GUIDELINE

Acute Respiratory Tract Infection

Scope (Staff):	Medical, Nursing, Pharmacy
Scope (Area):	All Clinical areas

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this disclaimer

Prior to initiation of antibiotic therapy, microbiology samples should be taken as appropriate. Empiric therapy should be modified once diagnostic tests are available. This guideline gives information on the appropriate duration of antibiotic therapy. Consider IV to oral switch to complete the course of antibiotics as required. A Biofire Respiratory Multiplex PCR should be sent on all admitted patients with a suspected respiratory tract infection.

CLINICAL SCENARIO		Usual duration	DRUGS/DOSES			
			Standard Protocol	Known or Suspected MRSA[a]	Low Risk Penicillin allergy[b]	High Risk Penicillin allergy[b]
Community Acquired pneumonia (CAP)	All CAP < 4 weeks of age	7 days	IV gentamicin[c] **AND** IV benzylpenicillin (dose as per neonatal guidelines)	As per standard protocol	IV cefotaxime[d] (dose as per neonatal guidelines)	Discuss with Infectious Diseases
	CAP (mild to moderate) ≥ 4 weeks of age	3 to 5 days (IV and oral)	Oral amoxicillin 25 mg/kg/dose (to a maximum of 1 gram) 8 hourly	As per standard protocol	Oral cefuroxime[e] or consider amoxicillin challenge in discussion with immunology	Oral azithromycin[f] **OR** Oral doxycycline[g]
			If intolerant to oral therapy, IV benzylpenicillin 50 mg/kg/dose (to a maximum of 1.2 grams) 6 hourly	As per standard protocol	IV ceftriaxone[h]	Discuss with Infectious Diseases

<table>
<tr><th colspan="2" rowspan="2">CLINICAL SCENARIO</th><th rowspan="2">Usual duration</th><th colspan="4">DRUGS/DOSES</th></tr>
<tr><th>Standard Protocol</th><th>Known or Suspected MRSA[a]</th><th>Low Risk Penicillin allergy[b]</th><th>High Risk Penicillin allergy[b]</th></tr>
<tr><td rowspan="5">Community Acquired pneumonia (CAP)</td><td rowspan="2">CAP (severe)
≥ 4 weeks of age
requiring intensive care admission, fluid bolus
≥ 20 mL/kg, or hypoxia (<85% in air)</td><td rowspan="2">Up to 7 days (IV and oral)</td><td>IV ceftriaxone 50 mg/kg/dose (to a maximum of 2 grams) once daily
AND
IV vancomycin[i] 15 mg/kg/dose (to a maximum initial dose of 750 mg) 6 hourly</td><td colspan="2">As per standard protocol</td><td>Discuss with Infectious Diseases</td></tr>
<tr><td colspan="4">The Biofire Respiratory Multiplex PCR is a rapid PCR test.
IF positive for atypical organisms (Bordetella pertussis, Bordatella parapertussis, Chlamydophilia pneumoniae or Mycoplasma pneumoniae)
ADD
IV/oral azithromycin 10 mg/kg/dose (to a maximum of 500 mg) once daily for up to 5 days

IF the PCR is positive for Influenza A or Influenza B
ADD
Oral oseltamivir 3mg /kg/dose (to a maximum of 75 mg) twice daily for five days
Refer to ChAMP monograph for suggested dose bands.
For empiric oral switch therapy, see mild to moderate CAP</td></tr>
<tr><td rowspan="2">CAP (with empyema or parapneumonic effusion)
≥ 4 weeks of age</td><td rowspan="2">variable</td><td>IV ceftriaxone 50 mg/kg/dose (to a maximum of 2 grams) once daily</td><td>ADD
IV vancomycin[i] to standard protocol</td><td>As per standard protocol</td><td>IV ciprofloxacin[j]
AND
IV vancomycin[i]</td></tr>
<tr><td colspan="4">In the setting of severe CAP with empyema, see CAP (severe).
If diagnostic sampling is not deemed safe or feasible, discuss with Infectious Diseases.
In confirmed pneumococcal empyema, IV benzylpenicillin with switch to oral amoxicillin is recommended (excluding patients with a high risk allergy to penicillin or amoxicillin).
Refer to Clinical Practice Guidelines: Pleural empyema</td></tr>
<tr><td rowspan="2">CAP: Aspiration pneumonia
≥ 4 weeks of age</td><td rowspan="2">7 days (IV and oral)</td><td>Oral amoxicillin 25 mg/kg/dose (to a maximum of 1 gram) 8 hourly</td><td>As per standard protocol</td><td>Oral cefuroxime[e] or consider amoxicillin challenge in discussion with immunology</td><td>Oral azithromycin[f]</td></tr>
<tr><td>If intolerant to oral therapy, IV benzylpenicillin 50 mg/kg/dose (to a maximum of 1.2 grams) 6 hourly</td><td>As per standard protocol</td><td colspan="2">Discuss with Infectious Diseases</td></tr>
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CLINICAL SCENARIO		Usual duration	DRUGS/DOSES			
			Standard Protocol	Known or Suspected MRSA[a]	Low Risk Penicillin allergy[b]	High Risk Penicillin allergy[b]
	CAP: Severe Aspiration pneumonia requiring intensive care admission, fluid bolus ≥ 20mL/kg or hypoxia (<85% in air) ≥ 4 weeks of age	7 days (IV and oral)	IV amoxicillin/clavulanic acid[k]	Discuss with Infectious Diseases	IV ceftriaxone[h] **AND** IV metronidazole[l]	Discuss with Infectious Diseases
			For empiric oral step down therapy, use oral amoxicillin/clavulanic acid 25 mg/kg/dose (to a maximum of 875 mg amoxicillin component) 12 hourly	Discuss with Infectious Diseases	Oral cefuroxime[e] or consider amoxicillin challenge in discussion with immunology	Oral clindamycin[l]
Hospital Acquired Pneumonia	Hospital acquired pneumonia (HAP) ≥ 4 weeks of age	7 days (IV or oral)	Oral amoxicillin/clavulanic acid 25 mg/kg/dose (to a maximum of 875 mg amoxicillin component) 12 hourly **OR** IV ceftriaxone 50 mg/kg/dose (to a maximum of 2 grams) once daily	As per standard protocol	Oral cefuroxime[e] or consider amoxicillin challenge in discussion with immunology	Discuss with Infectious Diseases
	Ventilator associated pneumonia (VAP) ≥ 4 weeks of age	5 days (IV and oral)	IV piperacillin/tazobactam 100 mg/kg/dose (to a maximum of 4 grams piperacillin component) 8 hourly	As per standard protocol	IV cefepime[n]	Discuss with Infectious Diseases
	HAP or VAP (severe) requiring intensive care admission, fluid bolus ≥ 20mL/kg, or hypoxia (<85% in air) ≥ 4 weeks of age	varies	IV piperacillin/tazobactam 100 mg/kg/dose (to a maximum of 4 grams piperacillin component) 8 hourly **AND** IV vancomycin 15 mg/kg/dose (to a maximum initial dose of 750 mg) 6 hourly	As per standard protocol	IV cefepime[n] **AND** IV vancomycin[i]	Discuss with Infectious Diseases
			For empiric oral step down therapy, use oral amoxicillin/clavulanic acid 25 mg/kg/dose (to a maximum of 875 mg amoxicillin component) 12 hourly	Discuss with Infectious Diseases	Oral cefuroxime[e] or consider amoxicillin challenge in discussion with immunology	Discuss with Infectious Diseases

CLINICAL SCENARIO		Usual duration	DRUGS/DOSES			
			Standard Protocol	Known or Suspected MRSA[a]	Low Risk Penicillin allergy[b]	High Risk Penicillin allergy[b]
Atypical infections	Confirmed pertussis **< 6 months old**	5 days	Oral azithromycin 10 mg/kg/dose (to a maximum of 500 mg) once daily			
			The Biofire Respiratory Multiplex PCR is a rapid PCR test. Only commence therapy if a positive result is reported. Refer to Medical prophylaxis guideline and Communicable Diseases Network Australia: Pertussis for information on prophylaxis indications			
	Confirmed pertussis **≥ 6 months old**	5 days	Oral azithromycin 10 mg/kg/dose (to a maximum of 500 mg) on day 1 then 5 mg/kg (maximum 250 mg) once daily for 4 days			
			The Biofire Respiratory Multiplex PCR is a rapid PCR test. Only commence therapy if a positive result is reported. Refer to Medical prophylaxis guideline and Communicable Diseases Network Australia: Pertussis for information on prophylaxis indications			
	Confirmed mycoplasma pneumonia ≥ 4 weeks of age	3 days	*Mycoplasma pneumoniae* pneumonia is usually self-limiting. The benefit of antibiotic therapy is unclear. **Consider:** Oral azithromycin 10 mg/kg/dose (to a maximum of 500 mg) once daily **OR** Oral doxycycline Child < 21kg: 2.2mg/kg (to a maximum of 50mg) given 12 hourly Child ≥ 21kg to <26kg: 50 mg given 12 hourly Child ≥ 26kg to <35kg: 75 mg given 12 hourly Child ≥ 35kg: 100 mg given 12 hourly			
Influenza	Influenza (confirmed or probable) requiring hospitalisation (≥ 4 weeks of age)	5 days	Oral oseltamivir 3 mg/kg/dose (to a maximum of 75 mg per dose) twice daily. Refer to ChAMP monograph for suggested dose bands Note: consider therapy for CAP (as per standard protocol) if coexisting bacterial pneumonia suspected			

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<tr><th colspan="2" rowspan="2">CLINICAL SCENARIO</th><th rowspan="2">Usual duration</th><th colspan="4">DRUGS/DOSES</th></tr>
<tr><th>Standard Protocol</th><th>Known or Suspected MRSA[a]</th><th>Low Risk Penicillin allergy[b]</th><th>High Risk Penicillin allergy[b]</th></tr>
<tr><td rowspan="3">Influenza</td><td>Influenza (confirmed) not requiring hospitalisation (≥ 4 weeks of age)</td><td>5 days</td><td colspan="4">IF risk factors for severe disease give oral oseltamivir 3 mg/kg/dose (to a maximum of 75 mg per dose) twice daily.
IF no risk factors, oseltamivir is not required.
Refer to ChAMP monograph for suggested dose bands.</td></tr>
<tr><td colspan="4">Refer to Medical prophylaxis guideline for information on influenza prophylaxis
Individuals at higher risk of poor outcomes with flu (adapted TG – Figure 2.41)
- Chronic cardiac disease
- Chronic respiratory conditions
- Severe neurological conditions
- Immunocompromised
- Down Syndrome
- Obesity
- Other chronic illness
- Residents of long-term residential facilities</td></tr>
<tr><td>Influenza (confirmed or probable) (< 4 weeks of age)</td><td></td><td colspan="4">Discuss with Infectious Diseases</td></tr>
<tr><td></td><td>SARS-CoV-2
COVID-19</td><td></td><td colspan="4">Refer to: Clinical care of paediatric patients with COVID-19
Discuss patients ≥ 12 years and ≥ 40 kg with significant immunocompromise and/or multiple risk factors for severe disease who are unvaccinated or under-vaccinated as antiviral therapy may be considered.</td></tr>
</table>

a) Children known or suspected to be colonised with MRSA may need to have their therapy/prophylaxis modified. Children suspected of having MRSA include:
   i. Children previously colonised with MRSA
   ii. Household contacts of MRSA colonised individuals
   iii. In children who reside in regions with higher MRSA rates (e.g. Kimberley, Pilbara and Goldfields) a lower threshold for suspected MRSA should be given
   iv. Children with recurrent skin infections or those unresponsive to ≥ 48 hours of beta-lactam therapy. For further advice, discuss with Microbiology or ID service.

b) Refer to the ChAMP Beta-lactam Allergy Guideline:
   - Low risk allergy: a delayed rash (>1hr after initial exposure) without mucosal or systemic involvement (without respiratory distress and/or cardiovascular compromise).
   - High risk allergy: an immediate rash (<1hr after exposure); anaphylaxis; severe cutaneous adverse reaction {e.g. Drug Rash with Eosinophilia and Systemic Symptoms (DRESS) and Stevens – Johnson syndrome (SJS) / Toxic Epidermal Necrolysis (TEN)} or other severe systemic reaction.

c) Gentamicin is rapidly bactericidal and should be administered prior to benzylpenicillin. Aminoglycoside antibiotics may be inactivated by penicillin and cephalosporin antibiotics;lines should be flushed well with a compatible fluid between administration.

d) IV cefotaxime dose as per neonatal guidelines

e) Oral cefuroxime **3 months or older: 15 mg/kg/dose** (to a maximum of 500mg) twice daily. Suspension has recently been discontinued, where possible round to the nearest portion of a tablet or discuss with ChAMP or pharmacy for alternative options

f) Oral azithromycin **10 mg/kg/dose** (to a maximum of 500mg) once daily

g) Oral doxycycline
   Child < 21kg: 2.2mg/kg (to a maximum of 50mg) given 12 hourly

Child ≥ 21kg to <26kg: 50 mg given 12 hourly
Child ≥ 26kg to <35kg: 75 mg given 12 hourly
Child ≥ 35kg: 100 mg given 12 hourly

h) IV ceftriaxone **50 mg/kg/dose** (to a maximum of 2 grams) once daily
i) IV vancomycin **15 mg/kg/dose** (to a maximum initial dose of 750 mg) 6 hourly. Therapeutic drug monitoring is required.
j) IV ciprofloxacin **10 mg/kg/dose** (to a maximum of 400mg) given 12 hourly.
k) IV amoxicillin/clavulanic acid (doses based on amoxicillin component):
   Birth (term) to 3 months and < 4 kg: IV infusion 25 mg/kg/dose every 12 hours.
   Birth (term) to 3 months and > 4kg: IV infusion 25 mg/kg/dose every 8 hours.
   > 3 months and < 40 kg: IV 25 mg/kg/dose (maximum 1 gram) every 8 hours; increase to every 6 hours in severe infections.
   > 40 kg: IV 1 gram every 8 hours; increase to every 6 hours in severe infections. Up to 2 grams every 6-8 hours can be used.
l) IV metronidazole **12.5 mg/kg/dose** (to a maximum of 500 mg) 12 hourly
m) Oral clindamycin **10 mg/kg/dose** (to a maximum of 450 mg) 8 hourly
n) IV cefepime **50 mg/kg/dose** (to a maximum of 2 grams) 8 hourly

Related CAHS internal policies, procedures and guidelines
Antimicrobial Stewardship Policy
ChAMP empiric guidelines and monographs
Neonatal Medication Protocols
Pleural empyema

References and related external legislation, policies, and guidelines

1. Antibiotic Writing Group. Therapeutic Guidelines - Antibiotic. West Melbourne: Therapeutic Guidelines Ltd; 2022. Available from: https://tgldcdp-tg-org-au.pklibresources.health.wa.gov.au/etgAccess.
2. McMullan BJ, Andresen D, Blyth CC, Avent ML, Bowen AC, Britton PN, et al. Antibiotic duration and timing of the switch from intravenous to oral route for bacterial infections in children: systematic review and guidelines. Lancet Infect Dis. 2016;16(e139-52).

This document can be made available in alternative formats on request.

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