

1. Osmotic Diuretics

Mannitol, Urea

MOA: Non-absorbed osmole → H₂O excretion

Use: PPX-Acute renal failure, Cerebral edema, elevated intraocular pressure

CI: Renal barrier or Blood brain barrier damage

SE: Volume expansion – Edema, hyponatremia

2. Carbonic anhydrase inhibitors

Acetazolamide, Dorzolamide (Both Sulfa-based)

MOA: Inhibit CA → inhibit Na/H exchange

Use: Diuresis, Glaucoma, altitude sickness, metabolic alkalosis, enhanced excretion of weak acids

SE: Metabolic Acidosis, Type 2 RTA, Ca⁺² Stones

CI: Metabolic acidosis, Pts w/ cirrhosis

3. Loop diuretics

Furosemide, Bumetanide, Ethacrynic acid (non-sulfa)

MOA: Na/K/2Cl symporter inhibitor, COX-induction

Use: Edema, hypertension, HF exacerbation (fast acting)

SE: ↓Ca⁺², ↓Na⁺, ↓K⁺, ↓Mg⁺², ↑PGs, Ototoxicity, Metabolic Alkalosis, hyperuricemia, adverse lipid panel,

CI: NSAIDs (↓efficacy), aminoglycosides, osteoporosis

Afferent Arteriole

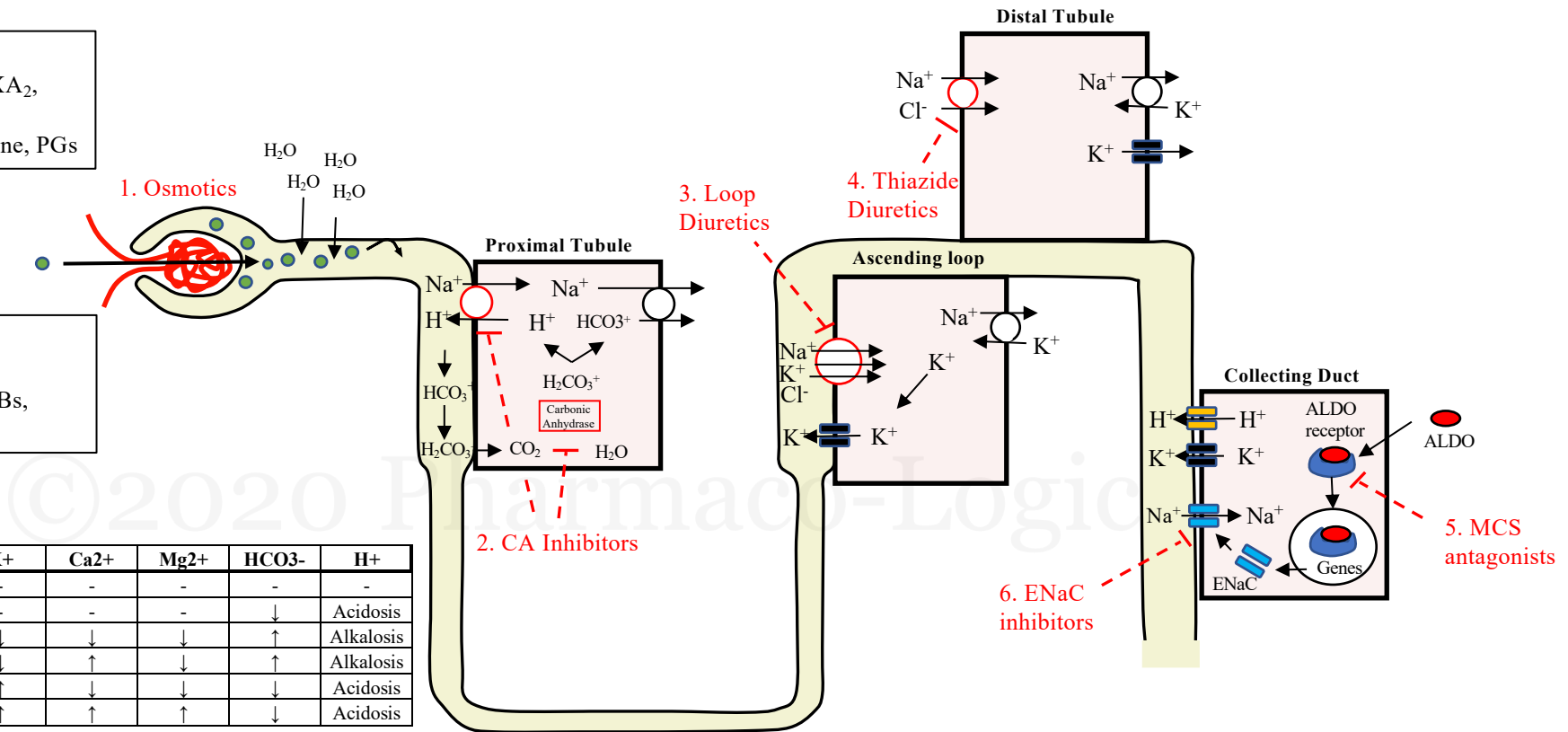
Constrictors: α₁ agonists, TXA₂, NSAIDs

Dilators: β₂ agonists, dopamine, PGs

Efferent Arteriole

Constrictors: Angiotensin II

Dilators: ACE inhibitors, ARBs, Acetylcholine



| | Na ⁺ | K ⁺ | Ca ²⁺ | Mg ²⁺ | HCO ₃ ⁻ | H ⁺ |
|--------------------|-----------------|----------------|------------------|------------------|-------------------------------|----------------|
| Osmotics | ↓ | - | - | - | - | - |
| CA inhibitors | ↓ | - | - | - | - | Acidosis |
| Loop diuretics | ↓ | ↓ | ↓ | ↓ | ↑ | Alkalosis |
| Thiazide diuretics | ↓ | ↓ | ↑ | ↓ | ↑ | Alkalosis |
| MCS antagonists | ↓ | ↑ | ↓ | ↓ | ↓ | Acidosis |
| ENaC inhibitors | ↓ | ↑ | ↑ | ↑ | ↓ | Acidosis |

4. Thiazide Diuretics

Hydrochlorothiazide, Chlorothiazide, Metolazone

Chlorthalidone, Indapamide – “thiazide-like” – inhibit CA

MOA: Na⁺/Cl⁻ Symport inhibitors

USE: Hypertension, Edema, Ca⁺² Stones, diabetes insipidus

SE: ↑Ca⁺², ↓Na⁺, ↓K⁺, ↓Mg⁺, Metabolic alkalosis, hyperglycemia, hyperuricemia, sulfa-based allergies, ↑LDL cholesterol

CI: Digoxin, Quinidine, lithium(↓Excretion), Sulfa allergies

5. MCS receptor antagonists – K-sparing

Spironolactone, Eplerenone

MOA: aldosterone receptor antagonist

USE: RAAS induced Hypertension, hirsutism, CHF, Conn syndrome, Hyperaldosteronism

SE: Anti-androgen effects, hyperkalemia, metabolic acidosis

CI: RAAS inhibitors (hyperkalemia), peptic ulcer (steroid-effect), K-supplements

6. ENaC inhibitors – K⁺ - Sparing

Amiloride, Triamterine

MOA: Epithelial Na⁺ Channel blocker

USE: RAAS induced Hypertension, Liddle's syndrome, Li toxicity, Diabetes insipidus

SE: ↑Ca⁺², ↓Na⁺, ↑K⁺, ↑Mg⁺, ↑Uric acid, Metabolic acidosis

CI: indomethacin