

# Benign Prostate Hyperplasia

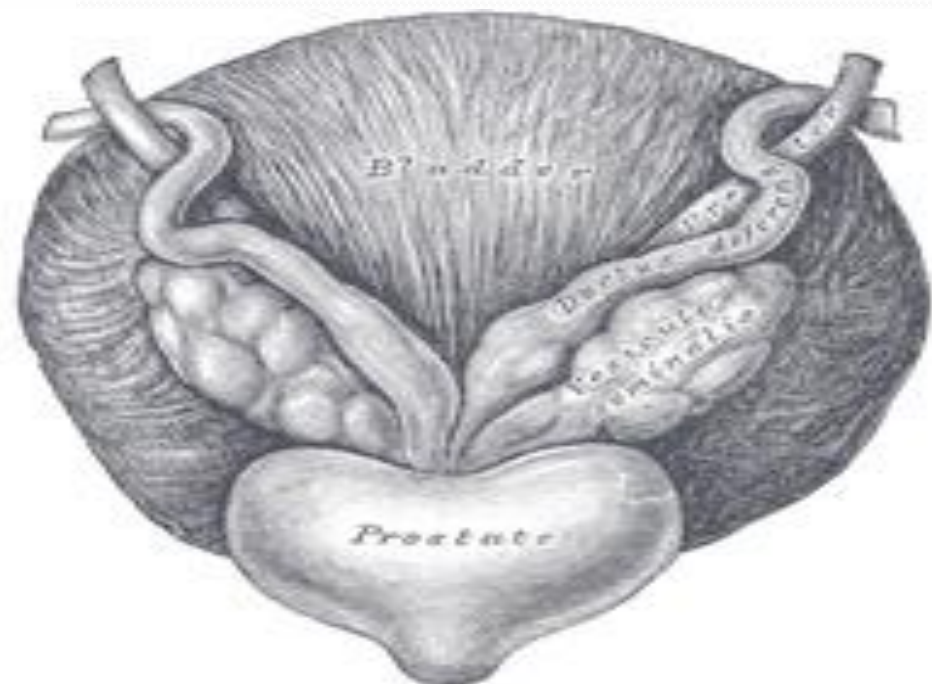
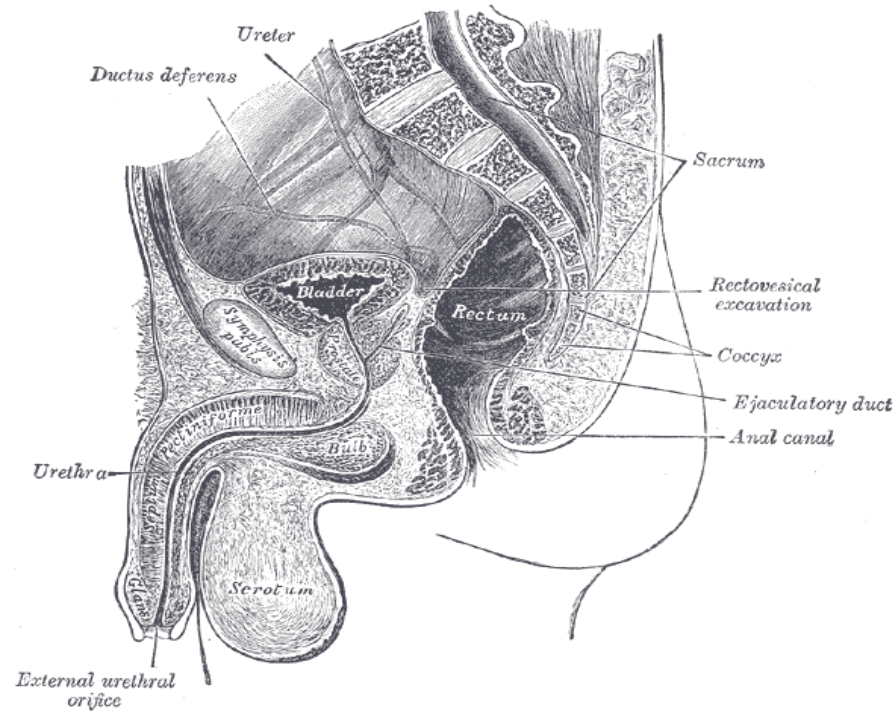
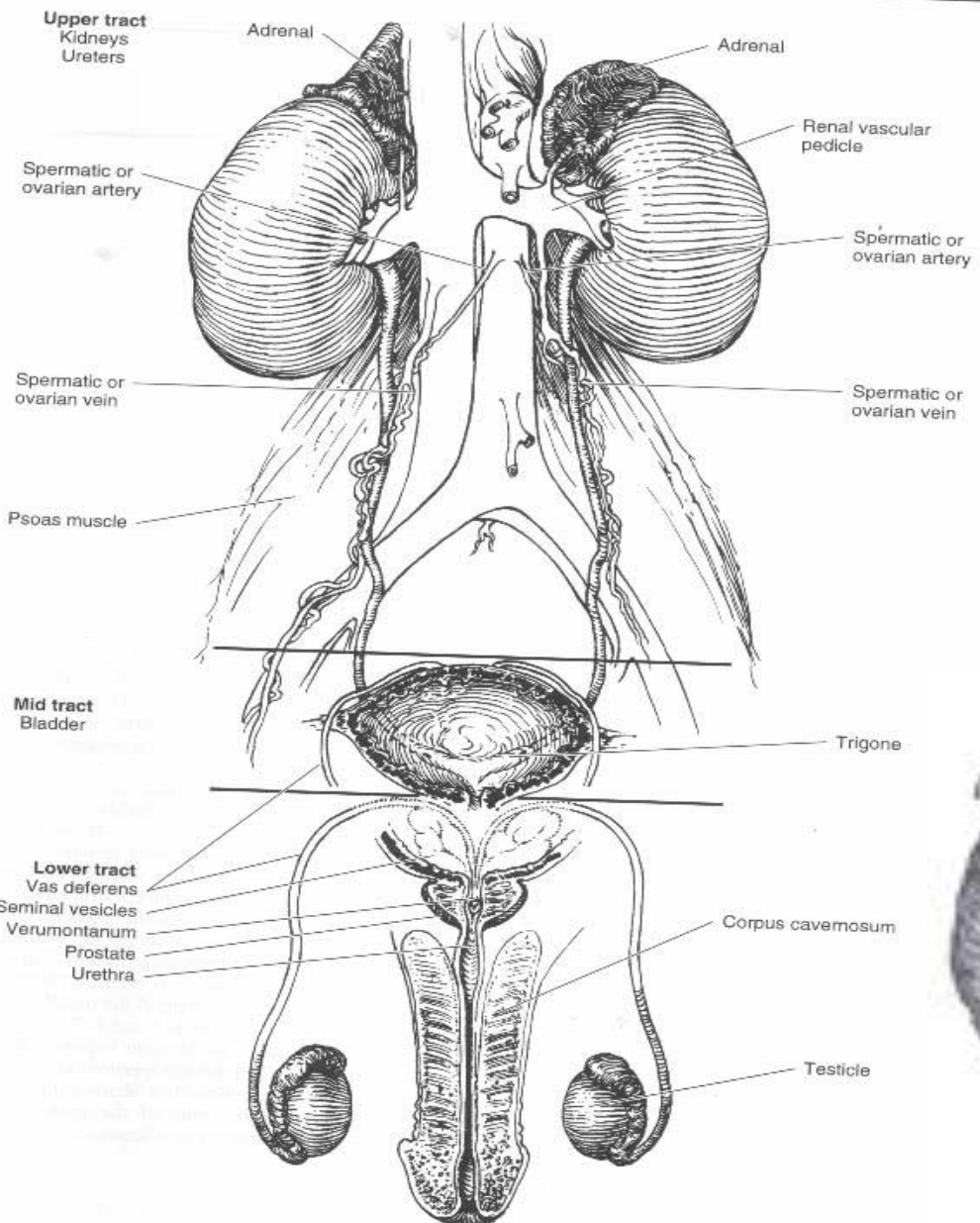


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# Introduction

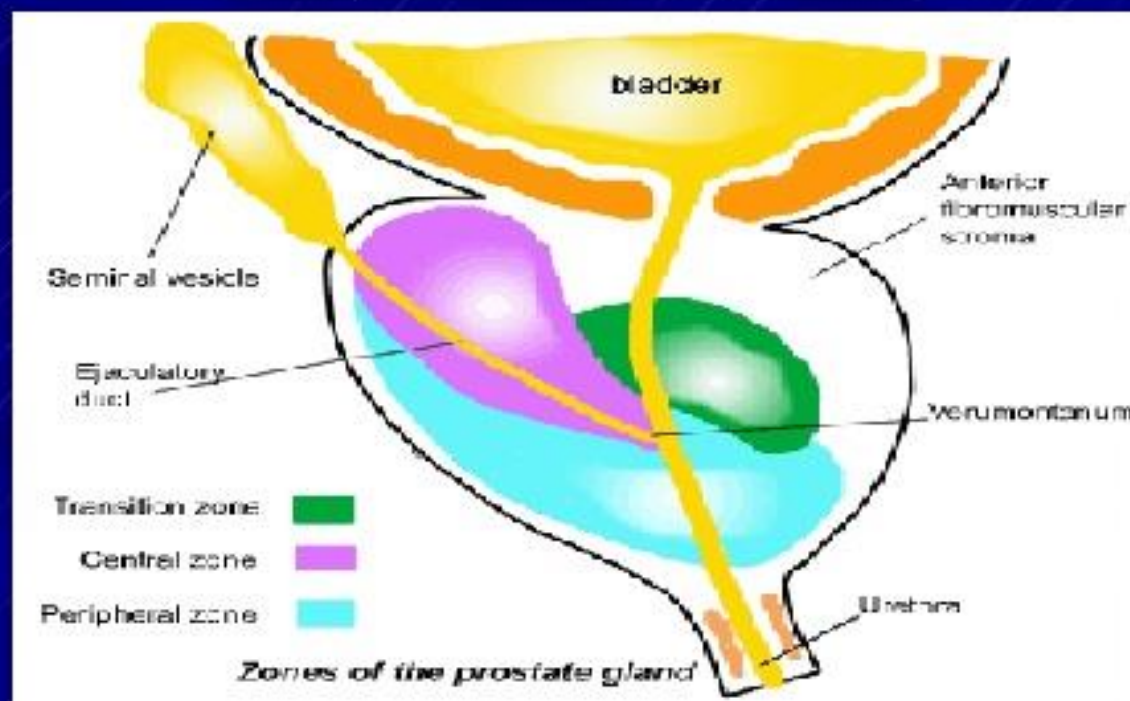
- BPH & prostate adenocarcinoma are the 2 major neoplasms affecting the human prostate.
- The prostate is a complex organ consisting of epithelial, stromal, & muscular element.
- Anatomically the prostate gland is the shape of a compressed inverted cone, residing in the true pelvis.
- Arterial blood supply: inferior vesical+ middle rectal a.
- Venous drainage: Dorsal venous plexes



- BPH(benign prostatic hyperplasia):
  - Histologically exists in more than 70% of men over age 70,
- Benign prostatic enlargement (BPE):
  - indicates enlargement in the size of the prostate detected by either digital rectal examination (DRE) or transrectal ultrasound.
- Bladder outlet obstruction:
  - urodynamically proven obstruction
- Benign prostatic obstruction (BPO) refers to BOO in association with BPE.

- The normal prostate measures between 3-4cm at its widest portion; it is 4-6cm in length & 2-3cm in thickness.
- Weight 17-25 gm
- In the early 1970's McNeal proposed a concept of zonal anatomy.
- According to this concept, the glandular portion of the prostate is composed of a large peripheral & a small central zone, which together constitute about 95% of the gland.

- The other 5% is formed by the transition zone which is located just outside the urethra & is composed of the periurethral glands, which presumably are responsible for all of the BPH.
- 60-70% of prostatic CA occurs in the peripheral zone, 10-20% in the transition zone, & 5-10% in the central zone.



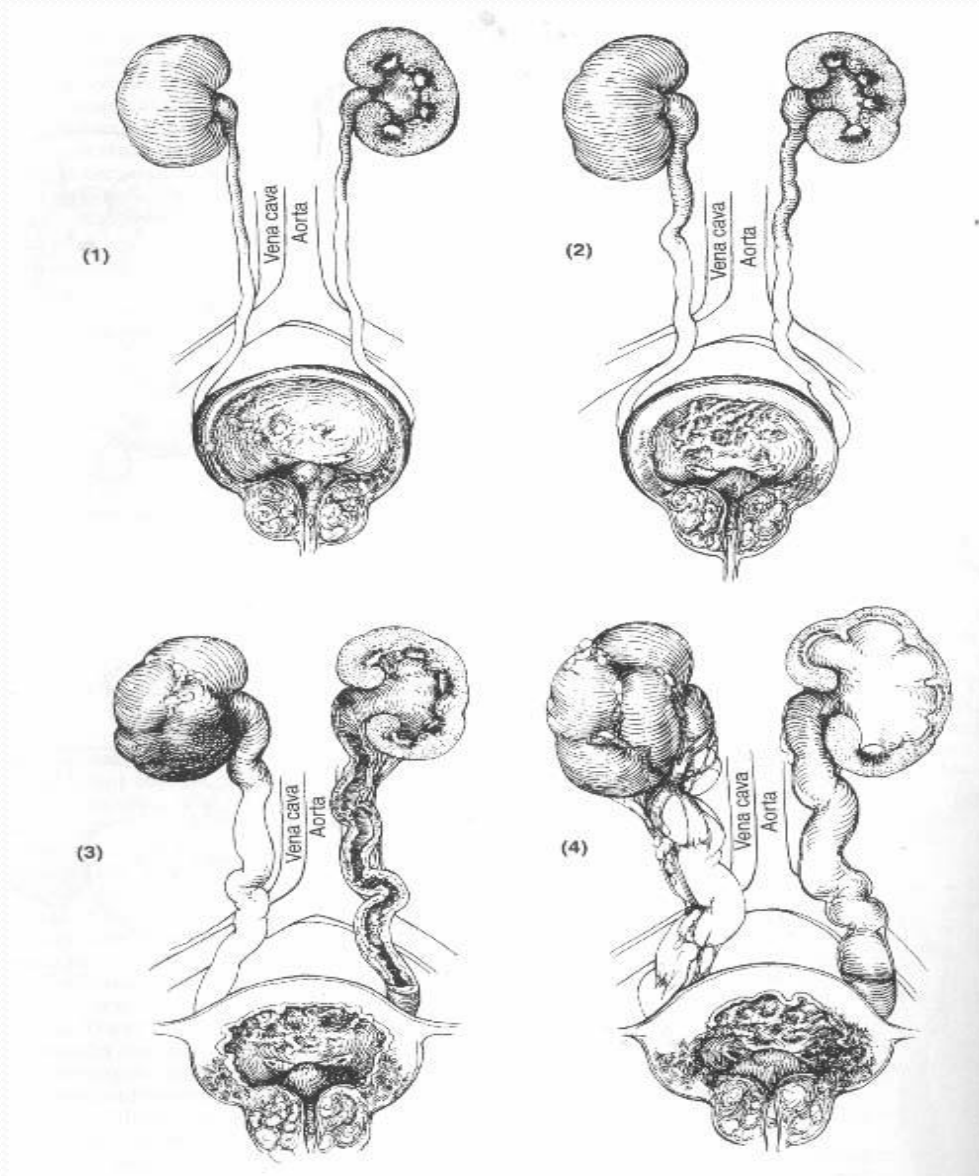
# Etiology

- The etiology of BPH is unclear.
- Two factors necessary for BPH to occur are:
  - (1) endocrine control (DHT)
  - (2) aging
- The relative roles of androgen & estrogen in inducing BPH, however, are complex & not completely understood.

# Evaluation and Treatment of Benign Prostatic Hyperplasia

- LUTS(lower urinary tract symptoms) replaces the term prostatism
- Storage symptoms:
  - frequency, nocturia, urgency, urge incontinence, and bladder discomfort
    - similar symptoms in detrusor overactivity
- Voiding symptoms:
  - decreased force of urinary stream or slow urinary stream, intermittency, dribbling, hesitancy, and the need to strain to void
    - similar symptoms in poor bladder contractility

- Bladder outlet obstruction due to BPE
- A major cause of LUTS related to BOO is the associated bladder dysfunction.
  - A bladder mass (hypertrophy of muscle)
    - Compensatory phase
      - Trabeculation, hypertrophy of trigon and interureteric ridge leading functional obstruction
      - Cellules, saccules and diverticula (Hutch)
    - Storage and voiding symptoms



# Decompensated bladder

- Acute decompensation acute urinary retention:
  - Sexual abstinence, infection, alcohol intake, prostate infarct, drugs(anticholinergics)
  - **GLOB VESICALE!!**
- Chronic decompensation:
  - Residual urine increases by time
  - Functional capacity decreases
  - Overflow incontinence ensues



## EVALUATION OF BPH

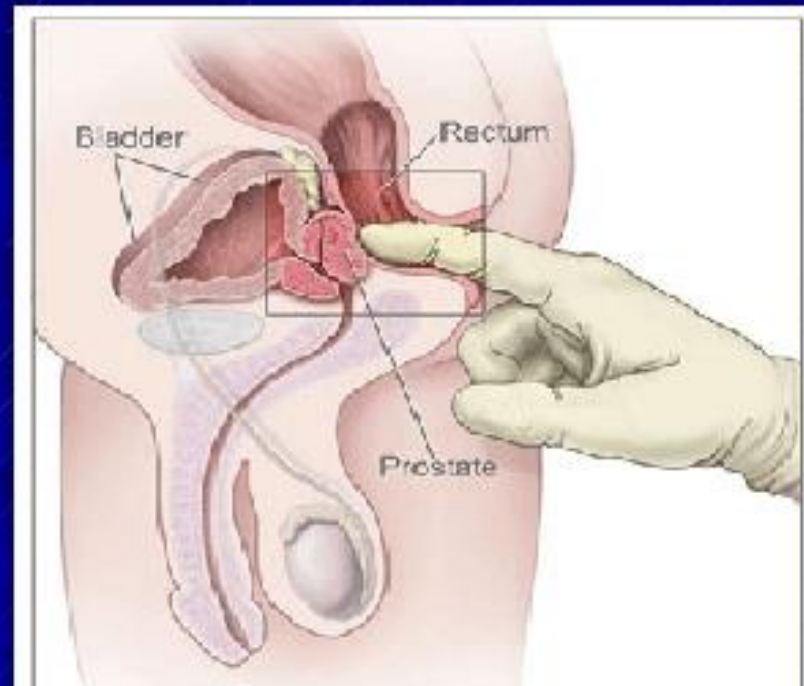
- AUASS(American Urological Association Symptom Score)
- QOL(quality of life)
- DRE(digital rectal examination)
- PSA(prostate specific antigen)
- Uroflowmetry and a postvoid residual (PVR).
  - a minimum voided volume of 125 mL
    - maximum flow rate ( $Q_{max}$ )15 ml/s
  - residual urine >300 ml usually indicates bladder decompensation
- Pressure/flow study

# Signs of BPH

- If the disease is advanced & has resulted in renal failure. Signs of renal failure include elevated BP, rapid pulse & respiration, uremic fetor, pericarditis & pallor of nail beds.
- Abdominal examination may reveal palpable kidney or flank tenderness if there is hydronephrosis or pyelonephritis.
- A distended bladder may be noted on palpation or percussion.

# Signs of BPH

- Rectal examination may reveal an enlarged prostate.
- The distinction between right & left lobes of the prostate is usually lost in BPH.
- Median sulcus always present.



# Laboratory Findings

- **Urinalysis & microscopic examination:** to R/O infection or the presence of hematuria.
- **serum U/E & creatinine:** to provide baseline information on renal function & metabolic status.
- **Uroflowmetry:** At a volume of 125-150ml, normal individuals have average flow rates of 12ml/sec & peak flow close to 20ml/sec.
  - Mild 11-15 ml/sec
  - Moderate  $> 7$  and  $< 10$  ml/sec
  - Severe  $< 7$ ml/sec
- **Residual Urine:** estimated by U/S or catheterizations. Volumes  $>150$  ml are considered significant since they constitute approximately one-third of normal bladder volume.

# Imaging

## Ultrasonography:

- In BPH, it is most useful for measuring bladder & prostate volume as well as residual urine.
- Estimation of prostatic size is important because most urologists prefer to perform TURP for glands under 100g.
- TRUS must be used as it is more accurate.

## IVP:

- For UTI & complications of BPH

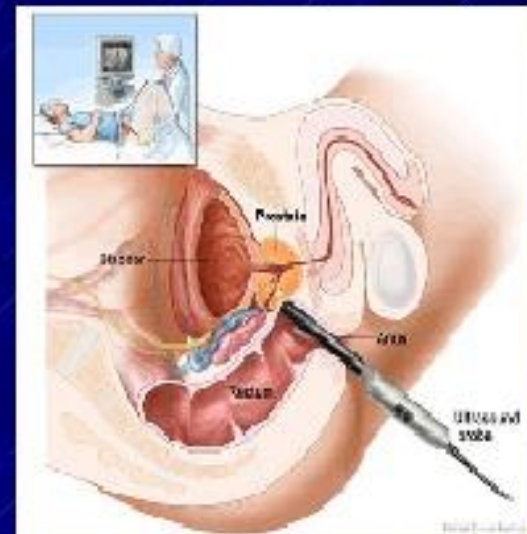


Table 1  
American Urological Association (AUA) Symptom Index

<i>Questions to be answered</i>	<i>Not at all</i>	<i>Less than 1 time in 5</i>	<i>Less than half the time</i>	<i>About half the time</i>	<i>More than half the time</i>	<i>Almost always</i>
1. Over the past month, how often have you had a sensation of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5
2. Over the past month, how often have you had to urinate again less than 2 h after you finished urinating?	0	1	2	3	4	5
3. Over the past month, how often have you found you stopped and started again several times when you urinate?	0	1	2	3	4	5
4. Over the past month, how often have you found it difficult to postpone urination?	0	1	2	3	4	5
5. Over the past month, how often have you had a weak urinary stream?	0	1	2	3	4	5
6. Over the past month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5
7. Over the past month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the morning?	0	1	2	3	4	5
	(None)	(1 time)	(2 times)	(3 times)	(4 times)	(5 times)

Sum of the seven circled numbers (AUA Symptom Score): \_\_\_\_\_

Scoring: Mild: 0 to 7 Moderate: 8 to 19 Severe: 20 to 35

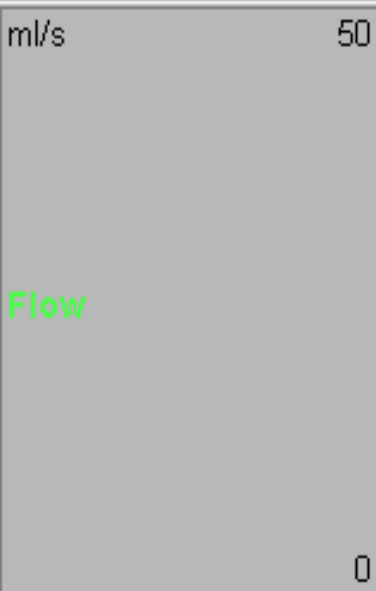
Table 2  
Quality of Life Symptom Assessment

1. Over the past month, how much physical discomfort did any urinary problems cause you?
  - 0 = none
  - 1 = only a little
  - 2 = some
  - 3 = a lot
  
2. Over the past month, how much did you worry about your health because of any urinary problems?
  - 0 = none
  - 1 = only a little
  - 2 = some
  - 3 = a lot
  
3. Overall, how bothersome has any trouble with urination been during the past month?
  - 0 = not at all bothersome
  - 1 = bothers me a little
  - 2 = bothers me some
  - 3 = bothers me a lot
  
4. If you were to spend the rest of your life with your prostate symptoms just as they are now, how would you feel about that?
  - 0 = delighted
  - 1 = pleased
  - 2 = mostly satisfied
  - 3 = mixed (about equally satisfied & dissatisfied)
  - 4 = mostly dissatisfied
  - 5 = unhappy
  - 6 = terrible
  
5. Over the past month, how much of the time has any urinary problem kept you from doing the kinds of things you usually do?
  - 0 = none of the time
  - 1 = a little of the time
  - 2 = some of the time
  - 3 = most of the time
  - 4 = all of the time

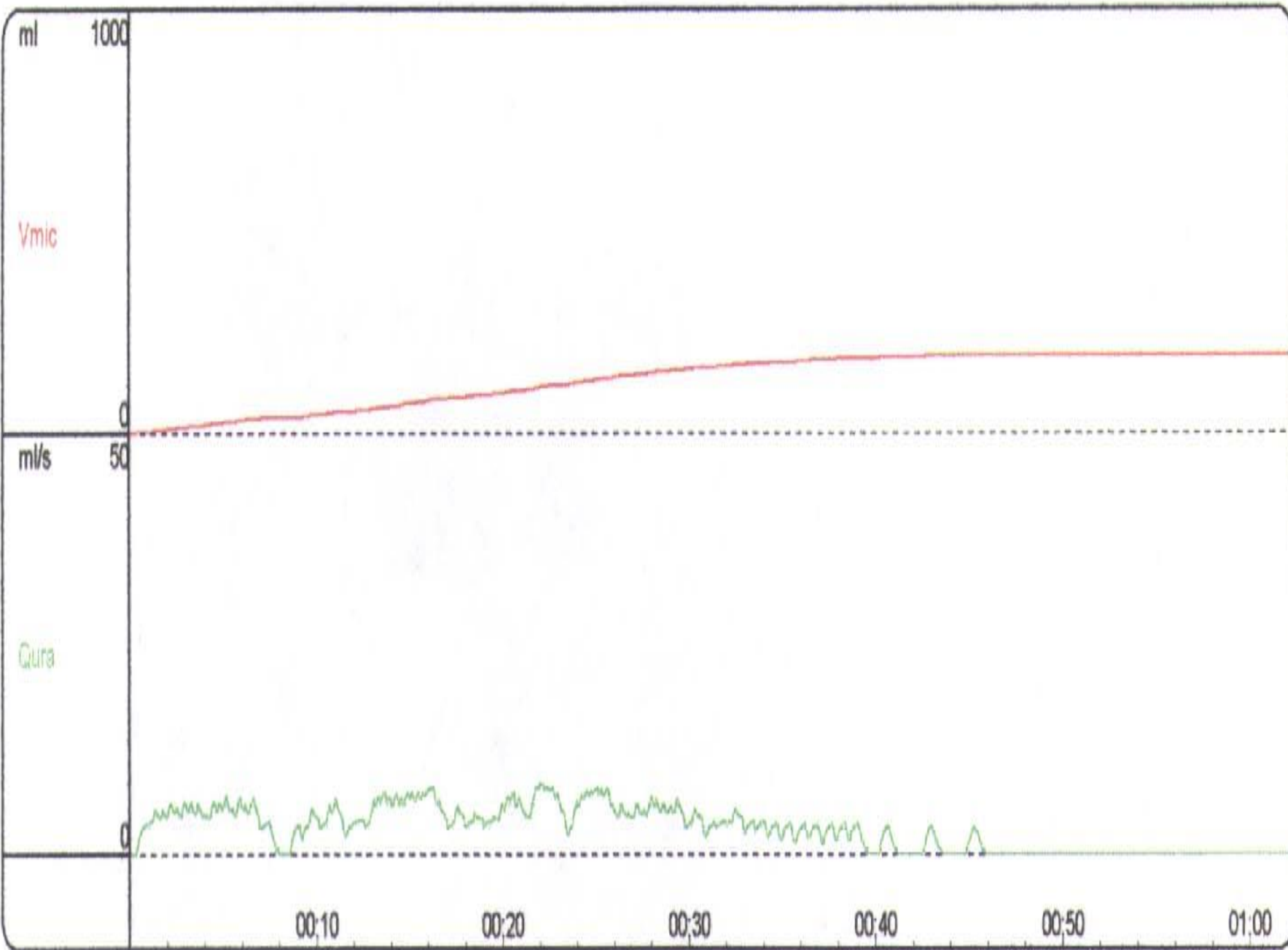
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Total: \_\_\_\_\_

# Uroflowmetry



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# Treatment

- Because BPH is not invariably progressive, the timing of intervention for each patient is variable.
- Absolute indications for treatment include severe obstructive symptoms & renal insufficiency.
- Relative indications include moderate symptoms of prostatism, recurrent UTI and hematuria.
- Until recently, surgery was the mainstay of therapy for BPH. In the last decade or so , there has been a tremendous resurgence of interest in non surgical therapies.

# TREATMENT

## ***Observation***

- AUA scores in the mild range (<7) are best managed conservatively with observation.
- In approx 50% of these patients, the symptoms remain stable and do not progress.

## ***Phytotherapy (Herbal or Alternative Therapy)***

saw palmetto (*Serenoa repens*),

a change in prostate volume or PSA has not been observed

African plumb (*Pygeum africanum*), and South African Star Grass (*Hypoxis rooperi*).

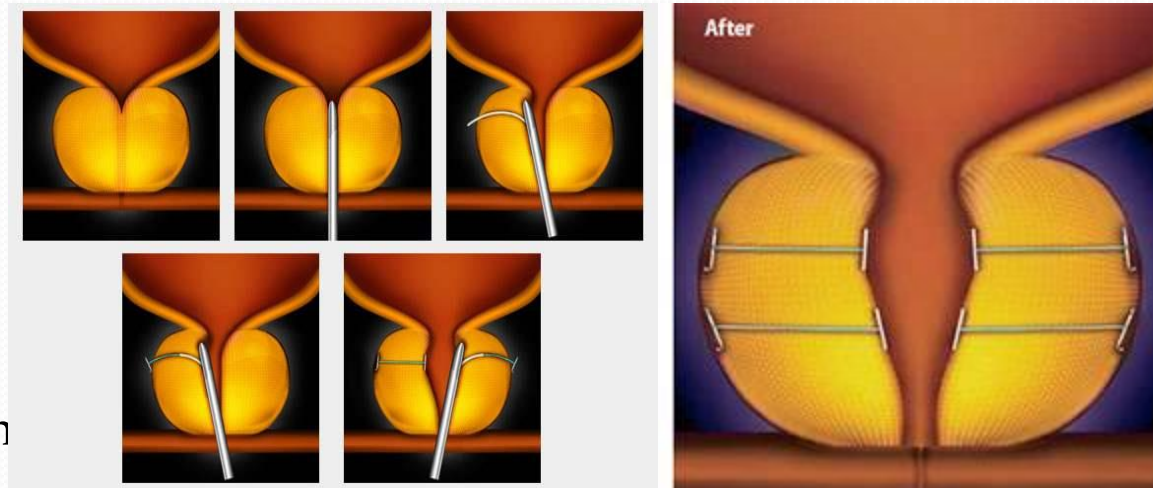
# *Medical Therapy*

- **$\alpha$ -ADRENERGIC RECEPTOR BLOCKERS**
- $\alpha_1$ -adrenergic receptor subtype, in particular, has been found to mediate smooth muscle contraction in the prostate, bladder base, and proximal urethra.
  - Terazosin, doxazosin, tamsulosin, silodosin
- The most commonly reported side effects are dizziness and asthenia.
- **$5\alpha$ -REDUCTASE INHIBITORS,**
  - finasteride, dutasteride
- **ANTIMUSCARINIC AGENTS**
  - oxybutynin chloride, solifenacin succinate, darifenacin hydrobromide, tolterodine l-tartrate, trospium chloride

# MINIMALLY INVASIVE TREATMENT

- Laser prostatectomy
- Transurethral needle ablation (TUNA)
- High intensity focused ultrasound (HIFU)
- Prostatic Stent
- Transurethral balloon dilatation
- transurethral microwave thermotherapy(TUMT)
- Absolute ethanol injection
- Botox
- Urolift

Urolift procedure



# Minimally Invasive Therapy

## 1) Laser prostatectomy

- advantages over TURP: technical simplicity, lack of complications & shorter hospital stay.
- Laser energy works by thermal destruction of tissue.
- disadvantages: lack of tissue availability for pathologic examination, longer postop catheterization time, more irritative voiding complain, & high costs

# Minimally Invasive Therapy

## 2) Transurethral needle ablation

- High frequency radio waves to cause thermal injury to the prostate.



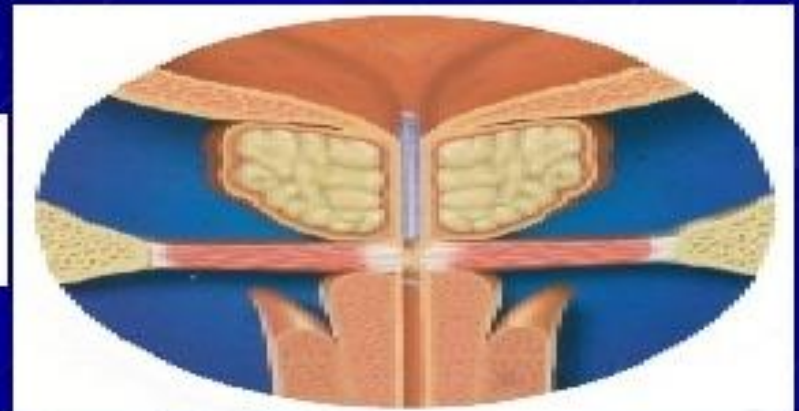
## 3) High-intensity focused Ultrasound



# Minimally Invasive Therapy

## 4) Prostate stents

- In recent years, metallic spirals & stents have been used as permanent indwelling prostheses .
- These stents may be placed endoscopically & under radiologic guidance.



# Minimally Invasive Therapy

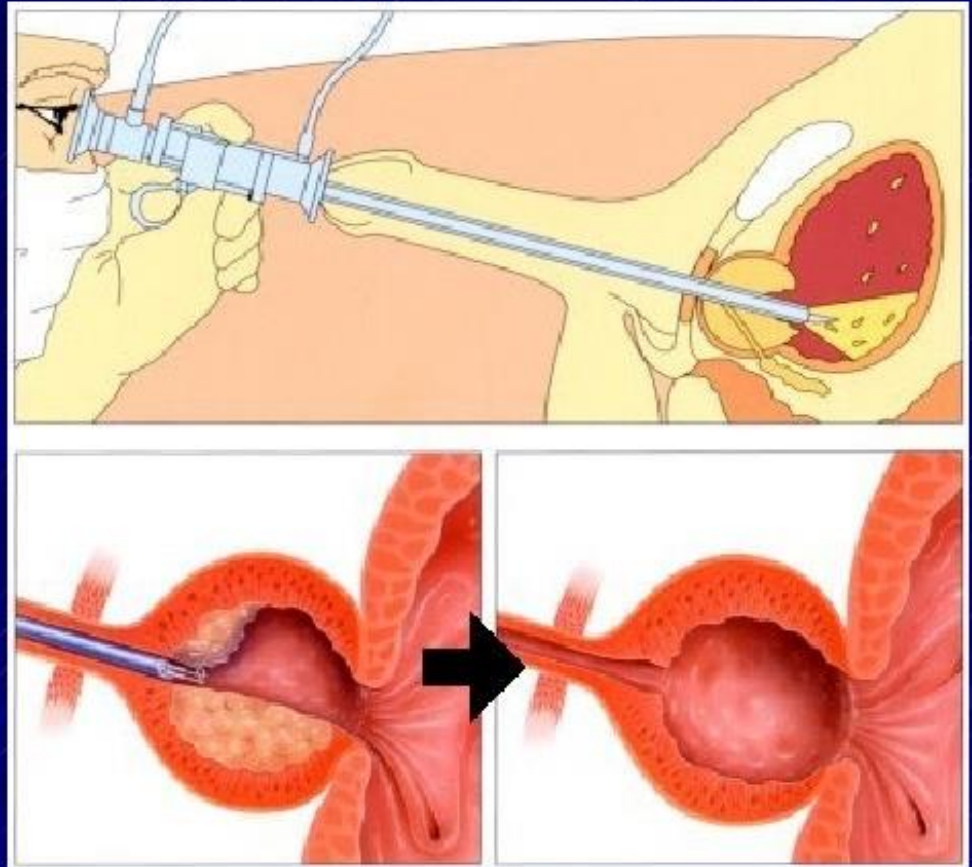
## 5) Transurethral balloon dilatation

- It involves the use of non compliant balloons to dilate the prostate under pressure.
- This pressure is maintained for 15 min.
- The exact mechanism is unclear.

## 6) Thermotherapy

# surgery

- Transurethral resection
  - Plasmakinetic
  - Bipolar
- Laser
- prostatectomy
- vaporization
- vaporesection
- enucleation



- Open prostatectomy
  - Laparoscopic
  - robotic

