

5 $\alpha$ -reductase. DHT is the major intracellular androgen and is believed to be responsible for the development and maintenance of the hyperplastic cell growth characteristics of BPH.

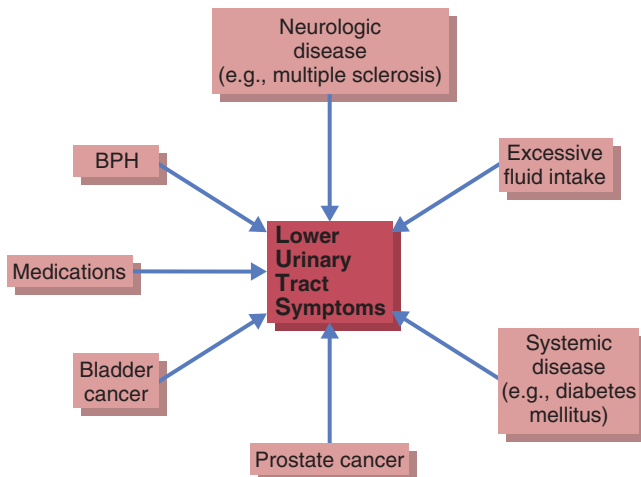
BPH develops predominantly in the periurethral prostatic tissue, referred to as the *transition zone* (Fig. 71-4). Tissue growth in this area leads to the phenomenon of bladder outlet obstruction (BOO), which leads to LUTS. BOO occurs as a result of two mechanisms: mechanical obstruction from increased tissue volume in the periurethral zone of the prostate and dynamic obstruction, which is caused by decreased bladder neck relaxation during voiding and increased smooth muscle tone in the bladder neck and prostate gland. Also important, but less well

characterized, is the response of the bladder muscle to the increase in outlet resistance provided by those two mechanisms. As bladder outlet resistance increases, the bladder responds by increasing the force of contraction. This added work results in physical and mechanical changes in bladder function.

Early in the course of BOO, the bladder is able to compensate; however, with persistent obstruction, the patient typically develops LUTS, particularly overactive bladder symptoms such as nocturia, frequency, and urgency. These symptoms frequently drive patients to seek medical care. Later during the course of the obstructive process, the bladder wall becomes thickened and loses compliance. The subsequent loss of compliance results in a decreased functional capacity of the bladder, which exacerbates the patient's overactive bladder symptoms.

**TABLE 71-4** SYMPTOMS OF LOWER URINARY TRACT SYNDROME

OVERACTIVE BLADDER	OBSTRUCTIVE VOIDING
Frequency	Hesitancy
Nocturia	Slow stream
Urgency	Stop-and-start voiding
Urge incontinence	Sensation of incomplete emptying

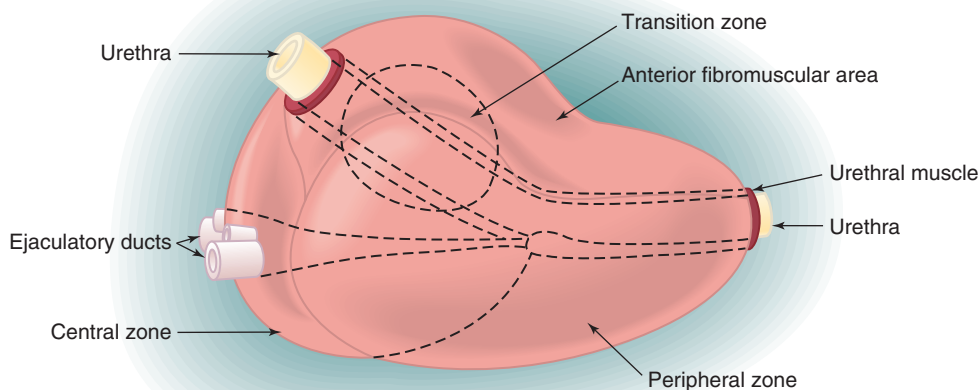


**FIGURE 71-3** Causes of lower urinary tract symptoms (LUTS). BPH, Benign prostatic hyperplasia.

## DIAGNOSIS

The initial evaluation of a patient with LUTS suggestive of BPH should include a detailed medical history that focuses on the patient's urinary symptoms as well as the past medical history, including comorbid conditions and any previous surgical procedures, general health conditions, and history of alcohol and tobacco use. The assessment of symptoms can be facilitated with the use of the AUA Symptom Index (also known as the *International Prostate Symptom Score*, or IPSS). This is a self-administered, validated questionnaire consisting of seven questions related to the symptoms of BPH and BOO. The AUA Symptom Index classifies symptoms as mild (0 to 7), moderate (8 to 19), or severe (20 to 35). Validated instruments such as the AUA Symptom Index are useful during the initial evaluation as an overall assessment of symptom severity and during follow-up visits to assess the effectiveness of any medical or surgical interventions.

A general physical examination should be performed that includes a DRE and a focused neurologic examination. Urinalysis, either by dipstick or by microscopic examination of urine sediment, is also mandatory to rule out hematuria and evidence of urinary tract infection. Glycosuria can be a significant finding, particularly if not previously identified. The initial clinical practice guidelines for the diagnosis of BPH recommended a serum creatinine measurement to assess renal function in all patients



**FIGURE 71-4** Zonal anatomy of the prostate gland.