

# Paediatric Antibiotic Prescribing Guideline



May 2017

## Paediatric Antibiotic prescribing guideline

Resistance to antibiotics is now recognised as a major risk to the future health of the world population. Antimicrobial resistance (AMR) threatens the effective prevention and treatment of ever-increasing infections caused by bacteria, parasites, viruses and fungi. This threat is now deemed so serious that it is included on the National Risk Register.

One method to help reduce antimicrobial resistance is to ensure appropriate prescription and administration of empiric antibiotics. The Oxford AHSN has a geographical footprint that includes five hospitals with paediatric inpatients providing an opportunity for the Children's Network to work with local paediatricians, pharmacists and microbiologists to harmonise local prescribing guidelines.

We asked the microbiologists to check that there were no local resistance patterns that might preclude harmonisation. Once this was confirmed, we conducted a gap analysis of the five hospitals' antibiotic guidelines to identify differences in prescribing practices. We brought together pharmacists, paediatricians and microbiologists from each of the five hospitals and reached agreement on the optimum prescribing practice for those areas where differences existed. Subsequent minor amendments were agreed and the revised guideline has now been adopted by each hospital.

Magdalen Centre North,  
1 Robert Robinson Avenue, Oxford Science Park, OX4 4GA, United Kingdom

t: +44(0) 1865 784944 e: [info@oxfordahsn.org](mailto:info@oxfordahsn.org)

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## Start Smart, Then Focus

Review all antibiotics after the 1st 48-72 hours according to microbiology results

Sepsis		
	First line	Allergy*
< 1 month admitted from the community (If on neonatal unit refer to neonatal guidelines)	<b>IV Cefotaxime and IV Amoxicillin</b> See BNFC for neonatal doses	
1-3 months	<b>IV Cefotaxime</b> 50mg/kg QDS  Consider switching to <b>IV Ceftriaxone 80mg/kg OD</b> if <b>not</b> receiving IV Calcium	
> 3 months	<b>IV Ceftriaxone</b> 1 month – 11 years (<50kg) 80mg/kg OD (max. 4g) 12-17 years (> 50kg) 2-4 g OD	Severe Penicillin allergy, consider: <b>IV Chloramphenicol</b> 25mg/kg single dose  Consider: <b>IV Vancomycin</b> 15mg/kg TDS (max. daily dose 2g)  <b>and IV Gentamicin</b> 7mg/kg single dose (max. 560mg)
Meningitis		
1-3 months	<b>IV Cefotaxime</b> 50mg/kg QDS <b>and</b> <b>IV Amoxicillin</b> 50mg/kg QDS  Consider switching to <b>IV Ceftriaxone 80mg/kg OD</b> if <b>not</b> receiving IV Calcium	Non severe Penicillin allergy: <b>IV Cefotaxime</b> 50mg/kg QDS  Severe Penicillin allergy consider:  <b>IV Chloramphenicol</b> 25mg/kg QDS
> 3 months	<b>IV Ceftriaxone</b> 1 month – 11 years (<50kg) 80mg/kg OD 12-17 years (> 50kg) 2-4 g OD	For severe Penicillin allergy consider <b>IV Chloramphenicol</b> 25mg/kg QDS

## Respiratory

	First line	Allergy*
<p><b>Pneumonia (mild/ moderate)</b> Treat for 5 days</p>	<p><b>PO Amoxicillin</b> 1 month – 11 months: 125mg TDS 1-4 years: 250mg TDS 5 -18 years: 500mg TDS</p> <p>If no improvement or atypical pneumonia consider adding &lt;6 months: <b>PO Clarithromycin</b> 7.5mg/kg BD (max. 500mg BD)</p> <p>&gt;6 months: <b>PO Azithromycin</b> 10mg/kg OD for 3 days (max. 500mg OD)</p>	<p>Penicillin allergy: &lt;6 months: <b>PO Clarithromycin</b> 7.5mg/kg BD (max. 500mg BD)</p> <p>&gt;6 months: <b>PO Azithromycin</b> 10mg/kg OD for 3 days (max. 500mg OD)</p>
<p><b>Pneumonia (severe) Complicated Pneumonia Empyema associated with septicaemia</b></p>	<p><b>IV Amoxicillin</b> 60mg/kg TDS (max. 1g)</p> <p>Consider adding PO <b>Azithromycin</b> 10mg/kg (max. 500mg) OD 3 days <b>or</b> <b>IV Clarithromycin</b> 7.5mg/kg BD (max. 500mg) if an IV agent required or child &lt; 6 months</p>	<p>Non-severe Penicillin allergy: <b>IV Ceftriaxone</b> 1 month – 11 years (&lt;50kg) 80mg/kg OD 12-17 years (&gt; 50kg) 2-4 g OD</p> <p>Severe Penicillin allergy: <b>IV Clarithromycin</b> 7.5mg/kg BD (max. 500mg BD)</p>

## Urinary Tract Infections

<p><b>Lower UTI/ uncomplicated</b> Treat for 3 days (unless otherwise stated)</p>	<p><b>PO Co-Amoxiclav</b> 1 month – 11 months: (125/31) 0.25ml/kg TDS 1-5 years: (125/31) 5mls TDS 6-11 years: (250/62) 5mls TDS 12-18 years: (250/125) 1 tablet TDS</p>	<p>Non-severe Penicillin allergy: <b>PO Cefalexin</b> 1 month – 11 months: 125mg BD 1-4 years: 125mg TDS 5-11 years: 250mg TDS 12-18 years: 500mg TDS</p> <p>Severe Penicillin allergy: 2nd line <b>PO Nitrofurantoin</b> 3 months – 11 years: 750micrograms/kg QDS 5 days 12- 18 years: <b>PO Nitrofurantoin MR</b> 100mg BD</p>
<p><b>Upper UTI/ complicated</b> Treat for 7 days</p>	<p><b>IV Co-Amoxiclav</b> &lt;3 months 30mg/kg BD &gt;3 months 30mg/kg (max. 1.2g) TDS <b>and</b> <b>STAT IV Gentamicin</b> 7mg/kg IV OD (max. 560mg)</p>	<p>For non-severe penicillin allergy: <b>IV Ceftriaxone</b> 1 month – 11 years (&lt;50kg) 80mg/kg OD 12-17 years (&gt; 50kg) 2-4 g OD <b>+/-</b> <b>IV Gentamicin</b> 7mg/kg OD (max. 560mg)</p> <p>Severe penicillin allergy: <b>IV Gentamicin</b> 7mg/kg OD (max. 560mg)</p>

## Bone & Soft Tissue Infections

	First line	Allergy*
<b>Septic Arthritis and Osteomyelitis</b>	<b>IV Ceftriaxone</b> 1 month – 11 years (<50kg) 80mg/kg OD (max. 4g) 12-17 years (> 50kg) 2-4 g OD	Severe Penicillin allergy: <b>IV Clindamycin</b> 6.25mg/kg QDS (max. 1.2g QDS)  <b>and</b> <b>IV Gentamicin</b> 7mg/kg OD (max. 560mg)
<b>Cellulitis (mild/moderate)</b>	<b>PO Flucloxacillin</b> 1 month – 1 year: 62.5mg - 125mg QDS 2-9 years: 125mg -250mg QDS 10-17 years: 250mg -500mg QDS	Penicillin allergy: <b>PO Clarithromycin</b> body weight: < 8 kg: 7.5mg /kg BD 8-11 kg: 62.5mg BD 12-19 kg: 125mg BD 20-29 kg: 187.5mg BD 30-40 kg: 250mg BD 12-17 years 250 mg BD
<b>Severe Cellulitis (without evidence of sepsis)</b> Treat for 7-10 days	<b>IV Flucloxacillin</b> 1 month - 18 years: 50mg/kg QDS (max 2g QDS) <b>and</b> <b>PO Clindamycin</b> 6mg/kg QDS (Max 450mg QDS)	Non-severe Penicillin allergy: <b>IV Ceftriaxone</b> 1 month – 11 years (<50kg) 80mg/kg OD 12-17 years (> 50kg) 2-4 g OD  Severe Penicillin allergy: <b>PO Clindamycin</b> 6mg/kg QDS (max. 450mg QDS) <b>IV Clindamycin</b> 6.25mg/kg QDS (max. 1.2g QDS)
<b>Toxic shock syndrome</b>	<b>IV Flucloxacillin</b> 50mg/kg QDS (max 2g QDS) <b>and</b> <b>IV Clindamycin</b> 6.25mg/kg QDS (max. 1.2g QDS)	<b>IV Clindamycin</b> 6.25mg/kg QDS (max. 1.2g QDS) <b>and</b> <b>IV Vancomycin</b> 15mg/kg TDS (max. daily dose 2g)
<b>Necrotising Fasciitis</b>	<b>IV Benzylpenicillin</b> 50mg/kg QDS (max 2.4g QDS) <b>and</b> <b>IV Clindamycin</b> 6.25mg/kg QDS (max. 1.2g QDS)	Non-severe Penicillin allergy: <b>IV Ceftriaxone</b> 1 month – 11 years (<50kg) 80mg/kg OD 12-17 years (> 50kg) 2-4 g OD <b>and</b> <b>IV Clindamycin</b> 6.25mg/kg QDS (max. 1.2g QDS)  Severe penicillin allergy: <b>IV Vancomycin</b> 15mg/kg TDS (max. daily dose 2g) <b>and</b> <b>IV Clindamycin</b> 6.25mg/kg QDS (max. 1.2g QDS)

## Bone & Soft Tissue Infections

	First line	Allergy*
<b>Peri-orbital cellulitis</b> Treat for 7 days	<b>IV Co-Amoxiclav</b> 30mg/kg TDS (if < 3 months 30mg/kg BD) (max. 1.2g TDS)	Non-severe Penicillin allergy: <b>IV Ceftriaxone</b> 1 month – 11 years (<50kg) 80mg/kg OD 12-17 years (> 50kg) 2-4 g OD  Severe Penicillin allergy <b>IV Clarithromycin</b> 7.5mg/kg BD (max 500mg BD)
<b>Orbital cellulitis</b> Treat for 7 days unless complicated	<b>IV Ceftriaxone</b> 1 month – 11 years (<50kg) 80mg/ kg OD 12-17 years (> 50kg) 2-4 g OD <b>and</b> <b>PO Clindamycin</b> 3-6mg/kg QDS (max 450mg QDS) Consider <b>PO Co-Amoxiclav</b> for follow-on therapy/not complicated	Severe Penicillin allergy: <b>PO Ciprofloxacin</b> 20mg/kg BD (max 750mg BD) <b>and</b> <b>IV Metronidazole</b> 7.5mg/kg TDS (max 500mg TDS) <b>and</b> <b>IV Vancomycin</b> 15mg/kg TDS (max. daily dose 2g)

## Aspiration pneumonia

	<b>PO Co-Amoxiclav</b> 1 month – 11 months: (125/31) 0.25ml/kg TDS 1-5 years: (125/31) 5mls TDS 6-11 years: (250/62) 5mls TDS 12-18 years: (250/125) 1 tablet TDS	Severe Penicillin allergy: <b>IV Metronidazole</b> 7.5mg/kg TDS (max. 500mg TDS) <b>and</b> <b>IV Clarithromycin</b> 7.5mg/kg BD (max. 500mg BD)
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## Upper respiratory Infection

<b>Epiglottitis</b>	<b>IV Ceftriaxone</b> 1 month – 11 years (<50kg) 80mg/kg OD 12-17 years (> 50kg) 2-4 g OD	Severe Penicillin allergy: <b>IV Chloramphenicol</b> 25mg/kg QDS
<b>Bacterial tracheitis</b>	<b>IV Co-Amoxiclav</b> <3 months 30mg/kg BD >3 months 30mg/kg TDS (max. 1.2g TDS)	Non-severe Penicillin allergy: <b>IV Ceftriaxone</b> 1 month – 11 years (<50kg) 80mg/kg OD 12-17 years (> 50kg) 2-4 g OD  Severe Penicillin allergy: <b>IV Chloramphenicol</b> 25mg/kg QDS
<b>Pharyngitis/Tonsillitis</b> Consider deferring treatment for 48 hours	<b>PO Penicillin V</b> 1 month – 11 months: 62.5mg QDS 1-5 years: 125mg QDS 6-11 years: 250mg QDS 12-18 years: 500mg QDS <b>or</b> <b>IV Benzylpenicillin</b> 50mg/kg (max.2.4g) QDS	Penicillin allergy: <6 months: <b>PO Clarithromycin</b> 7.5mg/kg BD (max. 500mg BD) >6 months: <b>PO Azithromycin</b> 10mg/kg OD (max. 500mg)

## Upper respiratory Infection

	First line	Allergy*
<b>Fever / bleeding following tonsillectomy</b>	<p><b>PO Co-Amoxiclav</b>            1 month - 1 year: (125/31)            0.25ml/kg TDS            1-5 years: (125/31) 5mls TDS            6-12 years: (250/62) 5mls TDS            12-18 years: (250/125) 1 tablet TDS</p>	<p>&lt;6 months:  <b>PO Clarithromycin</b> 7.5mg/kg BD            (max. 500mg BD)</p> <p>&gt;6 months:  <b>PO Azithromycin</b>            10mg/kg OD            (max. 500mg)</p>
<p><b>Otitis Media</b>            Consider treatment after 24-48 hours            Treat for 5 days</p>	<p><b>PO Amoxicillin</b>            1 month – 11 months: 125mg TDS            1-4 years 250mg TDS            5-18 years 500mg TDS</p>	<p>Penicillin allergy:            &lt;6 months:  <b>PO Clarithromycin</b> 7.5mg/kg BD            (max. 500mg BD)</p> <p>&gt;6 months:  <b>PO Azithromycin</b>            10mg/kg OD 3 days            (max. 500mg)</p>
<b>Soft tissue</b>		
<b>Lymphadenitis</b>	<p><b>Mild:</b>  <b>PO Co-Amoxiclav</b>            1 month - 1 year: (125/31)            0.25ml/kg TDS            1-5 years: (125/31) 5mls TDS            6-11 years: (250/62) 5mls TDS            12-18 years: (250/125) 1 tablet TDS</p> <p><b>Severe:</b>  <b>IV Co-Amoxiclav</b>            &lt;3 months 30mg/kg BD            &gt;3 months 30mg/kg TDS            (max. 1.2g TDS)</p>	<p>Penicillin allergy:            &lt;6 months:  <b>PO Clarithromycin</b> 7.5mg/kg BD            (max. 500mg BD)</p> <p>&gt;6 months:  <b>PO Azithromycin</b>            10mg/kg OD 3 days            (max. 500mg)</p> <p>Non severe Penicillin allergy:  <b>IV Ceftriaxone</b>            1 month – 11 years (&lt;50kg)            80mg/kg OD            12-17 years (&gt; 50kg) 2-4 g OD</p> <p>Severe Penicillin allergy:  <b>IV Clindamycin</b> 6.25mg/kg QDS            (max. 1.2g QDS)</p>

## Soft Tissue

	First line	Allergy*
<b>Soft tissue injury</b> (Clean)	No antibacterials required	
<b>Soft tissue injury</b> (Contaminated) NB Check tetanus vaccination status	<p><b>PO Co-Amoxiclav</b>            1 month - 11 months: (125/31) 0.25ml/kg TDS            1-5 years: (125/31) 5mls TDS            6-11 years: (250/62) 5mls TDS            12-18 years: (250/125) 1 tablet TDS</p> <p><b>+/- PO Metronidazole</b>            1 – 2 months: 7.5mg/kg BD            &gt; 2 months: 7.5mg/kg TDS (max. 400mg TDS)</p>	<p>Non-severe Penicillin allergy:  <b>IV Ceftriaxone</b>            1 month – 11 years (&lt;50kg) 80mg/kg OD            12-17 years (&gt; 50kg) 2-4 g OD  <b>and</b>  <b>PO Metronidazole</b>            1 – 2 months: 7.5mg/kg BD            &gt; 2 months: 7.5mg/kg TDS (max. 400mg TDS)</p> <p>Severe Penicillin allergy:  <b>IV Clindamycin</b> 6.25mg/kg QDS (max. 1.2g QDS)</p>
<b>Animal Bites</b> (including humans) NB Check tetanus vaccination status	<p><b>PO Co-Amoxiclav</b>            1 month – 11 months: (125/31) 0.25ml/kg TDS            1-5 years: (125/31) 5mls TDS            6-11 years: (250/62) 5mls TDS            12-18 years: (250/125) 1 tablet TDS</p> <p><b>+/- PO Metronidazole</b>            1 – 2 months: 7.5mg/kg BD            &gt; 2 months: 7.5mg/kg TDS (max. 400mg TDS)</p>	<p>Non-severe Penicillin allergy:  <b>IV Ceftriaxone</b>            1 month – 11 years (&lt;50kg) 80mg/kg OD            12-17 years (&gt; 50kg) 2-4 g OD  <b>and</b>  <b>PO Metronidazole</b>            1 – 2 months: 7.5mg/kg BD            &gt; 2 months: 7.5mg/kg TDS (max. 400mg TDS)</p> <p>Severe Penicillin allergy:  <b>PO Ciprofloxacin</b> 20mg/kg BD (max. 750mg BD)  <b>and</b>  <b>PO Clindamycin</b>            3-6mg/kg QDS (max 450mg QDS)</p>

## Abdominal

	First line	Allergy*
<b>Intra-abdominal infections</b> (including peritonitis)	<p><b>IV Co-Amoxiclav</b>                      &lt;3 months 30mg/kg BD                      &gt;3 months 30mg/kg TDS                      (max. 1.2g TDS)</p> <p>STAT dose IV Gentamicin 7mg/kg if septic (max. 560mg)</p>	<p>Severe Penicillin allergy:  <b>IV Ciprofloxacin</b>                      10mg/kg TDS (max 400mg TDS)  <b>and</b>                      IV Metronidazole 7.5mg/kg TDS                      (max.500mg TDS)</p>
<b>Appendicitis</b>	<p><b>IV Co-Amoxiclav</b>                      &lt;3 months 30mg/kg BD                      &gt;3 months 30mg/kg TDS                      (max. 1.2g TDS)</p>	<p><b>or</b></p> <p><b>IV Gentamicin</b> 7mg/kg OD                      (max 560mg)  <b>and</b>  <b>IV Metronidazole</b> 7.5mg/kg TDS                      (max.500mg TDS)</p> <p>Consider adding: <b>IV Vancomycin</b>                      15mg/kg TDS                      (max. daily dose 2g)</p>
<b>Gastroenteritis</b>	No antibiotics required	
<b>Campylobacter enteritis</b>	<p>Usually self-limiting.                      If immunocompromised/severe:  <b>PO/IV Clarithromycin</b> 7.5mg/kg                      BD (max. 500mg BD)</p>	
<b>Enteric Fever/Typhoid</b>	<p><b>IV Ceftriaxone</b>                      1 month – 11 years (&lt;50kg)                      80mg/kg OD                      12-17 years (&gt; 50kg) 2-4 g OD</p> <p>Switch to oral antibiotics once sensitivities known  <b>PO Azithromycin</b> 10mg/kg OD                      (max. 500mg)  <b>or</b>  <b>PO Ciprofloxacin</b> 20mg/kg BD                      (max. 750mg BD)</p>	
<b>Clostridium difficile</b>	<p>Stop all other antibiotics  <b>PO Vancomycin</b>                      1 month – 4 years: 5mg/kg QDS                      5-11 years: 62.5mg QDS                      12 – 18 years: 125 mg QDS                      for 14 days                      Doses may be increased if fails to respond                      Don't treat asymptomatic infants</p>	

## **Anaphylaxis (Resuscitation Council UK):**

Anaphylaxis is likely when ALL of the following 3 criteria are met:

1. Sudden onset and rapid progression of symptoms
2. Life-threatening Airway and/or Breathing and/or Circulation problems
3. Skin and/or mucosal changes (flushing, urticaria, angioedema)

The following supports the diagnosis:

- Exposure to a known allergen for the patient

### **Remember:**

- Skin or mucosal changes alone are not a sign of an anaphylactic reaction
- Skin and mucosal changes can be subtle or absent in up to 20% of reactions (some patients have only a decrease in blood pressure, i.e., a Circulation problem)
- There can also be gastrointestinal symptoms (e.g. vomiting, abdominal pain, incontinence)



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[www.oxfordahsn.org/children](http://www.oxfordahsn.org/children)

Magdalen Centre North,  
1 Robert Robinson Avenue, Oxford Science Park, OX4 4GA, United Kingdom

**t:** +44(0) 1865 784944 **e:** [info@oxfordahsn.org](mailto:info@oxfordahsn.org)

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