

Clinical Guideline: Supporting statement for Trusts on the use of ceftriaxone in paediatric patients over 1 month of age

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For use in: EoE Paediatric Units, EoE Emergency Departments
Guidance specific to the care of children from 1 month age – 16 years age

Used by: Paediatricians, nurses

Key Words:

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Not applicable to this document

Audit points

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Executive summary

There is now evidence to support intravenous ceftriaxone administration over 10 minutes for doses $>50\text{mg/kg}$, outside of the approved licensed information, when this would benefit the patient clinically. It is important to note that any use of ceftriaxone outside of the approved licensing will be 'off-label' use and any risk/benefit must be assessed. Trusts wishing to deviate from the licensed information must ensure that this has been discussed and approved via any appropriate local governance groups.

Recommendations for children > 1 month of age

1. Higher doses of ceftriaxone $>50\text{mg/kg}$ are usually recommended to be administered as an intravenous infusion over 30 minutes. To facilitate ambulatory administration of ceftriaxone, these higher doses ($>50\text{mg/kg}$) can be administered as a 10 minute slow intravenous injection. This shorter administration time may also be of benefit to patients attending Emergency Departments where IV access may be limited and a shorter administration time may be beneficial. 'This is an off label' use
2. To facilitate doses of ceftriaxone being administered during the daytime and to help with timing of ceftriaxone for ambulatory administration, doses of ceftriaxone can be rescheduled. If the first dose of ceftriaxone has been administered overnight, then it can be moved to the day time by moving the second dose forward any time from 12 hours following the initial dose. This is an 'off label' use.
3. Doses of $\leq 50\text{mg/kg}$ can be administered as an intravenous injection over 5 minutes. There is no need to reduce a dose of exactly 50mg/kg to facilitate administration as a bolus injection. This is an 'off label' use.

Background

For children > 1 month of age, ceftriaxone is licensed to be administered as an intravenous infusion for doses $\geq 50\text{mg/kg}$ given over 30 minutes. This potentially leads to problems for ambulating a child at home to continue a course of antibiotics administered by community nursing teams, due to a lack of IV pump availability to administer infusions. This results in either the dose being reduced, so that ceftriaxone can be administered as a bolus injection (but at an inappropriate dose), the child returning to the hospital each day for ceftriaxone infusions, or the child not being discharged until the ceftriaxone course is complete.

There is recent evidence to support administration of higher ceftriaxone doses (80mg/kg) over 10 minutes⁽¹⁾, demonstrating tolerability in the paediatric population. This approach has been adopted by the Paediatric Innovation, Education and Research Network (PIER) in Wessex and Thames Valley⁽²⁾ and anecdotally in a number of Trusts in the UK.

Administration of these higher ceftriaxone doses over 10 minutes is an 'off label' use of ceftriaxone and should only be used when there is a clinical benefit for the patient over the licensed administration method. 'Off label' use of ceftriaxone in this way would be considered appropriate in the following scenarios: -

- a) Children being ambulated on home IV ceftriaxone administration where higher doses are required.
- b) Children being admitted to the Emergency Department, where there is limited IV access and administration of high dose ceftriaxone over 10 minutes will facilitate other medicines and IV fluids being administered in a timelier manner.

Although not expected to be a problem, if any pain at the injection site does occur with the 10 minute infusion, then it is suggested to give the remainder of the dose at a slower infusion rate.

Recommendations regarding the adjustment of timings of ceftriaxone dosing are published in the EU FP7 funded Global Research in Paediatrics (GriP) Prescribing Medicines for Children Book (2019)⁽³⁾. Information in this publication was peer reviewed, and the book has been endorsed by Global GriP, RCPCH, NPPG and BNFC. This publication contains the following pragmatic information.

- If a first dose of ceftriaxone has been given overnight it can be moved to day time by giving the second dose early, any time from 12 hours following the initial dose
- A regimen of 80mg/kg with the first two doses being given at a 12 hourly interval was previously widely and effectively used for paediatric meningococcal sepsis without adverse effects

This information regarding adjusting ceftriaxone timings has also been adopted by the PIER network and again is anecdotally used in centres in the UK.

A pragmatic approach should be taken when considering how doses of exactly 50mg/kg should be administered. The licensed recommendation is that these should be administered over 30 minutes. However, it is still appropriate to administer as a bolus dose over 5 minutes, rather than subtly reduce the dose to 49.5mg/kg to stay within the licensed recommendations.

References

1. Patel S, Green H, Gray J, Rutter M, Bevan A, Hand K, Jones CE, Faust SN. Evaluating Ceftriaxone 80 mg/kg Administration by Rapid Intravenous Infusion-A Clinical Service Evaluation. *Pediatr Infect Dis J.* 2021 Feb 1;40(2):128-129. doi: 10.1097/INF.0000000000002923. PMID: 33165272.
2. PIER Network: Statement regarding ceftriaxone prescribing. June 2021 [Ceftriaxone Statement from the Infectious Disease Network - PAEDIATRIC INNOVATION, EDUCATION & RESEARCH NETWORK \(piernetwork.org\)](#)
3. Sharland M. Prescribing medicines for children. Pharmaceutical Press 2019

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