Louth: Antimicrobial Guidelines - Louth Hospitals: Antimicrobial Guidelines: Paediatric Empiric Treatment Guidelines

Paediatrics - Bone and Joint Infections

Infection

Paediatrics - Acute Osteomyelitis or Septic Arthritis

Likely Organisms

Child < 3 months

S. aureus, Group B Streptococcus, H. influenzae & other gram negative bacilli

Child > 3 months

S. aureus, Group A Streptococcus, Kingella kingae if ≤ 5 years, H. influenzae in septic arthritis in unvaccinated individuals

Empiric Antimicrobial Treatment

Child < 3 months

Cef-O-taxime IV

plus

Flucloxacillin IV

plus

Gentamicin IV

Child > 3 months to < 5 years

Cef-AZ-olin IV 50mg/kg TDS (max 6g/day)

Child > 5 years

Flucloxacillin IV

OR

Cef-AZ-olin IV 50mg/kg TDS (max 6g/day)

Duration of Treatment

Contact Consultant Microbiologist for advice.

IV to Oral Switch

- Child **< 2 months** should have IV antibiotics for entire duration of treatment
- Child **> 2 months** who is afebrile and who has shown improvement both clinically and in inflammatory markers can change to oral antibiotics after 5-7 days.
- **Discuss optimum choice of oral antibiotic with Microbiology.**
- For difficult to treat organisms, IV therapy will be required for longer.

Comments

Kingella kingae susceptible to cephalosporins but not to flucloxacillin.

Infection

Paediatrics - Osteomyelitis in sickle cell disease or galactosaemia

Likely Organisms

S. aureus, Group A Streptococcus, Salmonella

Empiric Antimicrobial Treatment

Flucloxacillin IV

plus

Cef-TRI-axone IV **OR** Cef-O-taxime IV

Duration of Treatment

Contact Consultant Microbiologist for advice.

IV to Oral Switch

- Child **< 2 months** should have IV antibiotics for entire duration of treatment
- Child **> 2 months** who is afebrile and who has shown improvement both clinically and in inflammatory markers can change to oral antibiotics after 5-7 days.
- **Discuss optimum choice of oral antibiotic with Microbiology.**
- For difficult to treat organisms, IV therapy will be required for longer.

Paediatrics - Central Nervous System Infections

Infection

Paediatrics - Acute Bacterial Meningitis: Child ≤ 8 weeks

Excludes neutropenic sepsis

Likely Organisms

Child ≤ 8 weeks (chronological age)

Group B Streptococcus, E. coli, Listeria monocytogenes, N. meningitidis, S. pneumoniae

Empiric Antimicrobial Treatment

For pre-term infants or previous NICU admission, refer patient to Neonatology / Microbiology.

Child ≤ 8 weeks (chronological age)

Cef-O-taxime IV

Plus

Amoxicillin IV

Plus consider (see comments below):

+/- Gentamicin IV

+/- Vancomycin IV

+/- Aciclovir IV

Plus contact Microbiology if recent foreign travel for mother or baby in case of potential for colonisation with resistant organism.

Plus

If > 6 weeks old, add dexamethasone 0.15 mg/kg (max 10 mg) 6 hourly IV for **4** days if H. influenzae / S. pneumoniae meningitis is suspected or confirmed as it may reduce long-term complications. In this case, ideally it should be given just before or within 1 hour of the first dose of antibiotics . Consult Microbiology.

Add Gentamicin if :

• Severe sepsis/ haemodynamically unstable

• Requiring inotropes/critical care

• Likely resistant organisms e.g., frequent or prolonged hospitalisation; >48 hours following admission; recent foreign travel for mother or baby.

Add Vancomycin if:

• MRSA positive

• Recent travel outside of Ireland for mother or baby

• Prolonged antibiotics in past 3 months

• Concern about infected prosthetic material e.g. PICC line in-situ.

Add Aciclovir if clinical features of HSV.

Add Clindamycin if suspected staphylococcal/streptococcal toxic shock.

If suspected abdominal source, please see monograph for Paediatric Intra-Abdominal Infections .

Duration of Treatment

For uncomplicated meningitis where causative organism known:

- N. meninigitidis: 7 days
- H. influenzae: 10 days
- S. pneumoniae: 14 days
- Group B Streptococcus: 14 - 21 days
- E. coli & Gram-negative bacilli: 21 days
- L. monocytogenes: 21 days

For culture and PCR negative suspected bacterial meningitis:

- Child <3 months old: 14 days
- Child >3 months old: 10 days

Longer durations may be required if persistent fever or other complications.

IV to Oral Switch

Continue IV therapy for entire duration of treatment.

Comments

- Ensure the correct dose and frequency of antimicrobials is prescribed: see CHI 'Clinibee' Antimicrobial Guidelines app or LH Quick Reference dosing cards.
- Obtain cultures **before** antibiotics are administered wherever possible: e.g. urine, blood culture, LP.
- Antibiotics should be administered within 1 hour if presenting as a red flag for septic shock and 3 hours if presenting as an amber flag for suspected sepsis.
- Check previous microbiology results to determine if recent antibiotic-resistant organisms have been identified and contact Microbiology for advice.
- The selection of appropriate antibiotic therapy is complex - this guideline is not intended to cover all possible scenarios.

Public Health notification required for meningitis caused by N. meningitidis, H. influenzae, S. pneumoniae, Listeria spp. and viral meningitis.

N.B. See chemoprophylaxis for meningococcal contacts.

Paediatrics - Dental Infections

Infection
Paediatrics - Dental Infections
Likely Organisms
Anaerobes, Viridans streptococci
Empiric Antimicrobial Treatment
Mild: Amoxicillin PO If penicillin allergic: 1 st line: Metronidazole PO OR 2 nd line: Clindamycin PO **Severe: Seek Dental Consult** Amoxicillin IV **plus** Metronidazole IV If penicillin allergic: Clindamycin IV
Duration of Treatment
Mild: Up to 5 days; review at 24 to 48 hours. Severe: 5 days - if definitive source control (e.g. removal of the causative tooth) is achieved, then discontinuation of antibiotic therapy can be considered before the 5 days is completed.
Comments
Antibiotics are only required in the case of spreading infection (cellulitis, lymph node involvement, swelling) or systemic involvement (fever, malaise). Severe infection: significant trismus, extra oral swelling, eye closing, floor of mouth swelling, difficulty breathing, systemic symptoms or rapidly progressing spread of infection. For less acute dental indications, please follow HSE dental community guidelines located at www. antibioticprescribing.ie .

Paediatrics - ENT Infections

Infection
Paediatrics - Cervical Lymphadenitis
Likely Organisms
S. aureus, Group A Streptococcus, anaerobes, Group B Streptococcus or S. aureus if < 3 months old
Empiric Antimicrobial Treatment
Mild (outpatient): Cef-AL-exin PO **OR** Flucloxacillin PO **OR** Co-amoxiclav PO **Moderate to Severe (hospitalised):** Cef-AZ-olin IV **OR** Flucloxacillin IV **Plus** Clindamycin PO or IV
Duration of Treatment
Mild to Moderate: 7 days. **Severe:** Duration as per Micro/ID.
IV to Oral Switch
Yes, when clinically appropriate. Cef-AL-exin is an appropriate PO switch for Cef-AZ-olin IV.
Comments
If suppuration present, may require incision & drainage, contact ENT.

Paediatrics - Eye Infections

Infection

Paediatrics - Conjunctivitis

Likely Organisms

Viruses (most cases):

Enteroviruses, Adenovirus, Herpes simplex virus

Bacteria:

H. influenzae, S. pneumoniae, M. catarrhalis

Empiric Antimicrobial Treatment

Child > 1 month

Treat only if proven bacterial conjunctivitis. Most cases, whether viral or bacterial, resolve spontaneously.

Topical chloramphenicol eye drops, continue for 48 hours after healing.

Note - the previous warning associated with use of chloramphenicol eye drops in patients under 2 years of age has been reviewed and removed.

Duration of Treatment

5 – 7 days

IV to Oral Switch

N/A

Comments

Consult Microbiology if Group B Streptococcus is identified.

Infection

Paediatrics - Cellulitis: Pre-septal (Peri-Orbital)

Likely Organisms

S. aureus, Group A Streptococcus, Pneumococcus, H. influenzae in unvaccinated individuals

Empiric Antimicrobial Treatment

Mild Cases :

Co-amoxiclav PO

OR

Cef-AL-exin PO

Severe Cases :

Cef-O-taxime IV

Duration of Treatment

10 to 14 days (including IV to oral switch)

IV to Oral Switch

As per clinical response

Comments

In severe cases:

- **Ensure that pus is examined urgently**
- Take blood cultures prior to commencing antibiotics

For children ill enough to require IV therapy, CT scan is recommended to determine:

- underlying sinusitis
- subperiosteal abscess
- intracranial extension

Tailor therapy to the most appropriate agents based on culture and sensitivity results.

Infection
Paediatrics - Cellulitis: Post-septal (Orbital)
Likely Organisms
S. pneumoniae, S. aureus, aerobic gram negative bacilli, anaerobes
Empiric Antimicrobial Treatment
Cef-O-taxime IV
plus
Metronidazole IV
Duration of Treatment
14 to 21 days including IV to oral switch
IV to Oral Switch
As per clinical response
Comments
In severe cases:
- **Ensure that pus is examined urgently**
- Take blood cultures prior to commencing antibiotics

For children ill enough to require IV therapy, CT scan is recommended to determine:
- underlying sinusitis
- subperiosteal abscess
- intracranial extension

Tailor therapy to the most appropriate agents based on culture and sensitivity results.

Paediatrics - Febrile Neutropenia

Please refer directly to Children's Health Ireland (CHI) 'Clinibee' Antimicrobial Guidelines app for guidance. Also, contact Microbiology for advice if needed.

Paediatrics - Fungal Infections

Please refer directly to Children's Health Ireland (CHI) 'Clinibee' Antimicrobial Guidelines app for guidance. Also, contact Microbiology for advice if needed.

Paediatrics - Gastrointestinal Infections

Infection
Paediatrics - Acute Gastroenteritis
Likely Organisms
Usually viral
Empiric Antimicrobial Treatment
Antibiotic **rarely if ever** indicated.

Paediatrics - Intra-abdominal Infections

Infection
Paediatrics - Acute Abdominal Sepsis **E.g.** • ascending cholangitis • infected ascites in chronic liver disease • fulminant liver failure
Likely Organisms
E. coli and other gram negative bacilli, anaerobes, Streptococci, Staphylococci
Empiric Antimicrobial Treatment
Piperacillin/tazobactam IV **plus** Gentamicin IV In infected ascites, if MRSA suspected: **Add** Vancomycin IV
Duration of Treatment
Minimum 10 to 14 days
IV to Oral Switch
Consult Microbiology

Infection
Paediatrics - Acute Appendicitis
Likely Organisms
E. coli and other gram negative bacilli, anaerobes, Streptococci especially S. milleri
Empiric Antimicrobial Treatment
Cef-UR-oxime IV **plus** Metronidazole IV **+/-** Gentamicin IV
Duration of Treatment
Uncomplicated appendix: No further antibiotic doses post-operatively. Perforated or appendix mass: 7 days (or longer if peritonitis suspected)
IV to Oral Switch
N.B. Cef-UR-oxime PO is not recommended due to low oral bioavailability. Change to oral cefaclor and metronidazole when child meets the COMS criteria for IV to oral switch .

Paediatrics - Malaria

Paediatrics - Respiratory Tract Infections

Infection

Paediatrics - Aspiration Pneumonia – Community-acquired

Likely Organisms

Streptococci, oral flora including anaerobes, aerobic gram negative bacilli

Empiric Antimicrobial Treatment

Co- amoxiclav IV

If penicillin allergic:

Co-trimoxazole IV

Plus

Metronidazole PO or IV

Duration of Treatment

5 days

IV to Oral Switch

Yes, when clinically appropriate

Comments

Antibiotics are not indicated for aspiration without evidence of pneumonia.

Infection

Paediatrics - Community-Acquired Pneumonia: Child ≤ 8 weeks

Likely Organisms

Group B streptococcus, E. coli & other gram negative bacilli, S. aureus, Listeria monocytogenes, CMV, very rarely HSV.

Empiric Antimicrobial Treatment

Recommended antimicrobials as per Paediatrics - Sepsis: Child < 8 weeks

IV to Oral Switch

No, continue IV for entire duration of therapy.

Duration

5 days

Comments

Always admit patient to hospital.

Stop antibiotics if viral aetiology proven.

Infection

Paediatrics - Community-Acquired Pneumonia: Child > 8 weeks

Likely Organisms

S. pneumoniae, Mycoplasma pneumoniae, H. influenzae, S.aureus, Bordetella pertussis (<3 months), Chlamydia pneumoniae

May also be viral: RSV, Parainfluenza

Empiric Antimicrobial Treatment

If well :

Amoxicillin PO

OR

Azithromycin (if patient has already received amoxicillin/co-amoxiclav in the community or presumed atypical infection)

Pneumonia without signs of sepsis or effusion (clinically unwell):

Amoxicillin IV (If a sensitive S. aureus is isolated or if pneumatocele, switch to Flucloxacillin IV instead of Amoxicillin)

Add Azithromycin PO if

- Prior amoxicillin or co-amoxiclav in the community pre-admission
- No response to 1st line therapy within 48 hours
- *Mycoplasma/Chlamydia pneumoniae* suspected (rare in patients < 3 years)

Complicated pneumonia and/or pleural effusion:

Cef-UR-oxime IV

Plus

Azithromycin PO (or Clarithromycin IV if not tolerating PO)

If MRSA pneumonia, **Add** Vancomycin IV (**OR** Clindamycin if sensitive)

IV to Oral Switch

Yes, when clinically appropriate.

N.B. Cef-UR-oxime PO is not recommended due to low oral bioavailability. Consider cefaclor PO.

Duration

Mild to moderate pneumonia: 5 days (3 days for Azithromycin)

Complicated pneumonia: 5 - 10 days (3 days for Azithromycin)

Paediatrics - Sepsis

Infection

Paediatrics - Sepsis: Child ≤ 8 weeks

Excludes neutropenic sepsis

Likely Organisms

Child ≤ 8 weeks (chronological age)

Group B Streptococcus, E. coli, Listeria monocytogenes, N. meningitidis, S. pneumoniae

Empiric Antimicrobial Treatment

For pre-term infants or previous NICU admission, refer patient to Neonatology / Microbiology.

Child ≤ 8 weeks (chronological age)

Cef-O-taxime IV

Plus

Amoxicillin IV

Plus consider (see comments below):

+/- Gentamicin IV

+/- Vancomycin IV

+/- Aciclovir IV

Plus contact Microbiology if recent foreign travel for mother or baby in case of potential for colonisation with resistant organism.

Add Gentamicin if :

• Severe sepsis/ haemodynamically unstable

• Requiring inotropes/critical care

• Likely resistant organisms e.g., frequent or prolonged hospitalisation; >48 hours following admission; recent foreign travel for mother or baby.

Add Vancomycin if:

• MRSA positive

• Recent travel outside of Ireland for mother or baby

• Prolonged antibiotics in past 3 months

• Concern about infected prosthetic material e.g. PICC line in-situ.

Add Aciclovir if clinical features of HSV.

Add Clindamycin if suspected staphylococcal/streptococcal toxic shock.

If suspected abdominal source, please see monograph for Paediatric Intra-Abdominal Infections .

Duration of Treatment

Duration depends on source of sepsis.

If cultures are negative and sepsis is not suspected, discontinue antibiotics.

Comments

- Ensure the correct dose and frequency of antimicrobials is prescribed: see CHI 'Clinibee' Antimicrobial Guidelines app or LH Quick Reference dosing cards.
- Obtain cultures **before** antibiotics are administered wherever possible: e.g. urine, blood culture, LP.
- Antibiotics should be administered within 1 hour if presenting as a red flag for septic shock and 3 hours if presenting as an amber flag for suspected sepsis.
- Check previous microbiology results to determine if recent antibiotic-resistant organisms have been identified and contact Microbiology for advice.
- The selection of appropriate antibiotic therapy is complex - this guideline is not intended to cover all possible scenarios.

Paediatrics - Skin, Soft Tissue and Surgical Wound Infections

Infection

Paediatrics - Animal or Human Bites

Likely Organisms

Pasteurella species, oral anaerobes, S. aureus, beta haemolytic streptococci

Empiric Antimicrobial Prophylaxis

1. No prophylaxis offered if skin is unbroken

2. Consider prophylaxis **if** skin is broken but not drawn blood if:

- it involves hands, feet, face, genitals, skin overlying cartilaginous structures or an area of poor circulation or
- high-risk of a serious wound infection because of a comorbidity (diabetes, immunosuppression, asplenia or decompensated liver disease) or
- deep wound from cat bite

3. Offer antibiotic prophylaxis if skin is broken **and** drawn blood

4. Prescribe Co-amoxiclav PO

Empiric Antimicrobial Treatment of Infected Bite

Co-amoxiclav PO

If penicillin allergic:

Co-trimoxazole PO

Duration

Prophylaxis: 3 days

Treatment of infected bite: 5 days.

Comments

Assess the risk of tetanus, rabies or a bloodborne viral infection and take appropriate action.

Ask about tetanus immunisation status.

Manage the wound with irrigation and debridement as necessary.

Other animal bites discuss with ID / Micro.

Infection

Paediatrics - Burns

Likely Organisms

Group A Streptococcus, S. aureus

If infection occurs > 5 days post-hospitalisation, also aerobic gram negative organisms (e.g.Pseudomonas aeruginosa)

Empiric Antimicrobial Treatment

Burns should not initially be treated with antibiotics. **Treat only if infected** and on the advice of the Consultant .

Be aware of potential for toxic shock syndrome in children who often have only relatively small burns (fever, rash, diarrhoea, and ultimately shock).

Flucloxacillin IV

OR

Cef-AZ-olin IV 25mg/kg TDS (Max 6g/day)

Plus if severe infection: Clindamycin PO/IV

Plus if infection occurs > 5 days post-hospitalisation: Pip/tazobactam IV

Duration of Treatment

7 days, including IV to oral switch if appropriate oral option available based on C&S.

IV to Oral Switch

Yes, when clinically appropriate

Comments

Ensure appropriate swabs are sent. Aim to rationalise based on sensitivities.

Paediatrics - Urinary Tract Infections

The following advice pertains to a child who has had a single UTI only. If previous or recurrent UTIs, please check previous antimicrobial susceptibilities.

Infection

Paediatrics - UTI: Child < 2 months old

Likely Organisms

E. coli, Proteus species, Klebsiella, other aerobic gram negative bacilli, enterococci

Empiric Antimicrobial Treatment

Amoxicillin IV

Plus

Cef-O-taxime IV

Plus consider (see comments below):

+/- Gentamicin IV

Plus contact Microbiology if recent foreign travel for mother or baby in case of potential for colonisation with resistant organism.

Add Gentamicin if :

• severe sepsis/haemodynamically unstable

•requiring inotropes/ critical care

•l ikely resistant organisms e.g., frequent or prolonged hospitalisation; >48 hours following admission; recent foreign travel for mother or baby.

Duration of Treatment

10 days

IV to Oral Switch

Age dependent.

Comments

- Pre-term babies require specialist advice.
- Empiric treatment in this age group covers possibility of bacteraemia and/or meningitis. If diagnosis of UTI is uncertain, please see paediatric sepsis guideline .
- **The selection of appropriate antibiotic therapy is complex - this guideline is not intended to cover all possible scenarios.**

Infection

Paediatrics - UTI: Child > 2 to 6 months old

Likely Organisms

E. coli, Proteus species, other aerobic gram negative bacilli, enterococci

Cef-UR-oxime IV

+/-

Gentamicin IV

Duration of Treatment

10 days total including IV to PO switch

IV to Oral Switch

N.B. Cef-UR-oxime PO is not recommended due to low oral bioavailability. Choice of PO antibiotic to be based on C&S.

Children can be switched to oral antibiotics and sent home after 48 hours if:

- they have received 48 hours IV antibiotics
- clinically well
- afebrile for 48 hours
- blood cultures are negative
- no significant abnormality on renal USS
- a suitable oral antibiotic is available based on urine culture and sensitivity