Benign prostatic hyperplasia (BPH) is a histologic diagnosis referring to smooth muscle and epithelial cell proliferation within the transition zone of the prostate.1 BPH can technically only be diagnosed after the prostate is biopsied and the specimen examined under a microscope.2 In contrast, benign prostatic enlargement is a clinical diagnosis that can be made on digital rectal examination.2

The prevalence of BPH increases significantly with age. Greater than 50 per cent of men will have BPH at 60 years of age, whereas approximately 90 per cent of men will have BPH by age 85.2 Fortunately, not everyone with BPH will be symptomatic; bothersome symptoms are estimated to affect about 30 per cent of men.3 For those affected, however, impact on quality of life can be significant.1 As symptom severity does not correlate well with the degree of hyperplasia, and because other conditions can cause similar symptoms, the clinical syndrome associated with BPH is often referred to as male lower urinary tract symptoms (LUTS).3

**SYMPTOMATOLOGY & COMPLICATIONS**

An enlarged prostate gland has been proposed to contribute to male LUTS via two primary mechanisms: (1) direct bladder outlet obstruction (static component), and (2) increased smooth muscle tone and resistance (dynamic component).1 Based on these mechanisms, male LUTS are commonly classified as either obstructive/voiding symptoms or storage/irritative symptoms1,2,4 (see Box 1). Potential complications of chronic bladder outlet obstruction secondary to BPH include renal insufficiency, urinary retention, recurrent urinary tract infections, and bladder stones.1,5

**ASSESSMENT & DIAGNOSIS**

According to recent Canadian guidelines for the management of BPH, assessment of symptom severity and bother is essential in the initial evaluation of a man presenting with LUTS.6 A formal assessment of symptoms, including their impact on quality of life, is also recommended as part of the initial diagnostic workup, as well as to monitor symptom evolution and evaluate response to treatment.3,6 Such an assessment can be done using the International Prostate Symptom Score (IPSS) or American...
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Urological Association Symptom Index (AUA-SI).

Box 2 – Some medications that can contribute to LUTS

<table>
<thead>
<tr>
<th>Androgens</th>
<th>Antihistamines</th>
<th>Opiates</th>
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</thead>
<tbody>
<tr>
<td>Testosterone</td>
<td>Brompheniramine</td>
<td>Codeine</td>
</tr>
</tbody>
</table>

Box 3 – Lifestyle changes for LUTS

- Modification or restriction of fluid intake (particularly prior to bedtime)
- Avoidance of excessive intake of caffeinated/alcoholic beverages or spicy foods
- Adjustment/avoidance/monitoring of some drugs* (e.g., diuretics)
- Timed or organized voiding (bladder retraining)
- Pelvic floor exercises
- Avoidance or treatment of constipation
- Increased exercise

* See Box 2
### TABLE 1 – SOME MEDICATIONS USED TO TREAT MALE LUTS\(^1,5,6,10,12-14\)

<table>
<thead>
<tr>
<th>Treatment Option/Drug</th>
<th>Usual Daily Dose*</th>
<th>Primary Place in Therapy</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alpha-blockers</strong></td>
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</tr>
</tbody>
</table>
| - Alfuzosin           | 10 mg             | First-line treatment for moderate-to-severe BPH-related LUTS | • All agents in class appear to be equally effective in appropriate doses  
  • Typically reduce IPSS by \(-35\text{--}40\%\) and increase \(Q_{\text{max}}\) by \(-20\text{--}25\%\); efficacy does not depend on prostate size  
  • Improvements may be noted in hours to days; full effects apparent within a few weeks; duration of efficacy appears to be maintained over at least 4 years  
  • Clinical impact of formulation (e.g., immediate vs. sustained release, etc.) is modest  
  • Do not alter the natural progression of disease  
  • Doxazosin and terazosin require dose titration and blood pressure monitoring |
| - Doxazosin           | 2--8 mg           |                          |          |
| - Tamsulosin          | 0.4 mg            |                          |          |
| - Terazosin           | 5--10 mg          |                          |          |
| **5-\(\alpha\) reductase inhibitors** |                   |                          |          |
| - Dutasteride         | 0.5 mg            | Appropriate treatment for moderate-to-severe BPH-related LUTS associated with prostate enlargement | • Both agents in class appear to be equally effective  
  • Typically reduce IPSS by \(-15\text{--}30\%\), decrease prostate volume by \(-18\text{--}28\%\), and increase \(Q_{\text{max}}\) by \(-1.5\text{--}2\) mL/s after 2--4 years of treatment; efficacy depends on prostate size\(^1\)  
  • Improvements generally seen after a minimum treatment duration of 6--12 months  
  • May alter the natural progression of disease through a reduction in risk of acute urinary retention and need for surgery  
  • Should not be used for BPH-related LUTS without prostate enlargement  
  • Result in decreased PSA levels,\(^2\) which needs to be considered for prostate cancer screening |
| - Finasteride         | 5 mg              |                          |          |
| **Anticholinergics\(^8\)** |                   |                          |          |
| - Darifenacin         | 7.5--15 mg        | Appropriate for moderate-to-severe BPH-related LUTS | • Efficacy data from RCTs are limited for men with LUTS; although storage symptoms appear to decrease in the majority of patients, statistical significance vs. placebo was not demonstrated in most trials  
  • Caution is advised in men with bladder outlet obstruction due to the theoretical risk of decreased bladder strength and resultant urinary retention or elevated PVR urine |
| - Oxybutynin          | 5--30 mg\(^5\)    |                          |          |
| - Solifenacin         | 5--10 mg          |                          |          |
| - Tolterodine         | 4 mg              |                          |          |
| - Trospium chloride   | 40 mg             |                          |          |
| **Alpha-blocker + 5-\(\alpha\) reductase inhibitor** | See individual agents | Appropriate treatment for moderate-to-severe LUTS associated with prostate enlargement | • Combination therapy significantly improves symptom scores and increases \(Q_{\text{max}}\) compared with either monotherapy option, although benefits may not be seen until at least 9 months of treatment\(^1\)  
  • The combinations tested in clinical trials include: dutasteride plus tamsulosin, or finasteride plus alfuzosin, doxazosin, or terazosin  
  • Successfully treated patients can be given the option to discontinue the alpha-blocker after 6--9 months of therapy; if symptoms recur, the alpha-blocker should be restarted |
| **Alpha-blocker + anticholinergic** | See individual agents | May be useful for moderate-to-severe LUTS where symptoms remain after monotherapy with either drug\(^1\) | • Combination therapy has been shown to reduce frequency, nocturia, and IPSS compared with alpha-blockers or placebo; combination therapy has also been shown to reduce urgency and urge incontinence and increase quality of life\(^5\)  
  • Use combination cautiously in men suspected of having bladder outlet obstruction |

*Continued on page iv*
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TABLE 1 – SOME MEDICATIONS USED TO TREAT MALE LUTS1,5,6,10,12-14 (continued)

<table>
<thead>
<tr>
<th>Treatment Option/Drug</th>
<th>Usual Daily Dose*</th>
<th>Primary Place in Therapy</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphodiesterase Inhibitors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sildenafil</td>
<td>NA</td>
<td>Not currently recommended for BPH-related LUTS outside of clinical trial settings</td>
<td>• All agents in class have reduced IPSS in RCTs; storage and voiding symptoms decreased equally during treatment; improvements in quality of life have also been demonstrated compared with placebo. • Insufficient information is available about combinations with other LUTS medications</td>
</tr>
<tr>
<td>• Tadalafil</td>
<td>NA</td>
<td>Not currently recommended for BPH-related LUTS</td>
<td></td>
</tr>
<tr>
<td>• Vardenafil</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complementary and alternative medicines</td>
<td>NA</td>
<td>Not currently recommended for BPH-related LUTS</td>
<td></td>
</tr>
</tbody>
</table>

BPH = benign prostatic hyperplasia; IPSS = International Prostate Symptom Score; LUTS = lower urinary tract symptoms; NA = not applicable; PSA = prostate specific antigen; PVR = post-void residual; Qmax = maximum urinary flow rate; RCT = randomized controlled trial

* Doses listed are for the oral route of administration.
† Demonstrated in controlled studies, after a run-in period.
‡ Finasteride may not be more efficacious than placebo in patients with baseline prostate volume <40 mL. Dutasteride appears to be efficacious in patients with baseline prostate volume between 30 mL and 40 mL, but symptom improvement is quicker and more pronounced in men with higher baseline prostate volume.
§ PSA levels are reduced by ~50% after 6–12 months of treatment.
¶ Also referred to as muscarinic receptor antagonists.
|| Dose varies according to formulation used.
** Use with caution in patients with a PVR urine >250–300 mL.
†† Based on data from a study evaluating the combination of tamsulosin and dutasteride.
‡‡ Combination may be most appropriate for patients with persistent bladder storage symptoms while on alpha-blocker monotherapy.

should consult the online versions of the guidelines1,5,6,8 (see References, below, for URLs).

References