

NEPHRON PHYSIOLOGY QUICK-REFERENCE

Nursing Pathophysiology & Pharmacology Study Guide

1. GLOMERULUS & BOWMAN'S CAPSULE

Primary Function: Ultrafiltration

Key Concept: GFR (Glomerular Filtration Rate). Normal: >90 mL/min.

What filters? Water, Electrolytes, Glucose, Urea.

What stays? RBCs, Albumin (Proteins).

2. PROXIMAL CONVOLUTED TUBULE (PCT)

Reabsorption: 65% of Na⁺ and H₂O. 100% of Glucose and Amino Acids.

Clinical Correlation: Site of Action for Carbonic Anhydrase Inhibitors.

3. LOOP OF HENLE

Descending: Permeable to Water (concentrates urine).

Ascending: Permeable to NaCl (dilutes urine). Impermeable to water.

Medication: Loop Diuretics (Furosemide) act on the thick ascending limb.

4. DISTAL CONVOLUTED TUBULE (DCT)

Regulation: Fine-tuning of electrolytes.

Medication: Thiazide Diuretics inhibit Na⁺/Cl⁻ symporter here.

Hormone: Parathyroid Hormone (PTH) increases Ca²⁺ reabsorption here.

HORMONAL REGULATION SUMMARY

Hormone	Source	Trigger	Effect on Nephron
Aldosterone	Adrenal Cortex	Angiotensin II / High K+	↑ Na+ & H ₂ O Reabsorption, ↑ K+ Excretion
ADH (Vasopressin)	Post. Pituitary	High Osmolality / Low Vol.	↑ H ₂ O Reabsorption in Collecting Ducts
ANP/BNP	Heart Atria/Ventricle	Fluid Overload (Stretch)	↑ Na+ Excretion (Natriuresis)

LABORATORY VALUES

BUN: 10-20 mg/dL

Creatinine: 0.6-1.2 mg/dL

Specific Gravity: 1.005-1.030

STUDENT NOTES