Preseptal and Orbital Cellulitis

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What is a Clinical Pathway?

An evidence-based guideline that decreases unnecessary variation and helps promote safe, effective, and consistent patient care.
Pathway Objectives

- To quickly identify patients with orbital cellulitis who may require surgery
- To identify those patients who require a CT Scan
- To improve coordination of the multiple subspecialists often involved in care of this group of patients
Why is Pathway Necessary?

- Orbital cellulitis is a fairly rare condition but has significant complications
- Requires the coordinated efforts of multiple services
- Important to define the responsibilities of each service
- CT imaging of the orbit is needed to determine the need for surgery, but currently there is no standard for when to get imaging
- Need to standardize recommended antibiotics
This is the Pre-septal and Orbital Cellulitis Clinical Pathway.

We will be reviewing each component in the following slides.
Inclusion Criteria: eye swelling and concern for cellulitis

*NOTE: If cellulitis is clearly the result of a break in the skin (i.e., infected insect bite), consider using the Skin and Soft Tissue Infection (SSTI) pathway.
Initial evaluation:

Guides the need for CT Scan

Symptoms that indicate need for a CT Scan include:

- Pain with eye movement
- EOM’s restricted or diplopia
- Proptosis
- ANC >10,000 (ANC = WBC x [%neutrophils + %bands])
- Cannot assess above due to extensive eyelid edema

The provider may always order a CT if there is clinical suspicion.
If there is a high clinical suspicion for orbital cellulitis based on initial exam:

Timely communication is **essential**!

- Formally consult ophthalmology
- Notify ENT (with a call!)
- Obtain the orbital CT with IV contrast

CLINICAL PATHWAY: Preseptal & Orbital Cellulitis

If high clinical suspicion:
- Formally consult ophthalmology
- Notify ENT via call
- Obtain orbital CT with IV contrast

CT positive for orbital cellulitis?

YES
- Place Ophthalmology consult for:
  - Urgent calls for any orbital involvement (clinically or on CT) OR
  - If ENT taking to OR

Signs of orbital cellulitis (≥1)?
1) Pain w/eye movement
2) EOM’s restricted/diplopia
3) Proptosis
4) ANC >10,000
5) Cannot assess due to extensive eyelid edema
If there is low suspicion for orbital cellulitis and/or the CT is negative:

**Diagnosis is likely Preseptal Cellulitis.**

**Admission criteria includes:**
- Toxic appearance
- Failed outpatient antibiotics
- Rapidly progressing cellulitis
- Dehydration
- Concern for compliance with treatment or follow up

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If Skin/soft tissue infection, follow Skin Soft Tissue Infection Pathway

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**CLINICAL PATHWAY: Preseptal & Orbital Cellulitis**

**Signs of orbital cellulitis (≥1)?**
1) Pain w/eye movement
2) EOM’s restricted/diplopia
3) Proptosis
4) ANC >10,000
5) Cannot assess d/t extensive eyelid edema

**Meets admission criteria?**
- Toxic appearing, failed outpatient antibiotics, rapidly progressing, dehydrated, concern for compliance or follow up

**Diagnosis is likely Preseptal Cellulitis.**

**Admission criteria includes:**
- Toxic appearance
- Failed outpatient antibiotics
- Rapidly progressing cellulitis
- Dehydration
- Concern for compliance with treatment or follow up

**Discharge on PO antibiotics** (see discharge instructions below).

**If Skin/soft tissue infection, follow Skin Soft Tissue Infection Pathway**

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**Discharge instructions:**
- Oral antibiotics: PO, avoid if skin/soft tissue infection
- Monitor for 7 days or until healed
- Follow up as indicated

**Oral Cefuroxime: 250 mg every 12 hours (children >40 kg)/500 mg every 12 hours (children ≤40 kg)**

**Oral Ciprofloxacin: 500 mg every 12 hours (children >40 kg)/750 mg every 12 hours (children ≤40 kg)**

**Oral Levaquin: 500 mg every 12 hours (children >40 kg)/750 mg every 12 hours (children ≤40 kg)**

**Follow up with Ophthalmology, ENT, and Family Medicine if needed during or after treatment.**
**Determining admitting service:**

- **Orbital cellulitis with surgical intervention:** admit to ENT with Pediatric Hospital Medicine (PHM) co-management
  - Ophthalmology will follow

- **Orbital cellulitis but surgery not indicated:** admit to IMT
  - ENT and Ophthalmology will follow

- **Preseptal Cellulitis:** admit to PHM

**CLINICAL PATHWAY: Preseptal & Orbital Cellulitis**

- **Admit to ENT service**
  - Ophtho to follow (needs to document vision PRIOR surgery)
  - IMT consult for co-management

- **Admit to IMT service**
  - IF ORBITAL INVOLVEMENT but surgery not yet indicated, ENT/Ophtho will continue to follow
Inpatient assessments:

- Pediatric provider to do vision checks with Snellen chart upon admission then twice daily.
  - MUST document results in the chart (particularly if not able to be done)
- Contact ENT and Ophthalmology IMMEDIATELY if there is a change!

Snellen charts will be available in pod B of med/surg units

Inpatient Management:

- General pediatric provider to do vision checks with Snellen chart upon admission and BID (If unable to complete, must document in chart.)
- Continue to monitor for development of orbital cellulitis
- NPO after midnight if strong possibility of surgery

Pre-Septal Cellulitis Antibiotic Recommendations:

- Ampicillin/Sulbactam based on ampicillin component: 200 mg/kg/day div q8hr (max 2,000 mg ampicillin/dose)
- If PCN allergy:
  - Clindamycin PO/IV 30-40 mg/kg/day div q8hr (max 600 mg/dose) AND Ceftriaxone IV 50 mg/kg/day q24hr (max 2,000 mg/dose)
- If concern for MRSA, consider addition of:
  - Vancomycin 15 mg/kg/day q6hr (if ≥18 yrs old: q8hr; max initial dose: 1 g/dose); maintain trough 15-20 mg/l

Orbital Cellulitis Antibiotic Recommendations:

- Ceftriaxone 100 mg/kg/day q24hr (max 2,000 mg/dose) AND
- Metronidazole 30 mg/kg/day IV div q8hr (max 500 mg/dose)
- If concern for MRSA, consider addition of:
  - Vancomycin 15 mg/kg/day q6hr (if ≥18 yrs old: q8hr; max initial dose: 1 g/dose; if concern for CNS involvement, max 1.5g/dose); maintain trough 15-20 mg/l
Epidemiology:

- Typical organisms accounting for 75% of bacterial causes: Staph aureus, Staph epidermidis, and Strep pyogenes
- Consider Haemophilus influenza B in the unimmunized patient
- Often polymicrobial

Recommended antibiotics are based on diagnosis of Pre-septal vs. Orbital cellulitis

**Inpatient Management:**

- General pediatric provider to do vision checks with Snellen chart upon admission and BID (If unable to complete, must document in chart.)
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Prior to discharge the patient’s vision should be back to baseline and they should be able to tolerate antibiotics by mouth.

**Discharge Criteria:**
- Vision back to baseline
- Clinical improvement
- Afebrile
- Follow up plan in place

**Discharge Antibiotics:**

- **If on Amoxicillin/Subbacram (Unasyn):**
  - Amoxicillin 90 mg/kg/day divided BID or TID (max 1g of Amoxicillin/dose)

- **If on Cindamyin iv/Ceftriaxone:**
  - Cindamyin PO 30-40 mg/kg/day divided q6-8hr AND Cefdinir 14 mg/kg/day divided BID (max 300 mg BID)

- **If on Vancomycin:**
  - ADD Cindamyin PO 30-40 mg/kg/day divided q6-8hr (continue coverage with Amoxicillin/Cindamyin or Cefdinir as appropriate)

- **If on Metronidazole:**
  - Metronidazole 30 mg/kg/day PO divided TID (max 500 mg/dose)

**Discharge Instructions:**
- Follow up with PCP; Ophthalmology f/u in 1-2 weeks if involved during admission; Complete course antibiotics
Review of Key Points

• The **most** appropriate antibiotic choice for **empiric therapy of Preseptal Cellulitis** is Ampicillin/Sulbactam (Unasyn)

• The antibiotic choice for **Orbital Cellulitis** is Ceftriaxone and Metronidazole

• Indication for obtaining a CT of the orbits
  - Pain with EOM or restricted EOM
  - Proptosis
  - ANC > 10,000
  - Inability to assess due to edema
Quality Metrics

- Percentage of patients with pathway order set usage
- Percentage of patients with ophthalmology consult
- Percentage of patients who have a CT scan
- Percentage of patients who have a CT scan with documented symptoms of orbital cellulitis
- Percentage of patients who require surgery
- Percentage of patients with appropriate antibiotic choice per pathway recommendation
- Percentage of patients with appropriate antibiotic duration per pathway recommendation
- ED average length of stay (minutes)
- Inpatient average length of stay (days)
- Number of returns to ED within 48 hours
- Number of readmission within 48 hours
Pathway Contacts

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• Botting AM, McIntosh D, Mahadevan M. Paediatric pre- and post-septal peri-orbital infections are different diseases. A retrospective review of 262 cases. *Int J Pediatr Otorhinolaryngol*, 2008 Mar;72(3):377-83.

About Connecticut Children’s Clinical Pathways Program

Clinical pathways guide the management of patients to optimize consistent use of evidence-based practice. Clinical pathways have been shown to improve guideline adherence and quality outcomes, while decreasing length of stay and cost. Here at Connecticut Children’s, our Clinical Pathways Program aims to deliver evidence-based, high value care to the greatest number of children in a diversity of patient settings. These pathways serve as a guide for providers and do not replace clinical judgment.