

Definition of hematuria

* We need to treat the underlying cause of hematuria, not hematuria itself.

* Hematuria isn't a disease, it a symptom or a manifestation of a disease.

- Simply: presence of blood in the urine!

* It is more accurate to say discoloration of urine or red urine because it could be dye, stain, Food, medication, hemolysis, rhabdomyolysis.

- Hematuria versus red urine ?
- Common causes for red urine:
 - Hematuria
 - Myoglobinuria
 - Hemoglobinuria
 - Anthocyanin in beets and blackberries
 - Medications Rifampicin, Phenolphthalein, ...etc

Classification of hematuria: Gross vs. microscopic

↳ seen by your eyes

- Gross Hematuria:
 - Or macroscopic (seen by naked eye!)
 - Initial, totally, or terminal
 - Painful versus painless
- Microscopic hematuria
 - * It can occur in normal people like after sexual intercourse, after exercise or trauma
 - The recommended definition of microscopic hematuria is three or more red blood cells per high-power microscopic field in urinary sediment from two of three properly collected urinalysis specimens.

* We classify the patients based on risk factors like age, smoking, gender, exposure to occupational hazard like aromatic amines and we fear from bladder cancer and other malignancies like RCC.

* Patient with high risk factor for urothelial and bladder cancer should undergo urine cytology, CTU, cystoscopy

↳ to see if there is abnormal cells and it detect high grade lesions.

↳ to see if there is kidney cancer, urothelial or bladder cancer because we give a contrast and if there is an abnormal tissue like filling defect, we will see it.

↳ to detect urothelial lesion.
↳ the gold standard to diagnose.

Microscopic hematuria: The dipstick test

- Urine dipstick detects heme in urine: RBCs, hemoglobin & myoglobin in urine.
- False positive:
 - Myoglobinuria or hemoglobinuria
 - Povidine
 - Bacterial peroxidase
- False negative:
 - Reducing agents such as ascorbic acid

Classification of hematuria: Medical versus surgical!

- Medical: IgA nephropathy, post-infection GN, membranous GN, H.S purpura, coagulopathy, hemophilia, papillary necrosis, vascular disease, emboli to the kidney ...etc

The presence of significant proteinuria, red cell casts or renal insufficiency, or a predominance of dysmorphic red blood cells in the urine should prompt an evaluation for renal parenchymal disease or referral to a nephrologist

- Surgical causes:

- Malignancies: bladder, renal, ureter, renal pelvis.
- Stone disease
- Infection
- Inflammatory: interstitial cystitis, drug-induced (cyclophosphamide)
- Trauma
- BPH, prostate cancer

** In gross hematuria, we should ask if the blood come in the beginning, Last or in all urine.*

mostly it's benign like stone disease
** We also should ask if it is painful or painless (we fear from it more because it could be bladder cancer)*

Prevalence

- In five population-based studies: the prevalence of asymptomatic microscopic hematuria varied from 0.19 percent to 16.1 percent.
- In older men, who are at a higher risk for significant urologic disease, the prevalence of asymptomatic microscopic hematuria was as high as 21 percent.

Hematuria is not always abnormal

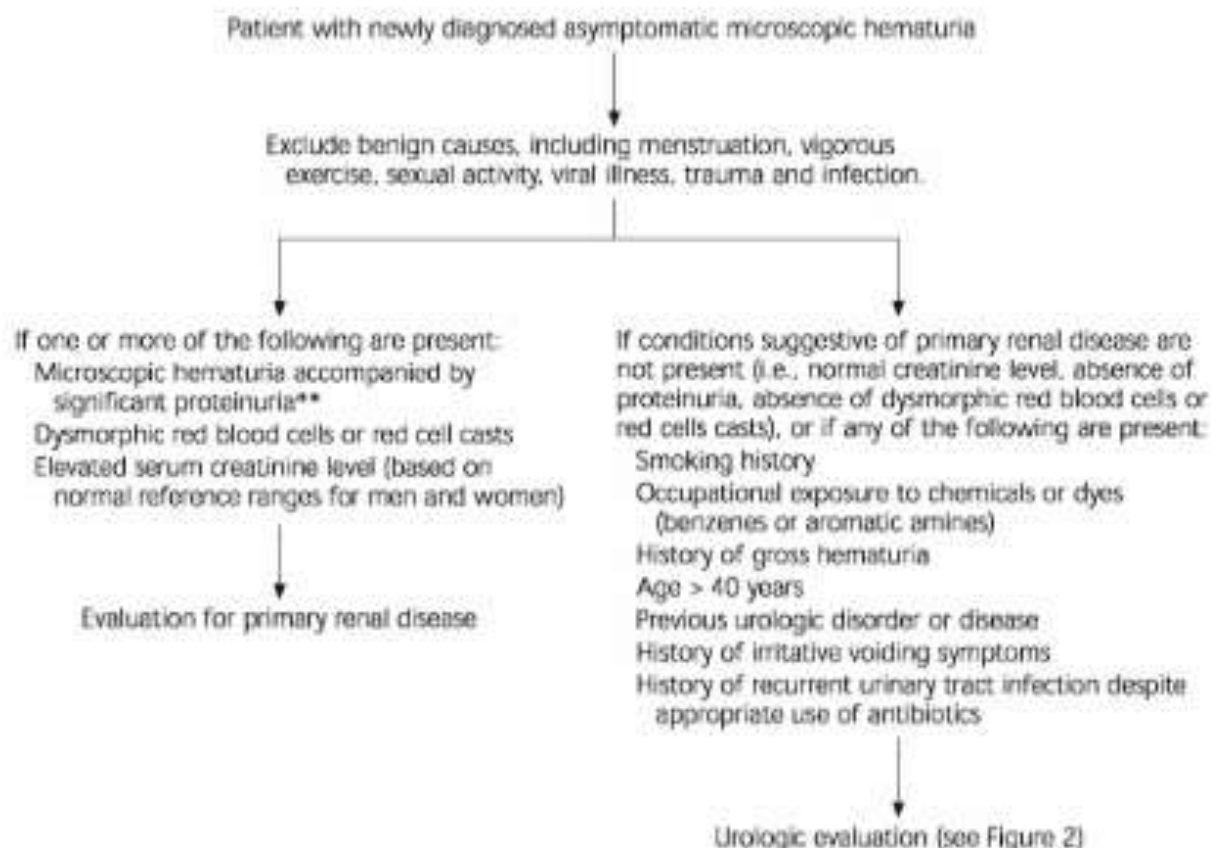
- A few RBC can be found in normal people.
- 40% of soliders has microscopic hematuria on at least one occasion and 15% on 2 or more occasions.
- Transient hematuria:
 - Rigorous exercise
 - Sexual intercourse
 - Menstrual contamination

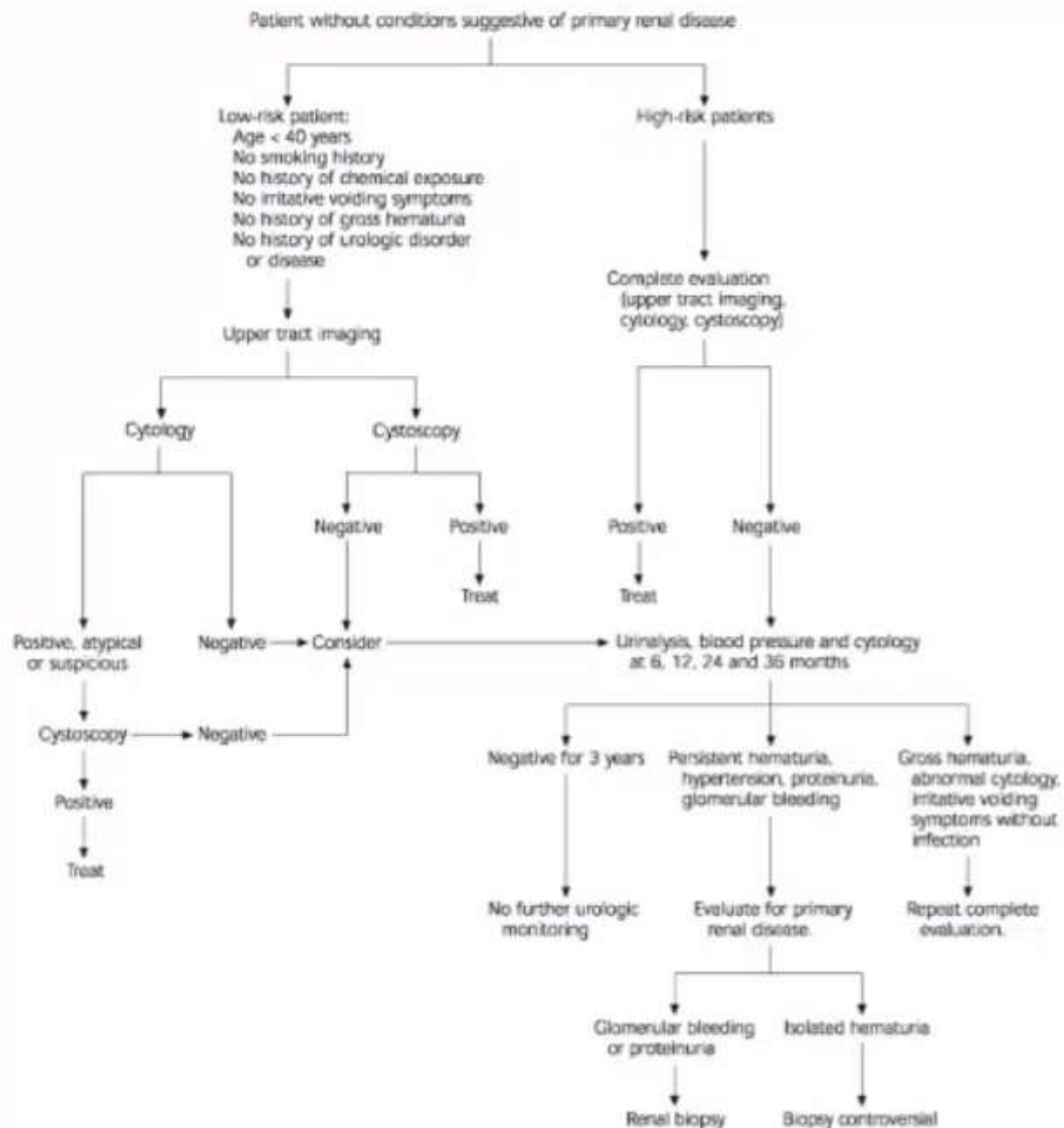
Approach to hematuria

- History
 - Age
 - Sex
 - Smoking
 - Characteristics of hematuria
 - History of clots
 - Occupational exposure to carcinogen
 - Irritative symptoms, obstructive symptoms
 - Medications: cyclophosphamide
 - History of instrumentation, exercise, catheterization, recent menstruation, recent throat infection

Risk Factors for Significant Disease in Patients with Microscopic Hematuria

- Smoking history
- Occupational exposure to chemicals or dyes (benzenes or aromatic amines)
- History of gross hematuria
- Age >40 years
- History of urologic disorder or disease
- History of irritative voiding symptoms
- History of urinary tract infection
- Analgesic abuse
- History of pelvic irradiation





Urothelial cancers, the target of a cytologic examination, are the most commonly detected malignancies in patients with microscopic hematuria

Intravenous urography, ultrasonography and computed tomography are used to evaluate the urinary tract in patients with microscopic hematuria. Because of lack of impact data, evidence-based imaging guidelines cannot be formulated

Cystoscopic evaluation of the bladder (complete visualization of the bladder mucosa, urethra and ureteral orifices) is necessary to exclude the presence of bladder cancer