

Renal Tubular Epithelial cell cast

Renal tubular epithelial cell casts are seen in urine with acute tubular necrosis, viral disease (e.g., cmv disease) or exposure to a variety of drugs.

Heavy metal poisoning , salicylate intoxication

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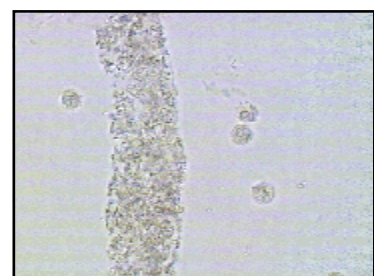
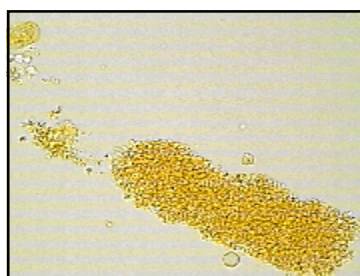
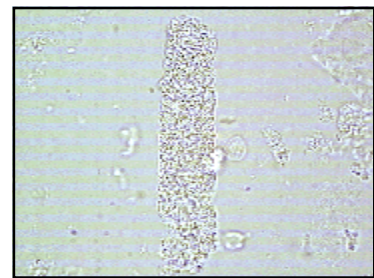
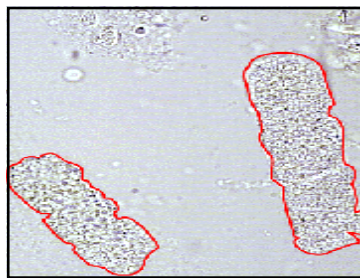
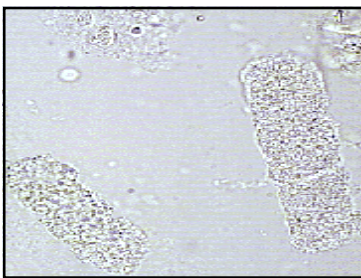
Inclusion casts

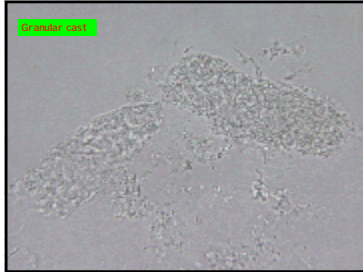
Granular casts : granules may be small or large may originate from plasma proteins aggregates that pass into the tubules from damaged glomeruli , as well as cellular remnants of WBC , RBC or renal tubular cells. Chronic disorder

Fatty casts , crystal cast , pigmented casts (Hb , Mb , Bili , Hemosidrin , Drug)

Broad cast ; two to six times that of normal cast : indicate CRF , poor prognosis

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Crystals

crystals form by the precipitation of urinary salts when alteration in multiple factors affect their solubilities. These include changes in PH , temperature and concentration . Majority of crystals are limited clinical significance.

Crystals

Crystals	Solubility	insolubility	appearance
Uric acid	alkali , heat	HCl,Acid	Rosette , diamond
Ca .oxalate	Hcl, 90% ethyl alcohol	Acetic acid	Envelope ,dumbbell, ovoid round
Triple phosphate	Acetic acid	NaOH, NH ₄ OH	Coffee- lid Fern leaf
Ca phosphate	Acetic acid	alkali	Flat-shaped or wedged prisms
Ammonium biurate	Acetic acid	NH ₄ OH	Thorn-apple Spiky projection
Ca carbonate	HCl,Acetic acid	alkali	Granule, dumbbells

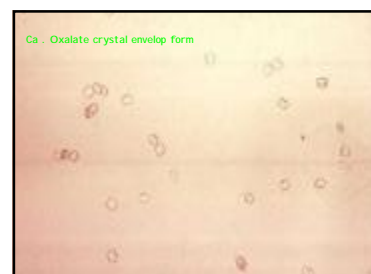
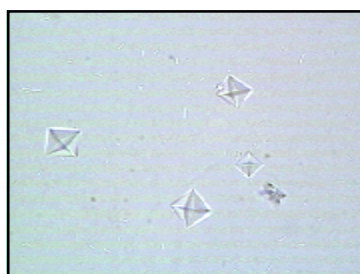
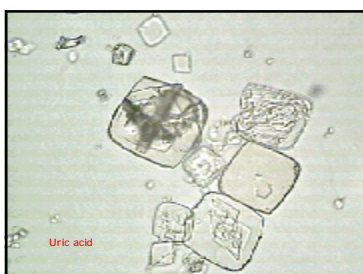
Crystals	Solubility	Insolubility	appearance
Leucine	NaOH, Hot water	HCl	Spheroids with concentric striation
Cystine	HCl, NaOH, NH ₄ OH	acetic acid	Hexagonal plates
Tyrosine	Hcl, NaOH	Alcohol , acetic acid	Single needle or clumped sheaves or rosettes
cholesterol	Chloroform or ether	bilute acid	Regular and irregular plates
Bilirubin	A. Acid , HCl, NaOH , acetone	Alcohol	Yellow -brown needles or granules
Sulfonamide	Acetone , alkali	acetic acid	Variety of shapes
Radiopaque dye	Associated with very high specific gravity >1.035	mistaken by tyrosine or sulfonamide	

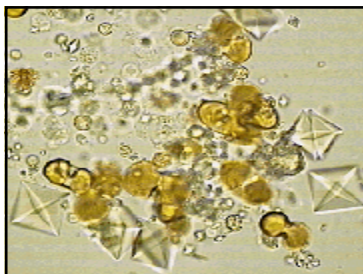
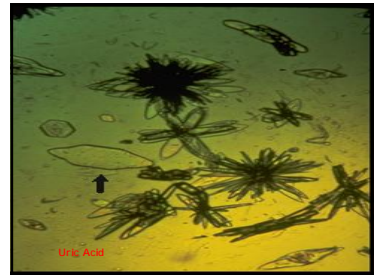
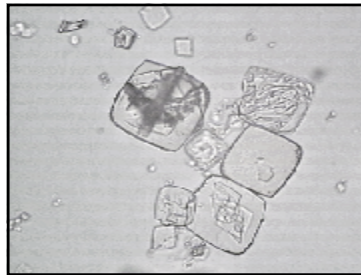
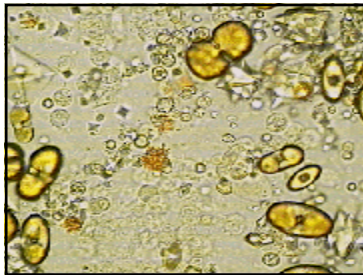
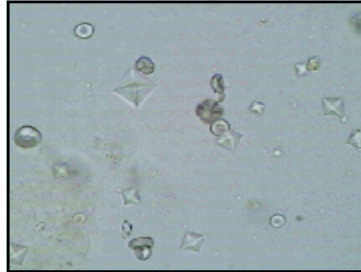
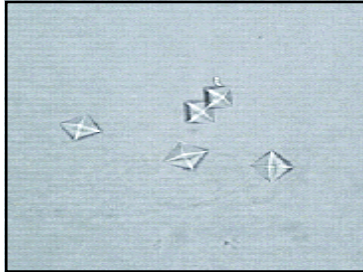
Crystals found in Acid urine

Amorphous urates (Ca, Mg, Na, K, urates)
 Appear pink-orange to reddish brown on macroscopic referred To brick dust dissolve in 60°

Uric acid occur at low PH 5.0-5.5 , variety shape , prisms oval form , rosettes , yellow to reddish brown. Large uric acid and urate reflect nucleo protein turnover.

Ca oxalates : dumbbell shape , envelope , or ovoid , PH 6.0 or neutral large number reflect sever chronic renal disease. confused with RBC

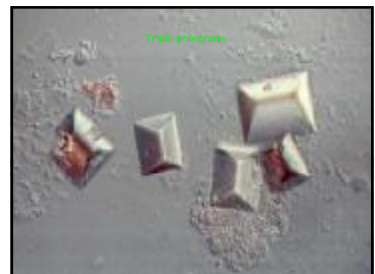


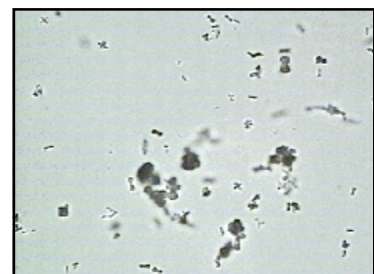
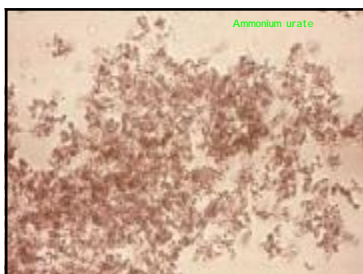
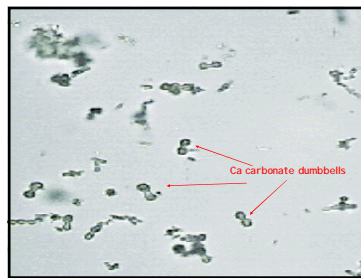
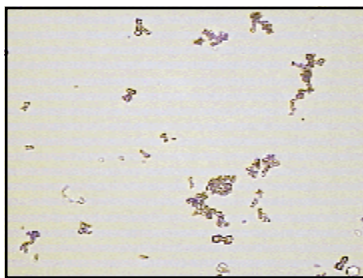
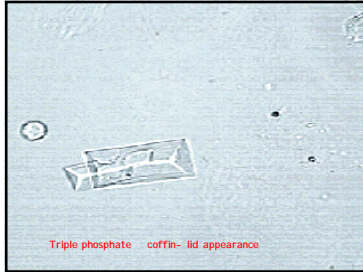


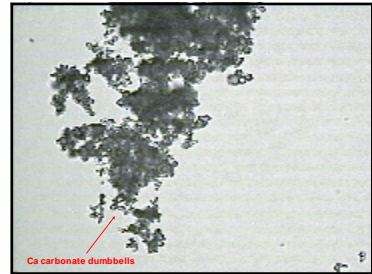
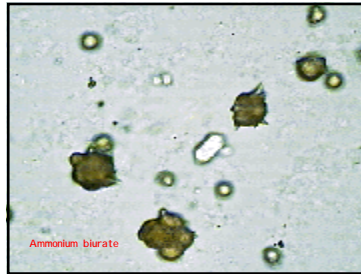
Crystals found in alkaline urine

Amorphous phosphate (ca , mg)
 CA. Phosphate large flat-shaped
 or wedge- shaped prisms , ,crystalline
 phosphate
 triple ph. Coffin-lid , fern leaf
 appearance Ca carbonate (granule
 ,dumbbells), ammonium
 biurate (thorn-apple ,thorny projection ,
 spiny projection)

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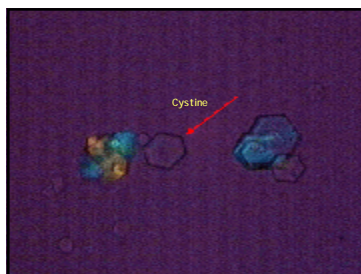
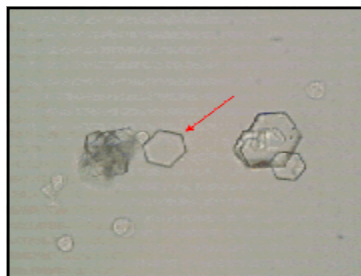
Crystals found in abnormal urine

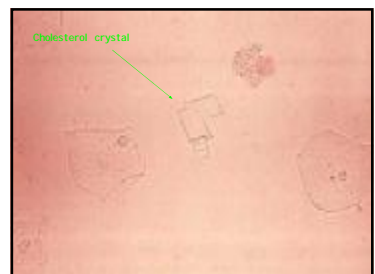
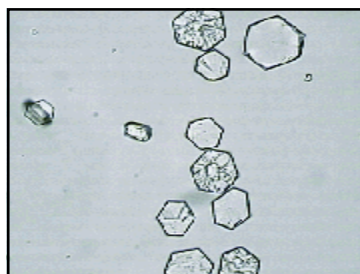
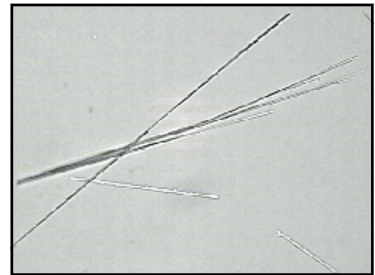
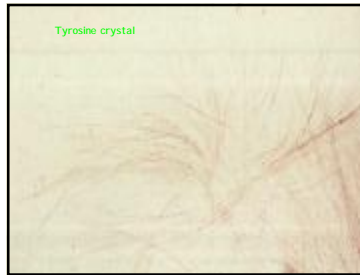
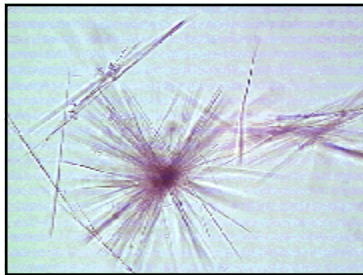
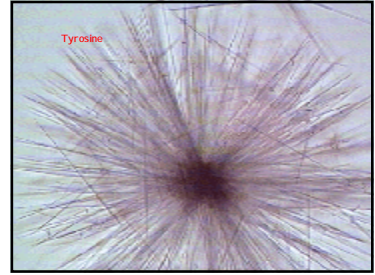
Cystine :are colorless, refractile ,hexagonal plate in acid urine , seen in cystinuria ,they are soluble in water at ph less than 2 or greater than 8 .may be confused with hexagonal forms of uric acid both are soluble in ammonia water , but cystine will also dissolve in dilute hydrochloric acid and uric acid will not.

Tyrosine : in acid urine , fine silky needles arranged in sheaves or clumps especially after refrigeration .may be colorless or yellow they are soluble in alkali and dilute Hcl and not soluble in alcohol or ether. seen in sever liver disease.

Xanthine : yellow oily appearing sphears with radial and concentric striation. they are soluble in both acids and alkali. Spheroid with concentric striation

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Abnormal cells

Tumor cells :
Malignant tumor cells exfoliated from renal pelvis
ureter bladder and urethra myeloma cell
Viral inclusion cells
Epithelial cells containing inclusion bodies
Syncytial giant cells (hepatic inflammation)
Bacteria : TB
Fungi : Candida
Parasites : sh. Haematobium

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Methods for urinalysis

- 1- pour 10 - 15 ml of a well - mixed urine specimen into a graduated disposable centrifuge tube . Perform physical examination and reagent strip/chemical evaluation. Centrifuge at 450 g for five minutes.
- 2- carefully remove and save the supernatant . The final volume used to resuspend the sediment may vary with the standardized system used but should remain a constant within any given laboratory . Use a disposable pipette , specialized tube , or pipette system to concentrate the sediment.
- 3- gently resuspend the sediment in the remaining supernatant , and add one drop of supravital stain if desired using an appropriate pipette , load / charge the examination chamber of a standardized slide . Allow the urine to settle for 30 to 60 seconds.
- 4 - examine with low - and high -power objectives

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Methods for urinalysis

- 5- count the number of cast in at least 10 hpf, average , and report the number of casts per hpf. A reasonable range may be used in reporting (e.g. , 0-2 , 2-5 , 5-10). Use high power to identify casts by type.
- 6- Identify and count erythrocytes , leukocytes , and renal epithelial cells using the hpf objective. count at least 10 hpf , average , and report as cells/ hpf.

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