

	OSMOTIC	LOOP	THIAZIDE	K SPARING
SITE	Act at proximal convoluted tubule	Act at ascending limb of L.H	Acts at proximal part of DCT	Act at distal part of DCT& CT
FEATURES/ EFFICACY	- Inert, not cause metabolic changes - Filtered free through glomerulus - Undergo limited reabsorption from renal tubules	most potent diuretic (25% Na filtrate loss)	moderate diuretic(10% Na filtrate loss)	weak diuretic (2-5%Na filtrate loss)
MEMBERS	<ul style="list-style-type: none"> Mannitol Conc. Glucose Glycerol 	<ul style="list-style-type: none"> Furosemide Bumetanide Torsemide Ethacrynic acid 	<ul style="list-style-type: none"> Chlorothiazide Hydrochlorothiazide Indapamide 	<ul style="list-style-type: none"> Aldosterone antagonists Spironolactone & Eplerenone Direct Na channels inhibitors Triamterene & Amiloride
MOA	↑osmolarity of plasma →↑osmolarity of tubular fluid →retain equiosmotic amount of water & ↓water reabsorption from all water permeable sites	A-Renal mechanism -Inhibit Na/K/Cl co transport in ascending limb of loop of henle → ↓Na & Cl reabsorption -Furosemide ↑ COX activity → ↑VD prostaglandins (PGE2&PGI) → ↑GFR & ↓Na-Cl reabsorption B-Extra renal mechanism Furosemide has venodilator effect mediated by PGs →Changes in RBF & ↓ LV filling pressure		A-Aldosterone antagonists block aldosterone receptors → ↓Na reabsorption & ↓K-H secretion B-Na channels blockers inhibit directly Na transport through Na channels → ↓Na reabsorption & ↓K-H Secretion
EFFECTS		<ol style="list-style-type: none"> ↑Na & Cl excretion ↑ Ca & Mg excretion ↑ K secretion ↓uric acid excretion because they compete it for secretory acid system at PCT ↑H ion secretion Furosemide ↑RBF Ethacrynic acid has uricosuric effect because it ↓ PT reabsorption of uric acid → ↑its excretion 	<ol style="list-style-type: none"> ↑Na & Cl excretion ↑k secretion ↓uric acid excretion → hyperuricemia ↓Ca excretion → hypercalcaemia ↓RBF by direct action on renal vasculature Antihypertensive paradoxical antidiuretic effect in nephrogenic D.I. ↑sensitivity of ADH receptors in renal tubules 	<ol style="list-style-type: none"> ↑Na excretion ↓k & H secretion ↓uric acid excretion → hyperuricemia Anti androgenic effect of spironolactone
USES	<ol style="list-style-type: none"> Maintain high urine volume in early ttt of ARF Maintain high urine volume during ttt of drug intoxication e.g. barbiturates, salicylates Acute congestive glaucoma (↓I.O.P.) ↑intracranial tension 	<ol style="list-style-type: none"> Acute pulmonary edema Edema & other forms of Na-water retention Hypertensive emergency Hypercalcemia Hyperkalemia Oliguria due to ARF Drug poisoning (forced diuresis) Ethacrynic acid treats hyperuricemia 	<ol style="list-style-type: none"> Essential hypertension As mono therapy or combined with other antihypertensive drugs Initial ↓BP due to hypovolemia but maintained ↓BP due to VD action Idiopathic hypercalcuria Nephrogenic D.I. Hyperkalemia Na & water retention (edema & ascites) 	<ol style="list-style-type: none"> with loop or thiazide diuretics to balance excessive K loss & incidence of metabolic alkalosis Hyperaldosteronism Primary (conn's syndrome) Secondary (CHF, hepatic cirrhosis, nephrotic syndrome) Refractory edema Potentiate effect of loop diuretic Spironolactone used in ttt of hirsutism??
S/E	<ol style="list-style-type: none"> Headache, nausea, vomiting Excessive use → dehydration & hypernatremia Mannitol → hypersensitivity Glycerol → hyperglycemia & glucosuria <p><u>CONTRAINDICATION</u></p> <ol style="list-style-type: none"> Severely impaired renal function Marked pulmonary edema & CHF Active intracranial bleeding 	<ol style="list-style-type: none"> Hypokalemia & metabolic alkalosis Hypovolemia & hyponatremia Hypomagnesamia & hypocalcemia Hyperuricemia(except Ethacrynic acid) Hyperglycemia Hyperlipidemia Hypersensitivity Ototoxicity (↑ with Aminoglycosides) 	<ol style="list-style-type: none"> Hypovolemia & hyponatremia Hypokalemia & metabolic alkalosis Hypercalcemia Hyperuricemia Hypersensitivity Hyperglycemia Hyperlipidaemia 	<ol style="list-style-type: none"> Hyperkalemia esp. with K intake or drugs have K sparing effect e.g. BBs, ACEIs, NSAIDs Metabolic acidosis Nausea, abdominal pain & mental confusion Spironolactone → gynecomastia, impotence & menstrual irregularities Due to steroid nucleus in its structure

1-Digitalis

↑cardiac contraction → ↑renal blood flow

2-Albumin

Mobilization edema fluid in cases of nutritional edema & nephrotic syndrome by correcting plasma osmotic pressure

3-Water

Inhibition of ADH

Carbonic anhydrase inhibitors

e.g. Acetazolamide (Diamox)

Weak diuretic, ↓HCO3 at proximal convoluted tubules & cause mild metabolic acidosis

Uses: -Glaucoma

-petit epilepsy

-high altitude sickness