Constituents of urine

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Learning Objectives

- Introduction
- Functions of urine
- Constituents of urine
- Inorganic constituents of urine
- Organic constituents of urine

INTRODUCTION

- Urine is an excretory product of the body.
- It is formed in the kidney.
- Urine examination helps in the diagnosis of various renal as well as systemic diseases.

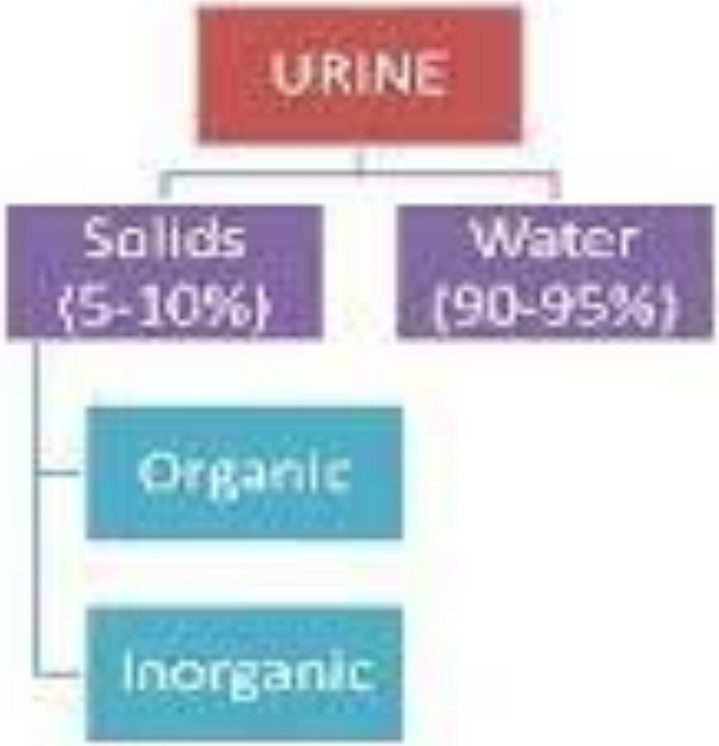
Functions of urine

- Removes extra salts from body – maintains homeostasis
- Removes acids and bases – maintains acid base balance
- Removes waste products
- Removes toxic and detoxified substances from body

COLLECTION OF URINE

- **First morning, midstream**: Preferred for routine urine examination.
- **Random, midstream**: Routine urine examination.
- **First morning, midstream, clean catch**: Bacteriological examination.
- **Postprandial**: Estimation of glucose, urobilinogen
- **24-hour**: Quantitative estimation of proteins or hormones.
- **Catheterised**: Bacteriological examination in infants, bedridden patients, and in obstruction of urinary tract.
- **Plastic bag** (e.g. colostomy bag) tied around genitals: Infants, incontinent adults.

COMPOSITION OF NORMAL URINE



Organic & inorganic constituents of urine

TABLE 23.2 Properties and Composition of Urine

Physical Properties		
Specific gravity	1.001–1.028	
Osmolarity	50–1,200 mOsm/L	
pH	6.0 (range 4.5–8.2)	
Solute	**Concentration***	**Output****
Inorganic Ions		
Chloride	533 mg/dL	6.4 g/day
Sodium	333 mg/dL	4.0 g/day
Potassium	166 mg/dL	2.0 g/day
Phosphate	83 mg/dL	1 g/day
Ammonia	60 mg/dL	0.68 g/day
Calcium	17 mg/dL	0.2 g/day
Magnesium	13 mg/dL	0.16 g/day
Nitrogenous Wastes		
Urea	1.8 g/dL	21 g/day
Creatinine	150 mg/dL	1.8 g/day
Uric acid	40 mg/dL	0.5 g/day
Urobilin	125 µg/dL	1.52 mg/day
Bilirubin	20 µg/dL	0.24 mg/day
Other Organics		
Amino acids	288 µg/dL	3.5 mg/day
Ketones	17 µg/dL	0.21 mg/day
Carbohydrates	9 µg/dL	0.11 mg/day
Lipids	1.6 µg/dL	0.02 mg/day