

Periorbital (preseptal) and Orbital (postseptal) Cellulitis - Management in Children & Young People - Paediatric Full Clinical Guideline – Joint Derby & Burton

Reference no.: CH CLIN C38/Aug 22/v003

1. Background

Periorbital (pre-septal) cellulitis is an infection localized to the anterior of the orbital septum whereas orbital (post septal) cellulitis is an infection of the soft tissues of the eye socket behind the orbital septum, a thin tissue which divides the eyelid from the eye socket.

The majority of patients are less than 10 years old but it can affect all ages. It can be preceded by an URTI or sinusitis where the infection can spread to the orbit via the lamina papyracea. Other causes are trauma to the eye, lid infections or conjunctivitis. Common pathogens in children are *S aureus* (including MRSA), *S pneumoniae*, *Streptococcus pyogenes*, nontypeable *H influenza* and anaerobes.

It may be confused with a chalazion, which is a localised eye lid lump which may become red with a white head, and if only minor erythema can be treated conservatively.

Urgent assessment is required because orbital cellulitis can be a life-threatening and rapidly progressing infection associated with the following complications; permanent visual loss, cavernous sinus thrombosis, intracerebral abscess, meningitis and death.

2. Assessment:

1. Thorough history
 - Onset
 - Preceding infection
 - Previous antibiotics treatment
 - Routine history (Birth, PMH, FH, Allergies, Immunisations, development, Drug history, Immunocompromised)

2. Examination
 - Systemic examination
 - Are you sure it isn't a chalazion? Localised Lid lump becoming large and red.
 - Watch for signs of systemic disease (i.e. sepsis) & sinus disease (blocked nose, frontal headache)
 - Examination of eye includes **documentation of the following**
 - Can the lids be opened? / is it painful
 - Is the conjunctiva involved?
 - Visual acuity / colour recognition
 - Extra – ocular movements
 - If possible – fundus
 - Pupillary responses
 - Examine neurology – this includes central and peripheral nervous system examination including assessment for signs of meningism (Kernig's sign), reduced GCS

Be aware the eye in orbital cellulitis can look deceptively quiet (preseptal LOOKS worse but is much more benign) but the child can be seriously ill.

It can sometimes be challenging to distinguish pre-septal from orbital cellulitis as they can both present with eyelid swelling and erythema. Table below summaries the clinical features (orbital vs. preseptal)

CLINICAL SIGNS (not all signs need to be present for a diagnosis of postseptal (orbital) cellulitis to be made)	POSTSEPTAL (ORBITAL)	PRESEPTAL
Proptosis	Yes	No
Hypoglobus (downward displacement of eye)	YES (if large collection)	No
Double vision (if both eyes open)	Yes	No
Eye movements	Painful & restricted	Normal
Vision (acuity, fields, colour)	Worse in severe	Normal
Relative Afferent Pupillary Defect	Yes in severe	Absent i.e. normal
Severe or persistent headache	Yes in severe	No

3. Management:

Indications for discharge on oral antibiotics +/- CED review

<p>Pre – septal cellulitis</p> <ul style="list-style-type: none"> Not immunocompromised Age > 12 months Not already on antibiotics Observations within normal range Systemically well Temperature < 38.0 Mild upper lid oedema / erythema Normal eye examination (but be aware of warning above)
--

Commence oral antibiotics (see table below)
 Advise parents to return if no improvement within 24hours or any worseningsymptoms.
 In more severe cases it may be more appropriate to arrange follow-up in the paediatric observation unit in 24-48 hours.

Indication for admission:

Pre-septal cellulitis not fitting into Green category

Suspicion of Orbital Cellulitis

Systemically unwell or pyrexial / toxic

Age < 12 months – **discuss with senior clinician**

Already on oral antibiotics for > 48hours Abnormal observations (low BP, Raised HR etc.)

Abnormal eye examination / unable to examine eye or difficult to examine / uncertain diagnosis (but be aware eye examination can be remarkably normal in orbital cellulitis)

- Proptosis
- Painful eye movements, Decreased eye movements
- Chemosis
- Diplopia
- Ophthalmoplegia
- Reduced visual acuity
- Bilateral oedema
- CNS signs

Management of admitted patients:

1. It is vital to understand the roles and responsibilities of the multidisciplinary team
 - A. Paediatrics: manage the systemic involvement
 - B. Ophthalmology: manage vision, optic nerve function and eye movement
 - C. ENT: Make decision about surgery
2. Baseline blood test (FBC, CRP, Blood cultures), Nasal Swabs (for bacterial culture NOT VIRAL)
3. Commence intravenous antibiotics (see antibiotic options below)
4. Xylometazoline 0.05% (Otrivine) if child has sinonasal symptoms:
6-11 years: 1-2 drops 1-2 times a day for maximum 5 days
12-17 years: 2-3 drops 2-3 times a day for maximum 7 days
OR
Ephedrine 0.5% nose drops
12-17 years: 1-2 drops up to 4 times a day for a maximum of 7 days
NB: For children under the age of 6, please consult ENT as the above can be prescribed on a case-by-case basis.
5. Urgent CT Brain, Orbit and Sinuses with contrast if:
 1. Unable to examine eye/open eyelids (this specific indication needs discussion with Paeds/ENT consultant first)
 2. CNS involvement
 3. Eye signs – any of: proptosis, restriction/pain on eye movement, chemosis, RAPD, reduced visual acuity/colour vision/visual field, optic nerve swelling , bilateral oedema
 4. Clinical progression despite 24 hours treatment or no improvement after 48 hours
 5. Continued pyrexia after 48 hours IV antibiotics
6. CONSIDER Brain MRI if cavernous sinus thrombosis is suspected
7. <12 months of age or possible meningitis consider LP
8. 4 hourly eye & neuro-observations
9. **Urgent ENT and Ophthalmology assessment & daily Ophthalmology and ENT review**
10. Suggest daily photos taken by parents
11. If suspicious of Orbital Cellulitis consider IV dexamethasone on a case-by-case basis
12. Immunocompromised or if culture positive - discuss all with Microbiology/ID

13. Discuss any intracranial complication with both Neurosurgery & Microbiology
14. Duration of antibiotics (A) Periorbital (preseptal) cellulitis minimum 7 days (IV +PO), (B) Orbital cellulitis minimum 14 days (IV + PO) and (C) CNS involvement: duration as per discussion with Neurosurgery, Microbiology and the responsible clinical team (Paediatrics, ENT and Ophthalmology)
15. Stewardship: Consider ambulation (see recommended antibiotics) when clinically stable and no risk factors (see below * differentials & ** red flags). Provide a written safety netting advice
16. IV to oral switch: When clinically improved and afebrile (see recommendation for oral switch). Provide a written safety netting advice.
17. CPD: [The link to this continuous professional development online module on this subject gives practitioners better understanding of the paediatric pathway for orbital cellulitis \(Paediatric Pathways \(bsac.org.uk\)\)](#)

Antibiotic Management

Please take an accurate allergy history prior to prescribing antibiotics. Commence antibiotic therapy as per the management table below.

Taken from: <https://uk-pas.co.uk/Antimicrobial-Paediatric-Summary-UKPAS.pdf>

Mild pre-septal: co-amoxiclav	5 days	RCPCH p156-159 BSAC Paediatric Pathways
Penicillin allergy: clarithromycin		
Oral not tolerated co-amoxiclav IV	IV 24-48 hours then oral 7 days	
Penicillin allergy: clindamycin PLUS ciprofloxacin		
Orbital cellulitis: cefTRIAxone (OR if contraindications cefOTAXime) PLUS metronidazole PLUS vancomycin (if MRSA colonised)	14 days minimum	
Penicillin anaphylaxis: ciprofloxacin IV PLUS vancomycin PLUS metronidazole OR if CNS involvement chloramphenicol PLUS metronidazole		
Oral stepdown if no intracranial involvement: co-amoxiclav		
Penicillin allergy: clindamycin		

For more severe infections or if true allergy to penicillin please contact Microbiology for further advice.

If **Chalazion and marked erythema**: 10 days co-amoxiclav as below and routine Ophthalmology outpatient referral as follow up

For patients who are allergic to penicillin please follow the advice on the trust guidelines re: Penicillin Allergy available at <https://derby.koha-ptfs.co.uk/cqi-bin/koha/opac-retrieve-file.pl?id=2bcf6ffaa63aeeec3503efe926f0dbb26>

References (including any links to NICE Guidance etc.)

Malcolm A Buchanan, Wisam Muen, Peter Heinz. Management of periorbital and orbital cellulitis. Paediatrics and Child Health., Volume 22, Issue 2, Pages 72-77, February 2012,

Baring DEC, Hilmi OJ. An evidence based review of periorbital cellulitis. Clin Otolaryngol 2011; 36: 57e64

Tsimpida M, Gore DM, Petrou P, Reddy MA. Protocol-guided management of paediatric peri-orbital cellulitis: an audit of multidisciplinary care. J Eval Clin Pract 2011; 17: 503e6

Pushker N1, Tejwani LK, Bajaj MS, Khurana S, Velpandian T, Chandra M. Role of oral corticosteroids in orbital cellulitis. Am J Ophthalmol. 2013 Jul;156(1):178-183

Intravenous Steroids With Antibiotics on Admission for Children With Orbital Cellulitis. Chen L¹, Silverman N, Wu A, Shinder R. Ophthalmic Plast Reconstr Surg. 2018 May/Jun;34(3):205-208. doi: 10.1097/IOP

Ball S, Okonkwo A, Powell S, Carrie S. Orbital Cellulitis Management Guideline – for adults and Paeds. ENT UK. 2017.

Chen L, Silverman N, Wu A, Shinder R. 2018. Intravenous Steroids with Antibiotics on Admission for Children with Orbital Cellulitis. Ophthalmic Plast Reconstr Surg 34(3):205-208.

Cochrane review: Kornelsen et al's cochrane review Corticosteroids for periorbital and orbital cellulitis published 28 April 2021

UKPAS: [Antimicrobial-Paediatric-Summary-UKPAS.pdf \(uk-pas.co.uk\)](https://www.uk-pas.co.uk/Antimicrobial-Paediatric-Summary-UKPAS.pdf)

CPD: [Paediatric Pathways \(bsac.org.uk\)](https://www.bsac.org.uk/Paediatric-Pathways)

APPENDICES

SEVERITY

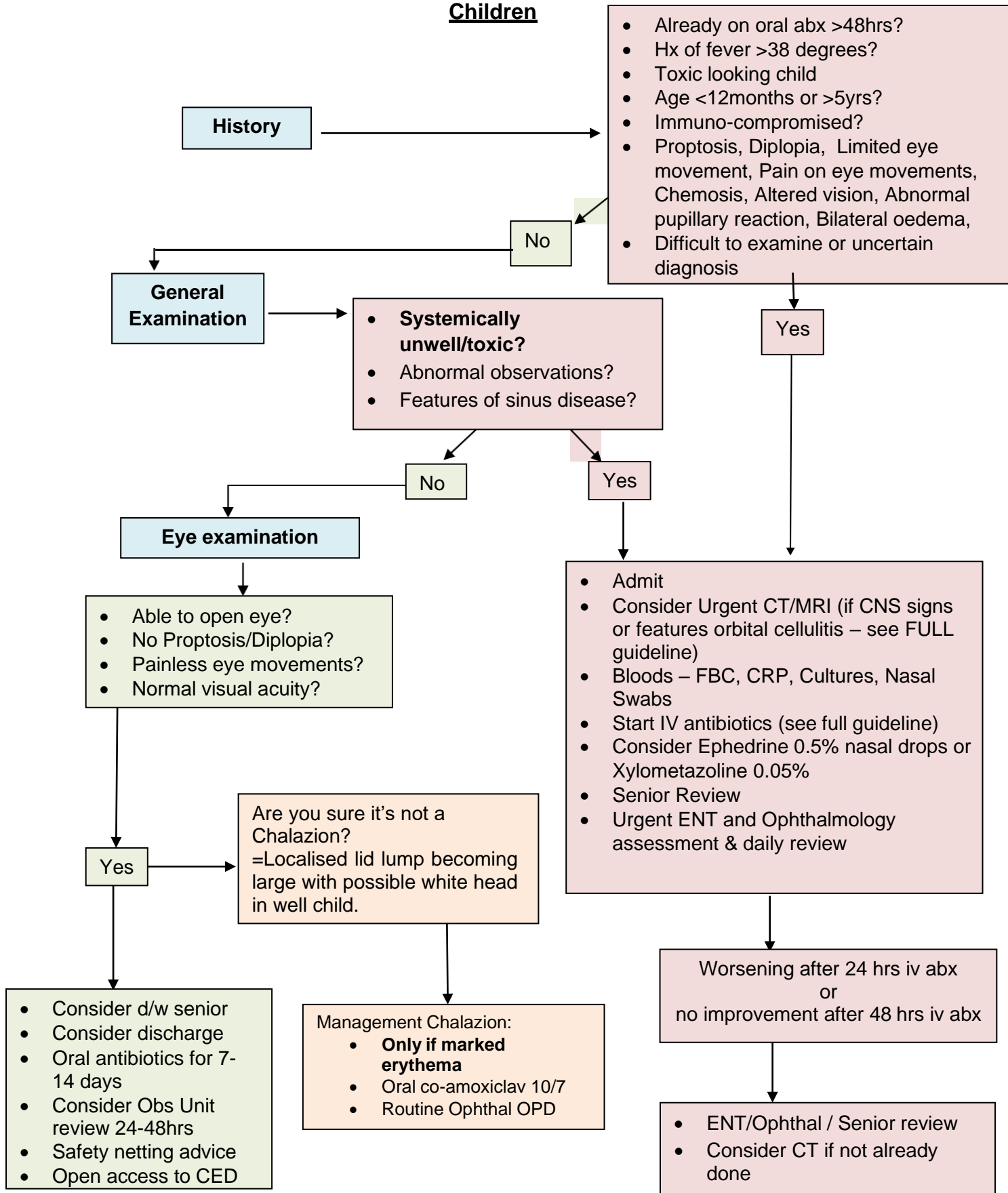
Factors associated with severe disease

- Clinical suspicion of orbital cellulitis or unable to assess eye due to swelling
- Systemically unwell including fever AND persisting tachycardia / tachypnoea
- Immunocompromised
- Worsening despite 36-48 hours of oral antibiotics
- If features of sepsis, for urgent senior input / paediatric input

Factors associated with mild disease

- Normal eye assessment
- History of insect bite or mild trauma

Flowchart summary management of Periorbital and Orbital Cellulitis in Children



Documentation Controls

Development of Guideline:	Dr G Robinson
Consultation with:	CED , ENT and Ophthalmology Consultants
Approved By:	Paediatric Business Unit Guidelines Group 9 th August 2022, Women's and Children's Clinical Governance Group 30 th August
Review Date:	Aug 2025
Key Contact:	Dr G Robinson