



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore - 35
Affiliated to Dr MGR Medical University, Chennai



DEPARTMENT OF CARDIO PULMONARY PERFUSION CARE
TECHNOLOGY

COURSE NAME : CPB AND ITS COMPLICATIONS

III RD YEAR

TOPIC : HEMATURIA CAUSES AND TREATMENT



Definition:

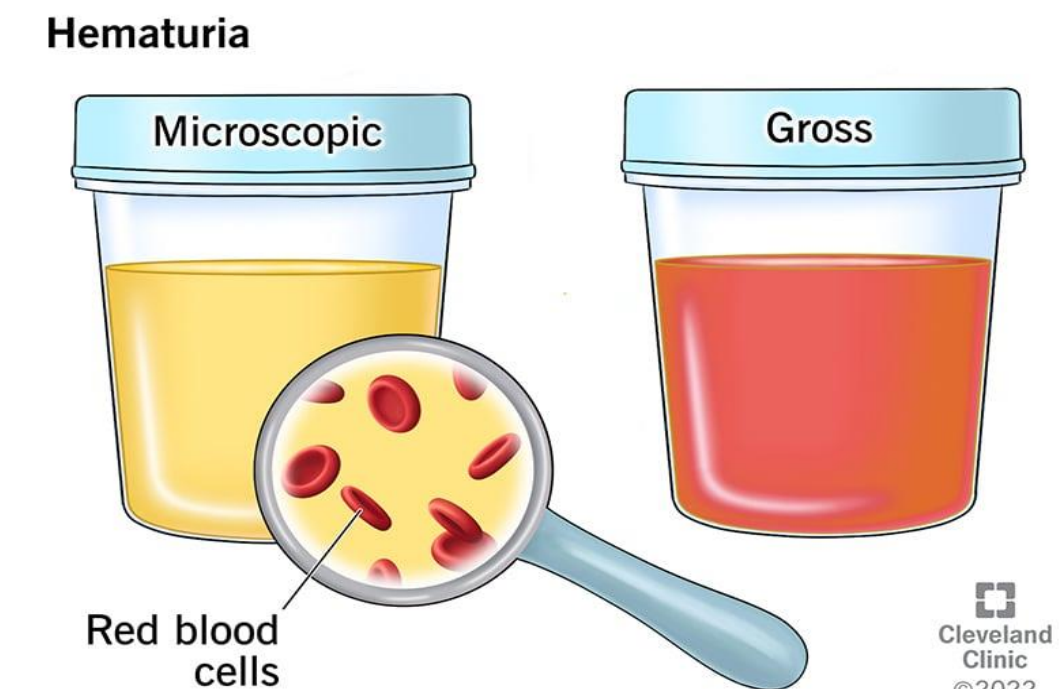
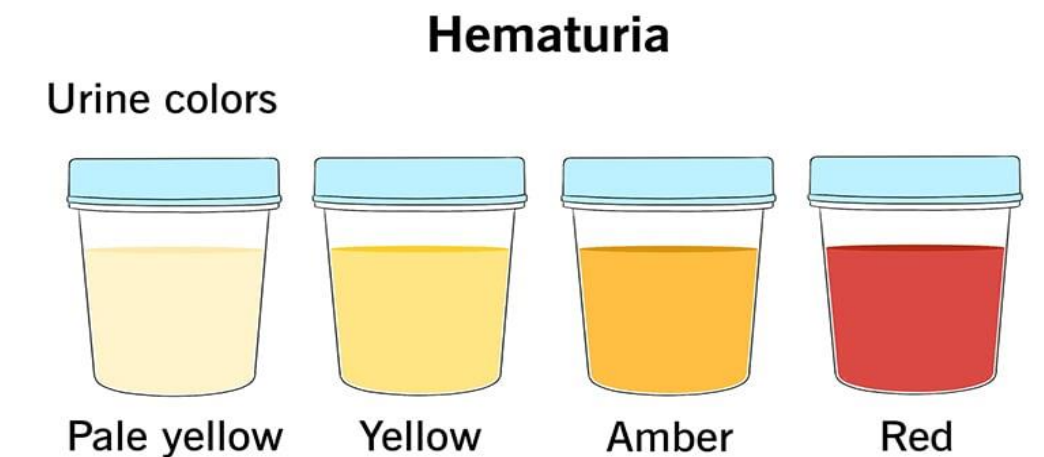
Hematuria or haematuria is defined as the presence of blood or red blood cells in the urine

Differential diagnosis

Hematuria can be classified according to **visibility, anatomical origin, and timing** of blood during urination.

In terms of visibility,

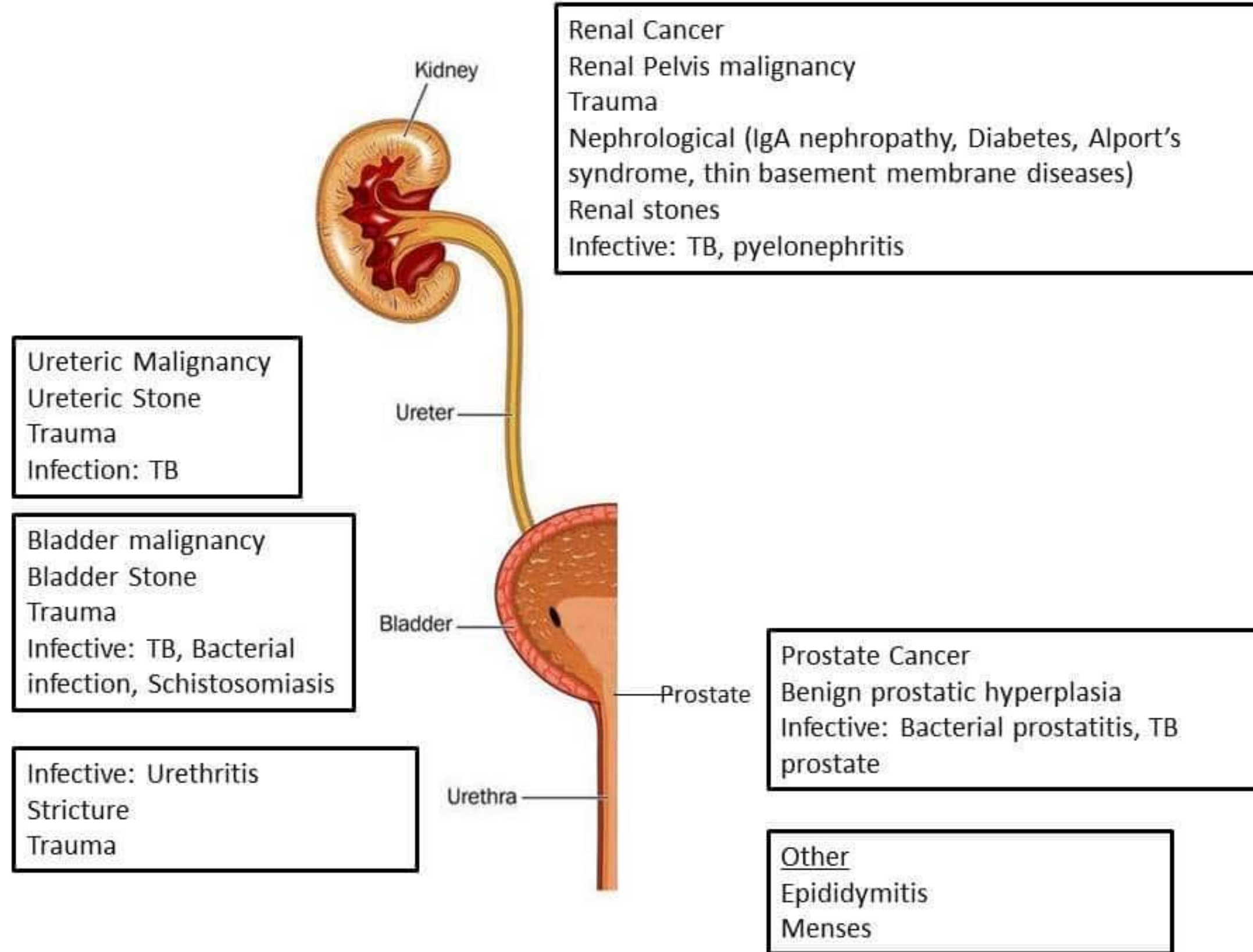
- Hematuria can be visible to the naked eye (termed "gross hematuria") and may appear **red or brown** (sometimes referred to as **tea-colored**)
- Microscopic hematuria is present when there are **three or more red blood cells** per high power field.





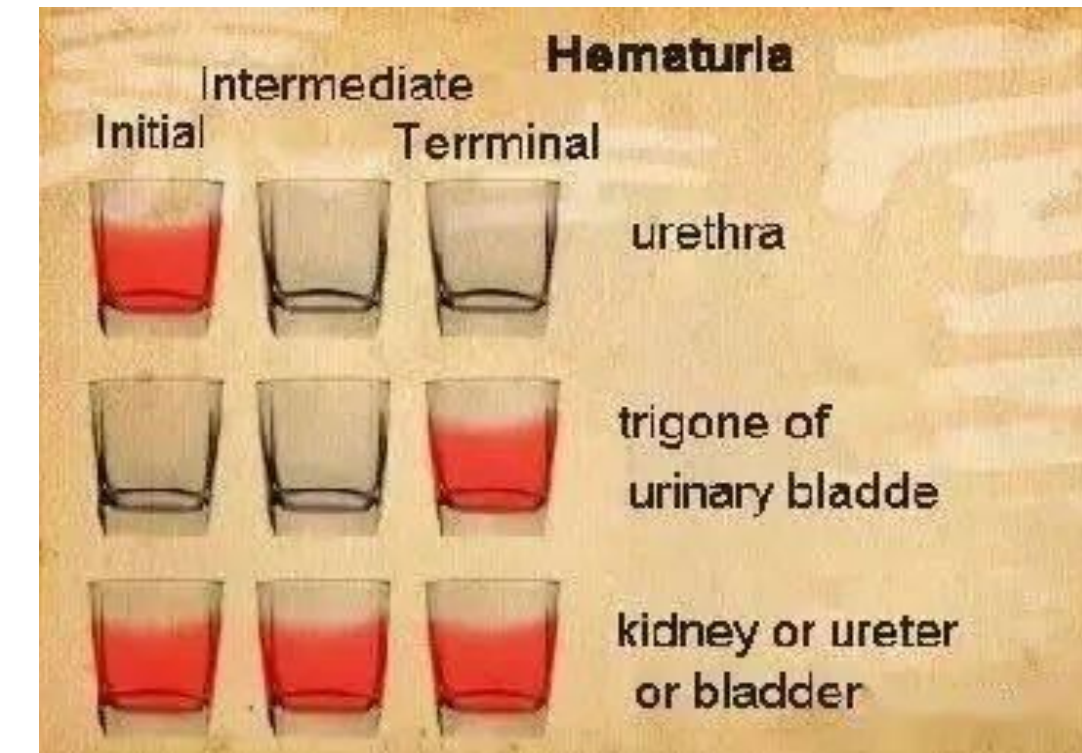
In terms of the anatomical origin,

- Blood or red blood cells can enter and mix with urine at multiple anatomical sites within the urinary system, including the kidney, ureter, urinary bladder, and urethra, and in men, the prostate.
- Anatomic locations can be divided into **glomerular and non-glomerular causes**, referring to the involvement of the glomerulus of the kidney.
- Non-glomerular causes can be further subdivided into the **upper urinary tract and lower urinary tract causes.**



In terms of the timing during urination,

- Hematuria can be **initial, terminal or total**, meaning blood can appear in the urine at the onset, midstream, or later.
- If it appears soon after the **onset** of urination, a **distal site** is suggested.
- A longer **delay** suggests a more **proximal** lesion.
- Hematuria that occurs **throughout** urination suggests that bleeding is occurring **above the level of the bladder**.





Glomerular haematuria



Glomerular causes include:

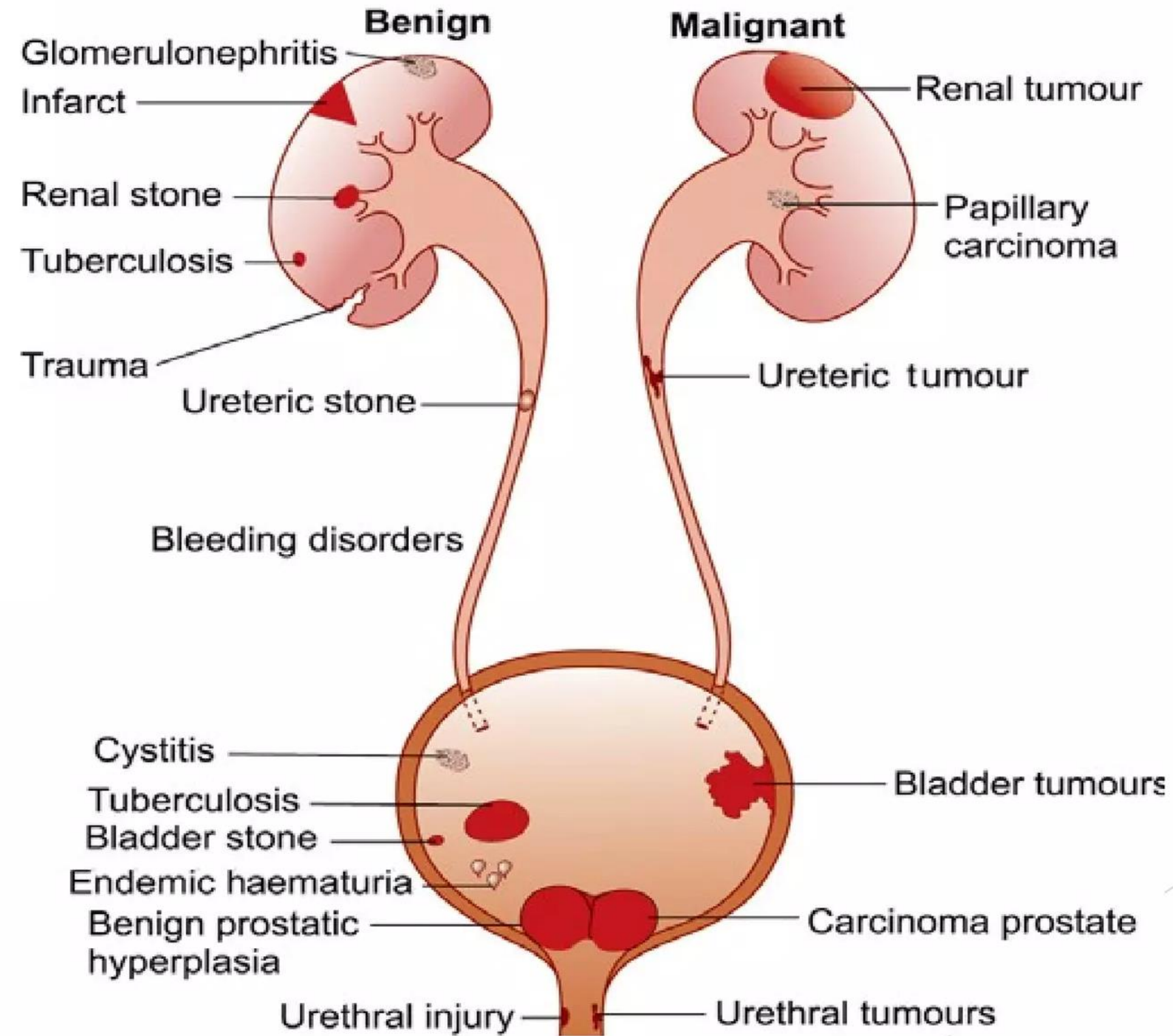
- IgA nephropathy
- Thin glomerular basement membrane disease
- Hereditary nephritis (Alport's disease)
- Hemolytic uremic syndrome
- Postinfectious glomerulonephritis
- Nephritic syndrome
- Nephrotic syndrome
- Polycystic kidney disease
- Idiopathic hematuria



Visible blood clots in the urine indicate a non-glomerular cause. Non-glomerular causes include:

- Urinary tract infections, such as pyelonephritis, cystitis, prostatitis, and urethritis
- Kidney stones
- Cancers, such as renal cell carcinoma and bladder cancer and in men, prostate cancer
- Urinary tract strictures
- Benign prostatic hyperplasia
- Renal papillary necrosis
- Trauma or damage to the lining of the urinary tract
- Intense exercise
- Increased tendency to bleed due to acquired or genetic conditions (e.g. sickle cell disease or vitamin K deficiency bleeding) or certain medications (e.g. blood thinners)

CAUSES





HEMATURIA in the Cardiac Surgical Patient - Causes



- Pathology within the urinary tract
- Anticoagulant-related nephropathy
- Drug-induced acute interstitial nephropathy
- Excretion of heme pigment–containing proteins, such as myoglobin and hemoglobin
- Hemolysis occurring during extracorporeal circulation.
- Within the kidneys, heme-containing compounds result in pigment nephropathy, which is a significant contributory factor to cardiac surgery–associated acute kidney injury.



CAUSES OF POSTOPERATIVE HAEMATURIA



- Traumatic catheterization / traction on catheter
- Instrumentation of the bladder or ureters (e.g. cystoscopy, ureteric stents, biopsy)
- Urinary tract infection
- Missed bladder or ureteric injury
- Urinary tract injury that was repaired intraoperatively will likely have hematuria develop as any clot / bleeding resolves, but also consider multiple sites of injury are possible



MANAGEMENT OF POST OPERATIVE HEMATURIA



- Leave catheter in situ until a minimum of 24hrs after haematuria resolves or as instructed by consultant responsible for the patient's care
- Consider urinary tract injury if haematuria persists and postoperative recovery not progressing as expected
- Hydrate the patient
- Clearly document urine volumes passed on fluid balance chart
- Keep catheter on free drainage (ensure no blockage or flip-flo valves)
- Exclude UTI (Dipstick tests are not useful in catheterized patients. If UTI is suspected, send urine samples for laboratory culture and commence empirical antibiotics as per local policy whilst results are awaited.)
- Discuss with consultant in charge of the patient's care



TREATMENT



Hematuria has no specific treatment. One should focus on the underlying condition !!!

Underlying cause	Treatment
Urinary tract infection	Antibiotics
Kidney disease	Relieve inflammation and limit further damage
Inherited disorders	Vary greatly depend on the disorders
Stone disease	Stone removal
BPH	Relieve obstruction & imitation
Malignancy	Depend on tumor stage



THANK YOU