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RENAL PHYSIOLOGY

Write short notes on Urinalysis

A urinalysis is a simple test that looks at a small sample of your urine. It can help find problems that need treatment, including infections or kidney problems. It can also help find serious diseases in the early stages, like kidney disease, diabetes, or liver disease. A urinalysis is also called a "urine test."

A urine test can include three parts:

1. Macroscopic/ Visual exam.

Macroscopic analysis of the urine is done by inspecting the physical appearance of the urine. Normal urine is light yellow and clear. Macroscopic urinalysis notes the amount, color, and clarity of the urine as well as any other visible characteristics of the urine such as the presence of blood or blood clots, precipitates, or sediments. The information from the macroscopic urinalysis may provide important clues to the health care practitioner performing the test. A normal urine sample may be reported as clear and yellow without any cloudiness. Obvious abnormalities in color, clarity, and cloudiness may suggest conditions such as:

dehydration,

infection,

liver disease, or

muscle breakdown (rhabdomyolysis)

Certain medications may change the color of urine.

Visible blood in the urine (gross hematuria) may suggest a kidney stone or more serious causes such as cancer of the urinary tract.

Foamy urine may indicate the presence of protein in the urine (proteinuria) due to certain kidney conditions that spill protein out of the kidney from circulating blood (nephrotic syndrome).

2. Microscopic exam. A small amount of urine will be looked at under a microscope to check for things that do not belong in normal urine that cannot be seen with the naked eye, including red blood cells, white blood cells (or pus cells), bacteria (germs), or crystals (which are formed

from chemicals in the urine and may eventually get bigger and become kidney stones).

3. Dipstick test. A dipstick is a thin, plastic stick with strips of chemicals on it. It is dipped into the urine. The strips change color if a substance is present at a level that is above normal. . Some of the things a dipstick examination can check for include:

- Acidity (pH)- is a measure of the amount of acid in the urine. A pH that is above normal may be a sign of kidney stones, urinary infections, kidney problems, or other disorders.
- Protein- is an important building block in the body. Everyone has protein in their blood. But it should only be in your blood, not your urine. Your kidneys play a role in this process. Healthy kidneys remove waste products and extra water from your blood, but leave behind the things your body needs, like protein. When kidneys are injured, protein leaks into your urine. Having protein in your urine suggests that your kidney's filtering units are damaged by kidney disease.
- Glucose (sugar)- is usually a sign of diabetes.
- White blood cells (pus cells)- are signs of infection.
- Bilirubin- is a waste product from the breakdown of old red blood cells. It is normally removed from the blood by the liver. Its presence in the urine may be a sign of liver disease.
- Blood- can It can be a sign of an infection, a kidney problem, certain medicines, or even heavy exercise. Finding blood in the urine requires further testing. It does not mean you have a serious medical problem.

A urinalysis can help to detect many diseases before you feel symptoms. Finding and treating a problem early can help keep serious diseases from getting worse.

How Do You Take a Urine Test?

The urinalysis test involves the collection of a urine sample in a specimen cup. The proper collection of a sample is very important to avoid contamination of urine. The collection technique is different for men and women. Alcohol wipes should be avoided as these may irritate the area.

For men, the opening of the urethra (tip of the penis) should be wiped clean with a cleansing wipe before the collection is begun.

In women, the area around the urethra also needs to be wiped clean with a cleansing wipe. The woman then spreads the labia of the external genitalia and wipes from front to back.

After the urethra is properly cleaned, the collection may begin by discarding the initial stream of urine into the toilet.

Then, 10-15 milliliters (ml) of urine may be collected in the provided sterile specimen cup by directly urinating into the cup.

Once an adequate amount is collected, then the remaining urine should be voided in the toilet.

This technique is called the mid-stream clean catch urine sample collection.

Other collection methods may be necessary depending on the specific situation. Frequently, hospitalized patients may have a urinary catheter (Foley catheter) placed in the bladder that directly drains urine from the bladder into a bag. The nursing staff simply collects the urine from the collection bag into the sterile cup. Samples can be collected from babies and toddlers who are not yet toilet trained by attaching a small collection bag with a bandage-type adhesive to the external genital region.