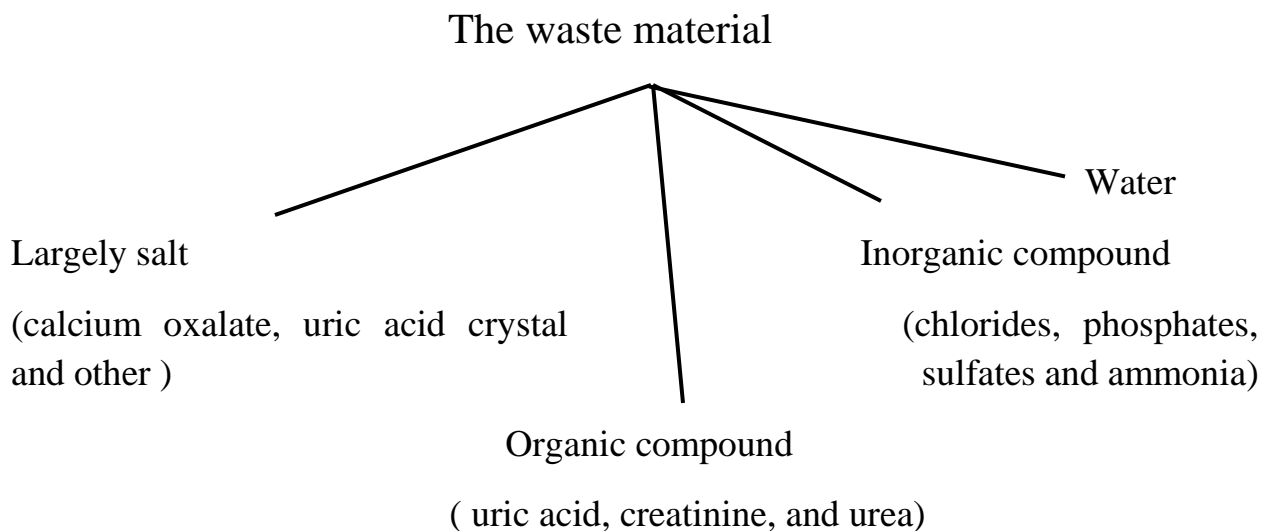


General Urine Examination

The waste materials of blood were remove by the kidney, passed to the bladder for temporary and excreted as urine. Urine is a liquid byproduct of the body through a process called urination and excreted through the urethra The normal chemical composition of urine is mainly water content, but it also includes nitrogenous molecules, such as urea, as well as creatinine and other metabolic waste components. Other substances may be excreted in urine due to injury or infection of the glomeruli of the kidneys.

Urinalysis

A urinalysis is a common test that can assess many different aspects of your health with a urine sample.



Purpose

1. General evaluation of health.
2. Diagnosis of disease or disorders of the kidneys or urinary tract.
3. Diagnosis of other systemic disease that affect kidney function
4. Monitoring of patients with diabetes.
5. Screening for drug abuse (e.g. Sulfonamide or aminoglycosides).

Types of urine specimens:

- Random urine specimen
- First morning urine specimen
- 24-hour urine specimen

General Urine Examination test including:

1. Physical examination.
2. Chemical examination.
3. Microscopic examination.

1 - The Physical examination of urine :

➤ **Color**

Normal urine color ranges from pale yellow to dark yellow - the result of a pigment called urochrome. This color difference is due to the concentration or dilution of the pigment.

The abnormal color of urine can be caused by dyes, foods, medications, and pathologic conditions that can change the color of urine.

➤ Transparency

Fresh voided: normal urine is typically clear and transparency.

Cloudy urine (turbidity): abnormal if may be caused by abnormal crystals, deposits, white cells, red cells, epithelial cells or fat globules and bacteria.

But is normal but if include mucus, sperm and prostatic fluid, cells from the skin, normal urine crystals, and contaminants such as body lotions and powders.

- Red urine: presence large quantities of blood named hematuria include urinary tract infections, an enlarged prostate, cancerous and noncancerous tumors, kidney cysts, long-distance running, and kidney or bladder stones.
- Medications that can turn urine orange include the anti-inflammatory drug sulfasalazine (Azulfidine); phenazopyridine (Pyridium); some laxatives; and certain chemotherapy drugs.
- A number of medications produce blue or green urine, including amitriptyline, indomethacin (Indocin, Tivorbex) and propofol (Diprivan).
- A number of drugs can darken urine, including the antimalarial drugs chloroquine and primaquine, the antibiotics metronidazole (Flagyl) and nitrofurantoin (Furadantin), laxatives containing cascara or senna, and methocarbamol — a muscle relaxant.
- Extreme exercise. Muscle injury from extreme exercise can result in pink or cola-colored urine and kidney damage.

➤ Volume

- The average adult: 800 ml to 2000ml/24h.

Oliguria and anuria

Oliguria is a term for urine volume < 400ml/24 hours.

Anuria is stands for volume < 100ml/24hours.

Causes: dehydration, kidney failure, obstruction of the urinary tract (may be stones, carcinoma), acute tubular necrosis, chronic renal failure.

Polyuria

The most common causes of polyuria are [diabetes mellitus](#) and [diabetes insipidus](#). In addition, polyuria can be caused by medications, caffeine, alcohol, kidney disease, and [electrolyte](#) imbalance, increase above 2,500 ml.

➤ **Smell of urine (odor)**

- Normal= aromatic due to the volatile fatty acids.
- Ammoniac – bacterial action.
- Fruity- ketonuria.

2 – The Chemical examination of urine :

To perform the chemical examination, most clinical laboratories use commercially prepared test strips. These are narrow plastic strips that hold small squares of paper called test pads, arranged in a row.

The most frequently performed chemical test using reagent test strips are:

- PH
- Protein
- Glucose
- Ketones
- Bilirubin
- Urobilinogen



Leukocytes 120s	Neg.		Trace 15	Small 70	Moderate 125	Large 500	cells/ μ l	
Nitrite 60s	Neg.		Positive Any degree of uniform pink color					
Urobilinogen 60s	3.2	Normal	16	32 +	64 ++	128 +++	μ mol/l	
Protein 60s	Neg.		Trace \pm	0.3 +	1.0 ++	3.0 +++	g/l	
pH 60s	5.0	6.0	6.5	7.0	7.5	8.0	8.5	
Blood 60s	Neg.	Non hemolyzed 10 Trace	Hemolyzed 10 Trace	25 Small	80 Moderate	200 Large	cells/ μ l	
Specific Gravity 45s	1,000	1,005	1,010	1,015	1,020	1,025	1,030	
Ketone 40s	Neg.		Trace 0.5	Small 1.5	Moderate 4.0	Large 8.0	16	mmol/l
Bilirubin 30s	Neg.			Small 17	Moderate 50	Large 100	μ mol/l	
Glucose 30s	Neg.		5 Trace	15 +	30 ++	60 +++	110 ++++	mmol/l

➤ **PH of urine**

The normal PH range is 4.6-8. The kidney plays an important role in maintaining the acid-base balance of the body. Any condition that produces acids or bases in the body such as acidosis or alkalosis, or the ingestion of acidic or basic foods, can directly affect urine PH.

A high-protein diet or consuming cranberries will make the urine more acidic. A vegetarian diet a low-carbohydrate diet, or the ingestion of citrus fruit will tend to make the urine more alkaline.

Some of the substances dissolved in urine will precipitate out to form crystals when the urine is acidic, others will form crystals when the urine is basic.

If crystals form while the urine is being produced in the kidney, a kidney stone or calculus can develop.

By modifying urine PH through diet or medication. The formation of these crystals can be reduced or eliminated.

➤ **Specific gravity**

The specific gravity of your urine. This measures your kidneys' ability to balance water content and excrete waste. the normal rang is 1.001 to 1.040

➤ **Protein**

A protein in urine test measures how much protein is in your urine. Proteins are substances that are essential for your body to function properly.

➤ **Glucose**

A glucose in urine test measures the amount of glucose in your urine.

➤ **Ketone**

The test measures ketone levels in your urine. Normally, your body burns glucose (sugar) for energy. If your cells don't get enough glucose, your body burns fat for energy instead. This produces a substance called ketones, which can show up in your blood and urine.

Result

- Small: 20 mg/dl
- Moderate: 30 to 40 mg/dl
- Large: >80 mg/d

➤ **Bilirubin**

A bilirubin test measures the amount of bilirubin in your blood. It's used to help find the cause of health conditions like jaundice (**a condition that causes your skin and eyes to turn yellow**), anemia, and liver disease.

Bilirubin is an orange-yellow pigment that occurs normally when part of your red blood cells break down.

➤ **Urobilinogen**

is a byproduct of bilirubin that is eventually eliminated through the stool and urine. Although urobilinogen is normally found in the urine, higher or lower levels may be a sign of a liver problem. Urobilinogen is a colorless pigment produced from the breakdown of bilirubin by gut bacteria. The majority of this compound is excreted in feces, and a small amount is reabsorbed and excreted in the urine.