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.
**Start Smart, Then Focus**

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

### Sepsis

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

### Meningitis

| 1-3 months | **IV Cefotaxime 50mg/kg QDS and IV Amoxicillin 50mg/kg QDS**<br>Consider switching to **IV Ceftriaxone 80mg/kg OD if not** receiving IV Calcium |
| > 3 months | **IV Ceftriaxone**<br>1 month – 11 years (<50kg) 80mg/kg OD<br>12-17 years (> 50kg) 2-4 g OD<br>For severe Penicillin allergy consider **IV Chloramphenicol 25mg/kg QDS** |
### Respiratory

<table>
<thead>
<tr>
<th>Condition</th>
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</thead>
</table>
| **Pneumonia (mild/ moderate)** | **PO Amoxicillin**  
1 month – 11 months: 125mg TDS  
1-4 years: 250mg TDS  
5 -18 years: 500mg TDS  
If no improvement or atypical pneumonia consider adding  
<6 months: **PO Clarithromycin** 7.5mg/kg BD  
(max. 500mg BD)  
>6 months: **PO Azithromycin** 10mg/kg OD for 3 days  
(max. 500mg OD) | Penicillin allergy:  
<6 months: **PO Clarithromycin** 7.5mg/kg BD  
(max. 500mg BD)  
>6 months: **PO Azithromycin** 10mg/kg OD for 3 days  
(max. 500mg OD) |

| **Pneumonia (severe)** | **IV Amoxicillin** 60mg/kg TDS  
(max. Ig)  
Consider adding PO **Azithromycin** 10mg/kg (max. 500mg) OD 3 days or **IV Clarithromycin** 7.5mg/kg BD (max. 500mg) if an IV agent required or child < 6 months | Non-severe Penicillin allergy:  
**IV Ceftriaxone**  
1 month – 11 years (<50kg) 80mg/kg OD  
12-17 years (> 50kg) 2-4 g OD  
Severe Penicillin allergy:  
**IV Clarithromycin** 7.5mg/kg BD (max. 500mg BD) |

| **Complicated Pneumonia**  
**Empyema associated with septicaemia** |  |  |

### Urinary Tract Infections

<table>
<thead>
<tr>
<th>Condition</th>
<th>First line</th>
<th>Allergy*</th>
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</thead>
</table>
| **Lower UTI/ uncomplicated**  
Treat for 3 days (unless otherwise stated) | **PO Co-Amoxiclav**  
1 month – 11 months: (125/31) 0.25ml/kg TDS  
0-5 years: (125/31) 5mls TDS  
6-11 years: (250/62) 5mls TDS  
12-18 years: (250/125) 1 tablet TDS | Non-severe Penicillin allergy:  
**PO Cefalexin**  
1 month – 11 months: 125mg BD  
1-4 years: 125mg TDS  
5-11 years: 250mg TDS  
12-18 years: 500mg TDS  
Severe Penicillin allergy:  
2nd line **PO Nitrofurantoin**  
3 months – 11 years: 750micrograms/kg QDS 5 days  
12- 18 years: **PO Nitrofurantoin MR** 100mg BD |
| **Upper UTI/ complicated**  
Treat for 7 days | **IV Co-Amoxiclav**  
<3 months 30mg/kg BD  
>3 months 30mg/kg (max. 1.2g) TDS  
and **STAT IV Gentamicin** 7mg/kg IV OD (max. 560mg) | For non-severe penicillin allergy:  
**IV Ceftriaxone**  
1 month – 11 years (<50kg) 80mg/kg OD  
12-17 years (> 50kg) 2-4 g OD +/-  
**IV Gentamicin** 7mg/kg OD (max. 560mg)  
Severe penicillin allergy:  
**IV Gentamicin** 7mg/kg OD (max. 560mg) |
<table>
<thead>
<tr>
<th>Bone &amp; Soft Tissue Infections</th>
<th>First line</th>
<th>Allergy*</th>
</tr>
</thead>
</table>
| **Septic Arthritis and Osteomyelitis** | **IV Ceftriaxone**  
1 month – 11 years (<50kg) 80mg/kg QD (max. 4g)  
12-17 years (> 50kg) 2-4 g OD | Severe Penicillin allergy:  
**IV Clindamycin** 6.25mg/kg QDS (max. 1.2g QDS)  
and  
**IV Gentamicin** 7mg/kg OD (max. 560mg) |
| **Cellulitis (mild/moderate)** | **PO Flucloxacillin**  
1 month – 1 year: 62.5mg - 125mg QDS  
2-9 years: 125mg - 250mg QDS  
10-17 years: 250mg - 500mg QDS | Penicillin allergy:  
**PO Clarithromycin**  
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 |
| **Severe Cellulitis (without evidence of sepsis)**  
Treat for 7-10 days | **IV Flucloxacillin**  
1 month - 18 years: 50mg/kg QDS (max 2g QDS)  
and  
**PO Clindamycin** 6mg/kg QDS (Max 450mg QDS) | Non-severe Penicillin allergy:  
**IV Ceftriaxone**  
1 month – 11 years (<50kg) 80mg/kg QD  
12-17 years (> 50kg) 2-4 g OD  
Severe Penicillin allergy:  
**PO Clindamycin** 6mg/kg QDS (max. 450mg QDS)  
**IV Clindamycin** 6.25mg/kg QDS (max. 1.2g QDS) |
| **Toxic shock syndrome** | **IV Flucloxacillin** 50mg/kg QDS (max 2g QDS)  
and  
**IV Clindamycin** 6.25mg/kg QDS (max. 1.2g QDS) | **IV Clindamycin** 6.25mg/kg QDS (max. 1.2g QDS)  
and  
**IV Vancomycin** 15mg/kg TDS (max. daily dose 2g) |
| **Necrotising Fasciitis** | **IV Benzylpenicillin** 50mg/kg QDS (max 2.4g QDS)  
and  
**IV Clindamycin** 6.25mg/kg QDS (max. 1.2g QDS) | Non-severe Penicillin allergy:  
**IV Ceftriaxone**  
1 month – 11 years (<50kg) 80mg/kg QD  
12-17 years (> 50kg) 2-4 g OD  
and  
**IV Clindamycin** 6.25mg/kg QDS (max. 1.2g QDS)  
Severe penicillin allergy:  
**IV Vancomycin** 15mg/kg TDS (max. daily dose 2g)  
and  
**IV Clindamycin** 6.25mg/kg QDS (max. 1.2g QDS) |
### Bone & Soft Tissue Infections

<table>
<thead>
<tr>
<th>Condition</th>
<th>First line</th>
<th>Allergy*</th>
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</thead>
</table>
| Peri-orbital cellulitis     | **IV Co-Amoxiclav** 30mg/kg TDS (if< 3 months 30mg/kg BD) (max. 1.2g TDS) | Non-severe Penicillin allergy:  
  **IV Ceftriaxone**  
  1 month – 11 years (<50kg) 80mg/kg OD  
  12-17 years (> 50kg) 2-4 g OD  
  Severe Penicillin allergy  
  **IV Clarithromycin** 7.5mg/kg BD (max 500mg BD) |
| Orbital cellulitis          | **IV Ceftriaxone**  
  1 month – 11 years (<50kg) 80mg/kg OD  
  12-17 years (> 50kg) 2-4 g OD  
  **PO Clindamycin** 3-6mg/kg QDS (max 450mg QDS)  
  Consider **PO Co-Amoxiclav** for follow-on therapy/not complicated | Severe Penicillin allergy:  
  **IV Metronidazole** 7.5mg/kg TDS (max 500mg TDS)  
  **IV Clarithromycin** 7.5mg/kg BD (max. 500mg BD) |

### Aspiration pneumonia

<table>
<thead>
<tr>
<th>Condition</th>
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<th>Allergy*</th>
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</thead>
</table>
| PO Co-Amoxiclav            | 1 month – 11 months: (125/31) 0.25mg/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:  
  **IV Metronidazole** 7.5mg/kg TDS (max. 500mg TDS)  
  **IV Clarithromycin** 7.5mg/kg BD (max. 500mg BD) |

### Upper respiratory Infection

<table>
<thead>
<tr>
<th>Condition</th>
<th>First line</th>
<th>Allergy*</th>
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</thead>
</table>
| Epiglottitis               | **IV Ceftriaxone**  
  1 month – 11 years (<50kg) 80mg/kg OD  
  12-17 years (> 50kg) 2-4 g OD | Severe Penicillin allergy:  
  **IV Chloramphenicol** 25mg/kg QDS |
| Bacterial tracheitis       | **IV Co-Amoxiclav**  
  <3 months 30mg/kg BD  
  >3 months 30mg/kg TDS (max. 1.2g TDS) | Non-severe Penicillin allergy:  
  **IV Ceftriaxone**  
  1 month – 11 years (<50kg) 80mg/kg OD  
  12-17 years (> 50kg) 2-4 g OD  
  Severe Penicillin allergy:  
  **IV Chloramphenicol** 25mg/kg QDS |
| Pharyngitis/Tonsillitis    | **PO Penicillin V**  
  1 month – 11 months: 62.5mg QDS  
  1-5 years: 125mg QDS  
  6-11 years: 250mg QDS  
  12-18 years: 500mg QDS or  
  **IV Benzylpenicillin** 50mg/kg (max.2.4g) QDS | Penicillin allergy:  
  <6 months:  
  **PO Clarithromycin** 7.5mg/kg BD (max. 500mg BD)  
  >6 months:  
  **PO Azithromycin** 10mg/kg OD (max. 500mg) |
### Upper respiratory Infection

#### Fever / bleeding following tonsillectomy
- **PO Co-Amoxiclav**
  - 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

#### Otitis Media
- **PO Amoxicillin**
  - 1 month – 11 months: 125mg TDS
  - 1-4 years 250mg TDS
  - 5-18 years 500mg TDS

#### Lymphadenitis
- **PO Co-Amoxiclav**
  - 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

#### Allergy
- **<6 months:**
  - **PO Clarithromycin** 7.5mg/kg BD (max. 500mg BD)
- **>6 months:**
  - **PO Azithromycin** 10mg/kg OD (max. 500mg)

### Soft tissue

#### Lymphadenitis
- **Mild:**
  - **PO Co-Amoxiclav**
    - 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

- **Severe:**
  - **IV Co-Amoxiclav**
    - <3 months 30mg/kg BD
    - >3 months 30mg/kg TDS (max. 1.2g TDS)

#### Allergy
- **Penicillin allergy:**
  - **<6 months:**
    - **PO Clarithromycin** 7.5mg/kg BD (max. 500mg BD)
  - **>6 months:**
    - **PO Azithromycin** 10mg/kg OD 3 days (max. 500mg)

- **Non severe Penicillin allergy:**
  - **IV Ceftriaxone**
    - 1 month – 11 years (<50kg) 80mg/kg OD
    - 12-17 years (> 50kg) 2.4 g OD

- **Severe Penicillin allergy:**
  - **IV Clindamycin** 6.25mg/kg QDS (max. 1.2g QDS)
# Soft Tissue

<table>
<thead>
<tr>
<th>Soft tissue injury</th>
<th>First line</th>
<th>Allergy*</th>
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<tbody>
<tr>
<td>Soft tissue injury (Clean)</td>
<td>No antibacterials required</td>
<td></td>
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<tr>
<td>Soft tissue injury (Contaminated)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NB Check tetanus vaccination status</td>
<td>PO Co-Amoxiclav</td>
<td>Non-severe Penicillin allergy:</td>
</tr>
<tr>
<td></td>
<td>0.25ml/kg TDS</td>
<td>IV Ceftriaxone</td>
</tr>
<tr>
<td></td>
<td>0-1 month: (125/31)</td>
<td>1 month – 11 years (&lt;50kg) 80mg/kg OD</td>
</tr>
<tr>
<td></td>
<td>1-5 years: (125/31) 5mls TDS</td>
<td>12-17 years (&gt;50kg) 2-4 g OD and</td>
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<td></td>
<td>6-11 years: (250/62) 5mls TDS</td>
<td>PO Metronidazole</td>
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<td></td>
<td>1-8 years: (250/125) 1 tablet TDS</td>
<td>1 – 2 months: 7.5mg/kg BD</td>
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<td></td>
<td>+/- PO Metronidazole</td>
<td>&gt; 2 months: 7.5mg/kg TDS (max. 400mg TDS)</td>
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<tr>
<td></td>
<td>1 – 2 months: 7.5mg/kg BD</td>
<td>Severe Penicillin allergy:</td>
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<tr>
<td></td>
<td>&gt; 2 months: 7.5mg/kg TDS (max. 400mg TDS)</td>
<td>IV Clindamycin 6.25mg/kg QDS (max. 1.2g QDS)</td>
</tr>
<tr>
<td>Animal Bites (including humans)</td>
<td>PO Co-Amoxiclav</td>
<td>Non-severe Penicillin allergy:</td>
</tr>
<tr>
<td>NB Check tetanus vaccination status</td>
<td>0.25ml/kg TDS</td>
<td>IV Ceftriaxone</td>
</tr>
<tr>
<td></td>
<td>1 month – 11 months: (125/31)</td>
<td>1 month – 11 years (&lt;50kg) 80mg/kg OD</td>
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<td></td>
<td>+/- PO Metronidazole</td>
<td>Severe Penicillin allergy:</td>
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<td></td>
<td>1 – 2 months: 7.5mg/kg BD</td>
<td>PO Ciprofloxacin 20mg/kg BD</td>
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<td>&gt; 2 months: 7.5mg/kg TDS (max. 400mg TDS)</td>
<td>(max. 750mg BD) and</td>
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<td></td>
<td>+/- PO Metronidazole</td>
<td>PO Clindamycin 3-6mg/kg QDS (max 450mg QDS)</td>
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<tr>
<td>Abdominal</td>
<td>First line</td>
<td>Allergy*</td>
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</tbody>
</table>
| **Intra-abdominal infections** (including peritonitis) | **IV Co-Amoxiclav**  
<3 months 30mg/kg BD  
>3 months 30mg/kg TDS  
(max. 1.2g TDS)  
STAT dose IV Gentamicin 7mg/kg if septic (max. 560mg) | Severe Penicillin allergy:  
**IV Ciprofloxacin**  
10mg/kg TDS (max 400mg TDS)  
and  
**IV Metronidazole** 7.5mg/kg TDS  
(max.500mg TDS)  

or  
**IV Gentamicin** 7mg/kg OD  
(max.560mg)  
and  
**IV Metronidazole** 7.5mg/kg TDS  
(max.500mg TDS)  
Consider adding: **IV Vancomycin**  
15mg/kg TDS  
(max. daily dose 2g) |
| **Appendicitis**          | **IV Co-Amoxiclav**  
<3 months 30mg/kg BD  
>3 months 30mg/kg TDS  
(max. 1.2g TDS) |  |
| **Gastroenteritis**       | No antibiotics required                         |  |
| **Campylobacter enteritis** | Usually self-limiting.  
If immunocompromised/severe:  
**PO/IV Clarithromycin** 7.5mg/kg BD (max. 500mg BD) |  |
| **Enteric Fever/Typhoid** | **IV Ceftriaxone**  
1 month – 11 years (<50kg)  
80mg/kg OD  
12-17 years (>50kg) 2-4 g OD  
Switch to oral antibiotics once sensitivities known  
**PO Azithromycin** 10mg/kg OD  
(max. 500mg)  
**or**  
**PO Ciprofloxacin** 20mg/kg BD  
(max. 750mg BD) |  |
| **Clostridium difficile** | Stop all other antibiotics  
**PO Vancomycin**  
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 |  |
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)