Administration in renal impairment. Doses of norfloxacin may need to be reduced in renal impairment; for urinary-tract infections, 400 mg once daily should be given to patients with a creatinine clearance of 30 mL/minute per 1.73 m^2 or less.

Preparations

BP 2008: Norfloxacin Eye Drops; Norfloxacin Tablets;
USP 31: Norfloxacin Ophthalmic Solution; Norfloxacin Tablets.

Proprietary Preparations (details are given in Part 3)

Arg.: Bio Tarbun; Chibroxin†; Floxamicin; Floxatral; Memento NF; Norflol; Noroxin; Norsol; Parcetin; Ritromine; Uro-Linfol; Urofos; Uronovag; Uroseptal; Urotem; Uroxacin; Wenflox; Yanurax†; ***Austral.:*** Insensye; Norfloxhexal; Noroxin; Nufloxib; Roxin; ***Austria:*** Floxacin; Norflostad; Urobacid†; Zoroxin; ***Belg.:*** Chibroxol; Zoroxin; ***Braz.:*** Androfloxin; Chibroxin†; Flox†; Floxacin; Floxanor; Floxatom†; Floxatrat†; Floxilin†; Floxinol; Genitoflox; Neofloxin; Norf; Norflamin†; Norflox; Norfloxasan; Norfloxil; Norfloxmed; Norxacin†; Norxin; Quinoform; Respexil; Uritrat; Uroflox†; Uroplex†; Uroseptal; Uroxazol-N; ***Canad.:*** Apo-Norflox; Noroxin†; ***Chile:*** Chibroxin†; Fulgram; Noroxin†; Urekolin†; ***Cz.:*** Gyrablock; Nolicin; ***Denm.:*** Zoroxin†; ***Fin.:*** Lexinor†; Noroxin†; ***Fr.:*** Chibroxine; Noroxine; ***Ger.:*** Bactracid; Barazan; Chibroxin; Firin; Norflohexal; Norflosal; Norflox; Norflox-Azu†; Norflox-Puren†; Norfloxbeta; Norfluxx; ***Gr.:*** Alenbit; Constilax; Dirunez†; Fluseminal; Grenis; Lemorcan; Lorcamin; Norocin; Ovinol; Pistofil; Setanol; Sinobid; Sofasin; Steinaclox; Urobacid; Uropses-N; Vetamol; ***Hong Kong:*** Floxen; Janacin; Lexiflox; Lexinor†; Mitatonin; Rexacin†; Uroctal; ***Hung.:*** Nolicin; ***India:*** Bacigyl; Biofloxin; Norbactin; Norflox; Normax; ***Indon.:*** Pyrflox; ***Israel:*** Apirol; Chibroxin†; ***Ital.:*** Diperflox; Flossac; Fulgram†; Norflox; Noroxin; Renoxacin; Sebercim; Theanorf; Uticina; Utinor; ***Jpn:*** Baccidal; ***Malaysia:*** Chibroxin†; Floxen†; Janacin; Lexinor†; Norbactin†; Norfloxin; Norfloxinor†; Rexacin; Trizolin; Urinox; Urobacid; ***Mex.:*** Baxamed; Difoxacil; Floxacin; Microxin; Nofloroxx; Noroxin; Norquinol; Oranor; ***Neth.:*** Chibroxol; Noroxin; ***NZ:*** Noroxin; ***Philipp.:*** Euroflox; Lexinor; Norbactin; Nortram; Septinor; Uritracin; Urobacid; Utiflox; Utinor; Winaflox; ***Pol.:*** Chibroxin; Nolicin; ***Port.:*** Besflox; Chibroxol; Noroxin; Quinoflex†; Taflox†; Uroflox; ***Rus.:*** Gyrablock (Гираблок); Negaflox (Негафлокс); Nolicin (Нолицин); Norbactin (Норбактин); Norfacin (Норфацин); Norilet (Норилет); Normax (Нормакс); ***S.Afr.:*** Floxin; Noroxin; Utin; ***Singapore:*** Bexinor; Chibroxin†; Effectsal; Foxgoria; Gyrablock; Norbactin; Sefnor†; Trizolin†; Urobacid†; ***Spain:*** Amicrobin; Baccidal; Chibroxin; Esclebin; Espeden; Nalion; Norflok; Noroxin; Senro; Uroctal; Xasmun; ***Swed.:*** Lexinor; ***Switz.:*** Chibroxol†; Norflocine; Noroxin; Norsol; Noxufen; ***Thai.:*** BGB Norflox†; Foxin; Foxinon; Gonorcin; Janacin; Lexfor†; Lexinor; Loxone; M-Flox; Manoflox; Myfloxin; Noracin; Norbactin; Norcin; Norfcin; Norflo†; Norflocin; Norfloxin; Norfloxyl; Norsa†; Norxacin; Norxia; Noxine; Noxinor; Proxinor; Rexacin; Sefnor; Snoffocin; Trizolin†; Urinox; Uritracin; Vesxacin; Xacin; ***Turk.:*** Noroxin; ***UAE:*** Uroxin; ***UK:*** Utinor; ***USA:*** Noroxin; ***Venez.:*** Chibroxin†; Danilon; Norflosan†; Norfloval†; Norilet†; Noroxin.

Multi-ingredient: ***Arg.:*** Nor 2; Urotem Dol; ***India:*** Bacigyl-N†; Bioflox-TZ; NM Powder; Nor T; Norflox TZ; Normax TZ; Parabact; Powergyl; Tinvista-NF; ***Mex.:*** Mictasol.

Norvancomycin Hydrochloride

N-Demethylvancomycin; 56-Demethylvancomycin. (S_a)-(3*S*,6*R*,7*R*,22*R*,23*S*,26*S*,36*R*,38a*R*)-44-{[2-*O*-(3-Amino-2,3,6-trideoxy-3-*C*-methyl-α-L-*lyxo*-hexopyranosyl)-β-D-glucopyranosyl]oxy}-3-(carbamoylmethyl)-10,19-dichloro-2,3,4,5,6,7,23,24,25,26,36,37,38,38a-tetradecahydro-7,22,28,30,32-pentahydroxy-6-[(2*R*)-4-methyl-2-(amino)valeramido]-2,5,24,38,39-pentaoxo-22*H*-8,11:18,21-dietheno-23,36-(iminomethano)-13,16:31,35-dimetheno-1*H*,16*H*-[1,6,9]oxadiazacyclohexadecino[4,5-*m*][10,2,16]-benzoxadiazacyclotetracosine-26-carboxylic acid, monohydrochloride.

$C_{65}H_{73}Cl_2N_9O_{24}$, HCl = 1471.7.
CAS — 91700-98-0 (norvancomycin).

Pharmacopoeias. In *Chin*.

Profile

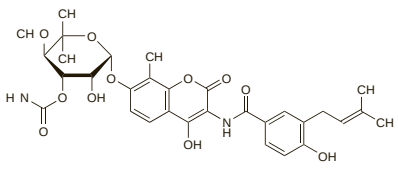
Norvancomycin is a glycopeptide antibacterial with properties similar to those of vancomycin (p.358).

Novobiocin *(BAN, rINN)*

Crystallinic Acid; Novobiocina; Novobiocine; Novobiocinum; Novobiosiini; Novobiosin; PA-93; Streptonivicin; U-6591. 4-Hydroxy-3-[4-hydroxy-3-(3-methylbut-2-enyl)benzamido]-8-methylcoumarin-7-yl 3-*O*-carbamoyl-5,5-di-*C*-methyl-α-L-lyxofuranoside.

Новобиоцин

$C_{31}H_{36}N_2O_{11}$ = 612.6.
CAS — 303-81-1.



Description. Novobiocin is an antimicrobial substance produced by the growth of *Streptomyces niveus* and *S. spheroides* or related organisms.

Novobiocin Calcium *(BANM, rINNM)*

Calcii Novobiocinum; Calcium Novobiocin; Novobiocina cálcica; Novobiocine Calcique; Novobiocinum Calcium.

Кальций Новобиоцин

$(C_{31}H_{35}N_2O_{11})_2Ca$ = 1263.3.
CAS — 4309-70-0.

Novobiocin Sodium *(BANM, rINNM)*

Natrii Novobiocinum; Novobiocina sódica; Novobiocine Sodique; Novobiocinum Natricum; Sodium Novobiocin.

Натрий Новобиоцин

$C_{31}H_{35}N_2NaO_{11}$ = 634.6.
CAS — 1476-53-5.

Pharmacopoeias. In *Fr.* and *US*.

USP 31 (Novobiocin Sodium). A white or yellowish-white, odourless, hygroscopic crystalline powder. Freely soluble in water, in alcohol, in methyl alcohol, in glycerol, and in propylene glycol; practically insoluble in acetone, in chloroform, and in ether; slightly soluble in butyl acetate. pH of a 2.5% solution in water is between 6.5 and 8.5. Store in airtight containers.

Profile

Novobiocin is an antibacterial which is structurally related to coumarin. It is active against Gram-positive bacteria such as *Staphylococcus aureus* (including meticillin-resistant strains) and other staphylococci; *Enterococcus faecalis* is usually resistant but *E. faecium* may be sensitive. Some Gram-negative organisms including *Haemophilus influenzae* and *Neisseria* spp. are also susceptible, as are some strains of *Proteus*, but most of the Enterobacteriaceae are resistant. Its action is primarily bacteriostatic, although it may be bactericidal against more sensitive species at high concentrations. It is an inhibitor of DNA gyrase and is effective in eliminating plasmids, but resistance to novobiocin develops readily *in vitro* and during therapy.

Although novobiocin has been used alone or with other drugs such as rifampicin or sodium fusidate in the treatment of infections due to staphylococci and other susceptible organisms, it has been largely superseded by other drugs because of the problems of resistance and toxicity.

Novobiocin is a potent sensitiser and hypersensitivity reactions are relatively common; they include rashes, fever, and pruritus, and more serious reactions such as Stevens-Johnson syndrome and pneumonitis. Jaundice and liver damage have occurred, although apparent jaundice may be due to a yellow metabolite of the drug rather than hyperbilirubinaemia. Other adverse effects include eosinophilia, leucopenia, thrombocytopenia, agranulocytosis, and haemolytic anaemia; gastrointestinal disturbances are common.

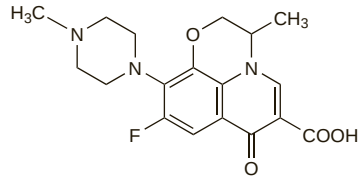
Porphyria. Novobiocin has been associated with acute attacks of porphyria and is considered unsafe in porphyric patients.

Ofloxacin *(BAN, USAN, rINN)*

DL-8280; Hoe-280; Ofloksacinas; Ofloksasiini; Ofloksasin; Ofloxacine; Ofloxacino; Ofloxacinum; RU-43280. (±)-9-Fluoro-2,3-dihydro-3-methyl-10-(4-methyl-1-piperazinyl)-7-oxo-7*H*-pyrido[1,2,3-*de*]-1,4-benzoxazine-6-carboxylic acid.

Офлоксацин

$C_{18}H_{20}FN_3O_4$ = 361.4.
CAS — 82419-36-1; 83380-47-6.
ATC — J01MA01; S01AX11.
ATC Vet — QJ01MA01; QS01AX11.



Pharmacopoeias. In *Chin.*, *Eur.* (see p.vii), *Jpn*, and *US*.

Ph. Eur. 6.2 (Ofloxacin). A pale yellow or bright yellow crystalline powder. Slightly soluble in water and in methyl alcohol; slightly soluble to soluble in dichloromethane; soluble in glacial acetic acid. Store in airtight containers. Protect from light.

USP 31 (Ofloxacin). Pale yellowish-white to light yellowish-white crystals or crystalline powder. Slightly soluble in water, in alcohol, and in methyl alcohol; sparingly soluble in chloroform. Store at a temperature of 25°, excursions permitted between 15° and 30°. Protect from light.

Ofloxacin Hydrochloride *(BANM, rINNM)*

Hidrocloruro de ofloxacino; Ofloxacine, Chlorhydrate d'; Ofloxacini Hydrochloridum.

Офлоксацина Гидрохлорид

$C_{18}H_{20}FN_3O_4$,HCl = 397.8.

Adverse Effects and Precautions

As for Ciprofloxacin, p.244.

Symptomatic hyperglycaemia and/or hypoglycaemia have been reported, usually in diabetics who are also taking hypoglycaemics or insulin. Such patients should have their blood-glucose concentrations closely monitored and if signs or symptoms of glucose disturbances develop, ofloxacin should be stopped.

A reduction in blood pressure may occur rarely after intravenous infusion. Similarly, sudden reductions in blood pressure may occur when intravenous ofloxacin is given with hypotensive drugs. Cardiovascular function should be monitored in such patients and in those also receiving barbiturate anaesthetics.

Certain medications may also increase these risks (see Interactions, below).

Breast feeding. The American Academy of Pediatrics has stated that no adverse effects have been seen in breast-fed infants whose mothers were receiving ofloxacin and that it is therefore usually compatible with breast feeding.[1] However, in a study[2] of 10 women given ofloxacin after termination of pregnancy, drug concentrations in breast milk were sufficiently high to recommend that the use of ofloxacin in lactating women should be avoided.

1. American Academy of Pediatrics. The transfer of drugs and other chemicals into human milk. *Pediatrics* 2001; **108:** 776–89. Correction. *ibid.*; 1029. Also available at: http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b108/3/776 (accessed 27/05/04)
2. Giamarellou H, *et al.* Pharmacokinetics of three newer quinolones in pregnant and lactating women. *Am J Med* 1989; **87** (suppl 5A): 49S–51S.

Interactions

As for Ciprofloxacin, p.246.

Use with drugs that alter blood-glucose concentrations with ofloxacin increases the risk of blood-glucose disturbances.

Antimicrobial Action

As for Ciprofloxacin, p.246.

Ofloxacin is more active than ciprofloxacin against *Chlamydia trachomatis.* It is also active against *Mycobacterium leprae* as well as *M. tuberculosis* and some other *Mycobacterium* spp. Synergistic activity against *M. leprae* has been reported between ofloxacin and rifabutin.

The optically active *S*-(−)-isomer levofloxacin (p.292) has twice the activity of the racemate ofloxacin.

Resistance has been reported in some strains of *Neisseria gonorrhoeae*.

Pharmacokinetics

Ofloxacin is rapidly and well absorbed from the gastrointestinal tract. Oral bioavailability is almost 100% and a peak plasma concentration of about 3 to 5 micrograms/mL occurs 1 to 2 hours after an oral dose of 400 mg. Absorption may be delayed by the presence of food, but the extent of absorption is not substantially affected.

About 25% is bound to plasma proteins. Ofloxacin is widely distributed in body fluids, including the CSF, and tissue penetration is good. It crosses the placenta and is distributed into breast milk. It also appears in the bile.

The elimination of ofloxacin is biphasic; half-lives of about 4 to 5 and 20 to 25 hours have been reported for the 2 phases, respectively. In renal impairment values of 15 to 60 hours have been reported. There is limited metabolism to desmethyl and *N*-oxide metabolites; desmethylofloxacin has moderate antibacterial activity. Ofloxacin is eliminated mainly by the kidneys. Excretion is by tubular secretion and glomerular filtration and 65 to 80% of a dose is excreted unchanged in the urine over 24 to 48 hours, resulting in high urinary concentrations. Less than 5% is excreted in the urine as metabolites. From 4 to 8% of a dose may be excreted in the faeces.