

# Top 100 Nephrology Concepts

BASED ON KMU PRE-PROFFS 2024

MEDICINE • PEADS • SURGERY

## 1. GLOMERULAR DISEASES (HIGH YIELD)

Concept	Exam Pearl / Clinical Scenario
Post-Streptococcal GN (PSGN)	Child, 2 weeks after sore throat/impetigo. Cola-colored urine, Low C3, High ASO.
IgA Nephropathy	Young male, hematuria 1-2 days after URTI (Synpharyngitic). Normal C3.
Minimal Change Disease	Most common Nephrotic Syndrome in children. Normal biopsy (electron microscopy shows foot process effacement). Rx: Steroids.
Focal Segmental GS (FSGS)	Nephrotic syndrome in adults. Associated with HIV, Heroin, Obesity. Poor prognosis.
Membranous Nephropathy	Nephrotic syndrome in elderly/adults. Associated with Hep B, SLE, Drugs (Gold/Penicillamine), Cancer.
Goodpasture's Syndrome	Hemoptysis + Hematuria (Renal-Pulmonary). Anti-GBM antibodies. Linear IgG on biopsy.
Wegener's (GPA)	Sinusitis + Hemoptysis + Renal failure. c-ANCA positive.
Alport Syndrome	Hematuria + Sensorineural Deafness + Eye disorders. X-linked dominant.
Lupus Nephritis	SLE patient (Malar rash, joint pain) with proteinuria/hematuria. Low C3/C4.
Nephrotic Syndrome Features	Proteinuria (>3.5g/day), Hypoalbuminemia, Edema, Hyperlipidemia.
Nephritic Syndrome Features	Hematuria (RBC casts), Hypertension, Oliguria, Mild proteinuria.
RBC Casts	Pathognomonic for Glomerulonephritis.

## 2. ACUTE KIDNEY INJURY (AKI)

Concept	Exam Pearl / Clinical Scenario
Pre-renal Azotemia	Most common cause of AKI in hospital. Dehydration/Hypotension. Urine Na < 20, High Osmolality.
Acute Tubular Necrosis (ATN)	Caused by ischemia or toxins (Gentamicin, Contrast). Urine Na > 40, Muddy Brown Casts.
Acute Interstitial Nephritis	Fever + Rash + Eosinophilia (Eosinophils in urine). Caused by Drugs (NSAIDs, Penicillins).
Contrast Nephropathy	Rise in Creatinine 48h after CT. Prevention: IV Hydration (N/S). Stop Metformin.
Rhabdomyolysis	Muscle pain + Dark urine (Myoglobin). High CK. Causes ATN. Rx: Aggressive Fluids.
Indications for Dialysis	"AEIOU": Acidosis, Electrolytes (Hyperkalemia), Intoxication, Overload (Fluid), Uremia (Encephalopathy/Pericarditis).
Hemolytic Uremic Syndrome	Child with bloody diarrhea (E. Coli O157) -> Anemia + Thrombocytopenia + Renal Failure.

## 3. CHRONIC KIDNEY DISEASE (CKD)

Concept	Exam Pearl / Clinical Scenario
Leading Cause	Diabetes Mellitus is the #1 cause globally. Hypertension is #2.
Diagnosis	eGFR < 60 or markers of damage for > 3 months.
Anemia of CKD	Normocytic, Normochromic. Due to decreased Erythropoietin (EPO).
Renal Osteodystrophy	Hyperphosphatemia + Hypocalcemia -> High PTH (Secondary Hyperparathyroidism).
Dietary Management	Restrict Phosphate (Dairy/Nuts), Potassium (Bananas), and Sodium.
Uremic Pericarditis	Chest pain + Friction rub in CKD. Indication for urgent Dialysis.
Hypertension in CKD	Target < 130/80. ACE Inhibitors are drug of choice (Renoprotective).

Small Kidneys on USG	Hallmark of CKD (shrunken, fibrotic). Normal size in Diabetic Nephropathy/PKD/Amyloidosis.
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## 4. ELECTROLYTES & ACID-BASE

Concept	Exam Pearl / Clinical Scenario
Hyperkalemia Rx	1. <b>Calcium Gluconate</b> (Protect heart). 2. Insulin/Dextrose. 3. Salbutamol.
Hyponatremia Signs	Confusion, Seizures. Check Volume status.
Hyponatremia Correction	Do not correct > 10mmol/L/day to avoid Central Pontine Myelinolysis.
Hypernatremia	Water deficit (Dehydration/DI). Correct slowly to avoid Cerebral Edema.
Hypocalcemia	Tetany, Chvostek's/Trousseau's sign. Post-thyroidectomy. Rx: IV Calcium Gluconate.
Metabolic Acidosis	Low pH, Low HCO3. Calculate Anion Gap. Causes: DKA, Renal Failure, Methanol.
Metabolic Alkalosis	High pH, High HCO3. Causes: Vomiting, Diuretics, Conn's.
Resp Acidosis	Low pH, High CO2. Causes: COPD, Opiates.
Resp Alkalosis	High pH, Low CO2. Causes: Hyperventilation (Anxiety), PE, Salicylates.
High Anion Gap	MUDPILES (Methanol, Uremia, DKA, Paracetamol, Iron, Lactic, Ethanol, Salicylates).

## 5. RENAL STONES (UROLITHIASIS)

Concept	Exam Pearl / Clinical Scenario
Diagnosis	Gold Standard: <b>Non-Contrast CT KUB</b> .
Pain Pattern	Colicky loin to groin pain. Hematuria often present.
Staghorn Calculus	<b>Struvite</b> (Magnesium Ammonium Phosphate). Associated with Proteus (UTI).
Radiolucent Stones	<b>Uric Acid</b> stones are invisible on X-ray.
Management < 5mm	Conservative (Hydration + Analgesia). Spontaneous passage likely.
Management > 2cm	PCNL (Percutaneous Nephrolithotomy).
Prevention	Calcium Stones: Potassium Citrate, Thiazides. Do NOT restrict dietary calcium.

## 6. SCROTAL & TESTICULAR

Concept	Exam Pearl / Clinical Scenario
Testicular Torsion	Sudden severe pain, high-riding testis, negative Prehn's sign. <b>Immediate Surgery</b> .
Epididymo-orchitis	Gradual pain, fever, dysuria. <35y: Chlamydia. >35y: E. Coli.
Hydrocele	Transilluminates. Can get above swelling. Fluid in Tunica Vaginalis.
Varicocele	"Bag of Worms". Left side common (drains to renal vein). Right side = Tumor alert.
Testicular Tumor	Painless lump. Markers: AFP, bHCG, LDH. <b>Radical Inguinal Orchiectomy</b> .
Undescended Testis	Cryptorchidism. Risk of Cancer (Seminoma) & Infertility. Surgery: Orchidopexy.
Blue Dot Sign	Torsion of Appendix Testis (Hydatid of Morgagni). Conservative Rx.

## 7. PEDIATRIC NEPHROLOGY

Concept	Exam Pearl / Clinical Scenario
Wilms Tumor	Most common renal tumor in children. Abdominal mass + Hematuria.
HSP	Palpable Purpura + Abd Pain + Joint Pain + IgA Nephropathy.
Posterior Urethral Valve	Newborn male with distended bladder, poor stream. Key cause of CKD in kids.
Polycystic Kidney Disease	<b>Autosomal Dominant (ADPKD)</b> in adults. Berry Aneurysms (SAH risk).
Congenital Anomalies	Most common cause of CKD in children.

# 8. MISCELLANEOUS

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Concept	Exam Pearl / Clinical Scenario
Renal TB	Sterile Pyuria (Pus cells but no growth on standard culture).
Bladder Cancer	Painless Hematuria in older smoker. Transitional Cell Carcinoma (TCC).
RCC Triad	Hematuria + Flank Pain + Mass. Paraneoplastic syndromes common.
BPH Management	Alpha-blockers (Tamsulosin) for symptoms. 5-Alpha Reductase Inhibitors (Finasteride) to shrink prostate.
Priapism	Painful erection >4h. Associated with Sickle Cell. Rx: Aspiration + Phenylephrine.
Hypospadias	Ventral urethral opening. <b>No Circumcision</b> (prepuce needed for repair).
Diabetic Nephropathy	Kimmelstiel-Wilson nodules. Microalbuminuria is first sign. Rx: ACE Inhibitors.