CHQ Hospital In the Home Antibiotic Guidelines

Purpose

The recommendations of this guideline are for patients that are suitable for care by the Children’s Health Queensland (CHQ) Hospital In The Home (HITH) service, who require antimicrobial therapy.

Scope

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

Related documents

Procedures, Guidelines, Protocols

- CHQ-PROC-01036 Antimicrobial: Prescribing and Management
- CHQ Antimicrobial restrictions formulary
- CHQ At Home Outpatient Parenteral Antimicrobial Therapy Prescribing, Administration and monitoring guideline
- CHQ-WI-80002 Continuous IV infusion administration via ambIT® - pumps for HITH- A basic guide for transfer to Hospital in the Home (HITH)
- CHQ-GDL-01057 Antimicrobial treatment: Early intravenous to oral switch – Paediatric Guideline
Guideline

Introduction

Some children with infections presenting to hospital may be deemed to be unsuitable for oral antimicrobial therapy (for example, inability to tolerate oral therapy or more severe disease) but clinically well enough to be managed without being admitted for inpatient hospital care.

Children’s Health Queensland Hospital In The Home (HITH) service facilitates care and delivery of antimicrobial therapy to these children.

This guideline has been developed to assist transitioning of children directly from the Emergency Department or inpatient wards onto HITH for antimicrobial therapy.

For the following indications and antibiotics ID antibiotic approval is not required for the first 3 days of intravenous therapy.

Clinical conditions for HITH antimicrobial therapy

The following clinical conditions can be treated via HITH service:

A. Community acquired pneumonia (not tolerating oral therapy)
B. Cellulitis
C. Lymphadenitis
D. Pre-septal/peri-orbital cellulitis
E. Urinary tract infections

Antimicrobial choice and duration for each of the above clinical conditions are summarised in the treatment recommendation table below (Table 1).

Children less than 3 months of age or children with allergies to the recommended antimicrobials are not eligible for direct admission to HITH from the Emergency Department.

First dose of intravenous antibiotics to be given in the Emergency department followed by a 1 hour observation period (for allergic reaction) before patient can be transferred home on HITH.

Patients with a positive blood culture should be recalled to hospital and IV antibiotic plan and follow up management discussed with the QCH ID Team on service.

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**ALERT**
Consider oral antibiotics first as the above clinical conditions can usually be treated with oral therapy.

Decision to commence or continue intravenous antibiotics and referral to HITH requires a Senior Medical Officer review.
<table>
<thead>
<tr>
<th>Clinical condition for HITH</th>
<th>Recommended intravenous and oral antimicrobial therapy &amp; duration (2 to 3 days)</th>
<th>MRSA risk factors$^a$</th>
<th>Recommended oral switch option</th>
<th>Usual total duration of therapy (IV and oral)</th>
</tr>
</thead>
</table>
| Community acquired pneumonia (not tolerating oral therapy)$^b$ | Cefazolin IV (as continuous infusion via AmBIT pump)$^c$  
OR  
Ceftiraxone IV (100 mg/kg once daily, maximum 2 g/day) | Not applicable$^a$. | Amoxicillin orally 25 mg/kg/dose (maximum 1 g/dose) three times a day. | 5 to 7 days |
| Cellulitis/ Lymphadenitis$^d$ | Cefazolin IV (as continuous infusion via AmBIT pump)$^c$  
OR  
Ceftiraxone IV 100 mg/kg once daily (maximum 2 g/day) | **Choose one IV option and one ORAL option:**  
Cefazolin IV  
(as continuous infusion via AmBIT pump)$^c$  
OR  
Ceftiraxone IV 100 mg/kg once daily (maximum 2 g/day)  
PLUS  
Oral Trimethoprim/ Sulfamethoxazole  
(see oral switch option for dosing)  
OR  
Oral Clindamycin$^e$  
(see oral switch option for dosing) | No MRSA suspected:  
Cefalexin suspension orally 30 mg/kg/dose three times a day (maximum 1 g/dose),  
or  
*For children who can swallow capsules:*  
Flucloxacillin orally 25 mg/kg/dose four times a day (maximum 1 g/dose)  
*For suspected or proven MRSA:*  
Trimethoprim/sulfamethoxazole orally 5 mg/kg/dose (maximum 160 mg/dose trimethoprim component) three times daily.  
or  
*For children who can swallow capsules:*  
Clindamycin$^e$ orally 7.5 mg/kg/dose (maximum 450 mg/dose) four times a day.  
Oral antibiotic choice should be guided by culture results, if available. | 5 to 7 days |

$^a$ See Footnotes

Table 1: Treatment recommendations for infants over 3 months of age, children and adolescents with normal renal function (see Footnotes)
<table>
<thead>
<tr>
<th>Clinical condition for HITH</th>
<th>Recommended intravenous and oral antimicrobial therapy &amp; duration (2 to 3 days)</th>
<th>MRSA risk factors(^{A})</th>
<th>Recommended oral switch option</th>
<th>Usual total duration of therapy (IV and oral)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peri-orbital cellulitis</td>
<td>Cefazolin IV (as continuous infusion via AmBIT pump)(^{C}) or Ceftriaxone IV 100 mg/kg once daily (maximum 2 g/day)</td>
<td>Choose one IV option to use with the ORAL option: Cefazolin IV (as continuous infusion via AmBIT pump)(^{C}) OR Ceftriaxone IV 100 mg/kg once daily (maximum 2 g/day) PLUS Oral Trimethoprim/Sulfamethoxazole (see oral switch option for dosing)</td>
<td>If child is more than 2 years old and fully vaccinated against HiB*, with no MRSA risk factors or concerns for sinusitis: Cefalexin 30 mg/kg/dose three times per day (maximum 1g/dose) If child is <strong>not</strong> fully vaccinated against HiB or has clinical concerns for concurrent sinusitis: Amoxicillin/clavulanic acid 22.5 mg/kg/dose (maximum 875 mg/dose amoxicillin component) twice daily *most children if vaccinated as per National Immunisation Program (NIP) schedule would have received 4 doses of HiB containing vaccine by 18 months of age. If child has proven or suspected MRSA: Trimethoprim/sulfamethoxazole orally 5 mg/kg/dose (maximum 160 mg/dose trimethoprim component) three times daily.</td>
<td>7 to 10 days</td>
</tr>
<tr>
<td>Urinary tract infection (UTI)/Pyelonephritis</td>
<td>Amoxicillin orally 25 mg/kg/dose three times a day (maximum 1 g/dose) PLUS Gentamicin IV(^{F}) • If more than 1 month and less than 10 year old: 7.5 mg/kg once daily (Maximum 320 mg/day) • If more than 10 year old: 6 mg/kg IV once daily (Maximum 560 mg/day)</td>
<td>Not applicable</td>
<td>Guided by urine culture result. Seek ID advice if required.</td>
<td>3 to 5 days for UTI 7 to 10 days for pyelonephritis</td>
</tr>
</tbody>
</table>
Footnotes:

A. Where MRSA is strongly suspected and significant infection present requiring IV antibiotic therapy, admission is required; follow CHQ-GDL-01202 CHQ Paediatric Antibiotic Card: Empirical Antibiotic Guidelines for antibiotic choices. MRSA specific intravenous antibiotics are either not HITH suitable or restricted and require ID approval.

B. Oral antibiotics are sufficient in most children with community acquired pneumonia unless unable to tolerate oral or severe/complicated disease

C. Cefazolin can be given as a 24-hour infusion with the AmBIT pump via a peripheral IV cannula (minimum 22 G). Patient suitability for continuous infusion will be at the clinician’s discretion.
   i. The Cefazolin 24-hour dose can be prepared in an IV bag for administration.
      a. A loading dose of 50 mg/kg (maximum 2 g) should be given prior to commencing continuous infusion (150 mg/kg/day, maximum 6 g/day).
      b. For Cefazolin infusion preparation information, please refer to the CHQ-WI-80002 Continuous IV infusion administration via AmbIT® - pumps for HITH- A basic guide for transfer to Hospital in the Home (HITH)
   ii. Further information available via the CHQ AMS website: CHQ At Home Outpatient Parenteral Antimicrobial Therapy Prescribing, Administration and monitoring guideline

D. A swab of any discharge or pus should be taken prior to commencing treatment. If no discharge or pus present, MRO swabs should be done to determine MRSA status. If known MRSA colonisation, therapy should be directed by culture results (if available).

E. If child can manage capsules, oral clindamycin is a suitable alternative given its excellent bioavailability. Continuing clindamycin for more than 24 hours requires ID approval.

F. In otherwise healthy children, therapeutic drug monitoring for gentamicin for UTI is not necessary for durations of less than 3 days. Patients who have renal impairment or require therapeutic drug monitoring due to concerns for potential nephrotoxicity are not suitable for HITH admission via the Emergency Department.

Antimicrobial treatment duration exceeding 3 days

Children who require longer than 3 days of IV antimicrobial therapy as recommended above require discussion with ID and antibiotic approval for continuing IV therapy
List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AMS</td>
<td>Antimicrobial Stewardship</td>
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<tr>
<td>CHQ</td>
<td>Children’s Health Queensland</td>
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<tr>
<td>CHQatHome</td>
<td>Children’s Health Queensland Hospital In The Home service</td>
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<tr>
<td>HITH</td>
<td>Hospital in the Home</td>
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<td>IMPS</td>
<td>Infection Prevention and Management Service</td>
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<tr>
<td>ID</td>
<td>Infectious Diseases Team</td>
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<tr>
<td>IV</td>
<td>Intravenous</td>
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<td>MRO</td>
<td>Multi-resistant organism screening</td>
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<td>MRSA</td>
<td>Methicillin Resistant Staphylococcus Aureus</td>
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<tr>
<td>SMO</td>
<td>Senior Medical Officer</td>
</tr>
<tr>
<td>QCH</td>
<td>Queensland Children’s Hospital</td>
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<tr>
<td>UTI</td>
<td>Urinary tract infection</td>
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</table>

Consultation

Key stakeholders who reviewed this version:

- Medical Lead AMS, IMPS (CHQ)
- Paediatric Infection Specialist, IMPS (CHQ)
- Pharmacist Advanced – Antimicrobial Stewardship, IMPS (CHQ)
- CHQatHome Senior Clinical Pharmacist, CHQ at home (CHQ)
- General Paediatrician, CHQ at home (CHQ)
- Nurse Unit Manager, CHQ at Home (CHQ)
- Medicines Advisory Committee – Endorsed 12/03/2021

References and suggested reading

1. Therapeutic Guidelines: Antibiotic 2020 Therapeutic Guidelines Ltd. Melbourne
# Guideline revision and approval history

<table>
<thead>
<tr>
<th>Version No.</th>
<th>Modified by</th>
<th>Amendments authorised by</th>
<th>Approved by</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 19/06/2019</td>
<td>Director – Infection Management and Prevention Services (IMPS), Immunology and Rheumatology</td>
<td>Medical Director, Division of Medicine</td>
<td>Executive Director Clinical Services (QCH)</td>
</tr>
<tr>
<td>2.0 12/01/2021</td>
<td>Infection Specialist (IMPS) Pharmacist Advanced, Antimicrobial stewardship</td>
<td>Medical Director, Division of Medicine</td>
<td>Executive Director Clinical Services</td>
</tr>
</tbody>
</table>

**Keywords**
- Hospital in The Home, Antibiotics, Antimicrobial Stewardship, CHQatHome, 63012

**Accreditation references**
- NSQHS Standards (1-8): 1 Clinical Governance, 2 Partnering with consumers, 3 Preventing and Controlling Healthcare Associated Infections, 4 Medication safety
- ISO 9001:2015 Quality Management Systems: (4-10)
Appendix A – Community acquired pneumonia HITH pathway

HITH Eligibility Criteria
- Lives/staying within 40 km of QCH or eligible for accommodation.
- Parent/guardian contactable via phone.
- Safe home environment
- Ability to represent as required.

Community Acquired Pneumonia

Clinically stable
- Not requiring supplemental oxygen

More than 3 months of age
- Failed trial of appropriate oral antibiotics.
- No supplemental oxygen requirement.

Less than 3 months of age
- Supplemental oxygen requirement.
- Clinically unstable.

Does the patient meet HITH eligibility criteria?

YES

Discharge Home on Oral antibiotics as per CHQ AMS guidelines.
- GP follow up.

HITH

Admit to HITH as per HITH Referral pathway

HOSPITAL

Refer to appropriate team for Hospital admission.
- IV Antibiotics as per CHQ AMS guidelines.

HOME

HITH IV antibiotics (via PIVC) (refer to guideline for dosing recommendations)
- IV Cefazolin (continuous infusion via AmBIT pump) OR IV Ceftriaxone (once daily)

IMPORTANT – First dose of IV antibiotics must be given in ED with 1 hour observation.
Appendix B – Cellulitis HITH pathway

HITH Eligibility Criteria
- Lives/ staying within 40 km of QCH or eligible for accommodation.
- Parent/guardian contactable via phone.
- Safe home environment
- Ability to represent as required.

Does the patient meet HITH eligibility criteria?

NO

Discharge Home on Oral antibiotics as per CHQ AMS guidelines. GP follow up.

HOME

YES

Mild to moderate erythema and no fever

Cellulitis

More than 3 months of age and rapidly spreading redness, swelling or pain or failed trial of appropriate oral antibiotics. Risk factors for nmMRSA.

Admit to HITH as per HITH Referral pathway

HITH

Less than 3 months of age or Evidence of abscess or foreign body or Immunosuppressed +/- Risk factors for nmMRSA

Refer to appropriate team for Hospital admission. IV antibiotics as per CHQ AMS guidelines.

HOSPITAL

Admitting team to consider step down to HITH in consultation with ID

HITH IV antibiotics (via PIVC) (refer to guideline for dosing recommendations)
- IV Cefazolin (continuous infusion via AmBIT pump) OR IV Ceftriaxone (once daily)

MRSA Risk factors present: Add oral Trimethoprim/sulfamethoxazole OR oral Clindamycin

IMPORTANT – First dose of IV antibiotics must be given in ED with 1 hour observation.
Appendix C – Lymphadenitis HITH pathway

**HITH Eligibility Criteria**
Lives/staying within 40 km of QCH or eligible for accommodation. Parent/guardian contactable via phone. Safe home environment. Ability to represent as required.

**Acute Lymphadenitis**
- Clinically well. Suitable for trial of oral antibiotics.
- More than 3 months of age. Failed trial of appropriate oral antibiotics or otherwise not suitable for oral antibiotics +/- Risk factors for nmMRSA.
- Less than 3 months of age. Fluctuant node and/or Clinically unstable.

**Does the patient meet HITH eligibility criteria?**

**YES**
- Discharge Home on Oral antibiotics as per CHQ AMS guidelines. GP follow up.
- Admit to HITH as per HITH Referral pathway.

**NO**
- Refer to appropriate team for Hospital admission IV antibiotics as per CHQ AMS guidelines.
- Admitting team to consider step down to HITH in consultation with ID.

**HITH IV antibiotics (via PIVC) (refer to guideline for dosing recommendations)**
IV Cefazolin (continuous infusion via AmBIT pump) OR IV Ceftriaxone (once daily)
**MRSA Risk factors present:** Add oral Trimethoprim/sulfamethoxazole OR oral Clindamycin
**IMPORTANT** – First dose of IV antibiotics must be given in ED with 1 hour observation.
Appendix D – Peri-orbital Cellulitis HITH pathway

HITH Eligibility Criteria
- Lives/ staying within 40 km of QCH or eligible for accommodation.
- Parent/guardian contactable via phone.
- Safe home environment
- Ability to represent as required.

If patient has features of orbital cellulitis, they are not appropriate for HITH.
- Scleral injection
- Painful or impaired eye movements
- Change in vision
- Proptosis

Peri-orbital Cellulitis

Mild
- More than 3 months of age
- No fever
- WCC normal (if measured)

Moderate
- More than 3 months of age
- Moderate erythema and swelling around eye and lid.
- Able to fully open eye for exam.
- No fever. WCC normal.
- No risk factors for nmMRSA.

Severe
- Extensive erythema and swelling around eye and lid
- +/- Fever
- WCC may be elevated
- +/- Risk factors for nmMRSA

Does the patient meet HITH eligibility criteria?

YES

Discharge Home on Oral antibiotics as per CHQ AMS guidelines.
- GP follow up.

NO

Admit to HITH as per HITH Referral pathway

Refer to appropriate team for Hospital admission.
- IV Antibiotics as per CHQ AMS guidelines

Admitting team to consider step down to HITH in consultation with ID

HITH IV antibiotics (via PIVC) (refer to guideline for dosing recommendations)
- IV Cefazolin (continuous infusion via AmBIT pump) OR IV Ceftriaxone (once daily)

MRSA Risk factors present: Add oral Trimethoprim/sulfamethoxazole

IMPORTANT – First dose of IV antibiotics must be given in ED with 1 hour observation.
Appendix E – Urinary tract infection (UTI)/ Pyelonephritis HITH pathway

HITH Eligibility Criteria
- Lives/staying within 40 km of QCH or eligible for accommodation.
- Parent/guardian contactable via phone.
- Safe home environment
- Ability to represent as required.

UTI or Pyelonephritis

More than 3 months of age
- Clinically well
- Not dehydrated
- Able to tolerate oral antibiotics.

More than 3 months of age
- Fever. Evidence of UTI.
- Not requiring IV fluids
- Unable to tolerate oral antibiotics.
- Would otherwise be admitted for IV antibiotics

Less than 3 months of age
- Clinically unstable
- Requiring IV fluids
- Acute renal failure
- Immunosuppressed

Does the patient meet HITH eligibility criteria

YES

Discharge Home on Oral antibiotics as per CHQ AMS guidelines.
- GP follow up.

Admit to HITH as per HITH Referral pathway

Refer to appropriate team for Hospital admission. IV Antibiotics as per CHQ AMS guidelines

NO

HITH IV antibiotics (via PIVC) (refer to guideline for dosing recommendations)
- IV Gentamicin (once daily) and Oral Amoxicillin

IMPORTANT – First dose of IV antibiotics must be given in ED with 1 hour observation.