Guideline

Paediatric Antibiocard: Empirical Antibiotic Guidelines

Document ID	CHQ-GDL-01202	**Standard 4** Medication Safety	
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Risk Rating	Very high		
Primary Document			
Custodian	Director, Infection Management and Prevention Services Medical Lead, Antimicrobial Stewardship	**Approval date**	27/09/2024
Accountable Officer	Executive Director Medical Services	**Effective date**	12/12/2024
Applicable to	All Children's Health Queensland staff	**Review date**	27/09/2025

HUMAN RIGHTS

This governance document has been human rights compatibility assessed. No limitations were identified indicating reasonable confidence that, when adhered to, there are no implications arising under the *Human Rights Act 2019.*

PURPOSE

The recommendations of this guideline are for the initial treatment of presumptive infections in patients cared for by Children's Health Queensland (CHQ). These guidelines are to be used only before the results of microbiological investigations are available or finalised.

SCOPE

This guideline provides information for all Queensland Health employees (permanent, temporary and casual) and all organisations and individuals acting as its agents (including Visiting Medical Officers and other partners, contractors, consultants and volunteers).

GUIDELINE

Introduction

Standards of Antimicrobial Stewardship in Children's Health Queensland

- Take cultures before starting antibiotics. In children commenced on empiric MRSA coverage, please do MRO screening swabs for MRSA to guide ongoing management/oral stepdown.
- Cease antibiotics if cultures negative at 48 hours **except if**:
  - the child has signs of severe sepsis.
  - cultures were taken after antibiotic treatment was started, discuss with Infectious Diseases (ID) team.
  - ongoing infection is likely.
- Change to narrow spectrum antibiotics once sensitivities are known.
- Consult Infection specialist.
  - if patient has a previous (or new onset) severe antimicrobial hypersensitivity reaction (include the following information: type of antimicrobial, type of reaction and severity, onset of reaction in relation to commencing antimicrobial, treatment required to treat symptoms).
  - for recommendations for treatment duration in confirmed infections.
- Document indication, Infectious Diseases (ID) approval number (where applicable) and planned duration/review date on the electronic Medication order in the integrated electronic medical record (ieMR) or the Paediatric National Inpatient Medication Chart (P-NIMC) when prescribing antimicrobials.
- Daily review of antibiotic plan (stop/continue antibiotics) should occur during ward round, review is to include:
  - Consideration of Early Intravenous (IV) to Oral Switch Therapy - Patients should be reviewed at 24 to 48 hours to consider whether early IV to oral switch would be appropriate. Refer to CHQ-GDL-01057 Antimicrobial treatment: Antibiotic duration and timing of the switch from intravenous to oral for common bacterial infections in children for further information. Exercise caution when considering a switch to oral in neonates and infants because of the relatively high incidence of bacteremia and the possibility of variable oral absorption.
  - Review of pathology results and appropriate antimicrobial dosing and choice based on these results.
- Seek Pharmacist / ID advice on appropriate therapeutic drug monitoring (TDM) and appropriate dosing for patients in renal failure
  - Paediatric Aminoglycoside (Tobramycin/Gentamicin/Amikacin) Guideline
  - Paediatric Vancomycin Therapeutic Drug Monitoring
- Patients labelled with an antibiotic allergy have longer hospital stays and increased exposure to suboptimal antibiotics. Take a comprehensive antimicrobial allergy history and assess the risk as per the CHQ-GDL-01076 Paediatric antibiotic allergy assessment, testing and de-labelling
- For ID consults:
  - Normal business hours (Monday to Friday) – contact QCH ID registrar
    - For Queensland Children's hospital, please also order a "Consult to Infectious Diseases" via iEMR
  - Afterhours – page QCH Paediatric infection specialist (ID SMO) on call via QCH switchboard

INFECTION	FIRST CHOICE ANTIMICROBIAL (* IV Lincomycin and IV Clindamycin can be used interchangeably for indications as specified in guideline in infants and children >1 month of age. Please confirm supply availability at your local hospital)	Alternative antibiotic in the event of immediate type (e.g. anaphylaxis) or delayed type (e.g. rash) hypersensitivity to 1st line antimicrobial
SEPSIS (Oncology / Haematology)		
Febrile neutropenia (Oncology / Haematology)	**Refer to** CHQ-GDL-01249 Management of Fever in a Paediatric Oncology Patient (Febrile Neutropenia and Febrile Non-neutropoenia). **Review at 48 to 72 hours**	
Febrile non-neutropenia (Oncology)	**Refer to** CHQ-GDL-01249 Management of Fever in a Paediatric Oncology Patient (Febrile Neutropenia and Febrile Non-neutropenia) **Review at 48 to 72 hours**	
SEPSIS		
COMMUNITY ACQUIRED SEPSIS (non PICU)	**Cefotaxime IV** 50 mg/kg/dose every 6 hours (maximum 2 g/dose); **OR Ceftriaxone IV** 100 mg/kg once daily (maximum 4 g/day). **Note: If Meningitis clinically or by LP treat as below under MENINGITIS.** Review antibiotics at 48 hours. **Less than 1 month old:** Refer to neonatal dosing section. **Cefotaxime IV** PLUS **Ampicillin IV (or Amoxicillin IV)**	**Immediate type hypersensitivity** **Ciprofloxacin IV** 10 mg/kg/dose 8-hourly (maximum 400 mg/dose) **PLUS** **Vancomycin IV** Seek ID advice within 24 hours.
	If at risk of nmMRSA: **Cefotaxime IV PLUS Lincomycin* IV** 15 mg/kg/dose every 8 hourly (maximum 1.2 g/dose). **Less than 1 month old:** Refer to neonatal dosing section. **Cefotaxime IV** PLUS **Ampicillin IV (or Amoxicillin IV)** PLUS **Clindamycin IV**	
	If at risk of multi-resistant MRSA **Cefotaxime IV PLUS Vancomycin IV** 15 mg/kg every 6 hours (maximum initial Vancomycin dose of 750 mg) (Perform TDM)**.** **Less than 1 month old:** Refer to neonatal dosing section **Cefotaxime IV** PLUS **Ampicillin IV (or Amoxicillin IV)** PLUS **Vancomycin IV**	

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CARDIAC		
Endocarditis **(Note: For directed therapy, seek ID advice)**	**Benzylpenicillin IV** 50 mg/kg/dose every 4 hours (maximum 1.8 g/dose) **PLUS Flucloxacillin IV** 50 mg/kg/dose every 4 hours (maximum 2 g/dose) **PLUS Gentamicin IV (Dose based on adjusted body weight. Perform TDM).** • **If more than 1 month and less than 10 years old:** 7.5 mg/kg once daily (maximum 320 mg/day). • **If more than 10 years old:** 6 mg/kg once daily (maximum 560 mg/day). **Note: If less than 1 month old, refer to neonatal dosing section. ID review required within 24 hours**	**Delayed type hypersensitivity** **Cefazolin IV** 50 mg/kg every 8 hours (maximum 2 g/dose) **PLUS Gentamicin IV** **PLUS Vancomycin IV** and seek ID advice within 24 hours. **Immediate type hypersensitivity,** **Gentamicin IV** **PLUS Vancomycin IV** and seek ID advice within 24 hours.
Endocarditis (prosthetic valve, nosocomial infection or community acquired MRSA is suspected) **(Note: For directed therapy, seek ID advice)**	**Vancomycin IV (Perform TDM)** • **If more than 1 month old:** 15 mg/kg/dose IV every 6 hours (maximum initial dose of 750 mg). **PLUS Flucloxacillin IV** • **If more than 1 month old:** 50 mg/kg/dose IV every 4 hours (maximum 2 g/dose) **PLUS Gentamicin IV (Dose based on adjusted body weight. Perform TDM)** • **If more than 1 month and less than 10 years old:** 7.5 mg/kg once daily (maximum 320 mg/day) • **If more than 10 years old:** 6 mg/kg once daily (maximum 560 mg/day) **ID review required within 24 hours. If Pseudomonas aeruginosa cultured, seek ID advice on appropriate directed therapy.** **Note: If less than 1 month old, refer to neonatal dosing section.** Perform TDM for Gentamicin and Vancomycin. **If Pseudomonas aeruginosa cultured, seek ID advice on appropriate directed therapy.**	

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CENTRAL NERVOUS SYSTEM		
Meningitis	**More than one month old:** **Cefotaxime IV** 50 mg/kg/dose IV every 6 hours (maximum 2 g/dose) **OR Ceftriaxone IV** 100 mg/kg/dose (maximum 4 g/dose) daily. Discuss with ID within 24 to 48 hours with cerebrospinal fluid (CSF) culture and susceptibility results. **PLUS** **If more than 2 months old:** Dexamethasone IV 0.15 mg/kg/dose (maximum 10 mg) every 6 hourly for 4 days. Start before or with first dose of antibiotics (ideally administered within 4 hours after starting IV antibiotic) but not beyond 12 hours. **Less than one month old:** Refer to neonatal dosing section **Cefotaxime IV Plus Ampicillin IV (or Amoxicillin IV)** Review antibiotics at 48 hours. For Gram negative meningitis/sepsis, consult ID	**Immediate type hypersensitivity,** **Ciprofloxacin IV** 10 mg/kg/dose 8-hourly (maximum 400 mg/dose) **PLUS Vancomycin IV** and seek ID advice within 24 hours.
	If Gram positive cocci in CSF: **Add Vancomycin IV (see** TDM section**)** and discuss with ID. **If more than 1 month old:** 15 mg/kg/dose IV every 6 hours (maximum 750 mg/dose starting dose). Perform TDM.	
If Encephalitis suspected	**Add Aciclovir IV** **Less than one month old:** Refer to neonatal dosing section **If more than 2 months old or less than 12 years old:** 500 mg/m^2/dose IV every 8 hours (maximum 1000 mg/dose). **If more than 12 years old:** 10 mg/kg/dose IV every 8 hours (maximum 1000 mg/dose). **If less than 2 months old:** 20 mg/kg/dose IV every 8 hours Review at 24 to 48 hours.	

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Prophylaxis for *N. meningitidis*	**Ciprofloxacin oral:** **Infant or Child 3 months to 5 years old:** 30 mg/kg (up to 125 mg) orally as a single dose. **Child 5 to 12 years old:** 250 mg orally, as a single dose. **Adolescents more than 12 years old:** 500 mg orally, as a single dose.	**Seek ID advice.**
	OR Rifampicin oral: **Less than 1 month old:** 5 mg/kg/dose orally twice daily for 2 days. **More than 1 month old:** 10 mg/kg/dose orally twice daily (maximum 600 mg/dose) for 2 days.	
Public Health Fact sheet	Meningococcal disease - antibiotics for close contacts of a person with meningococcal infection: ciprofloxacin, rifampicin | Health and wellbeing | Queensland Government (www.qld.gov.au)	
CSF shunt infection	**Neonates: Seek ID advice.** **If more than 1 month old:** **Cefotaxime IV** 50 mg/kg/dose IV every 6 hours (Maximum 2 g/dose) **AND Vancomycin IV (Perform** TDM **)** 15 mg/kg/dose IV every 6 hours (maximum initial dose of 750 mg) Discuss with ID within 48 hours.	**Immediate type hypersensitivity, seek ID advice.**

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RESPIRATORY		
Community acquired Pneumonia Neonate (less than or equal to 1 month old)	**Ampicillin IV (or Amoxicillin IV) PLUS Gentamicin IV** Age dependent dosing - Refer to neonatal dosing section. Use adjusted body weight for dosing Gentamicin and perform TDM. Review antibiotics at 24 to 48 hours. (Comment: Consider adding oral azithromycin if pertussis, *chlamydia trachomatis* likely. Discuss with ID within 24 hours)	**Immediate type hypersensitivity, seek ID advice.**
Community acquired Pneumonia (CAP) (more than 1 month old)	**Amoxicillin orally** 30 mg/kg/dose every 8 hours (maximum 1 g/dose). Comment: Oral antibiotics are sufficient in most children with CAP unless unable to tolerate oral or severe/complicated disease.	**Immediate type hypersensitivity, Azithromycin orally** 10 mg/kg/dose once daily (maximum 500 mg/dose)
Community acquired Pneumonia (more than 1 month old) (unable to tolerate oral)	**Benzylpenicillin IV** 60 mg/kg/dose every 6 hours (maximum 2.4 g/dose). Review antibiotics at 24 to 48 hours.	**Delayed type hypersensitivity, Cefazolin IV 50 mg/kg/dose (maximum 2 g/dose) 8 hourly. Immediate type hypersensitivity, seek ID advice within 24 hours.**
Empyema (more than 1 month old) **Neonates – seek ID advice**	**Benzylpenicillin IV** 60 mg/kg/dose every 6 hours (maximum 2.4 g/dose) **PLUS, Lincomycin IV** 15 mg/kg/dose every 8 hours (maximum 1.2 g/dose) **If < 5 years AND not fully vaccinated for HiB, use Cefotaxime 50 mg/kg/dose (maximum 2 g/dose) 6 hourly PLUS Lincomycin IV** **Seek ID advice within 48 hours. Consult respiratory team regarding pleural drainage.**	**Delayed type hypersensitivity, Cefazolin IV plus Lincomycin IV and seek ID advice within 24 hours** **Immediate type hypersensitivity, seek ID advice**.

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Severe Pneumonia (Paediatric intensive care (PICU)) (more than 1 month old) **Neonates – seek ID advice**	**Cefotaxime IV** 50 mg/kg/dose every 6 hours (maximum 2 g/dose). **PLUS, Lincomycin IV** 15 mg/kg/dose every 8 hours (maximum 1.2 g/dose) **Discuss with ID within 48 hours.**	**Immediate type hypersensitivity, seek ID advice**.
	If life threatening pneumonia OR multi-resistant MRSA suspected: **Cefotaxime IV** 50 mg/kg/dose every 6 hours (maximum 2 g/dose) **PLUS Lincomycin IV** 15 mg/kg/dose every 6 hours (maximum 1.2 g/dose) **PLUS Vancomycin IV** 15 mg/kg/dose IV every 6 hours (maximum initial dose of 750 mg) (Perform therapeutic drug monitoring for Vancomycin.) **PLUS if M. pneumoniae suspected, add Azithromycin IV** 10 mg/kg once daily (maximum 500 mg/day). Switch to oral Azithromycin after 24 hours. **Seek ID advice within 24 hours. Consult respiratory team regarding pleural drainage if applicable.**	
Tracheitis/Epiglottitis	**Cefotaxime IV** 50 mg/kg/dose IV every 6 hours (maximum 2 g/dose) and seek ID review within 24 hours.	**Immediate type hypersensitivity, seek ID advice.**
Pertussis	**Azithromycin oral** **Less than or equal to 6 months old:** 10 mg/kg orally once daily (maximum 500 mg/day) for 5 days. **More than 6 months old:** 10 mg/kg orally once daily on Day 1 (maximum 500 mg), then 5 mg/kg daily on Day 2 to 5 (maximum 250 mg/day). Notifiable disease - Pertussis | Disease control guidance (health.qld.gov.au)	**Immediate type hypersensitivity, seek ID advice.**

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EAR, NOSE AND THROAT (ENT)		
Tonsillitis	**Phenoxymethylpenicillin** 15 mg/kg/dose orally twice daily (maximum 500 mg/dose) for 10 days.	**Delayed type hypersensitivity** Azithromycin 10mg/kg orally once daily for 5 days.
Acute Otitis Media	**Amoxicillin** 30 mg/kg/dose orally every 8 hours (maximum 1 g/dose) for 5 days. For further information, refer to CHQ-GDL-6000 Acute otitis media - Emergency management in children.	**Delayed type hypersensitivity, Cephalexin orally** 30 mg/kg/dose every 8 hourly (maximum 1 g/dose).
Otitis externa	**Refer to** CHQ-GDL-00720 Otitis Externa: Emergency Management in Children for guidance.	
Mastoiditis	**Cefotaxime IV** 50 mg/kg/dose every 6 hours (maximum 2 g/dose) and seek ID review within 72 hours.	**Immediate type hypersensitivity,** seek ID advice
Retropharyngeal abscess	**IV Amoxicillin-Clavulanic acid** **Neonates and Infants (0 to 3 months old):** If less than or equal to 4 kg: 25 mg/kg/dose (amoxicillin component) every 12 hours. If more than 4 kg: 25 mg/kg/dose (amoxicillin component) every 8 hours. **Infants and children (more than 3 months old):** **Severe infection:** 25 mg/kg/dose (amoxicillin component) every 6 hourly (maximum 1 g/dose Amoxicillin component). **Adolescents older than 12 years old (and more than 40 kg):** **Severe infection:** 25 mg/kg/dose (amoxicillin component) every 6 hourly (maximum 1 g/dose Amoxicillin component; maximum 200 mg/dose clavulanate component). **Seek ID review within 24 hours.**	**Delayed type hypersensitivity, Cefotaxime IV.**

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GASTRO-INTESTINAL		
Appendicitis **SURGICAL PROPHYLAXIS**	For patients transferring to theatre for appendicectomy, refer to CHQ-GDL-01064 CHQ Paediatric surgical antibiotic prophylaxis guidelines for guidance on peri-operative antibiotic prophylaxis. Note: To achieve optimal cover, per-operative prophylaxis should be administered at time of induction (knife to skin).	
Appendicitis **UNCOMPLICATED** **(e.g. no perforation)**	IV antibiotics are not usually required for postoperative treatment of uncomplicated appendicitis. If operative intervention will be significantly delayed (> 6 hours) preoperative antibiotics below may be started. If post operative antibiotics are requested a short course (e.g. <72 hours) is usually sufficient: Seek ID advice within 72 hours. **Amoxicillin-Clavulanic acid IV** **Neonates and Infants (0 to 3 months old):** **If less than or equal to 4 kg:** 25 mg/kg/dose (amoxicillin component) every 12 hours. **If more than 4 kg:** 25 mg/kg/dose (amoxicillin component) every 8 hours. **Infants and children (more than 3 months old):** **Severe infection:** 25 mg/kg/dose (amoxicillin component) every 6 hours (maximum 1 g/dose Amoxicillin component). **Adolescents older than 12 years (and more than 40kg):** **Severe infection:** 25 mg/kg/dose (amoxicillin component) every 6 hours (maximum 1 g/dose Amoxicillin component; maximum 200 mg/dose clavulanate component).	**Immediate type hypersensitivity,** Gentamicin IV (dose based on adjusted body weight) **PLUS Lincomycin IV** 15 mg/kg/dose every 8 hours (maximum 1.2 g/dose). Seek ID advice within 48 hours.

<table>
<tr><th>INFECTION</th><th colspan="2">FIRST CHOICE ANTIMICROBIAL
(* IV Lincomycin and IV Clindamycin can be used interchangeably for indications as specified in guideline in infants and children >1 month of age. Please confirm supply availability at your local hospital)</th><th>Alternative antibiotic in the event of immediate type (e.g. anaphylaxis) or delayed type (e.g. rash) hypersensitivity to 1st line antimicrobial</th></tr>
<tr><td rowspan="5">Appendicitis COMPLICATED (e.g. perforation, appendiceal collection / abscess)

Peritonitis

NEC (for neonates - Age dependent dosing - Refer to Ampicillin/Amoxicillin, Metronidazole and Gentamicin neonatal section).

Note: If Pseudomonas aeruginosa cultured, seek ID advice on directed therapy.</td><td colspan="2">EMPIRICAL ANTIBIOTICS FOR FIRST 72 HOURS, CHOOSE EITHER:</td><td rowspan="4">Seek ID advice within 48 hours.

Delayed type hypersensitivity,
Ceftriaxone IV 50 mg/kg once daily (Maximum 2 g/day)
PLUS Metronidazole IV.

If associated sepsis, give
Ceftriaxone IV 100 mg/kg once daily (Maximum 4 g/day)
PLUS Metronidazole IV.

Immediate type hypersensitivity,
Gentamicin IV
PLUS Lincomycin IV
15 mg/kg/dose every 8 hours (maximum of 1.2 g/dose).</td></tr>
<tr><td>Ampicillin IV (or Amoxicillin IV)
If more than 1 month old: 50 mg/kg/dose every 6 hours (maximum 2 g/dose)
PLUS Metronidazole IV 7.5 mg/kg/dose every 8 hours (Maximum 500 mg/dose)
PLUS Gentamicin IV (Dose based on Adjusted body weight. Perform TDM)
If more than 1 month and less than (or equal to) 10 years old: 7.5 mg/kg once daily (maximum 320 mg/day).
If more than 10 years old: 6mg/kg once daily (maximum 560 mg/day).
Seek ID advice within 72 hours. Due to risk of toxicity, consider switching to non-aminoglycoside containing regimen.</td><td>Piperacillin/ Tazobactam 100mg/kg/dose IV every 6 hours (maximum 4 g/dose Piperacillin component).</td></tr>
<tr><td colspan="2">IF ANTIBIOTICS REQUIRED BEYOND 72 HOURS, CHANGE TO EITHER:</td></tr>
<tr><td>Amoxicillin-Clavulanic acid IV (for up to 4 days)
Neonates and Infants (0 to 3 months old):
If less than or equal to 4 kg:
25 mg/kg/dose (amoxicillin) every 12 hours.
If more than 4 kg: 25 mg/kg/dose (amoxicillin) every 8 hours.
Infants and children (more than 3 months old):
Severe infection: 25 mg/kg/dose (amoxicillin) every 6 hours (maximum 1 g/dose Amoxicillin component).
Adolescents older than 12 years (and more than 40kg):
Severe infection: 25 mg/kg/dose (amoxicillin) every 6 hours (maximum 1 g/dose Amoxicillin component; maximum 200 mg/dose clavulanate component).</td><td>Piperacillin/ Tazobactam 100mg/kg/dose IV every 6 hours (maximum 4 g/dose Piperacillin component) (for up to 4 days).</td></tr>
<tr><td colspan="2">Oral option to complete course: Amoxicillin/ Clavulanic acid
22.5 mg/kg/dose orally twice daily (maximum 875 mg/dose Amoxicillin component). Early oral switch can take place if patient clinically improving.</td><td>Immediate type hypersensitivity, seek ID advice.</td></tr>
<tr><td colspan="3">If poor clinical response, antibiotic regimens may be modified based upon the results of cultures of blood, peritoneal fluid, or surgical specimens - seek ID advice. Antibiotic therapy is generally required for total 4 to 7 days, the duration may need to be further prolonged if there are deep undrained collections. Seek ID advice for treatment beyond 7 days.</td></tr>
</table>

INFECTION	FIRST CHOICE ANTIMICROBIAL **(* IV Lincomycin and IV Clindamycin can be used interchangeably for indications as specified in guideline in infants and children >1 month of age. Please confirm supply availability at your local hospital)**	**Alternative antibiotic in the event of immediate type (e.g. anaphylaxis) or delayed type (e.g. rash) hypersensitivity to 1st line antimicrobial**
GASTRO-INTESTINAL		
Cholangitis	**Cefotaxime IV** 50 mg/kg/dose every 6 hours (maximum 2 g/dose) **(OR if more than one month old: Ceftriaxone IV** 50 mg/kg once daily (maximum 2 g/day)) **PLUS Metronidazole IV** 7.5 mg/kg/dose every 8 hours (maximum 500 mg/dose). Seek ID advice within 72 hours. **If associated sepsis,** Give Ceftriaxone IV 100 mg/kg once daily (maximum 4 g/day) **PLUS** Metronidazole IV 7.5 mg/kg/dose every 8 hours (maximum 500 mg/dose). Seek ID advice within 72 hours.	**Immediate type hypersensitivity** seek ID advice
Giardiasis	**Metronidazole** 30 mg/kg/dose orally once daily (maximum 2 g/dose) for 3 days.	
Clostridium Difficile	**Refer to** CHQ-GDL-01058 Paediatric Clostridium (Clostridioides) Difficile Infection - Treatment Guidelines for guidance.	
Suspected salmonella (non typhoidal) infection	**Refer to** CHQ-GDL-63001 Management Guideline for Non-typhoidal Salmonellosis in Children for guidance.,	
Pinworms **(Treat all family members)**	**Mebendazole:** **If less than or equal to 1 year old:** 50 mg orally as a single dose. **If more than 1 year old:** 100 mg orally as a single dose.	

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URINARY TRACT		
Uncomplicated Urinary Tract Infection (UTI)	**UTI and less than 3 months old - Treat as for Pyelonephritis.** **Infants and children more than 3 months old:** **Trimethoprim/ Sulfamethoxazole** 4 mg/kg/dose orally twice daily (maximum 160 mg/dose Trimethoprim component) for 5 days. **OR Cefalexin** 30 mg/kg/dose orally every 8 hours (maximum 1 g/dose)	
Pyelonephritis	**If more than 1 month old:** **Ampicillin IV (or Amoxicillin IV)** 50 mg/kg/dose IV every 6 hours (maximum 2 g/dose) **PLUS** **Gentamicin IV (Dose based on adjusted body weight. See TDM section)** **If more than 1 month old and less than (or equal to) 10 years old:** 7.5 mg/kg once daily (maximum 320 mg/day). **If more than 10 years old:** 6 mg/kg IV once daily (maximum 560 mg/day). Seek ID advice within 48 hours. Perform TDM. **Less than 1 month old:** Refer to neonatal dosing section.	**Immediate or delayed hypersensitivity penicillin,** use **Gentamicin IV** as single agent initially then seek ID advice within 48 hours.

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SKELETAL / SOFT TISSUE / SKIN		
Mild Cellulitis **Mild Periorbital cellulitis** **Impetigo** **Cervical lymphadenitis** **(Outpatient)**	**Cefalexin** 30 mg/kg/dose orally every 8 hours (maximum 1 g/dose) **OR** **Flucloxacillin** 25 mg/kg/dose orally four times a day (maximum 1 g/dose) (For children who can swallow capsules). **If at risk of nmMRSA or if family/personal history of boils** (Previous nmMRSA, History of boils or Aboriginal or Pacific islander descent) **Trimethoprim/ Sulfamethoxazole** 4 mg/kg/dose orally twice daily (maximum 160 mg/dose Trimethoprim component). **OR** **Clindamycin** 10 mg/kg/dose orally three times a day (maximum 600 mg/dose) (For children who can swallow capsules whole) Duration: Refer to CHQ GDL 01057 Antimicrobial treatment: Antibiotic duration and timing of the switch from intravenous to oral for common bacterial infections in children - Paediatric Guideline	**Immediate type hypersensitivity to penicillin or cephalosporin, give Trimethoprim / Sulfamethoxazole orally.**
Severe cellulitis **Severe preseptal cellulitis** **Severe cervical lymphadenitis** **(Inpatient)**	**Flucloxacillin** 50 mg/kg/dose IV 6 hourly (maximum 2 g/dose) For patients who are likely to require >72 hours of IV therapy, to conserve peripheral intravenous cannula, suggest Cefazolin switching to 50mg/kg/dose IV 8 hourly (maximum 2 g/dose) **If at risk of nmMRSA or if family/personal history of boils** (Previous nmMRSA, History of boils or Aboriginal or Pacific islander descent) **Lincomycin IV** 15 mg/kg/dose every 8 hours (maximum 1.2 g/dose). Review antibiotics with ID within 48 hours	**Immediate type hypersensitivity to penicillin, give** Lincomycin IV 15mg/kg 8 hourly (maximum 1.2 g/dose)

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Osteomyelitis **Septic Arthritis**	**Under 5 years of age (risk of Kingella infections):** **Cefazolin IV** 50 mg/kg/dose (maximum 2 g/dose) every 8 hours **Under 5 years AND not immunised against HiB (ie. No HiB containing vaccines received):** **Cefotaxime IV** 50 mg/kg/dose (maximum 2 g/dose) every 6 hours **Over 5 years of age:** **Flucloxacillin IV** 50 mg/kg/dose every 6 hours (maximum 2 g/dose). For patients who are likely to require >48-72 hours of IV therapy **AND** have no long line, to conserve peripheral IV cannula, suggest Cefazolin 50 mg/kg/dose IV 8 hourly (maximum 2 g/dose) Refer to CHQ-GDL-01067 Paediatric Bone and Joint Infection Management for further information. **If at risk of nmMRSA or if family/personal history of boils** (Previous nmMRSA, History of boils or Aboriginal or Pacific islander descent) **ADD Lincomycin IV** 15 mg/kg/dose every 8 hours (maximum 1.2 g/dose). Review antibiotics with ID within 48 hours	**Delayed type hypersensitivity to flucloxacillin, give Cefazolin IV.** **Immediate type hypersensitivity to penicillins or cephalosporins, Lincomycin IV** and seek ID advice.
Moderate to Severe Periorbital cellulitis (under 5 years and not immunised against HiB) **OR** **Orbital Cellulitis (ALL ages)**	**Cefotaxime IV** 50 mg/kg/dose every 6 hours (maximum 2 g/dose) If peri-orbital or orbital cellulitis suspected, refer to CHQ-GDL-00723 Peri-Orbital and Orbital Cellulitis: Emergency Management in Children Review antibiotics with ID within 48 hours	**Immediate type hypersensitivity,** seek ID advice.
	If at risk of nmMRSA: **Cefotaxime IV** 50 mg/kg/dose every 6 hours (maximum 2 g/dose). **PLUS Lincomycin IV** 15 mg/kg/dose every 8 hours (maximum 1.2 g/dose) Review antibiotics with ID within 48 hours	
	If at risk of multi-resistant MRSA: **Cefotaxime IV** 50 mg/kg/dose every 6 hours (maximum 2 g/dose) **PLUS Vancomycin IV** 15 mg/kg/dose every 6 hours (maximum initial dose of 750 mg). (Perform TDM for Vancomycin). Review antibiotics with ID within 48 hours	

INFECTION	FIRST CHOICE ANTIMICROBIAL **(* IV Lincomycin and IV Clindamycin can be used interchangeably for indications as specified in guideline in infants and children >1 month of age. Please confirm supply availability at your local hospital)**	**Alternative antibiotic in the event of immediate type (e.g. anaphylaxis) or delayed type (e.g. rash) hypersensitivity to 1st line antimicrobial**
SKELETAL / SOFT TISSUE / SKIN		
Suspected necrotising fasciitis	**Cefotaxime IV** 50 mg/kg/dose every 6 hours (maximum 2 g/dose). **PLUS Lincomycin IV** 15 mg/kg/dose every 8 hours (maximum 1.2 g/dose) **PLUS Vancomycin IV** 15 mg/kg/dose every 6 hours (maximum initial dose of 750 mg). (Perform therapeutic drug monitoring for Vancomycin). **Seek ID advice within 24 hours.**	**Immediate type hypersensitivity** seek ID advice.
	If external wound / inoculation associated with necrotising fasciitis: **Meropenem IV** 40 mg/kg/dose every 8 hours (maximum 2 g/dose) **PLUS Lincomycin IV** 15 mg/kg/dose every 8 hours (maximum 1.2 g/dose) **PLUS Vancomycin IV** 15 mg/kg/dose every 6 hours (maximum initial dose of 750 mg). (Perform therapeutic drug monitoring for Vancomycin). **Seek ID advice within 24 hours.**	
Compound fractures	**For open fractures with no clinical evidence of skin or soft tissue infection or severe tissue damage, give systemic antibiotic prophylaxis:** **Cefazolin IV** 50 mg/kg/dose (maximum 2 g/dose) every 8 hourly and **seek ID advice within 24 hours.**	**Immediate type hypersensitivity** **Lincomycin IV** and seek ID advice.
	For open fractures with severe tissue damage or clinical evidence of skin or soft tissue infection: **Piperacillin - Tazobactam IV** 100 mg/kg/dose every 6 hours (maximum 4 g/dose Piperacillin component) and **seek ID advice within 24 hours.**	**Immediate type hypersensitivity** **Ciprofloxacin IV** (10 mg/kg/dose 12-hourly (maximum 400 mg/dose) **PLUS Lincomycin IV** and seek ID advice within 24 hours.

INFECTION	FIRST CHOICE ANTIMICROBIAL **(* IV Lincomycin and IV Clindamycin can be used interchangeably for indications as specified in guideline in infants and children >1 month of age. Please confirm supply availability at your local hospital)**	**Alternative antibiotic in the event of immediate type (e.g. anaphylaxis) or delayed type (e.g. rash) hypersensitivity to 1st line antimicrobial**
SKELETAL / SOFT TISSUE / SKIN		
Animal Bites with established infection **Prophylaxis for animal bites is not indicated for small wounds not involving deeper tissues that present within 8 hours and can be adequately debrided and irrigated** **Always check Tetanus immunisation status**	**Amoxicillin/ Clavulanic acid** 22.5 mg/kg/dose orally twice daily (maximum 875 mg/dose Amoxycillin component). Duration: 5 to 7 days	**Delayed type OR immediate type hypersensitivity,** **Trimethoprim/ Sulfamethoxazole orally** 4 mg/kg/dose twice daily (maximum 160 mg/dose trimethoprim component) **PLUS** **Metronidazole orally** 7.5 mg/kg/dose every 8 hours (maximum 400 mg/dose).
	For Severe infection: **Amoxicillin-Clavulanic acid IV (seek ID advice within 48 hours)** **Neonates and Infants (0 to 3 months old):** **If less than or equal to 4 kg:** 25 mg/kg/dose (amoxicillin component) every 12 hours. **If more than 4 kg:** 25 mg/kg/dose (amoxicillin component) every 8 hours. **Infants and children (more than 3 months old):** **Severe infection:** 25 mg/kg/dose (amoxicillin component) every 6 hourly (maximum 1 g/dose amoxicillin component). **Adolescents older than 12 years old (and more than 40kg):** **Severe infection:** 25 mg/kg/dose (amoxicillin component) every 6 hourly (maximum 1 g/dose amoxicillin component; note: maximum 200 mg/dose clavulanate component).	**Delayed type hypersensitivity,** **IV Ceftriaxone** 100 mg/kg once daily (maximum 4 g/day) **PLUS** **Metronidazole orally** 7.5 mg/kg/dose every 8 hours (maximum 400 mg/dose).

INFECTION	FIRST CHOICE ANTIMICROBIAL **(* IV Lincomycin and IV Clindamycin can be used interchangeably for indications as specified in guideline in infants and children >1 month of age. Please confirm supply availability at your local hospital)**	**Alternative antibiotic in the event of immediate type (e.g. anaphylaxis) or delayed type (e.g. rash) hypersensitivity to 1st line antimicrobial**
SKELETAL / SOFT TISSUE / SKIN		
Antibiotic prophylaxis for wounds (excluding fractures, wounds sustained in water and animal bites) **Always check** Tetanus immunisation status	Antibiotic prophylaxis is not routinely required for traumatic wounds that do not require surgical management and are not significantly contaminated. If concerned about infection, send swabs from base of wound for M/C/S. **Severe wounds** **Cefazolin IV** 50 mg/kg/dose (maximum 2 g/dose) every 8 hourly **PLUS** **Metronidazole IV** 7.5 mg/kg/dose (maximum 500 mg/dose) every 8 hourly For severe wounds contaminated with vegetative matter (soil, grass etc) use piperacillin-tazobactam IV 100 mg/kg/dose (maximum 4g/dose) every 6 hourly. Discontinue at wound closure (Maximum 24 hours IV antibiotics). If severe seek ID advice (may require continuation 24 hours after definitive wound closure – ID approval required). **Less severe wounds** **Flucloxacillin orally** 25 mg/kg (Maximum 500mg/dose) 6-hourly for 24 hours. OR **Cefalexin orally** 30 mg/kg (Maximum 1 g/dose) 8-hourly for 24 hours. Maximum duration 72 hours. Seek ID advice.	**Delayed type OR immediate type hypersensitivity,** seek ID advice.
Wounds sustained in water **Always check** Tetanus immunisation status	Refer to CHQ-GDL-63000 Management of Water-immersed Wound Infections in Children for guidance. Seek ID advice within 24 hours.	
Bat (Lyssavirus) exposure	Refer to CHQ-GDL-00719 Management of children presenting with potential Lyssavirus (rabies) exposures - Emergency Management in Children for guidance. Notify Public Health and CHQ ID service.	

SPECIFIC NEONATAL ANTIMICROBIAL DOSING - AUSTRALASIAN NEONATAL MEDICINES FORMULARY (ANMF) and NEOMEDQ		
Antimicrobial	**Australasian Neonatal Medicines Formulary (ANMF)**	**NeoMedQ**
Aciclovir IV	*ANMF – Aciclovir*	*NeomedQ – Aciclovir*
Amikacin IV	*ANMF – Amikacin*	-
Amoxicillin IV	*ANMF – Amoxicillin*	*NeomedQ - Amoxicillin*
Amoxicillin/clavulanate	*ANMF – Amoxicillin-clavulanate*	-
Ampicillin IV	*ANMF – Ampicillin*	*NeomedQ - Ampicillin*
Azithromycin	*ANMF – Azithromycin*	*NeomedQ - Azithromycin*
Benzylpenicillin IV	*ANMF – Benzylpenicillin*	*NeomedQ - Benzylpenicillin*
Cefalexin PO	*ANMF – Cefalexin*	
Cefazolin IV	*ANMF – Cefazolin*	*NeomedQ - Cefazolin*
Cefepime IV	*ANMF - Cefepime*	*NeomedQ - Cefepime*
Cefotaxime IV	*ANMF – Cefotaxime*	*NeomedQ - Cefotaxime*
Ceftazidime IV	*ANMF – Ceftazidime*	-
Clindamycin IV Comment: Does not provide CNS cover – seek ID advice	*ANMF - Clindamycin*	-
Flucloxacillin IV Comment: Higher oral mg/kg doses may be required in neonates – see AMH CDC for dosing recommendations	*ANMF – Flucloxacillin*	NeomedQ - Flucloxacillin
Gentamicin IV Comment: TDM required. Seek AMS/ Pharmacist advice.	*ANMF – Gentamicin*	NeomedQ - Gentamicin
Meropenem IV	*ANMF – Meropenem*	*NeomedQ - Meropenem*
Metronidazole IV	*ANMF – Metronidazole*	*NeomedQ - Metronidazole*
Piperacillin/Tazobactam IV Comment: Does not provide CNS cover – seek ID advice	*ANMF – Piperacillin/Tazobactam*	-
Tobramycin IV Comment: TDM required. Seek AMS/ Pharmacist advice.	*ANMF – Tobramycin*	-
Trimethoprim/ sulfamethoxazole PO Caution: Kernicterus risk in neonates – seek ID advice	*ANMF – Trimethoprim/sulfamethoxazole*	NeomedQ – Trimethoprim/sulfamethoxazole
Vancomycin IV Comment: TDM required. Seek AMS/ Pharmacist advice.	*ANMF – Vancomycin*	NeomedQ - Vancomycin

SUPPORTING DOCUMENTS

- CHQ-PROC-01036 Antimicrobial: Prescribing and Management
- CHQ-GDL-01057 Antimicrobial treatment: Antibiotic duration and timing of the switch from intravenous to oral for common bacterial infections in children
- CHQ Antimicrobial restrictions
- CHQ-GDL-01076 Paediatric antibiotic allergy assessment, testing and de-labelling
- Pathology Queensland – Queensland Children's Hospital Antibiograms
- Pathology Queensland – All children at Queensland Public Hospitals Antibiograms
- Queensland Paediatric Statewide Sepsis Pathway

CONSULTATION

Key stakeholders who reviewed this version:

• Service Group Director - Infection Management and Prevention service, Rheumatology and Immunology • Paediatric Surgeon • Paediatric Infection Specialist Consultant and Fellow Team (CHQ)	• Paediatric Infection Specialist Consultant, Gold Coast University Hospital Clinical Pharmacist Lead - Antimicrobial Stewardship • Medicines Advisory Committee (CHQ) – endorsed 20/10/2022

DEFINITIONS

Term	Definition
ABW	Actual body weight
AMS	Antimicrobial stewardship
CHQ	Children's Health Queensland
CNS	Central nervous system
CSF	Cerebral spinal fluid
IBW	Ideal body weight
iEMR	Integrated electronic medical record
ID	Infectious diseases team
IV	Intravenous
LP	Lumbar puncture
MRSA	Multi-resistant staphylococcus aureus
nmMRSA	Non multi-resistant staphylococcus aureus
QCH	Queensland Children's hospital
TDM	Therapeutic drug monitoring

REFERENCES

No.	Reference
1	Antibiotic Therapeutic Guidelines (14th Edition) Therapeutic Guidelines Committee, North Melbourne, Victoria (2021).
2	Taketomo CK eds. Pediatric Dosage Handbook International – available online: https://uptodate.chq.health.qld.gov.au/ [Accessed 25 August 2024]
3	The Australasian Neonatal Medicines Formulary Steering group. https://www.anmfonline.org/clinical-resources/ [Accessed 25 August 2024]
4	Bijleveld YA et al. Population Pharmacokinetics and Dosing Considerations for Gentamicin in Newborns with Suspected or Proven Sepsis Caused by Gram-Negative Bacteria. Antimicrobial Agents and Chemotherapy. 2017; 61 (1): e01304-16.

GUIDELINE REVISION AND APPROVAL HISTORY

Version No.	Modified by	Amendments authorised by	Approved by	Comments
2.0	Infectious Diseases Consultant- Antimicrobial Stewardship (Infection Management and Prevention Service)	Medicines Advisory Committee (CHQ)	General Manager Operations	
3.0 (04/08/2016)	Infectious Diseases Consultants (Infection Management and Prevention Service) Antimicrobial Stewardship Pharmacist (CHQ)	Medicines Advisory Committee (CHQ) Infectious Diseases Consultant team and Medical Lead - Antimicrobial Stewardship (Infection Management and Prevention Service)	General Manager Operations	
4.0 (30/11/2016)	Infectious Diseases Consultants (Infection Management and Prevention Service) Antimicrobial Stewardship Pharmacist (CHQ)	Medicines Advisory Committee (CHQ) Infectious Diseases Consultant team and Medical Lead - Antimicrobial Stewardship (Infection Management and Prevention Service)	Executive Director Hospital Services	
5.0 (11/10/2017)	Infectious Diseases Consultants (Infection Management and Prevention Service) Antimicrobial Stewardship Pharmacist (CHQ)	Medicines Advisory Committee (CHQ) Infectious Diseases Consultant team and Medical Lead - Antimicrobial Stewardship (Infection Management and Prevention Service)	Executive Director Hospital Services	
6.0 (12/03/2019)	Infectious Diseases Consultants (Infection Management and Prevention Service)	Medicines Advisory Committee (CHQ)	Executive Director Clinical Services (QCH)	

	Antimicrobial Stewardship Pharmacist (CHQ)			
7.0 (20/06/2019)	Director, Infection Management and Prevention Services Medical Lead, Antimicrobial Stewardship (QCH)	Medicines Advisory Committee (CHQ)	Executive Director Clinical Services (QCH)	
8.0 (10/06/2021)	Director, Infection Management and Prevention Services Clinical Pharmacist Lead, Antimicrobial Stewardship (QCH)	Medicines Advisory Committee (CHQ)	Executive Director Clinical Services (QCH)	
8.1 (21/09/2021)	Medical Lead, Paediatric Sepsis program Clinical Pharmacist Lead, Antimicrobial Stewardship (QCH)	Medicines Advisory Committee (CHQ)	Executive Director Clinical Services (QCH)	
9.0 (18/10/2022)	Clinical Pharmacist Lead, Antimicrobial Stewardship (QCH)	Director, Infection Management and Prevention Services	Divisional Director Medicine	
10.0 27/09/2024	Pharmacist Advanced – Antimicrobial Stewardship	Director, Infection Management and Prevention Services	Executive Director Medical Services	Scheduled review
10.1 12/12/2024	Pharmacist Advanced – Antimicrobial Stewardship			Minor change to correct typo

Key words	Paediatric antibiocard, empirical, antimicrobial stewardship, sepsis, pneumonia, empyema, meningitis, CSF shunt infection, febrile neutropenia, non-neutropenia, community acquired, meningitis, encephalitis, pertussis, cholangitis, uncomplicated appendicitis, complicated appendicitis, necrotising enterocolitis, NEC, peritonitis, endocarditis, mastoiditis, retropharyngeal abscess, otitis media, tonsillitis, tracheitis, epiglottitis, compound fracture osteomyelitis, septic arthritis, cellulitis, periorbital cellulitis, orbital cellulitis, animal bites, wounds, UTI, urinary tract infection, pyelonephritis, giardiasis, pinworms, neonatal antibiotic dosing, therapeutic drug monitoring, ampicillin, amoxicillin, azithromycin, benzylpenicillin, gentamicin, cefotaxime, cefazolin, ceftriaxone, ciprofloxacin, clindamycin, vancomycin, gentamicin , flucloxacillin, mebendazole, cefalexin, clindamycin, trimethoprim/ sulfamethoxazole, metronidazole, meropenem, piperacillin-tazobactam, lincomycin, amoxicillin/ clavulanic acid, therapeutic drug monitoring, TDM, area under the curve, AUC, nmMRSA, mrMRSA, ANMF, NeoMedQ, 01202
Accreditation references	National Safety and Quality Health Service Standards (1-8): • Standard 3 Preventing and Controlling Healthcare-Associated Infection, • Standard 4 Medication Safety