	0	1(50%)	0	1(50%)
Presenting symptoms for urinary retention	0	2(100%)	0	1(50%)	0	1(50%)
How to assess urinary retention	0	2(100%)	0	1(50%)	0	1(50%)
How to manage urinary retention	2(100%)	0	0	1(50%)	0	1(50%)
Bladder emptying	1(50%)	0	1(50%)	1(50%)	0	1(50%)

- **Barriers and limitations**

The two final questions on the survey invited Nurse Unit Managers to comment on any limitations of the guidelines and to offer suggestions for improvement. Despite all wards having received education at the time that the guidelines were introduced, two responses were given in relation to a lack of education:

- "No education at the time of the poster coming to the ward;" and
- "Poster looks complex without spending time studying it or without education/explanation"

One other comment was made with regard to placement of the poster:

- "Poster put in pan room, staff did not use it"

As an outcome of this feedback, the poster was moved to a more prominent position on the ward. Two suggestions were made for improvement:

- "Education to accompany poster and reinforcement later for all nursing staff on the ward;" and
- "The high PVR either with pain or no pain seems to be managed the same way on the poster-could it be more simplified".

Stage 4: Summary of findings

Evaluation of clinical use of guideline

The effectiveness of the clinical guideline was evaluated in terms of nurses' perspectives of its clinical usefulness. Two groups of nurses from the two participating sites were invited to complete this survey. These included Division 1 Registered Nurses who worked in unit management roles and Division 1 and 2 Registered Nurses who worked in clinical nursing roles. The main findings of this survey are as follows:

- the guidelines were perceived as helpful by 90% of acute and 91% of sub-acute care clinical nurses;
- 78% of acute and 82% of sub-acute clinical nurses rated their confidence in their ability to manage urinary retention higher as a consequence of the guidelines;
- the majority of respondents believed that the guidelines had assisted them in the assessment of urinary retention and had also increased their knowledge on the condition;
- participants who were unable to attend the educational workshops commented that they would have benefited from participating in the workshops; and
- all nurses (100%) in acute and sub-acute care reported that urinary retention was managed well in their wards and most reported that this was a direct result of introduction of the guidelines.

Overview of findings

The aim of this project was to develop a clinical guideline for the nursing assessment and management of urinary retention in older adults in acute and sub acute care. By providing nurses with a better understanding of this condition it was anticipated that the project would lead to;

- increased nurse awareness of identification, management and treatment of urinary retention;
- improved identification of the condition of urinary retention during in-patient stay in an acute or sub-acute care facility;
- improved management of the condition of urinary retention in elderly and/or disabled patients as they transect the continuum of care; and
- improved discharge outcomes for elderly and/or disabled individuals who have experienced the condition of urinary retention during the period of their hospitalisation.

Stage 1

Review of literature

Key points from the review of literature were as follows:

- there are many factors that affect bladder emptying, including both environmental factors and pathophysiological disease;
- urinary retention or incomplete bladder emptying manifests either acutely or chronically and is a common finding in hospitalised older adults;
- whilst acute urinary retention is generally characterised by pain, symptoms associated with chronic urinary retention may be limited to urinary incontinence and hence, the condition may be difficult to detect. This has particular relevance for the care of patients with cognitive impairment and for individuals with urinary incontinence;
- initial assessment procedures should include: taking a brief patient history, reviewing the patients risk for urinary retention, conducting a physical examination of the lower abdomen, attending a urinalysis and estimating the post-void residual (PVR) urine volume;
- there is conflicting evidence on the clinical significance of the finding of a PVR urine volume in older adults; with normative PVR urine volumes ranging from 20-300mL;
- the PVR urine volume is one of many factors to be considered in determining treatment options. Other factors include: the person's preferences for treatment, psychosocial status and quality of life, the potential for upper tract damage, the type and severity of symptoms, the results of investigations, comorbidities, prognosis and underlying pathology;
- outcomes associated with acute urinary retention are poor in terms of morbidity and mortality; and

- a search of national and international peak bodies' websites revealed a lack of guidelines for the assessment and management of urinary retention.

The Incontinence Outcomes Measurement Suite Report

The outcomes measurement suite report identified a wide range of reviews of urinary and faecal incontinence outcome measures and very little consensus as to which instruments and tools should be employed in the measurement of outcomes of interventions for incontinence. As urinary retention may or may present with urinary incontinence symptoms, use of an outcome measure that focuses on urinary incontinence symptoms is not specific enough for use as an outcome measure for urinary retention.

Survey of current practice

Key points from the staff survey in the sub-acute care facility are as follows:

- the majority of nurses and medical staff reported that they sometimes identify patients with previously undetected urinary retention as well as patients who have the condition but who do not have abdominal pain as a defining feature;
- the condition is sometimes detected during random bladder scanning;
- few nurses and medical staff report having a standard protocol for the management of patients with urinary retention;
- ward practices in response to the finding of a PVR urine volume in the sub-acute care facility suggest a high degree of variability in practice; and
- the most commonly reported outcome of patients' failure to regain bladder function (i.e. appropriately empty the bladder) whilst an inpatient of the sub-acute care facility was to be discharged with a urinary catheter inserted.

Stage 2

Development of the Clinical Guideline

- **Use of Delphi technique to develop a clinical guideline**

The first draft of the clinical guideline (see Appendix B) and a draft clinical resource guide for the nursing assessment and management of urinary retention in hospitalised older adults were developed based on the information from the review of literature and from information obtained from the multidisciplinary expert panel. Using the Delphi technique, members of the expert panel were consulted on three separate occasions (see acknowledgments section for list of names). The guideline was

developed and refined based on this information. Where consensus from the multidisciplinary expert panel was unable to be reached, the research team referred to the literature.

The expert panel provided input into the development of:

- a definition of urinary retention;
- the associated risk factors;
- the assessment and management of a person who presents with signs and symptoms of urinary retention and
- the interpretation of post-void residual urine volume.

The panel strongly recommended that the guideline should target a particular profession and that this target should be nurses rather than doctors.

Stage 3

Implementation of the clinical guideline

Educational workshops were conducted prior to the implementation of the clinical guideline. All nurses who attended were given a clinical resource guide and the guideline poster (see separate documents). These nurses were asked to place the poster on an easily visible area of the ward. The implementation of the guideline in ward areas was supported by the presence of a clinical nurse consultant who assisted staff with their enquiries.

- **Educational workshops**

A series of workshops were convened by the research team. Local clinical experts from the fields of continence and/or urology participated as facilitators. The workshops were attended by approximately 52 nurses who worked in both the acute and sub-acute care hospitals. They provided comprehensive information on the condition of urinary retention, prevalence, risk factors, impact, assessment considerations and management options.

- **Clinical facilitation**

Following the workshops, a continence clinical nurse consultant (CNC) was employed to work on the trial wards, providing nurses with advice and support on the clinical application of the guideline. This initiative was promoted and supported by

nursing management in both organisations. This CNC's expertise was utilised more by nurses in the sub-acute care hospital than by nurses in the acute care hospital.

- **Evaluation of the workshop**

The nurses who attended the workshop were asked to complete a urinary retention knowledge questionnaire prior to and post attending the workshop. Evaluation data revealed that the nurses' knowledge on this topic improved following the workshop. Nurses rated their knowledge on urinary retention higher than it had been prior to their participation in the workshop (i.e. increasing from an average score of 4.5 to an average of 8.5 on a scale of 1 to 10).

Stage 4

Evaluation of clinical use of guideline

The effectiveness of the clinical guideline was evaluated in terms of nurses' perspectives of its clinical usefulness. Two groups of nurses from the two participating sites were invited to complete this survey. These included Division 1 Registered Nurses who worked in unit management roles and Division 1 and 2 Registered Nurses who worked in clinical nursing roles. The main findings of this survey are as follows:

- the guidelines were perceived as helpful by 90% of acute and 91% of sub-acute care clinical nurses;
- 78% of acute and 82% of sub-acute clinical nurses rated their confidence in their ability to manage urinary retention higher as a consequence of the guidelines;
- the majority of respondents believed that the guidelines had assisted them in the assessment of urinary retention and had also increased their knowledge on the condition;
- participants who were unable to attend the educational workshops commented that they would have benefited from participating in the workshops; and
- all nurses (100%) in acute and sub-acute care reported that urinary retention was managed well in their wards and most reported that this was a direct result of introduction of the guidelines.

Difficulties experienced in the development and implementation of the Clinical Guideline.

The project team encountered a number of difficulties in the development and implementation of the clinical guideline.

Development issues

The literature did not reveal a clear and consistent definition of the term 'urinary retention'. Additionally, the expert panel commented on the limitations of currently used definitions as the condition presents with variable signs and symptoms and there is no clear delineation between acute and chronic urinary retention.

Difficulties were also experienced in defining normative values for PVR urine volumes. Information from the review of literature and opinions from the expert panel confirmed a lack of consensus on what constitutes a significant PVR compared with a normal PVR for older adults. Therefore the research team defined urinary retention in terms of its most commonly experienced signs and symptoms.

Implementation and evaluation issues

The research team were unable to implement the clinical guideline at the proposed acute care site. Specifically, staff at this site found it difficult to commit to the project due to unforseen staff changes and shortages. The research team organised an alternative site within the health network. Organising an alternative site was time consuming and delayed the project by several weeks.

The research team were unable to compare pre and post intervention incidence levels of urinary retention, management procedures (i.e. frequency and duration of trial of voids; duration of catheterisation; the frequency of bladder scanning and the type and frequency of medical assessment) and patient discharge outcomes. There were two key reasons for this. The first was based on the advice from staff within the Eastern Health Information Services Department who stated that the documentation on these issues was inconsistent and unreliable and that the research team would be unable to draw any worthwhile conclusions from this analysis. Additionally, the research team were unable to obtain ethics approval to review patient records without obtaining patient written consent. As some patients were discharged, this task was considered difficult and would cause patients undue concern. In order to

overcome this barrier, the staff surveys at stages 1 and 4 included additional questions that provide information on these topics.

Despite using a number of implementation strategies for the use of the guideline within the clinical environments that were supported by management, the findings from stage 4 data indicated that approximately half of the nurses on the study sites were unaware of the existence of the clinical guideline. Future studies may need to consider extending the time frame allocated for implementation and to use an action research approach to the implementation and evaluation of any guidelines.

As the evaluation of the project was primarily based on nurses' perceptions of the clinical usefulness of the clinical guideline and not on their specific clinical practice and patient outcomes, these findings should be interpreted cautiously till further in-depth evaluation studies using field observations are conducted.

Conclusion

This project resulted in the development of a clinical guideline for nurses to better understand urinary retention issues for elderly hospitalised adults. It was anticipated that this would result in improved identification of the condition, improved management and improved discharge outcomes. Whilst a number of strategies were implemented to support the uptake of the clinical guidelines into clinical practice, evaluation data suggests that further work is required to improve the level of its use. The challenges encountered by the research team in implementing and evaluating the clinical guidelines echo the findings of other research teams' experience of implementing clinical guidelines. The Scottish Intercollegiate Guidelines Network (2001), have identified a number of facilitators and barriers to the implementation of clinical practice guidelines and/or evidence, including; structural factors (i.e. financial disincentives), organisational factors (i.e. inappropriate skill mix, lack of facilities or equipment), peer group (i.e. local standards of care not in line with desired practice), individual factors (i.e. knowledge, attitudes, skills) and professional-patients interaction (i.e. problems with information processing).

The research team put in place a number of strategies that were aimed at addressing some of these barriers, including providing a series of educational workshops for nurses at the participating sites, providing financial reimbursement to enable nurses to be replaced so that they could attend the workshops and employing a clinical facilitator with expertise in the assessment and management of urinary retention to

provide on-site advice and support on the clinical application of the guideline. This clinical facilitator's expertise was utilised more in the sub-acute care hospital than by the nurses in the acute care hospital. One explanation for this could be that the nurses working in the acute care clinical environment, with higher levels of patient acuity, were more focussed on more important and other aspect of care and had no time to focus on the clinical guideline.

The research team did not locate any specific urinary retention guidelines from peak national and international organisations with expertise in incontinence and urology. Additionally, there were no measures or instruments identified in the Continence Outcomes Measurement Suite Project that were specifically designed to detect urinary retention (Thomas et al., 2003). Based on advice from the expert panel, the project was limited to the development of a clinical guideline for the assessment and management of urinary retention for use by nurses. This was considered to be an important foundational starting point. It may be worthwhile to consider further developing this clinical guideline to incorporate a multidisciplinary approach that can be used across a range of health and aged care settings. As urinary retention can result in increased morbidity and mortality, further research and development on the assessment and management of urinary retention in older adults is required.

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Appendix A. Stage 1: Questionnaire for nurses and medical staff survey

Please indicate your profession *(tick appropriate box)*

Medical Nursing *If nursing* Division 1 Division 2

Please note: for this research project, urinary retention is defined as incomplete or impaired bladder emptying.

1. Have you had experience in caring for patients with urinary retention?
   Yes No
   If yes, please continue. If no, thank you for your participation.

2. When are bladder scans performed on your patients?

a) Routinely on admission Yes No

b) Routinely following removal of a catheter Yes No

c) Routinely as a component of a trial of void Yes No

d) Routinely as a component of a continence assessment
   Yes No

e) When they have a history of urinary retention Yes No

f) When they have signs and symptoms of retention Yes No

g) Randomly Yes No

h) Other (please describe)

2. When patients have the following PVRs, please indicate your ward's usual practice/s. *(Place a tick in the appropriate box)*

Ward practice / management	**50ml – 100ml**	**100ml-250ml**	**250ml-400ml**	**400ml or >**
We notify the medical staff				
We monitor the patient's urine output and repeat the bladder scan following their next voluntary void				
We monitor the patient's urine output and repeat the bladder scan according to a schedule				
We insert a urinary catheter (pending medical advice)				
We institute a program of intermittent clean catheterisation (pending medical advice)				
We teach the patient to self-catheterise (pending medical advice)				
No action is taken				

If action is other than the above, please specify .....

4. Do you have a standard protocol to follow when a urinary catheter is removed?

Yes No

If yes to 4), please indicate your ward's standard protocol? *(Place a tick in the appropriate box)*

	Our ward's standard protocol	**Agree**	**Disagree**
a)	We monitor the patient's urine output by using a bladder chart		
b)	We rely on patient reports to monitor the patient's urine output		
c)	We rely on nursing observations to monitor the patient's urine output		
d)	We perform bladder scans after each void		
e)	We perform bladder scans according to a predefined schedule		
f)	We observe the patient for signs and symptoms of retention		

Comments _____

Please place a circle around the most correct response for each of the following statements.

5. Patients are admitted to our ward whose condition of urinary retention has not been detected prior to their admission

Often Sometimes Never

6. I have looked after patients who have urinary retention but who do not have the associated symptom of abdominal pain

Often Sometimes Never

7. The diagnosis of urinary retention is made during random bladder scanning

Often Sometimes Never

8. If patients with urinary retention do not regain normal bladder function by the time they are due to be discharged, they are:

a) discharged with a urinary catheter insitu

Often Sometimes Never

b) discharged after being taught how to perform intermittently self-catheterisation

Often Sometimes Never

c) discharged with a referral for follow-up by a medical or surgical specialist

Often Sometimes Never

d) discharged with a referral for follow up by a urology or continence nurse consultant

Often Sometimes Never

e) discharged with a referral for follow up by a community nursing agency

Often Sometimes Never

f) no action is taken

Often Sometimes Never

---

9. Our ward has a standard protocol for the management of patients with urinary retention

Yes *(go to question 10)* No *(go to question 11)*

10) If yes, how helpful is the protocol in managing the condition

Very helpful Somewhat helpful Not helpful

Please describe the protocol .....

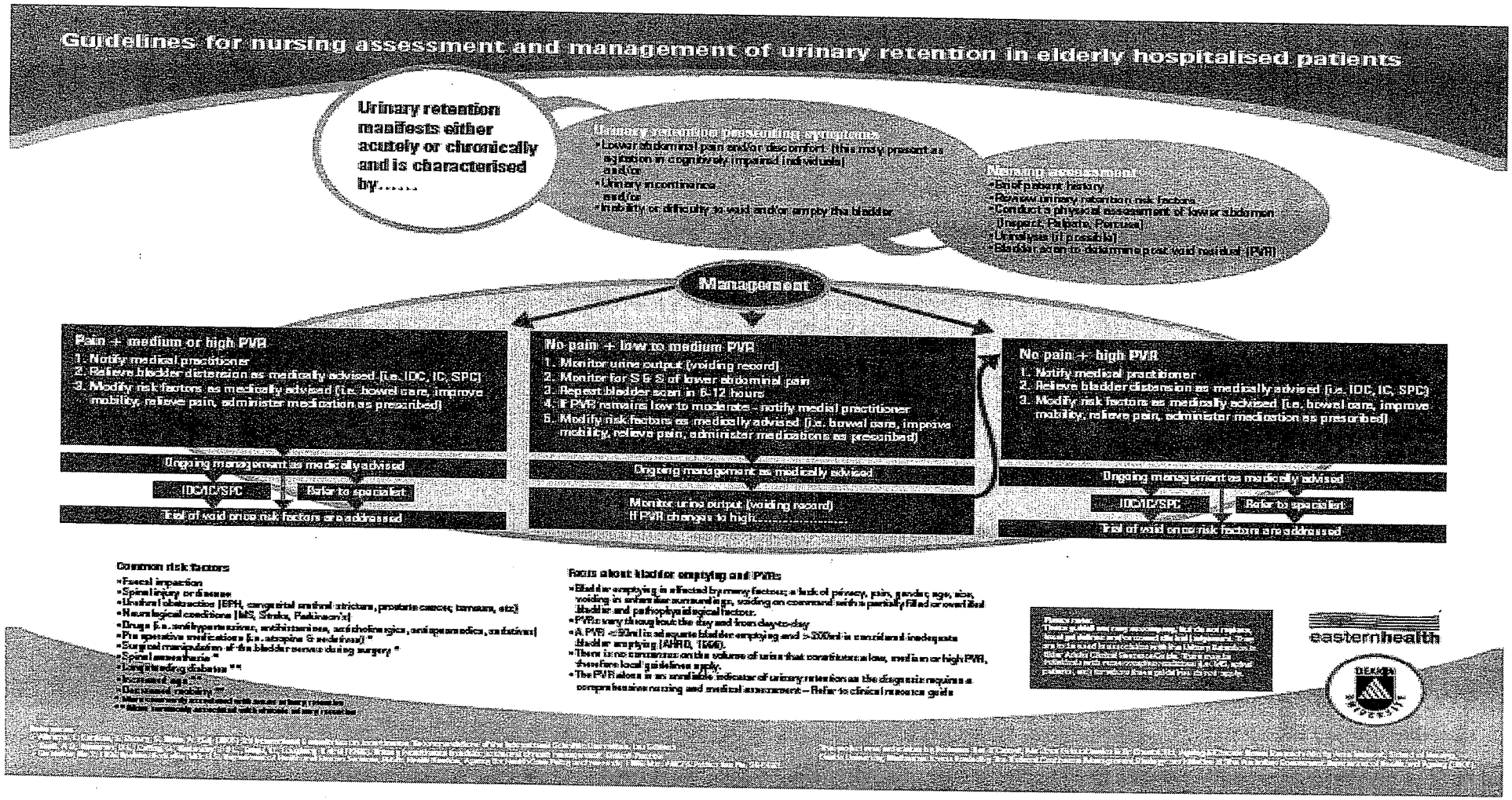
11. Overall I think the condition of urinary retention is managed well by our ward

Extremely well Reasonably well Poorly

Comments .....

Thank you for your participation

Appendix B. Draft guideline for the nursing assessment and management of urinary retention in hospitalised older adults



Appendix C. Stage 4: Questionnaire to evaluate nurses' pre and post workshop knowledge

Pre & post workshop questionnaire *(Please place a circle around the correct response/s)*

1) On a scale of 0 – 10 *(0 = lowest & 10 = highest),* please indicate your level of knowledge on the management of urinary retention in hospitalised older adults

0 1 2 3 4 5 6 7 8 9 10

2) In people with 'normal' health bladder function, the first sensation to void occurs at a volume of:

a) 400 – 600ml
b) 100 – 200ml
c) 250 – 350ml
d) 600 – 700ml

3) List three non pathophysiological (non disease related) factors that can influence normal bladder emptying

_____

_____

_____

4) The incidence of acute urinary retention in men between over the age of 70 is:

a) 2.6%
b) 34.7
c) 23%

5) Symptoms associated with acute urinary retention include: *(you may tick more than one)*

a) An abrupt loss of the urge to urinate
b) The rapid onset of upper urinary tract distress
c) A painless and nonpalpable bladder
d) A sense of incomplete voiding

6) The incidence of urinary retention following a stroke is estimated at

a) 25% - 37%

b) 10% - 20%

c) 40% - 52%

d) 62% - 70%

7) The upper threshold for a PVR is

a) anything over 150ml

b) 400 – 600ml

c) 1 litre

d) variable from person to person

8) A patient with a PVR of 600ml requires bladder decompression (relief of bladder distension)

a) Yes

b) No

c) Depends on a range of factors

9) List four common risk factors for chronic urinary retention in hospitalised older adults

_____

_____

_____

_____

10) List three neurological conditions that are associated with urinary retention

_____

_____

_____

11) Herpes zoster can be a cause of urinary retention.

a) Yes

b) No

12) Infrequent voiding can lead to:

a) Bladder outlet obstruction

b) Chronic bladder over-distension

c) Increased detrusor muscle tone

d) Increased sensation of bladder filling

13) Which of these measures would be the most effective in assisting in the diagnosis of urinary retention? *(You may tick more than one)*

a) Ascertaining how often the patient voids

b) Determining if the patient has nocturia

c) Observing for abdominal distension

d) Obtaining a PVR

e) Burning on urination

14) A patient's total bladder capacity is equal to

a) The voided volume

b) The PVR

c) The voided volume plus the PVR

d) The PVR minus the voided volume

Appendix D. Stage 4: Questionnaire to clinical nurses

Ward .....

1. Please indicate your nursing role
   RN Div 1
   RN Div 2
   Ward based continence resource nurse
   Ward nurse

2. Does your ward have a poster of the guidelines for the nursing assessment and management of urinary retention in elderly hospitalised patients?
   No (*You have completed the questionnaire. Please submit this questionnaire*)
   Yes (*please proceed with questionnaire*)
   Don't know (*You have completed the questionnaire. Please submit this questionnaire*)

3. Have you referred to the guidelines to assist you to assess and manage elderly patients with urinary retention?
   No Yes

3a. If yes, were they easy to use?
   No Yes

3b. If no, what suggestions do you have to make them easier to use?
   .....

4. How helpful are the guidelines in assessing and managing the condition of urinary retention in hospitalised older adults?
   Very helpful Somewhat helpful Not helpful

5. Do you feel more confident about assessing for urinary retention compared to prior to the guidelines being available?
   No Yes

5a. If yes – on a scale of 1-5, how confident do you feel in assessing for urinary retention?

1.....2.....3.....4.....5

(lowest) (highest)

6. Have the guidelines assisted you to identify the need to do the following

a) Take a brief patient history?

No Yes Don't know

b) Review urinary retention risk factors?

No Yes Don't know

c) Conduct a physical assessment of lower abdomen?

No Yes Don't know

d) Do a urinalysis?

No Yes Don't know

a) Perform a bladder scan?

No Yes Don't know

We encourage you to provide further comment on your response

.....

7. Have the guidelines assisted you to better manage patients with pain and a medium to high PVR?

No Yes

If yes – can you provide an example of where this was the case?

.....

8. Have the guidelines assisted you to better manage patient with no pain and a low to medium PVR?

No Yes

If yes – can you provide an example of where this was the case?

.....

9. Have the guidelines assisted you to better manage patient with no pain and a high PVR?

No Yes

If yes – can you provide an example of where this was the case?

.....

10. Have the guidelines made any difference to the discharge outcomes of patients found to have an elevated PVR?

No Yes Don't know

If yes, can you provide an example of where this was the case?

.....

11. Have the guidelines increased your knowledge of risk factors for urinary retention?

No Yes

12. Have the guidelines increased your knowledge of presenting symptoms for urinary retention?

No Yes

13. Have the guidelines increased your knowledge of the assessment of urinary retention?

No Yes

14. Have the guidelines increased your knowledge of the management of urinary retention?

No Yes

15. Have the guidelines increased your knowledge of bladder emptying?

No Yes

16. How well do you believe the condition of urinary retention in older patients is managed in your ward? *(please circle)*

Extremely well Reasonably well Poorly

We encourage you to provide further comment on your response

.....

.....

17. In general, do you think the guidelines have improved the way in which you manage this condition in patients in your ward?

No Yes

We encourage you to provide further comment on your response

.....

.....

18. Are there any barriers or limitations to the guidelines being used?

No Yes

We encourage you to provide further comment on your response

19. Did you attend one of the workshops on guidelines for the nursing assessment and management of urinary retention in hospitalised older adults recently held at your hospital?

No Yes

20. Have you taken the opportunity to consult with the Clinical Facilitator to enquire how the guidelines can be used in your clinical practice?

No Yes

Thank you for your completing this questionnaire

Appendix E. Stage 4: Questionnaire to Nurse Unit Managers

1. Please indicate your nursing role

☐ CNC

☐ NUM

2. How helpful are the guidelines in supporting clinical nurses to assess and manage the condition of urinary retention in hospitalised older adults?

☐ Very helpful

☐ Somewhat helpful

☐ Not helpful

☐ Don't know

We encourage you to provide further comment on your response

.....

3. Have you observed any situations where the guidelines have been used to assist clinical nurses to perform the following key components of assessment?

a) Take a brief patient history? No ☐ Yes ☐ Don't know ☐

b) Review urinary retention risk factors? No ☐ Yes ☐ Don't know ☐

c) Conduct a physical assessment of lower abdomen? ☐

No ☐ Yes ☐ Don't know ☐

d) Do a urinalysis? No ☐ Yes ☐ Don't know ☐

e) Perform a bladder scan? No ☐ Yes Don't know ☐

We encourage you to provide further comment on your response

.....

4. Have the guidelines assisted clinical nurses to better manage patients with pain and a medium to high post void residual urine volume?

Yes ☐ No ☐ Don't know ☐

If yes – can you provide an example of where this was the case?

.....

5. Have the guidelines assisted clinical nurses to better manage patient with no pain and a low to medium post void residual urine volume?

Yes ☐ No ☐ Don't know ☐

If yes – can you provide an example of where this was the case?

.....

6. Have the guidelines assisted clinical nurses to better manage patient with no pain and a high post void residual urine volume?

Yes ☐ No ☐ Don't know ☐

If yes – can you provide an example of where this was the case?

.....

7. Have the guidelines made any difference to the discharge outcomes of patients found to have an elevated post void residual urine volume?

Yes ☐ No ☐ Don't know ☐

If yes – can you provide an example of where this was the case?

.....

8. Have the guidelines increased clinical nurses' knowledge of risk factors for urinary retention?

Yes ☐ No ☐ Don't know ☐

9. Have the guidelines increased clinical nurses' knowledge of presenting symptoms for urinary retention?

Yes ☐ No ☐ Don't know ☐

10. Have the guidelines increased clinical nurses' knowledge of how to assess for urinary retention?

Yes ☐ No ☐ Don't know ☐

11. Have the guidelines increased clinical nurses' knowledge of how to manage urinary retention?

Yes ☐ No ☐ Don't know ☐

12. Have the guidelines increased clinical nurses' knowledge of bladder emptying?

Yes ☐ No ☐ Don't know ☐

13. Are there any barriers or limitations to the guidelines being used?

Yes ☐ No ☐ Don't know ☐

We encourage you to provide further comment on your response

.....

14. Do you have any suggestions for improving the guidelines?

Yes ☐ No ☐

We encourage you to provide further comment on your response

.....

Thank you for your completing this questionnaire

Appendix G. Final guideline