

Ciprofloxacin

Antibiotic Class:

Quinolone

Antimicrobial Spectrum:

Gram-positive: methicillin-susceptible *Staphylococcus aureus* (MSSA) (lowest quinolone activity vs. MSSA), *Streptococcus pneumoniae*

Gram-negative: *Enterobacteriaceae*, *H. influenzae*, other *Haemophilus spp.*, *N. gonorrhoeae*, *N. meningitidis*, *M. catarrhalis*, *P. aeruginosa*, *S. maltophilia*

Atypicals: *Legionella pneumophila*

Mechanism of Action:

Inhibition of topoisomerase (DNA gyrase) enzymes, which inhibits relaxation of supercoiled DNA and promotes breakage of double stranded DNA.

Pharmacodynamics

Fluoroquinolones produce both concentration dependant (peak:MIC), and a combination of concentration and time-dependant killing (AUC:MIC).

Pharmacokinetics:

Dose of 750mg

C_{max}: 3.5mg/ml

Volume of distribution: 3.2 L/kg

Table 2

Table 3

Adverse Reaction:

CNS: headache, insomnia, dizziness; hallucinations, depression, psychotic reactions (rare)

Connective tissue: tendon injury

Renal: interstitial nephritis

Cardiovascular: QTC prolongation, torsades de pointes, arrhythmias

Dosage:

Tablets: 100mg, 250mg, 500mg, 750mg, 500mg extended release tabs, 1000mg extended release tablets

IV: 200mg, 400mg

Suspension: 250mg/5ml and 500mg/5ml (both in 100ml bottles)

Adult patients:

Lower respiratory tract infections: 500-750mg PO q12h / 400mg q8-12h IV x 7-14 days

Acute sinusitis: 500mg PO q12h / 400mg q12h IV x 10 days

Nosocomial pneumonia: 400mg IV q8h x 10-14 days

Uncomplicated UTI: 250mg PO q12h x 3 days

500mg extended release tablets q24h

Complicated UTI/Pyelonephritis: 500mg PO q12h / 400mg IV q12h x 7-14 days

1000mg extended release tablets q24h
Prostatitis: 500mg PO q12h / 400mg IV q12h x 28 days
Uncomplicated gonococcal infections: 500mg PO x 1 dose
Chancroid: 500mg PO q12h x 3 doses
Uncomplicated skin/skin structure: 500-750mg PO q12h x 7-14 days / 400mg IV q8-12h
Intra-abdominal infections: 500mg PO q12h x 7-14days / 400mg IV q12h
Infectious diarrhea: 500mg q12h x 3-5 days (current recommendations)
500mg PO q12h x 5-7 days (labeled)
Inhalational anthrax (post-exposure): 500mg PO q12h x 60 days
Febrile neutropenia: 400mg IV q8h

Pediatrics:

Complicated UTI/Pyelonephritis: 6-10mg/kg not to exceed 400mg per dose q8h x 10-21 days
10-20mg/kg not to exceed 750mg per dose q12h x 10-21 days
Inhalational anthrax (post-exposure): 10mg/kg not to exceed 400mg per dose q12h x 60 days
15mg/kg not to exceed 500mg per dose q12h x 60 days

Table 4

Disease state based dosing:

Renal failure: IV: CrCl 30 mL/min or greater, give usual dose; CrCl 5-29 mL/min, 200-400 mg IV every 18-24 hr
ORAL: CrCl greater than 50 mL/min, give usual dose; CrCl 30-50 mL/min, 250-500 mg every 12 hr; CrCl 5-29 mL/min, 250-500 mg every 18 hr
Hepatic failure: No dosing changes recommended at this time.

Dosing during Continuous Renal Replacement Therapy

CVVH (Continuous venovenous hemofiltration): 200mg IV q12h
CVVHD (Continuous venovenous hemodialysis): 200-400mg IVq12h
CVVHDF (Continuous venovenous hemodiafiltration) 200-400mg g IV q12h
Note: CVVH is mainly for fluid removal alone. Many institutions will employ more CVVHD or CVVHDF which combine dialysis with fluid removal.

Contraindications/Warnings/Precautions:

Precautions

- alkalinized urine; may result in crystalluria
- tendon effects, including ruptures of shoulder, hand, Achilles tendon or other tendons; risk factors include patients over 60 years of age, renal failure, dialysis, concomitant corticosteroid therapy, and dyslipidemia

Drug Interactions:

Anticoagulants: Warfarin (prolonged warfarin half-life)
Divalent cations: aluminum, magnesium zinc, iron, calcium, antacids, sucralfate – reduced bioavailability of quinolones (potential to cause therapeutic failure)
Theophylline, caffeine, xanthines: clearance of these is inhibited with fluoroquinolones

Pregnancy Risk Factor:

C

Monitoring parameters:

Therapeutic: Culture and sensitivities, signs and symptoms of infection

Toxic: Urinalysis, BUN, SCr, AST and ALT, physical examination: encephalopathic changes

Brand names/Manufacturer:

Available by many names and manufacturers ([click here](#))

- ACEOTO - (Zambon, Spain; Salvat, Spain)
- ACEOTO PLUS - (Zambon, Spain)
- ADCO-CIPRIN - (Ranbaxy, S.Afr.)
- AFENOXIN - (Faran, Gr.)
- AGYR - (Tyrol, Austria)
- ARFLOXINA (FM) - (Arlex, Mex.)
- ARGEFLOX - (Bristol-Myers Squibb, Arg.)
- ARISTIN-C - (Anpharm (Anfarm), Gr.)
- BACTOFLOX (DI) - (Aurantis, Braz.; Biochimico, Braz.)
- BACTOQUIN - (Otsira, India)
- BALEPTON - (Leovan, Gr.)
- BAYCIP - (Bayer, Chile)
- BAYCIP - (Bayer, Spain)
- BELMACINA - (Pliva, Spain)
- BIAMOTIL - (Allergan, Braz.)
- BIAMOTIL-D - (Allergan-Frumtost, Braz.)
- BIOICIP - (Biochem, India)
- BIOICIPRO - (Biospray, Gr.)
- BIOICIP-TZ - (Biochem, India)
- BIOFLOX - (Bioresearch, Mex.)
- BIOTIC - (TRB, Arg.)
- BIVORILAN - (Medinova (Mentinova), Gr.)
- BLADER - (Fada, Arg.)
- CARMICINA - (Irex, Port.)
- CATEX - (Cantabria, Spain)
- C-BILDZ - (Alcon, Austria)
- CEPRIMAX - (Fides Ecopharma, Spain)
- CETRAXAL - (Salvat, Spain)
- CETRAXAL PLUS - (Salvat, Spain)
- CEXIDAL OTICO (FM) - (Salvat, Spain)
- C-FLOX - (Alphapharm, Austral.)
- C-FLOXACIN - (SM, Thai.)
- CIDROPS - (Faran, Gr.)
- CIFIN - (Pharmacodane, Denm.)
- CIFLAN - (Azevedos, Port.)
- CIFLOC - (Triomed, S.Afr.)
- CIFLOLAN - (Olan-Kemed, Thai.)
- CIFLOX (DI) - (Alcon, Denm.)
- CIFLOX (DI) - (Bayer, Fr.)
- CIFLOX (FM) - (Bayropharm, Ital.)
- CIFLOX - (Lannacher, Austria)
- CIFLOX (DI) - (Medley, Braz.)
- CIFLOXIN - (Lafi, Chile)
- CIFLOXIN - (Siam Bheasach, Thai.)
- CIFLOXINAL - (ProMed, Cz.)
- CIFLOXTRON - (Ariston, Braz.)
- CIFRAN - (Ranbaxy, Cz.)
- CIFRAN - (Ranbaxy, Hung.)
- CIFRAN - (Ranbaxy, India)

- CIFRAN - (Ranbaxy, S.Afr.)
- CIFRAN - (Ranbaxy, Thai.)
- CILAB - (Biolab, Thai.)
- CILODEX - (Alcon, Braz.)
- CILOQUIN - (Iloquin, Austral.)
- CILOX - (Alcon, Norw.)
- CILOXACIN - (Alcon, Chile)
- CILOXAN - (Alcon, Arg.)
- CILOXAN - (Alcon, Austral.)
- CILOXAN - (Alcon, Austria)
- CILOXAN - (Alcon, Belg.)
- CILOXAN - (Alcon, Braz.)
- CILOXAN - (Alcon, Canad.)
- CILOXAN - (Alcon, Cz.)
- CILOXAN - (Alcon, Denm.)
- CILOXAN - (Alcon, Fr.)
- CILOXAN - (Alcon, Ger.)
- CILOXAN - (Alcon, Hong Kong)
- CILOXAN - (Alcon, Hung.)
- CILOXAN - (Alcon, Israel)
- CILOXAN - (Alcon, Malaysia)
- CILOXAN - (Alcon, Mex.)
- CILOXAN - (Alcon, Neth.)
- CILOXAN - (Alcon, NZ)
- CILOXAN - (Alcon, S.Afr.)
- CILOXAN - (Alcon, Singapore)
- CILOXAN - (Alcon, Swed.)
- CILOXAN - (Alcon, Switz.)
- CILOXAN - (Alcon, Thai.)
- CILOXAN - (Alcon, UK)
- CILOXAN - (Alcon, USA)
- CILOXAN - (Alcon (Alkon), Gr.)
- CIMOGAL - (Galen, Mex.)
- CINFLOXINE - (Medicine Products, Thai.)
- CINOFLEX - (Ativus, Braz.)
- CIP ECO - (Ecosol, Switz.)
- CIPFLOXIN - (Asian Pharm, Thai.)
- CIPHIN - (Slovakofarma, Cz.)
- CIPIDE - (Merck, Hong Kong)
- CIPLOX - (Cipan, Port.)
- CIPLOX - (Cipla, Cz.)
- CIPLOX - (Cipla, India)
- CIPLOX - (Cipla, Israel)
- CIPLOX D - (Cipla, India)
- CIPLOX TZ - (Cipla, India)
- CIPOBACTER - (Rubio, Spain)
- CIPRAIN - (Maver, Mex.)
- CIPRENIT OTICO - (Vita, Spain)
- CIPREX (FM) - (Sintofarma, Braz.)
- CIPRINE - (Pfizer, Switz.)
- CIPRINOL - (KRKA, Cz.)
- CIPRO - (Bayer, Arg.)
- CIPRO - (Bayer, Braz.)
- CIPRO - (Bayer, Canad.)
- CIPRO - (Bayer, USA)
- CIPRO - (1A, Ger.; Basics, Ger.)
- CIPRO HC - (Alcon, Braz.)
- CIPRO HC - (Alcon, Canad.)
- CIPRO HC - (Alcon, Hong Kong)
- CIPRO HC - (Bayer, Arg.)
- CIPRO HC - (Bayer, USA)
- CIPROBAC - (Pisa, Mex.)

- CIPROBAY - (Alcon, Hung.)
- CIPROBAY - (Bayer, Cz.)
- CIPROBAY - (Bayer, Ger.)
- CIPROBAY - (Bayer, Hung.)
- CIPROBAY - (Bayer, Malaysia)
- CIPROBAY - (Bayer, S.Afr.)
- CIPROBAY - (Bayer, Singapore)
- CIPROBAY - (Bayer, Thai.)
- CIPROBAY HC - (Alcon, S.Afr.)
- CIPROBAY HC - (Alcon, Singapore)
- CIPROBAY HC OTIC - (Bayer, Cz.)
- CIPROBETA - (Betapharm, Ger.)
- CIPROBID - (Cadila, Cz.)
- CIPROBID - (Cadila, India)
- CIPROBID - (Cadila, Thai.)
- CIPROBIOT - (Hexal, Braz.)
- CIPROBIOTIC - (Cryopharma, Mex.)
- CIPRO-CENT - (Centaur, India)
- CIPROCEP - (TO-Chemicals, Thai.)
- CIPROCIN (FM) - (Eurofarma, Braz.)
- CIPROCINA - (Zeus, Braz.)
- CIPRODEX - (Alcon, USA)
- CIPRODEX - (Dexcel, Israel)
- CIPRODEX - (Saval, Chile)
- CIPRODINE - (Sanval, Braz.)
- CIPRODURA - (Merck dura, Ger.)
- CIPROFAR - (Elofar, Braz.)
- CIPROFIN - (Utopian, Thai.)
- CIPROFLOX - (CT, Ger.)
- CIPROFLOX - (Hebron, Braz.)
- CIPROFLOX - (Senosiain, Mex.)
- CIPROFLOX - (Spirig, Switz.)
- CIPROFLOXACIN HY
- CIPROFLOXACIN HY - (Alkon (Alkon), Gr.)
- CIPROFLOXACIN INJECTION USP 28
- CIPROFLOXACIN INJECTION USP 28
- CIPROFUR - (Fustery, Mex.)
- CIPROGLEN - (Glenmark, Thai.)
- CIPROHEXAL - (Hexal, Ger.)
- CIPROK (FM) - (Sanofi Synthelabo, Spain)
- CIPROL - (Arrow, Austral.)
- CIPROLET - (Reddy, Thai.)
- CIPRO-LICH (FM) - (Lichtenstein, Ger.)
- CIPROMED - (Alpharma, Fin.)
- CIPRO-MED - (Medika, Switz.)
- CIPROM-H - (M & H, Thai.)
- CIPROMYCIN - (Medichrom, Gr.)
- CIPRONAL - (Cazi, Braz.)
- CIPRO-OTICO - (Alcon, Arg.)
- CIPROXIL - (Haller, Braz.)
- CIPROXIN - (Bayer, Austria)

- CIPROXIN - (Bayer, Denm.)
- CIPROXIN - (Bayer, Fin.)
- CIPROXIN - (Bayer, Gr.)
- CIPROXIN - (Bayer, Hong Kong)
- CIPROXIN - (Bayer, Irl.)
- CIPROXIN - (Bayer, Israel)
- CIPROXIN - (Bayer, Ital.)
- CIPROXIN - (Bayer, Neth.)
- CIPROXIN - (Bayer, Norw.)
- CIPROXIN - (Bayer, NZ)

- CIPROXIN - (Bayer, Swed.)
- CIPROXIN - (Bayer, UK)
- CIPROXIN HC - (Alcon, Austral.)
- CIPROXIN HC (FM)
- CIPROXIN HC (FM) - (Alcon, Austria)
- CIPROXIN HC - (Alcon, Israel)
- CIPROXIN HC - (Alcon, NZ)
- CIPROXIN HC - (Alcon, Switz.)
- CIPROXINA (DI) - (Alcon Cusi, Spain)
- CIPROXINA - (Bayer, Mex.)
- CIPROXINA - (Bayer, Port.)
- CIPROXINA SIMPLE - (Alcon Cusi, Spain)
- CIPROXINE - (Bayer, Belg.)
- CIPROXINE - (Bayer, Switz.)
- CIPROXIN-HYDROCORTISON
- CIPROXIN-HYDROCORTISON - (Alcon, Fin.)
- CIPROXINO - (Andromaco, Chile)
- CIPROXYL - (Bangkok Lab & Cosmetic, Hong Kong)
- CIPROXYL - (Farmaline, Thai.)
- CIPTINI - (Cipla, India)
- CIQFADIN - (IQFA, Mex.)
- CIRFLOX-G - (Klonal, Arg.)
- CIRIAX - (Roemmers, Arg.)
- CIRIAX OTIC - (Roemmers, Arg.)
- CITIZOL - (Aristo, India)
- CITROVENOT - (Bros, Gr.)
- COBAY - (Millimed, Thai.)
- CRISACIDE - (Kampel Martian, Arg.)
- CUNESIN - (Recordati, Spain)
- CYCIN - (Dong, Singapore)
- CYFLOX - (Greater Pharma, Thai.)
- CYFLOXIN - (Marching, Hong Kong)
- DORIMAN - (Vir, Spain)
- EHLIXACIN (FM) - (Ehlinger, Mex.)
- ENI - (Grossman, Mex.)
- ESTECINA - (APS, Port.)
- ESTECINA - (Normon, Spain)
- EXERTIAL - (Baliarda, Arg.)
- FELIXENE - (Quimifar, Spain)
- FLOBAC (FM) - (Pharmus, Braz.)
- FLOCIPRIN - (IBI, Ital.)
- FLOCIPRIN - (Phoinix Pharm (Foinix Farm), Gr.)
- FLORAXINA - (Amhof, Arg.)
- FLOXACIPRON - (BA Farma, Port.)
- FLOXAGER - (Streger, Mex.)
- FLOXAKIN (FM) - (Kener, Mex.)
- FLOXAN - (Prodotti, Braz.)
- FLOXANTINA - (Degorts, Mex.)
- FLOXELENA - (Pharmacos Abug, Mex.)
- FOREXIN - (Pharmaland, Thai.)
- FORTERRA - (Help, Gr.)
- GIROFLOX - (Tecnimede, Port.)
- GIROFLOX - (Tecnimede, Spain)
- GLOBUCE - (Sigma-Tau, Spain)
- GLOSSYFIN - (Doctum, Gr.)
- GONNING - (HPP, Hong Kong)
- GRENIS-CIPRO - (Genepharm, Gr.)
- GRIFOCIPROX - (Laboratorios Chile, Chile)
- HUBERDOXINA - (ICN, Spain)
- IFICIPRO (FM) - (Unique, India)
- INFLOXA - (Alpharma, Mex.)
- INKAMIL (FM) - (Ipsen, Spain)

- ITALNIK - (Italmex, Mex.)
- KECIFLOX - (Pfleger, Ger.)
- KEEFLOXIN - (Angenerico, Port.)
- KENZOFLEX - (Collins, Mex.)
- LABENTROL - (Chrispa (Chrispa), Gr.)
- LADININ - (Pharmaten (Farmaten), Gr.)
- LEMYFLOX - (Lemery, Mex.)
- LIFERXINA - (Liferpal, Mex.)
- LIMOX - (Biomedica-Chemica, Gr.)
- MEDOCIPRIN - (Medochemie, Hong Kong)
- MEDOCIPRIN (FM) - (Medochemie, Thai.)
- MEGAFLOX - (Baldacci, Port.)
- MICRORGAN - (Liomont, Mex.)
- MICROSULF - (Microsules, Arg.)
- MITROKEN - (Kendrick, Mex.)
- NAFLOXIN - (Cooper (Koper), Gr.)
- NEOCIP - (Cipla, India)
- NEOCIP FC - (Cipla, India)
- NEOCIP M - (Cipla, India)
- NEOFLOXIN - (Beximco, Singapore)
- NIVOFLOX - (Andromaco, Mex.)
- NIVOFLOX - (Euro-Labor, Port.; Grunenthal, Port.)
- NIXIN - (Mepha, Braz.)
- NIXIN - (Mepha, Port.)
- NOVIDAT - (Temis, Arg.)
- NOVOQUIN - (Rayere, Mex.)
- OCEFAX - (Roux-Ocefa, Arg.)
- OCIMIX - (Panacea, India)
- OFLONO - (SMB, Chile)
- OFOXIN - (Zambon, Braz.)
- OFTACILOX - (Alcon Cusi, Spain)
- OFTACILOX - (Alcon, Ital.)
- OFTACILOX - (Alcon, Port.)
- OFTACIPROX - (Laboratorios Chile, Chile)
- OFTAQUIN - (Columbia, Mex.)
- OMAFLAXINA - (Eczane, Arg.)
- OPTHAFLOX - (Grin, Mex.)
- OTEX HC - (Cassara, Arg.)
- OTOCIPRO - (Fortbenton, Arg.)
- PANOTILE CIPRO - (Zambon, Ger.)
- PHARCINA - (Pharmacos, Mex.)
- PIPROL - (Elfar, Spain)
- PLENOLYT - (Madaus, Spain)
- PLUSGIN - (Asofarma, Arg.)
- POLI-CIFLOXIN - (Polipharm, Thai.)
- PRINCIPROX - (Streuli, Switz.)
- PROCIN - (Schering-Plough, Braz.)
- PROCIP - (Ipca, India)
- PROFLOX (DI) - (Pharmasant, Thai.)
- PROFLOX (DI) - (Sigma, Braz.)
- PROFLOXIN - (Hexal, Austral.)
- PROQUIN - (Douglas, Austral.)
- PROXACIN - (Neo Quimica, Braz.)
- PROXITEC - (Tecnofarma, Mex.)
- QUIFLOX - (Teuto, Braz.)
- QUIFLOXONA - (Farmaco, Mex.)
- QUINOACT - (Nicholas Piramal, India)
- QUINOFLOX - (Biolab Sanus, Braz.)
- QUINOFLOX - (Diba, Mex.)
- QUINOX - (Labesfal, Port.)
- QUINTOR - (Torrent, Cz.)
- QUIPRO - (Andromaco, Cz.)

- QUIPRO - (Ciclum, Spain)
- RAVALTON - (Rafarm, Gr.)
- REMENA - (Remedina, Gr.)
- REVION - (Norma (Norma), Gr.)
- RIGORAN - (Vita, Spain)
- SANCIPRO - (United Nordic, Denm.)
- SARF - (Julphar, UAE)
- SEPCEN - (Centrum, Spain)
- SEPTICIDE - (Bago, Arg.)
- SEPTOIPRO - (Vita, Spain)
- SERVIFLOX - (Novartis, Thai.)
- SIBUNAR - (Durascan, Denm.)
- SIPRION - (Orion, Fin.)
- SOPHIXIN - (Sophia, Mex.)
- STROX (FM) - (Dabur, India)
- SUIFLOX - (Novartis, Mex.)
- SYNALOTIC - (Yamanouchi, Spain)
- TAM - (Alacan, Spain)
- TOPISTIN - (Elpen (Elpen), Gr.)
- TRIGEN - (Rimsa, Mex.)
- TRUOXIN - (Helsinn Birex, Irl.)
- UFEXIL - (Demo, Gr.)
- ULTRAMICINA (DI) - (Q Pharma, Spain)
- ULTRAMICINA PLUS (FM) - (Dom, Spain)
- UNIFLOX - (Bayer, Fr.)
- URODIXIN - (Gerolimatos (Gerolymatos), Gr.)
- UROXIN (DI) - (Unison, Hong Kong)
- UROXIN (DI) - (Unison, Singapore)
- UROXIN (DI) - (Unison, Thai.)
- UTAHZONE - (Daewon, Hong Kong)
- VELMONIT - (Bayer, Spain)
- XORPIC (FM) - (Andromaco, Port.; Grunenthal, Port.)
- ZIPRA - (Columbia, Mex.)