

# Empirical Antibiotic Therapy in Children

**STOP AND THINK BEFORE YOU GIVE ANTIBIOTICS** - Is antibiotic therapy required? - Lanarkshire is the highest prescriber of antibiotics in Scotland

Clostridium difficile infection associated with prescribing of: Cephalosporins, Ciprofloxacin, Co-amoxiclav and Clindamycin

**REVIEW IV ANTIBIOTICS DAILY** - IV therapy must have a documented review in medical notes within 48-72 hours

**CULTURE BLOOD** - and appropriate source i.e. Urine, sputum, CSF, wound or venous access

**SWITCH** - Switch IV to oral when sepsis is resolving

**SIMPLIFY** - Review antibiotics and change to narrow spectrum once microbiology results are available

**STOP** - Observe indicated duration of therapy

## IV THERAPY IS REQUIRED FOR SEPSIS OR OTHER SEVERE INFECTIONS - DOCUMENT INDICATION IN THE NOTES

### ❖ STOP

**Recognition:** Infection + 2 or more signs (Temp >38°C or <36°C, inappropriate tachycardia, altered mental state, reduced peripheral perfusion/prolonged capillary refill/cool or mottled peripheries)

### SEPSIS IS A CLINICAL EMERGENCY

#### ❖ THINK

**Reduce threshold:** If child with higher risk of sepsis (<3 months, immunosuppressed, recent surgery, indwelling devices/lines, neurodisability, high index of clinical suspicion, significant parental suspicion)

#### ❖ Do

**Ensure first antibiotic administered within 1 hour**

#### Respiratory System

Refer to individual breathing management plan if complex respiratory patient

##### Community acquired Pneumonia (CAP)

**Birth to 28 days**  
IV Benzylpenicillin + Gentamicin<sup>1</sup>

**Over 28 days**  
IV Amoxicillin  
OR (if previously treated)  
IV Co-amoxiclav

**Penicillin allergy**  
Vancomycin<sup>1</sup>

Add Clarithromycin<sup>2</sup> to treatment if atypical pneumonia is suspected or in very severe disease

**Total duration (IV+oral): 7-10 days**

##### Aspiration Pneumonia

IV Amoxicillin  
(**Penicillin allergy** - Vancomycin<sup>1</sup>)  
+ IV Metronidazole

If severe:  
ADD Gentamicin<sup>1</sup>

**Total duration (IV+oral): 7 days**

##### Staphylococcal Pneumonia Suspected

(e.g. with measles/influenza)  
As per Community acquired pneumonia  
+ ADD IV Flucloxacillin<sup>3</sup> on clinical condition/response

**Penicillin allergy or MRSA suspected:**  
As per Community acquired pneumonia + Vancomycin<sup>1</sup>

**Total duration (IV+oral): 14 days**

##### Exacerbation of CF

Refer to NHSL guidelines for management of infection in paediatric patients with CF

##### Epiglottitis

IV Cefotaxime

**Penicillin allergy:** Clarithromycin<sup>2</sup>

**Total duration (IV+oral): 7 days**

#### Urinary tract

**UTI at risk**  
(Abnormal renal tract or under 6 months)

**Under 1 month**  
IV Amoxicillin + Gentamicin<sup>1</sup>

**1 month and over**  
IV Ceftriaxone

**Penicillin Allergy:** Gentamicin<sup>1</sup>

**Total duration (IV + oral): 7 days**

##### Upper UTI/Pyelonephritis

**Under 6 months**  
See 'UTI at risk'

**6 months and above**  
IV Ceftriaxone

**Penicillin Allergy:** Gentamicin<sup>1</sup>

**Total duration (IV + oral): 7-10 days**

#### Skin/soft tissue/bone/joint

**Moderate to severe cellulitis/erysipelas**  
IV Flucloxacillin<sup>3</sup>

**Penicillin Allergy:** Vancomycin<sup>1</sup>

**Total duration (IV + oral): 7-10 days**

##### Osteomyelitis/septic arthritis

If septic arthritis is clinically suspected, discuss needle aspiration **before antibiotics** with orthopaedics. All antibiotics should be prescribed at upper end of dose range.

**Under 1 month**  
IV Amoxicillin + Cefotaxime

**1 month - 6 years**  
Cefuroxime

**Over 6 years**  
IV Flucloxacillin<sup>3</sup>

If NOT HIB immunised, has MRSA risk factors, immunocompromised or sickle cell disease: Cefuroxime +/- clindamycin

**Penicillin Allergy:** IV Rifampicin + Vancomycin<sup>1</sup>

**Total duration (IV + oral):**

Before stopping treatment agree decision with orthopaedics and infection specialist

**Under 3 months: 6 weeks**

**Over 3 months: Osteomyelitis - 4 weeks**

**Septic arthritis - 3 weeks**

##### Periorbital Cellulitis

Discuss with ENT/Ophthalmology

##### Mild/Moderate infection

IV Flucloxacillin + Benzylpenicillin (discontinue flucloxacillin if Streptococcal infection confirmed) OR IV Co-amoxiclav (if sinusitis suspected)

**Penicillin Allergy:** Vancomycin<sup>1</sup> + Gentamicin<sup>1</sup>

##### Severe infection

IV ceftriaxone + IV Flucloxacillin +/- IV Metronidazole

**Penicillin Allergy:** Vancomycin<sup>1</sup> + Gentamicin<sup>1</sup> +/- IV Metronidazole

#### Gastro-intestinal

##### Intra-abdominal sepsis

IV Amoxicillin

(**Penicillin allergy:** Vancomycin<sup>1</sup>)

+ IV Metronidazole

+ Gentamicin<sup>1</sup>

**Total duration (IV + oral):**

**7-10 days**

Give all 3 recommended antibiotics otherwise the regimen may be ineffective

##### Gastroenteritis

No antibiotics required

#### CNS infection/Meningitis

##### Under 6 weeks

IV Amoxicillin

+ Gentamicin<sup>1</sup>

+ Cefotaxime

##### From 6 weeks to 3 months

IV Cefotaxime

+ Gentamicin<sup>1</sup> (if severe)

Clear history of immediate hypersensitivity reaction to penicillin:  
IV chloramphenicol only on the advice of Paediatric Consultant and Infection Specialist

##### Over 3 months

IV Cefotaxime

+ IV Dexamethasone for 4 days if bacterial meningitis without purpura.

After 48 hours if child unlikely to require HDU/ITU care then consider switching to Ceftriaxone.

**Clear history of immediate hypersensitivity reaction to penicillin:**

IV chloramphenicol only on the advice of Paediatric Consultant and Infection Specialist

##### Possible encephalitis

+ IV Aciclovir

##### Duration - dependant on culture and/or clinical condition

**Meningococcal: 7 days**

**H.Influenzae: 10 days**

**Pneumococcal: 14 days**

**Listeria: 21 days**

#### Severe systemic infection

##### Over 3 months

IV Cefotaxime

+ Gentamicin<sup>1</sup> (if severe)

+ Metronidazole (if anaerobic infection or intra-abdominal sepsis suspected)

**Clear history of immediate hypersensitivity reaction to penicillin:**

IV Vancomycin<sup>1</sup> + Gentamicin<sup>1</sup>

+ IV Metronidazole (if anaerobic infection or intra-abdominal sepsis suspected)

##### Possible infective endocarditis

Send 3 sets of blood cultures

Seek senior specialist advice

#### Immunocompromised plus sepsis

##### Immunocompromised plus sepsis

If haematology/oncology patient discuss with appropriate specialist

IV Piperacillin/Tazobactam<sup>4</sup>

(**Penicillin Allergy:** Vancomycin<sup>1</sup>)

+ Gentamicin<sup>1</sup>

## ORAL THERAPY USUALLY REQUIRED - DOCUMENT DURATION ON CARDEX

##### Community acquired Pneumonia (CAP)

Amoxicillin (+ Clarithromycin<sup>2</sup> if atypical pneumonia is suspected or in very severe disease)

**Penicillin allergy - Clarithromycin<sup>2</sup>**

**Total duration: 7-10 days**

##### Pertussis

Refer to Guidelines for Public Health Management of Pertussis in England  
Clarithromycin<sup>2</sup>

**Total duration: 7 days**

##### Tonsillitis

Penicillin V (if unable to swallow, IV Benzylpenicillin)

**Total duration (IV+oral): 10 days**

**Penicillin allergy - Clarithromycin<sup>2</sup>**

**Total duration (IV+oral): 5 days**

##### Otitis Media

Not routinely recommended. Consider delayed antibiotic prescription.

Amoxicillin

**Penicillin allergy - Clarithromycin<sup>2</sup>**

**Total duration: 5 days**

##### Upper UTI/Pyelonephritis

**Under 6 months**

Treat with IV therapy as above

**6 months and above**

Cefalexin (OR Co-amoxiclav if culture results available and susceptible)

**Penicillin allergy - Ciprofloxacin<sup>2</sup>**

**Total duration (IV + oral):**

**7-10 days**

##### Lower UTI

**Under 6 months**

See 'UTI at risk'

**6 months and above**

Trimethoprim

**Total duration: 3 days**

##### Limited soft tissue infection

Flucloxacillin<sup>3</sup>

**Penicillin Allergy:** Clarithromycin<sup>2</sup>

**Total duration: 7 days**

##### Human or animal infected bite

Co-amoxiclav

**Penicillin Allergy:** Ciprofloxacin<sup>2</sup> + Metronidazole

**Total duration: 7 days**

##### Gastroenteritis

No antibiotics required

##### Clostridium difficile infection

❖ Stop/simplify concomitant antibiotic(s)

❖ Review/stop gastric acid suppression and antimotility agents

##### Clostridium difficile infection

**Non severe**

Metronidazole

**Severe/Recurrence**

ORAL Vancomycin

**Ileus or hypotension**

+ IV Metronidazole

**Total duration: 10 days**

### Antibiotic Dosing in Children

Doses of antibiotics are as recommended in the children's BNF.

Doses may need to be adjusted in renal impairment.

Always check BNF for interactions

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- Click for **online children's BNF** <https://bnf.nice.org.uk/>

- Click for **neonatal IV drug monographs** <http://firstport2/staff-support/neonatal/drug-formulary-index/default.aspx>

- Click for **paediatric IV Drug Monographs (can also be accessed via FirstPort)**

Always check allergy status of patient prior to prescribing including nature of any allergies. See NHSL Penicillin Allergy Guidance for more information

1. Gentamicin/Vancomycin. Refer to separate dosing guidelines.

2. Check interactions in BNF. May prolong QTc – caution

3. Monitor sodium

4. ALERT antibiotic – needs an ALERT form completed

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