Casts

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| --- | --- |
| **Urine findings** | **Meaning** |
| RBC casts | Glomerulonephritis  Malignant hypertension |
| WBC casts | Tubulointerstitial inflammation  Acute pyelonephritis  Transplant rejection |
| Fatty casts | Nephrotic syndrome |
| Granular casts | Acute tubular necrosis |
| Waxy casts | End stage renal disease  Chronic renal failure |
| Eosinophilic casts | Chronic pyelonephritis |
| Hyaline casts | Normal |
| Pyuria, no casts | Acute cystitis |
| Hematuria, no casts | Kidney stones  Bladder cancer |

Kidney Stone Types

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type** | **Findings** | **Crystal** | **Notes** | **Treatment** |
| Calcium phosphate | Opaque on XR/CT | **Envelope**  **Dumbell** | **Most common type**  Prevalence: oxalate > phosphate  Ethylene glycol, Vit. C abuse,  **Hypocitraturia**, Crohn disease  (Dec. citrate absorption in gut) | Thiazides  **Citrate**  **(chelates Ca2+)**  Low sodium |
| Calcium oxalate | Opaque on XR/CT | **Wedge shaped prism** |
| Ammonium  Magnesium  Phosphate | Opaque on XR/CT | **Coffin lid** | **Caused by urease + organisms**  (S. saprophyticus, Klebsiella, Proteus)  Form **staghorn calculi** | **Remove infection**  Remove stone |
| Uric acid | **Lucent on XR**  Minimally visible on CT | **Rhomboid**  **Rosettes** | **Associated w/ gout**  Seen w/ high cell turnover | Alkalinize urine  **Allopurinol** |
| Cystine | **Lucent on XR**  Sometimes visible on CT | **Hexagonal** | **Defect in PCT cysteine transporter**  Stones in childhood  **Sodium cyanide nitroprusside test**  (rxn. turns purple) | Alkalinize urine  Low sodium  Chleating agents |

Renal Infections

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| --- | --- | --- | --- | --- | --- | --- |
|  | **Risk Factors** | **Presentation** | **Causes** | **Lab Findings** | **Biopsy/Imaging** | **Complications** |
| **UTI** | Female (**short urethra**)  Sexual intercourse  Indwelling catheter  **Diabetes** | **Suprapubic pain**  **Dysuria**  Frequency  Urgency | **E. coli**  S. saprophyticus  Klebsiella  Proteus  N. gonorrhoeae  C. trachomatis | **Leukocyte esterase +**  **Nitrites +** |  |  |
| **Acute Pyelo.** | Urinary obstruction  **Vesicoureteral reflux**  Indwelling catheter  Diabetes  **Pregnancy** | **Flank pain**  Nausea  Vomiting  **Chills**  **Fever** | **Ascending UTI**  Hematogenously | WBCs in urine  **WBC casts** | Neutrophil infiltrate  (**spares glomeruli**)  Striated parenchyma | **Chronic pyelo.**  **Papillary necrosis**  Perinephric abscess  Urosepsis |
| **Chronic Pyelo.** | **Recurring acute pyelo.**  Chronic kidney stones  **Vesicoureteral reflux** | **Flank pain**  Nausea  Vomiting  **Chills**  **Fever** | **Ascending UTI**  Hematogenously | **Eosinophilic casts** | Corticomedullary scars  Blunted calyxes  **Thyroidization** | **Xanthogranulomatous pyelo.**  (granulomatous tissue  w/ foamy macrophages) |