1. Introduction and background

1.1 Rationale

Because of its high prevalence and chronic but preventable nature, urinary incontinence may well be considered a public health problem (Sampselle, Palmer, Boyington et al., 2004). Urinary incontinence is defined as "the complaint of any involuntary leakage of urine". It is one of a group of symptoms termed lower urinary tract symptoms (LUTS). LUTS can be divided into three groups: storage, voiding and post-micturition symptoms, and include increased daytime frequency, nocturia, urgency, hesitancy, straining to void, terminal dribble and dysuria (Abrams, Cardozo, Fall et al., 2003).

The primary objective of this guideline is to improve the quality of life of older people who live at home, and have urinary incontinence. The guideline aims to guide the practice of registered nurses and allied health professionals with generalist backgrounds who work in community settings, by presenting evidence based practice in this area. The guideline does not focus on general medical practitioner management of urinary incontinence; however, it does make recommendations about referral to general medical practitioners. A separate guideline for managing incontinence in general practice has previously been published (Tilbury, 2002). The clinical algorithm in Section ten indicates the central role of the general medical practitioner in continence management of the community dwelling older person.

Registered nurses and allied health professionals have contact with older people as part of their day-to-day practice in the community. Many of these older people suffer from urinary incontinence. While urinary incontinence is often not fully curable in this population, taking active steps in managing this condition can result in significant improvement. The best practice recommendations made in this guideline will be particularly helpful in assisting registered nurses and allied health professionals to first identify urinary incontinence in older people, and in their reassessment of the continence status of older people who are existing clients of community health services.

This guideline is based on recommendations made by the Third International Consultation on Incontinence, 2004 (Abrams, Cardoza, Khoury et al., 2005) regarding the 'initial management' of urinary incontinence. The Consultation addressed initial assessment and treatment strategies for people with urinary incontinence. Some of the strategies recommended by the Consultation should be undertaken by continence nurse advisors and pelvic floor physiotherapists who have had specialised training in continence care. While these strategies are briefly outlined in Section 11.5.5, this guideline specifically addresses initial assessment and management strategies that can be undertaken by registered nurses and allied health professionals with generalist backgrounds.

The following clinical questions are addressed in the guideline:

- What are the causes of urinary incontinence?
- How does ageing affect bladder function?
- What is the prevalence and psychosocial impact of urinary incontinence?
- What medical conditions are associated with urinary incontinence?
- What other factors contribute to urinary incontinence?
- How does one undertake an initial continence assessment?
- What are the indications for referral to a general medical practitioner?
- What co-morbid conditions, when treated, can result in improvement or resolution of urinary incontinence?
- What strategies are effective and appropriate first steps in the management of urinary incontinence in a community setting?
- How is continence care for older people best delivered within a community health care setting?

1.2 Format of this guideline

The guideline has been developed with 12 sections. Section one, introduction and background, explains the client group on which the guideline focuses, clarifies the type of health professional for whom the document is intended, and defines the concept of first steps in the management of urinary incontinence in community-dwelling older people. It sets the scene for the rest of the document by defining urinary incontinence and other bladder symptoms, outlining the causes, prevalence and association with other medical conditions, and the psychosocial impact of urinary incontinence on older community-dwelling people.

Section two, bladder function and urinary incontinence, provides the reader with background information about conditions associated with urinary incontinence that require immediate general medical practitioner referral, that is, conditions termed 'Red Flags', and co-existing conditions that are considered potentially reversible or treatable causes of urinary incontinence (DIAPPERS).

Section three, the impact of ageing on urinary incontinence, details the mechanisms by which ageing impacts on the urinary system.

Section four, factors that contribute to urinary incontinence, highlights other factors, common in the ageing population, which may contribute to urinary continence. It is recognised that incontinence often coincides with numerous other factors and co-morbid conditions. A comprehensive review of an individual's continence is incomplete without an awareness of these contributing factors.

Section five, constipation, provides the link between the impact of constipation and stool impaction on the lower urinary tract. Management of constipation is essential in the first steps for management of urinary incontinence.

Section six covers risk factors associated with urinary incontinence, and includes economic and environmental factors.

Section seven, the psychosocial impact of urinary incontinence, addresses psychosocial issues for the individual and his/her family members/carers.

Section eight, health care professionals and urinary incontinence: the challenges, has been written specifically to address the needs of the generalist clinicians who feel uncomfortable about inquiring and talking about urinary incontinence. It is understood that for a number of generalist clinicians, undertaking an initial urinary assessment has not been part of their regular area of work. Therefore, this section provides background information on how to ensure the initial questioning is well directed.

Section nine, significant and causative factors related to urinary incontinence in older people, provides detailed information on 'Red Flags', and the mnemonics 'DIAPPERS' and 'TOILETED'.

Section ten, recommendations for referral pathways, describes the service delivery model for continence care that has been recommended for use in Queensland. It makes suggestions about referral pathways for use in community health care settings. The continence management strategy review (2004) indicates the need for the development and enhancement of local networks and referral pathways between HACC funded continence services, to increase collaboration between services and continuum of care for people with incontinence. The strategy also recommends that referral to other health professionals may be required for specific interventions such as medication reviews or pelvic floor muscle exercises (Christiansen, 2004). Similarly, an Australian Government report (2006) stresses the importance of involving the multidisciplinary team in continence management (McCallum, Millar, Dong et al., 2006).

Section eleven, first steps in the management of urinary incontinence, outlines the essential steps in the management of urinary incontinence in older people. Recommendations are made about assessment and treatment strategies.

Section twelve, development of the guideline, provides the reader with information about the development of the guideline, listing the members of the development panel and describing the literature search process used to inform the guideline.

1.3 Levels of evidence used in this guideline

The Scottish Intercollegiate Group Network (SIGN) grading system (Harbour & Miller, 2001) has been used to grade recommendations and rate levels of evidence (see Table 1). Where the level of evidence is rated as 4, it has been derived from the opinion of the Clinical Expert Development Panel and/or opinion expressed in peer-reviewed articles, or of continence representative bodies such as the International Continence Society. Most of the evidence supporting the recommendations is rated at the lower levels. This indicates a need for further high quality research in the area of continence care related to the first steps.

Table 1: The Scottish Intercollegiate Group Network grading system (SIGN)

Levels of evidence	
1 + +	High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs) or RCTs with a very low risk of bias.
1 +	Well conducted meta-analyses, systematic reviews of RCTs or RCTs with a low risk of bias.
1 –	Meta-analyses, systematic reviews or RCTs or RCTs with a high risk of bias.
2 + +	High quality systematic reviews of case-control or cohort studies or high quality case-control of cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal.
2 +	Well conducted case-control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal.
2 –	Case-control or cohort studies with a high risk of confounding, bias or chance and a significant risk that the relationship is not causal.
3	Non-analytic studies, eg case reports, case series.
4	Expert opinion.

Grades of recommendation	
A	At least one meta-analysis, systematic review or RCT rated as 1+ + and directly applicable to the target population or a systematic review of RCTs or a body of evidence consisting principally of studies rated as 1+ directly applicable to the target population and demonstrating overall consistency of results.
B	A body of evidence including studies rated as 2 + + directly applicable to the target population and demonstrating overall consistency of results or extrapolated evidence from studies rated as 1 + + or 1 +.
C	A body of evidence including studies rated as 2 + directly applicable to the target population and demonstrating overall consistency of results or extrapolated evidence from studies rated as 2 + +.
D	Evidence level 3 or 4 or extrapolated evidence from studies rated as 2 +.

(Harbour and Miller 2001)

1.4 Icons

The following icons have been used in this document

Links

Link to Section

Throughout the guideline, different aspects of one particular topic may be covered in different sections. This icon is used to link the reader to these related sections of the document.

Recommendation

This icon refers to a guideline recommendation.

Point of Interest

This icon is used to indicate a point of interest. These are small sections of information, sourced mainly from research articles, that highlight an issue discussed in the body of the guideline.

Good Practice Point

This icon indicates that the information presented is a good practice point. These points support and supplement the recommendations. They cover clinical issues that are considered by health professionals experienced in continence care to form part of good practice.

Steps

There are seven of these icons in Section 11 of the guideline, each representing one of the seven steps in the management of community-dwelling older people with urinary incontinence.

1.5 Glossary of Terms

Benign Prostatic Hyperplasia (BPH): a benign growth of the prostate gland which wraps around the urethra

Bladder diary: a document used to record the times of micturition, voided volumes, incontinence episodes, pad usage and other information such as fluid intake, the degree of urgency and the degree of incontinence

Chelation: the process by which a molecule encircles and binds to a metal and removes it from tissue

Constipation: a condition of the bowels in which the faeces are dry and hardened, and evacuation is difficult and infrequent

Detrusor overactivity: a urodynamic observation characterised by involuntary detrusor contractions during the filling phase, which may be spontaneous or provoked; this may be neurogenic (when there is a relevant neurological condition) or idiopathic (when there is no defined cause)

Diabetic cystopathy: an impairment of bladder sensation which is a complication of diabetes and causes increased post-void residual volume, and decreased detrusor contractility

Diabetic neuropathy: nerve dysfunction caused by diabetes mellitus. There are two broad types – peripheral neuropathy which affects the periphery, and autonomic neuropathy, affecting the sympathetic and parasympathetic nerve pathways

Diurnal: daily

Diurnal polyuria: see polyuria

Dyspareunia: difficult or painful sexual intercourse

Dysuria: literally means 'abnormal urination' but is often used to describe the stinging/burning sensation characteristic of urinary infection. It is suggested that the descriptive words such as stinging and burning should be used instead to describe the subjective individual response

Frequency (daytime): the individual considers he/she voids too often by day

Frailty: a state of reduced physiological reserve associated with increased susceptibility to disability

Functional incontinence: incontinence caused by environmental or physical barriers

Hesitancy: difficulty in initiating micturition resulting in a delay in the onset of voiding after the individual is ready to pass urine

Ideopathic detrusor overactivity: a group of bladder problems characterised by urgency, with or without urge incontinence, usually with frequency and nocturia. It describes overactive bladder syndrome, and has replaced the term detrusor instability

Intermittent stream: a urine flow that stops and starts, on one or more occasions, during micturition

Intravesical: situated or occurring within the bladder

Laxation: defecation; a bowel movement

Lower urinary tract symptoms (LUTS): a group of irritative symptoms demonstrated in lower urinary tract dysfunction, including nocturia, frequency, urgency and urge incontinence

Micturition: urination

Mixed urinary incontinence: describes involuntary urine leakage associated with urgency and also with exertion, effort, sneezing or coughing

Neurogenic detrusor overactivity: a group of bladder problems characterised by urgency, with or without urge incontinence, usually with frequency and nocturia. It describes overactive bladder syndrome, and has replaced the term detrusor hyperreflexia

Nocturia: waking at night one or more times to void. However, for some people, once or twice may be normal

Nocturnal enuresis: night time bed wetting

Nocturnal polyuria: the presence of a normal 24 hour urine volume (i.e. no diurnal polyuria), with the total of all night voids and the first void of the morning upon rising being greater than 33% of the total 24 hour volume

Osmotic diuresis: increased urination caused by the presence of excessive amounts of glucose (blood sugar)

Overactive bladder syndrome/urge syndrome/urgency-frequency syndrome: see neurogenic detrusor overactivity

Polyuria: the passing of an excessive quantity of urine, greater than 40 mL per kilogram of body weight

Post-void residual (PVR): the volume of urine left in the bladder at the end of micturition. This is usually diagnosed by bladder scan (ultrasound) or in-out catheterisation. Abnormal volumes are variously defined by researchers as being greater than 100 mL or greater than 200 mL, depending on the researcher

Prolapse: the falling down, or slipping out of place of an organ or part, such as the uterus

Slow stream: the individual's perception of reduced urine flow usually compared to previous performance or in comparison to others

Straining to void: the muscular effort used to initiate, maintain or increase the urinary stream

Stress urinary incontinence (SUI): involuntary urine leakage on effort or exertion, or on sneezing or coughing

Terminal dribble: a prolonged final part of micturition, when the flow has slowed to a trickle/dribble

Urgency: a sudden, compelling desire to pass urine that is difficult to defer

Urge urinary incontinence: involuntary urine leakage accompanied by or immediately preceded by urgency

Urinary incontinence: any involuntary leakage of urine

Urodynamic (genuine) stress urinary incontinence: stress urinary incontinence confirmed by urodynamics observations

Voiding: emptying

The International Continence Society (ICS) publishes proceedings from its working group committees every two years. These publications are invaluable sources of up-to-date information about types of incontinence, recommendations for practice and further research etc. The reader is encouraged to use these resources to find further information about incontinence (Abrams, Cardozo, Fall et al., 2003). The ICS website address is http://www.icsoffice.org/default.htm.

1.6 Prevalence

Urinary incontinence is a common health problem which affects 3.8 million Australians (Commonwealth of Australia, 2006). The best estimates for prevalence are that 24% of the total population are affected by urinary incontinence, comprising 38% of women and 10% of males. Figures indicate that the prevalence of urinary incontinence in community dwelling women and men increases with age, from 13% in women aged 18-23 years, to 36% for those aged 45-50 years, and to 35% for those aged 70-75 years. The slightly lower prevalence rate in older women may be because these figures refer to community-dwelling individuals. Incontinence is a major reason for admission to residential care for older adults, and approximately 70% to 80% of high level residential care individuals are older women. Prevalence rates for both stress and urge urinary incontinence in males are lower than in females, with about 1% (1%) of men aged 15-39 years, 1% (1%) of men aged 40–59 years and 7% (11%) for those aged over 60 years having stress (urge) urinary incontinence (Hawthorne, 2006).

As the population ages, the incidence of urinary incontinence increases (Commonwealth of Australia, 2006). Of the Australians who needed assistance with bladder management and/or used continence aids in 2003, 79% were aged over 50 years and 65% were aged over 70 years (Moore, Ho, Lapsley et al., 2006). Indeed, the latest figures from the National Continence Management Strategy (2006) indicate that up to 40% of people over 75 years of age are affected by incontinence to some degree. Within 50 years the number of people aged over 65 will almost triple, from 2.4 million today to around 7.1 million in 2051 (Commonwealth of Australia, 2006). These statistics are a cause for even greater concern when it is realised that urinary incontinence is one of the major factors for admission to residential care (Commonwealth of Australia, 2006).

Women tend to experience urinary incontinence proportionally more than men, regardless of age, with 3.06 million women and 770,000 men having urinary incontinence. Severity of urinary incontinence varies between individuals. An estimated 545,000 Australians experience severe incontinence, 723,100 experience moderate incontinence, defined as leakage of urine several times a month or less, and a further 2,877,500 Australians experience slight urinary incontinence, with urine leakage less than once per month. Unfortunately, no definition of severe incontinence is provided (Commonwealth of Australia, 2006). It has been suggested that urinary incontinence be considered a public health problem for which population-based interventions are used (Keilman, 2005).

2. Bladder function and urinary incontinence

2.1 How the normal bladder works

Normal urine production depends on normal blood flow to the kidneys (25% of cardiac output). Urea, the most abundant waste product excreted by the kidneys, is formed from ammonia which in turn is formed in the liver from the breakdown of amino acids (Richardson, 2003).

The lower urinary tract is made up of the bladder and the urethra. These structures form a functional unit which stores and evacuates urine. The bladder is continuously filled with urine via the ureters at an average rate of 1-2 mL per minute. As the bladder fills, the smooth muscle of the bladder (the detrusor) relaxes. At the same time, there is a continuous contraction of the smooth and skeletal sphincter muscles of the urethra, and a watertight seal at the bladder outlet is maintained. Normally there is no pain, discomfort or leakage during bladder filling. The first sensation to empty the bladder is felt when the bladder is approximately half full (150-250 mL) with voiding able to be deferred until the bladder reaches full capacity and the place and time are convenient (Homma, Batista, Bauer et al., 2002).

Point of Interest

The normal healthy adult experiences:

- **The first sensation of filling at about 170 mL**
- **The first or normal desire to void at about 250 mL**
- **A strong desire to void at around 400 mL**

The maximum capacity is about 480 mL (Griffiths, Kondo, Bauer et al., 2005).

A contraction of the detrusor muscle and synchronous relaxation of the urethral sphincter muscles take place during bladder emptying, with the normal bladder emptying an average volume of 300-500 mL every three to four hours. Normally a continuous forceful flow of urine occurs without the individual needing to strain, with only minimal residual urine in the bladder at the end of emptying (Homma, Batista, Bauer et al., 2002).

Post void residual urine in the older individual is thought to occur with bladder outlet obstruction (in men) and with an age-related decrease in detrusor contractility in both men and women. Significant daily variations in individual post-void residual urine can occur for no known reason. Larger residuals of up to 40% have been measured in the early morning (Griffiths, Kondo, Bauer et al., 2005). Problems associated with post-void residual urine include recurrent urinary tract infections, ongoing dribbling of urine, and urinary frequency. Individuals experiencing these problems require ongoing follow up and management by their health professional.

2.2 Established and treatable urinary incontinence

Urinary incontinence is an involuntary leakage of urine, which is not defined by the amount of urine that is lost. Thus, a few drops of urine or a large pool are both episodes of incontinence. Established urinary incontinence is caused by disease to or injury of the lower urinary tract, which does not resolve by itself but persists over time. A number of medical and health-related factors may cause urinary incontinence or worsen established urinary incontinence. These are known as potentially reversible or treatable causes of urinary incontinence (Fonda, 2005).

Incontinence is a symptom of an underlying condition and the key to successful treatment is a comprehensive assessment leading to a diagnosis of the underlying condition, and not simply management of the symptoms. Individuals with continence difficulties are entitled to assessment and treatment that aims to achieve a cure (Morrow, 2005).

There are a number of different types of established urinary incontinence resulting from the presence of one or both of the following abnormalities of the lower urinary tract (Fonda, 2002):

- An inability of the bladder to store urine due to:
  - an incompetent sphincter mechanism that fails to provide adequate levels of sphincter outlet resistance and/or
  - an overactive detrusor muscle that fails to relax during filling
- An inability of the bladder to empty due to:
  - decreased ability of the detrusor muscle to contract during emptying and/or
  - obstruction of the urethra causing increased outlet resistance.

In addition to established urinary incontinence, a number of medical and health related factors may cause urinary incontinence or worsen established urinary incontinence. These are known as significant and causative factors (red flags) and potentially reversible or treatable causes of urinary incontinence (DIAPPERS/TOILETED), and they may co-exist with established urinary incontinence (Fonda, 2005). Red flag factors may reflect serious organic disease and require immediate medical referral, while some of the DIAPPERS/TOILETED can be addressed by the primary health care professional.

When DIAPPERS/TOILETED are addressed initially as the first steps in management, significant improvement in urinary incontinence can occur. Conversely, failure to address these treatable conditions may limit the effectiveness of therapies that are directed at the lower urinary tract (Fonda, 2002).

Good Practice Point

If older people have underlying disease of, or injury to, the lower urinary tract (that is, established urinary incontinence), urinary incontinence will persist following the management of the treatable co-morbid conditions. Accurate identification of the type of established urinary incontinence (through a complex continence assessment) is essential, to allow an individually targeted treatment program to be undertaken (Fonda, 2002). Hence, older people should be referred to health professionals who can carry out complex continence assessments and provide appropriate interventions.

Further discussion regarding the pathophysiology, clinical presentation, assessment and treatment of the different types of established urinary incontinence falls outside the scope of this guideline. Additional information is available in the International Continence Society literature (Abrams, Cardozo, Khoury et al., 2005).

Table 2: Summary of lower urinary tract symptoms (LUTS)

Classification of symptoms	*Type of symptoms*
Storage symptoms	Increased daytime frequency
	Nocturia
	Urgency
	Urinary incontinence
	Stress urinary incontinence
	Urge urinary incontinence
	Mixed urinary incontinence
	Nocturnal enuresis
	Continuous urinary incontinence
	Situational urinary incontinence
	Bladder sensation (normal, increased, reduced, absent, non-specific)
Voiding symptoms	Slow stream
	Intermittent stream
	Hesitancy
	Straining
	Terminal dribble
Post-micturition symptoms	Feeling of incomplete emptying
	Post micturition dribble

(Staskin, Hilton, Emmanuel et al., 2005)

3. The impact of ageing on urinary continence

A variety of factors lead to an increased prevalence of urinary incontinence with ageing. These include age-related changes in bladder function, and the impact of ageing on other bodily functions and processes. While none of these changes alone cause urinary incontinence, they can predispose older people to the effects of additional pathological, physiological, and pharmacological changes, and increase their risk for developing urinary incontinence (Engberg, Kincade, & Thompson, 2004; Sampselle, Palmer, Boyington et al., 2004; Stern, 2006).

Factors such as mobility, manual dexterity, environment and access to toilets, cognitive state and thought processes, and medical conditions common to older people and medications for these conditions, may impact on the individual's ability to be continent. For example, diabetes is prevalent in up to 20% of the older population. The associated osmotic diuresis (increased urination caused by the presence of excessive amounts of glucose in the renal tubules), can lead to polyuria, while neuropathic changes may cause detrusor overactivity and, in more advanced stages, diabetic cystopathy (impairment of bladder sensation, increased post-void residual volume, and decreased detrusor contractility). Chronic heart failure, arthritis, sleep apnoea, and severe constipation may also lead to urinary incontinence (DuBeau, 2006).

Another change which occurs with ageing is a delay from the time of fluid intake to urine excretion, with greater excretion occurring later in the day and into the evening. Lower limb oedema causes nocturnal polyuria due to a relocation of fluid when the individual is at rest in the reclining position. Sleep apnoea also causes nocturnal polyuria and should be considered in obese and/or hypertensive individuals with nocturia (DuBeau, 2006). Table 3 indicates some of the age related changes which may impact on urinary incontinence.

A recent article suggests that, while urinary incontinence is two to three times more common in women than men up to the age of 80 years, after 80 years both sexes are equally affected (Gibbs, Johnson, & Ouslander, 2007).

Point of Interest

Maximum urethral closure pressure, detrusor contraction strength, urine flow rate and bladder sensation all decline with age, while the volume at first desire to void shows a significant increase with age. This, combined with unchanged voided volumes is of clinical importance. The larger the volume at which an individual realises the need to go to the toilet, the shorter is the warning period during which he/she can void at his/her convenience. The effect is likely to be greater in those with an overactive bladder or urge incontinence (Pfisterer, Griffiths, Schaefer et al., 2006).

Table 3: Age related changes that may contribute to urinary incontinence

Changes	*Impact*
Decrease in bladder elasticity (compliance) and capacity	Increased frequency of voiding
Decreased strength of detrusor muscle (impaired contractility of bladder wall)	Incomplete bladder emptying Increase in post void residual (PVR) to 50-100 mL
Involuntary detrusor muscle contractions or increased muscle hyperactivity	Symptoms of urgency Decreased ability to delay voiding
Detrusor muscle laxity, large, atonic bladder	Insufficient intravesical pressure to initiate urination
Kidney size and renal weight decreased	Loss of functional glomeruli leading to decreased renal function
Decreased renal blood flow	Drug excretion through kidney may be altered and thus require dose adjustment
Enlargement of the prostate gland	Decreased flow, hesitancy, difficulty initiating the urine stream, prolonged voiding, post micturition dribble, obstructed urinary output
Decreased oestrogen production, leading to thinning of the urethral epithelium, decreased volume and vascularity of the urethral submucosa, atrophic vaginitis and urethritis, decreased urethral mucosal seal	Irritation, more prone to urinary tract infections, dryness, itchiness of vulva and vagina
Decrease in maximum urethral closure pressure	Increased potential for leakage
Production of urine altered, related to circadian sleep-awake pattern	Nocturia increased Increased risk of falls
Changes in secretion of arginine vasopressin (AVP) (anti-diuretic hormone)	Proportion of urine excreted at night increases significantly Nocturia
Diminished sensation of bladder filling	Symptoms of urgency as bladder does not register sensation of fullness until later in the filling cycle Shorter warning period Decreased ability to postpone voiding
Increased susceptibility to urinary tract infection	Increased risk of incontinence
Decreased overall bone density	Spinal column curvature and compression Degenerative changes in joints Decreased hand dexterity and lower limb function Increased pain on ambulation Slower movement

Changes	*Impact*
Decreased muscle bulk, tone and strength	Reduced strength Falls Fear of falling
Decline in vision and ability to focus	Poor eyesight Decreased ability to adjust to changes in lighting levels Increased risk of falls

(DuBeau, 2006; Fonda, Khera, Brooks et al., 2002; Keilman, 2005; Pfisterer, Griffiths, Schaefer et al., 2006; Stern, 2006)

4. Factors that contribute to urinary incontinence

As indicated in the previous section, advancing age increases the risk of urinary incontinence. However, there are numerous other factors and medical conditions which, individually or in combination, are associated with an increased risk of urinary incontinence. It is likely that these factors are cumulative and coexisting, and that they will be compounded by other life events such as pregnancy, illness and surgery (Birch, Doyle, Ellis et al., 2006).

Contributing factors for urinary incontinence in women include pregnancy and childbirth, increased body mass index, obesity, current cigarette smoking, menopause, hysterectomy and parity (Sampselle, Palmer, Boyington et al., 2004). Wilson suggests that parity, pregnancy at younger ages (younger than 21 years) or over 35 years, parturition, gynaecological procedures, and hormonal changes accompanying menopause are risk factors (M. Wilson, 2004), while Jackson indicates that oral oestrogen use is a significant risk factor (Jackson, Vittinghoff, Kanaya et al., 2004).

Contributing factors for urinary incontinence in men include cystitis, bladder outlet obstruction, radical prostatectomy, obesity, decreased mobility, prostatic enlargement, benign prostatic hyperplasia, chronic diarrhoea (Stern, 2006; M. Wilson, 2004) and hip fracture (Newman, Denis, Gruenwald et al., 2005). Wilson found that the mortality rate among incontinent men is higher than that of their female counterparts, and hypothesised that urinary incontinence may be a more aggressive condition in men, more likely a result of complex psychological and cultural factors than biologic gender-based differences (M. Wilson, 2004).

Other characteristics such as chronic obstructive pulmonary disease, diabetes, diuretic medications, arthritis, depression, altered cognitive status, neurological conditions such as stroke, Parkinson's disease and Multiple Sclerosis, and poor lower-extremity physical performance are associated with urinary incontinence (Jackson, Vittinghoff, Kanaya et al., 2004; Rohr, Stovring, Christensen et al., 2005; Sampselle, Palmer, Boyington et al., 2004).

4.1 Arthritis

Arthritis has been associated with urge urinary incontinence as pain, stiffness and joint damage may restrict mobility and the ability to disrobe quickly. Decreased lower extremity physical performance is also associated with urge incontinence. Arthritis may also limit the ability to use position changes to prevent stress-incontinent episodes (Jackson, Vittinghoff, Kanaya et al., 2004; McGrother, Donaldson, Hayward et al., 2006).

Lewis et al (2005) found that arthritis was strongly associated with urinary incontinence in a population of women aged 50 to 90 years. This may be secondary to limited mobility or an autoimmune interaction involving the lower urinary tract, creating urge-type symptoms (Lewis, Schrader, Many et al., 2005). Treatment for some forms of arthritis may trigger detrusor overactivity and cause incontinence in both men and women (Tennstedt, Fitzgerald, Nager et al., 2007), with non-steroidal anti-inflammatory drugs (NSAID) having an adverse impact on bladder function (Bicopoulos, 2008). For example, tiaprofenic acid enhances detrusor activity, frequency and urgency, and may cause cystitis like symptoms (Australian Pharmaceutical Formulary and Handbook, 2006).

4.2 Back pain

A connection between lower back pain and urinary incontinence has been reported in a study of 200 Swedish women, which showed that lower back pain increased the risk of urinary incontinence by almost three times for parous women, and even more for nulliparous women (Eliasson, Elfving, Nordgren et al., 2007). The relationship of incontinence and back pain may be due to the contribution of trunk muscles to continence and lumbopelvic control, especially in younger women (Eliasson, Elfving, Nordgren et al., 2007; MD. Smith, Russell, & Hodges, 2006). An association between incontinence and back pain for a cohort of 70-75 year olds has also been demonstrated in the Australian Longitudinal Study on Women's Health (MD. Smith, Russell, & Hodges, 2006).

4.3 Bowel problems

The overall prevalence of faecal incontinence is estimated to be 5.3% in Australian women and 5.5% in Australian men (Chiarelli, Bower, Wilson et al., 2005). An earlier Australian study by the same principal author found that the prevalence of self-reported constipation in women aged 70 to 75 years was almost twice that of women aged 18 to 23 years (27.7% versus 14.1% respectively) (Chiarelli, Brown, & McElduff, 2000). It is estimated that faecal incontinence occurs in more than 10% of elderly people in hospitals and residential care facilities, with constipation and faecal incontinence often co-existing, particularly among people with neurological conditions including dementia, and people with impaired consciousness and behavioural disturbances (Lam & Jones-Roberts, 2003). Poor mobility is the strongest predictor of faecal incontinence in long-term care hospital patients, with the appearance of faecal incontinence being a marker of deteriorating health and increased mortality (Bravo, 2004).

Management of constipation is an integral part of the initial management of urinary incontinence and, as such, is necessary for the primary level clinician to consider. However, management of faecal incontinence and stool impaction requires more specific knowledge and skills than those possessed by generalist clinicians, and an individual with either of these symptoms should be referred to his/her general practitioner or a secondary level continence clinician for appropriate intervention and management. There are close links between bladder and bowel health. Therefore, bowel issues are covered in greater detail in Section 5 of this guideline.

Link to Section 5

4.4 Caffeine

Caffeine is found in tea, coffee, cola, energy boosting drinks and a range of over-the-counter cold, flu and stimulant medications (Addison, 2000). Caffeine acts on the renal tubules to increase renal blood flow and decrease sodium and water reabsorption from the distal tubule. It also acts on skeletal muscle to enhance the capacity for muscular work and causes smooth muscle relaxation (Creighton & Stanton, 1990). It has been hypothesised that caffeine may cause an increased rise in pressure during bladder filling, indicating lower bladder compliance, possibly through a direct excitatory effect on the detrusor smooth muscle (Creighton & Stanton, 1990). Caffeine increases urgency and frequency in people with proven detrusor instability (Creighton & Stanton, 1990). Urethral pressure may be reduced by caffeine, which could increase the risk of stress incontinence (Palermo and Zimskind, cited in Addison (2000).

Caffeine stimulates colonic motor activity, so is contraindicated for those with diarrhoea or faecal continence problems (Addison, 2000).

Points of Interest

A group of 20 subjects with underlying detrusor overactivity each drank a cup of coffee. Their bladder function during filling was investigated, and the results were compared to subjects with normal bladders. The pressure inside the bladder during filling was significantly higher in people with detrusor overactivity compared to subjects with normal bladders. It was thought that the increase in bladder pressure due to coffee intake was the reason that subjects with detrusor overactivity experienced frequency and urgency after drinking coffee (Creighton & Stanton, 1990).

The data on caffeine intake and incontinence are conflicting. Large cross-sectional surveys indicate no association between caffeine consumption and urinary incontinence, whereas smaller clinical trials suggest that decreasing caffeine intake does improve incontinence (Creighton & Stanton, 1990; Milne, 2008).

4.5 Cardiac conditions

Vascular risk factors have been found to play a role in the development of lower urinary tract symptoms in both sexes, according to a survey of 2554 Austrians (Ponholzer, Temml, Wehrberger et al., 2006).

Ageing changes the diurnal pattern of fluid excretion due to reduced renal concentrating capacity, increased sodium excretion in the urine, and a loss of the daily rhythm of antidiuretic hormone secretion. This causes larger volumes to be excreted at night (nocturnal polyuria), which increases the likelihood of nocturnal enuresis. Cardiac dysfunction also leads to increased sodium excretion, and, when heart failure is present, fluid is retained in the extravascular spaces, as hyponatremia reduces fluids being drawn into the blood vessels. At rest, improved cardiac output improves venous return to the heart, which in turn increases blood supply to the kidneys, resulting in an increase in urine production (L. Wilson, 2003).

Congestive heart failure and venous insufficiency can cause volume overload and can contribute to urinary frequency and nocturia when the patient is supine. This can be treated with leg elevation, support hose, salt restriction, and proper timing of administration of diuretics (Stern, 2006). When diuretics are used to assist in the management of cardiac conditions, they can add to urinary symptoms such as frequency and urgency. The rapid onset of some diuretics can produce symptoms of urgency and frequency.

4.6 Childhood history

A study by Fitzgerald et al (2006) found that women who reported childhood daytime frequency or childhood daytime incontinence were more likely to report adult urgency or urge incontinence. Frequent nocturia in childhood was strongly associated with adult nocturia. Similarly, a history of more than one childhood urinary tract infection (UTI) was associated with adult UTIs, with childhood urinary symptoms and UTIs being significantly associated with adult overactive bladder symptoms (Fitzgerald, Thom, Wassel-Fyr et al., 2006).

Point of Interest

A study of 1021 women reported an association between childhood bedwetting and urinary incontinence in adulthood. It was found that 29.6% of those with urinary incontinence had a history of childhood bedwetting, significantly greater than the rates found in continent women (Gurbuz, Karateke, & Kabaca, 2005).

For some older people, urinary incontinence may be linked with negative childhood experiences such as rigid toilet training, punishment for being wet, or child abuse (Shapiro, Setterlund, & Cragg, 2003). Therefore speaking about their condition may evoke painful memories, so should be sensitively discussed.

Point of Interest

It remains to be seen whether treatment of childhood symptoms reduces the increased risk of adult urinary incontinence.

4.7 Dehydration

There is a very real risk of dehydration in older people, particularly in the sub-tropical and tropical climate of Queensland (see table 4). The sensation of thirst is a security mechanism. Fluid intake is largely stimulated by thirst, and, as the sensation of thirst decreases with age, the desire to drink is often less in older people. Consequently, thirst may only occur with the onset of dehydration (Ferry, 2005). It has been suggested that dehydration may result from the conscious decision of a person to limit fluid intake to reduce episodes of incontinence (Joanna Briggs Institute, 2008). However, reduced intake causes urine to become more concentrated, causing bladder irritation and associated urinary symptoms.

Table 4: Dehydration risks in the elderly

Dehydration risks in the elderly include:
• Age › 85 years
• Thirst reduction
• Mobility and dexterity problems, causing difficulty accessing drinks
• Communication problems
• Cognitive disorders
• Swallowing difficulties
• Reduced appetite
• Medications (diuretics, laxatives, sedatives)
• Acute pathology (fever, vomiting, diarrhoea)
• Lack of attention from caregivers
• Fluid loss due to perspiration.

(Ferry, 2005)

4.8 Dementia

Incontinence is frequently linked with dementia. In a 2005 Australian report, it was estimated that 200,000 people diagnosed with dementia would also report symptoms of incontinence (Bostock & Kralik, 2006). Incontinence in a person with dementia increases the level of dependency and results in a heavier care burden. This may result in earlier institutionalisation (Yap & Tan, 2006). Many clinicians believe that people with dementia will automatically have urinary incontinence because of cortical dysfunction. This may contribute to overuse of continence pads, leading to a loss of continence in some instances (Bravo, 2004). A number of studies in this population group have shown that impaired mobility and the inability to transfer are greater predictors of urinary incontinence than the severity of the dementia

(Bravo, 2004; DuBeau, 2006; Yap & Tan, 2006). Many individuals with dementia can still walk or be assisted in walking to the bathroom and, therefore, have a good chance of remaining continent (DuBeau, 2006).

Incontinence in dementia is multifactorial and does not lend itself to easy solutions. A comprehensive assessment is required, and management should be directed at ameliorating predisposing causes, with the ultimate goal being to maintain independence, choice and comfort. Cognitive deficits in people with dementia can interfere with their ability to recognise the need to go to the toilet, to hold on until it is appropriate to go, to find and recognise the toilet, and to adjust clothing and use the toilet properly (Yap & Tan, 2006).

A number of factors are required to maintain continence, including having a bladder capable of storing and voiding urine, sufficient cognitive capacity to perceive the desire to pass urine and interpret it as such, motivation to be continent, sufficient mobility and skill to reach the toilet, and ready access to a toilet or appropriate receptacle. The absence of these abilities may contribute to urinary incontinence in individuals with dementia (Bravo, 2004). Apathy and depression commonly occur in dementia and could also account for poor volition to maintain continence (Yap & Tan, 2006). Additionally, the influence of sedative drugs, physical restrictions and other environmental or social factors must not be forgotten (Bravo, 2004). A person who has been using continence pads for a considerable period may continue to void passively because this has become conditioned behaviour. Use of the DIAPPERS/TOILETED mnemonic will help diagnosis of potentially reversible causes of incontinence (Yap & Tan, 2006).

Urinary incontinence increases with increasing dementia severity (Evans & Castleden, 1998). It is unrealistic to expect positive results for all people with dementia. Sometimes, trying to reduce the severity of incontinence and to maintain the individual's well-being, good perineal hygiene and social continence may be a more realistic goal. Thus, an approach which can be adapted to the characteristics of each individual is essential (Bravo, 2004), and should include consideration of behavioural characteristics which have functional causes. For example, a client who is stubborn and uncooperative during activities such as toileting and bathing is often thought of as being difficult. It is important to remember that a lack of privacy when toileting can cause resistance. Allowing privacy and plenty of time, encouraging independence, facilitating with simple step-by-step instructions, avoiding derogatory remarks and being constantly reassuring will help maintain dignity and independence in self-care activities. People with advanced dementia may have difficulty communicating their needs, and unexplained agitation, pacing and tugging on trousers may signal the need to toilet (Bostock & Kralik, 2006; Yap & Tan, 2006). When all attempts at keeping the person continent fail, the use of continence aids is appropriate (Yap & Tan, 2006).

Good Practice Point

Clinicians are advised to pay attention to the behaviour and nonverbal cues of an individual with dementia, to allow privacy and plenty of time, to encourage independence in self-care activities, to facilitate the process with simple step-by-step instructions, to be reassuring and to maintain dignity (Yap & Tan, 2006).

4.9 Diabetes Mellitus

There are two types of diabetes mellitus relevant to this guideline, type 1 and type 2. In type 1 diabetes, the pancreas produces little or no insulin, so insulin injections are required to control blood glucose levels. Type 1 diabetes affects approximately 5% – 10% of people with diabetes, while type 2 affects 90% – 95%. Those with type 2 diabetes have decreased sensitivity to insulin (insulin resistance) and decreased insulin production. In the initial stages, type 2 diabetes may have minimal symptoms. Initial management of type 2 diabetes is with diet and excercise, which may be supplemented with oral medications and, in some cases, insulin injections (Smeltzer, Bare, Hinkle et al., 2007). As indicated in Section 4.19.1, a number of medications prescribed for the treatment of mental illness may predispose people to develop diabetes.

Link to Section 4.19.1

A range of studies have reported a link between type 2 diabetes and urinary incontinence:

- Large data sets aggregated at a 2003 symposium indicated that the risk of urinary incontinence in people with diabetes increased with age; for the elderly the frequency was 30%-50% (D. Smith, 2006)
- A large United States study of community dwelling women aged 50-90 years found that women with diabetes reported a greater prevalence of incontinence than those without diabetes. Women with insulin dependent diabetes (type 1) reported the highest level of incontinence, followed by those with non-insulin dependent diabetes (type 2). Insulin dependent diabetes is a risk factor for both mild and severe urinary incontinence, independent of other risk factors found in this population (Lewis, Schrader, Many et al., 2005). It has also been found that the risk of urinary incontinence appears to be associated with longer duration of type 2 diabetes mellitus. Type 2 diabetes is a largely preventable problem, and studies have indicated that weight loss may decrease diabetes and urinary incontinence (Lifford, Curhan, Hu et al., 2005)
- A urodynamics study of 54 men and women with type 2 diabetes found that 74% of men and 59% of women had bladder dysfunction (Kebapci, Yenilmez, Efe et al., 2007)
- The Nurses Health Study, a longitudinal study of over 100,000 American nurses, found that the odds of urinary incontinence are increased by 20% for women with type 2 diabetes (Danforth, Townsend, Curhan et al., 2009).

A study which correlated the factors of diabetes and obesity in a group of American women discovered that women who were both obese and diabetic had a greater probability of urinary incontinence than other women. Less frequent urinary incontinence may be a powerful motivator for women to choose weight loss as a lifestyle modification strategy to prevent diabetes (Brown, Wing, Barrett-Connor et al., 2006).

Link to Section 4.15

Diabetes is associated with nocturia (Coyne, Zhou, Bhattacharyya et al., 2003), detrusor overactivity and neuropathy of the autonomic nerves supplying the bladder (Hunter & Moore, 2003). This neuropathy (diabetic cystopathy) is characterised by decreased bladder sensation, increased bladder capacity and impaired detrusor contractility (Hunter & Moore, 2003). Brown (2005) suggests that bladder cystopathy appears not to constitute the majority of bladder dysfunction in older women with type 2 diabetes, but is instead a relatively uncommon end organ effect of diabetes. Similarly, Lifford (2005) indicates that diabetic cystopathy affects approximately one third of people with type 2 diabetes.

Diabetes may lead to urge incontinence via damage to the innervation of the bladder or altered detrusor muscle function. In large observational studies, diabetes has been reported to be associated with a 30% – 70% increased prevalence of incontinence in women (Jackson, Vittinghoff, Kanaya et al., 2004). It has also been hypothesised that microvascular damage

may be the cause of increased urinary incontinence in women with type 2 diabetes mellitus. If these microvascular complications also damage the vasculature and innervation of the bladder and urethral sphincter, this could explain the increased risk of incontinence in women with type 2 diabetes. It therefore follows that intensive glycemic control may also prevent or improve the severity of urinary incontinence (Brown, 2005).

Point of Interest

Knowing that type 2 diabetes mellitus is associated with severe urinary incontinence may assist clinicians in identifying patients likely to have incontinence (Brown, 2005).

Good Practice Point

Community dwelling older people with diabetes have been found to have high rates of cognitive impairment, deficits in physical function and depressive symptomatology (Bruce, Casey, Grange et al., 2003). Given that cognitive deficits, mobility impairment and depression can each be a contributing factor to urinary incontinence, treating these co-morbidities may be beneficial when managing older people with diabetes who have urinary incontinence.

4.10 Ethnicity

A number of studies from the United States of America have investigated ethnic differences in incontinence between whites, blacks and Hispanics. These studies demonstrate that ethnicity appears to influence both the incidence and type of urinary incontinence (Birch, Doyle, Ellis et al., 2006).

One study of healthy American women, 70-79 years of age, found stress and urge urinary incontinence to be highly prevalent in white women, who had almost twice the prevalence of incontinence (occurring at least weekly) than did black women. Other risk factors included oral oestrogen use and arthritis (Jackson, Vittinghoff, Kanaya et al., 2004).

Point of Interest

The authors of this guideline have been unable to find any corresponding literature concerning people of different ethnic (non Indigenous) backgrounds pertinent to the Australian population.

4.11 Frailty

Frailty is an ever-changing state of increased vulnerability to poor health outcomes because of acute and chronic medical conditions. Frail individuals are more susceptible to injury and illness, and are less able to manage physical and environmental challenges because of a loss of physiological reserve. The ability to compensate for environmental challenges and to maintain functional stability during a state of illness is diminished. For example, simply going to the toilet requires voluntary bladder control, muscle strength, balance, ambulatory endurance, manual dexterity and hand-eye coordination. Functional limitations due to disease and/or illness can make successful toileting difficult, and can cause urinary incontinence. Indeed, it has been suggested that urinary incontinence may be an early marker of frailty (Gammack, 2004).

4.12 Gynaecological factors

4.12.1 Pelvic organ prolapse

Link to Section 9.1.10

Pelvic organ prolapse is a common condition in older women, with estimates that half of all women who have had children will experience some form of prolapse in later life. Pelvic organ prolapse occurs when the pelvic floor muscles become weak or damaged and can no longer support the pelvic organs. While prolapse is not a life threatening condition it may cause considerable discomfort and distress (http://www.womenshealthlondon.org.uk/leaflets/prolapse/prolapse.html, downloaded 31/3/2009).

Table 5 shows the three categories of prolapse, defined by the part of the vagina that is affected.

Table 5: Types of prolapse

Location of Prolapse	*Type of Prolapse*
Prolapse of the anterior vaginal wall	Cystocele (bladder prolapse): The bladder falls towards the vagina, creating a large bulge in the front of the vaginal wall. The most common type of prolapse is of both the bladder and urethra (cystourethrocele)
	Urethrocele (prolapse of the urethra): the urethra pushes against the front of the vaginal wall, near the opening of the vagina. This usually happens together with a cystocele
Prolapse of the posterior vaginal wall	Enterocele (small bowel prolapse): Part of the small intestine that lies just behind the uterus slips down between the rectum and the back wall of the vagina. Often concurrent with a rectocele or uterine prolapse
	Rectocele (prolapse of the rectum or large bowel): the rectum loses support and bulges into the back wall of the vagina. This is different to a rectal prolapse, when the rectum falls out of the anus
Prolapse of the top of the vagina	Uterine prolapse: the uterus drops down into the vagina. This is the second most common type of prolapse. The pelvic organ prolapse quantification (POP-Q) staging system classifies the severity of the prolapse, with stage I being mild and stage IV being severe
	Vaginal vault prolapse: The vaginal vault is the top of the vagina. It can only fall in on itself after a woman's uterus has been removed (hysterectomy). Vault prolapse occurs in about 15% of women who have had a hysterectomy for uterine prolapse, and in about 1% of women who have had a hysterectomy for other reasons

(Beus, 2003)

Pregnancy is thought to be the main cause of pelvic organ prolapse, whether the prolapse occurs immediately after pregnancy or decades later. The ageing process further weakens the pelvic muscles, and the natural reduction in oestrogen at menopause also causes less elasticity in the muscles. Obesity, large fibroids and pelvic tumours can also increase the risk of prolapse due to the extra pressure exerted on the abdominal area (Beus, 2003).

Point of interest

A cross-sectional study of 296 women older than 40 years undergoing gynaecological and urogynaecological examinations found that vaginal descent 0.5 cm distal to the hymen accurately predicted bulging/protrusion symptoms. However, prolapse severity is only a weak predictive factor of urinary symptoms, and provides little or no predictive value for bowel symptoms (Gutman, Ford, Quiroz et al., 2008).

4.12.2 Gynaecological surgery

Urinary incontinence is more prevalent in women who have undergone gynaecological surgery (Chiarelli & Brown, 1999), with hysterectomy in women under the age of 45 years being identified as a risk factor for urinary incontinence (Thom, van den Eeden, & Brown, 1997).

An English study of 226 women having surgery for urinary incontinence found that such surgery carried with it a higher risk of complications, such as urinary tract infection and voiding dysfunction, in the elderly compared to younger people. The authors note that it is therefore wrong to assume that a minimally invasive procedure is necessarily one with fewer complications (Pugsley, Barbrook, Mayne et al., 2005). However, Pollack (2004) concludes that, with skilled surgeons, urogynaecological and reconstructive pelvic surgery is safe and effective in women aged 80 and older, if strict surgical protocol is in place to reduce morbidity and mortality in these patients (Pollak, Davila, Kopka et al., 2004).

4.13 Medications

As people age they tend to have more health problems, and an increase in medication use. For example, in Australia, aged pensioners use 22% of all prescription drugs and 55% of psychotropic drugs. In industrialised nations, an estimated 60%-90% of community dwelling older people aged 65 years and over, take medications. Over 50% use at least one drug on a regular basis with the average number of medications used ranging from two to five (2020: A vision for aged care in Australia – the Myer Foundation, cited in Aged Care Crisis, 2008). Clinicians also need to be aware that older people may be using complementary and illicit drugs, which may affect continence status.

The proportion of people using medication increases steadily with age, from 51% of those aged less than 15 years to 91% of those aged 65 years or more. Appropriate use of medication by older people is a major public health concern. As the proportion of people using medication increases with age, so does the number of medications taken (Australian Bureau of Statistics, 1995, Updated Dec 2006).

Medications used by older people largely reflect the medical conditions more prevalent in this group. For example, in 1995 around 30% of those aged 55 – 64 years used medications for heart problems/blood pressure, increasing to 47% of those aged 65-74 years, and 53% of those aged 75 years and over. Other medications commonly used by the older age groups included pain relievers (19% of people aged 65 years or more), medications for arthritis (14%), fluid tablets/diuretics (13%) and stomach medications (12%). Just over 10% of people aged 65 years or more used sleeping medications, tranquillisers or sedatives. Use of vitamins and minerals was primarily for preventive health reasons, rather than the treatment of particular conditions (Australian Bureau of Statistics, 1995, Updated Dec 2006).

In 1995, of those aged 65 years or more who used prescribed or non-prescribed medication in the previous two weeks, 36% used four or more different types of medication, and 14% used six or more. (Australian Bureau of Statistics, 1995, Updated Dec 2006). Medications have a major role in causing or exacerbating urinary incontinence. Many people with urological symptoms are older and may be taking multiple medications which may affect urinary symptoms. For example, ACE inhibitors (used for cardiac problems) may cause a cough and therefore precipitate stress incontinence. Diuretic medication can inhibit the ability to delay urgency, resulting in urge incontinence. Calcium channel blockers, opiates, and anticholinergics can impair bladder emptying (DuBeau, 2006), as shown in table 6.

Complementary medicines may also contribute to urinary incontinence, perhaps through the claimed mechanism of action (e.g. those preparations that claim to have a diuretic, sedative or antidepressant action).

A number of agents may exert a cytotoxic effect on the bladder wall leading to cystitis which may manifest as urinary incontinence (e.g. cyclophosphamide, vincristine and cisplatin). Some of the non-steroidal anti-inflammatory drugs (NSAID) such as tiaprofenic acid have been associated with this effect (Australian Pharmaceutical Formulary and Handbook, 2006). More detailed information on medications and their impact on bladder and bowel function is included in Tables 6 (bladder) and 9 (bowel). Any medication that affects cognition, mobility, fluid balance, coughing, detrusor contractility, or sphincter function may increase incontinence (DuBeau, 2007) (refer Table 6).

Link to Section 5.1.1

Table 6: Medications that can cause or aggravate urinary incontinence

NB. This table is intended for people with some knowledge of medications. For further information or explanation, the reader is advised to consult a pharmacist.

Key to table: ↑ = increased → = leading to/causing ↓ = decreased α = alpha β = beta

Medications marked with [1] relax the bladder and increase its capacity, and are used for urge incontinence. Older people are more sensitive to their adverse effects.

Medication	Mechanism	Effect
α – adrenergic blockers e.g. prazosin, terazosin, phenoxybenzamine, tamsulosin	↓ Urethral resistance; ↓ proximal urethral pressure; sphincter relaxation	Stress incontinence
α – adrenergic agonists e.g. pseudoephedrine, ephedrine, phenylephrine	Stimulation of constriction of urethral sphincter → ↑ urethral resistance; ↑ proximal urethral pressure	Hesitancy, straining to void → urinary retention → overflow incontinence
ACE-Inhibitors e.g. captopril, enalapril, fosinopril, lisinopril, perindopril, ramipril	Cough induced sphincter weakness	Stress incontinence
Alcohol	↑ Urinary volume; diuretic effect, sedation, altered mental state, depressed central inhibition of micturition	Frequency, urgency, nocturia, confusion, sedation, immobility
Anticholinergics e.g. antihistamines, disopyramide, tricyclic antidepressants, thioridazine, haloperidol, benztropine, benzhexol, oxybutinin[1], propantheline[1], tolterodine[1], solfenacin[1], darifenacin[1]	Interferes with cholinergic innervation of detrusor → detrusor relaxation; ↓ force of detrusor contractions	Hesitancy, straining to void, urinary retention → overflow incontinence; constipation
Antihypertensives (all)	Postural hypotension (unsteadiness)	Functional incontinence
β – adrenergic antagonists e.g. propranolol, atenolol, metoprolol	Sphincter contraction	Hesitancy, straining to void, urinary retention → overflow incontinence
β – adrenergic agonists e.g. terbutaline, salbutamol	Sphincter relaxation	Stress incontinence
Caffeine	Diuresis	Polyuria, frequency, urgency, confusion, delirium

Cholinergics e.g. bethanechol, cisapride	↑ Detrusor activity (instability), urgency	Urge incontinence
Acetylcholinesterase inhibitors e.g. donepezil, galantamine, rivastigmine	Cholinergic effect, detrusor instability, frequency, urgency	Urge incontinence, overflow incontinence
Calcium channel blockers e.g. verapamil, diltiazem	Smooth muscle relaxation → detrusor relaxation, ↓ force of detrusor contractions; ↑ residual volume	Hesitancy, straining to void, urinary retention → overflow incontinence; constipation
Centrally-acting antihypertensives e.g. methyldopa, reserpine, guanethidine	↑ α-adrenergic receptor inhibition; ↓ proximal urethral pressure	Leakage
Diuretics e.g. frusemide, hydrochlorothiazide, indapamide	↑ Urine volume → stimulates contractions	Polyuria, frequency, urgency → exacerbates urge incontinence; confusion, delirium, constipation
Muscle relaxants	Urethral sphincter relaxation	Polyuria, frequency, urgency
Narcotics e.g. morphine, oxycodone, tramadol	↓ bladder contractions; ↑ smooth muscle tone; ↓ response to voiding cues	Urinary retention; ↓ voluntary control to void; overflow, functional incontinence, constipation, confusion
Non-steroidal anti-inflammatories e.g. indomethacin, diclofenac, piroxicam	↑ prostaglandin inhibition in bladder smooth muscle → ↓ force of detrusor contractions	↓ Detrusor contractions; urinary retention
Tiaprofenic acid	Enhance detrusor activity; frequency, urgency	Urgency, cystitis-like symptoms
Psychotropics e.g. amisulpride, clozapine, haloperidol, olanzapine, quetiapine, risperidone	Constipation, confusion, sedation, parkinsonism	Overflow, functional, stress incontinence
e.g. benzodiazepines	Sedation, impaired mobility	Functional incontinence
e.g. chlorpromazine, pericyazine, thioridazine, trifluoperazine	Anticholinergic action, sedation, confusion, parkinsonism, impaired mobility	Overflow, functional incontinence

e.g. lithium	Polydipsia, nocturia	Polyuria, frequency, urgency ⟶ exacerbates urge incontinence; functional incontinence
e.g. SSRIs (selective serotonin reuptake inhibitors), (paroxetine has some anticholinergic effects), moclobemide, venlafaxine	Enhance detrusor activity (instability), sedation, impaired mobility	Urge, functional incontinence
e.g. TCAs (tricyclic antidepressants – eg amitriptyline, imipramine, doxepin, dothiepin), mianserin, mirtazapine, reboxetine	Anticholinergic action, sedation, impaired mobility	Overflow, functional incontinence

Based on original work provided for the Pharmacy Guild of Australia by Debbie Rigby, and the Australian Pharmaceutical Formulary and Handbook 21st Edition, 2009.

4.14 Mobility

Link to Section 11.7.1.1

As indicated in Section 11.7.1.1 of this guideline, continence status may be affected by issues beyond the lower urinary tract function, including environmental factors, physical functioning, cognitive status, psychological distress, mobility, manual dexterity, motivation, medical conditions and medications. Environmental barriers are strongly and independently associated with urinary incontinence in frail older community-dwelling people (Landi, Cesari, Russo et al., 2003).

It has been suggested that continence problems following a stroke commonly result from immobility and dependency rather than neurological damage, and that the ability to walk unaided is the most important factor in regaining continence (Nazarko, 2003). Similarly,

Link to Section 4.23

the literature on dementia and incontinence also indicates that mobility and the ability to

Link to Section 4.8

transfer are important factors in the maintenance of continence.

4.15 Obesity

Obesity is associated with an increase in diabetes mellitus, cardiovascular disease, various cancers, respiratory disorders in sleep, gallbladder disease and osteoarthritis. It has negative effects on a variety of other conditions such as psychological conditions and stress urinary

Link to Section 4.1

incontinence (Rubenstein, 2005). Arthritis is commonly seen in morbidly obese women, and has been reported to be associated with the presence of urinary incontinence in older women (Richter, Burgio, Brubaker et al., 2005). A prospective study of 116,671 female nurses established that adiposity and weight gain are strong independent risk factors for incontinence development in middle-aged women (Townsend, Danforth, Rosner et al., 2007).

Obesity may affect the neuromuscular function of the genitourinary tract, which will in turn contribute to incontinence (Cummings, 2000). Obesity appears to be a risk factor for pelvic organ prolapse in women (Croghan, 2007), and is associated with stress urinary incontinence due to increased pressure on the bladder and pelvic floor (Lekan-Rutledge, 2004; McGrother, Donaldson, Hayward et al., 2006). It causes an increase in intra-abdominal pressure resulting in increased intravesical pressure, increased pressure at maximum cystometric capacity, increased urethral mobility and decreased cough pressure transmission from the bladder to the urethra (Jackson, Vittinghoff, Kanaya et al., 2004; Richter, Burgio, Brubaker et al., 2005; LL. Subak, Whitcomb, Shen et al., 2005). Little information exists with regard to male obesity and continence or pelvic floor function, but as incontinence and pelvic floor dysfunction are increased through increased intra-abdominal pressure, it is likely that this is the case for both men and women (Croghan, 2007).

Link to Section 4.12

It is possible that increased intra-abdominal pressure causes or exacerbates detrusor instability and results in urge incontinence, with Subak et al (2005) finding an improvement in urge urinary incontinence in women after weight loss, and suggesting that weight reduction lowers bladder pressure. Obesity may also predispose women to anal incontinence due to the increase in baseline intra-abdominal pressure (Richter, Burgio, Brubaker et al., 2005).

Although there are some limitations to measuring obesity by the body mass index (BMI), it is an index that provides a measurable estimate of body fat and is related to the risk of complications associated with obesity (Rubenstein, 2005). Table 7 shows the broad range of BMI for weight descriptors.

Point of Interest

The most common method used for calculating the body mass index (BMI) is with the formula: BMI = weight in kilograms divided by height squared (Rubenstein, 2005).
Thus, the BMI of a person who weighs 90 kg and is 165 cm tall, is 90/(1.65x1.65) = 90/2.72 = 33.08. This individual would be classified as obese.

Table 7: BMI categories

Description of weight	*BMI*
Underweight	‹18.5
Normal	18.5 – 24.9
Overweight	25.0 – 29.9
Obesity (class I)	30.0 – 34.9
Severe obesity (class II)	35.0 – 39.9
Extreme (morbid) obesity (class III)	40.0 or greater

(Rubenstein, 2005)

"Bariatric" is a term used to describe the study, prevention or treatment of obesity. People who have a BMI of 40.0 or greater should be bariatrically managed. In practice, this applies to men > 144 kg (only 1.6% of men are taller than 190 cm) and to women > 130 kg (only 0.1% of women are taller than 180 cm).

As older people tend to shift fat from peripheral to central sites, waist circumference alone has been shown to correlate with obesity related disorders. A waist circumference of greater than 101.6 cm increases risk of diabetes 3-5 fold, even after controlling for body mass (Rubenstein, 2005). In a study involving postmenopausal women with coronary heart disease, women with a high waist-hip ratio (reflecting abdominal obesity) were at greater risk of incontinence than women with a lower ratio at the same BMI (Brown, Grady, Ouslander et al., 1999). This suggests that abdominal obesity in particular is a risk factor for urinary incontinence. Other studies also demonstrate that increasing BMI increases the risk of urinary incontinence in women (Brown, Grady, Ouslander et al., 1999; Brown, Seeley, Fong et al., 1996; Chiarelli & Brown, 1999; Thom, van den Eeden, & Brown, 1997), but there is insufficient evidence to conclude whether this is related to urodynamic changes or other factors (Birch, Doyle, Ellis et al., 2006).

Points of Interest

Each five-unit increase in BMI is associated with a 60% – 100% increased risk of daily incontinence (Croghan, 2007).

The role of obesity in urinary incontinence has led to the suggestion that collaboration with weight reduction organisations might encourage effective and widely disseminated prevention programs for urinary incontinence (Sampselle, Palmer, Boyington et al., 2004).

Pre-operative obesity appears to be a long-term risk factor for an adverse outcome, as does the feeling of incomplete bladder emptying post-operatively (Kjolhede, 2005). Surgically-induced weight loss has been shown to significantly reduce stress and urge urinary incontinence in women (Mallett, 2005; Richter, Burgio, Brubaker et al., 2005). Two prospective studies have demonstrated that the weight loss after gastric bypass surgery has been associated with decreased intra-abdominal pressure (Bouldin, Ross, Sumrall et al., 2006).

A randomised control was conducted among 48 overweight and obese women with urinary incontinence occurring at least four times per week. Twenty-four women were randomly assigned to the treatment group, with the intervention comprising a three month liquid diet weight reduction program, encouragement to increase physical activity gradually until they were exercising one hour per day, and cognitive and behavioural skill training to assist in modifying eating and exercise habits. Participants attended weekly structured meetings. The remaining non-treatment group of 24 women received no intervention for the first three months, after which time they received the same intervention as the treatment group. The results indicated that women who were assigned to the weight reduction program were more likely to experience markedly improved incontinence and quality of life at three months. Similar improvement occurred in the control group once they became involved in treatment. Fifty percent reductions in incontinence frequency were observed among women who lost as little as 5% – 10% of their baseline weight. In the cohort study, sustained improvement in urinary incontinence and quality of life were observed for six months after weight reduction. A 50%-60% reduction in weekly incontinence episodes was observed with weight loss, which is comparable to the improvement observed with other behavioural therapies and with pharmacological therapy (LL. Subak, Whitcomb, Shen et al., 2005). A later randomized trial

of 338 women established that after six months of participation in a weight loss program, there was a 47.4% decrease of incontinence episodes (L. Subak, Wing, West et al., 2009).

Point of Interest

A waist measurement of greater than 80 cm for adult women or 94 cm for adult men is an indicator of internal fat deposits, which can coat the heart, kidneys, liver and pancreas, and increase the risk of chronic disease. A waist measurement of greater than 88 cm for adult women or 102 cm for adult men are indicators of a much greater risk of chronic disease (WHO, 2000).
In the study by Subak et al (2005), reduction in waist circumference and therefore, pressure on the bladder, were independent predictors of improved incontinence following weight reduction (LL. Subak, Whitcomb, Shen et al., 2005).

Good Practice Point

In practice, it can be very difficult to obtain accurate height measurements in older community dwelling individuals, rendering assessments of BMI an inappropriate tool for assessing health risk in this age group. A more practical and useful tool for measuring health risk in terms of adipocity, in the older population, would be to obtain a waist measurement.

Obesity is an independent risk factor for the prevalence of urinary incontinence in women, and weight loss would appear to be an acceptable treatment option for morbidly and moderately obese women (P. Wilson, Berghmans, Hagen et al., 2005).

Recommendation

In women who are overweight or obese, supervised weight reduction is a clinically feasible treatment option for incontinence. Weight reduction is a novel treatment for urinary incontinence, with wide-ranging impact on personal and public health, and it should be considered a first-line, non-surgical intervention for UI (Milne, 2008; LL. Subak, Whitcomb, Shen et al., 2005). A five percent to ten percent loss of base line weight in morbidly obese women decreases incontinence.

Level of evidence: ***2++***
Grade of recommendation: ***B***

4.16 Oestrogens

A 2003 Cochrane review found that oral oestrogen treatment can improve incontinence, particularly urge incontinence. However, there is limited evidence about post-treatment effectiveness, and no evidence about long-term effects. Combined oestrogen and progesterone appeared to reduce the likelihood of cure or improvement. There is insufficient data to reliably address other aspects of oestrogen therapy such as oestrogen type, dose and route of administration. Moreover, the risk of endometrial and breast cancer after long-term use suggests that oestrogen treatments should be for limited periods, especially in women with an intact uterus (Moehrer, Hextall, & Jackson, 2003). A large study published since the Cochrane review provides evidence for a possible adverse effect of oral oestrogen on continence (Hendrix, Cochrane, Nygaard et al., 2005).

Point of Interest

The 2005 Women's Health Initiative (WHI) study assessed the effects of menopausal hormone therapy on the incidence and severity of symptoms of urinary incontinence in healthy postmenopausal women. This study included two trials – one examining the effects of oral oestrogen plus progestin (for women who had not had a hysterectomy) and the other trial examining the effects of oral oestrogen alone (for women who had had a hysterectomy). Over 27,000 women in total were enrolled in the studies. In both trials, oral hormone therapy was associated with an increased incidence of urinary incontinence and worsening symptoms of pre-existing urinary incontinence, and this effect persisted at three years (Hendrix, Cochrane, Nygaard et al., 2005).

The mechanism by which oestrogen affects incontinence is unclear. Oestrogens may have a limited effect on the urethral sphincter but may increase loose connective tissue or stimulate collagen degradation in the urethra. Progestins may also worsen incontinence (Jackson, Vittinghoff, Kanaya et al., 2004). The combination of oestrogen and progestin treatment was found to increase the risk of urge and stress incontinence episodes within four months of treatment in postmenopausal women suffering with heart disease (Robbs, 2006).

Controversy surrounds the use of oestrogens in recurrent urinary tract infections (defined as three episodes of urinary tract infections in the previous 12 months or two episodes in the last six months), with vaginal oestrogens appearing to decrease UTIs, but oral oestrogens apparently not having this effect. This, combined with concerns relating to long term oestrogen use, prompted a systematic review to assess the efficacy and safety of oestrogens administered in various ways for preventing recurrent UTIs in postmenopausal women. The results of this Cochrane review published 23 April 2008 found oral oestrogens did not reduce UTI compared to placebo. Vaginal oestrogens versus placebo reduced the number of women with UTIs in two small studies. Two further studies compared oral antibiotics versus vaginal oestrogens (one using cream, the other pessaries). Vaginal oestrogen reduced the proportion of UTIs compared to antibiotics in one study and in the second study antibiotics were superior to vaginal pessaries. Adverse events noted for vaginal oestrogens were breast tenderness, vaginal bleeding or spotting, nonphysiological discharge, vaginal irritation, burning and itching. It was concluded, based on only two studies, that vaginal oestrogen reduced the number of UTI's in postmenopausal women with recurrent UTI, however this varied according to the type of oestrogen used and the treatment duration (Perrotta, Aznar, Mejia et al., 2008).

4.17 Pregnancy and childbirth

Pregnancy and childbirth can have long-term implications for incontinence and affect women in later life. Up to 43% of women have urinary incontinence after childbirth (Shaw & Kaczorowski, 2008) and it has been reported that onset of stress urinary incontinence during the first pregnancy or puerperium increases the prevalence of symptoms 12 years later (Viktrup, Rortveit, & Lose, 2008).

Pregnancy, labour and delivery can impact on the myofascial structures of the pelvic floor. Stretching or tearing of tissues can occur, either slowly over time as the weight of the foetus increases, or traumatically during second stage labour and vaginal delivery (Lee, Lee, & McLaughlin, 2008).

Obstetric issues, including babies with high birth weight and prolonged second stage of labour, increase the risk of neural damage to the pelvic floor (Herbruck, 2008). Vaginal delivery may result in pelvic floor laxity due to a weakening and stretching of the muscles and connective tissue. Pelvic floor damage may also occur due to spontaneous lacerations and episiotomies during delivery, leading to impaired support of the pelvic organs and alteration of their positions. Stretching of the pelvic tissues during vaginal delivery may damage the pudendal and pelvic nerves, and interfere with the ability of the striated urethral sphincter to contract promptly and efficiently in response to increase in abdominal pressure or detrusor contractions (Hunskaar, Burgio, Clark, et al., 2005). Specifically, stretching of the pudendal nerve may result in weakness and atrophy of the medial portions of the levator ani muscle, as well as the voluntary muscles of the perineum (Herbruck, 2008). It should be noted, however that congenital factors and changes related to ageing may increasingly outweigh the effects of traumatic childbirth as women grow older (Dietz & Wilson, 2005).

A literature review found weak evidence supporting elective caesarean delivery over planned vaginal delivery for decreasing the risk of post-partum urinary incontinence, although the duration of effect was not clear, particularly in older populations and in women after multiple deliveries. One trial found less urinary incontinence three months after delivery in women in the planned caesarean delivery group compared with the planned delivery group. However, by two years after delivery, the level of urinary incontinence in the two delivery groups was similar. Other studies also suggest that the effect of delivery route diminishes over time, and that, therefore, a caesarean delivery is not completely protective against the development of urinary incontinence (A. Weber, 2007).

Timely perinatal information about pelvic floor health and good bladder and bowel habits may prevent long term urinary incontinence problems in later life. A systematic review found that urinary incontinence following childbirth can be improved by performing pelvic floor muscle exercises (PFME), and that any form of a specific PFME program appears to improve exercising frequency (Haddow, Watts, & Robertson, 2005). Dumoulin (2006) extends this argument, and states that “in the prevention/treatment of postnatal urinary incontinence immediately after delivery and in persistent incontinence, supervised intensive programs prove more effective than standard postnatal care”. She concludes that obstetrics services need to reorganise their postnatal PFME instructions based on exercise physiology and PFME literature, so that all women can receive up-to-date instructions on PFME after delivery, with a reminder to exercise (Dumoulin, 2006).

4.18 Prostate disorders

Benign prostatic hyperplasia (BPH) is the leading cause of lower urinary tract symptoms (LUTS) in men over 50 years of age (Rosen, Giuliano, & Carson, 2005) and describes a variety of symptoms including :

- A histological change of hyperplasia within the gland (microscopic)
- Clinical enlargement of the prostate gland
- The clinical symptom complex of LUTS (Hirst, Butler, Lajoie et al., 2000).

Over time, prostate size increases, symptoms and bothersomeness scores worsen, flow rates deteriorate and some men develop difficulties such as acute urinary retention, and may need surgery (Fitzpatrick, 2006).

The intrinsic integrity of the pelvic floor muscles determines early recovery of continence after prostatectomy, and appears to be facilitated by voluntary contraction exercises (Song, Kyung Doo, Hong et al., 2007). One study of 14 men found a marked improvement in the level of incontinence following an aggressive exercise program which included pelvic floor muscle exercises, integration of pelvic floor muscles with abdominal muscle contraction and retraining neuromuscular control (Dornan, 2005). Another study of 14 men post prostatectomy found that pelvic floor exercises combined with biofeedback resulted in an improved ability to maintain vigorous activities and to walk up to 2km, resulting in overall psychological well-being and quality of life (Zhang, Strauss, & Siminoff, 2006). It has also been suggested that verbal and written feedback on pelvic floor muscle therapy, plus access to a knowledgeable urology nurse who can respond to questions beyond continence, may be as beneficial as focused physiotherapy after radical prostatectomy (KN. Moore, Valiquette, Chetner et al., 2008).

It should be noted, however, that a 2007 Cochrane review found conflicting information about the benefit of pelvic floor muscle training for either prevention or treatment of urine leakage after prostate surgery, whether for cancer or benign (non cancerous) enlargement of the prostate (endoscopic resection). More research of better quality is needed to assess conservative managements (Hunter, Moore, & Glazener, 2007).

For information regarding surgical interventions for prostate conditions, refer to Section 6.5.3 in the “Second Steps” clinical practice guideline (Queensland Health (MASS), 2008).

4.18.1 Radical prostatectomy

Male urinary incontinence was identified as a significant risk factor of radical prostatectomy surgery in a general health screening study (Schmidbauer, Temml, Schatzl et al., 2001). A Cochrane review found a variation in reported rates of prevalence of urinary incontinence from between 5% to over 60% following surgery (Hunter, Moore & Glazener, 2004). The problem often improves with time; however some men are left with incontinence that persists for years afterwards. (Hunter, Moore, & Glazener, 2007; KN. Moore, Truong, Estey et al., 2007).

The period after a radical prostatectomy is a difficult time for men when the aftermath of treatment impacts a man’s sense of self in terms of masculinity, self-efficacy and social support. The three physical function deficits that emerge are effect on sexual function, urinary incontinence and bowel function. A study of 72 men after a prostatectomy revealed that urinary dysfunction is the most important because it affects a greater part of their lives (B. Weber, Roberts, Chumbler et al., 2007). Another study found that men use various strategies to minimize the negative impact of post radical prostatectomy urinary incontinence on their

quality of life, including drinking minimal fluids, wearing pads, limiting travel away from home, avoiding going out because of uncertainty about toilet arrangements, and avoiding sexual intercourse (O'Connell, Baker, & Munro, 2007). Men without adequate support may become socially isolated or be stressed by social embarrassment. This may occur after their families and friends have resumed their normal activities, paying less attention to the man than they did immediately following the diagnosis and surgery (B. Weber, Roberts, Chumbler et al., 2007).

4.19 Psychiatric/Mental health conditions

People with mental illness experience urinary incontinence for the same reasons as those without mental illness. However, mental illness can be a significant contributory factor in the development of bladder and bowel symptoms. People with mental illness may have inattention, poor memory, depression, confusion, anxiety, fluctuations in mental state, apathy or disorganised thinking. These problems may occur as a result of the underlying psychosis and may contribute to incontinence. Additionally, treatments prescribed may also adversely affect bladder or bowel function, either through a direct impact on the function of the urinary system or by indirectly affecting an individual's awareness and ability to manage his/her incontinence effectively. These factors may contribute to the individual feeling that continence is out of his/her control (Kelly & Kralik, 2002).

People with mental illness may have other significant health issues resulting from long term neglect of their physical health or the effects of long standing medication, and these may contribute to incontinence. Those with severe, disabling mental illness usually require considerable support to manage day to day activities and these may include those associated with the maintenance of continence. Consequently if these supports are not available incontinence may develop (Kelly & Kralik, 2002).

The stigma surrounding both mental illness and adult incontinence is strong. Incontinence can be associated with childlike behaviours and is generally perceived as socially unacceptable. Incontinence may be perceived by others as being purely a behavioural issue (Kelly & Kralik, 2002). However, some psychiatric disorders impair motivation and therefore may contribute to self-neglect which reduces motivation for controlling continence. Withdrawal from social engagements further reduces the drive to maintain personal hygiene (Gammack, 2004).

Some people may have inadequate diets, drink too much or too little fluid, or ingest large amounts of caffeine, which can all contribute to poor bladder and bowel function and may cause incontinence (Kelly & Kralik, 2002).

Link to Section 4.19.2

Good Practice Point

Symptoms of caffeine withdrawal include headache, drowsiness, fatigue, decreased performance, anxiety, muscle pain and stiffness, flu like symptoms, nausea and vomiting, mood change and caffeine craving. Altering caffeine intake can affect the efficiency of some medications used to control mental illness. It is advisable to consult with the relevant general medical practitioner or psychiatrist before assisting people with a mental illness to reduce caffeine, particularly if their intake is very high (Kelly & Kralik, 2002).

Regardless of the cause, incontinence is yet another complication in the already difficult lives of people with mental illness. Given the disabilities and restrictions on day to day functioning frequently caused by mental illness, successful treatment and management of bladder and bowel problems requires commitment and perseverance. Some people with a mental illness may find dealing with incontinence is simply too much, and use denial as an option. An individual's apparent lack of motivation and desire to resolve his/her incontinence may be a part of the mental illness, and is not necessarily a sign of laziness or disinterest (Kelly & Kralik, 2002).

Promotion of continence requires a supportive, positive, realistic, practical, flexible and consistent approach. It is essential to collaborate with the individual when formulating the continence action plan, taking into account the individual's strengths and limitations (Kelly & Kralik, 2002).

4.19.1 Medications for mental illness that may impact on urinary incontinence

Refer to Table 6 for information on psychotropic medications.

Point of Interest

A number of medications prescribed for the treatment of mental illness may predispose people to develop diabetes. This may be because these medications affect metabolic status and contribute to obesity, or because the medications themselves affect glucose metabolism in some way. In addition, as a result of the mental illness, life-style factors such as inattention to diet, exercise and general health may also lead to the development of diabetes (Kelly & Kralik, 2002)**.**

4.19.2 Psychogenic polydipsia

Psychogenic polydipsia is a severe form of excessive drinking known to occur particularly in people with schizophrenia and to a lesser extent bipolar disorder. Contributing factors include:

- Medications causing dry mouth
- Alterations to production of anti-diuretic hormone (ADH)
- Some antipsychotic medications, particularly lithium
- Impaired thirst regulation
- Cigarette smoking
- Boredom
- Compulsion
- Addiction
- Desire to achieve a "high" from altered brain chemistry
- Delusions/hallucinations.

Complications of psychogenic polydipsia may include urinary retention, enlarged bladder, kidney damage, delirium, seizures, coma and death (Kelly & Kralik, 2002). Psychogenic polydipsia may cause urinary incontinence particularly if the person has impaired mobility, has excessive sedation or is a heavy sleeper (Fonda, 2007).

Good Practice Point

Clinicians should assess an individual's fluid intake carefully before stressing the importance of drinking plenty of water to people who may be susceptible to developing psychogenic polydipsia (Kelly & Kralik, 2002).

4.19.3 Toilet facilities and their influence on toileting behaviour

Clinicians need to be mindful that inappropriate toilet facilities can affect toileting habits of those without continence issues. Table 8 lists a number of issues which can make toilet facilities less than ideal, hence less likely to be used appropriately. Lack of visual privacy, appropriate ventilation and auditory privacy, and insufficient toilets can prohibit use of a toilet in a timely manner in the general population. For those with a mental illness, these issues may take on extra significance, and increase the risk of incontinence.

Table 8: Characteristics of a problem toilet, for people with a psychiatric disorder

A problem toilet is one that:	
Is constantly occupied	Has harsh toilet paper
Is difficult to get to	Has no toilet paper
Is dirty	Has someone hurrying you
Doesn't have a lock on the door	Doesn't have a place to wash your hands
Has gaps under the door	Doesn't have soap for hand-washing
Is difficult to flush	Doesn't have hand drying facilities
Has a seat too high or too low	Doesn't have a receptacle for pad disposal

(Kelly & Kralik, 2002)

4.20 Respiratory disease

Upper respiratory tract symptoms are associated with urinary incontinence (Chiarelli & Brown, 1999; Hannestad & Hunskaar, 2004). Chronic obstructive pulmonary disease (COPD) increases the risk of stress and urge incontinence fivefold, and most likely reflects the chronic cough caused by COPD (Jackson, Vittinghoff, Kanaya et al., 2004; Rohr, Stovring, Christensen et al., 2005), although Hirayama et al (2008) observed that Japanese men with COPD had a higher prevalence of urge incontinence than stress incontinence caused by coughing (Hirayama, Lee, Binns et al., 2008). Incontinence symptoms are more severe in women with COPD than women without respiratory disorders (Hannestad & Hunskaar, 2004).

Point of Interest

At a tertiary referral clinic for the diagnosis and management of severe asthma and bronchiectasis, it was found that the overall prevalence of urinary incontinence (at least one episode per week, regardless of the severity) in women (n=75) was 45%, suggesting that severe incontinence is over-represented in this population. The high prevalence of urinary incontinence across respiratory populations is not necessarily associated with cough, and may be due to a modifying co-factor such as corticosteroid use. Patients with bronchiectasis are often reluctant to discuss their incontinence issues and therefore go untreated. Hence, it is recommended that specific questioning on urinary incontinence should be included in a respiratory assessment (Prys-Picard & Niven, 2006).

4.21 Sleep-disordered breathing

Sleep-disordered breathing, including obstructive sleep apnoea, has been shown to be associated with nocturia.

A small study of 27 long-term nursing home residents who were known to be incontinent at night, found that a relatively large proportion of nocturnal wetness episodes were related to sleep-disordered breathing. The authors hypothesise that mechanical factors, such as the downward displacement of the diaphragm exerting pressure on the detrusor, may contribute to urine leakage during sleep in people with sleep disordered breathing (Bliwise, Adelman, & Ouslander, 2004).

Point of Interest

A review of individuals suspected of having sleep-disordered breathing found that nocturnal urination increases with the severity of sleep-breathing disorders, and more than three urinations per night is mostly associated with severe obstructive sleep apnoea syndrome. The authors highlight the link between diseases leading to nocturia, including cardiovascular disease, diabetes mellitus and lower urinary tract obstruction, as also being highly associated with sleep-breathing disorders. Individuals with obstructive sleep apnoea had a significantly higher BMI than those with other forms of sleep-breathing disorders, and those with moderate obstructive sleep apnoea had significantly higher BMI than those with primary snoring (Kaynak, Kaynak, & Oztura, 2004).

4.22 Smoking

Both former and current cigarette smoking is associated with frequent and severe incontinence. Smoking contributes to chronic obstructive pulmonary disease and is therefore linked to an increased risk for urinary incontinence (Birch, Doyle, Ellis et al., 2006; Brown, Seeley, Fong et al., 1996). Chronic coughing exerts significant force on the bladder. The pressure from frequent and forceful coughing may ultimately cause damage to the urethral sphincter, vaginal supports, and perineal nerves, thereby worsening symptoms of stress urinary incontinence (Lekan-Rutledge, 2004). A study comparing non-smoking and smoking women found that smokers generally seem to develop genuine stress incontinence in spite of stronger urethral sphincters and a lower risk profile than non-smokers (younger, and having a lower prevalence of oestrogen deprivation than non-smokers). Smokers demonstrate significantly greater increases in abdominal pressure with coughing than do non-smokers, and possibly

Link to Section 4.20

cough more frequently than non-smokers, thus promoting the earlier development of anatomic and pressure transmission defects and overcoming any protective advantages of a stronger urethral sphincter (Bump & McClish, 1994).

The number of cigarettes smoked also appears to be an important determinant for urinary incontinence. A large survey of almost 28,000 Norwegian women found that previous and current smoking of twenty or more cigarettes per day was associated with any type of urinary incontinence, while severe incontinence had a weak association with smoking regardless of the number of cigarettes smoked on average each day (Hannestad, Rortveit, Kjersti Daltveit et al., 2003). Similarly, Molander (2006) concluded that heavy smoking in combination with long term smoking over many years can be a risk factor for urinary incontinence (Molander & Milsom, 2006). The carcinogens in cigarettes are associated with irritative voiding patterns and bladder cancer (Lekan-Rutledge, 2004).

Point of Interest

Current data suggests that smoking increases the risk of more severe urinary incontinence. No studies have been reported examining whether cessation of smoking resolves incontinence (P. Wilson, Berghmans, Hagen et al., 2005).

4.23 Stroke/Cerebral vascular accident (CVA)

It has been reported that the incidence and prevalence of urinary incontinence after stroke is between 32% – 80%, with the incidence decreasing with time (Coleman Gross, 2003).

Point of Interest

Stroke outcome is better in people who remain continent or become continent (Brittain, 2002)**, with those who remain continent in the first few days after stroke experiencing lower mortality. Indeed, urinary incontinence in and beyond the acute stage of stroke is seen as a predictor of death, severe disability, and an important factor on hospital discharge destination** (Brittain, Peet, & Castleden, 1998; Coleman Gross, 2003; Gariballa, 2003).

The exact nature of the relationship between urinary incontinence and stroke outcomes is unclear (Coleman Gross, 2003). It has been hypothesised that urinary incontinence may be a good predictor of stroke severity because of its relationship with infarct size and intracranial haemorrhage, and its subtle effect on morale and the consequent response to rehabilitation (Brittain, Peet, & Castleden, 1998).

Good Practice Point

It is important to consider whether the individual was incontinent before the stroke, because those who have pre-morbid incontinence may have very different morbidity and mortality to those who become incontinent after the stroke (Brittain, Peet, & Castleden, 1998).

Other factors which create difficulties in the practical management of the bladder, such as motor impairment, altered consciousness, sensation, lesions, ataxia, depression and dysphasia can also contribute to the likelihood of post-stroke urinary incontinence. Stroke is often followed by depression and feelings of apathy, which can adversely affect an individual's 'normal' voiding pattern (Brittain, Peet, & Castleden, 1998). Hypotonic bladder function is common immediately after stroke, with the potential to cause over-distension and overflow incontinence (Coleman Gross, 2003). After this initial period, the more common urinary problems are frequency, urgency and urge incontinence, due to uninhibited neurogenic dysfunction of a hypertonic bladder (Coleman Gross, 2003).

5. Constipation

Constipation is a contributing factor to urinary incontinence, due to the pressure of the faecal mass on the bladder wall, stimulating an increase in bladder contraction. The emphasis of this section is on functional constipation. Therefore it only briefly touches on acute or sudden onset constipation which is frequently caused by underlying diseases of the bowel (W. Thompson, Longstreth, Drossman et al., 1999). Where the single word 'constipation' is used it is intended to refer to functional constipation unless otherwise stated.

Link to Section 5.7.1

If chronic constipation is not resolved, it will lead to stool/faecal impaction.

Link to Section 9.2.8

Good Practice Point

Chronic constipation and faecal impaction both interfere with the individual's quality of life, affecting social and family life, sexual relationships and work (Rao, Tuteja, Vellema et al., 2004). These issues should be taken into account when managing constipation in older people.

5.1 Risk factors

A number of factors have been shown to increase the risk of constipation, including increasing age, being of female gender, physical inactivity, low calorie intake, and medication issues, including taking opioids for pain relief (see Table 9) (Bosshard, Dreher, Schnegg et al., 2004; O'Keefe, Talley, Zinsmeister et al., 1995). Low income, low educational level, depression, physical abuse and sexual abuse also increase the risk of constipation (Locke, Pemberton, & Phillips, 2000), as do an imposed change in toileting habit, ongoing privacy issues with toileting, a change in dietary habit, poor fluid intake, stress, and cognitive or functional impairment (Folden, 2002).

5.1.1 Medications which may cause constipation

Table 9: Medications which may cause constipation

Medication Class	*Example only (not inclusive)*
Opioids	Morphine, Oxycodone, Codeine, Fentanyl
Anticholinergics	Belladonna, Hyoscine, Oxybutinin
Tricyclic antidepressants	Amitriptyline, Nortriptyline
Calcium channel blockers (some)	Verapamil
Antiparkinsonian drugs	Amantadine, Benztropine
Sympathomimetics	Ephedrine, Terbutaline
Antipsychotics	Chlorpromazine, Clozapine, Thioridazine
Diuretics	Frusemide
Antihistamines	Promethazine, Diphenhydramine
Iron supplements	Ferrous sulphate
Calcium supplements	Calcium carbonate

Anticonvulsants	Phenytoin, Clonazepam
Antihypertensives (some)	Prazosin, Methyldopa, Propranolol
Anti-inflammatories	Ibuprofen
Polystyrene resins	Resonium A
Cholestyramine	Questran
Laxative abuse	All types of laxatives
Antidiarrhoeals	Loperamide, Diphenoxylate/Atropine
Antispasmodics	Dicyclomine, Hyoscine

5.2 Physiological causes

There are multiple causes of constipation including mechanical obstruction, metabolic causes, neurological disease, psychiatric diseases, and medication (Gallagher, O'Mahony, & Quigley, 2008; Morley, 2007). A study of 2,109 community dwelling women enrolled in the Reproductive Risks for Incontinence Study found several demographic and medical variables associated with weekly or more frequent obstructive defecation. These included unemployment, reporting fair or poor health, being postmenopausal, having urinary incontinence or pelvic organ prolapse, having had a hysterectomy, colectomy, appendectomy, surgery for urinary incontinence or pelvic organ prolapse, and taking a number of medications (Varma, Hart, Brown et al., 2008).

Constipation can be categorised as:

- Primary constipation – slow transit constipation and pelvic floor hypertonicity are the two principal causes of primary constipation. It is possible for these to co-exist (Locke, Pemberton, & Phillips, 2000). Dysfunctional local intrinsic reflex mechanisms within the colon leads to slowed intestinal transit and impaired colonic contractions. Symptoms include infrequent bowel movements without pain or strain. However, it is generally accepted that ageing does not decrease colonic motility significantly, and that constipation in older people is probably due to a lower response of the neurotransmitters and to innervation deficits. Co-morbidity and polypharmacy also have a major influence (Bravo, 2004; Ginsberg, Phillips, Wallace et al., 2007).
- Secondary constipation – symptomatic constipation which includes mechanical obstructions, medical co-morbidities, medications, and lifestyle issues. For example, people unable to reach the bathroom unassisted because of limited mobility may hold on, which promotes constipation (Ginsberg, Phillips, Wallace et al., 2007).

5.3 Diagnostic criteria

Diagnostic criteria known as the Rome II criteria for functional constipation have been developed, and are shown in Table 10 (Locke, Pemberton, & Phillips, 2000; W. Thompson, Longstreth, Drossman et al., 1999).

Table 10: The Rome II criteria for functional constipation

In the preceding 12 months, the individual will have had, for at least 12 weeks (not necessarily consecutive), two or more of the following symptoms:

- straining › ¼ of defecations
- lumpy or hard stools › ¼ of defecations
- sensation of incomplete evacuation › ¼ of defecations
- sensation of anorectal obstruction or blockage › ¼ of defecations
- manual manoeuvres to facilitate › ¼ of defecations (eg digital evacuation, support of the pelvic floor)
- less than 3 defecations per week.

5.4 Dietary fibre and constipation

An adequate intake of both fibre and fluid is required for the prevention and management of constipation (Folden, 2002; Gilding, Weedon, Schofield et al., 1999; Wallis, Gass, St John et al., 2003). Dietary fibre is the part of plants that is not digested in the human stomach and small intestine, with good sources including fruits, vegetables, whole-grain and high-fibre bread, cereal and grain products, legumes and nuts.

Fibre contributes to the increase in stool weight through several mechanisms. The insoluble forms of fibre such as lignin and cellulose (e.g. whole wheat, wheat bran) provide bulk from their undigested components and water-holding capacity (American Dietetic Association, 2008). The slowly fermented, soluble fibres such as psyllium, pectins, gums, oligosaccharides and resistant starch (e.g. fruits, legumes and oat bran) provide bulk through the process of fermentation increasing bacterial cell mass. It should be noted that psyllium seed husk has significant water attracting abilities compared to other fibre types and the presence of psyllium in the diet will contribute to an increased stool weight due to the fraction of undigested psyllium fibre itself, the water it holds and any bacterial cells formed due to any fermentation of psyillium. The combined effect of increasing fibre mass, water and bacterial cell mass is a larger, softer stool with a reduced transit time through the colon (American Dietetic Association, 2008; Anderson & Shepherd, 2003).

Point of Interest

Poor swallowing, poorly fitting dentures and mouth problems may contribute to poor dietary intake and potentially low fluid and fibre intake. Individuals who experience these conditions are likely to suffer from constipation.

5.5 Probiotics/prebiotics

Older adults may have decreased microflora and disturbances in the normal processes of digestion and absorption (Folden, 2002). There is some indication that the combined use of probiotics and prebiotics may be useful in the treatment of constipation by improving the survival and growth of the health-promoting bacteria in the large bowel (Hamilton–Miller, 2004; Topping, Fukushims, & Bird, 2003). The role of healthy bacteria (probiotics) in contributing to a soft bulky stool is an important consideration in the management of constipation. Probiotics are components of normal intestinal flora (usually lactobacilli and bifidobacteria). They ferment undigested carbohydrates (resistant starch) and soluble fibre, and are found in yoghurt and yoghurt drinks as well as special formulated supplements (Floch, 2005).

Prebiotics act as substrates (chemicals acted on and changed by an enzyme in a chemical reaction) for the probiotic bacteria and therefore encourage their growth (Topping, Fukushims, & Bird, 2003). They occur naturally in vegetables, with the best sources of prebiotics being artichokes and onions. Resistant starch (starch not digested and absorbed in the small intestine) provides protection within the starch matrix to resist breakdown in the small intestine by probiotic bacteria. It also provides a substrate for probiotic bacteria to allow fermentation in the large bowel (Hamilton-Miller, 2004; Topping, Fukushims, & Bird, 2003).

Point of Interest

A non-randomised trial of 28 older people investigated the effect of probiotics on constipation. Those receiving the probiotics exhibited a 24% increase in defecation frequency, indicating that probiotics may bring some relief from constipation (Ouwehand, Lagstrom, Suomalainen et al., 2002).

Sairanen (2007) found in a randomised, double-blind cross-over study of two cultured yogurts, one containing fibre, and the other not, that constipation severity was relieved in both groups, however more so in the yoghurt plus fibre group. The observed improvement in both groups was concluded to be the likely result of the probiotics present in both yoghurt mediums (Sairanen, Piirainen, Nevala et al., 2007).

Link to Section 9.2.8

5.6 Assessment of constipation

Individuals with or at risk of constipation should undergo a comprehensive assessment encompassing history and physical examination, with the aim being to identify risk factors for constipation (Gilding, Weedon, Schofield et al., 1999; Harari, 2004).

Good Practice Point

Link to Section 5.7.1.1

It should be noted that some symptoms and signs such as blood in stools, pain associated with defecation etc. may be suggestive of colorectal or anal cancer and should be urgently referred to appropriate medical specialists.

5.6.1 Subjective assessment/history

A subjective history should include:

- presenting symptoms and their duration, including bowel incontinence (flatus, liquid, solids or mucus)
- bowel habits including frequency of urge to defecate, presence of bleeding and pain associated with defecation
- toileting behaviour including straining, sitting position, foot support, manual assistance, time taken to empty, toileting hygiene, and wiping habits (individuals should be encouraged to wipe from front to back to avoid faecal contamination around the urethra, which may lead to urinary tract infections)
- completion of bowel diary (see Table 11 for a sample bowel diary)
- previous management and effect on bowel function
- medical history including recent illness, surgery or lifestyle change
- history of previous investigations e.g. anal manometry, colonoscopy, abdominal x-ray, defaecogram, ultrasound or anal manometry
- current medications
- diet and fluid intake, including ability to chew and swallow high-fibre foods
- cultural beliefs
- complementary medicine
- expectations of treatment

Link to Section 7.1

- cognitive status.

Good Practice Point

People describe symptoms of constipation in many different ways, so health professionals must ask the patient specific questions, derived from the Rome II diagnostic criteria, about the presence of symptoms related to constipation (Locke, Pemberton, & Phillips, 2000; W. Thompson, Longstreth, Drossman et al., 1999). For example:

- *What is the main problem with your bowels?*
- *What is your bowel motion like? Is it loose, soft but formed, hard or hard pellets? Does this vary? Use the Bristol Stool Form Scale.*

Link to Figure 1

- *Do you have difficulty opening your bowels? Do you need to strain? If so, for how long?*
- *Do you ever need to self assist the passage of stool? Do you need to push on the area around your back passage?*
- *How often do you feel as though you haven't emptied your bowel completely?*
- *How often do you feel as though you have a blockage during bowel emptying?*
- *How many times do your bowels open per week?*
- *Do you ever not get to the toilet in time and have a bowel accident?*
- *Do you have any leakage from your back passage of which you are unaware? Is this liquid or solid?*
- *Can you control wind? Are you able to tell the difference between wind and the need to empty your bowels?*
- *Do you have pain associated with opening your bowels?*

(Chelvanayagam & Norton, 2004)

5.6.2 Objective assessment

5.6.2.1 Basic objective examination

A basic objective examination is one that is able to be undertaken by primary level registered nurses and allied health professionals. It includes the following:

- assessing the condition of teeth
- assessing the ability to swallow (a referral to a speech pathologist may be required)
- observation for abdominal distension
- analysis of bowel diary (see Table 11)
- stool colour
- bowel
- pattern of bowel movements.

Good Practice Point

The individual's bowel pattern and dietary intake should be recorded for at least one week using a bowel diary (Chelvanayagam & Norton, 2004). *The best way to encourage a client to identify and describe faecal matter is to use the Bristol Stool Form Scale* (Heaton & Cripps, 1993). *This enables the type and consistency of stool to be graded (Figure 1).*

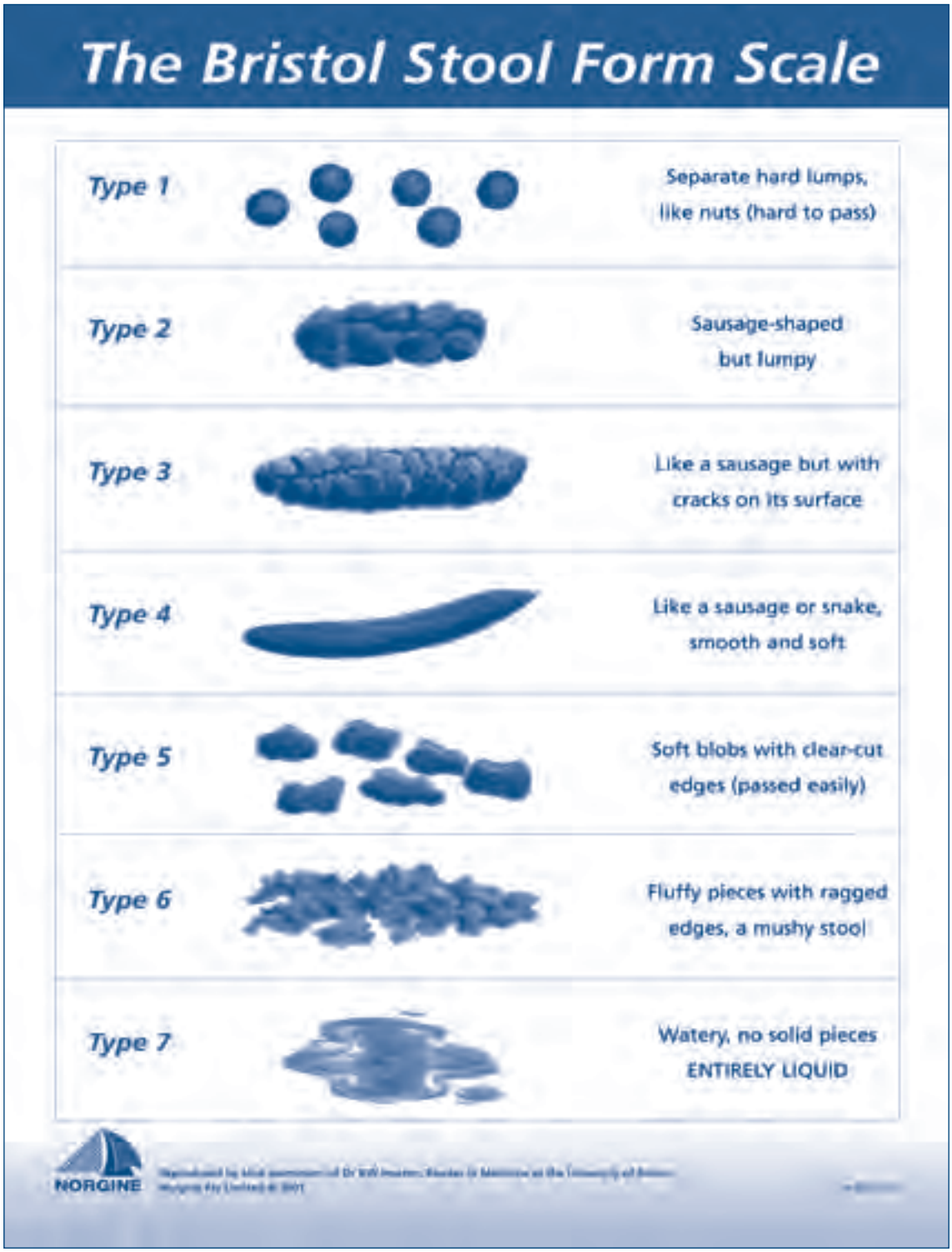
Table 11: Bowel diary

Bowel Diary
Record accurately for 7 days

Name:

Date/Time	Bristol Stool Form Type	Did you feel the urge to go? YES	NO	Accident or soiling	Comments e.g. straining/ digital assist

Figure 1: The Bristol Stool Form Scale



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The Bristol Stool Form Scale identifies 7 types of stool:

- Types 1 and 2 describe hard and lumpy stool
- Types 3 and 4 describe soft formed stool
- Types 5, 6 and 7 describe stools that are soft, runny, or liquid
- Types 3 and 4 are the ideal as they are smooth, soft and easy to pass (Edwards, Dolman, & Horton, 2003).

5.6.2.2 Complex objective assessment

In addition to a simple objective assessment for constipation, a complex objective assessment should also be undertaken by clinicians with specialised training, such as general medical practitioners, continence nurses and continence physiotherapists. It includes the following:

- examination of skin flaccidity and eye pressures (signs of hydration)
- abdominal auscultation for bowel sounds
- abdominal visualisation for distension
- abdominal palpation for hard faecal masses
- digital rectal examination for constipation/impaction
- visual check for haemorrhoids, anal fissures and skin condition
- neurological evaluation – anal reflex (Folden, 2002)
- results of further investigations e.g. colonoscopy, abdominal x-ray, defaecogram, ultrasound or anal manometry.

Continence physiotherapists will also perform an assessment of pelvic floor muscle function to help identify evacuation disorders due to pelvic floor muscle dysfunction.

5.7 Management of constipation

The management of constipation must be individualised according to each person's needs. Individuals with a "neurogenic bowel" (caused by spinal injury, long-term opioid analgesics etc.) may require specialised bowel management programs. Several lifestyle factors may be overlooked when reviewing simple constipation. Sufficient time is required for bowel emptying, and if this is not provided, constipation may result due to more fluid being reabsorbed. A lack of auditory, visual and/or olfactory privacy may inhibit the voluntary passing of faeces.

Other lifestyle factors associated with constipation include inadequate fluid intake, insufficient dietary fibre, a history of laxative usage, sedentary habits, delaying the urge to defecate (Joanna Briggs Institute, 2008) and having a poor sitting position on the toilet. There is evidence showing that dietary fibre influences bowel transit time, faecal weight and bowel movement frequency (Anti, 1998; Joanna Briggs Institute, 2008). A low fluid intake is linked to slow colonic transit and low stool output (Anti, 1998; Joanna Briggs Institute, 2008).

If factors contributing to volume in the abdominal cavity put pressure on the bladder, then it would be accurate to suggest that preventing constipation should be an important factor in the management of urinary incontinence (Morley, 2007). It has long been considered that a high fibre diet in the presence of balanced hydration is essential to the management of constipation (Frizelle & Barclay, 2008; Morley, 2007; Ramkumar & Rao, 2005). However with the aged population and those with particular neurogenic conditions and/or dementia, the ability to consume adequate dietary fibre from a range of dietary sources may be compromised. It may be necessary to include supplements of dietary fibre or appropriate stool softeners as long term strategies for such clients. Pushing a high fluid intake may contribute to urinary incontinence if large boluses of fluids are consumed in a short period of time (Shafiee, Charest, Cheema-Dhadli et al., 2005). It may be necessary to recommend adequate fluids hourly, or a certain limit every few hours to prevent over filling the bladder and /or causing bladder spasm.

Instructing clients on appropriate strategies to improve their intake of dietary fibre and to ensure a good variety and balance between different types of dietary fibres is important.

Lifestyle strategies to help manage constipation include having a good toilet position, adequate exercise, recognising the need to empty the bowels, and making use of the gastro-colic reflex after meals, particularly after breakfast. Maintaining adequate levels of hydration are also important to ensure normal bowel functioning and regular bowel habits. Increasing dietary fibre without ensuring an adequate fluid intake may increase faecal impaction in the immobile elderly (Joanna Briggs Institute, 2008). An adequate stool volume, soft stools and a good gut transit time are important factors for normal bowel function and the prevention of constipation.

5.7.1 Types of constipation

The Gut Foundation of Australia (NSW) has classified constipation into four categories that are useful to consider in relation to the Stepping out of Constipation algorithm (Bolin, 2002).

5.7.1.1 Acute constipation

Acute constipation is recent and sudden in onset and occurs without a change in routine. It may reflect underlying disease, such as hypothyroidism, cancer or neurological disease. Acute constipation requires urgent medical investigation.

Good Practice Point

A review from the American Gastroenterological Association stated that 'Constipation may, in fact indicate a higher risk of colorectal malignancy' (Locke, Pemberton, & Phillips, 2000). It is recommended that patients reporting a recent sudden onset of constipation be referred promptly to their general medical practitioner for medical review (Bolin, 2002).

5.7.1.2 Simple constipation

Simple constipation is short-term constipation. It is related to changes in normal patterns of daily living such as alteration in diet, medication, a change in daily routine, or it may be stress-induced. Management of simple constipation involves step one, with a return to the normal routine, addressing adequate hydration, dietary fibre needs, and physical activity.

Link to Section 5.7.2.1

5.7.1.3 Chronic constipation

Individuals with chronic constipation may have a history of constipation since childhood, or may have experienced a gradual onset in adulthood. Usually the frequency of bowel movement is every two to three days. There may be an underlying physiological cause, although chronic poor diet is also common. The overall best management and prevention of chronic constipation is to aim for a regular bowel habit rather than intermittent bowel "clean-outs" (Joanna Briggs Institute, 2008). This should commence with assessing hydration needs, then dietary fibre and activity levels, where possible.

If adequate levels of hydration do not improve the constipation, then the intake of dietary fibre should be improved. If an adequate target of dietary fibre is unable to be achieved through changes in eating habits, and there is no specific underlying cause for the constipation, then a bulking agent or soluble fibre supplement can be tried (step two). If this strategy still doesn't alleviate the constipation, then small regular doses of stool softeners (e.g. plain coloxyl) or osmotic laxatives (e.g. Movicol, lactulose) titrated to suit the individual's needs should be employed (step three and step four). If these are not effective or not tolerated then stimulant laxatives may be necessary (Joanna Briggs Institute, 2008) (step five).

Link to Section 5.7.2.2

Link to Sections 5.7.2.3, 5.7.2.4 and 5.7.2.5

When extra agents need to be used to alleviate the constipation, bulking agents or soluble fibre supplements (Slavin, Savarino, Paredes-Diaz et al., 2009) are best for ambulant elderly, while osmotic and stimulant laxatives may be more effective for those who are bed-bound (Joanna Briggs Institute, 2008).

5.7.1.4 Severe constipation leading to faecal impaction

Severe constipation involves a long history of infrequent bowel movements (once every two to three weeks). Underlying bowel pathology exists and can include diseases such as Hirschsprung's disease or megacolon. Both high quantities of fibre and stimulants containing anthraquinone are contraindicated in these individuals. Anthraquinone containing stimulants include senna and cascara, and are present in preparations such as Peritone and Nulax. The management of faecal impaction usually requires an initial strategy to clear the rectum using suppositories, enemas or osmotic laxatives. This then should be followed by a bowel management program using preventative interventions such as modifying dietary fibre and fluid intake, education and effective bowel habits. Step two may be required or even steps three and four, often in combination (Bump, Hurt, Fantl et al., 1991). It is recommended that advice be sought from a doctor, continence advisor or stomal therapist if the severe constipation is unresponsive to treatment (Joanna Briggs Institute, 2008).

Link to Sections 5.7.2.2, 5.7.2.3 and 5.7.2.4

R

Recommendation

Management of constipation should follow the 'Stepping out of Constipation' algorithm, according to the classification described by the NSW Gut Foundation.
No attempt should be made by registered nurses, allied health professionals or health-care workers to treat acute constipation before medical screening for an underlying pathology has been undertaken.
Management of simple constipation starts at Step 1. If the constipation does not resolve in three to four days, compliance to recommendations should be checked. Providing compliance has been good, treatment can progress to Step 2 (non-prescription bulk-forming laxatives) if required.
Management of chronic constipation begins at Step 1 and works through to Step 3 and 4 as required.
Management of severe constipation (faecal impaction) involves Step 3 (plain coloxyl) and Step 4 (osmotic laxatives) following an initial bowel clearance strategy (Sanburg, McGuire, & Lee, 1996). Once the bowel has been cleared, the prevention strategies in Step 1 should be explained and encouraged and Step 2 may also be required on an ongoing basis.

Level of evidence: ***4***
Grade of recommendation: ***D***

Link to Figure 2

5.7.2 The Stepping out of constipation algorithm

The Stepping out of constipation algorithm is a seven-step guide for the lifestyle and pharmacological management of constipation.

Stepping out of Constipation

Fibre

Will be of value in the case of:
- Most patients
- Mild Haemorrhoids
- Irritable bowel syndrome
- Anterior mucosal prolapse
- Rectocoele

Will be of limited value (unpredictable response) in the case of:
- Primary megacolon
- Long-established megacolon
- Severe impairment of neurological control

Unless the patient has a recognised cause for their constipation (e.g. drug therapy), they should be commenced on Step1 of this ladder for the prevention or treatment of constipation, ensuring an adequate trial is given for each step before progressing down the ladder. In acute constipation, start at Step 5 or 6. Once constipation is resolved, move back up the ladder to Step 1, possibly combined with one medication from Steps 2 – 4.

Specific Treatment

Steps

1. *Exercise – Fluid Intake – Fibre in Diet*
2. *Bulk-Forming Laxatives*
3. *Stool Softeners*
4. *Osmotic Laxatives*
5. **Stimulants**
6. **Suppository**
   Enema
7. **Colonic lavage**

Acute

1 Coffee, tea or alcohol are not substitutes for water. Their action as diuretics decreases fluid levels, limiting their usefulness.

a 2-4 week period of Step 1 should be tried before initiating laxative therapy.

2 Low-osmolarity hydrocolloids eg [1]Isphagula husk, [2]Psyllium hydrocolloid
Dissolved in water. **Dose** as per manufacturer's instructions
Onset: 2 to 3 days
*Some examples: [1]Fybogel, [2]Metamucil,

3 Docusate sodium 120mg
Dose: Two tablets at night increasing if required
Onset: 1 to 5 days
*Some examples: Coloxyl 120

4 [1]Sorbitol or [2]Lactulose solution, [3]Polyethylene glycol/electrolytes
Dose: ~20mL initially three times daily. Maintenance dose once daily
Onset: Dose dependent – within 6 hours[1,2], 2 to 3 days[3]
*Some examples: [1]Sorbilax, [2]Actilax, [2]Duphalac, [3]Movicol

Magnesium sulphate(Epsom salts)
Dose: 5g to 10g daily or twice daily **Onset:** 2 to 6 hours
These are more appropriate than stimulants for long-term management

5 [1]Sennosides (alone or in combination – tablets or granules)
Dose: 15 – 30mg sennosides once or twice daily
Onset: 6 – 12 hours
[2]Bisacodyl Dose: 5 – 10mg daily **Onset:** 6 – 12 hours
*Some examples: [1]Senokot, [1]Ford Pills, [2]Bisalax, [2]Durolax
Safety limited to short-term use due to adverse effects such as colonic neural damage

6 Glycerin suppository **Dose:** one as needed **Onset:** 30 minutes
[1]Bisacodyl suppository 10mg **Dose:** 1 – 2 in the morning as needed **Onset:** 15 – 60 minutes
[2]Docusate/soap/glycerin enema **Dose:** one rectally as needed **Onset:** 10 – 20 minutes
Warm water enema **Dose:** 100 – 200mL **Onset:** immediate
*Some examples: [1]Bisalax, [1]Durolax, [2]Enemax, [2]Microlax

7 Polyethylene glycol/electrolyte solutions **Dose:** 1L per hour (usually 3L) **Onset:** 30 minutes
*Some examples: ColonLYTELY, Glyco-Prep
Avoid in rectal impaction

Major Causes of Constipation

To prevent constipation, commence the patient at:

1 Drugs*

Opiates ..... **Steps 2, 3 or 4**
eg:
Morphine
Codeine
For infrequent or low dosing.
Step 5
For regular dosing.

Anticholinergics ..... **Step 1**
also
Antidepressants
Antipsychotics
Antihistamines
Especially increasing fluid intake

Diuretics ..... **Step 1**
eg:
Thiazides
Frusemide
Spironolactone
Increasing fluid intake where necessary. Aggravate constipation via fluid loss and dehydration

Resins ..... **Step 1**
eg:
Cholestyramine

Others
eg:
Iron] ..... **Step 2**
Verapamil]

Methyldopa ..... **Step 1**

* For further information, or examples of other implicated medications, consult relevant texts or your pharmacist.

2 Physiological
Dehydration
Insufficient bulk
Starvation
Decreased physical activity

3 Psychological
Avoidance of urge to 'go'
Depression
Emotional stress

4 Mechanical
Carcinoma
Diverticulitis
Haemorrhoids (Piles, Fissures)
Neurological diseases

5 Other
Forced bed rest
Poor dentition

*** The list of trade-names is not exhaustive and is for example only. No recommendation intended.**

Stepping Out of Constipation-an Educational Campaign. ***Australian Journal of Hospital Pharmacy Practice*** **1996;26 (3) :351-5**

Figure 2: Stepping out of constipation algorithm

The stepping out of constipation diagram shows the seven levels of intervention which can be used to manage constipation. It must be remembered that faecal impaction requires medical intervention initially, followed by implementation of the stepping out of constipation steps to prevent constipation and faecal impaction from recurring.

For the prevention of constipation, start at Step 1. Give each step adequate time to trial, before moving further down the triangle.

For the treatment of constipation, agents in Steps 4, 5 or 6 may be required. Once constipation is resolved, try to move back up the triangle (Sanburg, McGuire, & Lee, 1996). Colonic lavage (Step 7) is not common practice in the community setting.

5.7.2.1 Step one: Fluids, fibre and exercise

Link to Section 11.5.2 and 5.7.4

A nutritious diet, with sufficient fibre and fluid is essential. Information on fluids is covered in Section 11.5.2 of this guideline. Table 12 in Section 5.7.4 indicates sources of fibre.

Regular exercise is encouraged. Exercise is an integral feature of bowel management programs, and lack of physical activity is a factor in the development of constipation in some people. Its effectiveness as an intervention to prevent or treat constipation has, however, yet to be demonstrated (Joanna Briggs Institute, 2008).

Allow two to four weeks for this step to work, ensuring there are bowel actions in this time period. If this does not resolve constipation, move to step two.

Link to Section 10.3

Referral to a dietitian is indicated when:

- compliance with initial dietary advice does not begin to resolve constipation within a two to four week period
- the individual has any condition requiring specialist dietitian management, such as diabetes, cardiovascular disease, coeliac disease, food intolerance, advanced renal disease, malnutrition or cancer
- an individual is significantly overweight or obese.

Link to Section 10.3

Referral to other members of the multidisciplinary team may also be appropriate at this stage.

Colonic Massage

Colonic massage may be used successfully to aid peristalsis and promote faecal evacuation (Kyle & Prynn, 2007), however there is little evidence to support its use either on its own or in combination with exercise in constipated people (Joanna Briggs Institute, 2008). Slow massage relieves muscle tensions, thereby improving blood circulation and lymphatic drainage. Different degrees of pressure may be used as each person has their own need and preference.

Good Practice Point

Placing hands gently on the abdomen, begin massage in a clockwise circular motion with a pressure that is well tolerated by the individual, being careful to avoid excessive pressure over the pubic area where the bladder is situated. Move from the lower right side of the abdomen, up, across and down the left side of the abdomen. This follows the direction of transit from the area of the appendix to the ascending, transverse and descending colon. Use two hands, one after the other (Kyle & Prynn, 2007).

5.7.2.2 Step two: Bulk forming laxatives

Like fibre, bulk forming laxatives increase the bulk of the bowel contents, thus stimulating contraction of bowel muscles. Adequate fluid intake must be maintained when using bulk-forming laxatives, otherwise they can worsen constipation. In the older immobile individual, it is better to use osmotic or stimulant laxatives instead of bulking agents (World Gastroenterology Organisation). Allow one to three days for these to establish regular bowel motions.

5.7.2.3 Step three: Stool softeners

These agents soften bowel motions by increasing the amount of lubricant and fluid secreted into the bowel. They are best used when a hard stool mass is present, or to prevent excessive straining. Lubricants are one form of stool softeners. Allow one to five days for these to work.

5.7.2.4 Step four: Osmotic laxatives

These agents draw fluid into and retain fluid in the large intestine. The resulting bulk stimulates bowel movement. Allow two to six hours for these to work.

5.7.2.5 Step five: Stimulants

These agents stimulate gut movement via an indirect irritant effect. Sometimes they can cause abdominal cramps. Prolonged use is not recommended as they can lead to a non-functioning colon. Stimulants therefore have a limited role in the treatment of chronic constipation. Allow six to twelve hours for these to work.

5.7.2.6 Step six: Suppositories and enemas

These agents act locally by various methods to promote evacuation. They should not be used routinely. Rather, they should be reserved for acute situations. Allow fifteen to thirty minutes for these to work.

Examples of medications to manage constipation are shown in Tables 13 and 14 in Section 5.7.5.

5.7.2.7 Step seven: Colonic lavage

Large volume enemas (tap water, phosphate) should only be used when all other conservative measures have failed. Their onset of action is rapid and unpredictable, and frequently they result in abdominal cramping and watery stools. Associated risks include electrolyte disturbances and rectoanal trauma. Retrograde colonic irrigation (bowel wash out) has been proven to be effective in some children with neurogenic disorders of the bowel (Wiesel & Bell, 2004).

Point of Interest

A prospective study in older hospitalised patients used education on the 'Stepping out of Constipation' algorithm to change laxative prescribing habits. At the end of the four-month survey period, over a 100% increase in prescription of bulk-forming laxatives (Step 2), and almost a 70% increase in prescription of stool softeners (Step 3) occurred. There was a 23% decrease in the prescription of stimulant laxatives (Step 5), a 37% decrease in suppository/enema use (Step 6) and a 15% decrease in colonic lavage (Step 7) (Sanburg, McGuire, & Lee, 1996)**.**

Good Practice Point

Effective treatment of constipation, and prevention of recurrence, requires a multi-disciplinary team approach. It is important that the individual has an understanding of the factors that increase the risk and what can be done to minimise the risk. The individual should be encouraged to adhere to the suggested treatment plan (Gilding, Weedon, Schofield et al., 1999).

Recommendation

Assessment and management of constipation should be undertaken in individuals with urinary incontinence.

Level of evidence: ***3***
Grade of recommendation: ***D***

Supporting evidence

It has been demonstrated that alleviating constipation in elderly adults improves their lower urinary tract symptoms. One study used various bowel preparations to eliminate constipation in a group of ambulatory and cognitively intact men and women aged 65-89 years. Some had co-morbidities such as Parkinson's disease, cardiovascular disease, diabetes, pelvic organ prolapse, benign prostate enlargement and stable prostate cancer. Treatment of constipation involved use of laxatives, with dosage adjusted until satisfactory bowel movements were reported. Lower urinary tract symptoms were monitored for four months and included symptoms of urgency, frequency, altered urine stream and a sensation of incomplete emptying. After successful treatment of constipation, there were significant reductions in post-void residual volumes, the number of subjects with bacteriuria episodes, and a reduction in the number with acute urinary retention episodes (Charach, Greenstein, Rabinovich et al., 2001).

Link to Section 4.7

5.7.3 Fluids

Restoring normal hydration levels by increasing fluid intake is one means of managing constipation.

Recommendation

For constipation management, total fluid intake should be established at 1500 mL/24 hours as a minimum (British Dietetic Association, 2006) unless contraindicated, before steps to increase fibre intake occurs. If the fluid intake alone does not alleviate the constipation then steps should be taken to increase the daily fibre intake. Any increase in fibre intake should be accompanied by further increases in fluid (Joanna Briggs Institute, 2008) up to at least 2000 mL/24 hours (Anti, 1998; Folden, 2002). Consumption of small volumes of fluids throughout the day, rather than intermittent large drinks, is more likely to promote good hydration (Shafiee, Charest, Cheema-Dhadli et al., 2005).

Level of evidence: ***4***
Grade of recommendation: ***D***

Point of Interest

Both foods and fluids contribute to an individual's fluid intake, with approximately 1000 mL being derived from liquid drinks and approximately 300-500 mL from foods containing liquids (Hashim & Abrams, 2008)**.**

The risk of dehydration in the elderly is of real concern however there may be cases where an individual is consuming an excessive fluid intake and with the background of a low sodium intake, this can put them at significant risk of hyponaetremia and significant diuresis as the body tries to normalise its electrolyte levels (Berl, 2008).

5.7.4 Fibre

For adults (excluding pregnant and lactating females) the adequate intake for dietary fibre has been set as 25 g per day for women and 30 g per day for men aged 19 years and above. These figures are based on the median for dietary fibre intakes in Australia and New Zealand from the 1995 National Nutrition Survey of Australia (Australian Bureau of Statistics, 1995, Updated Dec 2006) and the 1997 National Nutrition Survey of New Zealand (Russell, Parnell, & Wilson, 1999).

Increasing adult intake of dietary fibre to 25 g per day for women and up to 30 g per day for men is considered the most effective treatment for all forms of constipation due to its influence on faecal bulk and consistency (NHMRC, 2006). However, specific recommendations for the older person have not been published. The position of the American Dietetic Association is that a safe recommendation would encourage intakes of 14 g dietary fibre per 1000 kcal (4200 kJ) (American Dietetic Association, 2008). In practice this may translate to only 20 g of dietary fibre per day and this may not be enough to prevent and manage constipation. Additional high fibre snacks and/or fibre supplements may need to be added to the dietary regimen (Joanna Briggs Institute, 2008).

If it is established that a client's intake of fibre is inadequate then the introduction of a variety of fibres needs to be gradual over time and maintained at the level most desirable to allow normal bowel function. This is to avoid discomfort, abdominal bloating and allow the person to get used to the new dietary regimen (American Dietetics Association, 2008).

Recommendation

25-30g of dietary fibre per 24 hours should be encouraged. Steps to increase fibre intake should be gradual, occurring over days or weeks, depending on individual tolerance (Registered Nurses' Association Ontario, 2005; Spinzi, 2007).

Level of evidence: ***4***
Grade of recommendation: ***D***

Dietary fibre has been defined by Food Standards Australia New Zealand (FSANZ) as the fraction of the edible parts of plants or their extracts, or synthetic analogues (inulin, fructo-oligosaccharides and polydextrose), that are resistant to digestion and absorption in the small intestine, usually with complete or partial fermentation in the large intestine. Dietary fibre includes polysaccharides, oligosaccharides (degree of polymerisation > 2) and lignins, and promotes one or more of the following beneficial physiological effects:

(i) laxation (defecation, a bowel movement)

(ii) reduction in blood cholesterol

(iii) modulation of blood glucose (p 45, NHMRC, 2006).

Dietary fibre has both a protective and therapeutic role in conditions such as hiatus hernia, diverticular disease and haemorrhoids due to its laxative effect. These conditions may also be affected by adequacy of fluid ingestion. Dietary fibre is considered the most effective treatment for all forms of constipation due to its influence on faecal bulk and consistency (NHMRC, 2006).

In order to determine the appropriate targets for dietary fibre, the presence or absence of clinical symptoms had to be considered. This is because there is no biochemical marker that can be used to determine dietary fibre needs. Therefore FSANZ chose to use the clinical symptoms such as adequate gastrointestinal function and adequate laxation rather than the reduction of risk for chronic disease.

The food fibre guide (Table 12) provides information on sources and approximate quantities of fibre per average serve.

Table 12: Food fibre guide

Food Fibre Guide

Fruits	Serving size	Total fibre (g)
Apple, unpeeled	1 medium	3.0
Avocado	½	3.8
Banana	1 medium	1.8
Blueberries, fresh/frozen	½ cup	2.1
Dates, dried	3	4.3
Grapes	10	0.5
Kiwi fruit	1 medium	1.5
Orange, fresh	1 medium	2.2
Pawpaw, fresh, cubed	½ cup	1.5
Peach, fresh, unpeeled	1	1.7
Pear, fresh, unpeeled	1 medium	4.6
Pineapple, diced	½ cup	0.7
Prunes, dried	5	3.1
Raisins, seedless	¼ cup	1.6
Rock melon, fresh, cubed	½ cup	0.6
Strawberries	½ cup	1.3
Watermelon, fresh, cubed	½ cup	0.3

Grain Products	Serving size	Total fibre (g)
Bread roll, hard	1 small	0.8
Bread, white or Italian	1 slice	0.8
Bread, whole wheat	1 slice	2.5
Bread, rye	1 slice	0.7
Bun, hamburger	1	1.0
Cereal, high fibre	½ cup	8.1
Cereal, regular	1 cup	0.7-1.2
Cookies, shortbread	4	0.4
Crackers, savoury	4	0.3
Doughnut, plain	1	0.3
Ice-cream cone	1	0.1
Muffin, English	1	1.7
Noodles, chow mein	1 cup	1.5
Pancake, 10 cm diameter	2	0.8
Pasta, macaroni, spaghetti	1 cup	
Rice, cooked	½ cup	0.4
Taco shell	1	0.7
Wheat germ	¼ cup	3.9

Vegetables	Serving size	Total fibre (g)
Asparagus, canned or fresh	½ cup	1.7
Bean sprouts	½ cup	0.8
Beans, cooked or raw	½ cup	1.5
Broccoli, cooked or raw	2 stalks	1.8
Brussel sprouts	½ cup	3.2
Carrot, sliced	½ cup	1.9
Cauliflower, cooked or raw	½ cup	1.2
Celery, diced, cooked or raw	½ cup	1.1
Corn, whole kernel	½ cup	1.6
Cucumber, unpeeled	½ cup	0.5
Lettuce, fresh, shredded	1 cup	0.7
Mushrooms, fresh, pieces	½ cup	0.3
Onion, raw, chopped	½ cup	1.2
Pepper, green or chilli, chopped	½ cup	0.9
Potato, french fries	10 strips	1.1
Spinach, raw	2 cups	2.3
Potato/pumpkin peeled	½ cup	1.4
Potato, unpeeled	1 medium	4.1
Sweet potato peeled	½ cup	3.0
Tomato, canned or fresh	½ cup	0.8

Legumes	Serving size	Total fibre (g)
Beans, kidney, canned	½ cup	4.5
Lentils	½ cup	2.9
Peas, green, canned or frozen	½ cup	3.0

Nuts and Seeds	Serving size	Total fibre (g)
Almonds, roasted with skin	22 whole	2.5
Cashews, roasted	18 medium	1.3
Peanuts	30-40 whole	1.9
Popcorn	1 cup	0.8
Pumpkin seeds	1 tbsp	0.8

(Marlett & Cheung, 1997)

Points of Interest

A fibre intake of 20g/day of wheat bran is frequently recommended as a starting dose. Poor tolerance as a result of bloating, flatulence and distension limits the applicability of this recommendation, and this strategy is not recommended. Alternate sources of fibre include cereals, fruits such as prunes, raisins, apples, and vegetables such as beans, peas, spinach, or supplements. Adherence to recommended dietary changes is, however, usually limited (Bosshard, Dreher, Schnegg et al., 2004).

While a lack of mobility contributes to constipation, it is not possible to conclude whether the opposite (increased levels of physical exercise) would benefit elderly people with existing constipation. Findings from observational studies support encouraging increased physical activity where feasible (Bosshard, Dreher, Schnegg et al., 2004). Allowing adequate time for a bowel motion and developing a regular bowel routine may also be beneficial in preventing constipation.

Link to Section 5.8.1

Good Practice Point

Dehydration is generally accepted as a potential risk factor for constipation, and has been associated with slowed transit time in some observational studies. However, data regarding the benefit of increased fluid intake is lacking (de Lillo & Rose, 2000; Joanna Briggs Institute, 2008; Spinzi, 2007). Simplistic recommendations to increase fluid intake may increase the potential risk of fluid overload in frail elderly people experiencing congestive heart failure or renal failure. It must be highlighted that when increasing the fibre intake in the elderly, if fluid isn't increased the elderly clients may be at risk of faecal impaction (Joanna Briggs Institute, 2008).

5.7.5 Laxatives

Laxatives are another means of managing constipation. However, they should not be regarded as the first or only line of management for constipation. Section 5.7.2 details the "stepping out of constipation" algorithm to assist clinicians in dealing with constipation in a stepwise manner.

Table 13 provides a quick reference when considering the time that may elapse before evacuation may occur following the administration of various classes of laxatives. Consult the comprehensive Table 14 to ascertain the effect of individual agents.

Table 13: Class of laxatives and time to effect

Class and time to effect	
bulking agents	
oral, 48–72 hours	
osmotic laxatives	
e.g. glycerol, lactulose, sorbitol	*oral*, 24–72 hours *rectal*, 5–30 minutes
e.g. polyethylene glycol or saline laxatives	*oral*, 0.5–3 hours *rectal*, 2–30 minutes
stool softeners	
oral, 24–72 hours; *rectal*, 5–20 minutes	
Stimulant laxatives	
oral, 6–12 hours; *rectal*, 5–60 minutes	

(Australian Medicines Handbook, 2008)

Table 14: Commonly used laxatives

Constituent(s), form and preparation [NB1]	*Dose*	*Approximate time to onset*
Bulk-forming laxatives—oral formulations: Bulk-forming agents should be taken with adequate fluid		
ispaghula powder (Fybogel)	**adult:** 1 sachet or 1 teaspoon **[NB2]**, twice daily	usually 24 hours, but 2 to 3 days to achieve full effect
psyllium husk dry + multiple additional components (Bioglan Psylli-Mucil Plus, Enterocare)	**adult:** 1 teaspoon in water before breakfast or at bedtime **[NB3]**	usually 24 hours, but 2 to 3 days to achieve full effect
psyllium powder (Metamucil)	**adult:** smooth texture orange: 1½ teaspoon **[NB2]**, 1 to 3 times daily **regular:** 2 teaspoons, 1 to 3 times daily **orange:** 3 teaspoons, 1 to 3 times daily	usually 24 hours, but 2 to 3 days to achieve full effect
psyllium + maize starch powder (Nucolox)	**adult:** 2 teaspoons **[NB2]**, 1 to 3 times daily	usually 24 hours, but 2 to 3 days to achieve full effect

Constituent(s), form and preparation [NB1]	*Dose*	*Approximate time to onset*
psyllium seeds (Nature's Own Psyllium Seeds)	**adult:** 2 capsules, twice daily	usually 24 hours, but 2 to 3 days to achieve full effect
wheat dextrin (Benefiber)	**adult:** 2 teaspoons in water, up to 3 times daily [max 6 teaspoonsful/day]	usually 24 hours, but 2 to 3 days to achieve full effect
Osmotic laxatives—oral formulations		
lactulose syrup (Actilax, Duphalac, Genlac, GenRx, Lac-Dol, Lactocur)	**adult:** 15 to 30 mL, once daily	1 to 2 days
macrogol 3350 (13.125 g) with electrolytes (Movicol) [NB4]	**adult:** 1 to 2 sachets, each sachet dissolved in 125 mL water, once daily ***For faecal impaction:*** **adult:** 8 sachets in 1 L water over 6 hours, maximum 3 days treatment	2 to 4 days
macrogol 3350 (6.56 g) with electrolytes (half-strength) (Movicol Half) [NB4]	**adult:** 2 to 6 sachets, each sachet dissolved in 60 mL water daily ***For faecal impaction:*** **adult:** 16 sachets in 1 L water over 6 hours, maximum 3 days treatment	2 – 4 days
magnesium sulfate (Gold Cross Epsom Salts)	**adult:** 15 g in 250 mL water	1 hour
macrogol 3350 powder (with electrolytes) (ColonLYTELY, Glycoprep, Glycoprep-C) [NB4]	**adult:** 2 sachets dissolved in 2 L water, drink over 2 hours (ColonLYTELY) or 1 sachet dissolved in 3 L water, drink over 2 hours (Glycoprep). *(For Glycoprep-C, see product information)*	1 hour
sorbitol liquid (Sorbilax)	**adult:** 20 mL once daily initially, increasing to 3 times daily if required	2 to 3 days
sodium phosphate (Fleet Phospho-soda Buffered Saline Mixture)	**adult:** 45 mL diluted in 125 mL water, followed by 1 L water; repeat after 12 hours if necessary	30 minutes to 6 hours
sodium picosulfate 7.5 mg/mL (Durolax SP)	**adult:** 10 drops once daily at night increasing to 20 drops if required	8 to 12 hours
sodium picosulfate 10 mg + magnesium carbonate + citric acid (Picolax)	Dissolve 1 sachet in 120 mL water: **adult:** 60 to 120 mL	up to 3 hours
sodium picosulfate 10 mg + magnesium oxide 3.5 g + citric acid 12 g (PicoPrep, Prep Kit-C)	**adult:** 1 sachet in 250 mL water, 1 to 2 times daily [NB3]	2 to 3 hours

Constituent(s), form and preparation [NB1]	*Dose*	*Approximate time to onset*
Osmotic laxatives—rectal preparations		
sodium citrate + sorbitol + sodium lauryl sulfoacetate enemas (Microlax)	**adult:** 5 mL rectally	30 minutes
sodium phosphate enemas (Fleet Ready-to-Use Enema) *(See product information for warnings re metabolic disturbances)*	**adult:** 133 mL as single dose rectally	2 to 5 minutes
Stool-softeners—oral preparations		
docusate tablets 50 mg, 120 mg (Coloxyl)	**adult:** 240 mg, once daily	1 to 3 days
Stimulant laxatives—oral preparations		
bisacodyl 5 mg tablets (Bisalax, Durolax, Lax-Tab)	**adult:** 1 to 2 tablets, once daily	6 to 12 hours
senna extract 33 mg + multiple herbal components (Healthstream Swedish Bitters)	**adult:** 1 teaspoon [NB2], before meals	6 to 12 hours
senna leaf 8% with dried fruits (Nulax)	**adult:** 10 g, once daily at night	6 to 12 hours
senna leaf 284–300 mg + multiple herbal components (Healthstream Herbal, Healthstream Prune and Senna complex, Herb-A-Lax, Herbal Laxative, Lax-Active)	**adult:** 1 to 2 tablets, once daily	6 to 12 hours
senna powder 50 mg + multiple herbal components (Blackmore's Peritone)	**adult:** 1 tablet, twice daily	6 to 12 hours
sennoside B 5.5 mg/g granules (Senokot)	**adult:** 1 to 2 teaspoons [NB2], once daily	6 to 12 hours
sennoside B 7.5 mg tablets (Sennetabs, Senokot)	**adult:** 2 to 4 tablets, once daily	6 to 12 hours
sennosides A and B 12 mg chocolate squares (Laxettes with Sennosides)	**adult:** 1 to 3 squares, once daily at bedtime	6 to 12 hours
sennosides A and B 12 mg tablets (Laxettes with Senna)	**adult:** 1 to 3 tablets, once daily at bedtime	6 to 12 hours
sennosides A and B 12 mg capsules (Bioglan Prune and Senna)	**adult:** 2 capsules, once daily at bedtime	6 to 12 hours
sennosides A and B 20 mg tablets (Bekunis Senna)	**adult:** 1 to 2 tablets, once daily at bedtime	6 to 12 hours

Constituent(s), form and preparation [NB1]	*Dose*	*Approximate time to onset*
Stimulant laxatives—rectal preparations		
bisacodyl 2 mg/mL enemas (Bisalax Micro-enema)	**adult:** 1 micro-enema, daily	15 to 60 minutes
bisacodyl 10 mg suppositories (Bisacodyl, Durolax, Fleet, Petrus)	**adult:** 1 suppository, daily	15 to 60 minutes
Stimulant combined with bulk-forming laxatives—oral preparations (Bulk-forming laxatives should be taken with adequate fluid)		
frangula + sterculia granules (Normacol Plus)	**adult:** 1 to 2 heaped teaspoons, once or twice daily	6 to 12 hours
various stimulant herbal components + psyllium powder (H Bio-Juven Vascurem 2, Herb-A-Lax, Herbal Laxative, Herbclens Herbal Laxative)	**adult:** 1 tablet, up to 3 times daily [NB3]	6 to 12 hours
Stimulant combined with stool-softening laxatives—oral preparations		
sennosides A and B 8 mg and docusate 50 mg (Chemists' Own Natural Laxative with Softener; Coloxyl with Senna, Sennesoft, Soflax)	**adult:** 1 to 3 tablets [NB3], once daily at bedtime	6 to 12 hours
Stimulant combined with stool-softening laxatives—rectal preparations		
bisacodyl 10 mg + docusate sodium 100 mg suppositories (Coloxyl)	**adult:** 1 suppository, once daily	15 to 60 minutes
Lubricant laxatives—oral preparations		
liquid paraffin suspension [NB5] (Agarol)	**adult:** 15 to 30 mL, once daily at least 2 hours before lying down	2 to 3 days
liquid paraffin [NB5] (Parachoc)	**adult:** 40 mL, once daily at least 2 hours before lying down	2 to 3 days
Lubricant laxatives—rectal preparations		
glycerol suppositories 0.7 g (infant size); 1.4 g (child size); 2.7 g (adult size) (Glycerin, Glycerol suppositories BP)	1 suppository of appropriate size, daily	5 to 30 minutes

Constituent(s), form and preparation [NB1]	*Dose*	*Approximate time to onset*

NB1: Trade names are provided in this table solely to assist with identification. Their inclusion does not imply recommendation of any individual product. The list is as complete as possible at the time of writing.

NB2: 1 level teaspoon = 5 mL medicinal measuring spoon.

NB3: Recommended dose may vary between brands; check individual product information for further detail.

NB4: Macrogol is the recommended International Non-proprietary Name (rINN) for polyethylene glycol (PEG).

NB5: Prolonged use of liquid paraffin can cause deficiency of fat-soluble vitamins. Liquid paraffin should not be used in infants, or in children at risk of aspiration from reflux.

(Therapeutic Guidelines, March 2009)

Point of Interest

Although laxatives are used widely, there are a number of potential interactions that may need to be borne in mind – especially when considering a laxative for a person taking regular medications. It is important to have an awareness of the potential risks that may be associated with what may seem to be a "safe" addition to a medication regime. Table 15 is provided as an alert and also provides some recommendations for avoiding these potential interactions.

For appropriate risk evaluation or further advice, it maybe necessary to contact a pharmacist or medical practitioner.

Recommendation

It is advised that any new medications, including laxatives and complementary medicines, that are added to a medication regime be done only with appropriate advice from the general medical practitioner or pharmacist. This will ensure that potential drug reactions are avoided, and optimal dosing regimes are utilised.

Level of evidence: ***1***
Grade of recommendation: ***A***

(Australian Medicines Handbook, 2008; Bicopoulos, 2008; MIMS Australia, 2009)

Table 15: Potential interactions of laxatives with other medications

Laxative Class or Medication	*Mechanism*	*Potential interacting medication*	*Potential effect*
All classes – generally when overused	May reduce serum potassium	Digoxin	Increase sensitivity to effects of digoxin
	May alter serum potassium	Diuretics – including Potassium sparing diuretics eg Spironolactone	Interfering with potassium balance
bisacodyl enteric-coated tablets	Antacids may increase gastric pH; administration within one hour of bisacodyl tablets may cause the enteric coating to dissolve too rapidly, resulting in gastric or duodenal irritation	Antacids or Histamine H2-receptor antagonists	May result in gastric or duodenal irritation
Bulk forming laxatives	Physical binding or absorption hindering. Allow 2 hours interval between laxative and medication administration	Most medications can be affected. Important medications to consider include Aspirin, Digoxin, Warfarin	Reduced effect of medication
Lactulose	Antacids inhibit reduction in faecal pH which reduces effect of lactulose	Non-absorbable antacids (eg PPI's)	Combination causes reduction in laxative effect
Magnesium containing laxatives	Reduced antibiotic absorption by chelation	Ciprofloxacin	Reduced antibiotic effect Ciprofloxacin should be taken 2 hours before or 6 hours after laxative
	Magnesium can alter effectiveness	Digoxin, phenothiazines especially chlorpromazine	Reduced effectiveness of medication – concurrent use best avoided
	Magnesium – containing laxatives have been found to prevent absorption of oral etidronate	Etidronate	avoid using magnesium-containing laxatives within 2 hours of etidronate
	Combination may result in non-absorbable complexes	Tetracyclines, oral	Laxative should not be taken within 1-3 hours of antibiotic

Laxative Class or Medication	*Mechanism*	*Potential interacting medication*	*Potential effect*
Liquid Paraffin	Combination may increase absorption of liquid paraffin	Stool softeners	Space doses at least 2 hours apart
	Concurrent use with liquid paraffin may rarely interfere with the proper absorption of these or other medications and reduce their effectiveness	Fat soluble vitamins & Warfarin	Reduced effectiveness of vitamins (supplement or dietary) and warfarin
	Decreases absorption of vitamin K	Warfarin	May lead to increased anticoagulant effects
Sodium phosphate	Additive effects on electrolytes	Diuretics	Increased risk of electrolyte abnormalities and acidosis
Sodium picosulfate	Laxative may flush medication from GI tract reducing absorption	Medications taken within 1 hour	Reduced effectiveness of medication
Stool softeners	Enhancing the absorption or hepatic cell uptake of other medications		Possibility of increasing toxicity of medication
Trade names are provided in this table solely to assist with identification. Their inclusion does not imply recommendation of any individual product. The list is as complete as possible at the time of writing.			

(Bicopoulos, 2008).

5.8 Good habits for bowel emptying

5.8.1 Timing for bowel emptying

The movement of faeces is facilitated by the gastrocolic and duodenocolic reflexes (Harari, Gurwitz, & Minaker, 1993; Leslie, 1990). The most effective time to empty the bowel is when the urge to defecate is first experienced, commonly first thing in the morning or following a meal. Adequate time to defecate is necessary; however, excessive sitting for lengthy periods of time is not recommended.

Recommendation

Individuals should be encouraged to go to the toilet to empty their bowels when the urge is first experienced.

Level of evidence: ***4***
Grade of recommendation: ***D***

5.8.2 Positioning for bowel emptying

Correct positioning on the toilet is essential to open the bowels effectively. The lower spine should be in a neutral position, so the anorectal angle is as straight as possible.

Recommendation

Individuals should be given instruction as to how to sit on the toilet to empty their bowels:

- *lower back straight, not slumped*
- *legs comfortably apart with the feet supported*
- *lean forward and rest on thighs or knees.*

Level of evidence: ***4***
Grade of recommendation: ***D***

(Sapsford, Hodges, Richardson et al., 2001)

Link to Section 11.5.4.1 Hovering over the toilet should be discouraged.

Figure 3: Good sitting position for bowel emptying

Good Practice Point

Having the legs comfortably apart may require lower limb garments to be pulled down to the ankles so that the thighs are not pulled towards each other. The individual may lean forward, back or remain upright depending on what position allows the bowels to open with the least amount of effort. Some individuals find it useful to have the knees raised higher than the hips with the use of a small footstool. In this case, it is important that the footstool be stowed away behind the toilet to avoid it being a safety hazard, and its use should be discouraged for those who have mobility, balance, or other medical issues where leaning forward to arrange its position may not be safe. If the foot stool is too high, it may encourage slumping of the lower spine, making it more difficult to effectively evacuate the bowel.
It is important that the individual who chooses to lean forward on the toilet has sufficient balance to do so. If grab rails are present, advise that these may be used for balance. It is important to consider surgical history in the elderly individual, as leaning forward in a sitting position is contraindicated with certain types of hip replacement.

5.9. Privacy and dignity

Dignity should be maintained when managing incontinence. Control of one's body, and the attitudes and behaviours of others influence the perception of self-dignity (Baillie, 2007). Privacy for personal hygiene becomes more important as people grow older, and helps to maintain a sense of dignity. This has major implications for older people using public restrooms, especially if they have bladder or bowel problems, and may affect decisions as to whether to go out or to stay home resulting in isolation (Muller, 2005). Bowel elimination in close proximity to others may cause an individual to suppress the urge to defecate because of embarrassing sounds and smells (Hall, 1995).

The need for privacy should be balanced against minimizing any risk such as a fall during defecation (Akpan, Gosney, & Barrett, 2006).

Recommendation

Clinicians need to be aware of and promote olfactory, visual, and auditory privacy issues.

Level of evidence: ***4***
Grade of recommendation: ***D***

6. Risk, economic and environmental factors associated with urinary incontinence

6.1 Admission to residential care

A lack of caregiver support may be an important factor in causing or exacerbating urinary incontinence, particularly among elderly women who live alone and who lack the appropriate assistance to help them remain continent (DuBeau, Simon, & Morris, 2006).

It is widely acknowledged that urinary incontinence increases the risk of admission to residential care, so availability of caregiver support is an important factor to consider in the management of urinary incontinence. It has also been demonstrated that incontinent older people in hospital, who had previously lived at home, are more at risk of discharge to residential care than their continent counterparts (Aditya, Sharma, Allen et al., 2003).

6.2 Carer strain

Link to Section 7.1 and 7.2

Caring for an individual with urinary incontinence can cause high levels of carer burden and stress. As discussed in Section 7, a person with incontinence risks losing social status and valued social roles. Their carers also share this risk. Whether paid or unpaid, carers are undertaking work which can be devalued because it entails management of smelly and unpleasant matter. To avoid embarrassment, full-time carers may also avoid social occasions, and risk social isolation along with the incontinent person (Brittain & Shaw, 2007). In addition, they may face mental and physical demands due to continence management. For example, a timed toileting program requiring an individual to be toileted two hourly could impact markedly on the carer in terms of escorting the individual to and from the toilet, providing toileting reminders, cleaning up after accidental urinary losses, and having greater laundering concerns. Nothing undermines caregiver coping more than physical fatigue (Upton & Reed, 2005).

Good Practice Point

Clinicians should consider the physical and social impact on carers when implementing continence management programs, and assess the willingness and ability of the carer to participate in such a program.

Link to Section 4.14

6.3 Depression

A clear association between depression and urinary incontinence has been demonstrated in older people, with the emotional impact appearing to be stronger for men than for women (Fultz, Rahrig Jenkins, Ostbye et al., 2005). The common (but incorrect) belief that incontinence is 'normal' for women, may dissuade incontinent men and women from seeking medical intervention, with incontinent women seeing no need to treat a 'normal' condition (Umlauf, Goode, & Burgio, 1996), and incontinent men reluctant to acknowledge a 'female' condition (Fultz, Rahrig Jenkins, Ostbye et al., 2005; Gammack, 2004; L. Wilson, 2003a).

Depressive symptoms and emotional distress are significantly more likely to be reported by adults with, than without, urinary incontinence (Dugan, Cohen, Bland et al., 2000) and the severity of depressive symptoms correlates positively with the severity of incontinence (Gammack, 2004).

Good Practice Point

Depression is still under-diagnosed and under-treated in the elderly population. Improving depression and increasing attention to personal care are essential elements in a multifactorial approach to the management of urinary incontinence (Gammack, 2004).

Recommendation

Women with moderate to severe urinary incontinence should be screened for co-morbid major depression and offered treatment if depression is present (Melville, Delaney, Newton et al., 2005).

Level of evidence: ***4***
Grade of recommendation: ***D***

In a prospective study, it was found that depression was consistently associated with both overactive bladder (OAB) and stress urinary incontinence. The association between OAB and depression appeared to depend largely on the presence of the physical morbidities. However, there was evidence to suggest that depression may accompany the onset of stress urinary incontinence independently (McGrother, Donaldson, Hayward et al., 2006). Similarly, a Japanese study indicates a link between overactive bladder and depressive tendency in elderly people, although it is unclear whether the depressive tendency is caused by the overactive bladder symptoms or vice versa (Ikeda, Nakagawa, Takemoto et al., 2006). It has also been suggested that urge urinary incontinence has a greater impact on quality of life in women with, as opposed to without, a history of depression, partly due to the fact that depression affects their perception of control of their bodies.

Good Practice Point

Women with a history of depression may gain additional benefit from the use of biofeedback in the management of their urinary incontinence, as it assists in the perception of control of the symptoms and self-concept (Tadic, Schaefer, Griffiths et al., 2006).

Point of Interest

One study of data collected from 4987 couples in the ongoing US Health and Retirement Study examined the impact of urinary incontinence on the emotional state of partners and found that men whose wives were incontinent reported significantly more depressive symptoms than did men whose wives were continent. The same study found no relationship between depressive symptoms and a husband's continence status for female respondents (Fultz, Rahrig Jenkins, Ostbye et al., 2005).

6.4 Economic impact

It is well recognised that incontinence has a financial impact on the individual and the government. The Australian Quadriplegic Association surveyed 200 of its members in 1998 and found that, on average, each individual was spending about $20 per fortnight on continence products, over and above the funding received from national and state subsidy

schemes (K. Moore, Ho, Lapsley et al., 2006). Another 1998 Australian study estimated the costs of urinary incontinence for women in the community to be $710 million, comprising $339 million on treatment costs and $372 million on personal costs (Australian Institute of Health and Welfare (AIHW), 2006). The latest research estimates that the monetary costs of urinary and faecal incontinence in Australia in 2003 totalled $1.5 billion (Australian Institute of Health and Welfare (AIHW), 2006).

It is also well known that incontinence is one of the main contributing factors for admission into residential care, which has cost implications for the individual, the organisation providing the residential care bed and the government which funds aged care places. A review of literature evaluating the cost components of incontinence in aged care facilities, found data addressing the cost of nurse time, laundry services and incontinence products. However, only a few studies addressed the cost of treatment of incontinence using medication, the cost of treating complications of incontinence, and the hypothetical costs associated with institutional placement of individuals who might otherwise live at home if they were continent (K. Moore, Ho, Lapsley et al., 2006).

Implementing the best practice recommendations of this guideline may well have staffing implications for the organisations involved, with an associated cost implication. Best practice necessarily involves thorough assessment, planning and implementation. After a period of time, evaluation and review must occur. Therefore, a minimum of two contact sessions are required with the individual client. Optimal outcomes also require timely, holistic interventions by members of the multidisciplinary team.

By investing time and resources in continence assessment and management, individuals are less likely to be at risk of associated symptoms and admission to aged care facilities, both of which have a financial impact on the health and aged care budgets.

The choice of disposable or reusable continence aids may be influenced by the ongoing costs of continence products, and individuals should be made aware of the financial cost of products when discussing continence management. Prescription of continence products should only be undertaken following the completion of a comprehensive assessment, implementation of a management plan, and evaluation of the intervention, so that the most appropriate continence product is recommended to the individual.

Some individuals find that their incontinence is such that it impacts on their ability to find and retain paid employment. Men with an overactive bladder plus incontinence were significantly more likely than women to report that their bladder problems had an impact on their daily work, including worrying about interrupting meetings, decisions about work location and hours, and voluntary termination or early retirement (Irwin, Milsom, Kopp et al., 2005).

Conversely, some people seek part time work to supplement their income so they can afford the continence products they require (K. Moore, Ho, Lapsley et al., 2006). Some family carers may be restricted in their employment due to the need to manage the urinary incontinence or lower urinary tract symptoms of their loved one, and may spend their own income subsidising continence products. As Moore (2006) states “Their (people with neuropathic disease) incontinence carries a tremendous burden of disease. This burden extends to the families who care for them at home. Such families provide 24 hour care, in changing their pads/bed linen/adult diapers. These care requirements also have a major financial impact upon the families of the affected patients... the lack of adequate subsidy imposes further distress to the families concerned”.

6.5 Environmental impact

Continence products are becoming increasingly environmentally friendly. However, there is a need to consider the impact of such products on the environment. Such considerations include:

- Chemicals used in manufacture
- Carbon emissions related to manufacture
- Biodegradability of the product
- Disposal methods
- Access to appropriate disposal methods
- Laundering requirements – cold or hot water, machine or hand washable
- Laundering products required
- Access to water for laundering of reusable products
- Ease of drying the product without tumble drying.

Increasing concerns regarding climate change makes environmental considerations of greater importance when selecting an appropriate continence aid.

A search of the literature found only one article relating to disposal of continence products, and this was an English study exploring waste disposal for individuals with stomas (Swan, 2001). As the waste disposal systems are different in England (where yellow clinical waste bags appear to be provided to some households) when compared to Australia, the findings cannot be extrapolated to Queensland.

6.6 Falls

A number of studies have examined the relationship between lower urinary tract symptoms (LUTS) and falls in older community-dwelling people and a clear link has been demonstrated. The following findings have been reported:

- The prevalence of urinary incontinence was significantly greater in people who fall (48.2%) compared to those who do not fall (35.9%) ($p<0.01$) (de Rekeneire, Visser, Peila et al., 2003)
- Subjects with urinary incontinence were 70% more likely to suffer from recurrent falls compared to subjects who were continent (Tromp, Pluijm, Smit et al., 2001)
- The presence of urinary incontinence was one of the factors most strongly associated with recurrent falls (Tromp, Smit, Deeg et al., 1998)
- The prevalence of urinary urgency was 70% greater in individuals with recurrent falls than in those without falls (Luukinen, Koski, Kivela et al., 1996)
- The risk of falls increased by 26% in a group with urinary urge incontinence or mixed urinary incontinence, compared with a group who were continent (Brown, Vittinghoff, Wyman et al., 2000)
- Nocturia was associated with an increased risk of falls (Massolt, Wooning, Stijnen et al., 2005)
- One episode of nocturia increased the risk of falling by 80% and three or more episodes increased the risk by 120% (Stewart, Moore, May et al., 1992)
- Urge urinary incontinence and abnormal daytime sleepiness are reversible factors associated with increased risk of falling in older women (Teo, Briffa, Devine et al., 2006).

Good Practice Point

It is important that medical and other health professionals involved in falls prevention in the older population screen for and treat urge urinary incontinence as part of a holistic management approach (Teo, Briffa, Devine et al., 2006).

Point of Interest

When an individual with urge urinary incontinence experiences urgency, his/her attention is divided between preventing urine leakage and safely getting to the toilet. Greater attention given to the task of preventing urinary leakage may result in insufficient attention to obstacles and lead to falls (Teo, Briffa, Devine et al., 2006).

6.7 Presentation to acute care

Urinary incontinence, if not assessed and/or managed in the community setting, may result in presentation to an acute care facility, usually to an emergency department, where the individual will be triaged and possibly categorised as "not being an emergency". It is therefore understandable that individuals who present with urinary incontinence to acute care facilities quite often spend extended periods waiting, resulting in frustration and an inability to access the specialist support that is required for their continence management. If incontinence is appropriately assessed, treated and managed in the community, the potential for emergency department presentation by people with symptoms such as delirium, dehydration, UTI and stool impaction may be avoided.

6.8 Reduced fluid intake

Link to Section 4.7

A common strategy for managing urinary incontinence, used by community dwelling individuals, is to reduce fluid intake. As detailed in Section 4.7, there are many adverse effects of limited fluid intake. Monitoring fluid intake over the day is important to ensure the minimum fluid requirements are met. However, individuals may safely be able to reduce their fluid intake at certain times during the day (eg when going on social outings where toilets may not be accessible) as long as they make up for their individual fluid requirements at other times in the day, when access to toilets are not a problem. Thus, fluids shouldn't be reduced unless the plan is to make up for this reduction somewhere within the 24 hour period. Deliberately limiting fluids without the intention of compensating later should be discouraged unless the general medical practitioner or medical specialist has indicated otherwise (Berl, 2008).

6.9 Excessive fluid intake

The risk of dehydration in the elderly is of real concern. However, there may be cases where an individual is consuming an excessive fluid intake and with the background of a low sodium intake, this can put them at significant risk of hyponaetremia and significant diuresis as the body tries to normalise its electrolyte levels (Berl, 2008).

6.10 Skin breakdown

Link to Section 13.1

With ageing, the skin changes in a number of ways. It is cooler due to less small blood vessels, paler due to less pigment, and is thin and loose and no longer fits. Indeed, it has been said that it "behaves like a worn-out garment". It tends to become dry scaly and rough. Similarly, a number of skin functions diminish with age, including its barrier function, immune response, cell renewal and healing after trauma, vascular response, sebum and sweat production, thermoregulation, elasticity, feeling and vitamin D production (Runeman, 2008).

Skin exposed to urine and/or faeces is readily affected by other factors such as:

- The microclimate (moisture, temperature and pH)
- Mechanical effects (pressure, abrasion and friction)
- Biochemical effects (fungi, bacteria, irritants, enzymes) (Runeman, 2008).

Urinary and faecal incontinence, unless appropriately managed, can cause perineal skin breakdown, which may be characterised by erythema (redness of the skin), oozing, vesiculation (blistering), pain or itching, crusting in groin, perineum and buttocks region (Nix, 2006), and dermatitis (Farage, Miller, Berardesca et al., 2007; Gray, Bliss, Doughty et al., 2007; Hanson, Macejkovic, Langemo et al., 2006; Nazarko, 2007; Voegell & Voegell, 2008).

Moisture from incontinence alters the skin's protective pH and increases the permeability of the stratum corneum (the outer layer of the skin) (Nix, 2006). Normal skin has an acid mantle that creates a barrier to protect the body from micro-organism invasion. When faecal and urinary incontinence are combined, the pH becomes alkaline because urea is converted to ammonia in the presence of faecal bacteria (Hanson, Macejkovic, Langemo et al., 2006). The need for frequent cleansing can lead to further pH changes and damage from friction (Nix, 2006). Skin moisture can also lead to friction/abrasion, cell loss, penetration, and the growth and activity of micro-organisms (Runeman, 2008).

Because of the intensity and length of exposure to the irritant effect on perineal skin integrity, perineal skin care requires timely and appropriate cleansing and protection that minimizes or prevents exposure of the skin to urinary or faecal incontinence. Use of an appropriate product is a key to any successful skin health program (Nix, 2006). However, overuse of creams and powders may cause skin breakdown. They may also interfere with the absorbency of a continence product, and the effectiveness of the adhesives on urinary sheaths.

Skin irritation can be avoided by provision of preventive and individualised care, minimising contact with faeces and exposure to moisture, minimising shear forces, and promoting a healthy skin, which includes ensuring adequate food and nutrients in the diet (Runeman, 2008).

Skin integrity needs to be considered when selecting continence products. Application and removal of the product may cause a shearing effect, and blistering may occur if adhesive tabs are applied directly to the skin.

For more detail around the management of skin care refer to Section 13.1 "*Skin health and continence products"* in the 2nd steps clinical practice guideline (Queensland Health (MASS), 2008).

6.11 Sleep disruption

Sleep disruption is a risk for people with lower urinary tract symptoms (Gibbs, Johnson, & Ouslander, 2007). Individuals who are up frequently during the night do not have the chance to enter rapid eye movement (REM) sleep. Lack of sleep can cause individuals to be less alert, more fatigued, and less able to concentrate, to problem solve, and to be responsive to others in their lives. These symptoms can in turn lead to a greater risk of falls, poor decision making and relationship difficulties.

6.12 Social isolation

A risk of embarrassment, fear of an incontinent episode, poor self esteem, reduced self confidence, inappropriate continence management strategies, depression linked with incontinence: each of these can contribute to the risk of social isolation in an incontinent individual, due to a reluctance or unwillingness to go out in public. Such individuals may have poor nourishment and a low overall health status, as their incontinence prohibits them from shopping for the necessities of life, and accessing available health services.

The importance of access to public toilets is underlined by a number of surveys in which many older people state that they would be more active if they were confident of being able to access public toilets (Holmes, 2008).

Social isolation may also be imposed on the individual. A partner may not wish to share the bed any more. Family and friends may choose not to visit, due to the smell of urine in the house, or unwanted exposure to continence products. Small grandchildren may not want to sit on the knee of a person with wet clothing.

Link to Section 6.2

The impact of social isolation on the carer should also not be underestimated. In order to avoid stigmatising incidents, carers may avoid social occasions and risk the same isolation as that experienced by the person for whom they are caring (Brittain & Shaw, 2007).

Good Practice Point

Clinicians need to assess the impact of incontinence on the social well-being of the individual and their carer, and ensure that management of urinary incontinence addresses any concerns regarding social isolation.

Link to Section 7

The psychosocial impact of urinary incontinence is covered in greater detail in Section seven of this guideline.