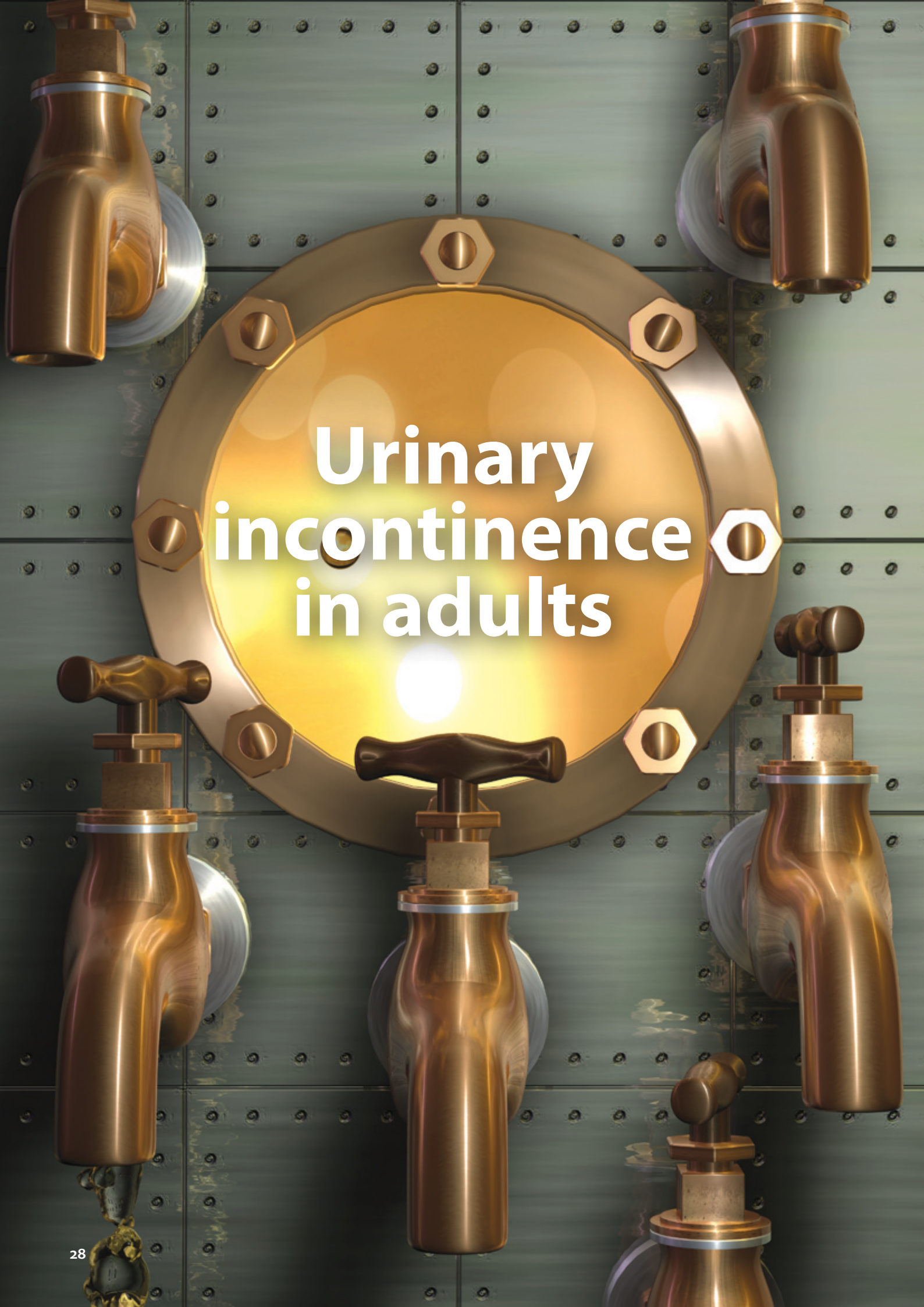

Urinary incontinence in adults

Managing urinary incontinence goes beyond just treating the medical condition. For the patient, the social and psychological impact of incontinence can far exceed the extent of the clinical problem. Incontinence can lead to depression, sexual dysfunction and social isolation. Once the type, cause, severity and impact of the patient's incontinence are determined, management involves exercise programmes and lifestyle changes. Pharmacological and surgical interventions are then considered if lifestyle intervention is insufficient.

General practice plays an important role in managing urinary incontinence

Urinary incontinence is defined as self-reported involuntary leakage of urine.[1] Incontinence is usually associated with ageing, childbirth or menopause. However, incontinence can occur secondary to conditions such as heart failure, stroke, multiple sclerosis and diabetes; as a result of trauma or after surgery; and as an adverse effect of some medicines, such as loop diuretics.

Approximately 10% of people experience urinary incontinence at some point in adulthood, and incidence increases with age.[1] Incontinence is approximately six times more common in females than in males.[1] This means that incontinence is often viewed as a condition exclusive to females. However, incontinence is prevalent in certain groups of males, such as those who have undergone any prostate surgery.

The impact of urinary incontinence on a patient's quality of life can be significant. Most complications of incontinence are psychosocial, including depression, feelings of shame, loss of self-confidence, lower perceived sense of wellbeing, social isolation, sexual dysfunction and financial difficulties (due to the cost of pads, bedding, laundry and reduced ability to work).[2] Loss of sleep, and falls and fractures (due to hurrying to the bathroom) are also often reported.[2]

Treatment initially focuses on lifestyle changes and behavioural interventions, such as pelvic floor muscle exercises and bladder training. If these are ineffective, pharmacological treatments can be trialled, depending on the type of incontinence. Surgical options are available for some types of urinary incontinence, particularly stress incontinence, if conservative treatments are unsuccessful.

The prognosis for people with urinary incontinence depends on the type of incontinence, the severity, the underlying cause(s), any contributing factors and the individual's motivation for treatment. However, most incontinence can be substantially improved even where it cannot be "cured".

Urinary incontinence in females

Urinary incontinence in females is usually divided into: stress incontinence, urgency incontinence, mixed incontinence, overactive bladder and overflow incontinence. Stress and urgency incontinence account for 90% of all cases of incontinence in females.[2]

The most significant risk-factors for incontinence are older age and previous pregnancy with a vaginal delivery.[2] Obesity and having a family history of incontinence also increase the likelihood of developing incontinence.[2]

Types of urinary incontinence

Stress incontinence is defined as leakage associated with physical activity or increased intra-abdominal pressure, such as coughing, sneezing or rising from a chair.[5] It occurs in 25 – 45% of females aged over 30 years.[5] It is caused by atrophy or damage to the pelvic floor muscles, ligaments or fascia. This is usually associated with childbirth and menopause (See: "Pelvic organ prolapse", Page 33).

Urgency incontinence is leakage associated with, or immediately after, the sudden need to void (termed urgency). The volume of urine lost is variable, and total emptying of the bladder, known as complete incontinence, may occur. Urgency incontinence occurs due to detrusor muscle overactivity. This overactivity may be neurogenic, secondary to an underlying pathology or idiopathic. Neurogenic overactivity of the bladder can result from any condition that causes loss of neurological control, most commonly stroke, multiple sclerosis, spinal cord injury or spina bifida.[5] Secondary causes of incontinence include urinary tract infection (UTI), sexually transmitted infections (STI), interstitial cystitis, atrophic vaginitis, bladder diverticula or prior pelvic radiation or surgical treatment. Idiopathic overactivity is poorly understood, but occurs with ageing, and is closely linked with overactive bladder syndrome.

Overactive bladder syndrome is a largely idiopathic urological condition comprising urgency, frequency and, often, nocturia.[6] Urgency incontinence with no known cause is often referred to as overactive bladder. However, in people with overactive bladder, urgency and frequency can occur without any resulting incontinence. The frequency of voiding will generally be more than eight times per day.[2] The cause of overactive bladder is not well understood, but loss of neurological control of the detrusor muscle activity is thought to contribute to the condition.[6] Overactive bladder is managed in the same way as urgency incontinence.[2]

Mixed incontinence is defined as a combination of stress and urgency incontinence, and occurs in approximately one-third of females with incontinence.[1] Mixed incontinence becomes more common with age as multiple disease states begin to occur, e.g. idiopathic urgency incontinence begins to develop in a woman with a weak pelvic floor that is causing stress incontinence. Management should follow the individual management of each type of incontinence, but with a focus on the dominant type.[2]

Overflow incontinence occurs when there is obstruction at the bladder neck or an impairment of detrusor contractility, so that leakage occurs from an over-filled bladder, often without urgency. It is more commonly seen in males. Overflow incontinence can be caused by urethral obstruction, prolapse of the pelvic organs, neurological damage and conditions that can reduce sensation in the bladder, such as stroke, multiple sclerosis and diabetes.

Other forms/causes of incontinence include:

- **Functional incontinence** occurs when cognitive or physical impairments prevent the patient from voiding independently and appropriately
- **Post-void dribbling** is leakage occurring after voiding due to urine remaining in the urethra
- **Urogenital fistula**, where a passage opens between the bladder/urethra and the vagina, bypassing the urethral sphincter. Urogenital fistula can cause complete incontinence. Among women in the developed world, this occurs most often due to complications from gynaecological surgery, e.g. hysterectomy.

How does the bladder work?

The bladder is a muscular reservoir for urine that sits behind the pubic symphysis. A normal bladder in an adult holds between 300 – 600 mL of urine.[3] When healthy, bladder function is controlled by coordination between musculoskeletal and neurological inputs.[3]

Neurological control of the bladder is bi-phasic, operating like a switch: alternating between storage or voiding.[4] The neural pathways controlling voiding are complex and involve the brain, spinal column and peripheral ganglia. These pathways involve autonomic (sympathetic and parasympathetic) and somatic nerves (via the pudendal nerve). N.B. Acetylcholine is one of the neurotransmitters of the parasympathetic pathways which mediate detrusor contraction, so this is why anticholinergic medicines are used to stabilise the bladder.

Damage to any of these structures or neural pathways can lead to incontinence.[4] Afferent and efferent nerve fibres involving bladder control are mainly located at the S2–S4 spinal nerve levels (but also involve the T11–L2 spinal segments),[4] so spinal cord injuries at the sacral level often affect continence. The frontal lobes of the brain provide inhibitory input, suppressing inappropriate bladder voiding,[4] therefore incontinence can result from damage to the frontal lobes, such as in people who have had a stroke or with dementia. Surgical procedures involving the urogenital system, such as prostatectomy in males, may damage the adjacent external urethral sphincter or the urethra itself, leading to incontinence.

In healthy person, voiding is under conscious control, and relies on learned behaviours that develop during childhood.[4] Mechanical control of continence involves the muscles and connective tissue surrounding the bladder.[3] The bladder neck and pelvic floor musculature work together to increase outflow resistance to a point where it is greater than the outflow pressure created by the resting bladder.[3] Acute spikes of pressure also occur with daily activities, such as coughing, standing up and laughing. If the pelvic floor muscles have sufficient tone, the guarding reflex increases urethral pressure as outflow pressure increases, maintaining continence. If the outflow resistance is less than these spikes of pressure, such as when pelvic floor support is lost, leakage occurs. Outflow pressure also increases when the detrusor muscles contract. This occurs consciously during normal voiding, but may also occur unconsciously with overactivity in the bladder, causing incontinence.

History and examination

As urinary incontinence is initially diagnosed based on the patient's report of symptoms, the focus of the history and examination should be on assessing the patient to determine the type, underlying factors, severity and impact of their incontinence.

Red flags in patients with urinary incontinence are listed on Page 38.

Patient history

Enquire about the following factors when taking a patient history:[7]

- Frequency of voiding
- Frequency of leakage (how many times per day, how many days in a typical week) and the volume of urine leaked
- The triggers associated with leakage, i.e. does leakage occur when the patient laughs? When they are lying flat in bed?
- The use of pads or other protective devices
- Diet and fluid intake, including caffeine and alcohol intake
- Lower urinary tract symptoms, e.g. UTI symptoms, post-void dribbling, needing to urinate again immediately after voiding[1]
- Other genitourinary symptoms, e.g. urogenital or abdominal pain, discomfort, haematuria, other discharge
- Constipation and faecal incontinence/soiling*
- Sexual function (i.e. psychosocial effects of incontinence)
- Past history of: bladder surgery, hysterectomy, childbirth (including number of births and mode of deliveries), previous UTI, previous STI
- Medicine use (see: "Medicines that may cause incontinence", over page)
- Smoking status**

* The rectum and bladder share similar neural pathways, and dysfunction of one often leads to dysfunction in the other, either neurologically or mechanically.

** Cigarette smoking is associated with bladder overactivity, is thought to be a bladder irritant and causes chronic cough, which may weaken the pelvic floor over time, and will directly influence the severity of stress incontinence.[8]

Determining the type of incontinence

At this point in the assessment the type of incontinence is likely to be apparent.

The following incontinence types are more likely depending on when the leakage of urine occurred:[2]

- Stress urinary incontinence – when coughing, sneezing, laughing, lifting or exercising
- Urgency incontinence, with or without overactive bladder syndrome – sudden urgency, often accompanied by frequency and nocturia, particularly if the patient is in bed and lying still (i.e. there is no stress)
- Mixed incontinence – both types of symptoms are present

If incontinence is not associated with the above causes (which will be rare), consider:[2]

- Chronic urinary retention associated with bladder overflow incontinence or a bladder outlet obstruction – voiding difficulty (hesitancy, straining to void, poor or intermittent urinary stream, and post-void dribbling)
- Fistula (vesicovaginal, urethrovaginal or ureterovaginal – constant passive leakage of urine and often complete incontinence
- Urethral diverticulum – post-void dribbling, frequency, dyspareunia and dysuria, particularly in a woman with recurrent UTI

A urethral diverticulum is an out-pouching of the urethra of uncertain aetiology. It most commonly occurs in females aged 30 – 60 years. Urine stagnates in this pouch and can predispose the patient to recurrent infections. If the diverticulum is large, it may cause bladder outlet obstruction. Over time, chronic inflammation may lead to malignant transformation of the cells lining the urethral diverticulum.[12]

Examination

The physical examination should be aimed at identifying any underlying or contributory causes to the type of incontinence identified from the history, and include:[1]

- An assessment of the patient's general health status, particularly looking for impaired mental status (i.e. confusion, signs of dementia), obesity and reduced mobility/dexterity
- Consideration of the presence of systemic conditions that may be contributing to incontinence, e.g. uncontrolled diabetes

Medicines that may cause, contribute to or worsen incontinence[9, 10]

Medicine class	How it causes incontinence
Sympathomimetics, e.g. pseudoephedrine	Tightening of the urinary sphincter can cause urine to be retained, leading to overflow incontinence
Alpha blockers, e.g. doxazosin	Relaxes the urinary sphincter and urethra; potentially causing stress incontinence
ACE inhibitors, e.g. cilazapril	Can cause cough and worsen stress incontinence
Tricyclic antidepressants, e.g. amitriptyline	Anticholinergic effect can interfere with bladder contraction and cause constipation leading to urinary retention and overflow incontinence
Antihistamines, e.g. promethazine	Anticholinergic effect as above
Antipsychotics, e.g. haloperidol, risperidone, quetiapine	Anticholinergic effect as above, and can also reduce physical mobility and cause abrupt urgency incontinence
Calcium channel blockers, e.g. diltiazem	Interfere with bladder contraction and worsen constipation leading to urinary retention and overflow incontinence
Diuretics, e.g. furosemide	Increase urine production, potentially worsening all types of incontinence
Vitamin and mineral supplements, particularly iron	Can cause constipation and urinary retention leading to overflow incontinence[11]
Opioids, e.g. oxycodone	Can interfere with bladder contraction and worsen constipation leading to urinary retention and overflow incontinence
Sedatives, e.g. diazepam	Can slow mobility and cause urgency incontinence

- Abdominal examination for masses, including an enlarged bladder (suggests potential urinary retention)
- Cough stress test (if stress incontinence is present)
- Pelvic examination – perineum and external genitalia including tissue health, signs of oestrogen deficiency, vaginal examination with a speculum for pelvic organ prolapse, bimanual pelvic and anorectal examination for pelvic masses and pelvic floor muscle function and tone

Cough test for stress incontinence

Stress urinary incontinence in females should ideally be confirmed with examination. To assess whether stress incontinence is present, ask the patient to lie flat on their back and cough. Observe the external urethral meatus for leakage during the first cough. The absence of leakage does not rule out stress urinary incontinence.

Pelvic examination

Perform a visual and digital examination of the vagina to assess for masses, structural abnormalities and for evidence of pelvic organ prolapse, using bivalve and Sims speculums (See: "Pelvic organ prolapse").[2] During the digital examination, feel for a soft, tender mass on the anterior vaginal wall and look for urethral discharge or tenderness, which may indicate urethral diverticulum.

The patient's pelvic floor musculature should ideally be assessed.[2] Insert a finger into the vagina and ask the patient to tense their pelvic floor muscles: assess both the strength and endurance of the muscle tone. This can give a baseline from which to measure the effectiveness of treatment. It is also useful to ensure that the patient is contracting the correct muscles, if they are going to begin pelvic floor muscle exercises while waiting for referral to a specialist physiotherapist or nurse.

Clinicians who are experienced with assessing incontinence may grade muscle tone using a scale such as the Oxford Grading system. Further information about this is

available from: **http://cks.nice.org.uk/incontinence-urinary-in-women#!scenarioclarification**

Additional examination

Further examination may be carried out as indicated by the patient's symptoms and signs. A focused neurological examination may be appropriate to assess the likelihood of a neurological condition causing incontinence, e.g. recent stroke, multiple sclerosis.

Investigations

Dipstick urinalysis should be performed to assess for haematuria, glycosuria and signs of infection.[2]

Serum creatinine is usually not necessary, but may be considered if the patient has recurrent UTI, urinary retention or renal obstruction is suspected.

The patient should be asked to keep a bladder diary.[2] The diary should cover three days and document the amount and types of fluids consumed, how frequently they void, any episodes of urgency, any episodes of incontinence and pad/clothing changes.[2] A bladder diary has been shown to be a reliable method of quantifying frequency, incontinence and measuring response to treatment.[2]

The normal volume of urine passed in each voiding is between 200 – 400 mL, and the generally accepted average voiding frequency is four to eight times daily, including one void per night.[2]

An example of a bladder diary is available from: **www.continence.org.nz.**

Further testing (below) may be necessary once the bladder diary is completed, at a follow-up consultation. Some of these tests may need to be carried out in a secondary care setting.

Post-void residual bladder volume should be assessed in patients with significant voiding symptoms, recurrent UTI, symptomatic pelvic organ prolapse (See: "Pelvic organ prolapse") or bladder distension.[1, 7] This should be done with a bladder ultrasound, which will require referral for those practices without a bladder scanning device (bladder scans may not be routinely available in some regions).[7] In-out catheterisation may also be used to measure residual urine volume in bladder, but should only be considered where bladder scanning is unavailable, or if urinary retention is noted during the examination.[7]

Pelvic organ prolapse

Pelvic organ prolapse is a frequent cause of urinary incontinence. It usually occurs following pelvic floor damage in childbirth, but can be multi-factorial, resulting from loss of support from the vagina, the pelvic floor musculature and connective tissue, as well as damage to the involved neurological system.[13]

Traditional terms for describing pelvic organ prolapse (e.g. cystocoele, urethrocoele, rectocoele, enterocoele) have generally been replaced. This is because the older terms imply a level of certainty about the structures causing the vaginal bulge, particularly in females who have had previous pelvic organ prolapse surgery. Current practice is to use terminology that divides the pelvis into anterior, posterior and middle or apical compartments.[13]

These terms refer to:[14]

- Anterior – the front wall of the vagina has herniated inward, usually caused by the bladder or/and urethra shifting position and placing pressure on the vaginal wall. This term includes the possibility of a cystocoele, urethrocoele and cystourethrocele.
- Posterior – weakening of the musculature and connective tissue or damage to the rectovaginal septum causes the rectum to herniate into the vagina. This term includes the possibility of a rectocoele or enterocoele.
- Apical – the tissue supporting the uterus weakens and the uterus slips downward, placing pressure on the vagina; usually associated with trauma in childbirth
- Vaginal vault prolapse – the roof of the vagina collapses, usually following hysterectomy (will also have an enterocoele present)[13]

Any pelvic organ prolapse is then staged based on the maximum prolapse descent seen when the patient performs a Valsalva manoeuvre. To clarify where the prolapse originates, a Sims speculum examination should be used. Referral to a Gynaecologist or Urologist is likely to be necessary for further evaluation and treatment.

Urodynamic testing may be used in secondary care.[7] Urodynamic testing measures how well the bladder and urethra store and release urine. The test usually records flow rate, residual urine, capacity and can identify involuntary spasm prior, during or after voiding that leads to leakage.

Pad testing, Q-tip testing, Bonney and Fluid-Bridge tests are not recommended for assessing urinary incontinence.[7]

Managing urinary incontinence in females

Women with most types of incontinence are initially managed with pelvic floor muscle exercises and lifestyle modifications. Pharmacological and surgical treatments then differ based on the type of incontinence.

General advice for all females with incontinence

The first step should be to recommend and offer support for weight loss for any patient with a BMI of ≥ 30 kg/m^2, as there is evidence of improved continence following weight loss.[2]

Other lifestyle advice focuses on reducing modifiable factors that may contribute to incontinence, such as:

- Avoid excessive fluid intake and drinking late at night. N.B. Some patients may overcompensate or try to control incontinence by reducing fluid intake below a normal level, which should be discouraged.
- Reduce caffeine and alcohol intake – as both have a diuretic effect and may increase frequency
- Avoid constipation by eating a varied diet and ensuring an adequate fibre intake (prescription of psyllium husk powder may be useful) – constipation and faecal incontinence can exacerbate urinary incontinence.
- Stop smoking (this may have the additional benefit of reducing coughing)
- Increase physical activity, starting with very light exercise in individuals with stress incontinence – increased cardiovascular fitness has been shown to reduce incontinence in some females[8]

Managing stress incontinence

As almost all stress incontinence in females is due to poor muscle tone in the pelvic floor muscles, exercises to strengthen these muscles are an essential part of treatment.[2] If this is ineffective or inappropriate, surgical options may then be considered. Pharmacological treatments are not routinely used for stress incontinence.

Pelvic floor muscle exercises are first-line

Pelvic floor muscle exercises are an effective treatment for stress incontinence. Females undergoing these exercises are more likely to report cure or improvement, better quality of life, fewer leakage episodes per day and have less urine leakage.[15]

Referral to an appropriate practitioner (such as a Continence Adviser, Nurse Specialist in urogynaecology or Physiotherapist specialising in women's health) for an assessment of the appropriateness of a supervised programme of pelvic floor muscle exercises is recommended. This programme should last for at least three months, be individualised and include instruction on correct technique and a programme of at-home exercise.[2]

The patient may be given advice on how to start the exercises while they wait for their referral (see: "Pelvic floor muscle exercises").

After twelve weeks of exercises the patient's pelvic floor muscle tone and the impact on incontinence should be reassessed. Any patient who shows benefit should be encouraged to continue the exercises two to four times per week.[2]

A list of continence health professionals by region is available from the New Zealand Continence Association: **www.continence.org.nz/pages/Continence-Service-Providers-for-adults-and-children/20**

Surgical and medical interventions

If the initial treatment with regular pelvic floor muscle exercises is unsuccessful, consider referral to an Urologist, Urogynaecologist or Gynaecologist for urodynamic investigations and potential surgery.[2]

Surgical interventions for females with stress incontinence include:[2]

- Mid-urethral slings – a mesh tape is placed under the urethra through two to three small incisions in order to support the urethra and "replace" the patient's pelvic floor muscles. The tape increases sub-urethral support and may help artificially recreate the pubo-urethral ligaments.
- Intramural urethral bulking agents – bulking materials are injected into the urethra and bladder neck, closing the lumen of the urethra, to increase the tissue's mass and increase outflow resistance. However, evidence about the effectiveness and durability of this treatment is limited.[16]

All surgical and medical interventions are associated with some adverse effects, such as increased voiding frequency and urgency incontinence.

Pharmacological treatment with duloxetine may be considered, although this medicine is not subsidised, and is considered second-line to surgical treatment. Pharmacological treatment is only given to women who decline or are not suitable for surgical treatment. Duloxetine can be effective in the short term, but there is no evidence of long-term efficacy or safety data for use in women with incontinence, and the medicine is associated with a range of adverse effects.[2, 17]

Managing urgency incontinence and overactive bladder

Urgency incontinence and overactive bladder can be initially managed with interventions for urgency and frequency, pelvic floor muscle exercises and bladder training.

Pharmacological interventions can also be trialled, followed by surgical interventions where medicines are ineffective or not tolerated.

Pelvic floor muscle exercises

Pelvic floor muscle exercises are used to strengthen the muscles under the uterus, bladder and bowel. They are used in both males and females who have problems with urinary incontinence or bowel control, and following pregnancy and childbirth in females. When performed correctly over several months, with good patient compliance, they can be effective in reducing stress incontinence for most people with mild to moderate stress incontinence.[7]

Most pelvic floor muscle exercise interventions will be designed and initiated under the supervision of a Physiotherapist or Continence Nurse.[2] An individualised programme of exercises is usually developed for each patient.[7] Where referral is not possible or where the wait time for referral will be significant, an exercise regimen may be initiated in primary care.

Pelvic floor muscle exercises can be described to the patient as tensing the muscles used to hold in urine. Advise the patient that next time they are voiding to attempt to stop the flow in order to "visualise" the muscles that should be tensed. Attempting to stop the flow of urine should only be used to assess whether the correct muscles are being contracted and not as part of the exercise programme itself. Unless the technique is correctly demonstrated, some females may do a Valsalva manoeuvre instead of contraction when they try to perform pelvic floor muscle exercises. If there is concern that the patient is performing the technique incorrectly, muscle contraction can be assessed with a digital examination (see Page 32).

Strengthening exercises are performed by tensing, holding and then relaxing the muscles. The exercise programme should comprise three sets of eight contractions, daily.[2] Each contraction should be held for approximately ten seconds. Between each contraction, the pelvic floor muscles are relaxed for several seconds. During contractions, it is important to isolate the pelvic floor muscles. To do this, tell the patient to keep the gluteal and thigh muscles relaxed during each contraction and to breath normally throughout the exercise.

Initially the patient may find it easiest to do the exercise while sitting or lying down, but once comfortable with the exercise they can be done at any time, place or body position. In addition, advise the patient that it may be more comfortable to empty their bladder prior to doing the exercise.

A Physiotherapist or Nurse may also suggest the use of biofeedback, electrical stimulation or vaginal cones as adjuncts to exercise where appropriate, e.g. in females with an absent or very weak contraction, or to increase confidence that the exercise is being done correctly.[2]

Commercially available products, such as Kegel balls and pelvic toners, are advertised as being effective for preventing incontinence and strengthening the pelvic floor. It is difficult to quantify the efficacy of such products, and it is advisable to discuss their use with a Physiotherapist first.

Treat the cause and train the bladder

Urgency incontinence has a more varied underlying aetiology than stress incontinence, and in some females, incontinence will be secondary to an infection or systemic condition. Treat or appropriately manage any underlying conditions that may be contributing to incontinence, such as:[2]

- Lower urinary tract infection
- Sexually transmitted infection
- Neurological conditions, e.g. Parkinson's disease and multiple sclerosis
- Systemic conditions, e.g. congestive heart failure and diabetes mellitus
- Functional and behavioural disorders, e.g. impaired mobility and excess alcohol use
- Adverse effects of medicines, e.g. diuretics

Following this, pelvic floor muscle exercises and bladder training are used to manage the symptoms of incontinence and overactive bladder. Refer females with urgency incontinence or an overactive bladder to an appropriate specialist, e.g. Continence Advisor, Nurse Specialist or Physiotherapist, for assessment and consideration of bladder training. The patient should be asked to complete a bladder diary before starting bladder training. This is also useful in assessing response to treatment.

Bladder training involves the patient becoming more aware of their voiding and incontinence patterns, and then learning to control them.[18] Scheduled times are set for voiding and then the times between voiding are gradually increased. If urgency occurs, the patient may be encouraged to try to "hold-on" for a short time, e.g. ten minutes, before voiding.

Strategies to decrease urgency include: squeezing and holding the pelvic floor muscles or doing several squeezes quickly, distraction, leaning forward slightly, keeping still, squeezing the fists tightly or pushing the ball of the foot hard onto the floor.

Combined, these actions can reduce frequency and urgency.[2] The effectiveness of bladder training varies and there is currently insufficient evidence to assess the likelihood of cure or improvement with bladder training, however, a Cochrane study concluded that it may be helpful and is a safe, low cost option.[18, 19]

Pharmacological treatment

If bladder training is ineffective or further control is needed, consider a trial of **oxybutynin**, an anticholinergic medicine. Anticholinergic medicines are effective for treating urinary incontinence because they decrease muscular spasms of the bladder, therefore suppressing urgency and overflow. Oxybutynin has been shown to reduce the symptoms of urgency and increase bladder capacity.[2] It is generally only appropriate for females with presumed detrusor overactivity or overactive bladder with frequency, urgency and incontinence. It is used first-line in preference to newer anticholinergic medicines due to a long history of use, a large evidence base for efficacy and lower cost.[7] In addition, oxybutynin must be trialled before other options to meet Special Authority criteria for subsidy for these medicines (see below).

The recommended starting dose of oxybutynin for incontinence is 5 mg, once daily, slowly titrated upward until effective, generally 5 mg, three times daily. The maximum dose is 5 mg, four times daily.[2, 10] In older patients the initial dose should be 2.5 mg, twice daily, and only increased if necessary.[10] Oxybutynin is available fully subsidised as an oral tablet or liquid, and without subsidy as a twice-weekly transdermal patch. Oxybutynin is associated with several adverse effects, most notably dry mouth, constipation and sedation, which often affects patient compliance with treatment. Transdermal patches may have fewer adverse effects due to a slower release of oxybutynin. Oxybutynin is contraindicated in people with bladder outflow obstruction, which can present in a similar way to urgency incontinence in some people. Oxybutynin is also contraindicated in people with angle-closure glaucoma, toxic megacolon, ulcerative colitis or gastrointestinal obstruction.[10]

Elderly patients are particularly susceptible to the effects of anticholinergics, and should have their current medicines reviewed to avoid anticholinergic loading.[2] Anticholinergic loading occurs in people taking multiple medicines with anticholinergic effects; the combined effect of all anticholinergic medicines is additive and their adverse effects become increasingly severe with greater load.

If oxybutynin is not tolerated or effective, consider other anticholinergic medicines,[2] such as solifenacin succinate, 5 mg, once daily, or tolterodine tartrate, 2 mg, twice daily.[10] These medicines have a more favourable adverse effect profile than oxybutynin because solifenacin and tolterodine are more selective for the bladder than oxybutynin.[20] Both solifenacin and tolterodine are subsidised subject to Special Authority criteria that require the patient to have first trialled oxybutynin and found it to be intolerable or ineffective.[10]

Patients taking any anticholinergic medicine for incontinence should be reviewed after six weeks to assess the efficacy of the medicine and the presence and severity of adverse effects.[2]

Other treatments can also be considered, such as intravaginal oestrogen.[2] How oestrogen works to reduce incontinence is not well understood. Oestrogen receptors have been identified in the tissues of the vagina, bladder, urethra and muscles of the pelvic floor; the bladder in particular is strongly influenced by circulating oestrogen levels.[21] It is thought that intravaginal oestrogen administration may reverse or limit the long-term loss of muscle tone to the urethral, pelvic and bladder muscle that occurs after menopause.[21]

Surgical interventions

Surgical interventions for females with urgency incontinence and overactive bladder may be considered where more conservative treatments have been ineffective. This includes botulinum toxin injected into the bladder, sacral nerve stimulation, augmentation cystoplasty and, where all other treatments have been ineffective, urinary diversion.

Botulinum toxin, when injected into the bladder wall, can reduce the frequency and strength of muscle spasms. The injection, given under anaesthesia, can be effective for nine months to one year. It appears to reduce bladder spasm and incontinence in approximately 60% of patients.[22] Botulinum toxin is associated with some adverse effects, the most significant of which is temporary urinary retention.

Sacral nerve stimulation involves the implantation of a device that applies mild electrical stimulation to the sacral reflex pathway of the bladder.[2] Sacral nerve stimulation generally decreases urinary frequency and can reduce the number of incontinent episodes.[2]

Augmentation cystoplasty is a surgical procedure that increases the capacity of the bladder and reduces overactivity.[2] The procedure involves grafting a section of tissue, usually from the small intestine or stomach, onto the top of the bladder. It is a relatively uncommon procedure.

Urinary diversion surgery is a complex and invasive procedure that diverts urine away from the bladder, generally through an ileal conduit (a passage made from a segment of the small intestine) into an external storage device (urostomy bag). It is a "last resort" treatment and is generally reserved for people with continuous or complete incontinence, for whom all other treatments have been trialled and been ineffective.

The role of incontinence pads

Incontinence pads are used as an adjunct to temporarily manage symptoms in some people. Clinicians should ask older female patients in particular about pad usage, as direct-to-consumer marketing and the easy availability of the products has made their use common and it may deter patients from seeking appropriate treatment. People with well controlled incontinence will usually not require incontinence pads. However, they can be recommended for the following reasons:[2]

- To manage urinary leakage while awaiting assessment and treatment
- To contain leakage while waiting for a treatment response
- For people with severe cognitive or mobility impairment the makes further assessment or treatment impossible
- For the long-term management of people who have trialled and not responded to all other treatment options

Whenever continence products are used, a variety of options should be discussed and trialled, with product choice based on patient preference. A Cochrane review found that the design of the product affected its efficacy.[23] Nappy-style products (i.e. side opening) were found to be most effective for males and pull-ups (underwear-style products with a smaller absorbency volume) or disposable pads were most effective and acceptable for females.[23] Nocturnal incontinence was best managed by nappy-style products for both males and females.[23]

Referral to a Continence Nurse specialist may be useful where continence pads need to be trialled. In addition, funding for incontinence pads may be available from some district health boards (DHBs).

Red flags for referral in people with incontinence

Males and females with urinary incontinence and any of the following factors should be referred to an appropriate specialist (Urologist or Gynaecologist) within two weeks:[2, 5, 24]

- Macroscopic haematuria without a concurrent urinary tract infection (UTI)
- Unexplained microscopic haematuria if aged over 40 years
- Recurrent or persistent UTI associated with haematuria if aged over 40 years
- A pelvic mass arising from the urinary tract or pelvis, e.g. palpable mass
- Suspected prostatic malignancy (in males)

Consideration for referral to a Urologist or Gynaecologist should be given to patients with the following factors(with urgency of referral based on clinical judgement):[2, 5, 24]

- A bladder that is palpable on abdominal or bimanual examination after voiding and/or chronic urinary retention/voiding difficulties
- Pelvic organ prolapse (in females)
- Associated faecal incontinence
- New or worsening incontinence in a person with a neurological disease
- Symptoms of voiding difficulty
- Recurrent UTI
- Suspected or recurrent urogenital fistulae
- Recurrent or continued incontinence following a previous continence surgery
- Previous pelvic cancer surgery or radiation treatment

Urinary incontinence in males

The approach to investigation and treatment of urinary incontinence in males is similar to that for females.

Many males experience incontinence at some point in their lives. Incidence increases with age and with certain conditions, particularly those involving the prostate. In males, incontinence is usually a subset of "lower urinary tract symptoms" (LUTS), which includes post-void dribbling, obstruction and overflow, nocturia and urgency. The likelihood of a significant underlying cause of incontinence is higher in males, and investigation of the cause is always necessary. Urinary incontinence in males is usually related to either prostate abnormalities or a neurological condition. The most common cause of urinary incontinence in males is benign prostatic hyperplasia, which causes incontinence, frequency and other LUTS due to the enlarged prostate pushing against the bladder.[1] Prostatectomy and radiation treatment of the prostate are also significant contributors to male incontinence (84% of males who undergo radical prostatectomy will develop incontinence).[25] Neurological causes of incontinence include age-related changes that lead to bladder overactivity, diabetes and other systemic conditions that reduce nerve function and neurological disorders such as stroke. More rarely, incontinence can be due to renal or bladder conditions, such as malignancy or vesical calculi (bladder stones).[26]

The dominant types of incontinence in males are similar to those seen in females, i.e. stress, urgency and overflow incontinence and bladder overactivity.

History and examination

Red flags for urinary incontinence in males should be assessed and the patient referred if necessary (see: "Red flags for referral").

As with females, the patient history should be used to assess the likelihood of an underlying cause, the severity of the incontinence and the impact that the incontinence has on the daily life of the patient (see: "Patient history", Page 31).

The history should also include questions on previous prostate conditions or surgery.[7]

Determining the type of incontinence present in males is similar to females and should be based on when and why leakage occurs, e.g. if leakage occurs during exercise, stress incontinence is likely.

The general examination should focus on any non-genitourinary causes or conditions that may be contributing to incontinence, e.g. obesity, stroke.

The external genitalia should be examined for signs of phimosis (the foreskin cannot be fully retracted over the glans), balanitis (inflammation of the glans), hypospadias (a birth defect causing the urethral opening to be abnormally placed on the ventral, or underside, of the penis), hernias, signs of infection or other abnormalities.[26]

A digital rectal examination is then recommended. Assess the size and consistency of the prostate and examine for nodules, tenderness and any masses.[26] The patient's **pelvic floor musculature** should also be assessed at this point, using the proxy measure of the patient's anal tone. To do this, with the patient supine, insert a finger one to two centimetres into the rectum (with the finger pad toward the coccyx) and assess the resting tone of the sphincter before asking the patient to tense the muscles. This contraction should be held for five seconds. Assess the relative strength and endurance of the muscle contraction. As for females, a grading scale may be used for this, such as the Oxford grading scale. See Page 32.

Investigations

Perform dipstick analysis of the urine in all males presenting with urinary incontinence to assess the likelihood of a treatable underlying cause, e.g. infection.[1, 26]

Request serum creatinine, as renal dysfunction or abnormalities may be a contributing factor, if any of the following are present:[26]

- Chronic urinary retention – this is suggested by overflow incontinence (e.g. bedwetting) or an enlarged bladder detected on abdominal palpation or percussion
- Recurrent urinary tract infection
- History of urinary tract stones

The patient should be asked to complete a bladder diary.[1] Further urodynamic testing such as flow testing (uroflowmetry) may be requested in secondary care.

Management

The management of urinary incontinence in males differs slightly from females as the likelihood of a significant underlying pathology is relatively high, particularly if there is no history of prostatic surgery or irradiation.

Management is based on the primary type of incontinence.

Managing stress incontinence in males

When stress urinary incontinence is caused by prostatectomy, patients should be referred to a Continence Nurse, Continence Physiotherapist or urology clinic for supervised pelvic floor muscle exercises.[26] Pelvic floor muscle exercises are very similar for both males and females. Exercises should be performed for at least three months before considering more invasive treatment options.[26]

For further information see: "Pelvic floor exercises", Page 35.

When stress urinary incontinence is not caused by prostatectomy, the patient should be referred to an Urologist for assessment to investigate the cause.[26] This is due to the potential for a significant underlying cause being present, such as prostate cancer or structural abnormalities.

Referral to an Urologist should still be considered in males with incontinence following prostatectomy, particularly if behavioural treatments are ineffective. Surgical interventions are available for males with stress incontinence. These are generally limited to male slings and artificial urinary sphincters.[26] For males with mild to moderate stress incontinence, male sling surgery has cure rates of 40 – 60%, with significant improvement in a further 10 – 40%.[25] The procedure is minimally invasive.[25] The artificial urinary sphincter is also highly effective, with complete continence achieved in 60 – 90% of males. However, this is a more invasive procedure and may be associated with greater adverse effects, such as urethral atrophy and mechanical failure of the device.[25]

Managing urgency incontinence and overactive bladder in males

First exclude or manage all treatable causes of urgency incontinence, such as benign prostatic hyperplasia, neurological conditions, current UTI or STI, vesical calculi or prostate or bladder cancer.[26] This may involve multiple consultations and temporary continence products can be offered while the cause of incontinence is being investigated (see: "Incontinence pads", Page 37).

Benign prostatic hyperplasia can be treated with alpha-blockers such as doxazosin or terazosin. Finasteride (Special Authority) may also be considered if alpha-blockers are not tolerated. N.B. Alpha blockers can potentially contribute to stress incontinence.

Where a preventable underlying cause is not identified, referral to a Physiotherapist or Nurse Specialist in incontinence for

bladder training is recommended.[26] Bladder training is similar for both males and females. For more information, see Page 36.

If symptoms persist despite bladder training, or where bladder training is not possible, consider a trial of oxybutynin (see Page 36).

If pharmacological treatment is ineffective, referral to an Urologist is recommended.[26]

Surgical and medical options for the treatment of urgency incontinence in males include botulinum injections into the bladder wall, sacral nerve stimulation and augmentation cystoplasty.[26]

Further resources

The New Zealand Continence Association (NZCA) has further information and resources for practitioners including templates of bladder diaries and examples on pelvic floor muscle exercise programmes. See: **www.continence.org.nz**

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