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

- For most of the routine investigations fresh midstream specimen of 10-20ml urine is collected in a clean dry vial
- Analysed within 2hours of collection

  In some cases 24hour urine sample is also collected

Types of specimens

- Random specimen (at any time)
- First morning specimen
- Clean catch sample (midstream urine)

Urinalysis look of :

A-physical Examination

1-Volume 2-Color 3-Odor 4-Reaction (pH)

5-Specific gravity

B-Chemical analysis

C-Microscopic Examination

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

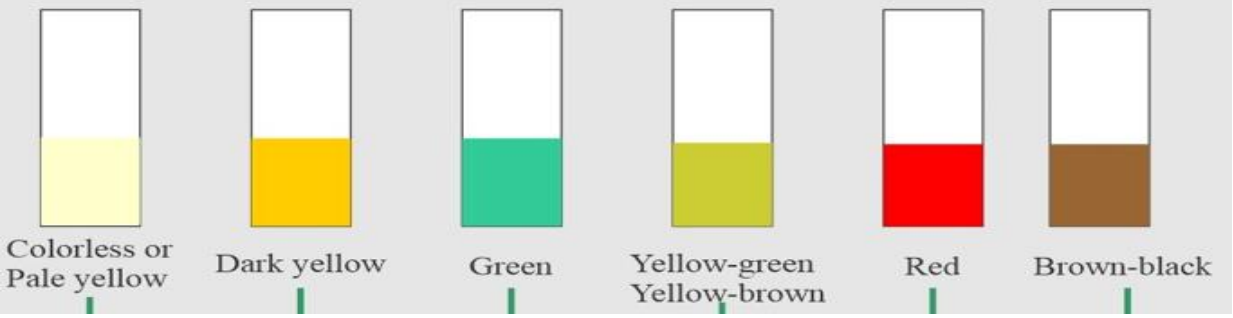
7-Cardiac failure and hypotension (reduced circulatory volume)

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

Due to bacterial infections	Foul or offensive
Due to acetone(Diabetic urine)	Fruity
Phenylketonuria	Mousy
Tyrosinaemia	Rancid

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**