

# PAEDIATRIC LIMB CELLULITIS ON HOME INTRAVENOUS THERAPY: PATIENT MANAGEMENT PRACTICE GUIDELINE<sup>®</sup>

## DOCUMENT SUMMARY/KEY POINTS

- Cellulitis is a common paediatric skin infection that is usually uncomplicated and resolves quickly with appropriate antibiotic therapy.
- Children with uncomplicated limb cellulitis may be managed on IV therapy at home as a direct referral to HITH from the Emergency Department.
- Patients will be managed through the Acute Review Clinic (ARC) as part of their HITH admission, or visited at home where appropriate. All cases considered for home therapy should be screened for risk factors for alternate diagnosis prior to referral to the General Medical Team.
- Ceftriaxone covers the spectrum of organisms seen in paediatric cellulitis and provides a once daily dosing option.

## CHANGE SUMMARY

- Updated flowchart regarding the process for admission and review in HITH
- Change in recommended antibiotic to ceftriaxone from cefazolin
- SCHN Network document

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

<b>Approved by:</b>	SCHN Policy, Procedure & Guideline Committee	
<b>Date Effective:</b>	1 <sup>st</sup> May 2018	<b>Review Period:</b> 3 years
<b>Team Leader:</b>	Staff Specialist	<b>Area/Dept:</b> Gen Med

# READ ACKNOWLEDGEMENT

- Medical and Nursing Staff in Emergency Department and HiTH/Ambulatory Unit should read this document. General Medical Team Members should be aware of this document.

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## Introduction

Cellulitis is a common paediatric infection that is usually uncomplicated and resolves quickly with appropriate antibiotic therapy. It is a bacterial infection of the skin commonly caused by *Staphylococcus aureus* and Group A Streptococci (*Streptococcus pyogenes*). It presents with recent onset of skin erythema, warmth, swelling and tenderness from an infective origin with mild constitutional symptoms such as fever. Most children with mild cellulitis can be managed at home on oral antibiotics but moderate to severe cellulitis requires intravenous (IV) therapy, which has traditionally required an inpatient admission. The majority of children who receive IV therapy are systemically well and receive short term IV antibiotics before they are well enough to switch to oral antibiotics. **In approximately 20% of cases, cellulitis can lead to a more serious diagnosis such as osteomyelitis, necrotising fasciitis or abscess formation.** All cases considered for home therapy should be screened for risk factors for alternate diagnosis (see red flags below) prior to referral to the HITH and the General Medical Team.

Treatment and disposition depends on the severity of cellulitis and can be approached as follows;

### HOME ON ORAL ANTIBIOTICS\* (non-admitted)

- Small area of skin erythema without any red flags
- Mark border of erythema and arrange GP follow up at 48 hours
- No investigations required

### HOME ON INTRAVENOUS ANTIBIOTICS\* (admitted to HITH)

- Larger area of skin > 5cm erythema or early lymphangitis **without any red flags**
- Child who has not improved on 24-48 hours of oral antibiotics
- Must fulfil eligibility criteria for home management (see below)
- Clinical trials have shown that it is safe to discharge febrile children with cellulitis if they do not have other features of a serious infection

### ADMIT FOR INTRAVENOUS ANTIBIOTICS\*(admitted to inpatient bed)

- Extensive or rapidly progressive skin erythema (doubling in size every 4h)
- **Presence of any red flag** or does not meet HITH criteria
- Refer and manage as per inpatient teams

\*See over for recommended antibiotic regimes

## Red Flags and Differentials

The following **red flags** should prompt consideration of an alternate diagnoses or unusual organisms:

- **TOXIC APPEARANCE**; children with pallor, lethargy, irritability, abnormal cardiovascular observations or high white cell count may be septicemic

- FOREIGN BODY OR FLUCTUANCE; raises the possibility of abscess formation which may require surgical drainage
- SEVERE PAIN; pain disproportionate to the degree of skin erythema and rapid spread of erythema may indicate necrotising fasciitis which needs prompt treatment and admission
- JOINT PROXIMITY; children with a limp or who are not weight bearing and have erythema close to a joint may have underlying osteomyelitis or septic arthritis and require admission
- POST-OP WOUND OR ANIMAL BITE; may need wound debridement
- CO-MORBIDITY OR IMMUNOSUPPRESSION; children who are immunosuppressed have a higher incidence of unusual organisms and are more likely to be septicaemic also consider comorbidities like diabetes mellitus and congenital cardiac lesions.

## Eligibility of Paediatric Limb Cellulitis on Home IV Therapy

Isolated limb cellulitis in children may be suitable for intravenous antibiotics at home or outpatient hospital setting (ARC) if the child is well and meets the following eligibility criteria:

Currently the ARC clinic operates with a nurse and registrar:

- CHW - Monday to Friday 08:30am to 4:00pm, excluding public holidays
- SCH – Monday to Friday 11:00am to 6:00pm and Saturday/Sunday 09:00am to 1:00pm

The patient requires a "HITH referral" through PowerChart and the team will decide on the most appropriate location to review the child, either ARC or in the home. On weekends HITH nursing staff are able to review patients in ARC

### Eligible Patients

- Age over 1 year
- Limb cellulitis only
- Meets HITH criteria

### Exclusion Criteria

- Age under 1 year
- Head/neck cellulitis or associated joint symptoms
- **Any red flag**

## Guideline Overview



- Discuss possible HiTH referral with ED Consultant/Fellow
- Insert IV and collect FBC and blood culture (consider wound culture if pus present)



- Refer potential ambulatory patients to the Medical Registrar for early review
- If deemed appropriate for home IV therapy refer to HiTH and place a referral for HiTH, including relevant clinical details



- Patient education, HiTH factsheet and consent completed



- Cellulitis should be marked at edges, measured, swabbed and documented
- Nasal swab for *Staphylococcus aureus* collected



- First dose IV antibiotics given and 48 hour medication chart completed on EMR (CHW) or Paediatric Medication Chart (SCH)
- Can go home ONLY after Fellow or Consultant review
- The patient should be admitted to a HiTH bed under Gen Med AMO of the day and AMO informed



- Acute Review Clinic (ARC) visit next day to review cellulitis and give IV antibiotics
- If red flags develop refer to Medical Team and discuss with AMO for possible admission



- Review in ARC next day. Plan for duration of antibiotic therapy
- Check blood/swab cultures. Consider change to PO or elect to continue ambulatory IV therapy
- If **positive blood culture**, this should be discussed with the ID physician on call



- If further IV antibiotics required patient continues to attend ARC daily with daily medical review by ARC registrar for upto 48 hours
- If the patient develops complications or is not improving after 48 hours, will need discussion with AMO and possible inpatient admission



- If improved, provide a script for 5 day oral antibiotic
- Follow up GP at 48 hours after discharge
- The ARC registrar is responsible for completion of a discharge summary upon completion of IV therapy

## Further Information

After the patient has been accepted by the medical team and HITH the family should be given a HITH and Paediatric Cellulitis information sheet and consented for home intravenous therapy.

Antibiotic regimens are outlined below. After review for antibiotic allergy a medication chart should be completed for 48 hours of IV therapy and the first dose given in ED. Children should remain in ED and be monitored for side effects and may leave the hospital following Fellow or Consultant review. All patients should be transferred to a virtual HITH bed under the on-call General Paediatrician at the time of departure from ED, and the AMO must be informed of the admission.

Scheduled reviews will take place in Acute Review Clinic by the ARC registrar the following morning. It is important to review all culture results as well as clinical progress at this visit. A plan for the duration of the intravenous management should be made at this time. If cellulitis has not resolved a further 24 hours of IV therapy may be ordered. Any red flags require referral to inpatient teams as usual. Intravenous antibiotics beyond 72 hours require further discussion and consideration of an inpatient admission.

If cellulitis has improved the patient should complete a 5 day course of oral antibiotics and review progress with their GP in the following 48 hours.

## Antibiotics

Most hospital based guidelines for managing paediatric cellulitis recommend flucloxacillin four times daily as first line intravenous therapy. Guidelines for home therapy often include cefazolin twice daily<sup>1</sup>. However, ceftriaxone is a suitable once daily option and has been found to be useful at least one study<sup>2</sup>. The minimum total duration of antibiotics should be 5-7 days.

The switch from IV to oral can usually occur within 2-3 days and when there is clinical improvement with reduction in erythema and improvement in fever.

## MRSA Risk Factors

Children who are high risk for Methicillin Resistant Staphylococcus aureus (MRSA) may not respond to oral flucloxacillin as a first line treatment. If the child has a personal or family history of MRSA, appropriate first line antibiotic choices are shown below.

	Oral	Home IV Therapy
<b>Standard First Line</b>	<b>Flucloxacillin capsules</b> <sup>(3)</sup> or <b>Cefalexin suspension</b> <sup>(1)</sup> 12.5mg/kg/dose QID (max 500mg/dose)	<b>Ceftriaxone</b> 25 mg/kg/dose daily (max 1g)
<b>First line MRSA Risk Factors</b>	<b>Bactrim</b> <sup>(1,2)</sup> 20mg sulfamethoxazole + 4mg trimethoprim /kg BD (max 800/160mg per dose) or <b>Clindamycin capsules</b> <sup>(2)</sup> 10mg/kg TDS (max 450mg)	<b>Teicoplanin</b> <sup>(2)</sup> 10mg/kg (max 400mg) BD for 3 doses, then 10mg/kg (max 400mg) daily thereafter
<b>Penicillin Allergic</b>	<b>Bactrim</b> <sup>(1,2)</sup> 20mg sulfamethoxazole + 4mg trimethoprim /kg BD	<b>Teicoplanin</b> <sup>(2)</sup>

<b>(Ceftriaxone may be appropriate for those without severe penicillin allergy)</b>	(max 800/160mg per dose) or <b>Clindamycin capsules</b> <sup>(2)</sup> 10mg/kg TDS (max 450mg/dose)	10mg/kg (max 400mg) BD for 3 doses, then 10mg/kg (max 400mg) daily thereafter
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- 1) As suspension where patient cannot take capsules
- 2) Subject to susceptibility results being available. May need to be changed.
- 3) Flucloxacillin should be taken on an empty stomach to improve absorption. Flucloxacillin mixture is less palatable, and cephalexin is preferable in younger children requiring liquid formulations.
- 4) Maximum doses may be exceeded in non-obese children over 40kg after discussion with senior medical staff and/or infectious diseases

## References

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