

PERIORBITAL AND ORBITAL CELLULITIS MANAGEMENT IN THE ED- CHW

PRACTICE GUIDELINE[®]

DOCUMENT SUMMARY/KEY POINTS

- Periorbital cellulitis (POC, Preseptal cellulitis) is a condition with inflammation of the eye and orbit limited to space anterior to the orbital septum. This condition needs treatment with antibiotics.
- There can be significant morbidity if this condition is not treated appropriately and in a timely fashion.
- Periorbital cellulitis can have several complications including progression to orbital cellulitis and neurological issues which in turn can have long-term implications.
- This guideline has been developed in conjunction with Emergency, Ophthalmology, ENT and Ambulatory services.
- This guideline provides guidance regarding detailed assessment leading to risk stratification, relevant investigations and treatment options (including innovative models of care)

CHANGE SUMMARY

- Minor review following recommendations from the Antimicrobial Stewardship team and CHW Drug Committee.

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.

Approved by:	SCHN Policy, Procedure and Guideline Committee	
Date Effective:	1 st September 2019	Review Period: 3 years
Team Leader:	Staff Specialist	Area/Dept: Emergency Department

READ ACKNOWLEDGEMENT

Read Acknowledgment required for participating staff in the Emergency Department, Ophthalmology, ENT and Ambulatory services.

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Background

Periorbital cellulitis (POC, pre-septal cellulitis) is a soft tissue infection around the orbit. It often occurs in young children as a result of trauma, allergic reaction or sinusitis. Less commonly, it may arise in the setting of bacteraemia secondary to *Haemophilus influenzae* infection, particularly in the unimmunised child. Complications include orbital cellulitis (post-septal cellulitis), abscess formation, sepsis, osteomyelitis and cavernous sinus thrombosis.

Orbital cellulitis (post-septal cellulitis) is considered a vision and life-threatening disease. It is an ocular emergency, involving extension of inflammation into the orbit. Intravenous antibiotics should not be delayed, and an urgent review by the ENT and Ophthalmology teams should be sought for further investigations and management. Orbital cellulitis with signs of optic nerve compression (inability to spontaneously open or close eyelids, proptosis, decreased visual acuity/ red perception, relative afferent pupillary defect, external ophthalmoplegia, increased intraocular pressure) suggest orbital compression syndrome and necessitates urgent surgical decompression.

Most of the children with mild POC can be managed at home with oral antibiotics and a structured follow up. This was confirmed in the recent study conducted at CHW.

New models of care have been developed for the moderate group of patients globally and have been incorporated in this guideline. This aligns with the SCHN strategic plan of bringing care to patients in the community so that suitable patients receive parenteral therapy in the comfort of their own home. Previous literature suggests that the ambulatory model of care for outpatient parenteral antibiotic therapy is safe and effective with similar practices being adopted by other Australian Paediatric hospitals

The emphasis of this guideline is on focused assessment, risk stratification and appropriate management strategies.

Chandler classification of orbital complications of acute sinusitis	Jain/Rubin classification of periorbital infections
Group 1: Preseptal cellulitis Group 2: Orbital cellulitis Group 3: Subperiosteal abscess Group 4: Intraorbital abscess Group 5: Cavernous sinus thrombosis	1. Preseptal cellulitis 2. Orbital cellulitis (with or without intracranial complications) 3. Orbital abscess (with or without intracranial complications) <ol style="list-style-type: none"> a. Intraorbital abscess, which may arise from collection of purulent material in an orbital cellulitis b. Subperiosteal abscess, which may lead to true infection of orbital soft tissues.

Assessment in ED

History	Additional information
Age	POC is more common in patients younger than 5 years
Fever on presentation Duration of fever	Can be due to concurrent viral infection, or can suggest sinusitis or orbital cellulitis
Recent infection Duration of illness	Upper respiratory infection (URTI), contiguous infection-sinusitis, otitis media, dental infection
Eye symptoms Swelling Redness Eye pain Inability to open eye Eye discharge Duration of eye symptoms	Basis of risk stratification into severity groups and will help differentiate periorbital disease from orbital cellulitis
Previous antibiotic use Choice of antibiotic used Duration of antibiotic use	Failure of therapy – If failure to improve or worsening in spite of 48 hours of appropriate antibiotic therapy
Oral intake	Indicates general well-being and will dictate patient disposition
Immunisations up to date	Especially <i>Haemophilus influenzae</i> B (HiB) and pneumococcal (Prevenar®) immunisation
History of other possible aetiologies - Trauma to eyes, skin or face-insect bite / allergy/penetrating injury. -Recent surgery to eyes, nasolacrimal ducts (probe/ syringe), teeth, or sinuses? -underlying eye issues-nasolacrimal duct obstruction, dacrocystitis, stye, chalazion	
Past history of significant chronic medical/surgical issues (co-morbidities)	Immunocompromised status, diabetes
Other symptoms (including neurological)	
Known drug allergies Specify the name of the drug and type of reaction	
High risk for Methicillin Resistant <i>Staphylococcus aureus</i> (MRSA) (previous or current colonisation, ethnicity, recurrent boils etc.)	
Need for interpreter	

Examination findings	Additional information
General wellbeing	Septic/unwell appearing –seen in severe POC or orbital cellulitis
Vital signs /Observations	Fever can indicate serious illness
Neurological signs (altered level of consciousness, focal neurology)	Suggestive of intracranial complication
Skin exam-skin infection, infected eyelid laceration, infected eczema around the eye.	

Eye examination:	Additional information
Eyelids and surrounding skin (extent of erythema and swelling)	
Conjunctiva-injection, chemosis, discharge	
Proptosis	Suggestive of orbital cellulitis
Ptosis	
Eye movements-reduced movement, pain, diplopia, ophthalmoplegia	Abnormality can suggest orbital cellulitis
Reduced light reflexes	Indicates severe POC/orbital cellulitis
Relative afferent pupillary defect –RAPD (swinging light test)	
Any other significant signs	
POC severity	Mild/Moderate/Severe (see classification criteria below)

Investigations	Additional information
Bacterial and viral swabs from the affected eye	May help direct antibiotic therapy. To look for MRSA colonisation.
Bacterial swab of anterior nares (MC&S) for MRSA	Blood culture may direct antibiotic therapy
Blood tests (FBC,CRP,EUC, blood culture, BSL)	Inflammatory markers may help differentiate severe disease from mild/moderate disease.
Imaging-CT scan, MRI	May be considered in severe disease in consultation with Ophthalmology/ENT teams.

Indications for imaging

Indications for urgent imaging:

1. Central nervous system symptoms or signs, (e.g. drowsy, seizures, cranial nerve lesion, headache or vomiting)
2. Proptosis
3. Ophthalmoplegia
4. Deteriorating acuity or colour vision or unable to evaluate vision
5. Bilateral periorbital oedema (suspicion of cavernous sinus thrombosis)

Indications for delayed imaging:

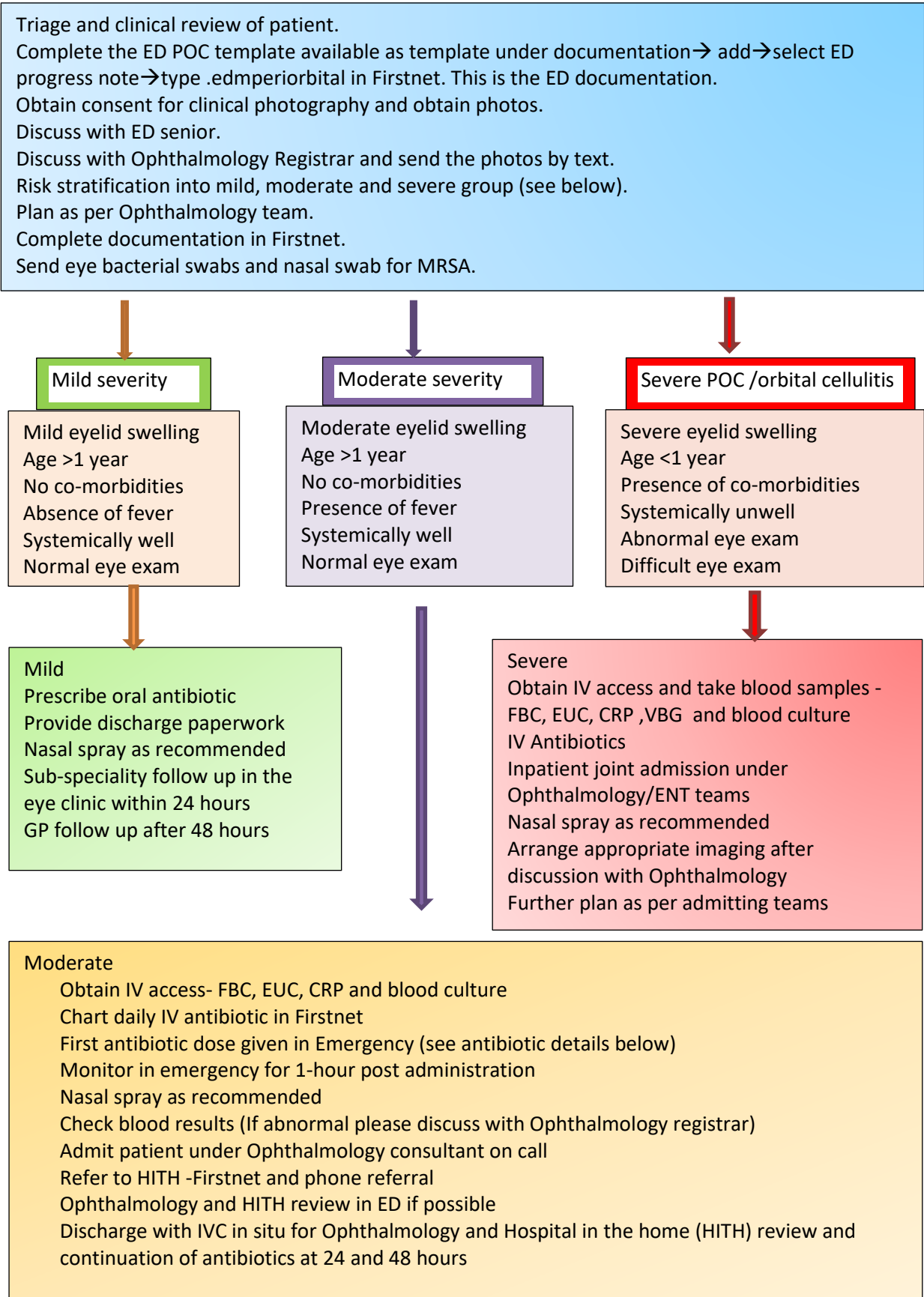
6. No improvement or deterioration at 24-36 hours after parenteral therapy
7. Swinging pyrexia **not** resolving within 36 hours inspite of antibiotic therapy

Contact Ophthalmology registrar urgently if any uncertainty via switchboard.

Note: If vision is deteriorating rapidly the orbit must be decompressed. This should be done <1 hour, and if imaging cannot be done within this time then surgery should not be delayed.

Decision to proceed with imaging should be discussed with Ophthalmology team.

Flow chart- ED Management pathway of POC



Hospital in the Home (HITH) referral process

HITH Referral Pathway

1. HITH Firstnet referral at all times

Steps for HITH referral:

Open Firstnet → click Add menu in orders → select consult and referrals from the list → select multidisciplinary → select HITH options and complete the form → sign the form to complete referral process.

Documentation for HITH form:

Please include a short summary of patient information, POC severity category, treatment details, preferred time period of HITH review and preferred parental contact number

Please also document any allergies or special considerations/concerns in the referral form.

Please also include "Patient for HITH review in Acute Review Clinic (ARC)" in your form.

2. In addition to Firstnet referral please contact HITH on the following numbers:

<u>Weekday:</u>	98453857 / 0419404872 (till 4 pm)	0419226590 (4 pm to 9:30 pm)
<u>Weekend</u>	0417226650 (7:30 am to 1 pm)	0419226590 (1 pm to 9:30 pm)
<u>After hours (after 9:30 pm)</u>	Firstnet referral only	Firstnet referral only

3. HITH nurses to review patient in ED during the day (if possible).
4. Parents to be informed about the need to present to ARC to receive antibiotics and also get an Ophthalmology review in the eye clinic during the follow up process within 24 and 48 hours.
5. Please provide the family with the cards with HITH details and directions to ARC clinic prior to discharge. Care of intravenous cannula at home factsheet should be provided to the families.

Treatment plan based on severity assessment

Severity	Clinical symptoms and signs	Management plan						
Mild	<ul style="list-style-type: none"> • Child ≥1 year old • Mild upper/lower eyelid oedema (not obstructing view of pupil). • Normal eye exam No proptosis No ophthalmoplegia Normal pupillary reflexes • Normal visual acuity • No history of/documented fever • Well looking child • Tolerating oral fluids/feeds • Not immunocompromised • Fully immunized 	<p>Outpatient-based management</p> <ol style="list-style-type: none"> 1. History and examination of patient 2. Complete the ED Questionnaire available as template under documentation → add → select ED progress note → type .edmperiorbital in Firstnet. 3. Written consent for photography for 3 months. 4. Obtain clinical photography of the affected eye on the ED photo phone 5. Contact Ophthalmology registrar via switch <ul style="list-style-type: none"> • Discuss case and confirm the grade of severity • Send image to Ophthalmology registrar's phone 6. Send bacterial and viral swabs from the affected eye Send bacterial swab of anterior nares (MC&S) for MSSA and MRSA 7. Commence treatment- give first dose in ED <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #cccccc;">1st line:</td> </tr> <tr> <td>PO Augmentin Duo® 22.5 mg/kg/dose, (maximum dose: 875 mg of Amoxicillin per dose), 12 hourly for 7 days</td> </tr> <tr> <td style="background-color: #cccccc;">2nd line for non-severe penicillin allergy:</td> </tr> <tr> <td>PO Cefuroxime 15 mg/kg/dose, (maximum dose: 500 mg) 12-hourly for 7 days</td> </tr> <tr> <td style="background-color: #cccccc;">3rd line for severe penicillin allergy:</td> </tr> <tr> <td>PO Bactrim® 4 mg/kg/dose, (maximum dose: 160 mg of trimethoprim), 12 hourly for 7 days</td> </tr> </table> <ol style="list-style-type: none"> 8. Nasal spray recommended: – Xylometazoline 500 microg/mL (Otrivin Junior®) BD, Mometasone 50 microg (Nasonex®) BD (only for children over 2 years of age) and Sodium chloride (Fess®) QID daily for 7 days if POC not from obvious skin source. 9. Follow up with the specialty team in eye clinic in 24 hours. 10. Discharge patient with discharge letter and antibiotic script 	1st line:	PO Augmentin Duo® 22.5 mg/kg/dose, (maximum dose: 875 mg of Amoxicillin per dose), 12 hourly for 7 days	2nd line for non-severe penicillin allergy:	PO Cefuroxime 15 mg/kg/dose, (maximum dose: 500 mg) 12-hourly for 7 days	3rd line for severe penicillin allergy:	PO Bactrim® 4 mg/kg/dose, (maximum dose: 160 mg of trimethoprim), 12 hourly for 7 days
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Severity	Clinical symptoms and signs	Management plan
Moderate	<ul style="list-style-type: none"> • Child with fever but well looking and not septic • Mild to Moderate eyelid oedema • Child ≥ 1 year of age • Normal visual acuity • Normal eye examination • No proptosis • No ophthalmoplegia • Normal pupillary reflex • Tolerating oral fluids/feeds • Not immuno compromised • Fully immunized • Failed oral antibiotics therapy if the child fulfills the above mentioned moderate group criteria 	<p>Outpatient-based management</p> <ol style="list-style-type: none"> 1. History and examination of patient 2. Complete the ED Questionnaire available as template under documentation → add → select ED progress note → type .edmpriorbital in Firstnet. 3. Written consent for photography for 3 months. 4. Obtain clinical photography of the affected eye on the ED photo phone 5. Contact Ophthalmology registrar via switch <ul style="list-style-type: none"> • Discuss case and confirm the grade of severity • Send image to Ophthalmology registrar's phone 6. Send bacterial and viral swabs from the affected eye Send bacterial swab of anterior nares (MC&S) for MSSA and MRSA 7. Obtain IV access- FBC, EUC, CRP and blood culture 8. Chart daily IV antibiotic in Firstnet. First antibiotic dose given in Emergency. Monitor patient in emergency for 1 hour post dose <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>1st line:</p> <p>IV Ceftriaxone 25 mg/kg/dose (maximum dose: 1 g) daily for 7 days</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>2nd line for Severe penicillin allergy:</p> <p>IV Azithromycin (10mg/kg/dose, maximum of 500mg/dose), Daily for 7 days</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0; text-align: center;"> <p>Switch to oral antibiotics when the patient is clinically improving</p> </div> <ol style="list-style-type: none"> 9. Nasal spray recommended –Xylometazoline 500 microg/mL (Otrivin Junior®) BD, Mometasone 50 microg (Nasonex®) BD (only for children over 2 years) and Sodium chloride (Fess®) QID daily for 7 days. 10. Check blood results-if abnormal please discuss with Ophthalmology registrar). 11. Admit patient under Ophthalmology consultant on call 12. Activate HITH pathway for outpatient parenteral antibiotic therapy Refer to HITH –Firstnet and phone referral <ol style="list-style-type: none"> a. HITH and Ophthalmology teams to review patient in ED if possible. Consider EMU admission overnight with review mane. b. HITH and Ophthalmology follow up at approximately 24 and 48 hours in ARC and Eye clinic. 13. Discharge patient with discharge letter and IVC in situ.

Severity	Clinical symptoms and signs	Management plan
Severe POC and Orbital cellulitis	<p>Any one of the below</p> <ul style="list-style-type: none"> • Fever and systemically unwell • Insufficient oral intake • Reduced visual acuity • Unable to perform eye examination • Marked ptosis (pupil obstructed by lid margin) • Diplopia • CNS signs or symptoms • Reduced pupillary light reflexes or positive afferent pupil defect swinging light test • Proptosis • Ophthalmoplegia 	<ol style="list-style-type: none"> 1. History and examination of patient 2. Complete the ED Questionnaire available as template under documentation → add → select ED progress note → type .edmpriorbital in Firstnet. 3. Written consent for photography for 3 months. 4. Obtain clinical photography of the affected eye on the ED photo phone 5. Contact Ophthalmology registrar via switch <ul style="list-style-type: none"> • Discuss case and confirm the grade of severity • Send image to Ophthalmology registrar's phone 6. Send bacterial and viral swabs from the affected eye Send bacterial swab of anterior nares (MC&S) for MRSA 7. Adequate analgesia to facilitate assessment 8. Obtain IV access – FBC, UEC, CRP, blood cultures 9. <u>Commence treatment immediately</u> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>1st line: IV Cefotaxime 50 mg/kg/dose (maximum dose: 2 g) 8 hourly for 10-14 days</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>2nd line for Severe penicillin allergy: Discuss with ID and consider: IV Vancomycin 15 mg/kg/dose (maximum dose: 750 mg) 6 hourly. Adjust dose based on levels. For 10-14 days PLUS IV Ciprofloxacin 10 mg/kg/dose (maximum dose: 400 mg) 12 hourly for 10-14 days</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0; text-align: center;"> <p>Switch to oral antibiotics when the patient is clinically improving</p> </div> 10. Nasal spray recommended - Xylometazoline 500 microg/mL (Otrivin Junior®)BD, Mometasone 50 microg (Nasonex®) BD (only for children over 2 years) and Sodium chloride (Fess®) QID daily for 7 days. 11. Urgent CT imaging will normally be indicated in all cases. <div style="border: 1px solid black; padding: 5px; margin: 5px 0; text-align: center;"> <p>If there is intracranial extension, seek ID advice</p> </div> 12. Do not delay decompression if orbital abscess suspected 13. Joint admission under Ophthalmology /ENT teams. 14. Daily inpatient review on the wards by Ophthalmology/ ENT team – if child deteriorates, seek urgent assessment/review. 15. Inpatient team to activate HITH pathway at any point during inpatient stay for outpatient parenteral antibiotics therapy if deemed appropriate.

Notes

- **All cases of suspected periorbital /orbital cellulitis should be discussed with the ED senior and the Ophthalmology team.**
- **Severe POC (or if there is a suspicion of orbital cellulitis)-will need parenteral antibiotics in a timely manner in hospital setting. Imaging should also be considered in all cases of suspected orbital cellulitis.**
- **History of previous MRSA colonisation- plan as per Ophthalmology team. Discuss with ID team if appropriate.**
- **Previous antibiotic use- discuss with Ophthalmology team regarding the possibility of potential (oral /parenteral) outpatient management for well children with mild /moderate POC who have received inappropriate (antibiotic choice) or inadequate antibiotic therapy (less than 48 hours of antibiotic therapy).**
- **History of recurrent POC episodes-plan as per Ophthalmology team.**
- **Age 6-12 months- discuss with Ophthalmology about specific treatment**
- **Children presenting to ED overnight and presumed to be in the moderate group can be admitted to EMU for HITH and Ophthalmology review mane prior to discharge.**

Summary of general indications for admission to hospital
<ul style="list-style-type: none"> • All children <u>under one year</u> of age with peri-orbital swelling • All <u>unimmunised</u> (without HiB vaccination at 2,4 and 6 months) children • All immunocompromised children • Worsening infection in spite of recommended treatment including • failed oral antibiotic therapy for patients in the mild group • failed parenteral antibiotics in the moderate group • All children who look unwell. • All children with severe POC or orbital cellulitis

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