Lasix (furosemide) - Drug Summary

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Related Drug Information ▼

Furosemide
(furosemide)

COMMON BRAND NAMES

Lasix, Furosemide

THERAPEUTIC CLASS

Loop diuretic

DEA CLASS

RX

ADULT DOSAGE & INDICATIONS

Edema

Associated w/ CHF, Liver Cirrhosis, and Renal Disease (Nephrotic Syndrome):
Oral:
Initial: 20-80mg as a single dose
Titrate: May repeat the same dose if needed or increase dose by 20mg or 40mg; give dose no sooner than 6-8 hrs after the previous dose until desired diuretic effect has been obtained; give individually determined single dose qd or bid
Severe Edematous States: May carefully titrate dose up to 600mg/day

Consider giving on 2-4 consecutive days each week
Closely monitor when exceeding 80mg/day for prolonged periods

Inj:
Initial: 20-40mg as a single dose IV/IM; give IV dose slowly (1-2 min)
Titrate: May repeat the same dose if needed or increase by 20mg no sooner than 2 hrs after the previous dose; give individually determined single dose qd or bid

Hypertension

Oral:
Initial: 40mg bid
Titrate: Adjust dose according to response

Add other antihypertensive agents if response is not satisfactory

Acute Pulmonary Edema

Inj:
Initial: 40mg IV slowly (over 1-2 min)
Titrate: May increase to 80mg IV slowly (over 1-2 min), if satisfactory response does not occur within 1 hr

Additional therapy (eg, digitalis, oxygen) may be administered concomitantly if necessary

PEDIATRIC DOSAGE & INDICATIONS

Edema

Associated w/ CHF, Liver Cirrhosis, and Renal Disease (Nephrotic Syndrome):
Oral:
Initial: 2mg/kg as a single dose
Titrate: May increase by 1 or 2mg/kg no sooner than 6-8 hrs after the previous dose, if diuretic response is not satisfactory after the initial dose
Maint: Adjust to the minimum effective level
Max: 6mg/kg

Inj:
Initial: 1mg/kg IV/IM
Titrate: May increase by 1mg/kg no sooner than 2 hrs after the previous dose, if response is not satisfactory
Max: 6mg/kg
Premature Infants: 1mg/kg/day

DOSING CONSIDERATIONS

Elderly
Oral/Inj:
Start at lower end of dosing range

Concomitant Medications
Antihypertensives:
Oral:
Reduce dose of other agents by at least 50%
May further reduce dose or d/c therapy of other antihypertensive drugs as BP falls

ADMINISTRATION

Oral/IV/IM route

IV
Add furosemide inj to NaCl inj, D5, lactated Ringer's inj after pH has been adjusted to above 5.5
Administer as a controlled IV infusion at a rate no greater than 4mg/min
Care must be taken to ensure that the pH of the prepared infusion sol is in the weakly alkaline to neutral range
Acid sol, including other parenteral medications (eg, labetalol, ciprofloxacin, amrinone, milrinone), must not be administered concurrently in the same infusion because they may cause precipitation of the furosemide
Furosemide inj should not be added to a running IV line containing any of these acidic products

HOW SUPPLIED

Inj: 10mg/mL [2mL, 4mL, 10mL]; Sol: 10mg/mL [60mL, 120mL], 40mg/5mL [500mL]; Tab: (Lasix) 20mg, 40mg*, 80mg *scored

CONTRAINDICATIONS

Anuria.

WARNINGS/PRECAUTIONS

May lead to profound diuresis with water and electrolyte depletion if given in excessive amounts; careful medical supervision required and dose and dose schedule must be adjusted to individual patient's needs. Initiate therapy in hospital with hepatic cirrhosis and ascites. Do not institute therapy until basic condition is improved in patients with hepatic coma and in states of electrolyte depletion. D/C if increasing azotemia and oliguria occur during treatment of severe progressive renal disease. Tinnitus, reversible or irreversible hearing impairment, and deafness reported. Ototoxicity is associated with rapid inj, severe renal impairment, use of higher than recommended doses, hypoproteinemia, or concomitant use with aminoglycoside antibiotics, ethacrynic acid, or other ototoxic drugs; control IV infusion rate if using high dose parenteral therapy. Excessive diuresis may cause dehydration, blood volume reduction with circulatory collapse, vascular thrombosis and embolism, particularly in elderly. Monitor for fluid/electrolyte imbalance (hyponatremia, hypochloremia alkalosis, hypokalemia, hypomagnesemia, or hypocalcemia), liver/kidney damage, blood dyscrasias, or other idiosyncratic reactions. Increased in blood glucose and alterations in glucose tolerance tests, and rarely, precipitation of diabetes mellitus (DM) reported. May cause acute urinary retention in patients with severe symptoms of urinary retention; monitor carefully, especially during the initial stages of treatment. May lead to a higher incidence of deterioration in renal function after receiving radiocontrast in patients at high risk for radiocontrast nephropathy. May potentiate ototoxicity and effect of therapy may be weakened in patients with hypoproteinemia. Asymptomatic hyperuricemia may occur and gout may rarely be precipitated. Caution in patients with sulfonamide allergy. May activate/exacerbate systemic lupus erythematosus (SLE). May precipitate nephrocalcinosis/nephrolithiasis in premature infants and children <4 yrs of age with no history of prematurity; monitor renal function and consider renal ultrasonography. May increase risk of persistence of patent ductus arteriosus in premature infants during the 1st weeks of life. May interfere with certain lab tests. Caution in elderly. (Inj) Use only in patients unable to take PO medication or in emergency situations; replace with PO therapy as soon as practical. May develop plasma level with potential toxic effects in premature infants with post conceptual age (gestational plus postnatal) <31 weeks receiving doses exceeding 1mg/kg/24 hrs. May cause hearing loss in neonates.

ADVERSE REACTIONS

Pancreatitis, jaundice, anorexia, paresthesias, diarrhea, N/V, dizziness, rash, urticaria, photosensitivity, fever, thrombophlebitis, restlessness, aplastic anemia, eosinophilia.

DRUG INTERACTIONS

May increase ototoxic potential of aminoglycoside antibiotics; avoid this combination, except in life-threatening situations. Avoid with ethacrynic acid and lithium. May experience salicylate toxicity at lower doses with concomitant high doses of salicylates for rheumatic disease. May antagonize skeletal muscle relaxing effect of tubocurarine. May potentiate action of succinylcholine. Potentiation of therapeutic effect of other antihypertensive drugs. Potentiation occurs with ganglionic or peripheral adrenergic blockers. May decrease arterial responsiveness to norepinephrine. Reduced CrCl in patients with chronic renal insufficiency with acetylsalicylic acid. Increased BUN, SrCr, and K^+ levels, and weight gain reported with NSAIDs. Hypokalemia may develop with adrenocorticotropic hormone and corticosteroids. Reduced natriuretic and antihypertensive effects with indomethacin. Indomethacin may affect plasma renin levels, aldosterone excretion, and renin profile evaluation. Digitalis may exaggerate metabolic effects of hypokalemia. (Inj/Tab) Avoid with chloral hydrate. May enhance nephrotoxicity of nephrotoxic drugs (eg, cisplatin) if furosemide is not given in lower doses and with positive fluid balance. Severe hypotension and renal function deterioration including renal failure may occur; interruption or reduction in dose of furosemide, ACE inhibitors, or ARBs may be necessary. Phenytoin interferes with renal action. Methotrexate and other drugs that undergo significant renal tubular secretion may reduce the effect of furosemide. May increase the risk of cephalosporin-induced nephrotoxicity. Increased risk of gouty arthritis with cyclosporine. Hypokalemia may develop with licorice in large amounts, or prolonged use of laxatives. (Tab/Sol) Reduced natriuretic and antihypertensive effects with sucralfate; separate intake by at least

2 hrs.

PREGNANCY AND LACTATION

Category C, caution in nursing.

MECHANISM OF ACTION

Loop diuretic; primarily inhibits the absorption of Na^+ and Cl^- not only in the proximal and distal tubules but also in the loop of Henle.

PHARMACOKINETICS

Absorption: Bioavailability (64% tab), (60% sol). **Distribution:** Plasma protein binding (91-99%); found in breast milk. **Metabolism:** Biotransformation; furosemide glucuronide (major metabolite). **Elimination:** Urine; $T_{1/2}$=2 hrs.

ASSESSMENT

Assess for anuria, sulfonamide/drug hypersensitivity, SLE, hepatic/renal impairment, hypoproteinemia, pregnancy/nursing status, and possible drug interactions.

MONITORING

Monitor for signs/symptoms of fluid/electrolyte imbalance, blood dyscrasias, hyperglycemia and alterations in glucose tolerance tests, hyperuricemia, precipitation of gout or DM, ototoxicity, dehydration, blood volume reduction with circulatory collapse, vascular thrombosis and embolism, acute urinary retention, and other adverse reactions. Monitor serum electrolytes, carbon dioxide, creatinine, and BUN frequently during 1st few months of therapy, then periodically thereafter. Monitor urine and blood glucose periodically in diabetics. Monitor renal function and perform renal ultrasonography in pediatric patients.

PATIENT COUNSELING

Advise that patient may experience symptoms from excessive fluid and/or electrolyte losses. Advise that postural hypotension can be managed by getting up slowly. Inform patients with DM that drug may increase blood glucose levels and affect urine glucose tests. Advise that skin may be more sensitive to sunlight during therapy. Advise hypertensive patients to avoid medications that may increase BP, including OTC products for appetite suppression and cold symptoms.

STORAGE

Protect from light. (Inj) 20-25°C (68-77°F). (Tab/Sol) 25°C (77°F); excursions permitted to 15-30°C (59-86°F).

Back to top