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Management of Lower Urinary Tract Symptoms Attributed to Benign Prostatic Hyperplasia: AUA Guideline (2026) Part I: Presentation and Evaluation

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Purpose: Benign prostatic hyperplasia (BPH) refers to the proliferation of glandular and stromal components within the transition zone of the prostate. Non-neurogenic lower urinary tract symptoms (LUTS) can be due to bladder, prostate, urethral, or other pathology. Bothersome LUTS is the main reason patients seek treatment and generally drives management decisions. As such, shared decision-making plays a critical role in the initiation and escalation of treatment. This Guideline covers the evaluation and treatment of LUTS/BPH. The summary presented herein represents Part I of the three-part series dedicated to Management of LUTS/BPH. Please refer to Parts II and III and the full version of the Guideline for additional information on this topic.

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Abbreviations and Acronyms

5-ARI = 5-alpha reductase inhibitor
AB = Alpha blocker
AUA = American Urological Association
AUA-SI = American Urological Association Symptom Index
AUA-SS = American Urological Association Symptom Score
AUR = Acute urinary retention
BMI = Body mass index
BOO = Bladder outlet obstruction
BPH = Benign prostatic hyperplasia
CT = Computed tomography
DO = Detrusor overactivity
DRE = Digital rectal examination
DU = Detrusor underactivity
eFI = Electronic frailty index
ED = Erectile dysfunction
FDA = U.S. Food and Drug Administration
IPDCB = Intraprostatic drug coated balloon
IPP = Intravesical prostatic protrusion
IPSS = International Prostate Symptom Score
LUTS = Lower urinary tract symptoms
MRI = Magnetic resonance imaging
NHANES = National Health and Nutrition Examination Survey
OAB = Overactive bladder
PCPT = The Prostate Cancer Prevention Trial
PCT = Penile cuff test
PICOTS = Populations, interventions, comparators, outcomes, timing, settings
PPV = Positive predictive value
PSA = Prostate-specific antigen
PUL = Prostatic urethral lift
PVR = Post-void residual
Q_{avg} = Average urinary flow rate
Q_{max} = Maximum urinary flow rate
RCT = Randomized controlled trial
rUTI = Recurrent urinary tract infection
RWT = Robotic waterjet treatment
SGLT2 = Sodium-glucose cotransporter-2
SSRI = Selective serotonin reuptake inhibitor
SUFU = Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction
TIPD = Temporary implanted prostatic device
TRUS = Transrectal ultrasound
TUGT = Timed-Up-and-Go Test
TURP = Transurethral resection of the prostate
TWOC = Trial without catheter
TyG-BMI = Triglyceride Glucose-Body Mass Index
UDS = Urodynamic studies
UTI = Urinary tract infection
WVTT = Water vapor thermal therapy

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Materials and Methods: The systematic review that informs this Guideline was based on searches in Ovid MEDLINE, the Cochrane Central Register of Controlled Trials, and the Cochrane Database of Systematic Reviews through January 2025. Update searches were conducted on December 15, 2025. Literature searches were limited to studies of medical therapies published since 2009 and surgical studies published since 2014. The searches were supplemented by reviewing electronic database reference lists of relevant articles. Criteria for inclusion and exclusion of studies were based on the Key Questions and the populations, interventions, comparators, outcomes, timing, types of studies and settings (PICOTS) of interest developed by the Panel.

Results: The recommendations herein address initial presentation, evaluation, and initial management of patients with LUTS/BPH. Where possible, evidence levels were assigned along with relevant supporting text to assist clinicians when encountering men with LUTS/BPH. Standard evaluation is established with appropriate tests and shared decision-making.

Conclusions: The presentation, evaluation, and initial management of patients presenting with LUTS/BPH is straightforward. In addition to patient history and physical examination, the recommendations herein include the appropriate use of tests and patient counseling.

Key Words: benign prostatic hyperplasia, BPH, lower urinary tract symptoms, benign prostatic enlargement, LUTS, prostate-specific antigen, 5-alpha reductase inhibitor, alpha blocker, bladder outlet obstruction, Erectile dysfunction, international prostate symptom score, magnetic resonance imaging, overactive bladder, maximum urinary flow rate, intraprostatic drug coated balloon, recurrent urinary tract infection, robotic waterjet treatment, temporary implanted prostatic device, transrectal ultrasound, transurethral resection of the prostate, urodynamic studies, water vapor thermal therapy

BACKGROUND

Histological proliferation of stromal and epithelial components of the prostate (ie, BPH) occurs with aging in males.[1] LUTS are often attributed to prostatic enlargement and its effects on the bladder outlet; however, they arise from a complex interplay among the bladder, the bladder outlet (including the prostate), the pelvic floor muscles, urine production by the kidneys, and the nervous system.

Bothersome LUTS in men with BPH are the most common indication for treatment. The presence of bladder stones, upper urinary tract deterioration (obstructive uropathy), recurrent or significant gross hematuria, urinary retention, and recurrent urinary tract infections (rUTIs) are considered absolute indications for BPH intervention and should still warrant treatment. Similarly, acute urinary retention (AUR) in the absence of an alternative etiology or recurrent episodes requiring catheterization are indications for BPH intervention.

Index Patient

For the purpose of this Guideline, the index patient is defined as a male $\geq$ 40 years of age who presents to a clinician for LUTS/BPH. It is important to note that in the absence of concurrent voiding LUTS, isolated storage symptoms, or nocturia are not typical manifestations of BPH.

As most patients present to clinicians for bothersome LUTS/BPH, unless otherwise stated in this Guideline, "LUTS/BPH" means "bothersome LUTS/BPH."

Standardized Symptom Questionnaires

The historical gold standard symptom questionnaire for LUTS/BPH in men who are not catheter-dependent is the International Prostate Symptom Score (IPSS). The IPSS is a validated assessment of symptom frequency and severity.[2] The American Urological Association Symptom Index or Score (AUA-SI/AUA-SS) and IPSS both include 7 identical LUTS severity questions that are summed for a score of 0 to 35 points. The BPH literature uses these questionnaires interchangeably, although the IPSS questionnaire includes an additional bother question that is scored separately.

Shared Decision-Making: Prostate Volume and Choice of Surgical Procedures

The overarching goal of this Guideline is to provide an evidence-based framework and useful reference for the diagnosis and treatment of male LUTS/BPH. Shared decision-making should be used at every juncture of the management process and patient priorities (eg, ejaculatory preservation, retreatment and catheter tolerance, anesthesia concerns) should be clearly documented.

Importantly, with the rapid expansion of technologies available for LUTS/BPH, the Panel recognizes that many of these technologies recommended herein may be unavailable to certain urologists/specialists. When either the technology is unavailable or expertise for individual procedures is lacking, urologists/specialists should perform the following:

- Counsel about the key elements of each procedural class
- Engage in shared decision-making regarding treatment choices

- Referral to another urologist/specialist for treatment, when appropriate

The Panel recognizes that urologist expertise with various technologies varies. The Panel recommends a thorough discussion of risks and benefits to support patient-centered, informed decision-making.

GUIDELINE STATEMENTS

Evaluation

Initial Evaluation

In the initial evaluation of patients presenting with LUTS/BPH, clinicians should obtain a medical history, conduct a physical examination, utilize standardized symptom scores, and perform a urinalysis. *(Clinical Principle)*

A complete medical history should be taken to assess urinary symptoms, prior genitourinary procedures or trauma, possible causes of neurogenic LUTS, sexual history, bowel habits, comorbidities, use of medications, cognitive functioning, fluid consumption habits/behavior, and general mental and physical health. The presence or history of these absolute indications for BPH treatment should also be assessed: bladder stones, upper urinary tract deterioration, recurrent or significant gross hematuria, rUTIs, AUR in the absence of an alternative etiology, and recurrent AUR requiring catheterization.

LUTS are non-specific and multifactorial. LUTS/BPH and subsequent bladder outlet obstruction (BOO) is just one of many different male LUTS etiologies. Therefore, clinicians should screen for common non-BPH causes of LUTS such as neurogenic LUTS, infections, and complications of a prior genitourinary or pelvic procedure, trauma, or iatrogenic injury such as urethral stricture. A detailed sexual history should be obtained. Relevant comorbidities include volume overload states, diabetes, hyperthyroidism, constipation, back pain or radiculopathy, and polydipsia/polyuria.

Recent anesthesia, recreational drugs are particularly important to capture for men with predominant voiding LUTS. Conversely, storage LUTS may be caused by diuretics, selective serotonin reuptake inhibitors (SSRIs), cholinesterase inhibitors, or sodium-glucose cotransporter-2 (SGLT2) inhibitors. Ketamine-induced bladder toxicity is increasingly recognized.[3]

A comprehensive physical exam should be conducted during the initial evaluation for BPH, including lower abdominal palpation, assessing the urethral meatus and phallus for any signs of fibrosis/stricture, a rectal exam and digital rectal examination (DRE) to assess pelvic floor tone and pain, a gross estimate of prostate volume, and stool burden.

In men who are not catheter-dependent, an IPSS or similar questionnaire should be obtained. Urinary incontinence, post-void dribbling, and pain should be assessed separately. Patients should be asked which urinary symptom(s) is the most bothersome. If patients are reporting predominantly storage LUTS or isolated nocturia, then a frequency-volume chart can provide additional information regarding etiology, and clinicians should consult the American Urological Association/Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (AUA/SUFU) Guideline on the Diagnosis and Treatment of Idiopathic Overactive Bladder.[4]

Additionally, a urinalysis can help clinicians to rule out non-BPH causes of LUTS. Typical urinary tract infection (UTI) symptoms (eg, acute-onset dysuria and frequency) should be confirmed with a reflex urinary culture prior to treating with antibiotics. Glucosuria should prompt an evaluation for diabetes. Microscopic hematuria in the absence of an infection should be evaluated according to the AUA/SUFU Microhematuria Guideline.[5]

Clinicians may obtain a prostate-specific antigen (PSA) in patients with LUTS/BPH after engaging in shared decision-making. *(Expert Opinion)*

PSA may be a good approximation for men without prostate cancer to aid in identifying LUTS/BPH. PSA performs reasonably well compared with planimetric transrectal ultrasound (TRUS) and better than DRE in estimating whether prostate volume is greater or smaller than 30, 40, or 50 cc.[6]

After engaging in shared decision-making with the patient, clinicians may obtain a PSA at initial evaluation for LUTS if there was no prior PSA obtained within the last year, a urinalysis shows no infection, and the patient is < 80 years of age.

The role of PSA in predicting whether LUTS/BPH will worsen over time has been studied to show that a large baseline prostate volume and a high serum PSA level are the predominant risk factors for developing AUR.[7,8] In the placebo group of controlled studies, baseline serum PSA level and to a lesser extent prostate volume, consistently predict the risk of AUR and BPH-related surgery.[9]

PSA also has a role in guiding treatment selection. PSA density could provide a variable for estimating BPH volume and may eventually improve selection of patients for 5-alpha reductase inhibitor (5-ARI) treatment. A 5-ARI is best used in a prostate volume > 30 cc and PSA > 1.5 ng/mL, as is the combination therapy of an alpha blocker (AB) and 5-ARI.[10]

Clinicians may obtain a post-void residual (PVR) and/or uroflowmetry in patients with LUTS/BPH to evaluate for urinary retention or exclude other disorders. *(Clinical Principle)*

A PVR is a relatively straightforward test that measures the amount of urine left in the bladder after micturition. PVR is usually measured via a non-invasive ultrasound bladder scanner and is often performed at the initial evaluation. A PVR may also be obtained via catheterization following micturition; however, it is more invasive and carries additional risks.

In patients without neurogenic disorders, a PVR $>$ 300 mL measured on 2 different occasions at least 6 months apart is considered non-neurogenic chronic urinary retention and should be followed closely.[11] Specifically, these patients should undergo a renal ultrasound and if hydronephrosis is present, further workup or intervention is recommended. Furthermore, if these patients have urinary incontinence or UTIs, intervention should also be strongly considered.

PVR $>$ 150 to 200 mL has been used as an exclusion criterion during trials for certain pharmacologic agents and if the use of these agents is planned, a PVR should be measured. Anticholinergic medications and beta-3 agonists should be used with caution in patients with elevated PVR because of the risk of exacerbating incomplete bladder emptying and possibly causing AUR.[12]

Uroflowmetry is a non-invasive tool to assess LUTS/BPH that measures speed, volume, and duration of urine flow. Measured urinary flow rate is reported as maximum (or peak) urinary flow rate (Q_{max}) and average urinary flow rate (Q_{avg}). Uroflowmetry can provide a valuable addition over symptoms and PVR in the management of LUTS.

Uroflowmetry can now be performed using home-based remote methods decreasing the variability of a single measurement and should be reported as Q_{max} and voided volume.

Clinicians may perform invasive or non-invasive pressure flow testing/urodynamic studies (UDS) in patients with LUTS/BPH to define bladder function when diagnostic uncertainty exists. *(Expert Opinion)*

UDS provides objective measures related to bladder function and may be used when diagnostic uncertainty exists. UDS should be performed in a standardized manner adhering to good urodynamic practices.[13] In patients with suspected neurogenic bladder, UDS is much more important as it is in other non-index situations such as patients with elevated PVR and diabetes mellites.[14]

UDS involves catheterizing the bladder and rectum and generally consists of filling cystometry and pressure flow voiding studies. In patients with LUTS/BPH, this is usually done to diagnose BOO and differentiate from other causes of LUTS. Due to the invasive nature and expense of this test, it has little utility in the initial evaluation of men with uncomplicated LUTS/BPH. In fact, UDS has not been shown to decrease rates of intervention in men randomized to UDS compared to men who underwent routine care, suggesting that it has a limited role in the diagnosis of uncomplicated LUTS/BPH.[15] UDS may be useful in patient counseling because although it did not alter management, it did offer a better explanation of LUTS and aids as a tool in a shared decision context for patients to understand what to expect after surgical intervention.

The penile cuff test (PCT) is a non-invasive pressure flow study which is used to estimate bladder pressure and has been used by some in the initial evaluation of men with LUTS/BPH. While it seems repeatable with reasonable accuracy at diagnosing BOO, a recent systematic review noted variability in definition of BOO and therefore UDS remains the diagnostic test of choice.[16]

Clinicians should inform patients with LUTS/BPH of their risk factors for LUTS progression and retention, address those that are modifiable, and consider BPH treatment for those with multiple non-modifiable risk factors. (*Expert Opinion*)

The risk factors for LUTS progression leading to retention fall into the 2 categories of fixed (eg, race, age) and modifiable (eg, prostate volume, prostate morphology, Q_{max}, weight, diet, exercise). AUR from an inciting event or condition is covered in a later statement. The strongest risk factor for LUTS progression is older age.[17-19] In the Olmsted County study of urinary symptoms, men 40 to 79 years of age were followed over 12 years, and the average increase in IPSS was 0.18 points per year, ranging from 0.05 points per year for men in their 40 s to 0.44 points per year for those in their 60 s.[20] The Prostate Cancer Prevention Trial (PCPT) demonstrated that Black and Hispanic men are at increased risk of developing BPH.[21]

Intravesical prostatic protrusion (IPP) $\geq$ 10 mm is associated with a higher risk of treatment resistance, AUR, or the need for prostatic surgery.[22]

There is a growing appreciation for the role of frailty as a risk factor for LUTS development and progression, and AUR. A multicenter prospective cohort study of men $>$ 65 years of age demonstrated that greater phenotypic frailty was associated with non-linear increases in LUTS severity over time, independent of age and comorbidities.[23] Frail and pre-frail men with LUTS due to suspected BPH are also more likely to experience clinical BPH progression, particularly worsening LUTS and AUR, despite drug therapy.[24] Although there is not a

single established method to assess frailty, the Timed-Up-and-Go Test (TUGT) has been used effectively in the academic urology clinic setting.[25] The electronic frailty index (eFI), an automated digital marker for frailty integrated within the electronic health record, can facilitate preoperative frailty screening.[26]

Studies have suggested that greater body mass index (BMI) is associated with increased risk of both LUTS and BPH diagnosis[21,27] with obesity further associated with LUTS progression.[28-31] Risk of BPH development with increased BMI is further positively correlated to Triglyceride Glucose-Body Mass Index (TyG-BMI).[32]

Men who are physically inactive are more likely to develop BPH and to experience symptom progression.[19,21,28,29,33-35] Data has shown that walking 2 to 3 hours/week yielded a 25% lower risk of BPH.[36]

Constipation is associated with increased risk of LUTS and may contribute to urinary retention in some men, particularly in cases of severe constipation or pelvic floor dysfunction, but it is not a universal cause. In a study of 3077 men in the National Health and Nutrition Examination Survey (NHANES), bowel habits (eg, frequency and consistency) affected LUTS.[37]

Clinicians should counsel patients with LUTS/BPH on options for intervention, which can include behavioral/lifestyle modifications, medical therapy, or procedural interventions. (*Clinical Principle*)

When considering treatment for BPH, all appropriate treatment modalities should be offered to patients. Selection of proper intervention should consider patient goals, anatomical and physiological characteristics, intervention benefits, treatment failure, retreatment rates, and potential treatment side effects.

The interventions discussed in this Guideline have evidence of symptom improvements; there is no evidence to support a stepwise approach for patients with LUTS/BPH.

Follow-Up Evaluation

Clinicians should evaluate patients with LUTS/BPH within six months after initiating treatment to assess response to therapy; re-evaluation should include standardized symptom scores and evaluation of any adverse events to treatment. (*Clinical Principle*)

Routine medical practice and prudent judgment suggests that clinicians should follow-up and re-evaluate patients for an appropriate response to any therapeutic intervention. Recommendations for follow-up after initiating treatment for LUTS/BPH remain undetermined. Certain red flag symptoms should prompt both the patient and clinician for the need of earlier evaluation and a potential change in treatment course. These symptoms include worsening PVR volumes, urinary incontinence, rUTIs or stones, and reduced renal function as a result of LUTS/BPH.

Clinicians should counsel patients appropriately and set proper expectations on the time frame for medication onset and symptom improvement. Outside any major adverse events that warrant earlier follow-up, the Panel felt 6 months was a reasonable follow-up time frame. Standardized questionnaires exist as a means for follow-up and tracking patient symptoms over time. Historically, clinicians have utilized the IPSS or similar symptom questionnaire.

Clinicians may offer PVR and/or uroflowmetry during routine follow-up of patients with LUTS/BPH. (*Expert Opinion*)

A PVR and uroflowmetry are readily available to most urologists and therefore are often used during routine follow-up in men with LUTS/BPH. This is particularly true in men with elevated PVR or those that have undergone a change in management.

Most trials reporting on .efficacy (comparative or not) of interventions for LUTS/BPH report changes in IPSS as well as changes in uroflowmetry parameters and PVR. Therefore, obtaining a PVR and uroflowmetry in patients at baseline and after an intervention allows clinicians to compare the results to published benchmarks and allow changes in management if the results are inadequate. Worsening PVR or uroflowmetry parameters can also be an initial sign of adverse events after surgical intervention (eg, bladder neck contracture or urethral stricture) or in the long term be a sign of prostate regrowth or worsening bladder function.

Clinicians may offer invasive or non-invasive pressure flow testing/UDS and/or cystoscopy in patients with LUTS/BPH if there is a worsening of LUTS/BPH during follow-up. (*Expert Opinion*)

Most patients report improvement in LUTS/BPH parameters after intervention. If this is not the case and patients have persistent or worsening symptom scores or worsening objective parameters such as PVR or uroflowmetry, UDS, PCT, and cystoscopy are reasonable options to determine the cause.

Cystoscopy is important in patients with subjective worsening of urinary stream, or those with new-onset hematuria. This is particularly useful to rule out bladder neck contracture in patients with worsening stream soon after surgical intervention for LUTS/BPH.

Lower urinary tract imaging also has a role in patients with persistent LUTS, particularly if it has not been performed prior to initiating treatment. For example, an IPP might be a reason for inadequate

response to medical therapy or a large residual prostate after transurethral resection of the prostate (TURP) and could be a reason for inadequate response to surgical therapy.

Among patients with LUTS/BPH who have undergone treatment and do not have symptom improvement, clinicians should pursue an alternative diagnosis and/or recommend an alternative treatment pathway. *(Clinical Principle)*

As mentioned above, the majority of initial BPH treatments will be empiric due to the inability to easily diagnose LUTS/BPH or to distinguish BPH from LUTS due to non-obstructive causes. Therefore, an initial BPH treatment failure should trigger a re-evaluation of the LUTS etiology rather than automatic escalation of more invasive de-obstruction interventions. Signs that a patient who did not respond to the initial therapy requires reconsideration of the diagnosis which include:

1. increasing or persistently high Q_{max} ($\geq$ 12 mL/s) and low PVR without corresponding improvement in symptoms
2. a small prostate volume ($<$ 30 cc) or low PSA
3. the presence of a medication or poorly controlled comorbidity that is known to cause LUTS
4. the presence of significant multimorbidity, frailty, or polypharmacy
5. predominant nocturia or storage LUTS

In this case, alternative diagnoses such as primary bladder dysfunction (including idiopathic overactive bladder [OAB] or detrusor underactivity [DU]), neurogenic LUTS, and other systemic conditions should be strongly considered and treated, if present, prior to escalating BPH treatments.

Signs that a patient who did not respond to initial therapy, particularly with persistent or worsening voiding LUTS, may require escalation to treat ongoing BOO which include:

1. persistently low Q_{max}
2. increasing or persistently elevated PVR
3. a personal history or the development of an absolute indication for BPH treatment

Pre-Procedural Testing

Prior to procedural intervention in patients with LUTS/BPH, clinicians should obtain a PVR. (*Clinical Principle*)

The assessment of PVR can help clinicians to assess and monitor improvements of incomplete bladder emptying. The use of PVR to diagnose BOO has an accuracy of only 63% if a PVR threshold of 50 mL is used. However, larger PVR volumes may indicate poor response to watchful waiting and has been identified as a risk factor for poor response to treatment in large clinical trials.[38-40] Subsequent increases in PVRs can be associated with treatment failure and warrant further workup, especially in patients with associated symptoms such as overflow incontinence, bladder stones, hydronephrosis, and/or worsening of renal function.

Prior to procedural intervention in patients with LUTS/BPH, clinicians should use imaging studies to assess the volume and shape of the prostate. (*Clinical Principle*)

Assessment of prostate volume and morphology can provide valuable information for the clinician related to available procedural options and optimal selection. While some surgical techniques have a broad range of sizes and morphologies that can be utilized, others may have a more limited utilization due to prostate volume limits based on current literature and U.S. Food and Drug Administration (FDA) approval (eg, water vapor thermal therapy [WVTT], prostatic urethral lift [PUL], temporary implanted prostatic device [TIPD], robotic waterjet treatment [RWT], intraprostatic drug coated balloon [IPDCB]). Prostate morphology can also be a limiting factor for some surgical techniques due to urethral length, or presence of a median lobe.

When evaluating prostate anatomy, imaging studies may offer the ability to measure IPP of the median lobe. IPP $\geq$ 1.0 cm was associated with BOO, an unsuccessful trial without catheter (TWOC),[41] and lower response to ABs.[42]

Proper prostate volume assessment can be performed using a variety of imaging modalities such as transabdominal ultrasound, TRUS, computed tomography (CT), and magnetic resonance imaging (MRI). DRE is unreliable for prostate volume assessment and should not be the only method to select surgical techniques that are prostate volume dependent. The differences in prostate volume based on imaging modalities are not large enough to justify one image modality over another. The clinician should use images already available or assess prostate volume and morphology by obtaining sizing information according to clinician and patient preference.

Prior to procedural intervention in patients with LUTS/BPH, clinicians may perform a cystoscopy. (*Clinical Principle*)

Cystoscopy may be utilized as a tool to evaluate prostate and bladder morphology and associated pathologies prior to surgical interventions. Patients with hematuria, suspicion of urothelial cancer, and urethral strictures may have a cystoscopy as part of their expected workup and follow-up. Cystoscopy, however, has a limited ability to determine the presence of obstruction caused by BPH if used as a single test.

The presence of a median lobe, its anatomy, and degree of obstruction is easily evaluated on cystoscopy, and correlates well with BOO with a positive predictive value (PPV) of 94%, and is negatively

Table 1. *Lifestyle Modifications*[a]

For overall urologic health
Maintaining a healthy weight
Regular aerobic and resistance exercises (including core)
Smoking cessation
Eating a healthy diet, including low salt intake
Managing blood pressure, cholesterol, and blood sugar
Avoiding constipation
Managing stress and treating mood disorders
For predominant storage symptoms
Documenting a frequency-volume chart or bladder diary to identify triggers
Double-voiding
Timed-voiding (eg, every 2-3 h)
Bladder retraining and urge suppression techniques
Avoiding bladder irritants or natural diuretics (eg, caffeine, alcohol, sweeteners, flavorings, colorings)
Self-directed or supervised pelvic physical therapy
Fluid restriction in the evening and good sleep hygiene to prevent nocturia
For predominant voiding symptoms
Focused relaxation of the pelvic floor during voiding
Urethral milking after completion of voiding to prevent post-void terminal dribbling

[a] This table was developed based on the expert opinion of the Panel.

correlated with Q_{max}.[43] Even though cystoscopy findings can provide useful information for surgical management, cystoscopy alone cannot definitively diagnose detrusor overactivity (DO), DU, or exclude BOO.[44]

NON-PROCEDURAL INTERVENTIONS

Behavioral/Lifestyle Changes

For patients with LUTS/BPH, clinicians should provide behavioral/lifestyle interventions prior to or in addition to initiating pharmacologic treatment. (*Moderate Recommendation; Evidence Level: Grade B*)

Behavioral and lifestyle interventions are attractive first-line therapies for many men with LUTS/BPH due to their wide accessibility, personalization, and low risk of harm. The Panel reviewed 4 randomized controlled trials (RCTs) that evaluated behavioral and/or lifestyle interventions for LUTS/BPH.[45-48] Targeted mechanisms of action were highly heterogeneous and there was minimal overlap in interventions tested across studies, including weight loss, general exercise, supervised pelvic floor muscle training, and other self-management techniques. All 4 trials demonstrated a modestly greater improvement in IPSS and quality of life in the intervention group compared to the active control group.

A systematic review and meta-analysis of 3 trials directly comparing LUTS self-management vs drug therapy found no evidence of a difference in symptom severity at 6 to 12 weeks, particularly in the setting of concurrent BPH and OAB.[49] In particular, men with BPH who are most bothered by nocturia may be more responsive to behavioral and/or lifestyle interventions compared to AB monotherapy.[50]

Another large cluster RCT among 1077 men with LUTS (ie, not necessarily due to BPH) demonstrated that a 12-month standardized self-management advice booklet was superior to usual care as determined by clinicians in the control group.[51] Lastly, given the disproportionately high prevalence of obesity, diabetes, cardiovascular disease, and vasculogenic erectile dysfunction (ED) among men with BPH, general lifestyle interventions such as smoking cessation, maintaining a healthy weight, and regular exercise would benefit all men with BPH and some may be particularly motivated by the possibility of modest improvements in LUTS.[52] The Panel developed Table 1 based on expert opinion for recommended lifestyle modifications for patients with LUTS/BPH.

SPECIAL CASES

Acute Urinary Retention

In addition to optimizing modifiable risk factors, clinicians should prescribe a uroselective AB to be taken for at least three days prior to a voiding trial to treat patients with AUR related to LUTS/BPH. (*Clinical Principle*)

Patients suffering from AUR often have an identifiable triggering event such as excessive fluid intake, bladder overdistention, alcohol consumption, anticholinergic or sympathomimetic medication, general or regional anesthesia, UTI, and constipation.[53] Whilst there are no clinical trials demonstrating that optimizing these factors improve the likelihood of a successful TWOC, it is considered standard practice to identify and correct these factors that can be modified.

At least 13 RCTs have demonstrated the benefit of ABs in improving the success rates of TWOC.[54] One meta-analysis of RCTs comparing ABs to placebo found a rate of successful TWOC of 60.2% vs 38.1%, respectively, with minimal adverse events in the AB groups.[55] The optimal timing of TWOC and duration of AB therapy has yet to be established, although some evidence exists to suggest that delayed TWOC is superior to immediate removal,[56] hence the pragmatic recommendation of 3 days of an AB prior to TWOC.

Clinicians should inform patients who pass a successful TWOC for AUR from LUTS/BPH, that they remain at increased risk for recurrent urinary retention. (*Clinical Principle*)

Given the lack of standardized follow-up, it is challenging to determine the long-term efficacy of AB therapy in treating AUR. All trials reported a significant number of patients with subsequent urinary retention and LUTS after treatment occurring days to months later, who then required repeat catheterization or surgical intervention.[54-58]

In addition to ABs, 5-ARIs have been shown to prevent progression to AUR attributed to LUTS/BPH. The MTOPS trial showed the risks of AUR, and the need for invasive therapy were significantly reduced by combination therapy of doxazosin and finasteride as well as finasteride monotherapy, but not by doxazosin alone.[38]

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