

Did You Know?

Loop Diuretics

Main Indications:

- Fluid retention in heart failure and kidney disease
- Hypertension

Special notes:

- The loop diuretics are more potent diuretics than thiazides, but less effective antihypertensives in most patients.¹
- Loop diuretics are recommended over thiazides in patients with renal impairment (GFR < 30 ml/min) due to decreased efficacy of the thiazides in this patient population. However, a thiazide can be added to a loop to enhance diuresis.²

Differences:

Bioavailability: A measure of the rate and fraction of the initial dose of a drug that successfully reaches either; the site of action or the bodily fluid domain from which the drug's intended targets have unimpeded access³:

- Furosemide is 10-100% (varies from patient to patient)
- Bumetanide and Torsemide are both about 80-100 %

Half-life:

- Furosemide and Bumetanide 4-6 hours
- Torsemide has a much longer half-life, allowing for once daily dosing: ~12-16 hours

Equivalent Dosing⁴:

- Furosemide 40 mg=Torsemide 20 mg=Bumex 1 mg=Ethacrynic acid 50 mg
- Ethacrynic acid is a loop diuretic that can be used in those with a Sulfa allergy as it does not contain a sulfa group. This particular loop is more ototoxic than the other loop diuretics.

References:

1. Cheng JW. Essential hypertension. In: Zeind CS, Carvalho MG. Koda-Kimble & Young's Applied Therapeutics: the Clinical Use of Drugs. 11th ed. Philadelphia, PA: Lippincott Williams & Wilkins, 2018: 132-61.
2. Singh H, Marrs JC. Heart failure. In: Zeind CS, Carvalho MG. Koda-Kimble & Young's Applied Therapeutics: the Clinical Use of Drugs. 11th ed. Philadelphia, PA: Lippincott Williams & Wilkins, 2018: 261-305.
3. Currie GM. Pharmacology, Part 2: Introduction to Pharmacokinetics. J Nucl Med Technol. 2018 Sep;46(3):221-230.
4. Pham D, et al. Card Fail Rev 2017; 3:108-12.

How Do They Work?

Loop diuretics work in the loop of Henle in the kidney (Fig. 1). They reduce sodium reabsorption, which causes the elimination of water and sodium from the body.

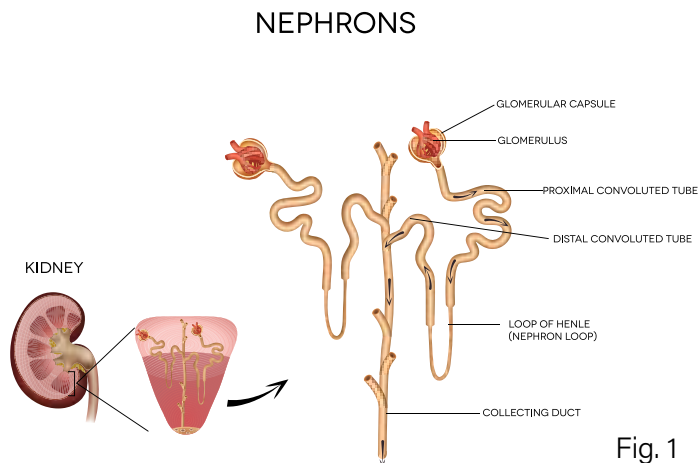


Fig. 1

Monitoring:

- Electrolytes
 - Diuretics can cause hypokalemia and potassium supplementation is often required. General rule: 20 mEq of potassium per 40 mg of Furosemide.
 - Magnesium loss can also be seen and therefore should be checked at least annually.
- Weights, blood pressure, and renal function should also be monitored.