

Ceftriaxone

Adult outpatient parenteral antimicrobial therapy (OPAT) good practice prescribing guide

Ceftriaxone is a cephalosporin antibacterial that is licensed for many different indications including respiratory tract infections, intra-abdominal infections, complicated urinary tract infections, complicated skin and soft tissue infections, bone and joint infections and central nervous system infections.

This guide shares practical experience of the use of ceftriaxone in an OPAT setting. We took an evidence based approach to create the guidance. We also used expert consensus and practical experience from across NHS Scotland.

This drug summary does not provide specific treatment guidance. Individual patient treatment should take into account the core principles of antimicrobial stewardship. This includes selection of the appropriate antimicrobial for the shortest duration with oral therapy being preferred, whenever possible. Please also refer to the British National Formulary (BNF) or Summary of Product Characteristics (SPC). These have more information on licensed use, drug interactions and use in pregnancy and breast feeding. When using unlicensed medicines, doses or indications, follow local health board governance processes.

It is strongly recommended that OPAT services in Scotland adhere to the [Key performance indicators for the management of patients in an outpatient parenteral antimicrobial therapy \(OPAT\) setting](#).

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1 Indication and dose

Licensed indication(s) in the OPAT setting	Dose
Intra-abdominal infections Complicated urinary tract infections (including pyelonephritis)	2g 24 hourly
Lower respiratory tract Infection Complicated skin and soft tissue infections Infections of bones and joints (except <i>Staphylococcus aureus</i> infection) Lyme Disease (except Central Nervous System) Bacterial endocarditis (sensitive Streptococcal species)	2g 24 hourly
Bacterial meningitis Central Nervous System Lyme disease Deep seated <i>Staphylococcus aureus</i> infection including bacteraemia bone and joint infections and endocarditis	4g 24 hourly OR 2g 12 hourly

Complicated skin and soft tissue infections (cSSTI)

Ceftriaxone is recommended as first line therapy in the [SAPG OPAT pathway for the management of adults with complicated skin and soft tissue infections \(SSTI\)](#)

This pathway supports reduced hospital admissions and promotes early discharge for patients with complicated skin and soft tissue infections.

2 Route and method of administration

Refer to Summary of Product Characteristics (SPC) or Medusa for further information

2.1 Intravenous (IV) administration

Reconstitution

Reconstitute 2g vial in 40ml sodium chloride (NaCl) 0.9%.

Method of administration

Dose	Route and method of administration
2g may be given by:	<ul style="list-style-type: none"> IV injection over 5 minutes OR IV infusion over 30 minutes
4g may be given by IV infusion over 60 minutes by:	<ul style="list-style-type: none"> administering 2 x 2g infusions back-to-back (one after the other) OR adding the total dose (4g) to an infusion bag
4g daily may be given in 2 divided doses	<ul style="list-style-type: none"> 2g IV injection over 5 minutes administered twice daily twice daily dosing may be self-administered by patient at home

Can also administer via elastomeric infusion device if available (see local or manufacturer guidance).

2.2 Intramuscular injection

Consider intramuscular administration when the intravenous route is not possible or less appropriate for the patient.

Reconstitution

Dissolve 1g ceftriaxone in 3.5ml of 1% Lidocaine Injection British Pharmacopoeia (BP). Administer the solution by deep intramuscular injection

Method of administration

- 2g dose administered as 1g injected intramuscularly into each buttock
- Inject intramuscular injections well within the bulk of a relatively large muscle and not more than 1g should be injected at one site

3 Dose adjustments and monitoring

3.1 Dose adjustments

Dosage adjustments may be required under the following circumstances

Patient characteristic	Dosage advice
Renal impairment	If creatinine clearance (CrCl) is 10 ml/min or less, dose should not exceed 2g daily
Hepatic impairment	No dose adjustment necessary
Obesity	No dose adjustment necessary

3.2 Monitoring requirements

Frequency	Recommended monitoring
Baseline	Urea and Electrolytes, liver function tests (LFTs), C-reactive protein (CRP) and full blood count (FBC)
Weekly monitoring (Note this may be more frequent if clinically necessary)	Urea and Electrolytes, LFTs, CRP and FBC
Therapeutic drug monitoring	No therapeutic drug monitoring required
Follow up	Ensure follow up is arranged with referring specialty and/or an infection specialist

4 Contraindications, cautions and adverse effects

4.1 Contraindications

History of severe hypersensitivity (eg anaphylactic reaction) to ceftriaxone and any other type of beta-lactam antibacterial agent (eg penicillins, monobactams or carbapenems) or excipients.

4.2 Cautions

- Recent history (last 8 weeks) or at high risk of *Clostridium difficile* infection.
- History of hypercalciuria (high calcium in the urine); history of kidney stones.
- Patients on a controlled sodium diet as each 1g vial of ceftriaxone contains 3.6 mmol sodium.

4.3 Adverse effects

Please note that this is not an exhaustive list. Refer to the BNF or SPC

Common
<ul style="list-style-type: none"> • diarrhoea • rash • deranged LFTs • neutropenia, leukopenia, eosinophilia
Uncommon
<ul style="list-style-type: none"> • nausea, vomiting • headache, dizziness • anaemia, coagulation disorder • pruritus
Rare
<ul style="list-style-type: none"> • bronchospasm • encephalopathy • urticaria
Unknown frequency
<ul style="list-style-type: none"> • antibiotic associated colitis • haemolytic anaemia • pancreatitis • seizure • nephrolithiasis • severe skin disorders –toxic epidermal necrolysis (TEN), Drug reaction with eosinophilia and systemic symptoms (DRESS), Stevens-Johnson syndrome, erythema multiforme

5 Interactions

Please note that this is not an exhaustive list. Refer to the BNF or SPC

Interaction	Details
Ceftriaxone and calcium-containing intravenous solution	<p>Ceftriaxone and calcium-containing solutions must not be mixed or administered simultaneously.</p> <p>Diluents containing calcium (eg Ringer's solution or Hartmann's solution), should not be used to reconstitute ceftriaxone vials or to further dilute a reconstituted vial for intravenous administration because a precipitate can form.</p> <p>Precipitation of ceftriaxone-calcium can also occur when ceftriaxone is mixed with calcium-containing solutions in the same intravenous administration line.</p> <p>Calcium-containing solutions can be given sequentially, via different lines or the same line if flushed well and giving sets changed in between.</p>
Warfarin	<p>Must ensure follow up with local anticoagulant service for international normalised ratio (INR) monitoring and any necessary dosage adjustments. Patients should also be counselled on signs of over anticoagulation (eg bruising, bleeding).</p>
Hormonal contraception	<p>Additional precautions are no longer necessary when ceftriaxone (a non-enzyme inducing drug) is taken with any combined or progestogen-only contraceptive preparation, unless diarrhoea or vomiting occurs. See manufacturer's guidance.</p>
Food interactions	<p>No known serious interactions with food.</p>

For the use of other antibiotics in an OPAT setting please refer to the [SAPG website](#)

Table of abbreviations

ASAP	Association of Scottish Antimicrobial Pharmacists
BNF	British National Formulary
CRP	C-reactive protein
CrCl	Creatinine clearance
DRESS	Drug reaction with eosinophilia and systemic symptoms
FBC	Full blood count
INR	International normalised ratio
LFTs	Liver function tests
OPAT	Outpatient parenteral antimicrobial therapy
SAPG	Scottish Antimicrobial Prescribing Group
SPC	Summary of Product Characteristics
TEN	Toxic epidermal necrolysis

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