Benign prostatic hyperplasia (BPH), also known as benign prostatic hypertrophy, is a non-cancerous enlargement of the prostate and one of the most common conditions among aging men. The frequency of BPH rises with increasing age and approximately 90 percent of men over the age of 80 will develop symptoms of BPH. The critical risk factors and exact cause for development of BPH are not completely understood. Advanced age and family history appear to play important roles. Suggested causes include decreased testosterone and/or elevated dihydrotestosterone (DHT) levels. The relative increase in estrogen seen with testosterone deficiency could promote the activity of substances that enhance prostate cell growth. Other research suggests that increased accumulation of the male hormone (androgen) DHT is associated with excessive growth of the prostate and development of BPH.

The Prostate Gland

The prostate is similar in size and shape to a chestnut and is located below the bladder and in front of the rectum. The prostate is surrounded by the urethra, a tube through which urine is removed from the bladder (See Figure 1). The role of the prostate in the male reproductive system is not completely understood. Its primary function is to produce ejaculatory fluid that stimulates sperm and reduces acidity of the vaginal canal.

Consequences of Prostate Enlargement

The prostate gland undergoes two primary growth periods. The first occurs during puberty when the prostate doubles in size. The second growth period begins at approximately age 25. This prolonged stage of growth is most closely associated with the development of BPH later in life. Symptoms do not usually appear until after the age of 40 and approximately 25 percent of men will have symptoms by the age of 55. Due to its increased size, the gland begins to press against the urethra resulting in restriction of urine flow and partial emptying of the bladder. Initially, the walls of the bladder begin to thicken and become irritable resulting in more frequent urination. Over time, the bladder is unable to completely empty causing an excess of urine to remain in the bladder. This progressive loss of bladder function and urethral constriction produces many of the symptoms of BPH.

Symptoms

The most common symptoms of BPH occur because of urinary obstruction and impairment of bladder function. Symptoms vary, but most often involve changes in urination. The most commonly experienced symptoms include:

- **Polyuria** - increased frequency of urination
- **Nocturia** - increased frequency of urination during the night
- **Urgency** - inability to postpone urination once the sensation arises
- **Hesitancy** - difficulty in starting to urinate
- **Sensation that the bladder is not empty after urination**
- **Urine stream interruptions, weakness, dribbling, or leaking**

The size of the prostate does not always determine the severity and extent of symptoms. Men with minor prostatic changes may experience more symptoms than those with greater enlargement of the gland. Urinary continence can still be maintained even in those with large glands, but urinary function has been shown to be significantly altered by the growth of the gland.

Upcoming Events  Mark Your Calendar

**JANUARY**

Center for Pharmacy Care–Wellness Mondays
- January 8, 22 & 29
  - Location: 320 Bayer, 9:00 a.m.-3:00 p.m.

Center for Pharmacy Care–Wellness Wednesdays for students!
- January 10 & 24
  - Location: 320 Bayer, 1:00-3:00 p.m.

Blood Pressure Screening
- January 10 & 24
  - Location: Union Concourse, 2nd Floor, Atrium 10:00 a.m.-noon

**FEBRUARY – American Heart Month**

Center for Pharmacy Care–Wellness Mondays
- February 5, 12, 19 & 26
  - Location: 320 Bayer, 9:00 a.m.-3:00 p.m.

Center for Pharmacy Care–Wellness Wednesdays for students!
- February 14 & 28
  - Location: 320 Bayer, 1:00-3:00 p.m.

Blood Pressure Screening
- February 14 & 28
  - Location: Union Concourse, 2nd Floor, Atrium 10:00 a.m.-noon

Lighten-Up Duquesne: Coming Soon!

Wellness Mondays/Wednesdays
To schedule an appointment, please call x5874.
Benign Prostatic Hyperplasia (BPH): As Common As Gray Hair

Diagnosis

There are several different methods to evaluate patients for BPH. One of the most common initial examinations is the digital rectal exam (DRE) during which the physician inserts a gloved finger into the rectum to assess the size and condition of the prostate. If an abnormality is discovered during the DRE, a prostate-specific antigen (PSA) blood test is performed to rule out the possibility of prostate cancer. A rectal ultrasound and biopsy may be performed if prostate cancer is suspected.

Treatment

Patients with mild prostate enlargement generally require no treatment, but regular examinations are recommended to monitor disease progression. Approximately 30 percent of men with mild symptoms will improve without treatment. Physicians usually recommend therapy in men with more severe or aggravating symptoms or in cases where there are potentially more significant health risks. Treatment for BPH is either accomplished with drug therapy or surgery.

Drug Therapy

The primary focus of drug therapy is to alleviate symptoms of BPH, shrink the size of the prostate, and/or completely stop its growth. Currently, the FDA has approved six drugs for the treatment of BPH and its symptoms. Finasteride (Proscar®) and dutasteride (Avodart®) belong to a class of drugs known as five-alpha reductase inhibitors. These drugs decrease the production of DHT and size of the gland. Another class of drugs known as alpha-adrenergic blockers is used to control symptoms of BPH. They do not affect the size of the prostate. This class includes terazosin (Hytrin®), doxazosin (Cardura®), tamsulosin (Flomax®), and alfuzosin (Uroxatral®). Combination therapy with an agent from each class is more effective in decreasing symptoms and delaying or eliminating the need for surgery. Because alpha-adrenergic blockers are also used to lower blood pressure, they should not be combined with certain drugs used to treat erectile dysfunction such as sildenafil (Viagra®), etc. Such a combination could cause a severe drop in blood pressure. For more information on these drugs, refer to Table 1 in the electronic version of the newsletter.

Surgical Procedures

Surgical procedures may be necessary when drug therapy fails or when complications occur such as inability to urinate, kidney damage, frequent urinary tract infections, bleeding or kidney stones. Transurethral resection of the prostate (TURP) is the most common surgical procedure for BPH and accounts for approximately 90 percent of all types of surgery for this condition. Less invasive procedures include prostatic stenting, catheterization, transurethral microwave procedure (TUMT) and transurethral needle ablation (TUNA). More invasive surgical procedures that remove the enlarged part of the prostate are the best form of long-term therapy.

BPH is one of the most common disorders in men, but early diagnosis and institution of appropriate medication or surgery can control symptoms and reduce complications.

For additional information, please visit the following Web sites:

- www.urolgyhealth.org

A publication of the Duquesne University Mylan School of Pharmacy

Center for Pharmacy Care & Pharmaceutical Information Center (PIC)

Additional information on any of the topics discussed may be obtained from the Pharmaceutical Information Center by calling 412-396-4600 or sending an e-mail to pic@duq.edu.

Questions about screenings or programs:
Christine O’Neil, Pharm.D, B.C.P.S., 412-396-6417

discussed may be obtained from the

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### Table 1: Drug Therapy for BPH

<table>
<thead>
<tr>
<th>DRUG</th>
<th>ROLE IN BPH</th>
<th>SIDE EFFECTS</th>
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<tbody>
<tr>
<td>5-alpha reductase inhibitors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>finasteride (Proscar®)</td>
<td>• reduces size of prostate</td>
<td>• breast enlargement or tenderness</td>
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<td></td>
<td>• increases urine flow rate</td>
<td>• skin rash</td>
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<tr>
<td>dutasteride (Avodart®)</td>
<td>• reduces symptoms of BPH</td>
<td>• sexual difficulties (less sexual desire or ability to get an erection; reduced amount of semen release)</td>
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<tr>
<td>Alpha-adrenergic blockers</td>
<td></td>
<td></td>
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<tr>
<td>terazosin (Hytrin®)</td>
<td>• relaxes the bladder muscle relieving</td>
<td>• prolonged painful erection (priapism) - rare</td>
</tr>
<tr>
<td></td>
<td>obstruction and improving urine flow</td>
<td>• visual problems</td>
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<tr>
<td>doxazosin (Cardura®)</td>
<td></td>
<td>• irregular heartbeat, chest pain or palpitations</td>
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<tr>
<td>tamsulosin (Flomax®)</td>
<td></td>
<td>• swelling of legs and ankles</td>
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<td>alfuzosin (Uroxatral®)</td>
<td></td>
<td>• constipation or diarrhea</td>
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<td>• drowsiness or dizziness</td>
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<td>• sexual problems</td>
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<td></td>
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<td>• headache</td>
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<td>• nasal stuffiness</td>
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