Benign prostatic hyperplasia (BPH) is nonmalignant overgrowth of the prostate gland. Symptoms can be of an obstructive or irritative nature and include: weak stream, hesitancy, urinary frequency, urgency, nocturia (nighttime urination), incomplete emptying, dribbling, overflow or urge incontinence, and even complete inability to urinate. The diagnosis is based primarily on digital rectal examination and symptoms. Sometimes cystoscopy, Urodynamics, or other imaging studies may be needed. Treatment options include observation, 5α-reductase inhibitors, α-blockers, minimally invasive thermal therapies and surgery.

The prevalence of BPH increases from 8% in men aged 31 to 40, to up to 50% in men aged 51 to 60 and to > 80% in men over 80. The exact cause is unknown but probably involves genetics and hormonal changes associated with aging.

Over time, as the channel of the prostatic urethra narrows and lengthens, urine outflow is progressively obstructed. Increased pressure associated with urination and bladder distention can progress to hypertrophy of the bladder muscle and sometimes the formation of diverticulae. Incomplete bladder emptying causes urine stasis and predisposes to stone formation and infection. Prolonged obstruction, even if incomplete, can compromise kidney function.

**Symptoms and Signs**

Symptoms include progressive urinary frequency, urgency, and nighttime urination due to incomplete emptying and rapid refilling of the bladder. Decreased size and force of the urinary stream causes hesitancy and intermittency. Sensations of incomplete emptying, dribbling, overflow incontinence, or even complete urinary retention may ensue. Straining to void can cause congestion of superficial veins of the prostatic urethra and bladder trigone, which may rupture and cause bleeding. Straining also may, over the long term, cause dilation of hemorrhoidal veins or development of inguinal hernias.

Some men present with sudden, complete urinary retention, along with marked abdominal discomfort and bladder distention. Retention may be precipitated by any of the following:

- Prolonged attempts to retain urine
Symptoms can be quantitated by the 7-question American Urological Association Symptom Score (see “forms for download”). This score also allows physicians to follow symptom progression over time. Scores > 10 but < 20 suggest moderate symptoms, and scores > 20 suggest severe symptoms. On digital rectal examination, the prostate usually is enlarged, non-tender, and has a rubbery consistency. However, prostate size as detected with digital rectal examination may be misleading. An apparently small prostate may cause obstruction.

**Diagnosis**

- Digital rectal examination
- Urinalysis and culture
- Prostate-specific antigen level

Sometimes uroflowmetry and bladder ultrasonography are performed to measure bladder function and residual volume. Flow rate < 15 mL/sec suggests obstruction, and post void residual volume > 100 mL suggests retention. Clinical judgment is used to evaluate the need for further testing.

**Treatment**

- Avoidance of anti-cholinergics, decongestants, narcotics, antihistamines, or alcohol
- Use of alpha-blockers (Flomax, Uroxatral or Rapaflo)
- Use of 5-ARIs (Avodart, Proscar)
- A combination of drugs from both classes is superior to either drug class alone
- **Surgery:** Surgery is done when patients do not respond to drug therapy or develop recurrent UTI or kidney dilation. Transurethral resection of the prostate (TURP) is the standard. Erectile function and continence are usually retained, although up to 90% of patients experience retrograde ejaculation. The incidence of erectile dysfunction and incontinence after TURP is about 1%. About 10% of men undergoing TURP need the procedure repeated within 10 yr because the prostate continues to grow. Larger prostates (usually > 100 g) require open surgery via a suprapubic or retropubic approach. Surgical methods require postoperative catheter drainage for 1 to 7 days.
- **Minimally Invasive Procedures:** Less invasive procedures include microwave thermotherapy, transurethral needle ablation, Greenlight laser ablation, electrovaporization (with plasma kinetic technology), and intraurethral stents. The circumstances under which these
procedures should be used have not been firmly established, but those done in the physician's office (microwave thermotherapy and radiofrequency procedures) are more commonly used and do not require use of general or regional anesthesia. These procedures may need to be repeated within 5 to 7 yr because the prostate continues to grow. (See section under Minimally Invasive Procedures)