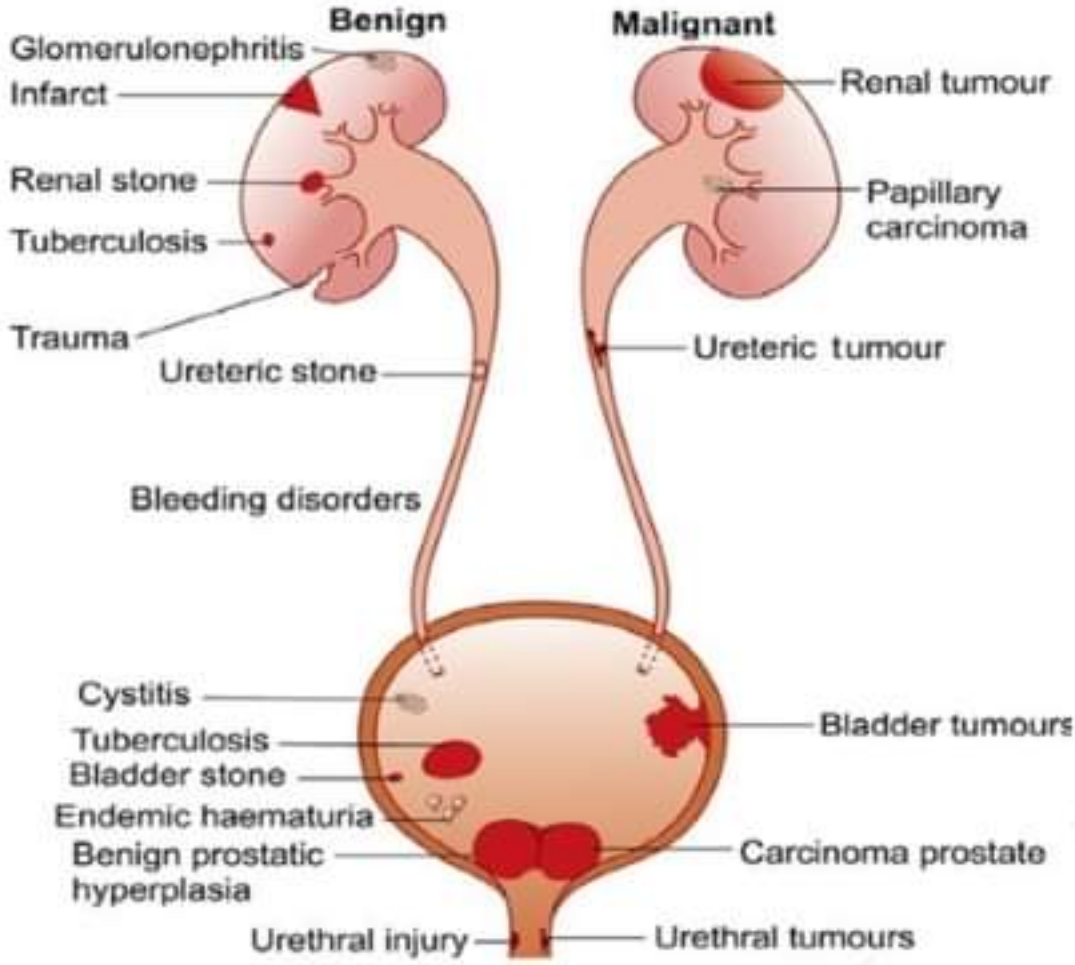

fb/nurse-info
Hematuria
Love to study

Definition:

- Hematuria is defined as the presence of 5 or more red blood cells (RBCs) per high-power field in 3 of 3 consecutive centrifuged specimens obtained at least 1 week apart.

CAUSES:



DIFFERENTIAL DIAGNOSIS

- Polluted urine: menstruation
- Drug and food: Rifampicin, Nitrofurantoin, sulfonamides, adriamycin.
- Porphyria: porphyrin in urine (+)
- Hemoglobinuria (hemolysis)
- Myoglobinuria

Signs and symptoms

The first step in the evaluation of hematuria consists of a detailed and a thorough physical examination.

Efforts should be made to distinguish glomerular causes from extraglomerular one:

- *Passage of clots in urine suggests an extraglomerular cause*
- *Fever, abdominal pain, dysuria, frequency, and recent enuresis in older children may point to a urinary tract infection as the cause*
- *Recent trauma to the abdomen may be indicative of hydronephrosis*
- *Early-morning periorbital puffiness, weight gain, oliguria, dark-colored urine, and edema or hypertension suggest a glomerular cause, Hematuria due to glomerular causes is painless*
- *Recent throat or skin infection may suggest postinfectious glomerulonephritis*

- *Joint pains, skin rashes, and prolonged fever in adolescents suggest a collagen vascular disorder(Rheumatoid arthritis, Systemic lupus erythematosus)*

- *Skin rashes and arthritis can occur in Henoch-Schönlein purpura and systemic lupus erythematosus*

- *Information regarding exercise, menstruation, recent bladder catheterization, intake of certain drugs or toxic substances, or passage of a calculus may also assist in the differential diagnosis.*

- *A family history that is suggestive of Alport syndrome, collagen vascular diseases, urolithiasis, or polycystic kidney disease is important*

Physical examination

- Measurement of the blood pressure and volume status is especially important when glomerulonephritis is a consideration.
- Evaluation for the presence of periorbital puffiness or peripheral edema
- Detailed skin examination to look for purpura.
- Abdominal examination to look for palpable mass reveals a renal tumor or hydronephrosis may exist,
- A palpable bladder after voiding indicates obstruction or retention

- A bruit over the kidney suggests a vascular cause.

- Always check for extrarenal manifestations and co morbid conditions.

- Check for other sites of bleeding. PR examination should not be missed. to diagnose prostatitis, prostate cancer, epididymitis, meatal stenosis, and other structural causes of hematuria .
- Inspect external genitalia in male for trauma.

- Atrial fibrillation raises the possibility of renal embolic infarction, especially if the patient has flank pain

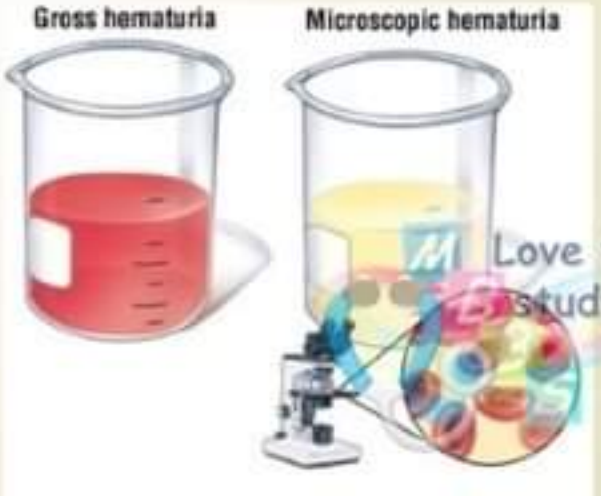
- Costovertebral angle tenderness is also suggestive of pyelonephritis, nephrolithiasis, or ureteropelvic junction obstruction.

- Detailed ophthalmologic evaluation (in familial hematuria).

Diagnosis

- *The laboratory tests ordered for the evaluation of [illegible] based on the clinical history and the physical examination. Tests that may be helpful include the following:*
- *Urinalysis with careful microscopic review of the urine sample*
- **Urine dip strip analysis it is the most** *commonly used method of testing the urine for blood is the urine test strip or dipstick, which utilizes the peroxidase-like activity of hemoglobin to generate a color change.*
- *False-positive tests may occur in the setting of myoglobinuria or hemoglobinuria, confirmed by the absence of RBCs on microscopic examination.*

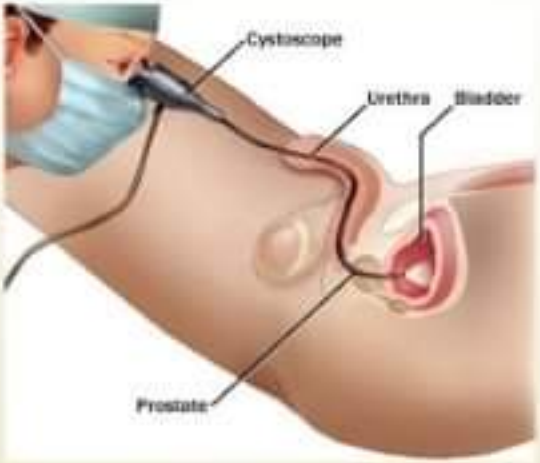
- *Phase-contrast microscopy to help determine the source of the bleeding*
- *Hematologic and coagulation studies (eg, complete blood count [CBC] and, sometimes, platelet counts)*
- *Blood urea nitrogen (BUN) for paraneoplastic syndrome and serum creatinine levels for kidney failure.*
- *Serologic testing (eg, complement, antistreptolysin [ASO], anti-DNase B, antinuclear antibody [ANA], and double-stranded DNA [dsDNA])*
- *Urine culture for suspected urinary tract infection (UTI)*



Imaging studies

The following may be helpful:

- Renal and bladder ultrasonography
- Voiding cystourethrography
- CT urography: now replaces IVU.
- MRI.
- Retrograde pyelography.
- Renal biopsy: in nephrological cases
- Cystoscopy

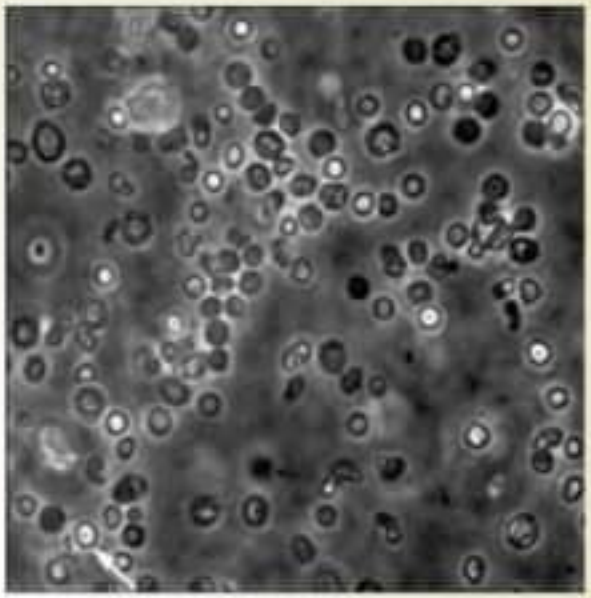


Kidney biopsy *is rarely indicated:*

- *Significant proteinuria*
- *Abnormal renal function*
- *Recurrent persistent hematuria*
- *Serologic abnormalities (abnormal complement, ANA, or dsDNA levels)*
- *Recurrent gross hematuria*
- *A family history of end-stagerenal disease*

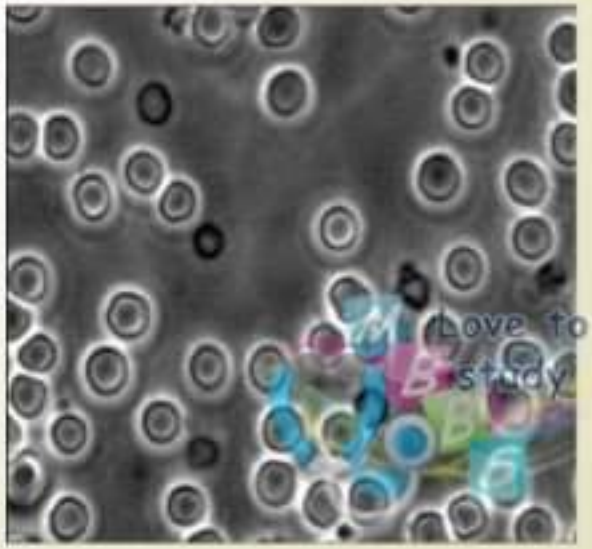
- *Glomerular hematuria:*

Brown-colored urine, RBC casts, and dysmorphic (small, deformed, misshapen, sometimes fragmented) RBCs and proteinuria



- **Nonglomerular hematuria:**

Reddish or pink urine, passage of blood clots, and eumorphic (normal-sized, biconcavely shaped) Erythrocytes.



Management:

- *Hematuria is a* **sign** *and* **not itself a disease**; *thus, therapy should be directed at the process causing t*
- *Asymptomatic (isolated) hematuria generally does not require treatment.*
- *In conditions associated with abnormal clinical, laboratory, or imaging studies, treatment may be necessary, as appropriate, with the primary diagnosis*

- *Surgical intervention may be necessary with certain anatomic abnormalities (eg, ureteropelvic junction obstruction, tumor, or significant urolithiasis)*

- *Dietary modification is usually not indicated, except for children who may tend to develop hypertension or edema as a result of the primary disease process (eg, nephritis)*

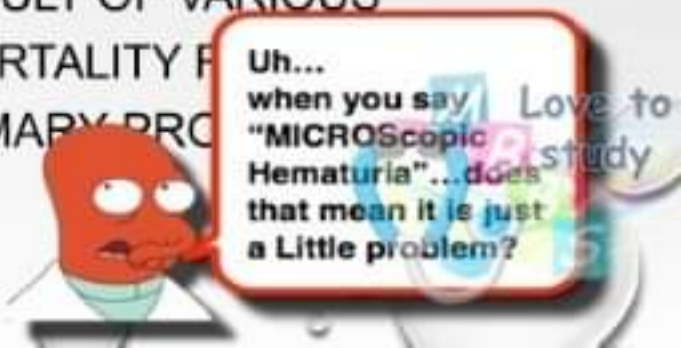
- *Patients with persistent microscopic hematuria should be monitored every 6-12 months for the appearance of signs or symptoms indicative of progressive renal disease*

MORTALITY/MORBIDITY

- IN GENERAL, CHILDREN WITH ISOLATED ASYMPTOMATIC MICROSCOPIC HEMATURIA TEND TO DO WELL,

- WHEREAS THOSE WITH ASSOCIATED FINDINGS (EG, HYPERTENSION, PROTEINURIA, ABNORMAL SERUM CREATININE LEVELS) ARE MORE LIKELY TO HAVE SERIOUS PROBLEMS.

- BECAUSE HEMATURIA IS THE END RESULT OF VARIOUS PROCESSES, THE MORBIDITY AND MORTALITY F
  THE CONDITION DEPEND ON THE PRIMARY PRO
  INITIATED IT.



RACE:

- THE INCIDENCE OF HEMATURIA IN SPECIFIC RACIAL GROUPS IS DETERMINED BY THE PRIMARY CAUSE.

- FOR EXAMPLE, IDIOPATHIC HYPERCALCIURIA IS INFREQUENT IN BLACK AND ASIAN CHILDREN,

- BUT RELATIVELY COMMON IN WHITES. CONVERSELY, HEMATURIA CAUSED BY SICKLE CELL DISEASE IS MORE COMMON IN BLACKS THAN IN WHITES.

SEX:

- SEX MAY PREDISPOSE A CHILD TO SPECIFIC DISEASES THAT MANIFEST AS HEMATURIA.
- FOR EXAMPLE, THE SEX-LINKED FORM OF ALPORT SYNDROME HAS A MALE PREPONDERANCE,
- WHEREAS LUPUS NEPHRITIS IS MORE COMMON IN ADOLESCENT GIRLS

AGE:

- PREVALENCE OF CERTAIN CONDITIONS VARIES WITH AGE.
- FOR INSTANCE, WILMS TUMORS ARE MORE FREQUENT IN CHILDREN OF PRESCHOOL AGE,
- WHEREAS ACUTE POSTINFECTIOUS GLOMERULONEPHRITIS IS MORE FREQUENT IN THE SCHOOL-AGED POPULATION.
- IN ADULTS, HEMATURIA IS OFTEN A SIGN OF MALIGNANCY OF THE GENITOURINARY TRACT (EG, RENAL CELL CARCINOMA, BLADDER TUMORS, PROSTATIC TUMORS). THESE CONDITIONS ARE RARE IN CHILDREN.

Types:

According to the amount of RBC in the urine, hematuria can be classified as:

- **Gross (ie,overtly bloody, smoky, or tea-colored urine)**
- **Microscopic > 5 RBC"s /HPF**

According to Timing (when it occurs during urination):

- *Early* (initial) haematuria: Urethral origin, distal to external Sphincter
- *Terminal* haematuria: Bladder neck or prostate origin
- *Diffuse* (total) haematuria: Source is in the bladder or upper urinary tract

PATHOPHYSIO:

- Glomerular
- Non glomerular

- *False hematuria*: Discolouration of urine from pigments such as food colouring and myoglobin.

- *Silent hematuria* is due to tumours of kidney or bladder unless proved otherwise.

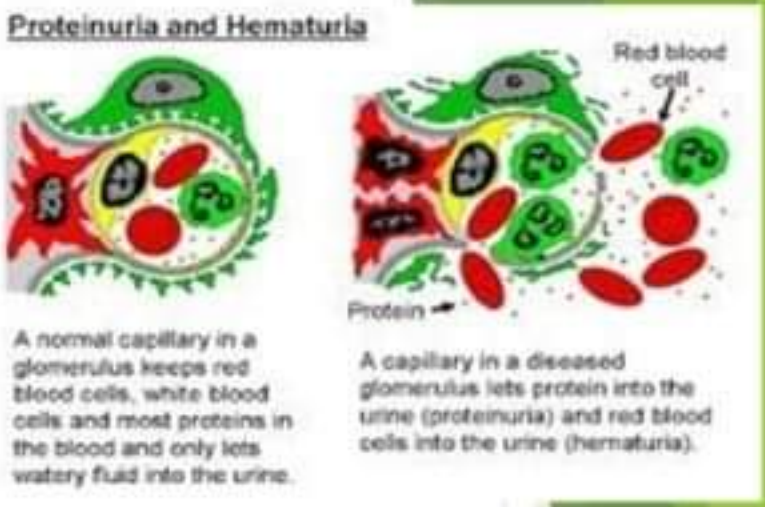
ETIOLOGY

- **Diseases of the urinary system - the most common cause**

- Glomerular
- Interstitial
- Uroepithelium
- Vascular

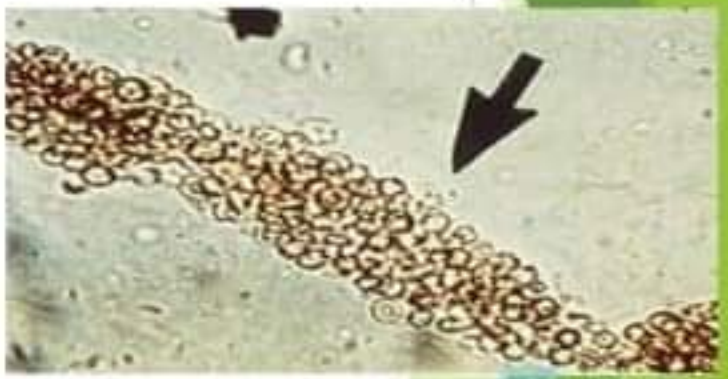
Glomerular

- IgA nephropathy
- glomerulonephritis



Interstitial

- Allergic interstitial nephritis
- Analgesic nephropathy
- Renal cystic diseases
- Acute pyelonephritis Tuberculosis
- Renal allograft rejection

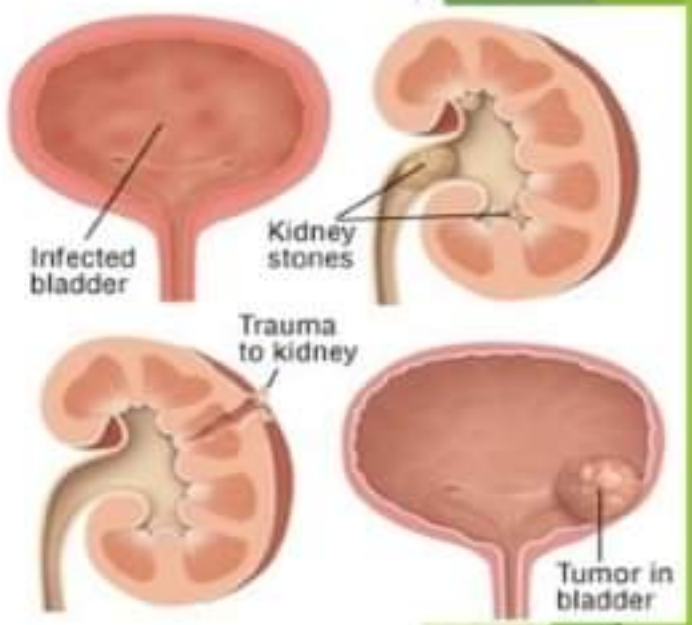


Uroepithelium

- Malignancy
- Trauma
- Papillary Necrosis
- Cystitis/Urethritis/Prostatitis
- Parasitic Diseases (Schistosomiasis)
- Stones

Vascular

- Arterial emboli or thrombosis
- Arteriovenous fistulae
- Renal vein thrombosis



υ System disorders (less common):

Hematological disorders--aplastic anemia leukemia hemophilia\,ITP (idiopathic thrombocytopenic purpura)

Infection--infective endocarditis,Septicemia,epidemic hemorrhagic fever, scarlet fever,Filariasis

Connective tissue diseases--SLE ,polyarteritis nodosa

Cardiovascular diseases--hypertensive nephropathy, chronic heart failure - renal artery sclerosise.

Endocrine and metabolism diseases-- gout - diabetes mellitus

Diseases of adjacent organs to urinary tract

Appendicitis

carcinoma of the rectum

carcinoma of the colon

uterocervical cancer

Drug and chemical agents anticoagulation

Cyclophosphamide, rifampin, sulfonamide, phenytoin,

Miscellaneous

exercise induced hematuria