Macroscopic Urinalysis

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4.1 Color

Depending on concentration, urine is light yellow to dark yellow in color. A noticeable deviation in color from the norm can indicate pathology or be harmless in nature.

4.1.1 Some Examples

- Colorless to light yellow
  Cause: polyuria, glycosuria in diabetes mellitus
- Dark yellow to orange
  Cause: oliguria, anuria, vitamin preparations
- Dark yellow to brownish-yellow
  Cause: hemoglobin and hemoglobin degradation products (bilirubin, porphyrins), drugs
- Milky/cloudy
  Cause: leukocyturia, salts, crystals
- Red to reddish-brown
  Cause: erythrocytes, myoglobin, urates, drugs, beetroot
- Dark brown to black
  Cause: erythrocytes, massive hemolysis

4.2 Odor

Certain foods, drugs, and bacteria alter the typical odor of urine.

4.2.1 Some Examples

- Extremely intensive odor
  Cause: garlic, asparagus
- Smells like chocolate, highly aromatic
  Cause: vitamin preparations, tropical fruits, spices
- Smells of ammonia
  Cause: urea-splitting bacteria
- Smells foul, putrid
  Cause: urinary tract infection
- Smells of fruit, acetone
  Cause: ketonuria

4.3 Cloudiness

Fresh urine at body temperature is normally clear. The colder and more concentrated a urine sample becomes, the more salts and crystals precipitate and cause turbidity or cloudiness. Urine also becomes visibly cloudy in the case of a pathological accumulation of bacteria or pyuria.

Only by analyzing solid components in urine (as in urinary sediment analysis) is it possible to conclusively identify the cause of cloudiness.

4.3.1 Some Examples

- Milky white
  Cause: bacteriuria, pyuria, phosphaturia, vaginal secretion
- Reddish (brick dust) upon cooling
  Cause: uraturia
- Red to reddish-brown
  Cause: macrohematuria
- Fat layer on the surface
  Cause: lipiduria in nephrotic syndrome, ointments, suppositories

J. Neuendorf, *Urine Sediment*, https://doi.org/10.1007/978-3-030-15911-5_4