MONOGRAPH

Ceftaroline Monograph - Paediatric

Scope (Staff):	Medical, Pharmacy, Nursing
Scope (Area):	All Clinical Areas

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this DISCLAIMER

QUICKLINKS

Dosage/Dosage Adjustments	Administration	Compatibility	Monitoring

DRUG CLASS

Cephalosporin.[1-3]

INDICATIONS AND RESTRICTIONS

- Ceftaroline is indicated as an alternative agent in the treatment of complicated skin and soft tissue infections and community acquired pneumonia. Limited data are available for its use in severe osteoarticular infections and bloodstream infections.[3-5]
- Ceftaroline has good activity against Gram-positive aerobic bacteria (including Methicillin Resistant *Staphylococcus aureus* [MRSA]), with variable activity against Gram negative aerobic bacteria, and anaerobic bacteria. It does not cover *Pseudomonas aeruginosa*.[6]

IV: Restricted (red) antibiotic

ChAMP approval is required prior to prescription.

CONTRAINDICATIONS

- Hypersensitivity to ceftaroline, cephalosporins or any component of the formulation.[3, 5, 7, 8]
- Hypersensitivity to L-arginine.[7]

PRECAUTIONS

- Ceftaroline may be prescribed in selected patients with high risk allergy to another Beta-lactam sub-class (e.g. some penicillins, carbapenems) in discussion with immunology.[3, 5, 7]
- In patients with a previous low risk reaction to ceftaroline or another cephalosporin (delayed rash [>1hr after initial exposure] without mucosal or systemic involvement) the risk of subsequent reaction is low. Re-challenge may be acceptable in discussion with immunology.[3, 5, 7]
- Care should be taken in patients with seizure disorders due to limited information. Seizures may occur in patients with high ceftaroline levels, such as in renal impairment or with high dose therapy.[5, 7, 8]

FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- 600 mg vial for reconstitution

Imprest location: Formulary One

DOSAGE & DOSAGE ADJUSTMENTS

IV:

Neonates and infants < 2 months postnatal age:

- **≤ 2 kg and ≤ 7 days postnatal age:** 6 mg/kg/dose given 12 hourly[8]
- **≤ 2 kg and > 7 days postnatal age:** 6 mg/kg/dose given 8 hourly[8]
- **> 2 kg:** 6 mg/kg/dose given 8 hourly[1, 4, 5, 8]

Standard dosing (community acquired pneumonia, complicated skin, soft tissue infections)

Children:

- ≥ 2 months to < 2 years: 8 mg/kg/dose every 8 hours.[1, 3-5, 7, 8]
- ≥ 2 to < 18 years
    - < 33 kg: 12 mg/kg/dose (to a maximum of 400 mg) 8 hourly[1, 3-5, 7, 8]
    - ≥ 33 kg: 600 mg 12 hourly[1, 3-5, 7, 8]

Alternative dosing recommendations:

Higher doses may be used in cases of confirmed MRSA infections with an MIC of 2 mg/L to 4 mg/L[7, 8]

- ≥ 2 months to < 2 years: 10 mg/kg/dose 8 hourly[3, 8]
- ≥ 2 years to < 18 years: 12 mg/kg/dose (to a maximum of 600 mg) 8 hourly[1, 3, 8]

There is limited dosing recommendations available for the treatment of bloodstream or osteoarticular infections. Consider the following doses in discussion with Infectious Diseases:

- ≥ 2 months to < 6 months: 10 mg/kg/dose 8 hourly.[8]
- ≥ 6 months: 15 mg/kg/dose (to a maximum of 600 mg) 8 hourly [8]

Dosing in Overweight and Obese Children: Dose based on measured body weight.[9]

Renal impairment:

eGFR calculator

Neonates and infants < 2 months postnatal age AND > 2 kg OR ≤ 2 kg and > 7 days postnatal age

There very limited data regarding dose adjustment in renal impairment in neonates. For patients ≤ 2 kg and ≤ 7 days old discuss with Infectious Diseases or ChAMP.

eGFR	**Dose**[8]
≥ 60 mL/minute/1.73m^2	No dose adjustment required
≥ 30 to < 60 mL/minute/1.73m^2	4 mg/kg/dose given 8 hourly
≥ 15 to < 30 mL/minute/1.73m^2	3.5 mg/kg/dose given 8 hourly
< 15 mL/minute/1.73m^2	2.5 mg/kg/dose given 8 hourly

Infants ≥ 2 months to < 2 years old:

eGFR	**Usual dose of 8 mg/kg/dose given 8 hourly** [8]	**Usual dose of 10 or 15 mg/kg/dose given 8 hourly**
≥ 60 mL/minute/1.73m^2	No dose adjustment required	No data available on the renal dosage adjustments required for the higher dose. Discuss with Infectious Diseases or ChAMP.
≥ 30 to < 60mL/minute/1.73m^2	5 mg/kg/dose given 8 hourly	
≥ 15 to < 30mL/minute/1.73m^2	4 mg/kg/dose given 8 hourly	
< 15 mL/minute/1.73m^2	3 mg/kg/dose given 8 hourly	

Children ≥ 2 years to < 12 years OR < 18 years weighing < 33kg:

eGFR (mL/minute/ 1.73m^2)	**Usual dose of 12 mg/kg/dose (to a maximum of 400 mg) 8 hourly**[8]	**Usual dose of 12 mg/kg/dose (to a maximum of 600 mg) 8 hourly**[8]	**Usual dose of 15 mg/kg/dose (to a maximum of 600 mg) 8 hourly**[8]
≥ 50 mL/minute/1.73m^2	No dose adjustment required	No dose adjustment required	No data available on the renal dosage adjustments required for the higher dose. Discuss with Infectious Diseases or ChAMP.
≥ 30 to < 50 mL/minute/1.73m^2	8 mg/kg/dose (to a maximum of 300 mg) given 8 hourly	10 mg/kg/dose (to a maximum of 400 mg) given 8 hourly	
≥ 15 to < 30 mL/minute/1.73m^2	6 mg/kg/dose (to a maximum of 200 mg) given 8 hourly	8 mg/kg/dose (to a maximum of 300mg) given 8 hourly	
< 15 mL/minute/1.73m^2	No information available, consider an alternative agent	No information available, consider an alternative agent	

Children 12 to 18 years and ≥ 33kg:

eGFR (mL/minute/ 1.73m^2)	**Usual dose of 600 mg given 12 hourly**[8]	**Usual dose of 12 mg/kg/dose (to a maximum of 600 mg) 8 hourly**[8]	**Usual dose of 15 mg/kg/dose (to a maximum of 600 mg) 8 hourly**[8]
≥ 50 mL/minute/1.73m^2	No dose adjustment required	No dose adjustment required	No data available on the renal dosage adjustments required for the higher dose. Discuss with Infectious Diseases or ChAMP.
≥ 30 to < 50 mL/minute/1.73m^2	400 mg given 12 hourly	10 mg/kg/dose (to a maximum of 400 mg) given 8 hourly	
≥ 15 to < 30 mL/minute/1.73m^2	300 mg given 12 hourly	8 mg/kg/dose (to a maximum of 300 mg) given 8 hourly	
< 15 mL/minute/1.73m^2	200 mg given 12 hourly	No information available. Maximum adult recommended dose is 200 mg given 8 hourly	

Hepatic impairment:

- No dosage adjustment is required for patients with hepatic impairment.[8]

RECONSTITUTION & ADMINISTRATION

Reconstitution:

- Reconstitute the vial with 20 mL of water for injection to make a final concentration of 30 mg/mL. Further dilution will be required prior to administration.[2, 7]

Administration – standard dosing:

- Dilute the required dose to a final concentration of 12 mg/mL or less with compatible fluid and infuse over:
  - < 2 months: 30 to 60 minutes.[2, 8]
  - ≥ 2 months: 5 to 60 minutes.[2, 5, 8]

Administration – alternative dosing recommendations:

- For patients prescribed higher doses for confirmed MRSA infections with an MIC of 2 mg/L to 4 mg/L or for osteoarticular infections, an extended infusion time of 120 minutes is recommended for all patients >2 months.[8]

COMPATIBILITY *(LIST IS NOT EXHAUSTIVE)*

Compatible fluids:

- Glucose 5%
- Sodium chloride 0.9%
- Hartmann's
- Lactated Ringers.[2, 7]

Compatible at Y-site:

Compatibilities of IV drugs must be checked when two or more drugs are given concurrently.

MONITORING

- Patients should have a complete blood count and renal function conducted at baseline and then twice weekly for courses longer than 7 days.[1, 3]
- Monitor the infusion site for all patients as infusion site reactions (e.g. erythema, phlebitis and pain) are common.[2]

ADVERSE EFFECTS

Common: neutropenia (more common if treated for longer than 2 weeks) diarrhoea, nausea, abdominal pain, eosinophilia, leucopenia, vomiting, pain and inflammation at the injection site, rash, headache, dizziness, allergy, *Clostridioides difficile* associated disease.[3, 5]

Infrequent: angioedema[5]

Rare: neurotoxicity (e.g. confusion, seizures, encephalopathy) especially with high dose and/or renal impairment, anaemia, thrombocytopenia, agranulocytosis, haemolytic anaemia, severe cutaneous adverse reactions (SCARs), bleeding, renal impairment, immunologic reactions (drug fever, anaphylaxis, urticarial, interstitial nephritis, arthritis, serum sickness like syndrome).[3, 5]

STORAGE

- Store the vial below 25°C and protect from light.[7]
- Store products prepared by Pharmacy Compounding Service (PCS) between 2 and 8°C[2]

INTERACTIONS

This medication may interact with other medications; consult PCH approved references (e.g. Clinical Pharmacology), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

Please note: The information contained in this guideline is to assist with the preparation and administration of **ceftaroline**. Any variations to the doses recommended should be clarified with the prescriber prior to administration

Related CAHS internal policies, procedures and guidelines

Antimicrobial Stewardship Policy

ChAMP Empiric Guidelines and Monographs

KEMH Neonatal Medication Protocols

References

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