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DIURETICS

EFFECT ON PLASMA ELECTROLYTE CONCENTRATIONS

DRUG CLASS	Diuresis	Sodium (Na^+)	Potassium (K^+)	Magnesium (Mg^{2+})	Calcium (Ca^{2+})	Chloride (Cl^-)	Bicarb (HCO_3^-)	Uric Acid	Glucose
Thiazides	++*	↓↓	↓	↓	↑	↓	↑	↑	↑
Loop Diuretics	++++	↓	↓↓	↓↓	↓↓	↓	↑↑	↑	↑
Mineralocorticoid Receptor Antagonists	++#	--	↑↑	--	--	--	--	--	--
Potassium Sparing Diuretics	+	--	↑↑	--	--	--	--	--	--
Carbonic Anhydrase Inhibitors	++	--	↓	--	--	--	↓	--	--

*Thiazide diuresis decreases with chronic use but the effect for hypertension persists due to decreased systemic vascular resistance from thiazides with long-term use.
Aldosterone antagonists in higher doses are excellent diuretics in cases of hyperaldosteronism, such as cirrhosis. The diuretic effect is minimal in those with low aldosterone levels.

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DIURETICS

INDICATIONS & COMMON USES

Drug Class	Ascites	Edema	Epilepsy	Heart Failure	CKD in Type 2 Diabetes	Hypertension	Intracranial Pressure Reduction	Intraocular Pressure Reduction	Mountain Sickness	Primary Hyperaldosteronism
Thiazides and Thiazide-Like										
Chlorothiazide		✓				✓				
Hydrochlorothiazide		✓				✓				
Chlorthalidone		✓				✓				
Indapamide		✓				✓				
Metolazone		✓				✓				
Loop Diuretics										
Bumetanide		✓		✓		✓				
Furosemide	✓	✓		✓		✓				
Torsemide		✓		✓		✓				
Mineralocorticoid Receptor Antagonists										
Eplerenone				✓		✓				✓
Finerenone				✓	✓					
Spironolactone	✓			✓		✓				✓
Potassium Sparing Diuretics										
Amiloride				✓		✓				
Triamterene		✓				✓				
Carbonic Anhydrase Inhibitors										
Acetazolamide		✓	✓				✓	✓	✓	
Methazolamide								✓		
Osmotic Diuretics										
Mannitol							✓	✓		

Note: The diuretics summary represents the editor's best effort to summarize the indications based on data from various reputable sources of information and reported clinical trial data. It is also meant to be for educational purposes only and is not intended to replace medical decision making or clinical judgment.

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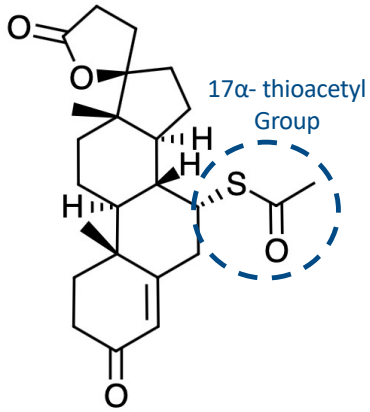
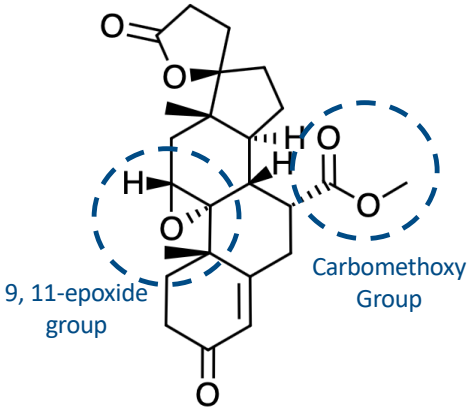
MINERALOCORTICOID RECEPTOR ANTAGONISTS

STEROIDAL

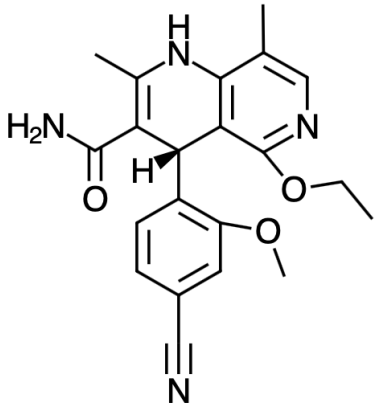


Spironolactone



Eplerenone

NON-STEROIDAL



Finerenone

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MINERALOCORTICOID RECEPTOR ANTAGONISTS (MRA)

PHARMACOKINETIC & PHARMACODYNAMIC PROFILES

Medication	PHARMACOKINETIC (PK) PROFILE				PHARMACODYNAMIC (PD) PROFILE					
	F	Distribution	Metabolism	Half-Life (hrs)	Selectivity to MR	Affinity (Potency) to MR	Anti-Fibrotic Effects	BP Lowering Effects	Risk of Hyperkalemia	Sexual Side Effects
Steroidal MRAs (Chemical Structure = Flat)										
Spironolactone	~ 90%	Kidney >> Heart (by > 6-fold). + CNS	CYP3A4 (Substrate; Major) Pro-drug --> Active metabolites	> 20	Low	High	+++	+++++	+++++	++
Eplerenone	69%	Kidney > Heart (~ 3-fold). + CNS	CYP3A4 (Substrate; Major) Inactive metabolites	4 to 6	Medium	Low	+++	++	+++	+
Non-Steroidal MRA (Chemical Structure = Bulky)										
Finerenone	44%	Kidney = Heart (at 1:1). - CNS	CYP3A4 (Substrate; Major). CYP2C8 (minor) Inactive metabolites	2 to 4	High	High	+++++	++	++	-

Note: The table represents the editor's best effort to summarize the intent of available clinical data based on data from various reputable sources of information. It is relevant to recognize that some information is intended to be estimates (not absolutes) or to provide initial guidance. Any use is meant to be for educational purposes only and is not intended to replace medical decision making or clinical judgment.

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Image last updated: 7/17/25

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LOOP DIURETICS

PHARMACOKINETIC & DOSING CONSIDERATIONS

	Furosemide	Bumetanide	Torsemide
PHARMACOKINETICS			
Bioavailability	50 - 70%	80 - 100%	80 - 100%
Affected by Food	Yes	Yes	No
Interpatient Variability	+++	+	+
Half-life	0.5 - 2 hrs	~ 1.5 hrs	~ 3.5 hrs
Duration	6 - 8 hrs	4 - 6 hrs	12 - 16 hrs
Elimination (Primary)	Renal Tubular Secretion (OAT1/3)	Renal Tubular Secretion (OAT1/3)	Renal Tubular Secretion (OAT1/3 & OATP1B1/1B3)
DOSING CONSIDERATIONS			
Usual Daily Dose	20 - 160 mg	0.5 - 4 mg	10 - 80 mg
Ceiling Dose	400 mg	10 mg	200 mg
Equivalent Dose	1	~ 40	~ 4
PO → IV Dose	1:0.5	1:1	1:1

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THIAZIDE DIURETICS

PHARMACOKINETIC & DOSING CONSIDERATIONS

	HCTZ	Chlorothiazide	Chlorthalidone*	Indapamide*	Metolazone*
PHARMACOKINETICS					
Bioavailability	50 - 80%	poor	65%	100%	40 - 65%
Half-life	5 - 14 hrs	45 - 120 min	35 - 55 hrs	14 - 15 hrs	8 - 14 hrs
Duration of Action	6 - 12 hrs	6 - 12 hrs	24 - 72 hrs	36 hrs	12 - 24 hrs
Elimination	Renal	Renal	Renal	Renal	Renal
DOSING CONSIDERATIONS					
Usual Daily Dose	25-100 mg QD - BID	250-1000 mg QD – BID. PO;IV	12.5-25 mg QD	2.5-5 mg QD	2.5-5 mg QD
Ceiling Dose	200 mg (25 mg max effective)	1000 mg	100 mg	5 mg	20 mg
Trough:Peak Ratio	-	-	-	85 - 89%	-
CrCl 20-50 mL/min	Not effective CrCl < 30 - 40	Not effective CrCl < 30 - 40	Not effective CrCl < 30 - 40	Not effective CrCl < 30 - 40	2.5 - 20 mg qd
CrCl < 20 mL/min	Avoid CrCl < 10	Avoid CrCl < 10	Avoid CrCl < 10	Avoid CrCl < 10	2.5-20 mg qd

Note: * Structurally different from the thiazide diuretics, but they work in the same way. The table represents the editor's best effort to summarize the intent of clinical data based on data from various reputable sources of information. It is relevant to recognize that some information is intended to be estimates (not absolutes) or to provide initial guidance. Each clinical scenario will be unique and requires clinical judgment, as well as consideration of multiple confounders. Any use is meant to be for educational purposes only and is not intended to replace medical decision-making or clinical judgment.

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