General Urine Examination

or

Urinalysis

Urinalysis

- It can detect diseases which pass unnoticed
- Diagnosis of many renal diseases
- Screening for drug abuse (e.g. Sulfonamide or aminoglycosides).

Collection of urine specimens

- Formostoftheroutineinvestigationsfreshmidstreamspecimenof10-20mlurineiscollectedinacleandryvial
- Analysedwithin2hoursofcollection
- Insomecases24hoururinesampleisalsocollected

Types of specimens

- Random specimen (at any time)
- First morning specimen
- Clean catch sample (midstream urine)
- 24 hrs. collection

Urinalysis look of ;

A-physical Examination

1-Volume 2-Color 3-Odor

4-Reaction (pH) 5-Specific gravity

B-Chemical analysis

1-Urobilinogen 2-Glucose 3-Bilirubin

4-Ketones 5-Blood 6-Protein

C-Microscopic Examination

1-Red blood cells (RBCs) 2-White blood cells (WBCs) 3-Mucus

4-Various Epithelial cells 5-Various Crystals 6-Casts

7-Bacteria 8-Fungi 9-Parasite

10-Artifacts

A-physical Examination

1-Volume

- Adult urine volume= 0.6-2.5 L/day
  average 1.5 L/day
- Children urine volume= 0.2-0.4 L/day

- The volume of urine is affected by:

1)Water intake

2) External temperature

3) Type of diet

4) Mental and physical state

5) Cardio-Vascular status

6) Intake of fluid and diuretics (drugs, alcohol and tea)

7) Renal functions

* Variations in volume of urine excreted :-

A-Polyuria **B-Oliguria** **C-Anuria**

A-Polyuria

(Urine output > 2.5 L/day)

- Conditions causing polyuria:

1-Increased water ingestion

2-Diabetes mellitus and insipidus

3-Late stage of chronic glomerulonephritis

4-Drug induced-diuretics

5-Alcohol

6-Compulsive polydipsia

B-Oliguria

(Urine output < 0.4 L/day)

- Conditions causing Oliguria:

1-Fever

2-Diarrhea and Dehydration

3-Shock

4-Sever edema

5-Acute nephritis

6-Early stage of acute glomerulonephritis

7-Cardiac failure and hypotension (reduced circulatory volume)

2-Color

- The color of normal urine may vary from pale yellow to dark amber due to the presence of pigment surochrome ,urobilin and uroerythrin

- Turbidity may because by excessive cellular material or protein in the urine or may develop from crystallization

- Color of urine depending upon its constituents

- Variations in urinary abnormal colors:

Color	Interpretation
Colorless	Very dilute urine (Diabetes and polyuria)
Deep yellow	Concentrated urine, Excess bile pigments and Jaundice
Orange	Carrots or Vitamin A
Red/smoky	RBCs ,Myoglobin ,beetroot and menstrual contamination
Blue-Green	Pseudomonas infection
Black	Iron therapy
Cloudy	Pus cells and bacteria

3-Odor

- Normal urine has an aromatic odor due to the volatile fatty acid.

Odor	Interpretation
Ammonia	On keeping sample for a long time
Foul or offensive	Due to bacterial infections
Fruity	Due to acetone(Diabetic urine)
Mousy	Phenylketonuria
Rancid	Tyrosinaemia

4-pH

- Urine pH range from 4.5 to 8
- Normally it is slightly acidic lying between 6-6.5

- **Acidic urine : seen in**

1-Ketosis (such as diabetes, starvation and fever)

2-Systemic acidosis

3-Urinary tract infections (UTI)-E. coli

4-Acidification therapy

- **Alkaline urine : seen in**

1-Diet rich in citrus fruits

2-Excessive intake of milk and antacids

3-UTI

4-Conditions of alkalosis

4-Specific gravity (SG)

- It is measurement of urine density which reflects the ability of the kidney to concentrate or dilute the urine relative to plasma from which it is filtered
- Measured by dipsticks
- The normal SG of urine ranges from 1.001to1.035

Normal urine abnormal urine