Management of lower urinary tract symptoms in men

Lower urinary tract symptoms in men are common, increase with age and can become bothersome, causing significant morbidity such as urinary retention or the need for surgery. This article outlines how to assess a man with lower urinary tract symptoms and when to refer to a specialist, and summarizes current treatment options.

Lower urinary tract symptoms are a common problem faced by ageing men. The most common cause of lower urinary tract symptoms in men is benign prostatic hyperplasia, causing symptoms previously known as prostatism. Other causes of lower urinary tract symptoms are listed in *Table 1*.

Benign prostatic hyperplasia is an age-related phenomenon. The prevalence of histological benign prostatic hyperplasia, examined in several autopsy studies, is approximately 10% for men in their 30s, 20% for men in their 40s, 50–60% for men in their 60s and 80–90% for men in their 70s and 80s (Roehrborn and McConnell, 2002). Histological benign prostatic hyperplasia does not necessarily constitute a problem to the patient and only becomes a clinical entity if and when it is associated with subjective symptoms, the most common manifestation being lower urinary tract symptoms.

Lower urinary tract symptoms can be divided into voiding, storage and post-void symptoms (*Table 2*). Voiding symptoms are typically caused by obstruction as seen by the mass effect of benign prostatic hyperplasia causing increased urethral resistance, while storage symptoms may be caused by detrusor instability or decreased compliance. However, there is considerable overlap in these symptoms.

Table 1. Causes of lower urinary tract symptoms

Benign prostatic hyperplasia
Prostatitis
Urethral stricture
Nocturnal polyuria
Bladder or ureteric stones
Urinary tract infection
Destrusor overactivity (overactive bladder)
Destrusor underactivity
Bladder tumour

Mr Matthew Jefferies *is Lecturer in Urology in the School of Biosciences, Cardiff University, Cardiff CF10 3AX,* **Mr Adam Cox** *is Specialist Registrar in Urology,* **Mr Adam Bennett** *is Specialist Registrar in Urology in the Department of Urology, in Cardiff and Vale University Health Board, Cardiff, and* **Professor Howard Kynaston** *is Professor of Surgery in Cardiff University and Honorary Consultant Urological Surgeon in the Department of Urology, Cardiff and Vale University Health Board, Cardiff*

Correspondence to: Mr M Jefferies (Matthew_jefferies@hotmail.com)

Assessment

There has been inconsistency in the assessment of men with lower urinary tract symptoms, with differing recommendations from the European Association of Urology, American Urology Association, British Association of Urological Surgeons and the National Institute for Health and Clinical Excellence (2010). Salient points will be taken from each of these, with particular emphasis on the National Institute for Health and Clinical Excellence guidelines. *Table 3* summarizes the initial assessment as recommended by the National Institute for Health and Clinical Excellence (2010).

Medical history and physical examination

A detailed medical history should be taken to identify causes or comorbidities that could lead to lower urinary tract symptoms. History should include types of symptoms (storage, voiding or post-micturition) and evidence

Table 2. Categories of lower urinary tract symptoms

Storage symptoms	Urgency
	Nocturia
	Frequency
	Urinary incontinence
Voiding symptoms	Hesitancy
	Spraying
	Poor flow
	Intermittency
	Straining
	Terminal dribble
Post-micturition	Post-micturition dribble
	Feeling of incomplete emptying

From National Institute for Health and Clinical Excellence (2010)

of haematuria, urinary tract infection, diabetes, nervous system disease (e.g. Parkinson's disease or stroke), and previous history of urethral strictures or urinary retention. Prescription and over the counter medications should be reviewed, as well as recreational drugs that could be contributing to the problem. Caffeine intake and smoking status should also be sought.

Physical examination should include an examination of the abdomen, assessing for an over-distended bladder or any palpable masses. The groin and external genitalia should be examined for evidence of meatal stenosis or palpable masses. Digital rectal examination is done primarily to assess prostate size or irregularity, and to rule out any neurological deficit.

Symptom assessment

A frequency volume chart (voiding diary) may help to identify patients with polyuria. A validated symptom score such as the International Prostate Symptom Score (IPSS) or American Urological Association Symptom Index (AUASI) can be completed to quantify the patient's baseline symptom severity and the effect of subsequent treatment. The IPSS uses seven questions, each scored between 0 and 5, giving a total score ranging from 0 to 35. Using the IPSS, lower urinary tract symptoms can be classified as mild (0–7), moderate (8–19) or severe (20–35).

Urinalysis and serum creatinine or estimated glomerular filtration rate

A urine dipstick should be performed to detect blood, glucose, leucocytes and nitrites. This can exclude diabetes, urinary tract infection and haematuria. Haematuria should be investigated thoroughly with referral to an appropriate haematuria service for additional tests such as flexible cystoscopy and imaging of the urinary tract. Renal function (serum creatinine or estimated glomerular filtration rate) was previously routinely performed in the initial assessments of lower urinary tract symptoms, but it is now only recommended in those men with suspected renal impairment, e.g. those with a palpable bladder, nocturnal enuresis, recurrent urinary tract infection or history of renal stones (National Institute for Health and Clinical Excellence, 2010).

Prostate-specific antigen

Prostate-specific antigen can be a marker of prostate cancer but also can be a surrogate marker of prostatic volume in benign prostatic hyperplasia. Nearly a third of men with histologically-proven benign prostatic hyperplasia have a serum prostate-specific antigen level greater than 4.0 ng/ml (McConnell et al, 1994). Prostate-specific antigen levels >1.4 ng/ml have been associated with greater risk of progression to the need for surgery or an episode of acute urinary retention (National Institute for Health and Clinical Excellence, 2010; Roehrborn et al, 2010).

The indications for performing prostate-specific antigen measurement are lower urinary tract symptoms that are suggestive of bladder outlet obstruction, an abnormal-feeling prostate on digital rectal examination and patient concerns about prostate cancer (National Institute for Health and Clinical Excellence, 2010). Men should be counselled appropriately about the implication of detecting an elevated prostate-specific

Table 3. Initial assessment

History	Symptoms		
	Past medical history		
	Medication		
Examination	Abdominal		
	Groin and external genitalia		
	Digital rectal examination		
Symptom assessment	Voiding diary		
	International Prostate Symptom Score		
Investigations	Prostate-specific antigen	Lower urinary tract symptoms suggestive of obstruction	
		Abnormal feeling prostate	
		Patient's concerns regarding prostate cancer	
	Urinalysis		
	Creatinine or estimated glomerular filtration rate	Suspected renal impairment	Palpable bladder
			Nocturnal enuresis
			Recurrent urinary tract infections
			History of renal stones

From National Institute for Health and Clinical Excellence (2010)

antigen reading in line with the Prostate Cancer Risk Management Programme (2009).

Specialist tests and assessment

Referral criteria for specialist assessment are summarized in *Table 4*. It is imperative that patients are assessed adequately before being seen in a specialist clinic. The symptom assessment and bladder diary are extremely useful screening tools, but are often forgotten. These tests are simple and quick, and should be assessed by the GP to determine whether any medical treatment is required and to assess the subsequent effect of new treatment on the patient's symptoms.

Specialist assessment is usually undertaken by a urologist or a health-care professional trained in the assessment of lower urinary tract symptoms. In addition to performing those tests described in the initial assessment, flow and post void residual should be measured. Uroflowmetry involves the electronic recording of the urinary flow rate throughout the course of micturition. It can help in assessing the degree of lower urinary tract symptoms and can be indicative but not diagnostic of bladder outflow obstruction. Post void residual, using ultrasound, is the volume of fluid remaining in the bladder immediately after the completion of micturition. Post void residual is a non-invasive test with uncertain value. While it has some variability, it can be useful in patients retaining large volumes of urine, as in chronic retention.

Flexible cystoscopy is recommended in men with a history of recurrent infection, sterile pyuria, haematuria, profound symptoms or pain (National Institute for Health and Clinical Excellence, 2010). Upper tract imaging to detect signs of obstruction with typical bilateral hydronephrosis is recommended in men with a history of recurrent infection, sterile pyuria, haematuria, chronic retention, profound symptoms or pain (National Institute for Health and Clinical Excellence, 2010). For men considering surgery, urodynamics or pressure studies can be performed to diagnose or confirm the presence of obstruction.

Conservative management

The management of lower urinary tract symptoms is dependent on whether the patient is bothered by his symptoms and whether he has any risk factors for progression to need surgery or develop an episode of acute urinary retention. For low risk men with symptoms that do not bother them enough to start medical therapy, a 'watchful waiting' policy can be adopted with 6-monthly reviews of the symptoms. For these patients there are many conservative measures that can help. These include fluid advice (e.g. increase or decrease fluid intake, reducing caffeine intake), bladder training and lifestyle advice such as weight loss and smoking cessation. Often, men with mild lower urinary tract symptoms will require no treatment once the condition is fully explained and concern about prostate cancer is resolved. Urethral milking and pelvic floor exercises can be performed to reduce post-micturition dribbling.

Drug treatment

When conservative management has failed, drug treatment should be considered in men with bothersome lower urinary tract symptoms. The treatment of choice is determined by the predominant symptom as summarized by *Figure 1*, adapted from the European Association of Urology. Where the predominant symptom is voiding in nature an alpha-blocker should initially be considered. Alpha-blockers (e.g. alfuzosin or tamsulosin) bind to α_1-adrenergic receptors in the smooth muscle at the prostate and bladder neck causing relaxation. This reduces outflow resistance, allowing a better flow of urine and subsequent reduction in bothersome lower urinary tract symptoms. Patients must be warned of the side effects of an alpha-blocker: dizziness, hypotension and retrograde ejaculation (redirection of semen into the bladder on ejaculation).

For men at high risk of progression to need surgery or develop acute urinary retention, a 5-alpha reductase inhibitor (e.g. finasteride or dutasteride) should be considered. High risk patients include those with a prostate volume >30 cm^3, severe lower urinary tract symptoms (IPSS 20–35), depressed peak urinary flow rates (<12 ml/s), older age (>70 years) (Jacobsen et al, 1997) or a prostate-specific antigen level >1.4 ng/dl (Jacobsen et al, 1997; National Institute for Health and Clinical Excellence, 2010). 5-alpha reductase inhibitors block 5-alpha reductase, the enzyme responsible for converting testosterone to dihydrotestosterone, the potent intracellular androgen involved in prostate growth. This reduces prostate volume, although this can take several months. Combination therapy with an alpha-blocker and

Table 4. Referral criteria for specialist assessment

Lower urinary tract symptoms complicated by:	Recurrent urinary tract infection
	Urinary retention
	Renal impairment that is suspected to be obstructive in nature
Suspected urological cancer	
Lower urinary tract symptoms that have failed to respond to conservative management or drug therapy	

From National Institute for Health and Clinical Excellence (2010)

5-alpha reductase inhibitor can also be used in high risk men. Combination therapy reduces the relative risk of benign prostatic hyperplasia progression, acute urinary retention and benign prostatic hyperplasia-related surgery when compared to monotherapy (McConnell et al, 2003; Roehrborn et al, 2010). 5-alpha reductase inhibitors can cause symptoms such as reduced libido, impotence and gynaecomastia. These again must be discussed with the patient, as these will have a significant influence on his decision on whether or not to take the drug.

In men with storage symptoms such as urgency and frequency, an anticholinergic or antimuscarinic (e.g. oxybutinin, solefenacin) can be used. Anticholinergics inhibit binding of acetylcholine to the cholinergic receptors in the bladder, preventing parasympathetic impulses and thereby suppressing involuntary contraction. In addition to this they can increase bladder capacity and cause systemic anticholinergic side effects such as dry mouth and bowel disturbances. For men where the predominant symptom is nocturnal polyuria, an afternoon dose of a loop diuretic (e.g. frusemide) or the vasopressin analogue desmopressin can be considered (Reynard et al, 1998; Van Kerrebroeck et al, 2007).

Catheterization

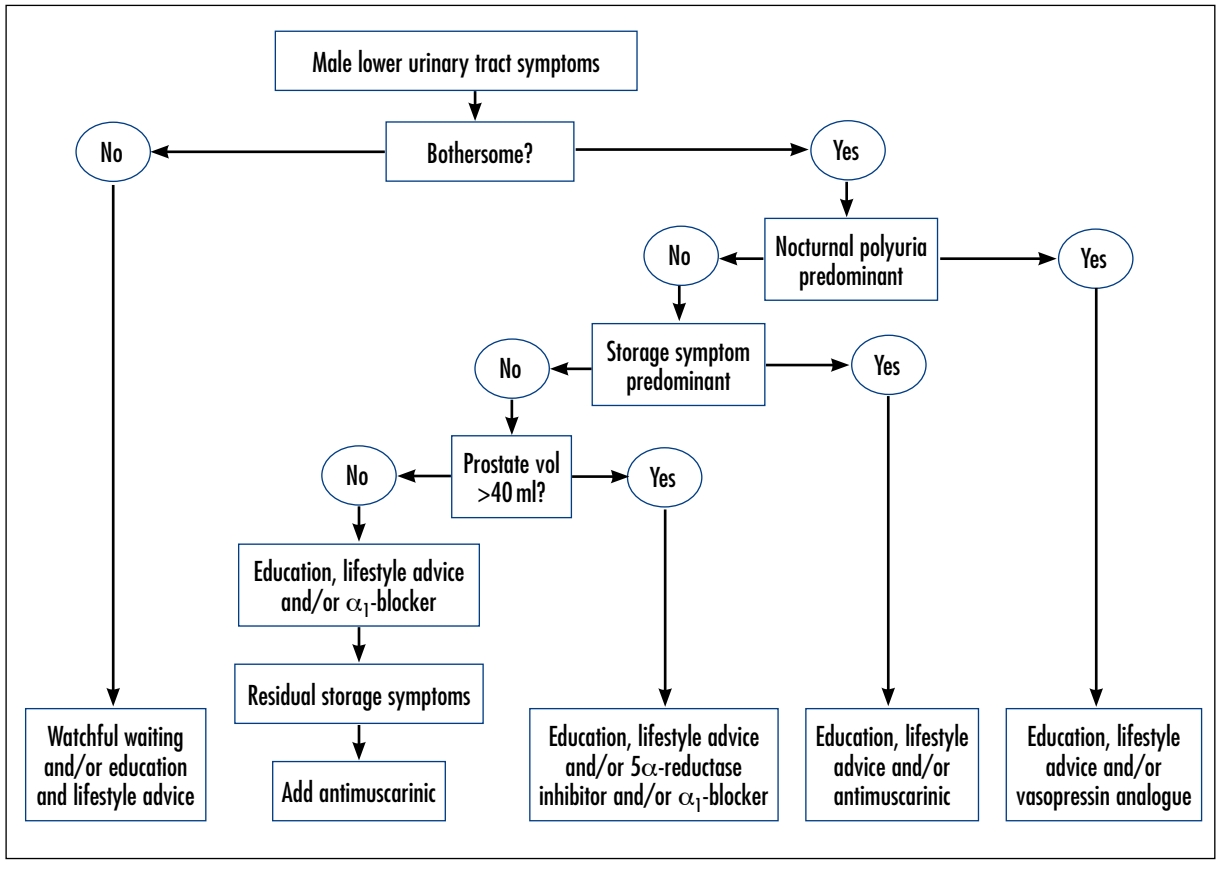
Intermittent self-catheterization can be a useful treatment in those who have significant post void residual that contributes to their lower urinary tract symptoms. Intermittent self-catheterization can be considered before surgery or as an alternative to surgery in men deemed unfit. A typical regimen for men would be to incorporate intermittent self-catheterization three to four times a day in between their normal voiding patterns. While this can reduce lower urinary tract symptoms it may be associated with an increased risk of urinary tract infection. In order to perform intermittent self-catheterization it is necessary for the patient to have suitable dexterity and vision to introduce the catheter.

A long-term indwelling catheter is usually reserved for medical and surgical failure in those not able to perform intermittent self-catheterization. A long-term indwelling catheter is also used in men with renal impairment or hydronephrosis secondary to bladder outflow obstruction who are unsuitable for surgery. Indwelling catheters can cause local symptoms such as ulceration of the penis and have a greater risk of infection, as well as being unacceptable for many men.

Surgery

In patients with severe lower urinary tract symptoms or when drug and conservative management have failed surgery can be offered. Traditionally this involves transurethral resection of the prostate gland. More recently holium laser enucleation of the prostate has been

Figure 1. Medical management of lower urinary tract symptoms in males. Adapted from European Association of Urology guidelines (Oelke et al, 2013).



used, which adopts the same principle of resecting the benign glandular prostate tissue back to the capsule, creating a large channel. This reduces resistance and lower urinary tract symptoms caused by obstruction. Holium laser enucleation of the prostate is particularly good for larger prostates (>80 g) as there is less blood loss resulting in reduced hospital stay. Holium laser enucleation of the prostate is expensive and is often only available in specialist units. Consequently, transurethral resection of the prostate gland continues to be the surgical treatment of choice. The side effects of transurethral resection of the prostate gland include a 75% risk of retrograde ejaculation, a 5% risk of bleeding requiring return to theatre and/or need blood transfusion, a 2–4% risk of urinary incontinence and a 0.5% risk of transurethral resection of the prostate gland syndrome (British Association of Urological Surgeons, 2012).

Where the bladder neck is tight with no gross enlargement of the prostate (<30 g), as seen in younger patients, a bladder neck incision can be performed to open a channel to allow urine to empty from the bladder. For men with storage symptoms where conservative and drug management has failed, injections of botulinum toxin (Botox) into the bladder wall can be used. Botox blocks the release of acetylcholine from the neuromuscular junction, inhibiting nerve impulses and causing paralysis of the detrusor muscles of the bladder. This is an effective treatment that is typically administered under regional anaesthesia, although it often needs to be repeated. Owing to its mechanism of action on the detrusor muscle retention of urine can occur, therefore patients must be taught to perform intermittent self-catheterization before embarking on surgery. If this fails cystoplasty can be considered, which is a major operation associated with significant morbidity.

Conclusions

Lower urinary tract symptoms are common in men. A thorough history and examination followed by appropriate investigation is required to assess the severity of symptoms and to highlight those patients at risk of progression to require surgery or have an episode of acute urinary retention. After risk stratifying, conservative, medical or surgical management options can be adopted and tailored to suit the needs of the individual patient. **BJHM**

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KEY POINTS

- Lower urinary tract symptoms in men are common and can cause significant morbidity.
- Lower urinary tract symptoms can be categorized into voiding, storage and post-void symptoms.
- Assessment of symptom severity and risk of progression (to require surgery or develop an episode of acute urinary retention) is required before considering treatment.
- Simple conservative management (such as fluid advice and lifestyle modifications) is often the only treatment required for men with mild or minimally 'bothersome' lower urinary tract symptoms.
- For bothersome lower urinary tract symptoms where conservative management has failed, medical therapy (alpha-blocker, 5-alpha reductase inhibitor, antimuscarinic) can be initiated.
- Surgical intervention (typically in the form of transurethral resection of the prostate gland) is reserved for medical and conservative failures or in men with severe lower urinary tract symptoms.