

# Furosemide

## Classification

Antihypertensive, loop diuretic

## Indications

■ CCP: Cardiogenic pulmonary edema

## Contraindications

- Systolic blood pressure < 100 mmHg
- Hypersensitivity to furosemide or sulfonamide-derived drugs
- Complete renal shutdown
- Hepatic coma or precoma
- Known or suspected electrolyte imbalance, hypovolemia, dehydration, or hypotension
- Jaundice in newborn infants or infants with diseases capable of causing hyperbilirubinemia
- Pregnancy or breast-feeding

## Adult dosages

■ CCP: Acutely decompensated cardiogenic pulmonary edema

- For patients with intact renal function: 40-80 mg IV/IO, or double the patient's usual daily dose
- For patients with known or suspected renal impairment (eGFR < 30 mL/minute/1.73 m<sup>2</sup>): higher doses may be required to achieve diuretic responses; single doses > 160-200 mg IV are unlikely to produce additional diuresis.

## Pediatric Considerations And Dosing

Caution: Limited data available. Consultation with CiniCall is required.

## Mechanism Of Action

Furosemide inhibits the reabsorption of sodium and chloride in the ascending loop of Henle, as well as the proximal and distal tubules.

## Adverse Effects

Cardiovascular: Necrotizing angiitis, orthostatic hypotension, thrombophlebitis

Dermatologic: Acute generalized exanthematous pustulosis, bulla (hemorrhagic), bullous pemphigoid, erythema multiforme, exfoliative dermatitis, lichenoid eruption, pruritus, skin photosensitivity, skin rash, Stevens-Johnson syndrome, toxic epidermal necrolysis, urticaria.

Endocrine & metabolic: Glycosuria, hyperglycemia, hyperuricemia, hypocalcemia, hypochloremic alkalosis, hypokalemia, hypomagnesemia, hypovolemia, increased serum cholesterol, increased serum triglycerides

Gastrointestinal: Abdominal cramps, anorexia, constipation, diarrhea, gastric irritation, nausea, oral irritation, pancreatitis, vomiting

Genitourinary: Bladder spasm

Hematologic & oncologic: Agranulocytosis, anemia, aplastic anemia, hemolytic anemia, leukopenia, purpuric disease, thrombocytopenia

Hepatic: Hepatic encephalopathy, increased liver enzymes, intrahepatic cholestatic jaundice

Hypersensitivity: Anaphylactic shock, anaphylaxis, angioedema, nonimmune anaphylaxis

Immunologic: Drug reaction with eosinophilia and systemic symptoms

Nervous system: Dizziness, headache, paresthesia, restlessness, vertigo

Neuromuscular & skeletal: Asthenia, muscle spasm

Ophthalmic: Blurred vision, xanthopsia

Otic: Deafness, tinnitus

Renal: Acute kidney injury, calcium nephrolithiasis (pediatric patients), interstitial nephritis (allergic) (Jennings 1986), nephrolithiasis (pediatric patients)

Miscellaneous: Fever

Source: Furosemide. In: Lexicomp Online, UpToDate, Waltham, MA. (Accessed November 20, 2020.)

## Warning And Precautions

- If given in excessive amounts, furosemide can lead to profound diuresis, causing fluid and electrolyte depletion. Supervise therapy closely.
- Monitor fluid status and renal function to prevent oliguria, azotemia, and increases in BUN and creatinine.

## Drug Interactions

May enhance the hypotensive effect of angiotensin-converting enzyme inhibitors.

Beta-2 adrenergic agonists may enhance the hypokalemic effect of loop diuretics, including furosemide.

Non-steroidal anti-inflammatory agents may diminish the effectiveness of loop diuretic.

Opioid agonists may enhance the toxic effects of diuretics, and diminish their therapeutic effectiveness.

