Preparations

USP 31: Cefprozil for Oral Suspension; Cefprozil Tablets.

Proprietary Preparations (details are given in Part 3)
Arg.: Ceprof; ***Austria:*** Procef†; ***Braz.:*** Cefzil; ***Canad.:*** Cefzil; ***Chile:*** Procef†; ***Cz.:*** Cefzil; ***Gr.:*** Cefgram; Cefpro; Gramium; Procef; Zamalin; ***Hong Kong:*** Procef; ***Hung.:*** Cefzil; ***India:*** Refzil-O; ***Indon.:*** Cefzil; Lizor; ***Ital.:*** Cronocef; Procef; Rozicel; ***Malaysia:*** Procef†; ***Mex.:*** Procef; ***Philipp.:*** Procef; ***Pol.:*** Cefzil; ***Port.:*** Procef; Radacefe; ***S.Afr.:*** Prozef; ***Singapore:*** Procef†; ***Spain:*** Arzimol; Brisoral; Precef; ***Switz.:*** Procef; ***Thai.:*** Procef; ***Turk.:*** Serozil; ***UK:*** Cefzil†; ***USA:*** Cefzil; ***Venez.:*** Procef.

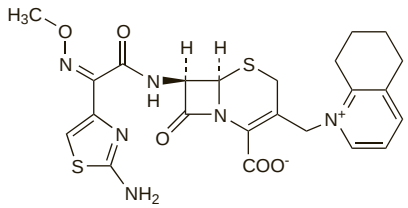
Cefquinome Sulfate *(USAN, rINNM)*

Cefquinome, Sulfate de; Cefquinome Sulphate *(BANM)*; Cefquinomi Sulfas; HR-111V; Sulfato de cefquinoma. {6*R*-[6α,7β(*Z*)]}-1-[(7-{[(2-amino-4-thiazolyl)-(methoxyimino)acetyl]amino}-2-carboxy-8-oxo-5-thia-1-azabicyclo[4.2.0]oct-2-en-3-yl)methyl]-5,6,7,8,-tetrahydroquinolinium sulfate (1:1).

Цефхинома Сульфат

$C_{23}H_{24}N_6O_5S_2,H_2SO_4$ = 626.7.

CAS — 84957-30-2 (cefquinome); 118443-89-3 (cefquinome sulfate); 123766-80-3 (cefquinome sulfate).



(cefquinome)

Profile

Cefquinome is a fourth-generation cephalosporin antibacterial used as the sulfate in veterinary medicine.

Cefradine *(BAN, rINN)*

Cefradin; Cefradina; Cefradinas; Céfradine; Cefradinum; Cefradyna; Cephradine *(USAN)*; Kefradiini; Sefradin; SKF-D-39304; SQ-11436; SQ-22022 (cefradine dihydrate). (7*R*)-7-(α-D-Cyclohexa-1,4-dienylglycylamino)-3-methyl-3-cephem-4-carboxylic acid.

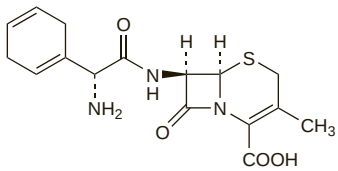
Цефрадин

$C_{16}H_{19}N_3O_4S$ = 349.4.

CAS — 38821-53-3 (anhydrous cefradine); 31828-50-9 (non-stoichiometric cefradine hydrate); 58456-86-3 (cefradine dihydrate).

ATC — J01DB09.

ATC Vet — QJ01DB09.



Pharmacopoeias. In *Chin.*, *Eur.* (see p.vii), and *US* (which allows the anhydrous form, the monohydrate, or the dihydrate).
Ph. Eur. 6.2 (Cefradine). A white or slightly yellow, hygroscopic powder. Sparingly soluble in water; practically insoluble in alcohol and in *n*-hexane. A 1% solution in water has a pH of 3.5 to 6.0. Store at 2° to 8° in airtight containers. Protect from light.
USP 31 (Cephradine). A white to off-white crystalline powder. Sparingly soluble in water; very slightly soluble in alcohol and in chloroform; practically insoluble in ether. pH of a 1% solution in water is between 3.5 and 6.0. Store in airtight containers.

Incompatibility and stability. Commercially available injections contain sodium carbonate or arginine as neutralisers. Injections containing sodium carbonate are incompatible with solutions such as compound sodium lactate injection that contain calcium salts.

References.

1. Wang Y-C J, Monkhouse DC. Solution stability of cephradine neutralized with arginine or sodium bicarbonate. *Am J Hosp Pharm* 1983; **40:** 432.
2. Mehta AC, *et al.* Chemical stability of cephradine injection solutions. *Intensive Therapy Clin Monit* 1988; **9**: 195–6.

Adverse Effects and Precautions

As for Cefalexin, p.218. Intramuscular injections of cefradine can be painful and thrombophlebitis has occurred on intravenous injection.

Porphyria. Cefradine is considered to be unsafe in patients with porphyria although there is conflicting experimental evidence of porphyrinogenicity.

Interactions

As for Cefalexin, p.218.

Antimicrobial Action

As for Cefalexin, p.218.

Pharmacokinetics

Cefradine is rapidly and almost completely absorbed from the gastrointestinal tract after oral doses. Doses of 0.25, 0.5, and 1 g given orally have produced peak plasma concentrations of about 9, 17, and 24 micrograms/mL respectively at 1 hour and are similar to those achieved with cefalexin. Absorption is delayed by the presence of food although the total amount absorbed is not appreciably altered. Following intramuscular injection peak plasma concentrations of about 6 and 14 micrograms/mL have been obtained within 1 to 2 hours of doses of 0.5 and 1 g respectively.

Only about 8 to 12% is reported to be bound to plasma proteins. A plasma half-life of about 1 hour has been reported; this is prolonged in patients with renal impairment. Cefradine is widely distributed to body tissues and fluids, but does not enter the CSF in significant quantities. Therapeutic concentrations may be found in the bile. It crosses the placenta into the fetal circulation and is distributed in small amounts into breast milk.

Cefradine is excreted unchanged in the urine by glomerular filtration and tubular secretion, over 90% of an oral dose or 60 to 80% of an intramuscular dose being recovered within 6 hours. Peak urinary concentrations of about 3 mg/mL have been achieved after a 500-mg oral dose. Probenecid delays excretion.

Cefradine is removed by haemodialysis and peritoneal dialysis.

◊ References.

1. Wise R. The pharmacokinetics of the oral cephalosporins—a review. *J Antimicrob Chemother* 1990; **26** (suppl E): 13–20.
2. Schwinghammer TL, *et al.* Pharmacokinetics of cephradine administered intravenously and orally to young and elderly subjects. *J Clin Pharmacol* 1990; **30:** 893–9.

Uses and Administration

Cefradine is a first-generation cephalosporin antibacterial given orally similarly to cefalexin (p.219) and by the parenteral route similarly to cefazolin (p.222) in the treatment of susceptible infections and in the prophylaxis of infections during surgical procedures.

Cefradine is given orally in doses of 1 to 2 g daily in 2 to 4 divided doses to adults; up to 4 g daily may be given by this route. In severe infections it should be given parenterally, by deep intramuscular injection or intravenously by slow injection over 3 to 5 minutes or by infusion, in doses of 2 to 4 g daily in 4 divided doses; up to 8 g daily may be given parenterally.

In children, the usual daily oral dose is 25 to 50 mg/kg in 2 to 4 divided doses, although 75 to 100 mg/kg daily may be given for otitis media. By injection, 50 to 100 mg/kg daily may be given in 4 divided doses, increasing to 300 mg/kg daily in severe infections.

For surgical infection prophylaxis, 1 to 2 g may be given pre-operatively by intramuscular or intravenous injection; subsequent parenteral or oral doses are given as appropriate.

For details of reduced doses of cefradine in patients with severe renal impairment, see below.

Administration in renal impairment. Doses of cefradine should be reduced in patients with severe renal impairment. The following oral and parenteral doses are recommended in UK licensed product information according to creatinine clearance (CC):

- CC more than 20 mL/minute: 500 mg every 6 hours
- CC 5 to 20 mL/minute: 250 mg every 6 hours
- CC less than 5 mL/minute: 250 mg every 12 hours

Patients undergoing chronic intermittent haemodialysis may be given a 250-mg dose at the start of the session, repeated after 6 to 12 hours, then again 36 to 48 hours after the initial dose, and again at the start of the next haemodialysis if more than 30 hours have elapsed since the previous dose.

Further dosage modification may be required in children with renal impairment.

Preparations

BP 2008: Cefradine Capsules; Cefradine Oral Suspension;
USP 31: Cephradine Capsules; Cephradine for Injection; Cephradine for Oral Suspension; Cephradine Tablets.

Proprietary Preparations (details are given in Part 3)
Belg.: Velosef; ***Chile:*** Velosef†; ***Fr.:*** Dexef; Kelsef†; Zeefra; ***Gr.:*** Tracilarin†; Vethisel†; ***Hong Kong:*** Qualisef; Velosef; Zeefra; ***Indon.:*** Dynacef; Lovecef; Velosef; ***Irl.:*** Velosef; ***Ital.:*** Cefrabiotic†; Ecosporina; Lisacef; Planocid†; ***Malaysia:*** Sephros†; ***Mex.:*** Veracef; ***Neth.:*** Velosef; ***NZ:*** Velosef†; ***Philipp.:*** Cefralon; Gramcep; Racep; Sedinef; Senadex; Solphride; Tolzep; Vamosef; Velodyne; Yudinef; Zepdril; ***Pol.:*** Tafril; ***Port.:*** Biocefra; Cefalmin; Cefradur; Novacefrex†; Velosef†; ***S.Afr.:*** Bactocef†; Cefril; Ranfradin†; ***Spain:*** Septacef; Velocef; ***UAE:*** Eskacef; Julphacef; ***UK:*** Nicef; Velosef; ***USA:*** Velosef†; ***Venez.:*** Cefracin†; Veracef.

Cefsulodin Sodium *(BANM, USAN, rINNM)*

Abbott-46811; Cefsulodina sódica; Cefsulodine Sodique; Cefsulodinnatrium; Cefsulodinum Natricum; CGP-7174E; Kefsulodiinatrium; Natrii Cefsulodinum; SCE-129; Sulcephalosporin Sodium. Sodium 3-(4-carbamoylpyridiniomethyl)-7-[(2*R*)-2-phenyl-2-sulphoacetamido]-3-cephem-4-carboxylate.

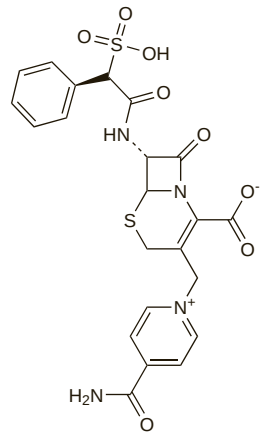
Натрий Цефсулодин

$C_{22}H_{19}N_4NaO_8S_2$ = 554.5.

CAS — 62587-73-9 (cefsulodin); 52152-93-9 (cefsulodin sodium).

ATC — J01DD03.

ATC Vet — QJ01DD03.



(cefsulodin)

Pharmacopoeias. In *Jpn.*

Adverse Effects and Precautions

As for Cefalotin Sodium, p.219.

Sodium content. Each g of cefsulodin sodium contains about 1.8 mmol of sodium.

Antimicrobial Action

Cefsulodin is a bactericidal antibiotic with activity against *Pseudomonas aeruginosa* as great as that of ceftazidime (p.234), but no significant activity against other Gram-negative bacteria. Gram-positive bacteria and anaerobes are not very susceptible. Its activity against *Ps. aeruginosa* may be enhanced by aminoglycosides.

Cefsulodin is stable to hydrolysis by many beta-lactamases, but emergence of resistant *Ps. aeruginosa* has been reported.

Pharmacokinetics

Cefsulodin is given parenterally as the sodium salt. It has a plasma half-life of about 1.6 hours, which is prolonged in renal impairment. Up to 30% of cefsulodin in the circulation is bound to plasma proteins. Therapeutic concentrations have been reported in a wide range of body tissues and fluids. The major route of excretion of cefsulodin is via the urine, mainly by glomerular filtration. Clearance may be enhanced in cystic fibrosis, although there have been conflicting reports.

◊ References.

1. Granneman GR, *et al.* Cefsulodin kinetics in healthy subjects after intramuscular and intravenous injection. *Clin Pharmacol Ther* 1982; **31:** 95–103.
2. Reed MD, *et al.* Single-dose pharmacokinetics of cefsulodin in patients with cystic fibrosis. *Antimicrob Agents Chemother* 1984; **25:** 579–81.
3. Hedman A, *et al.* Increased renal clearance of cefsulodin due to higher glomerular filtration rate in cystic fibrosis. *Clin Pharmacokinet* 1990; **18:** 168–75.