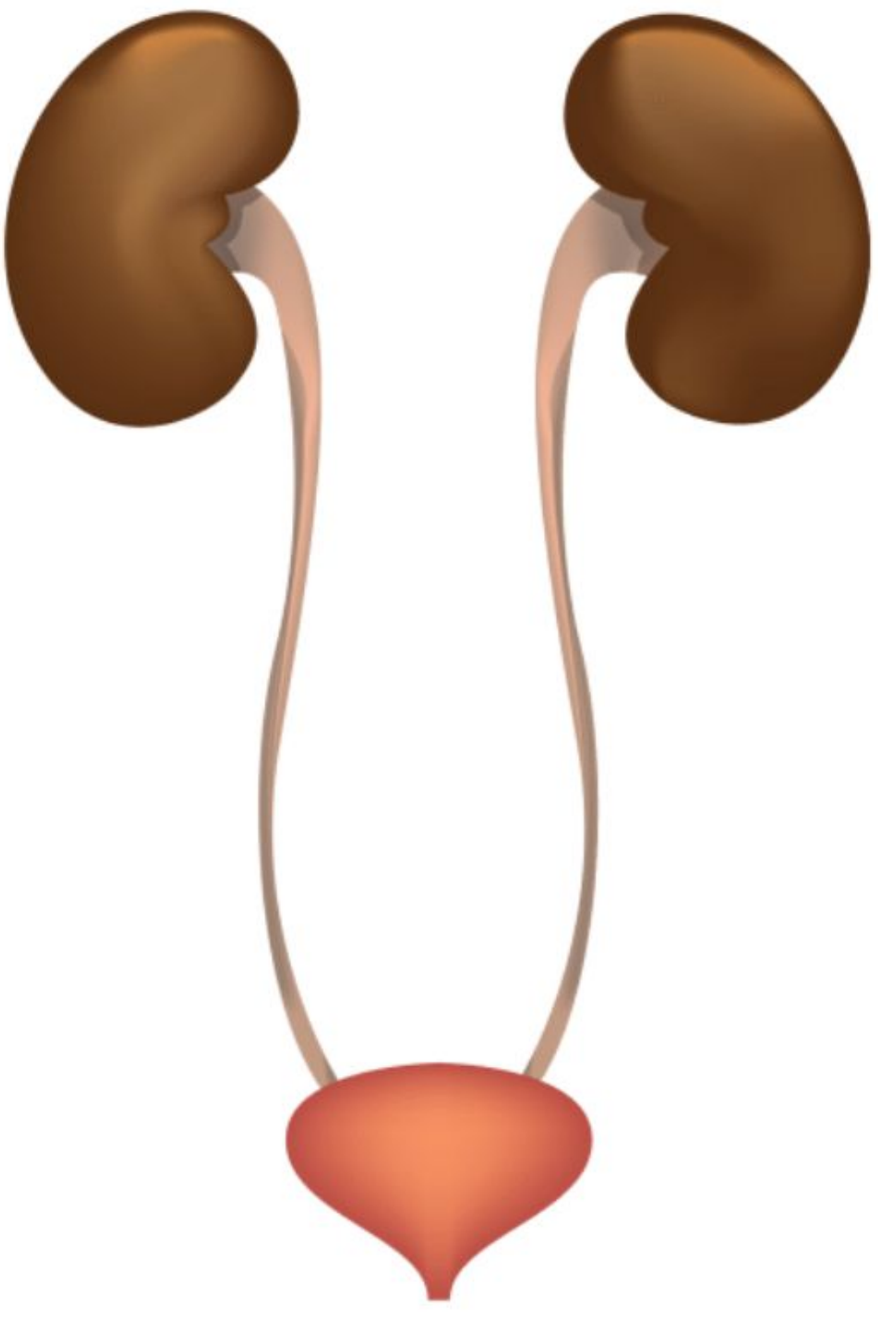
PLABABLE

GEMS

VERSION 3.9

UROLOGY



Ureteric Stones

Presentation

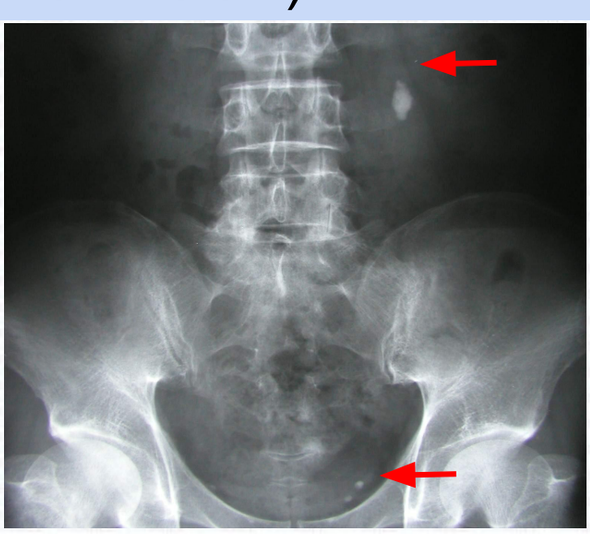
- Loin to groin acute severe pain
- Haematuria
- Dysuria
- Nausea and vomiting

Risk factors

- Anatomical abnormalities such as ureteric stricture or horseshoe kidneys
- Gout
- Hyperparathyroidism
- Dehydration
- Cystinuria

Investigation

- **Non-contrast CT scan (Investigation of choice)**
- Ultrasound for radiolucent stones
- Pregnancy → Ultrasound of whole abdomen (preferred over NCCT)



Ureteric Stones

Management	
Asymptomatic stones < 5 mm	Watchful waiting
Asymptomatic stones > 5 mm	Explain the risk and benefits Wait and watch if the patient agrees
Symptomatic stones < 10 mm	ESWL Ureteroscopy
Symptomatic stones 10 - 20 mm	Ureteroscopy (first line) ESWL (second line)
Symptomatic stones > 20 mm	PCNL

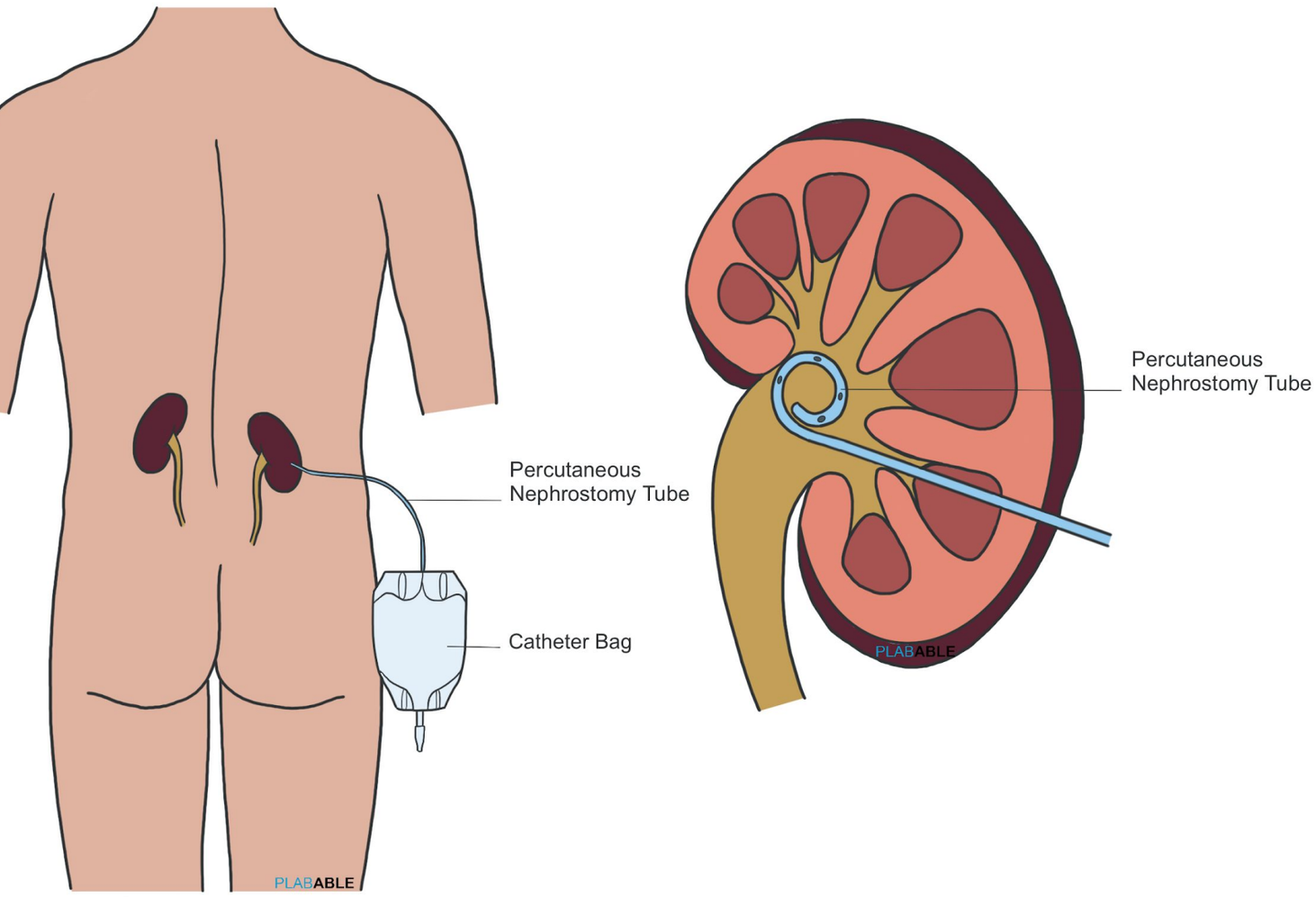
*ESWL - Extracorporeal shock wave lithotripsy
PCNL - Percutaneous nephrolithotomy

Ureteric Stones

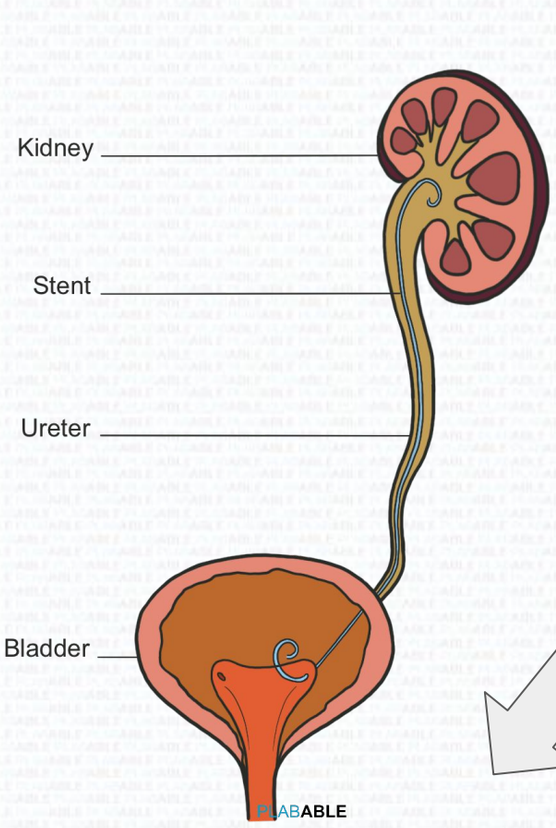
- Provide painkiller (NSAIDs) before definitive management
- Stones < 5 mm usually pass on their own with adequate hydration
- Calcium channel blockers or alpha blockers may be used to facilitate expulsion when there is no need for immediate surgical intervention
- Patient with only one kidney plus hydronephrosis → **Percutaneous nephrostomy or ureteric stent** (decompression)
- Patient with two kidneys +AKI and hydronephrosis → **Percutaneous nephrostomy or ureteric stent**

Top tip:
Have a low threshold to pick percutaneous nephrostomy or JJ stent (ureteric stent) for patients who have stone + fever/acute kidney injury

Ureteric Stones



Percutaneous Nephrostomy



Ureteric Stent

Stone + Fever/AKI

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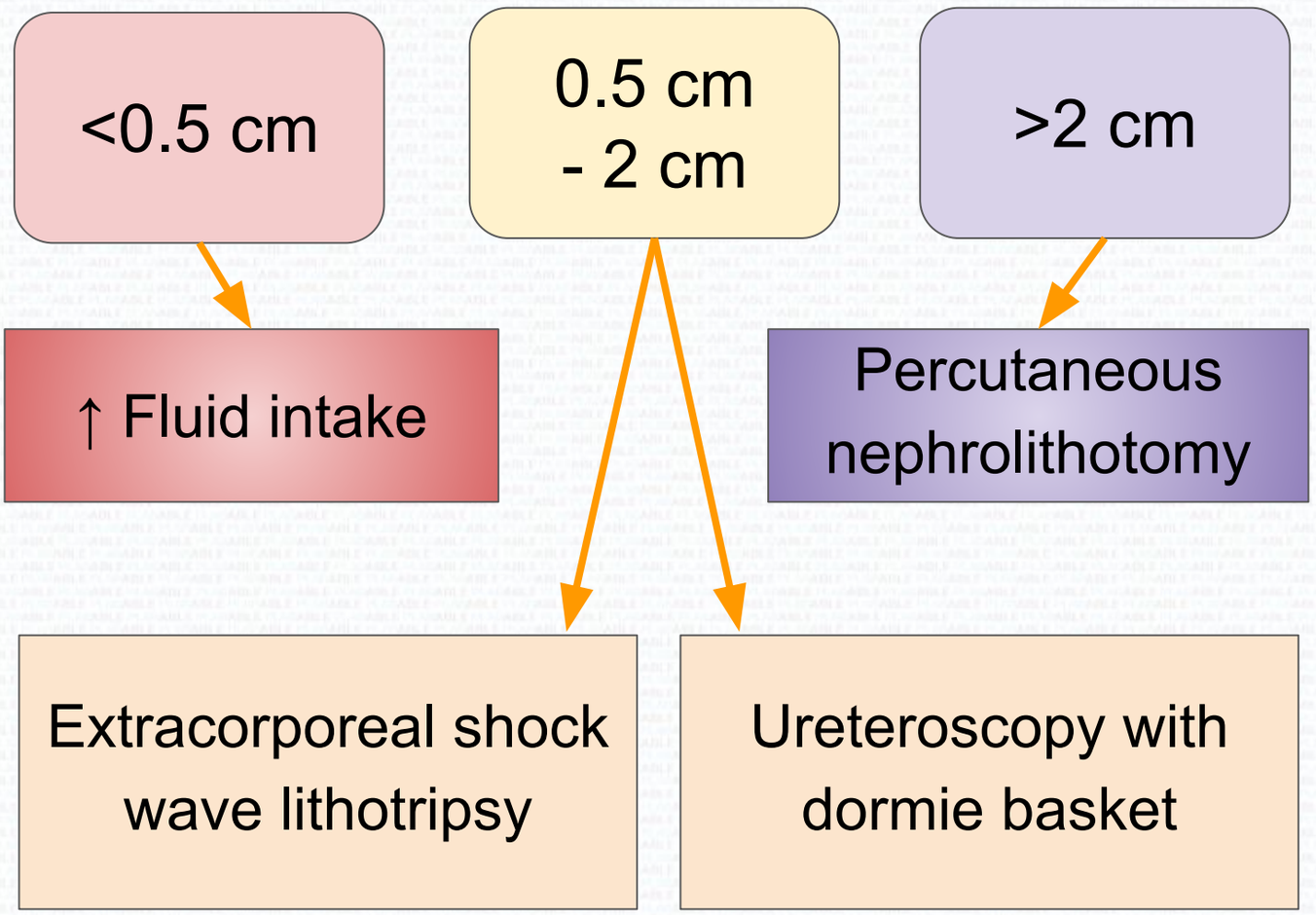
Managing Renal Stones



Percutaneous **nephrostomy** vs. **nephrolithotomy**

Stoma catheters to pelvicalyceal system of kidney for decompression.
→ Draining the obstructed fluid in kidney

Removal of urinary stone percutaneously via scope
(if size >2cm)

Managing Renal Stones Complications

Obstructive uropathy:

With 1 functioning kidney:

- A stone (**any size**) with dilation of pelvicalyceal system (PCS)
- ± anuria
- ± fever

→ Treat with **decompressing PCS** by percutaneous nephrostomy

With 2 kidneys:

- AKI
- Fever
- Hydronephrosis

→ Treat with **decompressing renal collecting system** by percutaneous nephrostomy

Managing Renal Stones Complications

Summary

- Loin pain + stone + hydronephrosis
  → Manage according stone size

- Loin pain + stone + hydronephrosis **+ AKI + Fever**
  → Percutaneous nephrostomy

Scrotal Swelling

Condition	Features
Inguinal hernia	• Inguinoscrotal swelling • Not able to get above the swelling • Cough impulse + • Reducible
Hydrocoele	• Soft fluctuant swelling • Painless and non-tender • Able to get above the swelling • Transillumination + • Below and in front of the testes
Epididymal cyst	• Single or multiple slow growing cysts • Painless and non-tender • Lies above and behind the testes • Able to get above the swelling
Acute epididymo-orchitis	• Dysuria • Urethral discharge • Fever • Red and tender scrotal skin • Pain reduce on elevation of the testis

Scrotal Swelling

Condition	Features
Testicular tumour	• Discrete testicular nodule • Firm to hard in consistency • USG scrotum • Raised serum AFP and β-HCG • Raised LDH **(seminoma)**
Varicocele	• Dilation of the pampiniform plexus • Common in the left side • Dull aching or dragging pain • Swelling ↑ on standing • Swelling ↓ on lying down • Bag of worm appearance • Scrotal doppler • Associated with renal cell carcinoma
Testicular torsion	• Acute, severe testicular pain • Common in adolescent and young • Pain does not reduce by elevation of the testis • Urgent exploratory surgery with Orchidopexy

Vesicovaginal Fistula

Presentation: Continuous and involuntary urine discharge

Pathology: Connection between bladder and vagina

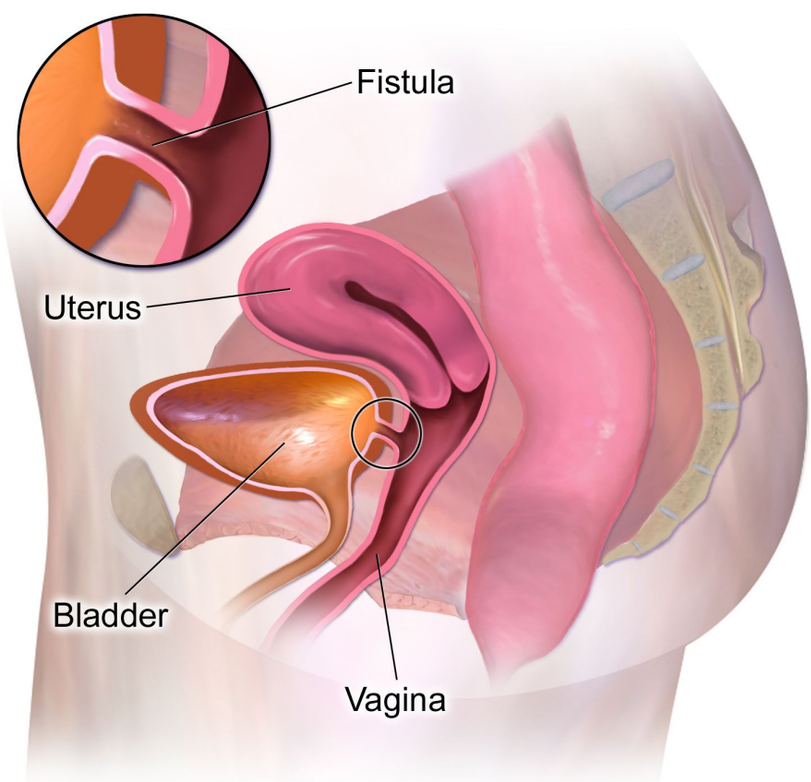
Causes:

- Obstetric fistula (prolonged labor)
- Hysterectomy
- Radiation therapy

Investigation

- 3 swab test
- USG

Management: Surgical treatment



Vesicovaginal Fistula

Urinary Incontinence

Stress incontinence - incompetent sphincter:

- Leakage of urine during activities which ↑ intraabdominal pressure such as sneezing, coughing or laughing
- **Cause:** Multiple vaginal delivery (pelvic floor muscles become weak)
- **Treatment:**
  - Pelvic floor exercises (first-line)
  - Surgical - open colposuspension

Urge incontinence - detrusor overactivity:

- Difficulty in controlling the desire to urinate
- Wetting before making it to the bathroom
- **Treatment:**
  - First → **Bladder training** - gradually ↑ the period between voiding
  - Second → Anticholinergic drugs: e.g. **oxybutynin** (only after trying bladder training)

Urinary Incontinence

Overflow incontinence - bladder outlet obstruction:

- Continuous overflow and difficulty in completely emptying the bladder

- **Causes**
  - BPH
  - Prostate cancer

- **Treatment**
  - Specific for BPH or prostate cancer
  - Intermittent catheterisation

Benign Prostatic Hyperplasia

Presentation

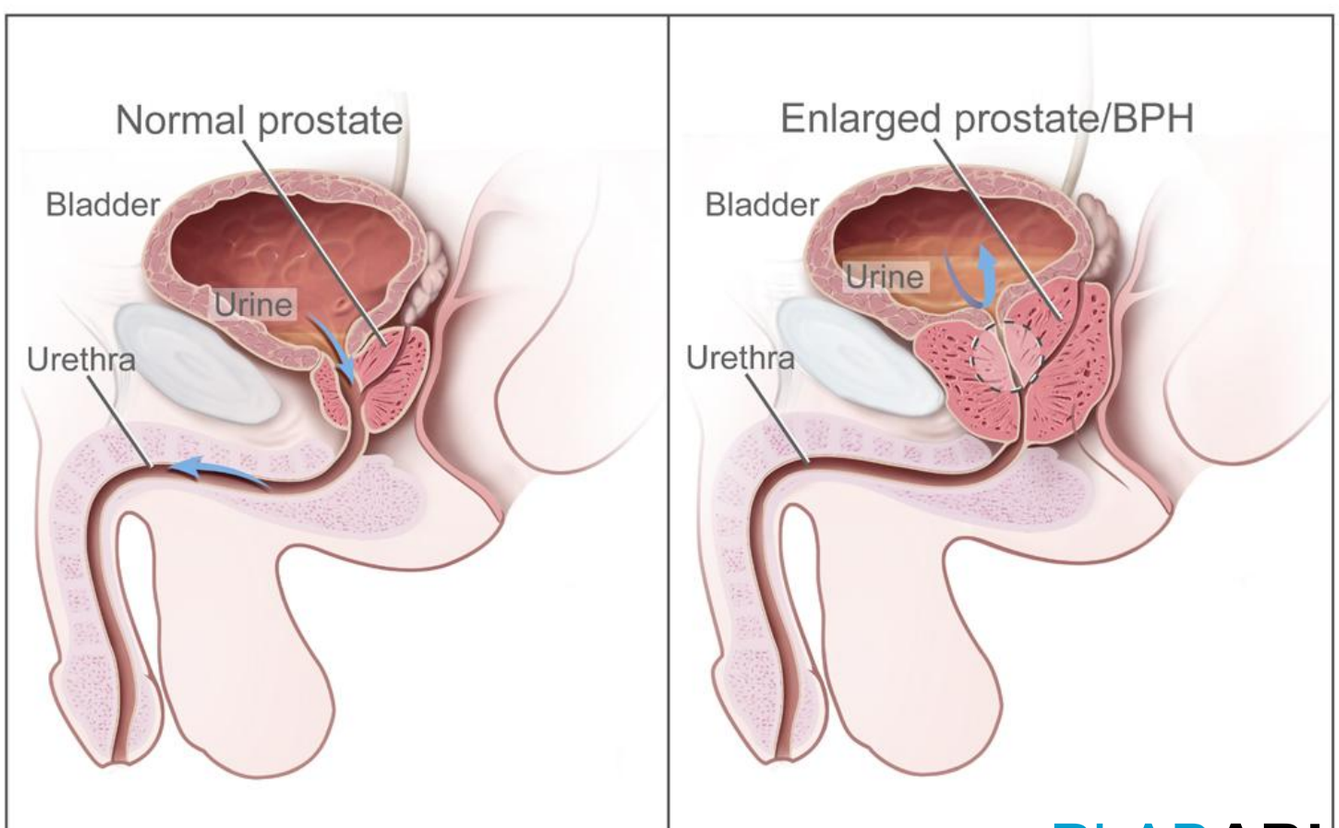
- ↑ Urinary frequency
- Incomplete bladder emptying
- Poor stream and dribbling of urine
- Hesitancy
- Common in elderly men

Digital rectal examination: shows smooth and enlarged prostate

Note: Hard and nodular prostate indicates prostate cancer

Investigations

- ↑ PSA *(Not as high as prostate cancer)*
- ↑ Post-void residual bladder volume



Benign Prostatic Hyperplasia

To make it simple, we have included the most commonly prescribed medications only. We believe those would be sufficient in the exam.

Treatment

- **Selective α-1a blockers:**
  - Tamsulosin
- **5-α reductase inhibitor**
  - Finasteride

- **Transurethral resection of prostate (TURP)** (If medical management fails)

- **α-1 blockers -** Mild to moderate lower urinary tract symptoms (LUTS) alone
- **5-α reductase inhibitor -** Urinary tract symptoms plus significant prostatomegaly or PSA>1.4 ng/mL
- Severe LUTS + prostatomegaly/PSA >1.4 ng/ml → Combination of **α-1 blockers AND 5-α reductase inhibitor**

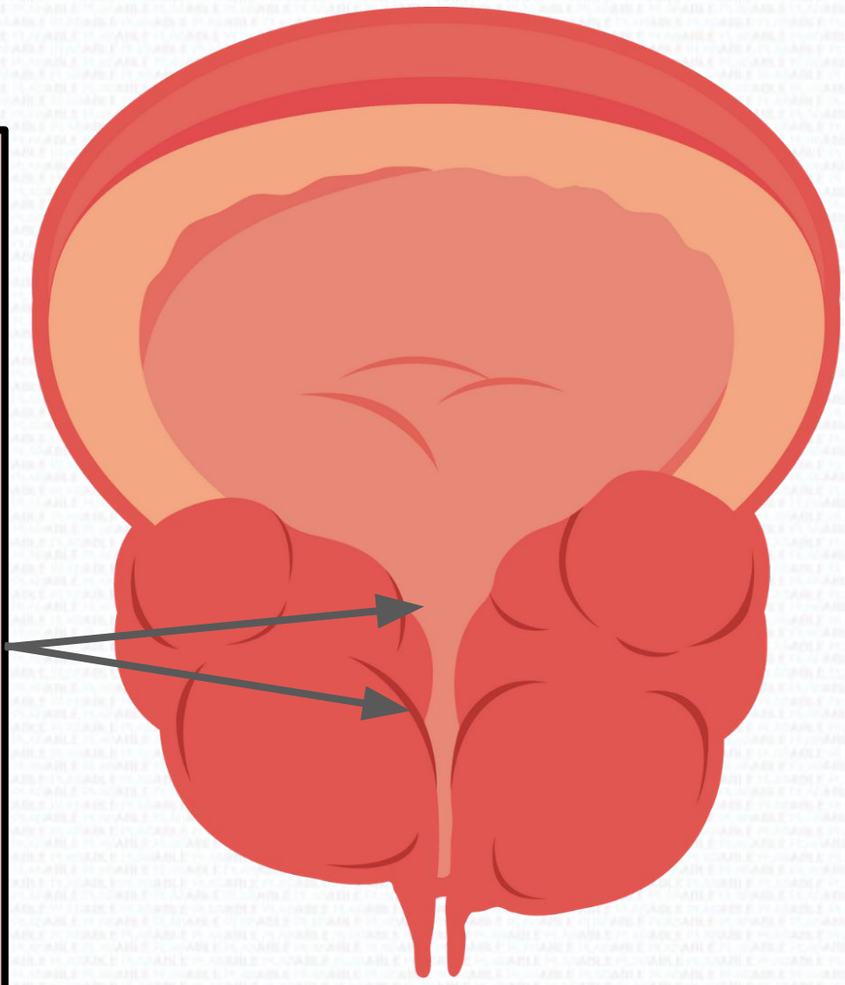
TURP syndrome can cause hyponatremia due to irrigation of bladder used during the procedure

Benign Prostatic Hyperplasia

If the patient has LUTS and you are asked to choose between finasteride or tamsulosin in the exam, we suggest picking tamsulosin to alleviate the patient's symptoms first.

Finasteride can take 3 to 6 months to see improvements of symptoms.

Tamsulosin reduces the symptoms of lower urinary symptoms caused by an enlarged prostate gland by relaxing the muscles in the bladder neck and prostate

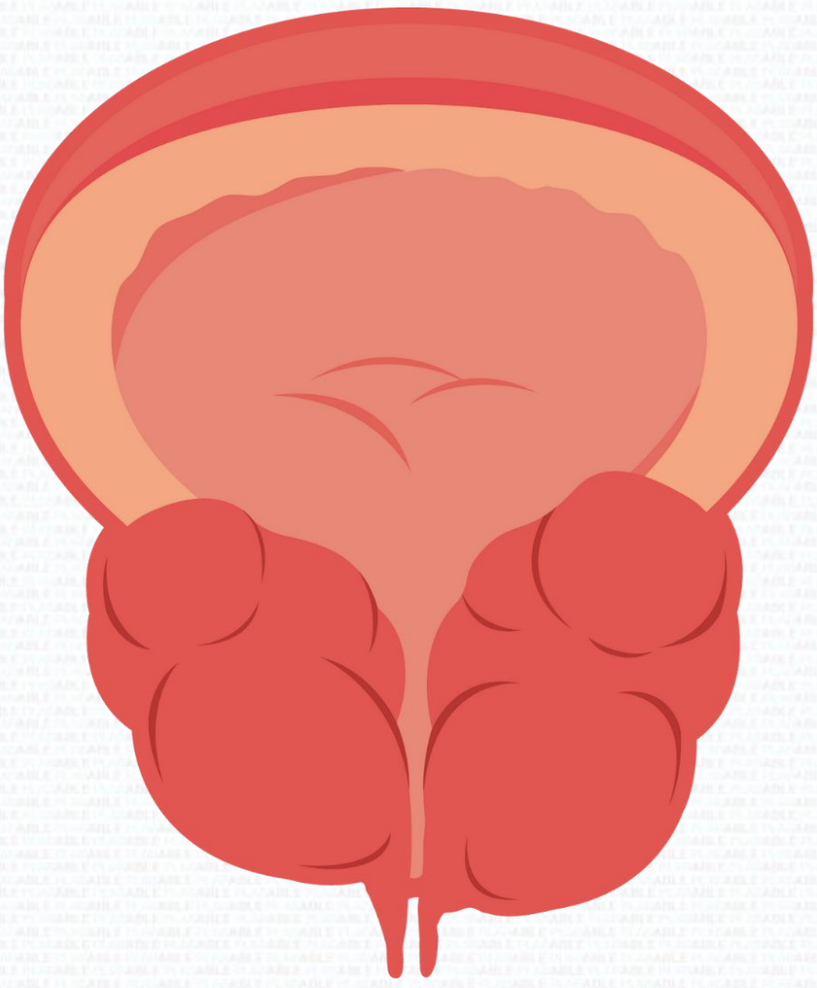


Benign Prostatic Hyperplasia

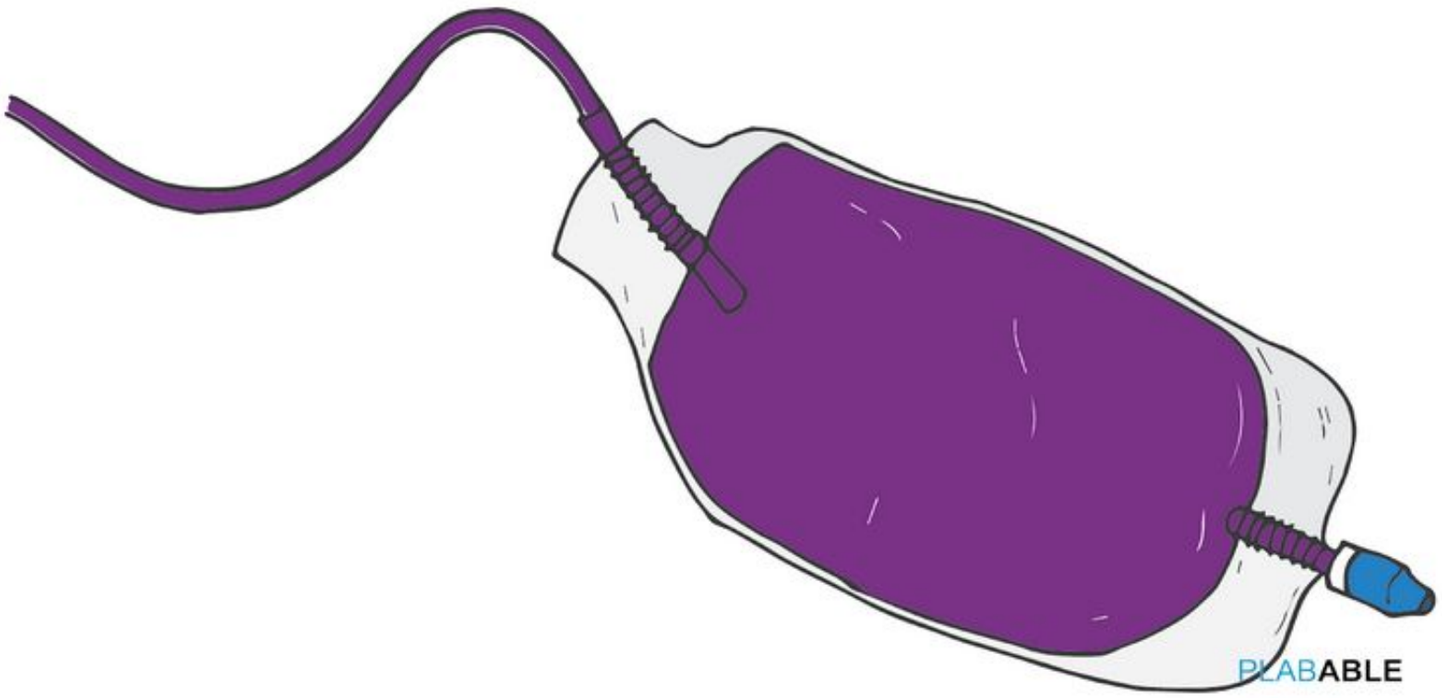
A good mnemonic to remember

If you want your smooth muscles of the bladder neck and prostate relaxed and activity **BLOCKED**, you would use a alpha **BLOCKER**

If you want your prostate size **REDUCED**, you would use a 5-α **REDUCTASE** inhibitor



Purple Urine Bag Syndrome



Brain trainer:

For the above pictured condition, what is the etiology indicated investigation and management?

➔ **Bacterial colonization of the urinary tract**
➔ **Urine culture**
➔ **Changing the catheter +/- antibiotics**

Prostate Cancer

Features

- Most common cancer in men
- Sensation of incomplete emptying
- ↑ Urinary frequency and urgency
- Haematuria
- Weight loss and back pain (metastasis)
- Metastasis - can lead to Cauda Equina syndrome presenting with saddle anesthesia & inability to urinate (urgent MRI spine)

Digital rectal examination

- Asymmetrical, irregular, hard & enlarged prostate

Investigations

- ↑ PSA (initial investigation)
- Prostate biopsy (definitive)
- MRI scan

Management

- **Localised** - radical prostatectomy & radiotherapy
- **Metastatic** - radical radiotherapy & androgen deprivation treatment

Bladder Cancer

Presentation

- Painless haematuria
- Sometimes voiding symptoms
- Common type: transitional cell carcinoma

Risk factors

- Smoking
- Occupational exposure to **aniline** dye

Investigation

- Urine cytology (**Initial**)
- Cystoscopic examination of bladder and biopsy (**most appropriate and definitive**)

Investigations should also include a CT urogram to look for renal or ureteric tumours since haematuria can present with these. CT urograms have radiation so if the patient is young (e.g. less than 40 years old), an ultrasound scan may be more appropriate.

Note: First differential for an **elderly male** with haematuria should be bladder cancer, and for an **elderly female** with vaginal bleeding should be endometrial cancer

Bladder Cancer

Brain trainer:

An 60 year old man with painless frank haematuria, urinary urgency and frequency. He has weight loss. His prostate examination reveals an enlarged smooth prostate without nodules. What is the most appropriate test?

➔ **Cystoscopy**

Even if PSA is seen in the options, cystoscopy is still a better examination given the clinical scenario since an examination shows features of a benign prostatic hyperplasia.

CT KUB Vs CT Urogram

CT KUB (Kidney Ureter Bladder) is without contrast and looks for urolithiasis as the cause of haematuria.

CT Urogram (CTU) looks for urothelial carcinomas as the cause of haematuria. It involves a non-contrast phase followed by a contrast phase (parenchymal phase and excretory phase). The contrast phase is taken after IV contrast boluses is given to show the parenchymal (also known as nephrographic) and excretory phases.

CT KUB	One phase of non contrast CT
CTU	First phase is a non contrast CT (similar to a CT KUB) so it can detect stones
	Second phase (parenchymal phase) which means more radiation
	Third phase (excretory phase) which means even more radiation

CT KUB → Excellent for demonstrating STONES

CTU → Excellent for demonstrating MALIGNANCY

Haematuria Investigations Examples

This card only applies to patients who have **PAINLESS** haematuria. Here are some examples:

Over 40 years old

Macroscopic haematuria	Microscopic haematuria
• CT Urogram • Cystoscopy • Urine cytology	• CT-KUB followed by US • Cystoscopy • Urine cytology

Under 40 years old

Macroscopic haematuria	Microscopic haematuria
• US followed by CT-KUB • Cystoscopy • Urine cytology	• US • Cystoscopy only if symptomatic

As you can see, the younger the patient is, the more we try to avoid CT Urogram since it has the most radiation *(almost 3 times more than a CT KUB since it has 3 phases).*

Most stones result in microscopic haematuria hence why microscopic haematuria investigations involve CT-KUB or US.

Haematuria

Bladder cancer	Smoker Asymptomatic haematuria
Urinary Stones	Renal colic Possibly fever
Prostate cancer	Enlarged prostate High PSA
Renal cancer	Loin pain Loin mass
Schistosomiasis	Africa (Egypt) and the Middle East

Urology Scans and Cameras

	Looks for
CT KUB	Renal stones, hydronephrosis
CT Urogram	Renal and ureteric cancers
Cystoscopy	Bladder cancers
Cystogram	Vesicoureteral reflux (VUR)
Intravenous urogram (IVU)	Largely superseded by CT urography (unlikely going to be your answer anymore)
DMSA scan	Renal scarring
MAG3 scan	PUJ obstruction

IV Urogram - The Confusion

The term intravenous urogram (IVU) can mean either an X-ray IVU or a CT IVU.

For the purpose of the exam, if you see the word “intravenous urogram” without any prefix then assume they mean the traditional intravenous urogram which is the X-ray IVU.

X-ray IVU

Has largely been replaced by CT urogram *(also known as CT IVU).* **No longer used in the UK!**

For this reason, you can safely say that any option with IVU in the exam is the wrong option.

CT IVU

The preferred term to use is CT urogram (CTU).

You may hear the word IVU used in urology clinics in the UK. When it is used, the urologist mean “CT IVU” since NO ONE in the UK would ever use X-ray IVU

Terminology for Urology Scans

CT Urogram = CT IVU

Visualises the kidney ureter and bladder after contrast is given.

Looks primarily at upper urinary tract tumours (renal cell carcinoma, urothelial carcinomas).

Testicular Cancer

Presentation

- Painless and non-tender lump in the body of testes
- Testicular pain
- Metastasis - bone pain
- > 95% are germ cell tumours

Risk factors

- Cryptorchidism
- Klinefelter syndrome

Investigations

- Scrotal ultrasound
- AFP - Yolk sac tumour
- Beta-hCG - Both teratoma and seminoma
- **LDH is most likely to be raised in seminoma**

Note: Testicular biopsy is not done as it can cause metastasis

Management

- Radical orchiectomy
- Chemotherapy (if metastasis)

Testicular Torsion

Rotation of the testes through the spermatic cord thereby occluding testicular blood vessels

Presentation

- Sudden and severe pain in one testes
- Happens during sports or activity
- Lifting the testes does not relieve the pain (reduces the pain in epididymo-orchitis)
- Absent cremasteric reflex

Investigation

- Colour doppler USG to look for blood flow

Management

- Emergency surgery and testicular detorsion followed by bilateral orchidopexy

Epididymo-Orchitis

Presentation

- Unilateral scrotal pain and swelling
- Urethral discharge
- Tenderness to palpation of epididymis
- Fever
- History of UTI
- Pain relieved by elevation of the testes
- <35 years old sexually transmitted organisms:
  - *Chlamydia* & *Gonorrhoea*
- >35 years old UTI causing organisms:
  - *E. coli & Pseudomonas. spp*

Investigation

- Urethral swab and smear
- Microscopy and culture of mid-stream urine

Treatment

- **Sexually transmitted pathogen:**
  - Ceftriaxone 1 gm IM Stat PLUS
  - Doxycycline 100 mg BD for 10-14 days
- **Enteric organisms:**
  - Ofloxacin 200 mg BD for 14 days OR
  - Levofloxacin 500 mg BD for 10 days

AD - Polycystic Kidney Disease

Presentation

- Loin pain
- Haematuria
- Hypertension

Associated with intracranial (Berry) aneurysm

Investigations

- Abdominal USG (initial test)
- MRI / CT (most sensitive)

Management

- Hypertension with ACEi or ARB
- Regular screening for intracranial aneurysm

Haematuria DDs

Goodpasture syndrome	• Haematuria • Hemoptysis • Anti-GBM antibodies
Wegener's granulomatosis (granulomatosis with polyangiitis)	• Haematuria • Haemoptysis • Arthritis
Haemolytic uremic syndrome	• Haematuria • Bloody diarrhoea • Haemolytic anaemia • Thrombocytopenia • Infection with E.coli
Bladder cancer	• Haematuria • Occupational exposure - Aniline dye / smoking • Old age
Post-streptococcal glomerulonephritis	• Haematuria • H/o Impetigo or pharyngitis • Oedema • Hypertension • Children

Vesicoureteric Reflux

Features

- Urine flows retrograde from bladder into the ureter and kidney
- Causes dilation of pelvicalyceal system
- Repeated UTIs
- Reflux nephropathy (if chronic)

Investigations

- **Initial:**
  - Ultrasound
  - Urinalysis and C&S
- **Gold standard:**
  - Micturating cystourethrogram
- **Detect parenchymal scars:**
  - DMSA scan

Management

- Prophylactic antibiotics to prevent recurrent UTIs
- Surgical for high grade reflux

Grade V VUR

Interstitial Cystitis

Presentation

- ↑ Urinary frequency
- Urgency
- Suprapubic pain ↑ with bladder filling and ↓ with voiding
- Diagnosis of exclusion
- Common in women

Investigations

- Urine routine and C&S to R/O UTI
- Cystoscopy to R/O bladder cancer
- **Hunner's ulcers** may be seen on cystoscopy

Management

First line

- Bladder training
- Pelvic floor relaxation techniques (avoid pelvic floor exercises)
- Behavior therapy
- Avoiding food triggers
- Analgesics

Second line

- Amitriptyline

Acute Urinary Retention

Presentation

- Suprapubic pain
- Inability to void
- Pain is relieved immediately once urinary catheter is put in

Management

- Insert a urinary catheter (if unable to do this, then insert a suprapubic catheter)

In men → do a PR examination to check prostate *(benign prostatic hyperplasia and prostate cancer are common causes)*

In men →

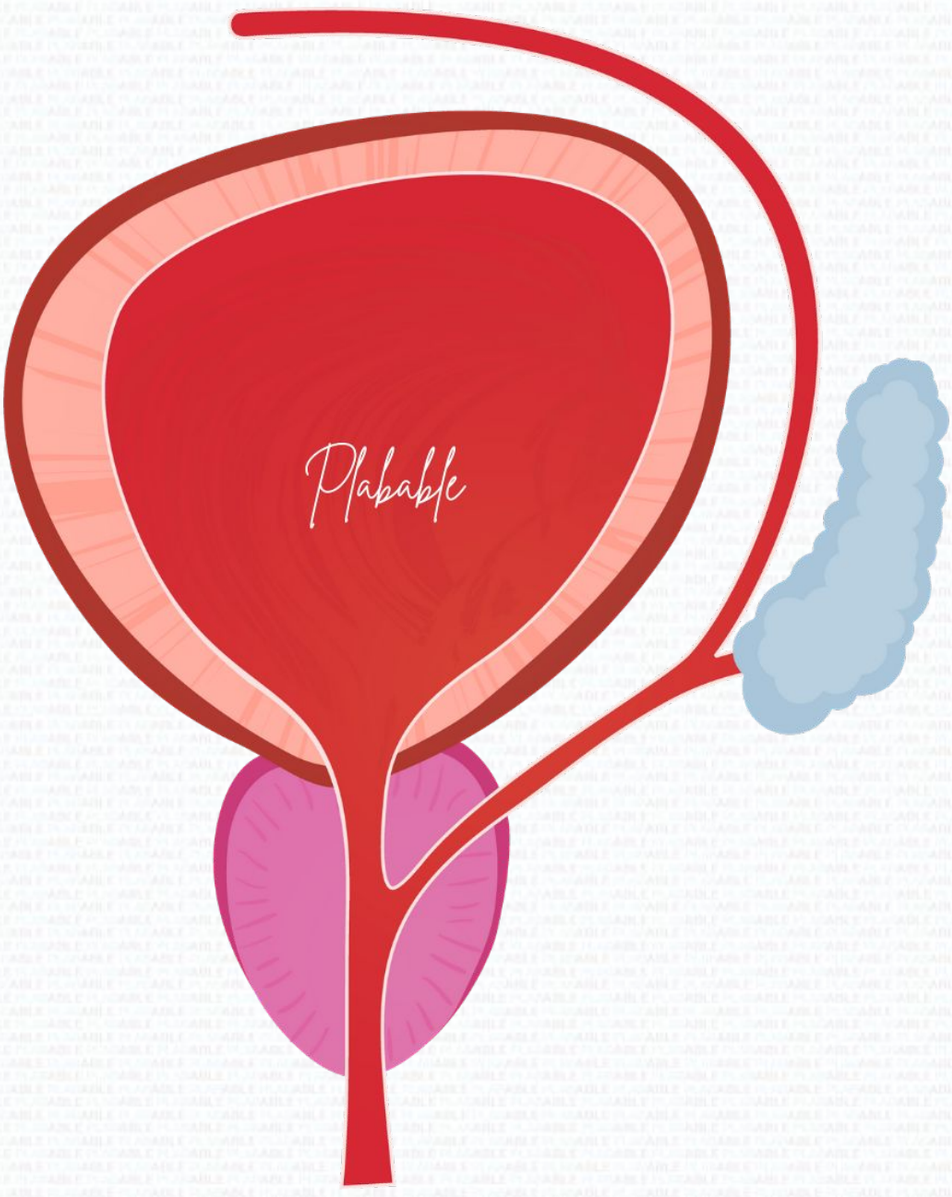
If enlarged prostate + normal PSA → Prescribe tamsulosin and trial without catheter (TWOC)

Tamsulosin relaxes smooth muscles of the bladder and the prostate

Acute Urinary Retention

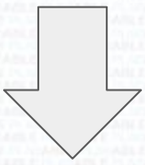
What is the MOST common cause of urinary retention in men?

Benign prostatic hyperplasia

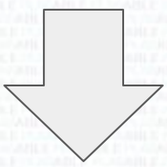


Benign Prostatic Hyperplasia and Acute Urinary Retention

Elderly man + history of nocturnal frequency



Presents with acute urinary retention



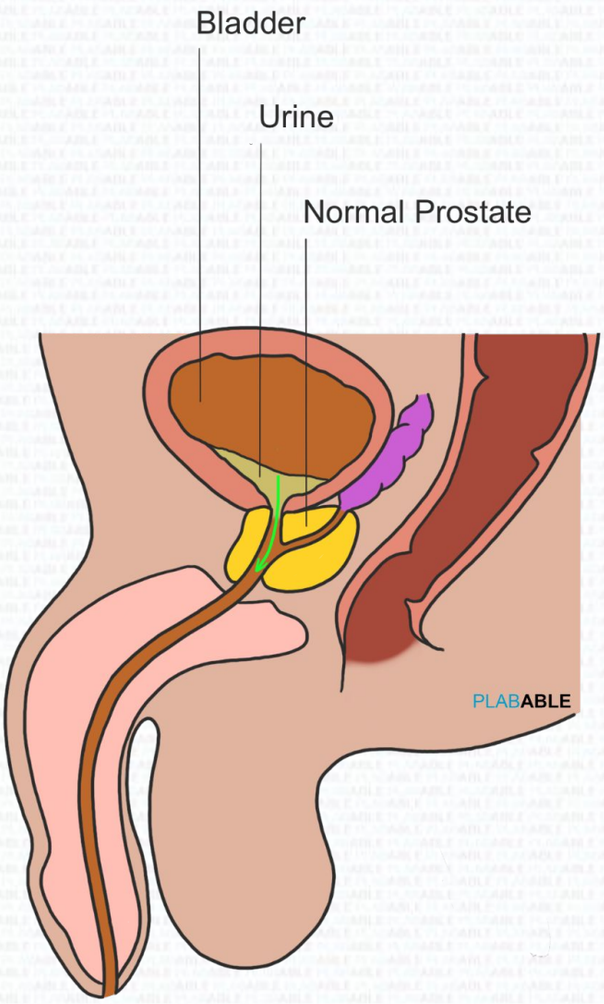
Cause → **Benign prostatic hyperplasia (BPH)**

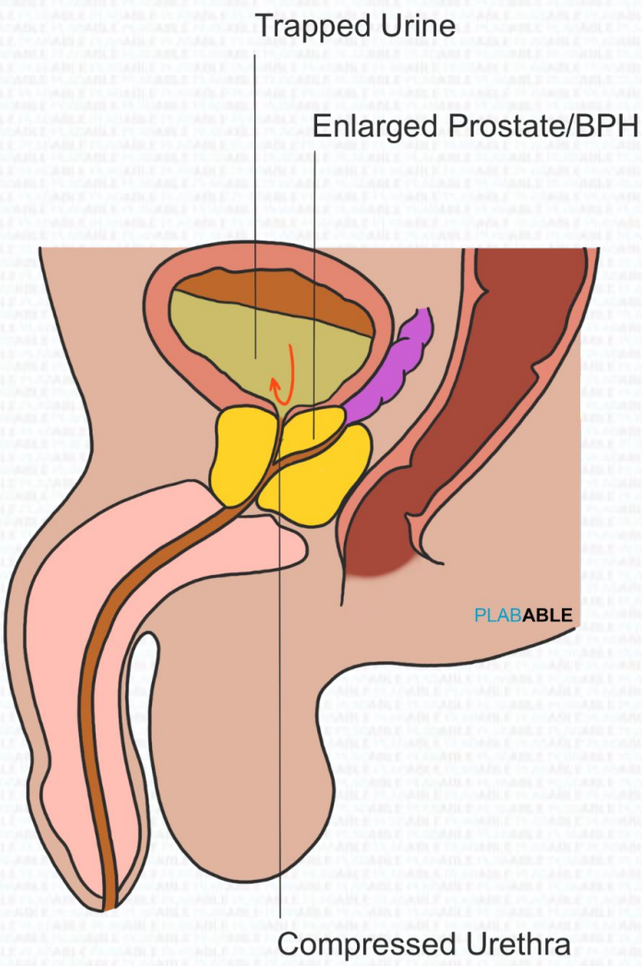
What about other causes of acute urinary retention?

Constipation? → Possible but it is less frequent than BPH. Pick constipation only if they provide information such as faecal impaction on examination.

Prostate cancer? → Possible but you would be looking at a VERY high PSA.

Benign Prostatic Hyperplasia and Acute Urinary Retention





Presents with acute urinary retention

TWOC

What is TWOC? → Trial WithOut Catheter

TWOC is when the catheter is removed from the bladder for a trial period of time to determine if the patient is able to void.

Examples of when to use TWOC:
Patient unable to void post surgery of which a urinary catheter needed to be reinserted
Acute urinary retention from BPH when a catheter needed to be inserted as part of the management to to relief the patient

TWOC can be days after or weeks after the initial catheter was inserted.

After the catheter is removed, the patient would be encouraged to drink fluids to fill his bladder. Once the patient's bladder is full, he would be asked to void and then a bladder scan would determine the amount of urine still in the bladder (residual volume). An acceptable residual volume is usually less than 200 ml. If the patient is able to void more than 100 ml and has a residual volume of less than 200 ml, it is considered a successful TWOC. If the patient fails to do this, it is a failed TWOC and a catheter is inserted again.

Management of Recurrent Urinary Tract Infections in Women

If acute UTI → Manage the UTI with antibiotics

The treatments below apply to those who are not pregnant, not catheterized and without haematuria

Postmenopausal → Vaginal oestrogen

Identifiable trigger (e.g. sexual intercourse) → Single-dose antibiotic prophylaxis for use when exposed to an identifiable trigger
E.g. Trimetoprim stat dose after sexual intercourse

Premenopausal + no identifiable triggers → Daily antibiotics long term for prophylaxis

Postmenopausal + no identifiable triggers + Vaginal oestrogen not working or unsuitable → Daily antibiotics long term for prophylaxis

Management of Recurrent Urinary Tract Infections in Women

Important to remember that vaginal oestrogen is tried first before long term antibiotics in a postmenopausal woman

PodsForDocs

Check out our podcast episode '*Urology Part 1 & 2*' to further solidify your knowledge on the topic.

Click on the image below to head to our PodsForDocs podcast page to find out more.

We also have a dedicated PodsForDocs WhatsApp group which you can join via the Study Group tab on your Account. Enjoy!

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