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Question

Write a short note on Urinalysis

Urinalysis

Urinalysis is the process of analyzing urine for target parameters of health and disease. A urinalysis (UA), also known as routine and microscopy (R&M), is an array of tests performed on urine, and one of the most common methods of medical diagnosis. Urinalysis means the analysis of urine, and it is used to diagnose several diseases. A urinalysis is a test of your urine. A urinalysis is used to detect and manage a wide range of disorders, such as urinary tract infections, kidney disease and diabetes. A urinalysis involves checking the appearance, concentration and content of urine. Abnormal urinalysis results may point to a disease or illness. For example, a urinary tract infection can make urine look cloudy instead of clear. Increased levels of protein in urine can be a sign of kidney disease. Unusual urinalysis results often require more testing to uncover the source of the problem. The target parameters that are measured or quantified in urinalysis include many substances and cells, as well as other properties, such as specific gravity. A part of a urinalysis can be performed by using urine test strips, in which the test results can be read as the strip's color changes. Another method is light microscopy of urine samples. When doctors order a urinalysis, they will request either a routine urinalysis or a routine and microscopy (R&M) urinalysis; the difference being that a routine urinalysis does not include microscopy or culture. R&M is used specifically for culturing bacteria found in urine, which can make it an important tool for diagnosing specific urinary tract infections.

Test Strip Urinalysis

Test strip urinalysis exposes urine to strips that react if the urine contains certain cells or molecules. Test strip urinalysis is the most common technique used in routine urinalysis. A urine test strip can identify:

- Leukocytes—their presence in urine is known as leukocyturia.
- Nitrites—their presence in urine is known as nitrituria.
- Proteins —their presence in urine is known as proteinuria, albuminuria, or microalbuminuria.

- Blood—its presence in urine is known as hematuria.
- pH_ the acidity of urine is easily quantified by test strips, which can identify cases of metabolic acidosis or alkalosis.

Urine Microscopy

The numbers and types of cells and/or material, such as urinary casts, can yield a great detail of information and may suggest a specific diagnosis. A urinary cast is any tiny structure found in urine that consists of multiple molecules or cells bound together.

Casts form within the nephron when abnormal cells and molecules are filtered from blood, and are excreted as the bound structures in urine. Microscopy can identify casts in urine and use them to diagnose kidney diseases, by characterizing symptoms such as:

- Red blood cell casts are associated with glomerulonephritis, vasculitis, or malignant hypertension.
- White blood cell casts are associated with acute interstitial nephritis, exudative glomerulonephritis, or severe pyelonephritis.
- Epithelial cell casts are associated with toxin-induced, acute tubular necrosis, hepatitis, and cytomegalovirus.
- (Heme) granular casts are associated with acute tubular necrosis, and are often composed of proteins, especially antibodies.
- Hyaline casts are associated with dehydration; it is the most common type of cast.
- Bacterial casts are associated with urinary tract infection; the cast may be cultured in order to identify the causative organism of the cast.

Uses of urinalysis:

- **To check your overall health.** Your doctor may recommend a urinalysis as part of a routine medical exam, pregnancy checkup, pre-surgery preparation, or on hospital admission to screen for a variety of disorders, such as diabetes, kidney disease and liver disease.

- **To diagnose a medical condition.** Your doctor may suggest a urinalysis if you're experiencing abdominal pain, back pain, frequent or painful urination, blood in your urine, or other urinary problems. A urinalysis may help diagnose the cause of these symptoms.
- **To monitor a medical condition.** If you've been diagnosed with a medical condition, such as kidney disease or a urinary tract disease, your doctor may recommend a urinalysis on a regular basis to monitor your condition and treatment.
- At times for pregnancy test.

What does urinalysis involve?

Urinalysis is done by collecting a urine sample from a patient. The optimal sample tends to be an early morning urine sample because it is frequently the most concentrated urine produced in the day. Typically, no fasting is required before the collection of urine sample and routine medications can be taken before the test, unless otherwise instructed by the ordering physician.

Methods of collection are slightly different for female and male patient.

- For females, the patient is asked to clean the area around the urethra with a special cleansing wipe, by spreading the labia of the external genitals and cleaning from front to back (toward the anus). The cleaning hand is then used to maintain the spread while the cup is held by the other hand to collect the sample.
- For men, the tip of the penis may be wiped with a cleansing pad prior to collection.
- The urine is then collected in a clean urine specimen cup while the patient is urinating. It is best to avoid collecting the initial stream of urine. After the initial part of urine is disposed of in the toilet, then the urine is collected in the urine container provided. Once about 30 mL to 60 mL (roughly 3 to 5 tablespoons) are collected in the container for testing, the remainder of the urine may be voided in the toilet again. This is called the midstream clean catch urine collection.
- The collected urine sample should be taken to the laboratory for analysis, typically within one hour of collection. If transportation to the lab could take more than one hour, then the sample may be refrigerated.

- In some patients who are unable to void spontaneously or those who are not able to follow instructions other methods may be used, such as placing a catheter (a small rubber tube) through the outside opening to the bladder (urethra) to collect the sample directly from the bladder.