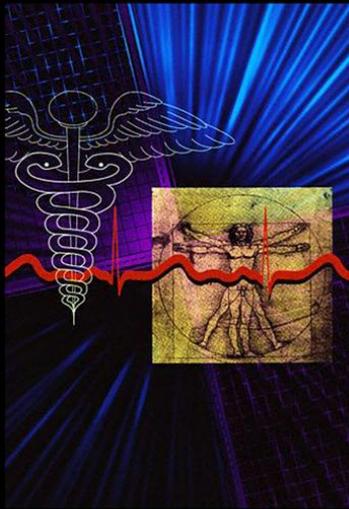


USMLE Live Virtual MedEd



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Preparation for the USMLE Step One

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Study Guide to the USMLE Step One

- It is strongly recommended that students review all of the material.
- For questions, please contact us
- info@virtualmeded.com

Question 7

- A 75-year-old male comes to your office with a 6-month history of nocturia, hesitancy, a slow flow of urine, and terminal dribbling.
- The symptoms have been progression. Otherwise, he is well and has had no significant medical illnesses.
- On examination, his abdomen is normal.
- He has an enlarged prostate gland, which is smooth in contour and firm and has no nodules or irregularities.
- What is the most likely diagnosis in this patient:
 - **A. Benign prostatic hypertrophy (BPH)**
 - **B. Carcinoma of the bladder**
 - **C. Prostatic carcinoma**
 - **D. Urethral stricture**
 - **E. Chronic prostatitis**

Answer 7

- A. BPH.
- EXPLANATION: The most likely diagnosis in this patient is BPH (hyperplasia). Hyperplasia of the prostate causes increased outflow resistance.

Question 8

- Refer to the previous case study.
- Which of the following symptoms is/are associated with the condition described in this case:
 - A. Dysuria
 - B. Daytime frequency
 - C. Incomplete voiding
 - D. Urgency
 - E. All of the above

Answer 8

- E. All of the above.
- EXPLANATION: The symptoms of BPH are described as either **obstructive** or **irritative**.

Explanation of Answer 8

- **Obstructive symptoms** are attributed to the mechanical obstruction of the prostatic urethra by the hyperplastic tissue and include the following: hesitancy, weakening of the urinary stream, feeling of residual urine (incomplete bladder emptying), urinary retention, postmicturition urinary dribbling.

Explanation continued

- **Irritative symptoms** are attributed to involuntary contractions of the vesical detrusor muscle (detrusor instability) and are associated with obstruction in approximately 50% of patients with prostatism. These symptoms include the following: nocturia, daytime frequency, urgency, urge incontinence, dysuria.
- Differential diagnosis includes carcinoma of the prostate, neuropathic bladder, chronic prostatitis, and urethral stricture.

Question 9

- Refer to previous case study.
- Which of the following pharmacologic treatments may be indicated in the treatment of the condition described in this case:
 - A. Finasteride
 - B. Prazosin
 - C. Terazosin
 - D. All of the above
 - E. None of the above

Answer 9

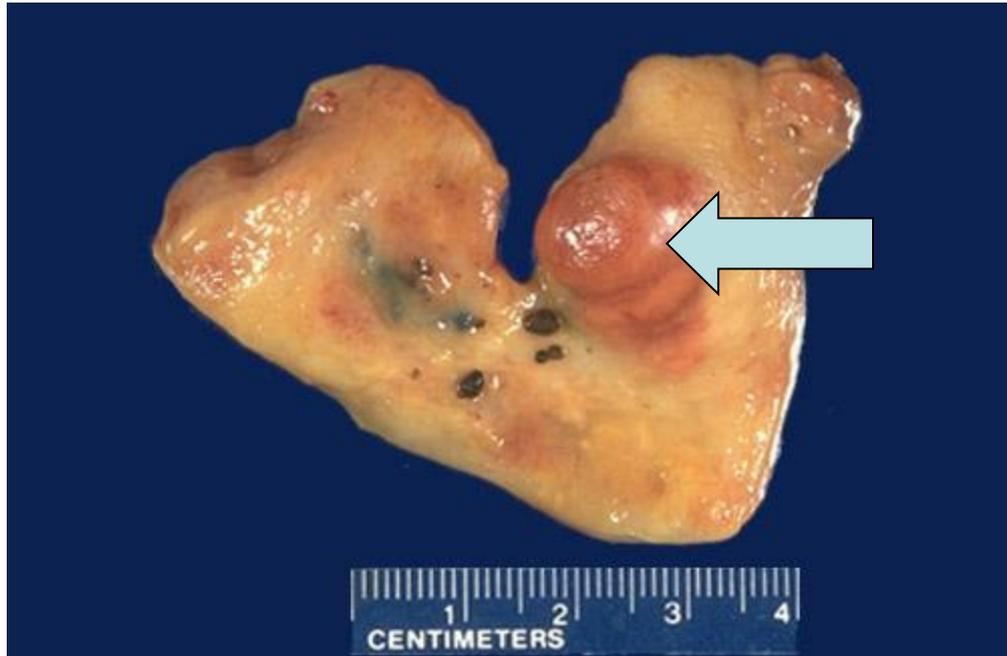
- All of the above.
- **EXPLANATION:** The pharmacologic treatment of BPH is directed toward relaxation of the prostatic smooth muscle fibers through inhibition of alpha-adrenergic receptors, as well as toward regression of the hyperplastic tissue by hormonal suppression.

- The growth of BPH depends on the presence of the androgenic hormone testosterone and its derivative dihydrotestosterone (via conversion by the enzyme 5-alpha reductase).
- The strategy of antiandrogenic therapy in BPH is to interfere with dihydrotestosterone production.
- Many antiandrogenic drugs have been tried, but at present the most promising is the 5-alpha reductase inhibitor, finasteride.

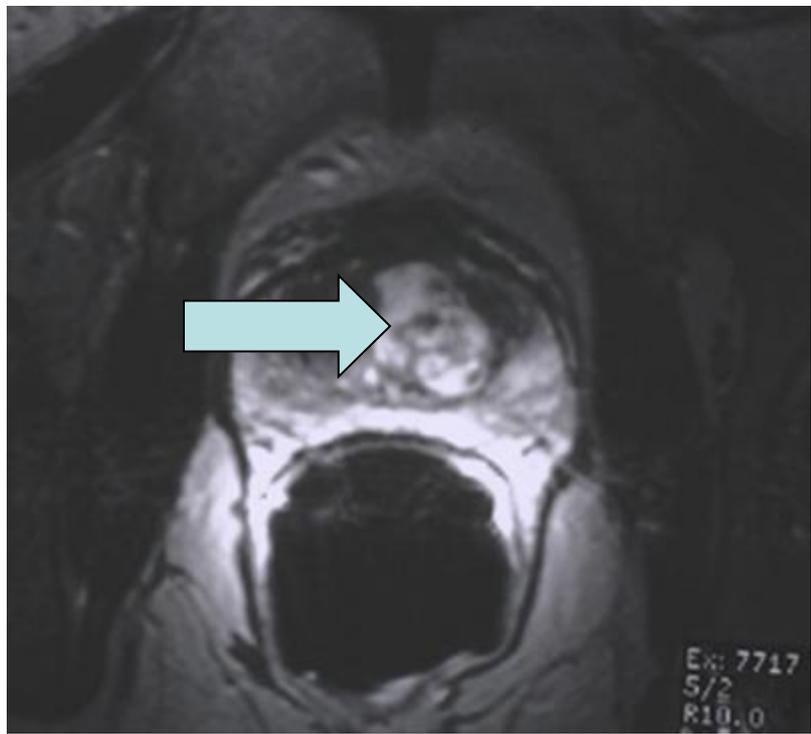
- Finasteride (Proscar) 5 mg/day results in a 20% reduction in prostatic size and a modest improvement of the urine's score and the symptom score.
- It also has a low incidence of adverse effects. Finasteride significantly decreases the prostate specific antigen (PSA) level, and detection of cancer of the prostate becomes difficult.
- Finasteride treatment should be considered in patients with moderate symptoms of prostatism.
- If the patient improves and side effects are minimal, continuation of therapy under careful urologic control is appropriate.



A normal prostate gland is about 3 to 4 cm in diameter. This prostate is enlarged due to prostatic hyperplasia, which appears nodular. Thus, this condition is termed either BPH (benign prostatic hyperplasia) or nodular prostatic hyperplasia.



This section through the prostate reveals a single prominent nodule that proved to be an adenocarcinoma. Such nodules may be palpable via digital rectal examination or may appear on ultrasound. Some small dark glandular concretions are also seen here.



The prostate seen here from pelvic MR imaging in this axial view shows marked irregular enlargement as a consequence of an adenocarcinoma. Note the heterogenous density of the carcinoma.

Prostate Adenocarcinoma

- Adenocarcinoma of the prostate is common. It is the most common non-skin malignancy in elderly men. It is rare before the age of 50, but autopsy studies have found prostatic adenocarcinoma in over half of men more than 80 years old. Many of these carcinomas are small and clinically insignificant. However, some are not, and prostatic adenocarcinoma is second only to lung carcinoma as a cause for tumor-related deaths among males.

- Men with a higher likelihood of developing a prostate cancer (in the U.S.) include those of older age, black race, and family history. Those with an affected first-degree relative have double the risk.

- Prostate cancers may be detected by digital examination, by ultrasonography (transrectal ultrasound), or by screening with a blood test for prostate specific antigen (PSA). None of these methods can reliably detect all prostate cancers, particularly the small cancers.

- PSA is a glycoprotein produced almost exclusively in the epithelium of the prostate gland.
- The PSA is normally less than 4 ng/mL (normal ranges vary depending upon which assay is used). A mildly increased PSA (4 to 10 ng/mL) in a patient with a very large prostate can be due to nodular hyperplasia, or to prostatitis, rather than carcinoma.
- A rising PSA (more than 0.75 ng/mL per year) is suspicious for prostatic carcinoma, even if the PSA is in the normal range.
- Transrectal needle biopsy, often guided by ultrasound, is useful to confirm the diagnosis, although incidental carcinomas can be found in transurethral resections for nodular hyperplasia.

- Men who have findings suspicious for carcinoma on digital rectal examination and a PSA of <4 ng/mL have a probability of cancer of at least 10%, while those with PSA levels from 4 to 10 ng/mL have a 25% probability. Men with PSA's above 10 ng/mL have a $>50\%$ likelihood of having a prostate cancer.

- Prostatic adenocarcinomas are composed of small glands that are back-to-back, with little or no intervening stroma.
- Cytologic features of adenocarcinoma include enlarged round, hyperchromatic nuclei that have a single prominent nucleolus.
- Mitotic figures suggest carcinoma. Less differentiated carcinomas have fused glands called cribriform glands, as well as solid nests or sheets of tumor cells, and many tumors have two or more of these patterns.
- Prostatic adenocarcinomas almost always arise in the posterior outer zone of the prostate and are often multifocal.

- Prostatic adenocarcinomas are usually graded according to the Gleason grading system based on the pattern of growth.
- There are 5 grades (from 1 to 5) based upon the architectural patterns.
- Adenocarcinomas of the prostate are given two grades based on the most common and second most common architectural patterns. These two grades are added to get a final grade of 2 to 10.
- The stage is determined by the size and location of the cancer, whether it has invaded the prostatic capsule or seminal vesicle, and whether it has metastasized.

- The grade and the stage correlate well with each other and with the prognosis.
- The prognosis of prostatic adenocarcinoma varies widely with tumor stage and grade. Cancers with a Gleason score of <6 are generally low grade and not aggressive.
- Advanced prostatic adenocarcinomas typically cause urinary obstruction, metastasize to regional (pelvic) lymph nodes and to the bones, causing blastic metastases in most cases.
- Metastases to the lungs and liver are seen in a minority of cases.

American Urological Society Clinical Staging

Stage	Definition	10-year Survival
A1	Incidental, <5% of volume	93-98%
A2	Incidental, >5% of volume, or high grade	50%
B1	Palpable nodule in one lobe but <1.5 cm in diameter	70-75%
B2	Larger palpable nodule	62%
C1	Invades capsule of prostate	40-50%
C2	Invades seminal vesicle	33-39%
D1	Metastases to regional lymph nodes, or extensive regional spread	17-20%
D2	Evident distant metastases	<10%