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Levofloxacin: Drug information

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(For additional information see "[Levofloxacin: Patient drug information](#)" and see "[Levofloxacin: Pediatric drug information](#)")

U.S. BRAND NAMES — Levaquin®; Quixin™

PHARMACOLOGIC CATEGORY

Antibiotic, Quinolone

DOSING: ADULTS — Note: Infuse I.V. solution over 60 minutes.

Chronic bronchitis (acute bacterial exacerbation): Oral, I.V.: 500 mg every 24 hours for at least 7 days

Maxillary sinusitis (acute): Oral, I.V.: 500 mg every 24 hours for 10-14 days

Pneumonia: Oral, I.V.:

Community-acquired: 500 mg every 24 hours for 7-14 days

Nosocomial: 750 mg every 24 hours for 7-14 days

Prostatitis (chronic bacterial): Oral, I.V.: 500 mg every 24 hours for 28 days

Skin infections: Oral, I.V.:

Uncomplicated: 500 mg every 24 hours for 7-10 days

Complicated: 750 mg every 24 hours for 7-14 days

Urinary tract infections: Oral, I.V.:

Uncomplicated: 250 mg once daily for 3 days

Complicated, including acute pyelonephritis: 250 mg every 24 hours for 10 days

Bacterial conjunctivitis: Ophthalmic:

Treatment day 1 and day 2: Instill 1-2 drops into affected eye(s) every 2 hours while awake, up to 8 times/day

Treatment day 3 through day 7: Instill 1-2 drops into affected eye(s) every 4 hours while awake, up to 4 times/day

DOSING: PEDIATRIC — Not for systemic use.

(For additional information see "[Levofloxacin: Pediatric drug information](#)")

Conjunctivitis (bacterial): Ophthalmic: Children ≥1 year: Refer to adult dosing.

DOSING: ELDERLY — Refer to adult dosing. ← No geriatric dose recommended

DOSING: RENAL IMPAIRMENT

Chronic bronchitis, acute maxillary sinusitis, uncomplicated skin infection, community-acquired pneumonia, chronic bacterial prostatitis, complicated UTI, or acute pyelonephritis: First dose as indicated in patients with normal renal function (250 mg or 500 mg), followed by:

Clcr 20-49 mL/minute: 250 mg every 24 hours

Clcr 10-19 mL/minute: 250 mg every 48 hours

Uncomplicated UTI: No dosage adjustment required

Complicated skin infection or nosocomial pneumonia:

Clcr 20-49 mL/minute: Administer 750 mg every 48 hours

Clcr 10-19 mL/minute: Administer 500 mg every 48 hours (initial: 750 mg)

Hemodialysis/CAPD: 250 mg every 48 hours (initial: 500 mg for most infections; initial: 750 mg for complicated skin/soft tissue infections followed by 500 mg every 48 hours)

DOSAGE FORMS

Infusion [premixed in D5W] (Levaquin®): 5 mg/mL (50 mL, 100 mL, 150 mL)

Injection, solution [preservative free] (Levaquin®): 25 mg/mL (20 mL, 30 mL)

Solution, ophthalmic (Quixin™): 0.5% (5 mL) [contains benzalkonium chloride]

Tablet (Levaquin®): 250 mg, 500 mg, 750 mg

GENERIC EQUIVALENT AVAILABLE — No

ADMINISTRATION

Oral: May be administered without regard to meals.

I.V.: Infuse I.V. solution over 60 minutes. Too rapid of infusion can lead to hypotension. Avoid administration through an intravenous line with a solution containing multivalent cations (ie, magnesium, calcium).

USE

Systemic: Treatment of mild, moderate, or severe infections caused by susceptible organisms. Includes the treatment of community-acquired pneumonia (including penicillin-resistant strains of *S. pneumoniae*); nosocomial pneumonia; chronic bronchitis (acute bacterial exacerbation); acute maxillary sinusitis; urinary tract infection (uncomplicated or complicated), including acute pyelonephritis caused by *E. coli*; prostatitis (chronic bacterial); skin or skin structure infections (uncomplicated or complicated)

Ophthalmic: Treatment of bacterial conjunctivitis caused by susceptible organisms

ADVERSE REACTIONS SIGNIFICANT

1% to 10%:

Central nervous system: Dizziness, fever, headache, insomnia

Gastrointestinal: Nausea, vomiting, diarrhea, constipation

Ocular (with ophthalmic solution use): Decreased vision (transient), foreign body sensation, transient ocular burning, ocular pain or discomfort, photophobia

Respiratory: Pharyngitis

<1% (Limited to important or life-threatening):

Systemic: Acute renal failure; allergic reaction (including pneumonitis rash, pneumonitis, and anaphylaxis); anaphylactoid reaction, arrhythmias (including ventricular tachycardia and torsade de pointes), arthralgia, bradycardia, cardiac failure, dysphonia, eosinophilia, erythema multiforme, granulocytopenia, hemolytic anemia, hepatic failure, hypertension, intracranial hypertension, jaundice, leukocytosis, leukopenia, leukorrhea, photosensitivity (<0.1%), pseudomembranous colitis, pulmonary embolism, QTc prolongation, seizures, Stevens-Johnson syndrome, tachycardia, tendon rupture, transaminases increased, thrombocytopenia, tremor

Ophthalmic solution: Allergic reaction, lid edema, ocular dryness, ocular itching

CONTRAINDICATIONS — Hypersensitivity to levofloxacin, any component of the formulation, or other quinolones

WARNINGS / PRECAUTIONS

Systemic: Not recommended in children <18 years of age; CNS stimulation may occur (tremor, restlessness, confusion, and very rarely hallucinations or seizures); use with caution in patients with known or suspected CNS disorders or renal dysfunction; use caution to avoid possible photosensitivity reactions during and for several days following fluoroquinolone therapy

Rare cases of torsade de pointes have been reported in patients receiving levofloxacin. Risk may be minimized by avoiding use in patients with bradycardia, hypokalemia, hypomagnesemia, cardiomyopathy, or in those receiving concurrent therapy with Class Ia or Class III

Severe hypersensitivity reactions, including anaphylaxis, have occurred with quinolone therapy. If an allergic reaction occurs (itching, urticaria, dyspnea or facial edema, loss of consciousness, tingling, cardiovascular collapse), discontinue drug immediately. Prolonged use may result in superinfection; pseudomembranous colitis may occur and should be considered in all patients who present with diarrhea. Tendon inflammation and/or rupture has been reported; discontinue at first sign of tendon inflammation or pain. Risk may be increased with concurrent corticosteroids, particularly in the elderly. Quinolones may exacerbate myasthenia gravis, use with caution (rare, potentially life-threatening weakness of respiratory muscles may occur).

Ophthalmic solution: For topical use only. Do not inject subconjunctivally or introduce into anterior chamber of the eye. Contact lenses should not be worn during treatment for bacterial conjunctivitis. Safety and efficacy in children <1 year of age have not been established.

DRUG INTERACTIONS

(For additional information: [Launch Lexi-Interact™ Drug Interactions Program](#) )

Antidiabetic agents: Blood glucose may be altered during concurrent therapy; monitor

Antineoplastic agents may decrease the absorption of quinolones.

Caffeine: Increased CNS stimulation is reported when used with other quinolone antibiotics

Cimetidine, and other H2 antagonists may inhibit renal elimination of quinolones. No dosage adjustment is recommended.

Corticosteroids: Concurrent use may increase the risk of tendon rupture, particularly in elderly patients (overall incidence rare).

Cyclosporine: Transient increases in serum creatinine are seen when used with other quinolones

Foscarnet has been associated with an increased risk of seizures with some quinolones.

Loop diuretics: Serum levels of some quinolones are increased by loop diuretic administration. May diminish renal excretion.

Metal cations (magnesium, aluminum, iron, and zinc) bind quinolones in the gastrointestinal tract and inhibit absorption (by up to 98%). Antacids, electrolyte supplements, sucralfate, quinapril, and some didanosine formulations (chewable/buffered tablets and pediatric powder for oral suspension) should be avoided. Levofloxacin should be administered 2 hours before or 2 hours after these agents.

NSAIDs: The CNS stimulating effect of some quinolones may be enhanced, resulting in neuroexcitation and/or seizures.

Probenecid: Blocks renal secretion of quinolones, increasing concentrations. No dosage adjustment is recommended.

QTc-prolonging agents (including Class Ia and Class III antiarrhythmics, erythromycin, cisapride, antipsychotics, and cyclic antidepressants) should be avoided with levofloxacin.

Theophylline: Increased plasma levels of theophylline are reported when used with other quinolone antibiotics; potential with levofloxacin appears limited; monitor

Warfarin: The hypoprothrombinemic effect of warfarin is enhanced by some quinolone antibiotics. Levofloxacin does not alter warfarin kinetics, but may alter the gastrointestinal flora. Monitor INR closely during therapy.

PREGNANCY RISK FACTOR — C ([show table](#))

PREGNANCY IMPLICATIONS — Avoid use in pregnant women unless the benefit justifies the potential risk to the fetus.

LACTATION — Enters breast milk/contraindicated

BREAST-FEEDING CONSIDERATIONS — Quinolones are known to distribute well into breast milk; consequently, use during lactation should be avoided, if possible.

DIETARY CONSIDERATIONS — May be taken without regard to meals.

PRICING — (data from drugstore.com)

Solution (Quixin)
0.5% (5): \$44.61

Tablets (Levaquin)
250 mg (10): \$82.27
500 mg (10): \$93.35
750 mg (7): \$105.75

MONITORING PARAMETERS — Evaluation of organ system functions (renal, hepatic, ophthalmologic, and hematopoietic) is recommended periodically during therapy; the possibility of crystalluria should be assessed; WBC and signs of infection

TOXICOLOGY / OVERDOSE COMPREHENSIVE — Symptoms include acute renal failure and

seizures. Treatment should include GI decontamination and supportive care. Not removed by peritoneal or hemodialysis.

CANADIAN BRAND NAMES — Levaquin®

INTERNATIONAL BRAND NAMES — Cravit® (ID, JP); Cravit Ophth Soln® (SG); Cravox® (ID); Elequine® (CR, DO, GT, HN, MX, PA, SV); Levaquin® (CA, CO); Levofloxacin® (BR); Levoxacin® [inj.] (IT); Levoxacin® (IT); Levoxetina® (SV); Mosardal® (ID); Nislev® (ID); Oftaquix® (DE); Tavanic® (AR, EC, ES, FI, GB, IN, IT, TR, ZA); Tavanic® [inj.] (AT, CO, HU, IE, PT, TR)

MECHANISM OF ACTION — As the S (-) enantiomer of the fluoroquinolone, ofloxacin, levofloxacin, inhibits DNA-gyrase in susceptible organisms thereby inhibits relaxation of supercoiled DNA and promotes breakage of DNA strands. DNA gyrase (topoisomerase II), is an essential bacterial enzyme that maintains the superhelical structure of DNA and is required for DNA replication and transcription, DNA repair, recombination, and transposition.

PHARMACODYNAMICS / KINETICS

Absorption: Rapid and complete

Distribution: Vd: 1.25 L/kg; CSF concentrations ~15% of serum levels; high concentrations are achieved in prostate and gynecological tissues, sinus, breast milk, and saliva

Protein binding: 50%

Metabolism: Minimally hepatic

Bioavailability: 100%

Half-life elimination: 6 hours

Time to peak, serum: 1 hour

Excretion: Primarily urine (as unchanged drug)

PATIENT EDUCATION

(For additional information see "[Levofloxacin: Patient drug information](#)")

Oral: Take per recommended schedule, preferably on an empty stomach (1 hour before or 2 hours after meals). Maintain adequate hydration (2-3 L/day of fluids unless instructed to restrict fluid intake). Take complete prescription; do not skip doses. Do not take with antacids; separate by 2 hours. You may experience dizziness, lightheadedness, or confusion; use caution when driving or engaging in tasks that require alertness until response to drug is known. Small frequent meals and frequent mouth care may reduce nausea or vomiting. You may experience photosensitivity; use sunscreen, wear protective clothing and eyewear, and avoid direct sunlight. Report palpitations or chest pain, persistent diarrhea, GI disturbances or abdominal pain, muscle tremor or pain, yellowing of eyes or skin, easy bruising or bleeding, unusual fatigue, fever, chills, signs of infection, or worsening of condition. Report immediately any rash, itching, unusual CNS changes, or any facial swelling. Report immediately any pain, inflammation, or rupture of tendon.

Ophthalmic: Wash hands before instilling solution. Sit or lie down to instill. Open eye, look at ceiling, and instill prescribed amount of solution. Close eye and roll eye in all directions, and apply gentle pressure to inner corner of eye. Do not let tip of applicator touch eye or contaminate tip of applicator. Temporary stinging or blurred vision may occur. Report persistent pain, burning, vision

disturbances, swelling, itching, or worsening of condition. Discontinue medication and contact prescriber immediately if you develop a rash or allergic reaction. Do not wear contact lenses.

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