

## C-Microscopic examination of urine

### •Crystals found in alkaline urine

1-Triplephosphate      2-Amorphousphosphate      3-Calciumcarbonate

4-Calciumphosphate      5-Ammoniumbiurates

1-Triplephosphate

-The crystals are colorless prisms with three to six sides and frequently with oblique end



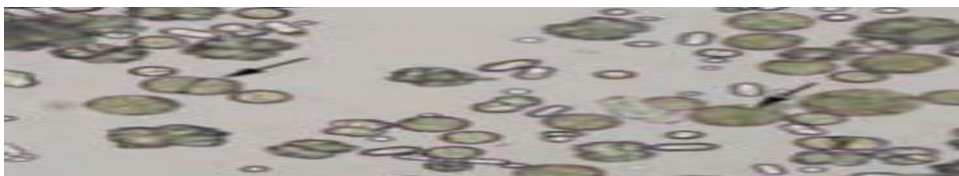
2-Amorphousphosphate

-These are present in amorphous, granular form



3-Calciumcarbonate

-These appear as small, colorless and in the form of spherical, dumbbell shape



4-Calciumphosphate

-These are long, thin and colorless. The appearance is like prisms with one pointed end , arranged as rosettes or stars



#### 5-Ammoniumbiurates

-These are yellow-brown , spherical bodies with or without long, irregular spicules



#### 6-Casts

\*Urinary casts are cylindrical aggregations of particles that form in the distal nephron , dislodge and pass into the urine . In urinalysis they indicate kidney disease.

**\*Types of cast seen:**

**- A cellular cast:**

1-Hyaline casts    2-Granular casts    3-Waxy casts    4-Fatty casts

**- Cellular cast:**

1-Red cell casts    2-White cell casts    3-Epithelial cell casts

**- A cellular cast:**

1-Hyaline casts

-Consists almost entirely of a muco-protein

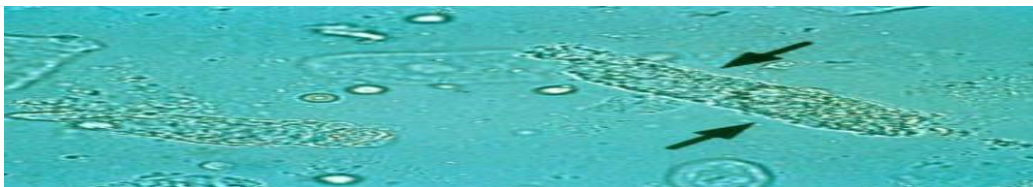
-They are colorless, homogeneous, transparent and with rounded ends



## 2-Granular casts

-These casts can contain either fine or coarse granules

-Originate from plasma protein aggregates that pass into tubules from damaged glomeruli



## 3-Waxy casts

-These are yellow or colorless and have a homogenous appearance

-These result from the degeneration of granular casts



## 4-Fatty casts

-Fatty casts are formed by incorporated free fat droplets or oval fat bodies

-These are frequently seen in nephrotic syndrome and toxic renal poisoning



**\* Cellular cast:**

1-Red cell casts

-The cast may contain variable amounts of erythrocytes embedded in the matrix of the cast

-Indicator of bleeding with in nephron and a highly specific marker of glomerular bleeding



2-White cell casts

-Contain variable amounts of neutrophils

-These casts may be present in acute pyelonephritis and glomerulonephritis

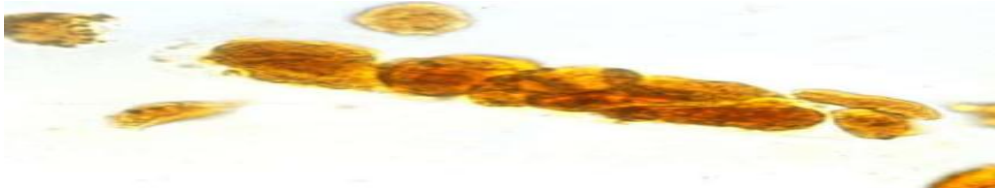


3-Epithelial cell casts

-These contain epithelial cells

-Presence of these casts indicate tubular degeneration and necrosis

-Present in severe chronic renal disease



### 7-Bacteria

-Seen as rods or cocci



### 8-Fungi

-Candida (Elongated, Ovoid or spherical)

-Presence of buds



### 9-Parasite

-Schistosoma haematobium

Eggs with terminal spine which causes haematuria



### 10-Artifacts

1-Fibers: they may come from clothing and toilet paper



2-Oil droplets



3-Hair



4-Air bubbles