Benign Prostatic Hyperplasia (BPH):
Evidence Based Guidelines for Primary Care Providers

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Objectives

1. Understand the pathophysiology and prevalence of BPH
2. Select the appropriate diagnostic and screening tools for diagnosis of BPH
3. Identify which patients with BPH are appropriate for referral to a Urologist

Disclosures

I have nothing to disclose.
Definition of BPH

- Proliferation of the smooth muscle and epithelial cells within the transition zone of the prostate
- Histologic diagnosis
- Causes of proliferation not entirely known
  - Age related hormonal changes
    - "Mother Nature vs. Father Time"
  - Androgen/estrogen imbalance

Anatomy of the Prostate Gland
Anatomy of the Prostate Gland

BPH vs. BPE vs. LUTS vs. BOO – WHAT?

BPH
- BPH alone does not cause pathology
- BPH + LUTS = bothersome symptoms
  - Impact quality of life
- BPH + BOO = incomplete bladder emptying → acute urinary retention
  - Deterioration of upper GU tracts
  - Deterioration of renal function

BPE = benign prostatic enlargement
LUTS = lower urinary tract symptoms
BOO = bladder outlet obstruction

### Lower Urinary Tract Symptoms

<table>
<thead>
<tr>
<th>Irritative Symptoms (storage)</th>
<th>Obstructive Symptoms (emptying)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Urinary frequency</td>
<td>• Incomplete bladder emptying</td>
</tr>
<tr>
<td>• Urinary urgency</td>
<td>• Weak urinary stream/urinary dribbling</td>
</tr>
<tr>
<td>• Nocturia</td>
<td>• Intermittency</td>
</tr>
<tr>
<td>• Urged incontinence</td>
<td>• Difficulty initiating urinary stream/straining</td>
</tr>
</tbody>
</table>

### Bladder Outlet Obstruction

<table>
<thead>
<tr>
<th>Dynamic</th>
<th>Fixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased tension of smooth muscle cells in the prostatic urethra and bladder neck</td>
<td>• Increased prostatic bulk</td>
</tr>
<tr>
<td>• Causes decreased urinary flow</td>
<td>• Impinges urethra causing decreased urinary flow</td>
</tr>
</tbody>
</table>

### Normal Prostate vs. BPH Prostate

- **A** Normal Prostate
- **B** Normal-sized Prostate with increased α-receptors
- **C** Enlarged Prostate due to glandular hyperplasia

Both B and C can cause LUTS and/or BOO.
Normal Prostate vs. BPH Prostate

A  Normal Prostate
B  Normal-sized Prostate with increased α-receptor (specifically α-1a receptors)
C  Enlarged Prostate due to glandular hyperplasia

Prostatic Hormonal Regulation

Testosterone diffuses into prostatic cells and is converted to dihydrotestosterone (DHT) by the 5α-reductase (5αR) enzyme

5α-reductase inhibitors (5ARIs) target this mechanism
**Molecular Control of Prostatic Growth**

![Diagram of molecular control of prostatic growth](image)

**BPH Prevalence and Associated Costs**

- 2014 Stats*
  - 38.1 million men with BPH (age>30)
  - 21.3 million men with bothersome symptoms (age 40-79)
  - 12.9 million men consulted a provider for BPH
  - 12.2 million men actively managed for BPH/LUTS

- Estimated annual cost of BPH treatment is approximately $4 billion in the United States**
  - Direct – drugs, procedures, imaging, office visits
  - Indirect – lost earnings
  - Intangible – pain, suffering

**Taub & Wei (2006), Current Urology Reports 7:272-281

**BPH Prevalence Worldwide**

![Graph of BPH prevalence worldwide](image)

Prevalence of histologic BPH from 9 autopsy studies
Adapted from Roehrborn, C (2008) International Journal of Impotence Research
Aging in the U.S.

- Latest statistics as of 2014
- Number of Americans ≥ 65 today = 46 million
- % of Americans ≥ 65 today = 15%
- Number expected to more than double (98 million) by 2060
- % of Americans ≥ 65 in 2060 = 24%


BPH in Primary Care

- Aging population = BPH patients
- Primary Care Providers first line for diagnosis
- Important to recognize gradual symptomatology of BPH
- Unrecognized BPH → unfavorable consequences
  - Recurrent UTIs
  - Acute urinary retention → urethral catheterization
  - Renal failure

Assessment and Diagnosis of BPH

- Thorough medical history
- Assessment of symptoms
  - American Urologic Association Symptom Index (AUA-SI) or International Prostate Symptom Score (I-PSS) for men ≥ 40
    - Self-administered tools
    - Seven item questionnaire + 1 Quality of Life questions
    - Score 0 – 35
    - Both are validated and reliable tools
International Prostate Symptom Score

Assessment and Diagnosis (continued)

- Physical exam
  - Digital rectal exam
  - Focal neurological exam
- Labs
  - Urinalysis
  - PSA
  - Serum creatinine NOT recommended as part of w/u

Treatment Options

- Dictated bases on severity of symptoms
- Classify symptoms of LUTS based on AUA-SI/IPSS
  - 0 – 7 = mild symptoms
  - 8 – 19 = moderate symptoms
  - ≥ 20 = severe symptoms
Treatment: Mild Symptoms (≤ 8)
- Watchful waiting
- No medications or surgical interventions
- Counsel patient on:
  - Limit night time fluid intake
  - Decrease alcohol and caffeine intake (known bladder irritants)
  - Avoid decongestants and antihistamines (act on α-receptors and cause urinary retention)
- Reassess annually

Treatment: Moderate Symptoms (8 -20)
- If no bothersome symptoms:
  - Watchful waiting measures
- If + bothersome symptoms:
  - Medical therapy
    - α-blockers
    - decreases smooth muscle tone in α-receptors
    - onset of symptoms improvement within 2-7 days
    - 5α-reductase inhibitors (5ARIs)
    - decrease prostate gland size
    - onset of action takes 3 – 6 months
    - Combination therapy
  - Reassess symptom score in 3 – 6 months

Medical Therapies

<table>
<thead>
<tr>
<th>Agent</th>
<th>Dose</th>
<th>Titration</th>
<th>Uroselective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terazosin</td>
<td>1mg, 2mg, 5mg, 10mg, 20mg</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Doxazosin</td>
<td>1mg, 2mg, 4mg, 8mg, 16mg</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Tamsulosin</td>
<td>0.4mg, 0.8mg</td>
<td>Yes/No (to improve efficacy)</td>
<td>Yes</td>
</tr>
<tr>
<td>Alfuzosin</td>
<td>10mg</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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Medical Therapies
Side Effects of Alpha Blockers

- Hypotension (for non-selective α-blockers)
- Retrograde ejaculation
- Floppy Intraoperative Iris Syndrome (specifically tamsulosin)
  - Should not be given to men who are undergoing cataract surgery
- Fatigue/weakness
- Hand or foot edema

Medical Therapies
5 Alpha Reductase Inhibitors (5 ARIs)

- Finasteride (Proscar®)
  - Selective 5 ARI - Type II AR isoenzyme
  - Dosage = 5mg daily
- Dutasteride (Avodart®)
  - Targets both Type I and Type II AR isoenzymes
  - Dosage = 0.5mg daily

Medical Therapies
Side Effects of 5 Alpha Reductase Inhibitors

- Retrograde ejaculation
- Decreased libido
- Gynecomastia
- Erectile dysfunction
Failure of Medical Therapy

If a patient is maxed out on medical therapy and is having no improvement or worsening of symptoms → refer to a Urologist

Treatment of Severe Symptoms (20-35)

Maxed out on medical therapy and no improvement of symptoms = surgical intervention

Surgical Interventions

Minimally Invasive
- Transurethral Needle Ablation (TUNA)
- Transurethral Microwave Therapy (TUMT)

More Invasive
- Transurethral Incision Prostate (TUIP)
- Transurethral Laser Ablation
- Transurethral Photovaporization
- Transurethral Resection Prostate (TURP)
- Open vs. Robotic simple prostatectomy (for large sized prostate glands)

Treatment Algorithm

Adapted from AUA Guidelines: Management of BPH, 2010 (updated 2014)
Case Study A

Patient A is a 67 year old male with complaints of frequency, straining to urinate along with urinary dribbling and nocturia x 3. These symptoms are bothersome to him. The remainder of his medical history is unremarkable. Physical exam reveals a mildly enlarged prostate gland. The rest of the physical exam is normal.
Case Study A (continued)

How would you further evaluate this patient?
A. Obtain a AUA/IPSS score
B. Perform UA and PSA
C. Order renal function studies and upper tract imaging
D. A & B
E. A, B & C

The correct answer is D.
It is appropriate to assess symptoms using a validated tool along with ordering a UA and PSA.
It is not recommended to order serum chemistries or imaging studies of the upper GU tracts.

Case Study A (continued)

Patient A’s AUA/IPSS score is 8 and his PSA is 2.0ng/dl. How would you treat this patient?

How would you treat this patient?
A. Trial of alpha blockers
B. Trial of combination of alpha blockers and 5 alpha reductase inhibitors
C. Treat only with 5 alpha reductase inhibitors
D. Refer to a urologist
Case Study A (continued)
The correct answer is A.

It is appropriate to initiate a patient on alpha blockers who has moderate symptoms and a normal sized or mildly enlarged prostate.

If prostate was thought to be more enlarged, could also do combination therapy.

Case Study B

Patient B is a 55 year old male with complaints of frequency, mild straining to urinate, and nocturia x 2. His AUA/IPSS score is 5. He reports that his symptoms are not bothersome. He has an unremarkable medical history. Physical exam is normal except for a mildly enlarged prostate.

Case Study B (continued)

How would you treat this patient?
A. Trial of alpha blockers
B. Trial of 5 alpha reductase inhibitors
C. Watchful waiting
D. Refer to a Urologist
Case Study B (continued)

The correct answer is C.

His symptoms are mild and not bothersome to the patient so it appropriate to offer watchful waiting.

Case Study C

Patient C is a 60 year old male with significant voiding symptoms including decreased urinary stream, straining, feelings of incomplete bladder emptying and nocturia x 3-4. His AUA/IPSS score is 30. He reports his quality of life is poor (scores a 4 out of 6 on questionnaire) and is bothered by his symptoms. The rest of his history is unremarkable. Physical exam reveals an extremely enlarged prostate without any other physical abnormalities.

Case Study C (continued)

The patient’s UA was normal and PSA 3.5ng/dl. What is the next step in management?

A. Start alpha blockers
B. Start combination therapy (αblockers + 5ARIs)
C. Order ultrasound of the prostate before starting any treatment
D. Refer to a Urologist
Case Study C (continued)
The correct answer is B.

The alpha blockers should help with LUTS and the 5 alpha reductase inhibitors with help to decrease the size of the prostate over time.

However, if the patient develops hematuria, pain or a urinary tract infection, or his symptoms do not improve within 3 months, he should be referred to a Urologist.

Questions?

Thank you for your attention!
References


