

Urinary problems in the elderly adult

Prompt recognition of disorders affecting the urinary tract allows for treatment or referral to a specialist, as appropriate, and helps to maintain a better quality of life in the elderly patient.

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With advancing age, the lower urinary tract becomes an increasingly important source of medical and social concern. Incontinence, urinary tract infections (UTIs), bladder cancer, and bladder outlet obstruction (BOO) are all more prevalent in patients older than 65 years. Clinicians play an essential role in the screening, diagnosis, and treatment of these problems to preserve quality of life in elderly patients.

Urinary incontinence

The prevalence of urinary incontinence among both men and women older than 65 years is 15% to 30% and is greater than 50% in institutionalized patients.¹⁻⁴ Despite this prevalence, incontinence often goes unrecognized, with only 25% to 50% of patients actively seeking treatment.^{4,5} Incontinence is associated with a number of adverse effects, including impairments in the ability to perform activities of daily living, a greater risk of falls, increased nighttime awakenings,

skin ulceration, recurrent UTIs, social isolation, and depression.^{5,6}

History and physical examination The history should address concurrent medical conditions, medications, relevant surgeries, obstetric history, sexual function, bowel habits, neurologic symptoms, mental status, and functional ability. Record any incontinence characteristics including onset, frequency, precipitating factors, and use of sanitary pads or other protective measures. Document history of previous incontinence treatment and the level of success. Ask patients about fluid intake and the presence of other lower urinary tract pathology such as recurrent UTIs, benign prostatic hyperplasia (BPH), and pelvic organ prolapse.

The physical examination should encompass abdominal, pelvic, genital, rectal, neurologic, and functional assessment and a calculation of body mass index. Other components include urinalysis, urine culture, voiding diaries, a cough test to assess for stress incontinence, and postvoid residual (PVR) volume measurement.^{1,3,4,7}

Patients with clinically identified uncomplicated incontinence should undergo conservative management for 8 to 12 weeks before a treatment regimen is changed or referral to a specialist is considered.⁷ Recurrent incontinence; incontinence accompanied by hematuria, pain, abnormalities on physical examination, a PVR volume of 200 cc or greater; or a history of a recent GU procedure, pelvic irradiation, or radical pelvic surgery are indications for referral to a specialist (see "Diagnosis and treatment of urinary incontinence," page 37).^{3,7}

Stress incontinence Accounting for approximately half of all female urinary incontinence, stress inconti-

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Learning objectives

- Describe the common presentations for urinary incontinence, urinary tract infection, bladder cancer, and bladder outlet obstruction
- Review the workup for each of these conditions
- Discuss the appropriate treatments

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IN THIS ARTICLE

Key Points

- Lower urinary tract symptoms in the elderly may be due to urinary incontinence, urinary tract infection, bladder cancer, or bladder outlet obstruction.
- There are four types of urinary incontinence: the stress, urge, overflow, and functional varieties, the causes of which vary between the sexes.
- Urinary tract infection in older adults differs from infection in younger patients because of the incidence of atypical presentations and the prevalence of asymptomatic bacteriuria.
- Bladder cancer is a disease of old age, with 70% of cases occurring in patients older than 65 years.
- Bladder outlet obstruction, most commonly recognized in men as benign prostatic hyperplasia, may be overlooked in women.

Competencies

Medical knowledge	◆◆◆◆◆
Interpersonal & communication skills	◆
Patient care	◆◆
Professionalism	◆
Practice-based learning and improvement	◆
Systems-based practice	◆

For an explanation of competencies ratings, see the table of contents.

nence peaks in prevalence in the fifth decade. It remains a concern in elderly women, however, since patients with sphincter dysfunction, insufficient pelvic floor support, urethral hypermobility, and neurogenic abnormalities are predisposed to this condition.² Urine leakage then occurs with increased intra-abdominal pressure, such as occurs with sneezing, coughing, laughing, or exertion.^{1,4} Trauma, pelvic and prostate surgery, and pelvic irradiation are inciting causes in men.^{4,8} Encourage patients to monitor the type and amount of fluid intake, stop smoking, lose weight, and void on a scheduled basis.^{1,7} Pelvic floor muscle (Kegel) exercises and bladder training are first-line treatments for both sexes.^{3,4,7} Female patients may benefit from the use of vaginal pessaries for additional pelvic structure support.⁷

There are currently no FDA-approved medications for stress incontinence, although trials of duloxetine, a serotonin and norepinephrine reuptake inhibitor, have shown promise.^{1,6,9} Surgical options include artificial sphincter implantation, retropubic suspension, and sling procedures.^{3,7} Urethral bulking agents, such as periurethral collagen injections, are associated with a

low incidence of mortality and can be useful treatment options for geriatric patients.^{3,4,7}

Urge incontinence The predominant form of incontinence in women older than 75 years,¹ urge incontinence is also common among men.⁴ In this condition, urine leakage is immediately preceded or accompanied by a sense of urgency. The cause may be idiopathic detrusor contractions or neurologic disease (including diabetic neuropathy, Parkinson’s disease, stroke, or spinal cord injury). Fecal impaction, GU infection, pelvic irradiation, and BPH contribute to idiopathic hyperactivity of the detrusor.^{1,3,4}

In the absence of a correctable cause, behavioral training and pharmacotherapy are used to treat urge incontinence. Pelvic floor exercises, bladder training, and scheduled voiding are the primary nonpharmacologic modalities.^{4,7,9} Electrical stimulation aims to decrease detrusor contraction and strengthen pelvic floor muscles.^{1,3} Pharmacotherapy is a mainstay of treatment for urge incontinence. The most commonly used agents are oxybutynin, an antimuscarinic agent, and tolterodine, a mixed anticholinergic/direct smooth muscle relaxant. Studies show that they both decrease episodes of incontinence in 70% to 85% of patients.^{5,8}

Overflow incontinence The predominant form of incontinence in elderly men, overflow incontinence is least common in women.^{1,4} This condition results from underactive detrusor muscle or BOO; patients will have elevated PVR volumes.^{3,9} Neurologic disease, including Parkinson’s disease, stroke, and diabetes, can lead to bladder underactivity.⁹ Causes of male overflow incontinence, including BPH, prostate cancer, and urethral stricture, contribute to the discrepancy in prevalence between the sexes.⁴

Men with mild BPH may be effectively treated in a primary care setting, although more severe cases of BPH and patients with other causes of obstruction require referral to a specialist.^{6,10} Bethanechol, a cholinergic agent, can be used to treat neurogenic causes of overflow incontinence, although GI and neurologic side effects may prevent its use.⁶ Clean, intermittent catheterization remains a mainstay of treatment in the absence of obstruction or other treatable causes.⁹

Functional incontinence It is important not to overlook functional incontinence, especially in elderly patients; it is characterized by physical or cognitive deficits that prevent patients from recognizing the need to urinate or prevent them from accessing facilities in time.

Medical illness and iatrogenic causes are often the inciting factors. Fractures, arthritis, muscle weakness, vision impairments, and restraints, as well as depression, delirium, and dementia, may lead to incontinent episodes. UTIs, constipation, atrophic vaginitis, and anatomic obstruction can also contribute to incontinence.

Alpha-blockers and ACE inhibitors can lead to stress incontinence. Beta-antagonists, loop diuretics, narcotic analgesics, antipsychotics, sedative-hypnotics, alcohol, nicotine, and caffeine may cause urge incontinence. Calcium channel blockers, antihistamines, anticholinergics, antidepressants, antipsychotics, sedative-hypnotics, narcotic analgesics, and alcohol have been linked to overflow incontinence.⁶ Functional incontinence is managed by addressing the underlying cause.^{1,3,6}

Urinary tract infections

UTIs are also highly prevalent in elderly adults, especially institutionalized and catheterized patients, in whom the prevalence is 12% to 30%.¹¹ The distinction between true infection and asymptomatic bacteriuria is important because the latter is usually benign—treatment of it is unnecessary and contributes to antibiotic resistance.¹¹⁻¹³

Age-related physiologic changes—such as declining renal function, diminished estrogen levels, BPH, reduced antimicrobial GU secretions, and increased adherence of bacteria to GU epithelium—predispose patients to UTIs.

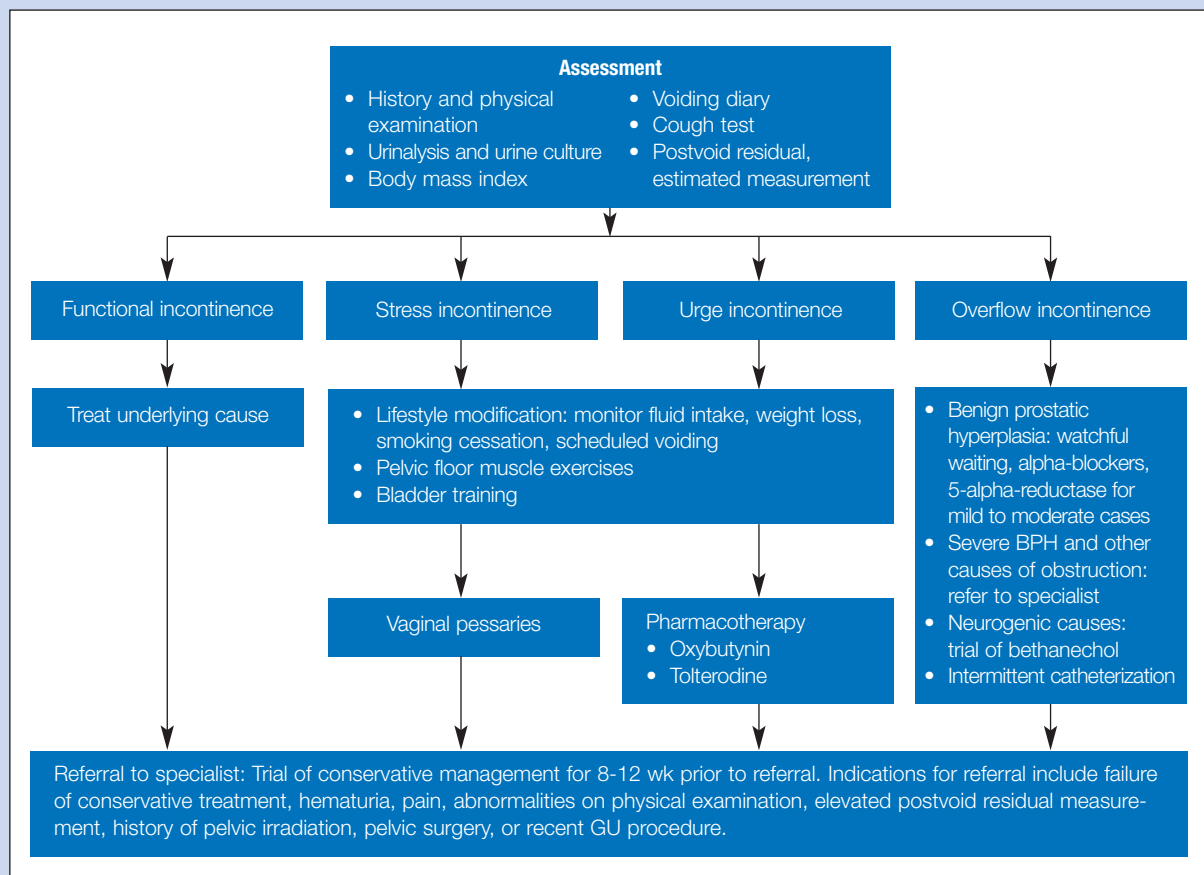
Comorbid conditions also put elderly patients at risk. More than their community-dwelling counterparts, institutionalized patients may have comorbid illnesses, indwelling catheters, and a history of antibiotic usage.¹¹⁻¹³

Diagnosis Patients may not manifest classic UTI signs and symptoms such as dysuria, frequency, urgency, and nocturia.¹¹⁻¹³ Moreover, because of other urinary tract pathology, symptoms may be present before an infection.¹² Mental status changes, fever, back pain, suprapubic tenderness, unstable gait, and falls are atypical presentations of UTIs in older adults.^{11,12} Rule out other serious medical conditions before making a diagnosis solely of UTI in an elderly patient with an atypical presentation.¹²

The mainstay of UTI diagnosis in the elderly consists of urinalysis, urine culture, and antibiotic sensitivity testing.¹¹ Clean-catch urine samples may not be easy to obtain in elderly patients; in-and-out catheterization and suprapubic aspiration may be necessary. The presence of nitrates and leukocyte esterase on dipstick urinalysis are less useful in the geriatric population than in younger patients. While culture is necessary to diag-

FIGURE 1

Diagnosis and treatment of urinary incontinence



nose infection in the elderly, final diagnosis depends on clinician interpretation of the patient as being symptomatic.¹² Asymptomatic bacteriuria is defined as 10⁵ colony-forming units (CFUs) in a patient without signs or symptoms. Infection is diagnosed with as few as 10³ CFUs in the symptomatic elderly patient.¹³ Furthermore, culture and sensitivity testing allows identification of causative organisms and their antibiotic resistance patterns, which is especially useful in institutionalized and catheterized patients and in those with a history of antibiotic treatment.¹¹

Escherichia coli, the predominant cause of UTI in younger patients, remains an important, though less predominant, cause in the elderly. *Proteus mirabilis*, *Klebsiella pneumoniae*, *Enterococcus faecalis*, group B streptococci, and coagulase-negative staphylococci are also important pathogens.^{11,13,14} Polymicrobial UTIs are more common in elderly patients, especially those who are institutionalized and catheterized. Long-term catheter use is associated with infection by gram-negative rods,^{11,13} although *Enterococcus* and methicillin-resistant *Staphylococcus aureus* may also be involved. UTIs of fungal origin are an additional source of infection in patients with indwelling catheters. Catheter and antibiotic use also places patients at risk for more resistant pathogens, such as *Pseudomonas aeruginosa*, *Enterobacter*, *Citrobacter*, and *Serratia marcescens*.¹¹

Treatment Initiate empiric therapy for symptomatic infection, since medication can be adjusted once antibiotic sensitivity data become available (see “UTIs

in the elderly adult”).¹¹ Oral fluoroquinolones are considered first-line agents for uncomplicated cystitis in patients of both sexes. Treat elderly women for 10 days and men for 14 to 28 days. Trimethoprim-sulfamethoxazole is an additional first-line agent for women only.^{11,12,14} Second-line agents include amoxicillin-clavulanate, second- and third-generation cephalosporins, and nitrofurantoin.^{11,12,14} A trial of topical estrogen therapy may help to prevent UTIs in elderly women.¹¹⁻¹⁴

Catheter-related infections require sterile replacement of the indwelling catheter and treatment with a broad-spectrum antibiotic. Options include 2 to 3 weeks of ampicillin plus gentamicin, a third-generation cephalosporin, piperacillin/tazobactam, aztreonam, or a carbapenem.^{11,14} Treat *Candida albicans* with 3 to 5 days of oral fluconazole; treat infection with other *Candida* species with amphotericin B bladder irrigation. Limiting the use of indwelling catheters is the best strategy for preventing UTIs.¹¹

Bladder cancer

A disease of elderly adults, bladder cancer occurs in adults older than 60 years in 70% of cases.¹⁵ The American Cancer Society predicts that bladder cancer will rank fourth in new cancer diagnoses among men and ninth among women in the United States in 2005.¹⁶ Ninety percent of bladder cancer in the United States is transitional cell carcinoma.^{15,17} Cigarette smoking is the single greatest risk factor, and tobacco cessation has been shown to decrease the risk. Occupational exposure

FIGURE 2

UTIs in the elderly adult

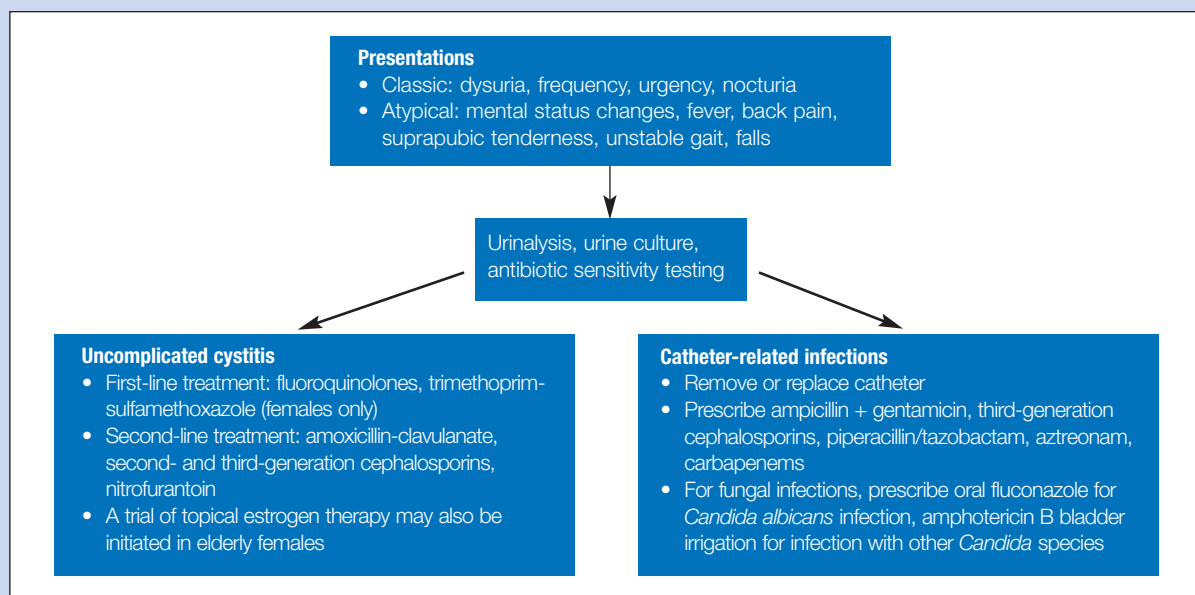
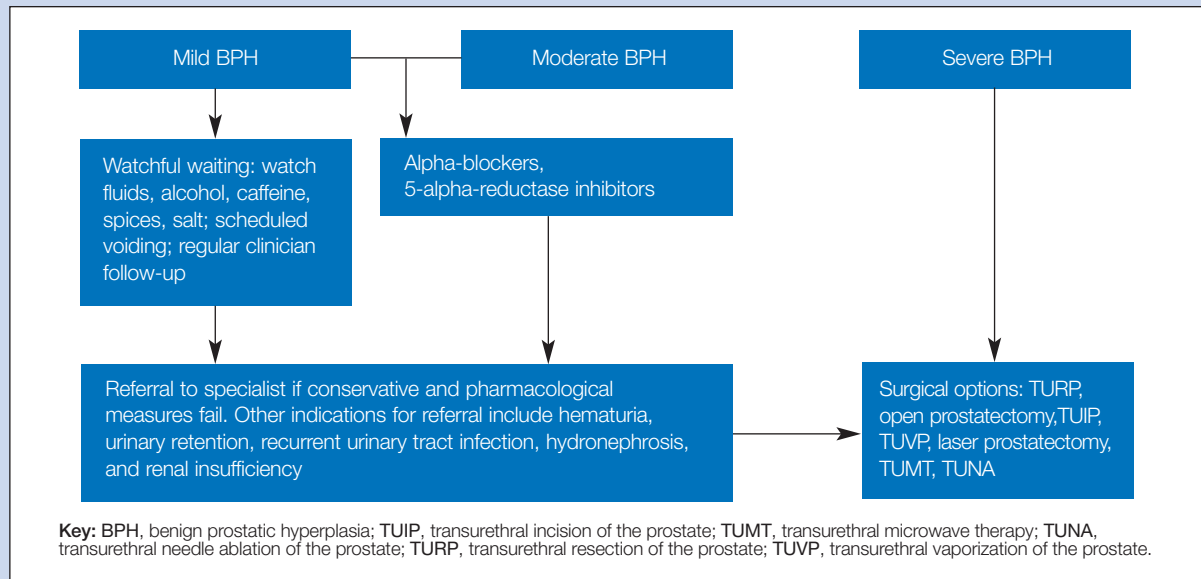


FIGURE 3

Management of BPH



to aromatic amines, such as aniline dyes, is also an established risk factor.^{17,18}

Diagnosis The most common presenting sign of bladder cancer is gross hematuria,^{17,18} a nonspecific sign that should be thoroughly investigated in older patients. The differential diagnosis of hematuria includes neoplastic diseases (cancers of the bladder, prostate, or kidneys; multiple myeloma; lymphoma), glomerulonephritis, AV malformations, renal vein thrombosis, kidney or bladder stones, UTI, BPH, bladder diverticulum, urethral stricture, and trauma, among others.^{18,19} Dysuria, frequency, urgency, or recurrent UTI may also be signs of a bladder neoplasm.^{17,18} Refer patients with suspected bladder malignancy to a specialist for appropriate diagnostic intervention and treatment.

Treatment At initial presentation, 70% of transitional cell carcinomas are superficial, while 30% have invaded the muscle layer.¹⁸ Superficial lesions are removed by transurethral resection (TUR) and may also be treated with adjuvant intravesical irrigation therapy.^{15,17,18,20} Indications for the use of intravesical therapy include positive urinary cytology, several sites of atypia, multiple lesions, large tumor size, and lesion recurrence.^{17,20} Bacille Calmette-Guérin is the preferred intravesical agent for carcinoma in situ and high-grade lesions. Other intravesical agents include thiotepa, mitomycin C, epirubicin, doxorubicin, and gemcitabine; these are more effective in low-grade disease.^{17,18}

Invasive disease requires radical cystectomy and lymph node dissection.^{15,20} M-VAC (methotrexate, vin-

blastine, Adriamycin, and cisplatin) has been the chemotherapeutic regimen of choice in bladder cancer.^{17,18,20} Options for urinary diversion following cystectomy consist of ileal conduits, urinary reservoirs, and neobladders.^{18,20} Patients who are not candidates for surgery may benefit from external beam radiation therapy.^{15,20}

Bladder outlet obstruction

The causes of BOO vary between the sexes, with BPH being the single most recognized cause. Other causes of BOO seen in elderly men are bladder cancer, urethral stricture, bladder diverticula, and bladder stones.²¹ BOO is less recognized in women but should not be overlooked as a possible cause of urinary problems; sources include pelvic organ prolapse, anti-incontinence surgery, neoplastic diseases, dysfunctional voiding, detrusor-sphincter dyssynergia, and primary bladder neck obstruction.²²

Outlet obstruction of any kind may manifest with irritative symptoms (frequency, urgency, and nocturia) or obstructive symptoms (postvoid dribbling, hesitancy, weak stream, and feelings of incomplete emptying).^{21,22} Women are more likely to present with irritative symptoms, which may be mistaken for UTI or incontinence.²²

A thorough history and physical examination are essential. Appropriate laboratory tests include urinalysis and urine culture to exclude UTI and measures of serum electrolytes to assess renal function.^{21,22} Voiding diaries, noninvasive uroflow studies, and PVR volume measurements are useful screening tools as well. When

measuring the prostate-specific antigen (PSA) level, keep in mind that elevated levels do occur in BPH and one cannot rule out prostate cancer based on PSA level alone. Refer patients with elevated levels and suspected obstruction, except those with mild BPH, to a specialist for more invasive testing.^{21,22}

Benign prostatic hyperplasia BPH, present in as many as 70% of men older than 70 years,^{10,23} is the most common cause of BOO in men.²¹ Treatment depends on the degree of bother experienced by the patient. The American Urological Association developed the 35-point Symptom Score Index questionnaire to determine the degree of bother and to direct treatment.¹⁰ Patients are grouped in three categories based on their score: those with 0 to 7 points are classified as having mild BPH; 8 to 19 points, moderate BPH; and 20 to 35 points, severe BPH. Management of these groups is discussed below, as well as in "Management of BPH" (page 39). Refer patients to a urologist if conservative management has failed, the BPH is severe, or complications such as acute urinary retention, recurrent UTIs, hematuria, hydronephrosis, or renal insufficiency have developed.^{10,23}

Watchful waiting is one management option for patients with mild BPH, low "bother" scores, and a desire to avoid pharmacologic or surgical intervention. Components of watchful waiting include regulating intake of fluids, alcohol, caffeine, salt, and spices; scheduled voiding; and regular follow-up with clinicians.¹⁰

Patients who are interested in medical therapy have several options. Selective alpha-adrenergic receptor blockers produce a 30% to 40% reduction in symptoms. Short-acting forms (prazosin and alfuzosin) are most likely to cause orthostatic side effects including postural hypotension, weakness, dizziness, syncope, and headache.^{10,23} Longer-acting forms (doxazosin and terazosin) have an improved side-effect profile and are also approved to treat hypertension. Tamsulosin, a prostate-specific form, does not affect BP or heart rate. A second category of medications used to treat BPH is the 5-alpha reductase inhibitors finasteride and dutasteride. Both are designed to prevent the unwanted sexual side effects associated with androgen suppression.

Surgical therapy is used when BPH has not responded to medical management, is severe, or has produced renal or urinary complications.^{10,23} Transurethral resection of the prostate (TURP), the most widely performed surgical intervention,^{10,21,23} alleviates symptoms by up to 75% to 96%. Potential side effects include excessive bleeding necessitating transfusion, impotence, retrograde ejaculation, bladder neck obstruction, urethral stricture, and transurethral resection syndrome.^{10,21,23}

Other surgical options are open prostatectomy, transurethral incision of the prostate (TUIP), transurethral

vaporization of the prostate (TUVP), and laser prostatectomy. Open simple prostatectomy is preferred if the patient has bladder diverticuli or stones, when the prostate is large (greater than 75 g), or when the patient's physical limitations preclude TURP. TUIP is indicated when the prostate is small. Since it can be performed under local anesthesia, it is suitable for elderly patients with risk factors for surgery.¹⁰ It also carries a lower incidence of impotence and retrograde ejaculation than does TURP.^{10,23} TUVP, which ablates prostate tissue, and laser prostatectomy, which causes coagulation necrosis, are other alternatives. The incidence of sexual side effects and incontinence with TUVP is similar to that with TURP, while laser treatments have an improved side effect profile and result in a shorter hospital stay.¹⁰ Two additional minimally invasive interventions that are options for elderly patients are transurethral microwave therapy (TUMT) and transurethral needle ablation (TUNA) of the prostate. These outpatient procedures, performed under local anesthesia, have fewer side effects than TURP.

Urethral stricture Patients present with symptoms of obstruction and usually have a history of urethral trauma, surgery, instrumentation, or sexually transmitted diseases.²¹ Retrograde cystourethrography, urethrocscopy, and x-ray urodynamics aid diagnosis.²⁴ Urethral dilation and urethrotomy, rarely curative, were the initial treatment options for urethral stricture. Urethral stents have been used to increase the efficacy of these procedures;²⁵ potential complications include pain, incontinence, ejaculation disturbances, stent stenosis, and migration.^{24,25} The advent of urethroplasty with skin or free grafts offers an additional treatment option.²⁵

Bladder stones Most common after age 50 years, bladder stones are an additional cause of outlet obstruction in men; they result from urinary stasis secondary to BPH, neurogenic bladder, bladder diverticula, and urethral stricture. Presenting symptoms may include hematuria, frequency, urgency, and suprapubic pain. Ultrasonography, abdominal plain films, intravenous urography, and cystoscopy confirm the presence of bladder stones. Stones can be removed endoscopically, though suprapubic cystotomy may work better for larger stones. Extracorporeal shock wave lithotripsy is not recommended for the routine treatment of bladder stones.²⁶

Outlet obstruction in females Physical examination identifies anatomic causes of outlet obstruction in females. One cause, pelvic organ prolapse, is treated conservatively with pessaries or vaginal packing. Surgery to restore the integrity of the vaginal vault is also an option. Obstruction caused iatrogenically during anti-incontinence surgery usually requires additional, corrective surgery.

BOO of functional origin can be harder to diagnose and treat. Dysfunctional voiding is a learned behavior that results in increased activity of the external sphincter; the clinician should rule out neurologic disease in patients exhibiting this habit. Treatment consists of biofeedback and behavioral modification. Detrusor-sphincter dyssynergia occurs in patients with spinal cord lesions superior to the sacrum; intermittent catheterization is the treatment of choice. Primary bladder neck obstruction, etiology unknown, describes improper bladder neck opening in the presence of adequate detrusor contractions. Treatment options include alpha-adrenergic receptor blockers and surgical alteration of the bladder neck.²² □

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