

Q

- **Pediatric Orbital Cellulitis**

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why?





A/Q

- **Pediatric Orbital Cellulitis**

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single key word pathogen



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single aerobic pathogen



A/Q

- **Pediatric Orbital Cellulitis**

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? **In children under 9, the bug is usually a single aerobic pathogen;** older than 9, the infection is usually polymicrobial and includes both and



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single aerobic pathogen; older than 9, the infection is usually polymicrobial and includes both aerobes and anaerobes



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?



Q/A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's and



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**:

--Neonates:

--Older children:

--Immunocompromised:



Q/A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**:

--Neonates: *S aureus*; G(-) bacilli

--Older children:

--Immunocompromised:



Q/A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**:

--Neonates: *S aureus*; G(-) bacilli

--Older children: *S aureus* and *epidermidis*; *Strep pyogenes*

--Immunocompromised:



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**:

--Neonates: *S aureus*; G(-) bacilli

--Older children: *S aureus* and *epidermidis*; *Strep pyogenes*

--Immunocompromised: All bets are off



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**:

--Neonates: *S aureus*; G(-) bacilli

--Older children: *S aureus* and *epidermidis*; *Strep pyogenes*

--Immunocompromised: All bets are off

Assuming no hx of penetrating orbital trauma, where do the bugs come from, ie, what is the original nidus of infection?



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**:

--Neonates: *S aureus*; G(-) bacilli

--Older children: *S aureus* and *epidermidis*; *Strep pyogenes*

--Immunocompromised: All bets are off

Assuming no hx of penetrating orbital trauma, where do the bugs come from, ie, what is the original nidus of infection?

Adjacent sinusitis



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**.

--Neonates: *S aureus*; G(-) bacilli

--Older children: *S aureus* and *epidermidis*; *Strep pyogenes*

--Immunocompromised: All bets are off

Assuming no hx of penetrating orbital trauma, where do the bugs come from, ie, what is the original nidus of infection?

Adjacent **sinusitis**

What proportion of orbital cellulitis cases are secondary to sinus dz?



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**.

--Neonates: *S aureus*; G(-) bacilli

--Older children: *S aureus* and *epidermidis*; *Strep pyogenes*

--Immunocompromised: All bets are off

Assuming no hx of penetrating orbital trauma, where do the bugs come from, ie, what is the original nidus of infection?

Adjacent **sinusitis**

What proportion of orbital cellulitis cases are secondary to sinus dz?

A whopping 90%!



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**:

--Neonates: *S aureus*; G(-) bacilli

--Older children: *S aureus* and *epidermidis*; *Strep pyogenes*

--Immunocompromised: All bets are off

Assuming no hx of penetrating orbital trauma, where do the bugs come from, ie, what is the original nidus of infection?

Adjacent sinusitis

Which sinus is most often implicated, and which comes in a distant second?



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**:

--Neonates: *S aureus*; G(-) bacilli

--Older children: *S aureus* and *epidermidis*; *Strep pyogenes*

--Immunocompromised: All bets are off

Assuming no hx of penetrating orbital trauma, where do the bugs come from, ie, what is the original nidus of infection?

Adjacent sinusitis

Which sinus is most often implicated, and which comes in a distant second?

The ethmoid is #1; the frontal, 2



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**.

--Neonates: *S aureus*; G(-) bacilli

--Older children: *S aureus* and *epidermidis*; *Strep pyogenes*

--Immunocompromised: All bets are off

The sinuses are not yet aerated in very young infants, and thus cannot be a source of infection. Infection of what structure should be considered if a very young infant presents with orbital cellulitis?

Which sinus is most often implicated, and which comes in a distant second?

The ethmoid is #1; the frontal, 2



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a **single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**

Which bug(s) are most often implicated?

This is a function of the child's **age** and **immune status**.

--Neonates: *S aureus*; G(-) bacilli

--Older children: *S aureus* and *epidermidis*; *Strep pyogenes*

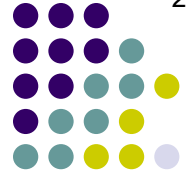
--Immunocompromised: All bets are off

The sinuses are not yet aerated in very young infants, and thus cannot be a source of infection. Infection of what structure should be considered if a very young infant presents with orbital cellulitis?

The lacrimal sac, ie, dacryocystitis. (Saw, and missed, one as a resident myself—very embarrassing. Thankfully, the baby recovered fully.)

Which sinus is most often implicated, and which comes in a distant second?

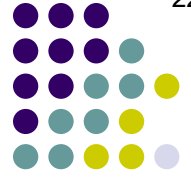
The ethmoid is #1; the frontal, 2



Q

● Pediatric Orbital Cellulitis

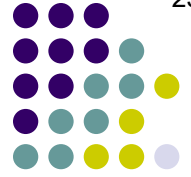
- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single aerobic pathogen; older than 9, the infection is usually polymicrobial and includes both aerobes and anaerobes
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis?



A

● Pediatric Orbital Cellulitis

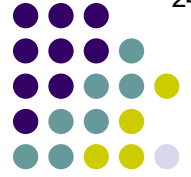
- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single aerobic pathogen; older than 9, the infection is usually polymicrobial and includes both aerobes and anaerobes
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is immunocompromised



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? **In children under 9, the bug is usually a single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? **When s/he is immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia...



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--
--
--
--
--
--
--
--



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

--Globe displacement

--Elevated IOP

--Decreased visual function (ie, acuity, VF, color)

--An RAPD



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

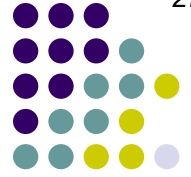
--**Globe displacement**

--Elevated IOP

--Decreased visual function (ie, acuity, VF, color)

--An RAPD

Globe displacement suggests the presence of what?



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

--**Globe displacement**

--Elevated IOP

--Decreased visual function (ie, acuity, VF, color)

--An RAPD

*Globe displacement suggests the presence of what?
A subperiosteal abscess*



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

--Globe displacement

--**Elevated IOP**

What is the mechanism responsible for increasing IOP?



Q/A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

--Globe displacement

--**Elevated IOP**

What is the mechanism responsible for increasing IOP?

Orbital congestion → compression of → increased → increased IOP



A

● Pediatric Orbital Cellulitis

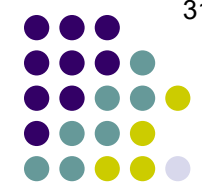
- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

- Lid edema
- Chemosis
- Orbital pain and tenderness
- Globe displacement
- Elevated IOP**

What is the mechanism responsible for increasing IOP?

Orbital congestion → compression of vortex veins → increased EVP → increased IOP



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

- Lid edema
- Chemosis
- Orbital pain and tenderness
- Globe displacement
- Elevated IOP**

What is the mechanism responsible for increasing IOP?
 Orbital congestion → compression of vortex veins → increased **EVP** → increased IOP

What does EVP stand for in this context?



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

- Lid edema
- Chemosis
- Orbital pain and tenderness
- Globe displacement
- Elevated IOP**

What is the mechanism responsible for increasing IOP?

Orbital congestion → compression of vortex veins → increased **EVP** → increased IOP

What does EVP stand for in this context?
Episcleral venous pressure



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

- Lid edema
- Chemosis
- Orbital pa
- Globe dis
- Elevated

What is the eponymous name of the equation delineating the relationship between EVP and IOP?

What is the mechanism responsible for increasing IOP?
Orbital congestion → compression of vortex veins → increased **EVP** → increased IOP

What does EVP stand for in this context?
Episcleral venous pressure





A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pa

--Globe dis

--Elevated

What is the eponymous name of the equation delineating the relationship between EVP and IOP?

The **Goldmann equation** (yes, that Goldmann)

What is the mechanism responsible for increasing IOP?

Orbital congestion → compression of vortex veins → increased **EVP** → increased IOP

What does EVP stand for in this context?

Episcleral venous pressure



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**

- Orbital cellulitis and ophthalmoplegia

What is the Goldmann equation? (Meaning, write it out)

$$IOP = \frac{\text{something}}{\text{something else}} + \text{something else}$$

- Before we get to what other signs and symptoms...
- Lid edema
- Chemosis
- Orbital pain
- Globe displacement
- Elevated IOP

What is the eponymous name of the equation delineating the relationship between EVP and IOP?
The Goldmann equation (yes, that Goldmann)

What is the mechanism responsible for increasing IOP?
 Orbital congestion → compression of vortex veins → increased **EVP** → increased IOP

What does EVP stand for in this context?
Episcleral venous pressure



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis and **ophthalmoplegia**

What is the Goldmann equation? (Meaning, write it out)

$$IOP = \frac{\text{Rate of aqueous formation}}{\text{Rate of aqueous outflow}} + EVP$$

Note: In the interest of simplicity, I fudged a little on the denominator—technically, it's outflow **facility**, not outflow **rate**

What is the eponymous name of the equation delineating the relationship between EVP and IOP?
The Goldmann equation (yes, *that* Goldmann)

What is the mechanism responsible for increasing IOP?
 Orbital congestion → compression of vortex veins → increased **EVP** → increased IOP

What does EVP stand for in this context?
Episcleral venous pressure

*Before we get to what other...
 --Lid edema
 --Chemosis
 --Orbital pain
 --Globe displacement
 --Elevated IOP*

ophthalmoplegia, orbital cellulitis?



Q

• Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years of age, the bug is usually a simple mix of **Staphylococcus aureus** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis is a **ophthalmic emergency**

What does the Goldman equation imply about the relationship between EVP and IOP?

What is the Goldman equation? (Meaning, write it out)

$$IOP = \frac{\text{Rate of aqueous formation}}{\text{Rate of aqueous outflow}} + EVP$$

Note: In the interest of simplicity, I fudged a little on the denominator—technically, it's outflow **facility**, not outflow **rate**

What is the eponymous name of the equation delineating the relationship between EVP and IOP?
The Goldman equation (yes, *that* Goldman)

What is the mechanism responsible for increasing IOP?
 Orbital congestion → compression of vortex veins → increased **EVP** → increased IOP

What does EVP stand for in this context?
Episcleral venous pressure



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years usually a single organism. When s/he is older than 9, the bug is usually polymicrobial and anaerobes
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is immunocompromised
- Orbital cellulitis is a clinical diagnosis. What are the signs and symptoms of orbital cellulitis?

What does the Goldmann equation imply about the relationship between EVP and IOP?
 It implies a 1:1 relationship; ie, that every 1mm increase in EVP will produce a 1mm increase in IOP

What is the Goldmann equation? (Meaning, write it out)

$$IOP = \frac{\text{Rate of aqueous formation}}{\text{Rate of aqueous outflow}} + EVP$$

Note: In the interest of simplicity, I fudged a little on the denominator—technically, it's outflow **facility**, not outflow **rate**

What is the eponymous name of the equation delineating the relationship between EVP and IOP?
 The **Goldmann equation** (yes, that Goldmann)

What is the mechanism responsible for increasing IOP?
 Orbital congestion → compression of vortex veins → increased **EVP** → increased IOP

What does EVP stand for in this context?
Episcleral venous pressure



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

--Globe displacement

--Elevated IOP

--Decreased visual function (ie, acuity, VF, color) }

--An RAPD }

These findings indicate what?



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

--Globe displacement

--Elevated IOP

--Decreased visual function (ie, acuity, VF, color) }

--An RAPD }

*These findings indicate what?
Optic nerve (ON) involvement*



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

--Globe displacement

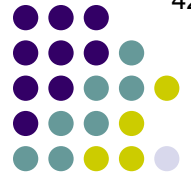
--Elevated IOP

--Decreased visual function (ie, acuity, VF, color) }

--An RAPD

*These findings indicate what?
Optic nerve (ON) involvement*

*What does (ON) involvement indicate
about the clinical status?*



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

--Globe displacement

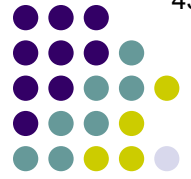
--Elevated IOP

--Decreased visual function (ie, acuity, VF, color) }

--An RAPD

*These findings indicate what?
Optic nerve (ON) involvement*

*What does (ON) involvement indicate
about the clinical status?
It's an ophthalmic emergency*



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

--Globe displacement

--Elevated IOP

--Decreased visual function (ie, acuity, VF, color) }

--An RAPD

*These findings indicate what?
Optic nerve (ON) involvement*

*What does (ON) involvement indicate
about the clinical status?
It's an ophthalmic emergency*

What management is indicated?



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset **proptosis** and **ophthalmoplegia...**

Before we get to this question...In addition to proptosis and ophthalmoplegia, what other ophthalmic signs/symptoms are associated with orbital cellulitis?

--Lid edema

--Chemosis

--Orbital pain and tenderness

--Globe displacement

--Elevated IOP

--Decreased visual function (ie, acuity, VF, color) }

--An RAPD }

These findings indicate what?
Optic nerve (ON) involvement

What does (ON) involvement indicate about the clinical status?
It's an ophthalmic emergency

What management is indicated?
Emergent surgery



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? **In children under 9, the bug is usually a single aerobic pathogen;** older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? **When s/he is immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ?



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single aerobic pathogen; older than 9, the infection is usually polymicrobial and includes both aerobes and anaerobes
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is immunocompromised
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? In orbital cellulitis the child is sick—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? In orbital cellulitis **the child is sick**—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.

What nonocular signs/symptoms (including vitals, lab findings) might the child display?

--
--
--
--



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? In orbital cellulitis **the child is sick**—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.

What nonocular signs/symptoms (including vitals, lab findings) might the child display?

--Leukocytosis

--Fever

--Headache

--Fussiness, or lethargy



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? **In children under 9, the bug is usually a single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? **When s/he is immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? **In orbital cellulitis the child is sick—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.**
- A child presents with ophthalmoplegia out of proportion to proptosis. There is no pain with EOMs; the orbit is nontender. What is your chief concern?



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? **In children under 9, the bug is usually a single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? **When s/he is immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? **In orbital cellulitis the child is sick—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.**
- A child presents with ophthalmoplegia out of proportion to proptosis. There is no pain with EOMs; the orbit is nontender. What is your chief concern? **Cavernous sinus thrombosis**



Cavernous sinus thrombosis



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? In orbital cellulitis the child is **sick**—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.
- A child presents with ophthalmoplegia out of proportion to proptosis. There is no pain with EOMs; the orbit is nontender. What is your chief concern? **Cavernous sinus thrombosis**

Three signs/symptoms of cavernous sinus involvement:

- 1) Ophthalmoplegia out of proportion to proptosis
- 2) Absence of pain (with eye movements, and of the orbit)

The third is:

3)



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? In orbital cellulitis the child is **sick**—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.
- A child presents with ophthalmoplegia out of proportion to proptosis. There is no pain with EOMs; the orbit is nontender. What is your chief concern? **Cavernous sinus thrombosis**

Three signs/symptoms of cavernous sinus involvement:

- 1) Ophthalmoplegia out of proportion to proptosis
- 2) Absence of pain (with eye movements, and of the orbit)

The third is:

- 3) Hypoesthesia in the distribution of the trigeminal nerve



● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? In orbital cellulitis the child is **sick**—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.
- A child presents with ophthalmoplegia out of proportion to proptosis. There is no pain with EOMs; the orbit is nontender. What is your chief concern? **Cavernous sinus thrombosis**

Caveat 1: This is per the Peds book; the Orbit book states that cavernous sinus thrombosis is associated with “rapid progression of proptosis”

Three signs/symptoms of cavernous sinus involvement:

1) Ophthalmoplegia out of proportion to proptosis

2) Absence of pain (with eye movements, and of the orbit)

The third is:

3) Hypoesthesia in the distribution of the trigeminal nerve



● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? In orbital cellulitis the child is **sick**—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.
- A child presents with ophthalmoplegia out of proportion to proptosis. There is no pain with EOMs; the orbit is nontender. What is your chief concern? **Cavernous sinus thrombosis**

Caveat 1: This is per the Peds book; the Orbit book states that cavernous sinus thrombosis is associated with “rapid progression of proptosis”

Three signs/symptoms of cavernous sinus involvement:

- 1) Ophthalmoplegia out of proportion to proptosis
- 2) Absence of pain (with eye movements, and of the orbit)

The third is:

3) Hypoesthesia in the distribution of the trigeminal nerve

Caveat 2: Per the Peds book the distribution is V2; per the Orbit book, it's both V1 and V2



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? **In children under 9, the bug is usually a single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? **When s/he is immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? **In orbital cellulitis the child is sick—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.**
- A child presents with ophthalmoplegia out of proportion to proptosis. There is no pain with EOMs; the orbit is nontender. What is your chief concern? **Cavernous sinus thrombosis**
- A child presents with an apparent bilateral orbital cellulitis. What is your chief concern?



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? **In children under 9, the bug is usually a single aerobic pathogen**; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? **When s/he is immunocompromised**
- Orbital cellulitis presents with rapid-onset proptosis and ophthalmoplegia. So can rhabdomyosarcoma. How might the presentations differ? **In orbital cellulitis the child is sick—systemic findings abound. In contrast, the rhabdo child seems otherwise healthy and happy.**
- A child presents with ophthalmoplegia out of proportion to proptosis. There is no pain with EOMs; the orbit is nontender. What is your chief concern? **Cavernous sinus thrombosis**
- A child presents with an apparent bilateral orbital cellulitis. What is your chief concern? **Cavernous sinus involvement; bilateral cellulitis is virtually diagnostic of it**



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- *What other entity—uncommon but not unknown in children—can present with what looks like a bilateral orbital cellulitis?*
- *What is your chief concern? Cavernous sinus thrombosis*
- **A child presents with an apparent bilateral orbital cellulitis. What is your chief concern? Cavernous sinus involvement; bilateral cellulitis is virtually diagnostic of it**

ur



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- *What other entity—uncommon but not unknown in children—can present with what looks like a bilateral orbital cellulitis?*
Orbital pseudotumor. In childhood, it can be associated with fever, headache, and nausea/vomiting.
- chief concern? Cavernous sinus thrombosis
- A child presents with an apparent bilateral orbital cellulitis. What is your chief concern? Cavernous sinus involvement; bilateral cellulitis is virtually diagnostic of it

ur



Q

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- *What other entity—uncommon but not unknown in children—can present with what looks like a bilateral orbital cellulitis?*
Orbital pseudotumor. In childhood, it can be associated with fever, headache, and nausea/vomiting.
- *Orbital pseudotumor in childhood has another manifestation not commonly associated with the adult version. What is it?*
Orbital pseudotumor in childhood has another manifestation not commonly associated with the adult version. What is it?
- *What is your chief concern? Cavernous sinus thrombosis*
- A child presents with an apparent bilateral orbital cellulitis. What is your chief concern? Cavernous sinus involvement; bilateral cellulitis is virtually diagnostic of it

ur



A

● Pediatric Orbital Cellulitis

- In a child with orbital cellulitis, whether s/he is older or younger than 9 years is important. Why? In children under 9, the bug is usually a single **aerobic** pathogen; older than 9, the infection is usually polymicrobial and includes both **aerobes** and **anaerobes**
- In what clinical scenario is a young child at risk for polymicrobial orbital cellulitis? When s/he is **immunocompromised**
- *What other entity—uncommon but not unknown in children—can present with what looks like a bilateral orbital cellulitis?*
Orbital pseudotumor. In childhood, it can be associated with fever, headache, and nausea/vomiting.
- *Orbital pseudotumor in childhood has another manifestation not commonly associated with the adult version. What is it?*
 Uveitis is common, and can even be the dominant manifestation
- *What is your chief concern?* Cavernous sinus thrombosis
- A child presents with an apparent bilateral orbital cellulitis. What is your chief concern? Cavernous sinus involvement; bilateral cellulitis is virtually diagnostic of it



Q

- **Pediatric Orbital Cellulitis: Management**

1)

2)

3)

4) *Image the patient*

*You have to do 4 things for your patient—
other than imaging, what are they?*



A

- **Pediatric Orbital Cellulitis: Management**

- 1) *Admit*
- 2) *Broad-spectrum IV antibiotics*
- 3) *Consider pan-culturing*
- 4) *Image the patient*

*You have to do 4 things for your patient—
other than imaging, what are they?*



Q

● Pediatric Orbital Cellulitis: Management

- 1) *Admit*
- 2) *Broad-spectrum IV antibiotics*
- 3) *Consider pan-culturing*
- 4) *Image the patient*

*You have to do 4 things for your patient—
other than imaging, what are they?*

- What is the preferred imaging study?



A

● Pediatric Orbital Cellulitis: Management

- 1) *Admit*
- 2) *Broad-spectrum IV antibiotics*
- 3) *Consider pan-culturing*
- 4) *Image the patient*

*You have to do 4 things for your patient—
other than imaging, what are they?*

- What is the preferred imaging study? **CT is probably superior, although some clinicians are understandably reluctant to irradiate the rapidly-developing head of a very young child**



Q

● Pediatric Orbital Cellulitis: Management

- 1) *Admit*
- 2) *Broad-spectrum IV antibiotics*
- 3) *Consider pan-culturing*
- 4) *Image the patient*

*You have to do 4 things for your patient—
other than imaging, what are they?*

- What is the preferred imaging study? **CT is probably superior, although some clinicians are understandably reluctant to irradiate the rapidly-developing head of a very young child**
- When reviewing the imaging, what two findings should you look for?



A

● Pediatric Orbital Cellulitis: Management

- 1) *Admit*
- 2) *Broad-spectrum IV antibiotics*
- 3) *Consider pan-culturing*
- 4) *Image the patient*

*You have to do 4 things for your patient—
other than imaging, what are they?*

- What is the preferred imaging study? **CT is probably superior, although some clinicians are understandably reluctant to irradiate the rapidly-developing head of a very young child**
- When reviewing the imaging, what two findings should you look for? **A subperiosteal abscess with adjacent sinusitis**



CT showing a medial orbital subperiosteal abscess on the left side associated with ethmoid and sphenoid sinusitis



Q

● Pediatric Orbital Cellulitis: Management

- 1) *Admit*
- 2) *Broad-spectrum IV antibiotics*
- 3) *Consider pan-culturing*
- 4) *Image the patient*

*You have to do 4 things for your patient—
other than imaging, what are they?*

- What is the preferred imaging study? **CT is probably superior, although some clinicians are understandably reluctant to irradiate the rapidly-developing head of a very young child**
- When reviewing the imaging, what two findings should you look for? **A subperiosteal abscess with adjacent sinusitis**
- If a subperiosteal abscess is present, how should it be managed?



A

● Pediatric Orbital Cellulitis: Management

- 1) *Admit*
- 2) *Broad-spectrum IV antibiotics*
- 3) *Consider pan-culturing*
- 4) *Image the patient*

*You have to do 4 things for your patient—
other than imaging, what are they?*

- What is the preferred imaging study? **CT is probably superior, although some clinicians are understandably reluctant to irradiate the rapidly-developing head of a very young child**
- When reviewing the imaging, what two findings should you look for? **A subperiosteal abscess with adjacent sinusitis**
- If a subperiosteal abscess is present, how should it be managed? **This is controversial. In adults, most clinicians advocate immediate drainage.**



A

● Pediatric Orbital Cellulitis: Management

- 1) *Admit*
- 2) *Broad-spectrum IV antibiotics*
- 3) *Consider pan-culturing*
- 4) *Image the patient*

*You have to do 4 things for your patient—
other than imaging, what are they?*

- What is the preferred imaging study? **CT is probably superior, although some clinicians are understandably reluctant to irradiate the rapidly-developing head of a very young child**
- When reviewing the imaging, what two findings should you look for? **A subperiosteal abscess with adjacent sinusitis**
- If a subperiosteal abscess is present, how should it be managed? **This is controversial. In adults, most clinicians advocate immediate drainage.** However, for children, many clinicians advocate close observation (ie, serial exams q 6-8 hr **around the clock**) in hopes of resolution with antibiotics alone.



A

● Pediatric Orbital Cellulitis: Management

- 1) *Admit*
- 2) *Broad-spectrum IV antibiotics*
- 3) *Consider pan-culturing*
- 4) *Image the patient*

*You have to do 4 things for your patient—
other than imaging, what are they?*

- What is the preferred imaging study? **CT is probably superior, although some clinicians are understandably reluctant to irradiate the rapidly-developing head of a very young child**
- When reviewing the imaging, what two findings should you look for? **A subperiosteal abscess with adjacent sinusitis**
- If a subperiosteal abscess is present, how should it be managed? **This is controversial. In adults, most clinicians advocate immediate drainage.** However, for children, many clinicians advocate close observation (ie, serial exams q 6-8 hr **around the clock**) in hopes of resolution with antibiotics alone. **If the ocular exam worsens, immediate drainage should be performed.**