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# Lower urinary tract symptoms

*Current management in older men*

## Background

Lower urinary tract symptoms are a common problem in men and the incidence of these symptoms increases with age.

## Objective

This article provides an update on the evaluation and treatment of lower urinary tract symptoms in older men. In particular, we describe current nomenclature, diagnosis, the International Prostate Symptom Score, and currently available medical and surgical treatments as well as indications for referral to a urologist.

## Discussion

Lower urinary tract symptoms may be divided into voiding and storage, and men may present with a combination of the two symptom groups. Voiding symptoms include weak stream, hesitancy, and incomplete emptying or straining and are usually due to enlargement of the prostate gland. Storage symptoms include frequency, urgency and nocturia and may be due to detrusor overactivity. In elderly men who present with lower urinary tract symptoms, indications for early referral to a urologist include haematuria, recurrent infections, bladder stones, urinary retention and renal impairment. In uncomplicated cases, medical therapy can be instituted in the primary care setting. Options for medical therapy include alpha blockers to relax the smooth muscle of the prostate, 5 alpha reductase inhibitors to shrink the prostate, and antimuscarinics to relax the bladder. The International Prostate Symptom Score is beneficial in assessing symptoms and response to treatment. If symptoms progress despite medical therapy or the patient is unable to tolerate medical therapy, urological referral is warranted.

**Keywords:** urological diseases; urination disorders; prostatic hyperplasia



Lower urinary tract symptoms (LUTS) are a common problem in men and may impact significantly on quality of life. Symptoms may be divided into: voiding, storage, or a combination of both.<sup>1</sup> Incidence increases with age (*Figure 1*). In this article we provide an approach to non-neurogenic LUTS in older men and discuss management strategies. In particular, we focus on pharmacological therapies as these are easily commenced in the primary care setting.

Although benign prostatic hypertrophy (BPH) is often used to refer to prostatic enlargement, BPH is actually a histological diagnosis describing periurethral prostatic hyperplasia.<sup>2</sup> The term 'benign prostatic enlargement' (BPE) is more correctly used to describe prostatic enlargement. In common practice, the terms are used interchangeably. The changes that occur with BPH are illustrated in *Figure 2*.

## Symptoms

Most patients present initially to their general practitioner, with voiding symptoms, obstructive symptoms or a combination of the two. Notably, not all men with BPE develop LUTS. Poor bladder contractility may contribute to difficulty voiding and this can be neurogenic or age related. Types of voiding and storage symptoms and the causes of these symptoms are outlined in *Table 1* and *2*.

## International Prostate Symptom Score

The International Prostate Symptom Score (IPSS) provides a validated method for assessment of symptoms and quality of life (*Figure 3*). This method is based on the original American Urological Association (AUA) Symptom Index with an additional question; the 'bother' question. The IPSS is freely available online (see *Resources*) and may be useful to GPs in quantifying the initial symptoms and response to treatment. The impact of LUTS on quality of life is highly variable and in the absence of medical indications therapy is not needed if 'bother' scores remain low.<sup>3,4</sup>

## Assessment

A comprehensive history is essential and should include questions about the comorbidities and medications that can affect LUTS. For

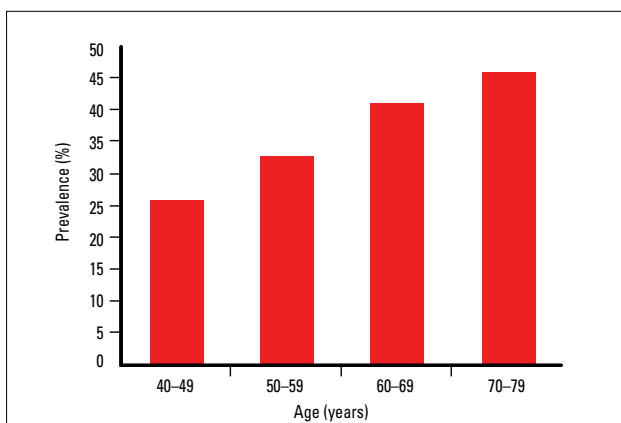


Figure 1. Percentage of men who have an American Urological Symptom Index over 7 (stratified by age). A score of over 7 indicates moderate to severe LUTS<sup>20</sup>

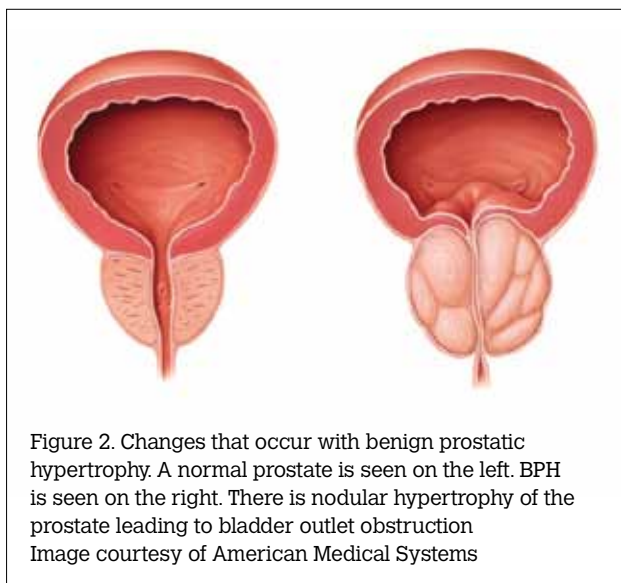


Figure 2. Changes that occur with benign prostatic hypertrophy. A normal prostate is seen on the left. BPH is seen on the right. There is nodular hypertrophy of the prostate leading to bladder outlet obstruction. Image courtesy of American Medical Systems

example, diuretics, diabetes, heart failure and sleep apnoea can all contribute to nocturia.

Physical examination should include the genitourinary system to exclude a palpable bladder, phimosis or meatal stenosis. Digital rectal examination (DRE) is useful to estimate prostate size and to exclude obvious abnormalities suggestive of malignancy. Most men present with a combination of voiding and storage symptoms, however, bladder outlet obstruction may also be complicated by:

- acute or chronic urinary retention (patients in acute urinary retention require catheter drainage and outpatient urological follow up)
- haematuria
- recurrent urinary tract infections (UTIs)
- bladder stones
- urgency or overflow incontinence.

Patients with complicated features outlined above warrant further investigation and early referral for specialist care.

A urinalysis and culture should be performed in all patients to exclude a UTI and the presence of microscopic haematuria. The IPSS can then be used to stratify older men with LUTS. Patients with high bother scores warrant early referral for specialist care and those with lower IPSS, or low bother scores, in the absence of the complicated features outlined, can be managed in the primary care setting.

If there is a suspicion of hydronephrosis, bladder stones or chronic urinary retention transabdominal ultrasound is necessary. Importantly, prostate size is generally inaccurate when measured using transabdominal ultrasound. Urine cytology is appropriate if there is a suspicion of urothelial carcinoma. However, even if urine cytology is normal, all patients with macroscopic haematuria and those with recurrent (present on two of three analyses) microscopic haematuria with risk factors for urothelial carcinoma (age >40 years, smoking history, chemical exposure) should be referred for urological evaluation.<sup>5</sup> After appropriate counselling, prostate specific antigen (PSA) may also be checked to assess the risk of prostate cancer according to The Royal Australian College of General Practitioners guidelines (see *Resources*).

In the specialist setting, uroflowmetry and bladder scanning for postvoid residual volume (PVR) may be helpful to further evaluate LUTS. Both may indicate bladder dysfunction or significant bladder outlet

**Table 1. Lower urinary tract symptoms in men**

|                                       |   |
|---------------------------------------|---|
| <b>Voiding (obstructive symptoms)</b> | Hesitancy<br>Poor stream<br>Intermittent flow<br>Incomplete emptying (with associated frequency)<br>Postvoid dribbling<br>Overflow incontinence |
| <b>Storage symptoms</b>               | Frequency<br>Nocturia<br>Urgency<br>Urgency incontinence  |
| <b>Complex symptoms</b>               | Haematuria<br>Recurrent UTI<br>Acute or chronic urinary retention<br>Urinary incontinence   |

**Table 2. Common causes of lower urinary tract symptoms in men**

|                         |  |
|-------------------------|--|
| <b>Storage symptoms</b> | Urinary tract infection<br>Bladder calculi<br>Urothelial carcinoma<br>Overactive bladder                   |
| <b>Voiding symptoms</b> | Benign prostatic enlargement<br>Bladder neck stenosis<br>Urethral stricture<br>Poor detrusor contractility |



obstruction. Uroflowmetry (*Figure 4*) calculates maximal flow in mL/sec and is noninvasive and easy to perform. A normal urine flow (Qmax) is greater than 10 mL/sec. The shape of the uroflow curve can suggest a diagnosis. The exact threshold for a 'normal' PVR is unclear and patients may maintain large PVRs without symptoms or complications.<sup>6</sup> Formal (pressure flow) urodynamic studies may be helpful in the evaluation of complex LUTS (see *Resources*). Cystoscopy is usually not required unless there is suggestion of urothelial carcinoma, urethral stricture, hematuria or an abnormality on ultrasound that needs clarification.

## Treatment

Treatment options include:

- watchful waiting (including reassurance and/or behavioural modification)
- pharmacological therapy
- surgery.

Treatment may be considered in a step-wise fashion and is illustrated in *Figure 5*. Patients with low IPSS and minimal bother may elect for watchful waiting while those with increasing IPSS (>8) and/or bother may benefit from a trial of medical therapy or surgery. Patients who

| Name:   |            | Date:                 |                         |  |                         |                 |            |
|---|------------|-----------------------|-------------------------|--|-------------------------|-----------------|------------|
|   | Not at all | Less than 1 time in 5 | Less than half the time | About half the time                              | More than half the time | Almost always   | Your score |
| <b>Incomplete emptying</b><br>Over the past month, how often have you had a sensation of not emptying your bladder completely after you finish urinating?           | 0          | 1                     | 2                       | 3  | 4                       | 5               |            |
| <b>Frequency</b><br>Over the past month, how often have you had to urinate again less than two hours after you finished urinating?                                  | 0          | 1                     | 2                       | 3  | 4                       | 5               |            |
| <b>Intermittency</b><br>Over the past month, how often have you found you stopped and started again several times when you urinated?                                | 0          | 1                     | 2                       | 3  | 4                       | 5               |            |
| <b>Urgency</b><br>Over the last month, how difficult have you found it to postpone urination?   | 0          | 1                     | 2                       | 3  | 4                       | 5               |            |
| <b>Weak stream</b><br>Over the past month, how often have you had a weak urinary stream?  | 0          | 1                     | 2                       | 3  | 4                       | 5               |            |
| <b>Straining</b><br>Over the past month, how often have you had to push or strain to begin urination?   | 0          | 1                     | 2                       | 3  | 4                       | 5               |            |
|   | None       | 1 time                | 2 times                 | 3 times  | 4 times                 | 5 times or more | Your score |
| <b>Nocturia</b><br>Over the past month, many times did you most typically get up to urinate from the time you went to bed until the time you got up in the morning? | 0          | 1                     | 2                       | 3  | 4                       | 5               |            |
| <b>Total IPSS score</b>   |            |                       |                         |  |                         |                 |            |
| Quality of life due to urinary symptoms   | Delighted  | Pleased               | Mostly satisfied        | Mixed – about equally satisfied and dissatisfied | Mostly dissatisfied     | Unhappy         | Terrible   |
| If you were to spend the rest of your life with your urinary condition the way it is now, how would you feel about that?  | 0          | 1                     | 2                       | 3  | 4                       | 5               | 6          |
| Total score: 0–7 mildly symptomatic; 8–19 moderately symptomatic; 20–35 severely symptomatic  |            |                       |                         |  |                         |                 |            |

Figure 3. International Prostate Symptom questionnaire<sup>3,4</sup>

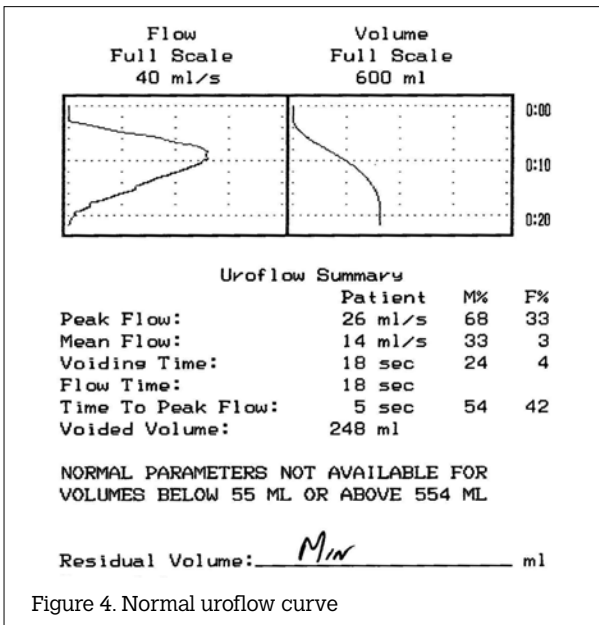


Figure 4. Normal uroflow curve

fail medical therapy or who progress may benefit from surgery. Treatment options are outlined in *Table 3*.

### Watchful waiting

Men without bothersome symptoms are suitable for watchful waiting and monitoring, particularly as the side effects of some of the treatments may outweigh the benefits.

Patients with mild frequency and urgency (storage symptoms) should undergo behavioural modification. Overactive bladder symptoms and nocturia may be alleviated by restriction of caffeine, alcohol and evening fluid intake. Diuretic medications should be taken in the morning. If void volumes are small, bladder training assists to suppress urge and increase time between voids to 2–3 hours.<sup>7</sup> Support from a urology nurse or continence therapist may be beneficial (see *Resources*). Regular monitoring with history, physical examination and the IPSS assess treatment response and changing symptoms. Prostate specific antigen should also be monitored where appropriate. Increasing symptoms or bother scores are reasonable indications to consider medical therapy.

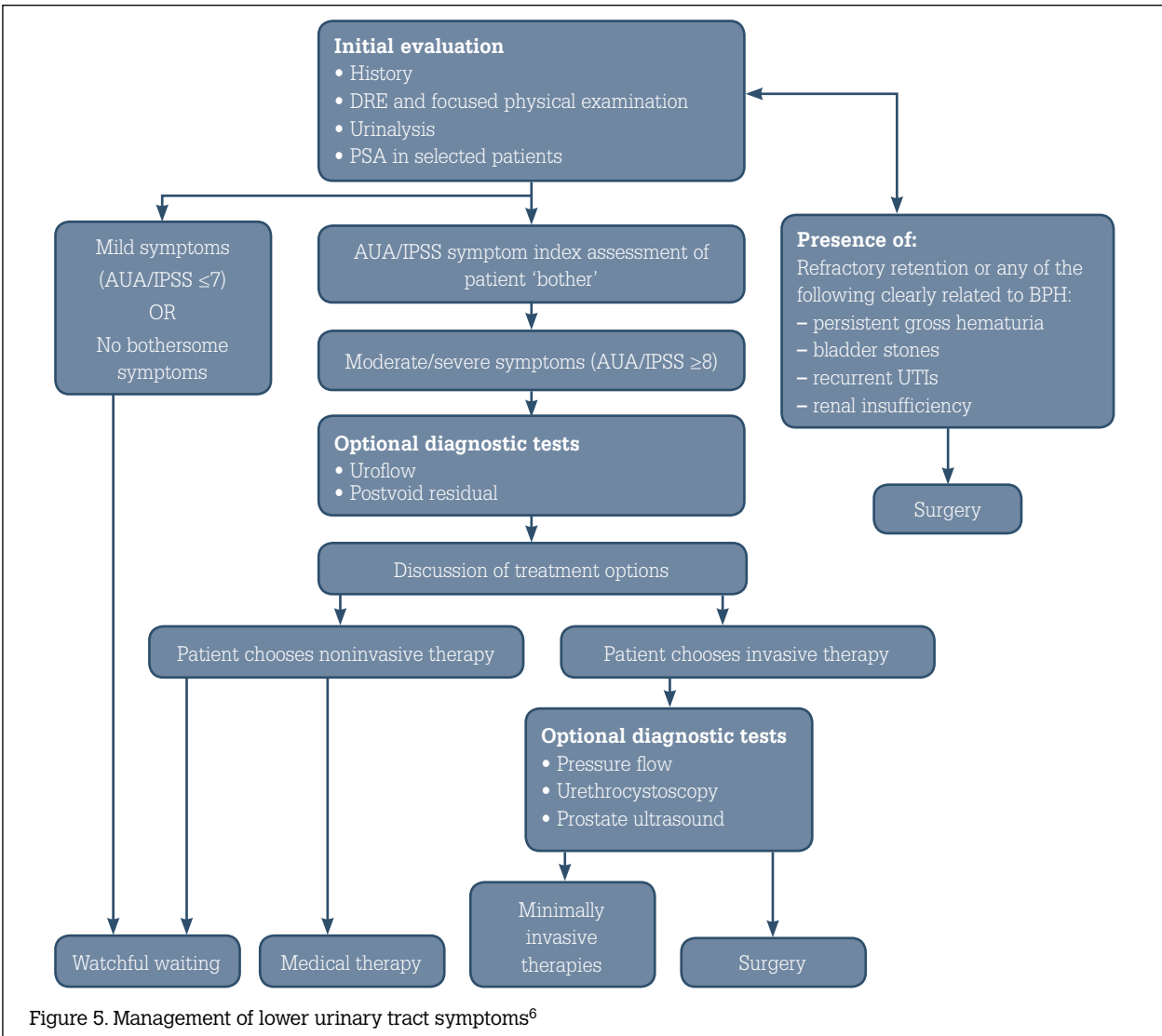


Figure 5. Management of lower urinary tract symptoms<sup>6</sup>



## Medical therapy

Surgical treatment is more effective, but medical therapy may provide adequate symptom relief with fewer and less serious adverse events<sup>8</sup> and is a useful adjunct to behavioural modification and bladder training. Medical therapy is easily commenced in the primary care setting when the diagnosis is clear. Medication classes, availability and side effects are listed in *Table 4*. Failure of medical therapy or progression of symptoms while on medical therapy would be an indication for specialist referral for consideration of other options.

## Drug therapy

### Alpha blockers

Alpha blockers are used to treat voiding (obstructive) symptoms and may improve urinary flow. Although ineffective in prostatic size reduction, they block prostatic alpha 1A adrenoreceptors to cause prostatic smooth muscle and bladder neck relaxation. They can also have peripheral and central nervous system effects.<sup>9</sup> Efficacy is similar between selective and nonselective medications<sup>10</sup> and is not affected by IPSS<sup>11</sup> or prostate size.<sup>12</sup> There may be an improvement in IPSS by up to 40% and a 25% improvement in Qmax.<sup>9</sup> There is no reduction in the long term risk of urinary retention.<sup>13</sup> Selective alpha blockers may have fewer systemic side effects but are not listed on the Pharmaceutical Benefits Scheme (PBS).

### Antimuscarinic therapy

Antimuscarinic drugs treat storage symptoms. Acetylcholine acts on muscarinic receptors and stimulates detrusor contractions via the M<sub>3</sub> receptor subtype.<sup>14</sup> M<sub>3</sub> selective drugs may have fewer anticholinergic side effects than nonselectives. Antimuscarinic drugs are contraindicated with high PVRs as there is a risk of acute urinary retention.<sup>9</sup> Antimuscarinics may impair cognitive function and should be used cautiously in the elderly.

**Table 3. Treatment options**

|   |   |
|---|---|
| Watchful waiting and behavioural modification |   |
| Medical therapy                               | <ul style="list-style-type: none"> <li>• Alpha blockers</li> <li>• Antimuscarinics</li> <li>• 5 alpha reductase inhibitors</li> <li>• Combination therapy</li> </ul>        |
| Ablative treatments                           | <ul style="list-style-type: none"> <li>• Transurethral microwave therapy</li> <li>• Transurethral needle ablation</li> </ul>  |
| Cavitating treatments                         | <ul style="list-style-type: none"> <li>• Transurethral resection of the prostate</li> <li>• Holmium laser enucleation</li> <li>• Green light laser prostatectomy</li> </ul> |

## 5 alpha reductase inhibitors

5 alpha reductase inhibitors, which are used to treat obstructive symptoms, inhibit the enzyme 5 alpha reductase to block the conversion of testosterone into the more active form, dihydrotestosterone (DHT). Two isoforms exist, with type 2 predominating in the prostate. Finasteride inhibits only type 2, while dutasteride inhibits both type 1 and type 2 isoforms. 5 alpha reductase inhibitors induce prostatic epithelial cell apoptosis,<sup>15</sup> thereby reducing prostate size by up to 25% and reducing PSA by 50% over a 6–12 month period.<sup>16</sup> The IPSS may improve by 30%, Qmax by 2 mL/sec and the long term risk of acute urinary retention is also reduced.<sup>9</sup> With appropriate counselling, baseline PSA should be checked before commencing therapy. These agents are not PBS listed and cost in excess of \$100 per month.

## Phytotherapy

Phytotherapy uses a range of plant extracts to improve obstructive symptoms. A large number of preparations exist and some patients prefer these to conventional medications. Saw palmetto (*Serenoa repens*) is the most commonly used preparation in Australia. They have minimal side effects. However, there is significant variation in their concentrations, co-ingredients and efficacy. In addition, they can be expensive as they are not PBS listed. A recent meta analysis found that *S. repens* was not superior to placebo, finasteride or tamsulosin with regards to IPSS or Qmax improvement or reduction in prostate size.<sup>17</sup> At present, international guidelines do not support the use of phytotherapy.<sup>6,9</sup>

## Combination therapies

Combination therapy using an alpha blocker with a 5 alpha reductase inhibitor is more effective than monotherapy at reducing disease and symptom progression, progression to surgery, as well as reducing the risk of acute urinary retention.<sup>13,18</sup>

Combination therapy with an alpha blocker and antimuscarinics can also be used where monotherapy has not given sufficient relief, especially if there are storage symptoms. A reduction in frequency, nocturia and IPSS has been demonstrated, especially compared to monotherapy.<sup>19</sup> Dutasteride is available on the PBS (Authority Required) when used with an alpha blocker when initiated by a urologist. Duodart is a recent Authority listed alpha reductase/alpha blocker combination.

## Surgical treatments

Absolute indications for surgical treatment include refractory urinary retention, bladder stones, recurrent infections or persistent haematuria. Patients may also opt for surgical treatment over medical therapy.

Surgical treatments are either cavitating or ablative. Of the former, which improve flow immediately, transurethral resection of the prostate (TURP) remains the gold standard treatment. *Figure 6* shows a cystoscopic image of obstructing lateral lobes of the prostate gland followed by an image of the prostatic fossa following TURP (*Figure 7*).





Other treatments include green light laser prostatectomy and holmium laser enucleation of the prostate, both providing similar cavitation of the prostatic fossa. Ablative treatments are less effective but have fewer side effects. Treatments available in

Australia include transurethral needle ablation and transurethral microwave thermotherapy. Open prostatectomy is reserved for very large prostate glands where endoscopic treatments may not be feasible.

**Table 4. Medical therapies currently available in Australia<sup>21</sup>**

|  | Type  | PBS listing                 | Approximate cost  | Dose                 | Side effects  |
|--|---|-----------------------------|---|----------------------|---|
| <b>Alpha blockers</b>  |   |                             |   |                      |   |
| Prazosin (Minipress <sup>TM</sup> )  | Alpha 1 (nonselective)                              | Yes                         | Up to \$17 for 100 tablets  | Up to 2 mg BD        | Postural hypotension, palpitations, oedema, nausea, headache, blurred vision  |
| Tamsulosin (Flowmaxtra <sup>TM</sup> )   | Alpha 1A selective                                  | No (Repatriation Authority) | Up to \$60 for 30 tablets   | 0.4 mg/day           | Postural hypotension, syncope, retrograde ejaculation, erectile dysfunction   |
| Terazosin (Hytrin <sup>TM</sup> )  | Alpha 1A selective                                  | No (Repatriation Authority) | Up to \$35 for 28 tablets (2 mg), up to \$77 for 28 tablets (10 mg) | 1–5 mg/day           | Postural hypotension, syncope, dizziness, palpitations, blurred vision, nausea  |
| Alfuzosin (Xatral <sup>TM</sup> )  | Alpha 1 (nonselective)                              | No                          | 30 tablets (10 mg) for \$55 (private)                               | 10 mg/day            | Orthostatic hypotension, dizziness, rhinitis, pharyngitis, URTI   |
| <b>Antimuscarinics</b>   |   |                             |   |                      |   |
| Tolterodine (Detrusitol <sup>TM</sup> )  | Not uroselective                                    | No                          | Up to \$50 for 56 tablets   | 1–2 mg twice daily   | Dry mouth, gastrointestinal upset, headache, visual disturbance, dizziness, memory impairment                                 |
| Oxybutynin (Ditropan <sup>TM</sup> )   | Not uroselective                                    | Yes                         | Up to \$25 for 100 tablets  | 5 mg 2–3 times daily | Dry mouth, gastrointestinal upset, headache, visual disturbance, dizziness, memory impairment, urinary hesitancy or retention |
| Darifenacin (Enablex <sup>TM</sup> )   | Uroselective  | No                          | Up to \$50 for 28 tablets   | 7.5 or 15 mg/day     | Dry mouth, constipation, UTI, abdominal pain, urinary retention   |
| Oxybutynin transdermal system  | Not uroselective                                    | Yes                         | Up to \$34.20 for 8 patches   | 3.9 mg/day           | Dry mouth, gastrointestinal upset, headache, visual disturbance, dizziness, memory impairment, urinary hesitancy or retention |
| Solifenacin (Vesicare <sup>TM</sup> )  | Uroselective  | No                          | Up to \$60 for 30 tablets (5 mg), up to \$70 for 30 tablets (10 mg) | 5–10 mg/day          | Dry mouth or eyes, gastrointestinal upset, blurred vision, fatigue, UTI, urinary retention                                    |
| <b>5 alpha reductase inhibitors</b>  |   |                             |   |                      |   |
| Finasteride (Proscar <sup>TM</sup> )   | 5 alpha reductase inhibitor                         | No (Repatriation Authority) | Up to \$105 for 30 tablets  | 5 mg/day             | Erectile dysfunction, reduced libido, reduced ejaculate volume, breast tenderness or enlargement                              |
| Dutasteride (Avodart <sup>TM</sup> )   | 5 alpha reductase inhibitor                         | Yes*                        | \$28.50 for 30 tablets  | 0.5 mg/day           | Impotence, altered libido, ejaculatory disorders  |
| <b>Combination treatments</b>  |   |                             |   |                      |   |
| Tamsulosin + dutasteride (Duodart <sup>®</sup> )   | 5 alpha reductase inhibitor with alpha 1A selective | Yes (Authority)             | \$90 for 30 tablets (private) or \$34 (Authority)                   | 0.4 mg/0.5 mg        | Postural hypotension, syncope, retrograde ejaculation, erectile dysfunction, impotence, altered libido, ejaculatory disorders |
| * PBS listing only available if patient is already on an alpha blocker and dutasteride is initiated by a urologist |   |                             |   |                      |   |



Figure 6. Obstructing lateral lobes of the prostate gland at cystoscopy  
Image courtesy of A/Prof Henry Woo



Figure 7. Open prostatic channel following transurethral resection of the prostate  
Image courtesy of A/Prof Henry Woo

- Absolute indications for referral to a urologist include haematuria, recurrent infections, bladder stones, urinary retention or renal impairment.
- In the absence of complicating factors medical therapy can be started in the primary care setting.
- Failure of medical therapy, progression of LUTS or inability to tolerate medical therapy are indications for referral to a urologist.
- Medical therapy includes alpha blockers to relax the smooth muscle of the prostate, 5 alpha reductase inhibitors to shrink the prostate, and anti-muscarinics to relax the bladder.

### Resources

- The RACGP guidelines on PSA screening: [www.racgp.org.au/policy/Prostate\\_screening.pdf](http://www.racgp.org.au/policy/Prostate_screening.pdf)
- The Continence Society of Australia: [www.continence.org.au](http://www.continence.org.au)
- For further information on urodynamics see the article: McKertish K. Urodynamics. *Aust Fam Physician* 2011;40:389–93
- Australia and New Zealand Urological Nurses Society: [www.anzuns.org](http://www.anzuns.org)
- The International Prostate Symptom Score is freely available online at many websites including: [www.gppartners.com.au/content/Document/guide\\_ipss.pdf](http://www.gppartners.com.au/content/Document/guide_ipss.pdf)
- Information about continence nurse services is available at the Australia and New Zealand Urological Nurses Society website and the Continence Society of Australia website (see above).

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Conflict of interest: A/Prof Prem Rashid has been a visitor to the American Medical Systems (AMS) US manufacturing facility undertaking a cadaveric dissection clinic and observed operative procedures by high volume implant urologists affiliated with AMS during that time. He also has acted as a consultant for Coloplast, Astra Zeneca, Ipsen, Hospira and Abbott pharmaceuticals, as well as, the Neotract Corporation. He was a Preceptor in Advanced Laparoscopic Urology with Professor Inderbir S. Gill, (then) Head of the Section of Laparoscopic and Robotic Surgery and Chairman, Glickman Urological Institute, Cleveland Clinic Foundation via a 2006 grant from the Australasian Urological Foundation. No commercial organisation initiated or contributed to the writing of the article (apart from providing images for use where indicated).

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## Conclusion

Lower urinary tract symptoms are common in men and their incidence increases with age. With an aging population, it is useful for GPs to have an understanding of the classification and aetiology of LUTS. Medical therapy can be started in the primary care setting and many patients may remain stable without the need for further treatment.

## Summary of important points

- LUTS may be divided into voiding symptoms (related to the outlet) or storage symptoms (related to the bladder), or a combination of the two.
- Most bladder outflow obstruction is caused by benign prostatic enlargement. Benign prostatic hypertrophy is a histological diagnosis.
- The IPSS is beneficial in assessing symptoms as well as the response to treatment.





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