Acute/Hyperacute Conjunctivitis

*What is Conjunctivitis?*
Acute/Hyperacute Conjunctivitis

What is Conjunctivitis?

Like any other -itis, it is an inflammatory condition involving the tissue of interest (in this case, the conj)
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response
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The nature of the inflammatory response

The Cornea book emphasizes four causes of noninfectious conjunctivitis—what are they?
Conjunctivitis

Noninfectious
- Allergic
- Ligneous
- SJS/TEN
- MMP

Infectious

The Cornea book emphasizes four causes of noninfectious conjunctivitis—what are they?

We can divvy conjunctivitis many ways, including in terms of: The nature of the inflammatory response
Conjunctivitis

Noninfectious

Allergic

Infectious

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The nature of the inflammatory response
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**The nature of the inflammatory response**
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

Conjunctivitis

Noninfectious

Allergic

Infectious

What are the four forms of allergic conjunctivitis?

--Seasonal allergic conjunctivitis (SAC)
--Perennial allergic conjunctivitis (PAC)
--Vernal keratoconjunctivitis (VKC)
--Atopic keratoconjunctivitis (AKC)

How should you group these four in your mind?

SAC and PAC constitute one group; VKC and AKC constitute a different, distinct group

see slide-set K36 to review these

see slide-set K6 to review these
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

Acute/Hyperacute Conjunctivitis

Conjunctivitis

Noninfectious

- Allergic
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Infectious
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The nature of the inflammatory response

Conjunctivitis

Noninfectious

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Infectious

Acute/Hyperacute Conjunctivitis

What is the cardinal clinical sign of ligneous conjunctivitis?
The presence of a firm yellow pseudomembrane on the conj

Ligneous firm vs soft color membrane vs pseudomembrane
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The nature of the inflammatory response

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Conjunctivitis

Noninfectious

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Infectious

Acute/Hyperacute Conjunctivitis
Firm yellowish lesions of the eyelids characteristic of ligneous conjunctivitis
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

What is the cardinal clinical sign of ligneous conjunctivitis?

The presence of a firm yellow pseudomembrane on the conj

What’s the difference between a membrane and a pseudomembrane?

A membrane is adherent to the conj, a pseudo isn’t

How can you tell whether it’s actually adhering?

A membrane bleeds when peeled; a pseudomembrane doesn’t
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

Conjunctivitis

Noninfectious

- Allergic
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Acute/Hyperacute Conjunctivitis
We can divvy conjunctivitis many ways, including in terms of:

- The nature of the inflammatory response
- Infectious vs. Noninfectious
  - Infectious
    - Allergic
    - SJS/TEN
    - MMP
  - Noninfectious
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- Acute/Hyperacute Conjunctivitis
Conjunctivitis

We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

**Acute/Hyperacute Conjunctivitis**

Conjunctivitis

Noninfectious → Infectious

- Allergic
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- SJS/TEN
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The nature of the inflammatory response
Conjunctivitis

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- The nature of the inflammatory response

**Noninfectious**
- Allergic
  - Ligneous
- SJS/TEN
- MMP

**Infectious**

*What is the cardinal clinical sign of ligneous conjunctivitis?*
The presence of a firm yellow pseudomembrane on the conj

*What arboreal term is used to describe the degree of firmness of the pseudomembrane?*
‘Woody’ (ligneous means ‘consisting of or resembling wood’ in Latin)

**Acute/Hyperacute Conjunctivitis**
Conjunctivitis

We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

Conjunctivitis

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Is ligneous conjunctivitis common, or rare?

Rare

With what clotting abnormality is it associated?
Plasminogen deficiency
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:

**The nature of the inflammatory response**

**Conjunctivitis**

- **Infectious**
  - Allergic
  - SJS/TEN
  - MMP
- **Noninfectious**
  - Ligneous

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- The nature of the inflammatory response

**Conjunctivitis**

- **Noninfectious**
  - Acute/Hyperacute Conjunctivitis

- **Infectious**
  - Infectious
  - Allergic
  - Ligneous
  - MMP

---

**What do SJS and TEN stand for in this context?**

- **SJS:**
- **TEN:**

---

**In just a few words, how would you describe the pathophysiology of SJS/TEN?**

It is an acute inflammatory vesiculobullous reaction of the skin and mucus membranes.

---

**How do SJS and TEN differ? What distinguishes one form the other?**

It's a matter of degree—TEN involves significantly more body surface area than does SJS.

---

**What is the pathogenesis of the acute inflammatory vesiculobullous reaction?**

A hypersensitivity reaction, usually to a drug or infectious agent.
We can divvy conjunctivitis many ways, including in terms of:

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Conjunctivitis

We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

Acute/Hyperacute Conjunctivitis

Noninfectious

Infectious

What do SJS and TEN stand for in this context?

SJS: Stevens-Johnson syndrome

TEN: Toxic epidermal necrolysis

In just a few words, how would you describe the pathophysiology of SJS/TEN?

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How do SJS and TEN differ? What distinguishes one form the other?

It's a matter of degree—TEN involves significantly more body surface area than does SJS.
Acute/Hyperacute Conjunctivitis

SJS

TEN
SJS/TEN. Early, severe involvement of the conjunctiva, right eye
We can divvy conjunctivitis many ways, including in terms of:

The **nature** of the inflammatory response
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**The nature of the inflammatory response**
We can divvy conjunctivitis many ways, including in terms of:

- The nature of the inflammatory response

**Noninfectious**

- Acute/Hyperacute Conjunctivitis

**Infectious**

- Infectious
  - Infectious
- Allergic
- Ligneous
- MMP

**Conjunctivitis**

- **What do SJS and TEN stand for in this context?**
  - **SJS**: Stevens-Johnson syndrome
  - **TEN**: Toxic epidermal necrolysis

- **Which infectious agent is most commonly implicated in SJS/TEN?**
  - A hypersensitivity reaction, usually to a drug
  - **infectious agent**

- **Which infectious agent is most commonly implicated in SJS/TEN?**
  - **Depends on who you ask. Per both EyeWiki and UpToDate, Mycoplasma pneumoniae** is by far the most common cause (EyeWiki attributes almost 90% of non-drug-induced cases to it). However, in the most recent version of the BCSC Cornea/External Disease book, Mycoplasma pneumoniae isn't even mentioned as a cause--HSV, strep and adeno are. On the other hand, the Peds book states that infection-related cases are usually secondary to "Mycoplasma species or herpes simplex virus." (Of course, this difference could be because Mycoplasma pneumoniae is a more common cause in kids.) At any rate, caveat emptor.
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

**Conjunctivitis**

- **Noninfectious**
- **Infectious**

**Acute/Hyperacute Conjunctivitis**

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A hypersensitivity reaction, usually to a drug or an infectious agent.
Conjunctivitis

We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

Acute/Hyperacute Conjunctivitis

Noninfectious

Infectious

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We can divvy conjunctivitis many ways, including in terms of:

The **nature** of the inflammatory response

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**Acute/Hyperacute Conjunctivitis**

Conjunctivitis

- **Noninfectious**
  - Allergic
  - Ligneous
  - MMP

- **Infectious**
  - Infectious

What do SJS and TEN stand for in this context?

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Which infectious agent is most commonly implicated in SJS/TEN?

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For more on SJS/TEN, see slide-set K8
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

Conjunctivitis

Noninfectious
- Allergic
- Ligneous
- SJS
- MMP

Infectious
- Viral
- Bacterial

What does MMP stand for in this context?

Mucus membrane pemphigoid

By what other name—less preferred, but frequently used—is it known?

Ocular cicatricial pemphigoid, OCP

In just a few words, what is the clinical manifestation of MMP?

It is a chronic cicatrizing conjunctivitis

Other than timeframe of presentation (ie, acute vs chronic), in what fundamental way does MMP differ from SJS/TEN?

SJS/TEN is an immune condition—a hypersensitivity reaction. In contrast, MMP is an autoimmune condition.
We can divvy conjunctivitis many ways, including in terms of:

*The nature* of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

**Conjunctivitis**

- **Noninfectious**
  - Allergic
  - Ligneous
  - SJS/TEN
- **Infectious**
  - Viral
  - Bacterial

**Acute/Hyperacute Conjunctivitis**

What does MMP stand for in this context?
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We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

**Conjunctivitis**

- Noninfectious
  - Allergic
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  - MMP

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Conjunctivitis

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The **nature** of the inflammatory response

---

**Conjunctivitis**

- Infectious
  - Viral
  - Bacterial
- Noninfectious
  - Allergic
  - Ligneous
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  - **MMP**

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The nature of the inflammatory response
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Conjunctivitis

Noninfectious

- Allergic
- Ligneous
- SJS/TEN
- MMP

Infectious

- Viral
- Bacterial

MMP

What does MMP stand for in this context?
Mucus membrane pemphigoid

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Ocular cicatricial pemphigoid, OCP

In just a few words, what is the clinical manifestation of MMP?
It is a chronic cicatrizng conjunctivitis
MMP: Subepithelial fibrosis, symblepharon, and shortening of the inferior fornix
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

Conjunctivitis

Noninfectious
- Allergic
- Ligneous
- SJS/TEN
- MMP

Infectious
- Viral
- Bacterial

What does MMP stand for in this context?
Mucus membrane pemphigoid

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In just a few words, what is the clinical manifestation of MMP?
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The nature of the inflammatory response

Conjunctivitis

Noninfectious
- Allergic
- Ligneous
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Infectious
- Viral
- Bacterial

MMP

What does MMP stand for in this context?
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SJS/TEN is an immune condition—a hypersensitivity reaction. In contrast, MMP is an autoimmune condition.
Conjunctivitis

We can divvy conjunctivitis many ways, including in terms of:

- The nature of the inflammatory response
  - Viral
  - Bacterial
- Infectious
- Allergic
- Ligneous
- SJS/TEN
- Mucous membrane pemphigoid
- MMP

**What does MMP stand for in this context?**
Mucus membrane pemphigoid

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**Other than timeframe of presentation (ie, acute vs chronic), in what fundamental way does MMP differ from SJS/TEN?**
SJS/TEN is an immune condition—a hypersensitivity reaction. In contrast, MMP is an autoimmune condition.

For more on MMP, see slide-set K29
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The nature of the inflammatory response
Conjunctivitis

We can divvy conjunctivitis many ways, including in terms of:
The nature of the inflammatory response

Acute/Hyperacute Conjunctivitis

What is the typical course for bacterial conjunctivitis?
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response

Conjunctivitis

Noninfectious
- Allergic
- Ligneous
- SJS/TEN
- MMP

Infectious
- Viral
  - Bacterial

Acute/Hyperacute Conjunctivitis

What is the typical course for bacterial conjunctivitis?
It’s generally a self-limited condition
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response
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Conjunctivitis

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- **The nature of the inflammatory response**
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response
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The nature of the inflammatory response

Conjunctivitis

Noninfectious

- Viral
- Bacterial
- Fungal
- Allergic
- Ligneous
- SJS/TEN
- MMP

Infectious

- Parasitic

When you hear ‘parasitic conjunctivitis,’ what bug should come to mind?
Microsporidia

What sort of bug is Microsporidia?
A protozoan

Broadly speaking, what are protozoa?
They are unicellular eukaryotes capable of some form of motility. Protozoa feed on organic material, and many are parasites. The term protozoa is considered outdated by modern biologists, but it persists in the ophthalmic literature.

What group of individuals is at particular risk for Microsporidia conjunctivitis?
AIDS pts

What is the classic presentation of Microsporidia conjunctivitis?
We can divvy conjunctivitis many ways, including in terms of:

The nature of the inflammatory response
Acute/Hyperacute Conjunctivitis

*Microsporidia* keratoconjunctivitis
We can divvy conjunctivitis many ways, including in terms of:

The **histology** of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of: The histology of the inflammatory response
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Acute/Hyperacute Conjunctivitis

We can divvy conjunctivitis many ways, including in terms of:

The **histology** of the inflammatory response.
Acute/Hyperacute Conjunctivitis

Conjunctivitis

Papillary

Follicular

What does a papillary reaction look like clinically?
Flattened nodules—sort of a cobblestone appearance

What does it look like histologically?
Each nodule contains a vascular core surrounded by mast cells, eos, and other inflammatory cells

We can divvy conjunctivitis many ways, including in terms of: The histology of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:
The histology of the inflammatory response

**Conjunctivitis**

- Papillary
- Follicular

**Acute/Hyperacute Conjunctivitis**

What does a papillary reaction look like clinically?
Flattened nodules—sort of a cobblestone appearance

What does it look like histologically?
Each nodule contains a vascular core surrounded by mast cells, eos, and other inflammatory cells
“The conj epithelium *(blue line)* extends over fine projections of blood vessels *(red)* and fibrous tissue, and the stroma contains eosinophils *(pink circles)*, lymphocytes, and plasma cells *(blue circles).*

Conj papilla per the *Path* book
The conj epithelium (*blue line*) extends over fine projections of blood vessels (*red*) and fibrous tissue, and the stroma contains eosinophils (*pink circles*), lymphocytes, and plasma cells (*blue circles*).“Conj papilla per the *Cornea* book

“Cross-sectional diagram of a conjunctival papilla with a central vascular tuft surrounded by acute and chronic leukocytes.”

“Conj papilla per the *Path* book
Papillary conjunctivitis. A, Clinical photograph. Papillae efface the normal palpebral conjunctival surface and form a confluent cobblestone pattern. B, Low-magnification photo-micrograph shows the characteristic closely packed, flat-topped papillae with central fibrovascular cores (arrows). The normal meibomian glands (M) of the tarsus are also shown.
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response

**Acute/Hyperacute Conjunctivitis**

Conjunctivitis

- **Papillary**
- **Follicular**

**What does a papillary reaction look like clinically?**
Flattened nodules—sort of a cobblestone appearance

**What does a follicular reaction look like clinically?**

**What does it look like histologically?**
Each nodule contains a vascular core surrounded by mast cells, eos, and other inflammatory cells
We can divvy conjunctivitis many ways, including in terms of:

The **histology** of the inflammatory response
Acute/Hyperacute Conjunctivitis

Follicles (note this is the lower lid viewed from above)
Follicular conjunctivitis. **A**, Inflammation of the right eye from glaucoma medication. **B**, Right eye showing follicular conjunctivitis in the inferior fornix.
We can divvy conjunctivitis many ways, including in terms of: The histology of the inflammatory response

**Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

- **Papillary**
  - What does a papillary reaction look like clinically?
    - Flattened nodules—sort of a cobblestone appearance
  - What does it look like histologically?
    - Each nodule contains a vascular core surrounded by mast cells, eos, and other inflammatory cells

- **Follicular**
  - What does a follicular reaction look like clinically?
    - Dome-shaped nodules
  - What does it look like histologically?
What does a papillary reaction look like clinically?
Flattened nodules—sort of a cobblestone appearance

What does a follicular reaction look like clinically?
Dome-shaped nodules

What does it look like histologically?
Each nodule contains a vascular core surrounded by mast cells, eos, and other inflammatory cells

We can divvy conjunctivitis many ways, including in terms of:
The histology of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response

**Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

- **Papillary**
  - What does a papillary reaction look like clinically?  
    Flattened nodules—sort of a cobblestone appearance
  - What does it look like histologically?  
    Each nodule contains a vascular core surrounded by mast cells, eos, and other inflammatory cells

- **Follicular**
  - What does a follicular reaction look like clinically?  
    Dome-shaped nodules
  - What does it look like histologically?  
    Each nodule contains a lymphoid follicle
We can divvy conjunctivitis many ways, including in terms of:
The histology of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of: The histology of the inflammatory response
“Cross-section of a conjunctival follicle with mononuclear cells obscuring conjunctival blood vessels.”
“The conj epithelium (blue line) overlies lymphoid follicles in the superficial stroma that have a paler germinal center surrounded by a darker corona (central pale blue surrounded by purple). The surrounding stroma contains lymphocytes and plasma cells (small blue circles).”

“Cross-section of a conjunctival follicle with mononuclear cells obscuring conjunctival blood vessels.”
Follicular conjunctivitis. A, Clinical photograph showing follicles, which occur only in the fornix. B, High-magnification photomicrograph shows a lymphoid follicle and the boundary between the germinal center and the mantle zone (arrowheads). Note the paler, relatively larger, immature lymphocytes in the germinal center compared with the darker, small, mature lymphocytes in the corona.
We can divvy conjunctivitis many ways, including in terms of:
The **histology** of the inflammatory response

There’s a third histology we must address. You are very familiar with it, but perhaps not in the context of conjunctivitis. What is it?

Acute/Hyperacute Conjunctivitis

Conjunctivitis

Papillary

Follicular

?
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response

There’s a third histology we must address. You are very familiar with it, but perhaps not in the context of conjunctivitis. What is it?

**Granulomatous** conjunctivitis
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:

The **histology** of the inflammatory response

---

**Acute/Hyperacute Conjunctivitis**

Conjunctivitis

- Papillary
- Follicular
- Granulomatous

There’s a third histology we must address. You are very familiar with it, but perhaps not in the context of conjunctivitis. What is it?

**Granulomatous conjunctivitis**

Is granulomatous conjunctivitis a commonly-encountered clinical entity?
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response

Conjunctivitis

- Acute/Hyperacute
- Papillary
- Follicular
- Granulomatous

There’s a third histology we must address. You are very familiar with it, but perhaps not in the context of conjunctivitis. What is it? Granulomatous conjunctivitis

Is granulomatous conjunctivitis a commonly-encountered clinical entity? No, it is vastly less common than its papillary and follicular cousins
We can divvy conjunctivitis many ways, including in terms of:
The **histology** of the inflammatory response

**Acute/Hyperacute Conjunctivitis**

Conjunctivitis

- Papillary
- Follicular

Granulomatous

- ?
- ?

*There’s a third histology we must address. You are very familiar with it, but perhaps not in the context of conjunctivitis. What is it?*

**Granulomatous** conjunctivitis

*Is granulomatous conjunctivitis a commonly-encountered clinical entity? No, it is vastly less common than its papillary and follicular cousins*

Granulomatous **dz** is divvied into two subtypes—what are they?
We can divvy conjunctivitis many ways, including in terms of: The histology of the inflammatory response

There’s a third histology we must address. You are very familiar with it, but perhaps not in the context of conjunctivitis. What is it?
Granulomatous conjunctivitis

Is granulomatous conjunctivitis a commonly-encountered clinical entity?
No, it is vastly less common than its papillary and follicular cousins

Granulomatous dz is divvied into two subtypes—what are they?
Caseating and noncaseating
We can divvy conjunctivitis many ways, including in terms of: The histology of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:
The **histology** of the inflammatory response

---

What does it mean to say a granuloma is ‘caseating’?
It means the center in necrotic
We can divvy conjunctivitis many ways, including in terms of:

The **histology** of the inflammatory response

---

**Acute/Hyperacute Conjunctivitis**

- Papillary
- Follicular

**Conjunctivitis**

- Granulomatous

  - Caseating
  - Noncaseating

---

*What does it mean to say a granuloma is ‘caseating’?*

It means the center in necrotic

*What is the classic cause of caseating granulomatous conjunctivitis?*
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response

What does it mean to say a granuloma is ‘caseating’?
It means the center in necrotic

What is the classic cause of caseating granulomatous conjunctivitis?
Parinaud oculoglandular syndrome (POS)
We can divvy conjunctivitis many ways, including in terms of:

The **histology** of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response

A unilateral granulomatous conjunctivitis is one of two hallmarks of POS.

What is the classic cause of caseating granulomatous conjunctivitis?

Parinaud oculoglandular syndrome (POS)
We can divvy conjunctivitis many ways, including in terms of: The histology of the inflammatory response

A unilateral granulomatous conjunctivitis is one of two hallmarks of POS. What is the other?

What is the classic cause of caseating granulomatous conjunctivitis?

Parinaud oculoglandular syndrome (POS)

What is the classic cause of Parinaud oculoglandular syndrome (POS)?

What is the classic ocular manifestation of Bartonella?

Neuroretinitis

What is the classic macular manifestation of Bartonella neuroretinitis?
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response

A unilateral granulomatous conjunctivitis is one of two hallmarks of POS. What is the other?
Preauricular and/or submandibular lymphadenopathy ipsilateral to the affected eye

What bug is the classic cause of POS?
Bartonella henselae

What is the other classic ocular manifestation of Bartonella?
Neuroretinitis

What is the classic macular manifestation of Bartonella neuroretinitis?
Exudate that takes on a star shape

What is the classic cause of caseating granulomatous conjunctivitis?
Parinaud oculoglandular syndrome (POS)
Parinaud oculoglandular syndrome. A, Marked follicular reaction in the lower fornix. B, Massive enlargement of submandibular lymph node on the affected right side.
A unilateral granulomatous conjunctivitis is one of two hallmarks of POS. What is the other? Preauricular and/or submandibular lymphadenopathy ipsilateral to the affected eye.

What is the classic cause of POS?

Parinaud oculoglandular syndrome (POS)

We can divvy conjunctivitis many ways, including in terms of: The histology of the inflammatory response.
We can divvy conjunctivitis many ways, including in terms of:

**The histology of the inflammatory response**
We can divvy conjunctivitis many ways, including in terms of:
The histology of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:
The histology of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of: The histology of the inflammatory response.
We can divvy conjunctivitis many ways, including in terms of:

The **histology** of the inflammatory response

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**Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

- Papillary
- Follicular

A *unilateral granulomatous conjunctivitis* is one of two hallmarks of POS. What is the other? Preauricular and/or submandibular lymphadenopathy ipsilateral to the affected eye

What bug is the classic cause of POS? *Bartonella henselae*

*What is the other classic ocular manifestation of Bartonella? Neuroretinitis*

*What is the classic macular manifestation of Bartonella neuroretinitis? Exudate that takes on a star shape*
Parinaud oculoglandular syndrome: Optic disc edema and a macular star
Conjunctivitis

- Papillary
- Follicular

A unilateral granulomatous conjunctivitis is one of two hallmarks of POS. What is the other? Preauricular and/or submandibular lymphadenopathy ipsilateral to the affected eye.

What is the classic mechanism by which the pt acquires a Bartonella infection?

What is the classic macular manifestation of Bartonella neuroretinitis? Exudate that takes on a star shape.

What is the classic cause of caseating granulomatous conjunctivitis?

Parinaud oculoglandular syndrome (POS)

We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:

**The histology of the inflammatory response**
We can divvy conjunctivitis many ways, including in terms of: The **histology** of the inflammatory response
We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response

Parinaud oculoglandular syndrome (POS)

POS and neuroretinitis are both subtypes of what condition?

Cat scratch disease

What is the classic cause of caseating granulomatous conjunctivitis?

Parinaud oculoglandular syndrome (POS)

What is the classic mechanism by which the pt acquires a Bartonella infection?

A cat scratch

What is the classic macular manifestation of Bartonella neuroretinitis?

Exudate that takes on a star shape

What is the classic cause of caseating granulomatous conjunctivitis?

Parinaud oculoglandular syndrome (POS)

A unilateral granulomatous conjunctivitis is one of two hallmarks of POS. What is the other?

Preauricular and/or submandibular lymphadenopathy ipsilateral to the affected eye
We can divvy conjunctivitis many ways, including in terms of:

The **histology** of the inflammatory response

What is the classic cause of noncaseating granulomatous conjunctivitis?
Acute/Hyperacute Conjunctivitis

We can divvy conjunctivitis many ways, including in terms of:

The histology of the inflammatory response

What is the classic cause of noncaseating granulomatous conjunctivitis?
Sarcoidosis
Sarcoidosis. A, Clinical photograph shows granulomas (arrows) of the conjunctiva in a patient with sarcoidosis. B, Histology shows a noncaseating granuloma with pale-staining histiocytes, including a multinucleated giant cell (arrowhead). Note the small cuff of lymphocytes and plasma cells.
We can divvy conjunctivitis many ways, including in terms of: The age of the pt
We can divvy conjunctivitis many ways, including in terms of: The age of the pt

Note: This part changed again
We can divvy conjunctivitis many ways, including in terms of:

The age of the pt
We can divvy conjunctivitis many ways, including in terms of:

The age of the pt
We can divvy conjunctivitis many ways, including in terms of: The age of the pt
We can divvy conjunctivitis many ways, including in terms of:

The age of the pt
We can divvy conjunctivitis many ways, including in terms of:

The age of the pt
We can divvy conjunctivitis many ways, including in terms of:

The age of the pt

What is the most common sort of conjunctivitis in kids?
Bacterial, specifically *H flu* and *Strep pneumo*

What is the most common sort of conjunctivitis in adults?
Viral, specifically *adeno* and *HSV*
We can divvy conjunctivitis many ways, including in terms of:

The age of the pt
We can divvy conjunctivitis many ways, including in terms of:

The age of the pt
We can divvy conjunctivitis many ways, including in terms of:

The nature of the response
We can divvy conjunctivitis many ways, including in terms of:

The nature of the response
In terms of presentation, what two factors differentiate between acute and hyperacute conjunctivitis?

?  

?
In terms of presentation, what two factors differentiate between acute and hyperacute conjunctivitis?

Course of onset

Severity
In terms of presentation, what two factors differentiate between acute and hyperacute conjunctivitis?

What constitutes an acute vs hyperacute course of onset?
In terms of presentation, what two factors differentiate between acute and hyperacute conjunctivitis?

- **Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

- Acute
- Hyperacute

**Course of onset**

- Hours to days
- <24 hrs

What constitutes an acute vs hyperacute course of onset?
In terms of presentation, what two factors differentiate between acute and hyperacute conjunctivitis?

- **Course of onset**
  - Hours to days
  - <24 hrs

**Severity**

To what does severity refer here?
In terms of presentation, what two factors differentiate between acute and hyperacute conjunctivitis?

- Hours to days: Acute (days) vs. Hyperacute (<24 hrs)

**Severity**

To what does severity refer here?
To the amount of purulent discharge and the extent of conj chemosis
In terms of presentation, what two factors differentiate between acute and hyperacute conjunctivitis?

Hours to days

Course of onset: <24 hrs

Severity: ?

What constitutes acute vs hyperacute severity?
In terms of presentation, what two factors differentiate between acute and hyperacute conjunctivitis?

- **Course of onset**
  - Acute: Hours to days
  - Hyperacute: <24 hrs

- **Severity**
  - Acute: ‘Moderate to severe’
  - Hyperacute: ‘Very severe’

What constitutes acute vs hyperacute severity?
Acute/Hyperacute Conjunctivitis

Acute bacterial conjunctivitis
Hyperacute bacterial conjunctivitis
Conjunctivitis

**Bugs:**

1) S pneumo: #1
2) S aureus: Less severe
3) H flu: Acute/Hyperacute Conjunctivitis

Acute

Hyperacute
Conjunctivitis

Acute

Hyperacute

Bugs:
1) *S pneumoniae*: #1
2) *S aureus*: Less severe
3) *H flu*
Conjunctivitis

Bugs:
1) *S. pneumoniae*: #1
2) *S. aureus*: Less severe
3) *H. influenzae*
   --?
   --?

Who is at risk for *H. influenzae* conjunctivitis?
Acute/Hyperacute Conjunctivitis

Conjunctivitis

**Acute**

**Bugs:**
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with dz (two words)
   --Adults with two words dz

*Who is at risk for H flu conjunctivitis?*
Conjunctivitis

**Bugs:**
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with *otitis media*
   --Adults with *chronic lung dz*

Who is at risk for *H flu conjunctivitis*?
**Conjunctivitis**

**Acute**

*Bugs:*
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with *otitis media*
   --Adults with *chronic lung dz*

---

**Hyperacute**

*Who is at risk for H flu conjunctivitis?*

*Cultures/stains needed?*

---

*yes/no/maybe so*
**Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

**Acute**

**Hyperacute**

**Bugs:**
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with **otitis media**
   --Adults with **chronic lung dz**

Who is at risk for *H flu* conjunctivitis?

**Cultures/stains needed?**
--**No**, unless:
   1) [ ]
   2) [ ]
   3) [ ]
Conjunctivitis

Acute

Bugs:
1) *S. pneumo*: #1
2) *S. aureus*: Less severe
3) *H. flu*
   --Kids with *otitis media*
   --Adults with *chronic lung dz*

Who is at risk for *H. flu conjunctivitis*?

Cultures/stains needed?
--*No*, unless:
   1) debilitated
   2) immunocompromised
   3) unresponsive to treatment
Acute/Hyperacute Conjunctivitis

Conjunctivitis

Acute

Hyperacute

**Bugs:**
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with **otitis media**
   --Adults with **chronic lung dz**

**Who is at risk for H flu conjunctivitis?**

**Cultures/stains needed?**
--**No**, unless:
   1) **debilitated**
   2) **immunocompromised**
   3) **unresponsive to treatment**

**Treatment:**
--**Polytrim** (has good *H flu* coverage)
Conjunctivitis

**Acute/Hyperacute Conjunctivitis**

### Bugs:
1. *S pneumoniae*: #1
2. *S aureus*: Less severe
3. *H flue*  
   --Kids with **otitis media**  
   --Adults with **chronic lung dz**

Who is at risk for *H flue* conjunctivitis?

### Cultures/stains needed?
--**No**, unless:
   1. debilitated
   2. immunocompromised
   3. unresponsive to treatment

### Treatment:
--**Polytrim** (has good *H flue* coverage)
**Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

**Acute** → **Hyperacute**

**Bugs:**
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with *otitis media*
   --Adults with *chronic lung dz*

**Who is at risk for H flu conjunctivitis?**

**Cultures/stains needed?**
--No, unless:
   1) debilitated
   2) immunocompromised
   3) unresponsive to treatment

**Treatment:**
--*Polytrim* (has good *H flu* coverage)
--Consider PO abx if *H flu* in kids
   (to prevent *dz/dz*)
Conjunctivitis

**Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

**Acute**

**Hyperacute**

**Bugs:**
1. *S pneumo*: #1
2. *S aureus*: Less severe
3. *H flu*
   --Kids with **otitis media**
   --Adults with **chronic lung dz**

**Who is at risk for H flu conjunctivitis?**

**Cultures/stains needed?**
--**No**, unless:
   1. **debilitated**
   2. **immunocompromised**
   3. **unresponsive to treatment**

**Treatment:**
--**Polytrim** (has good *H flu* coverage)
--Consider PO abx if *H flu* in kids
(to prevent **otitis/pharyngitis**
Conjunctivitis

**Acute/Hyperacute Conjunctivitis**

Conjunctivitis

**Acute**

**Hyperacute**

**Bugs:**
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with *otitis media*
   --Adults with *chronic lung* dz

**Cultures/stains needed?**
--**No**, unless:
   1) *debilitated*
   2) *immunocompromised*
   3) *unresponsive to treatment*

**Treatment:**
--**Polytrim** (has good *H flu* coverage)
--Consider PO abx if *H flu* in kids
(to prevent *otitis/pharyngitis*)
Acute Hyperacute Conjunctivitis

Conjunctivitis

Acute

Bugs:
1) *S. pneumoniae*: #1
2) *S. aureus*: Less severe
3) *H. influenzae*
   --Kids with *otitis media*
   --Adults with *chronic lung* dz

Hyperacute

Bugs:
1) *N. gonorrhoea*
2) *N. meningitides* (much less common)

Cultures/stains needed?
--No, unless:
   1) debilitated
   2) immunocompromised
   3) unresponsive to treatment

Treatment:
--Polytrim (has good *H. influenzae* coverage)
--Consider PO abx if *H. influenzae* in kids
   (to prevent *otitis/pharyngitis*)
Conjunctivitis

Acute/Hyperacute Conjunctivitis

**Acute**

**Bugs:**
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with otitis media
   --Adults with chronic lung dz

**Cultures/stains needed?**
--**No**, unless:
   1) debilitated
   2) immunocompromised
   3) unresponsive to treatment

**Treatment:**
--**Polytrim** (has good *H flu* coverage)
--Consider PO abx if *H flu* in kids
(to prevent *otitis/pharyngitis*)

**Hyperacute**

**Bugs:**
1) *N gonorrhea*
2) *N menigitidis* (much less common)

**Cultures/stains needed?**
--?
Conjunctivitis

**Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

**Acute**

**Bugs:**
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with *otitis media*
   --Adults with *chronic lung dz*

**Cultures/stains needed?**
--No, unless:
   1) *debilitated*
   2) *immunocompromised*
   3) *unresponsive to treatment*

**Treatment:**
--**Polytrim** (has good *H flu* coverage)
--Consider PO abx if *H flu* in kids
(to prevent *otitis/pharyngitis*)

**Hyperacute**

**Bugs:**
1) *N gonorrhea*
2) *N menigitidis* (much less common)

**Cultures/stains needed?**
--Yes
Conjunctivitis

**Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

**Acute**

*Bugs:*
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with *otitis media*
   --Adults with *chronic lung dz*

**Cultures/stains needed?**
--*No*, unless:
   1) *debilitated*
   2) *immunocompromised*
   3) *unresponsive to treatment*

**Treatment:**
--*Polytrim* (has good *H flu* coverage)
--Consider PO abx if *H flu* in kids
   (to prevent *otitis/pharyngitis*)

**Hyperacute**

*Bugs:*
1) *N gonorrhea*
2) *N meningitidis* (much less common)

**Cultures/stains needed?**
--*Yes*

**Treatment:**
--*If no corneal involvement:*

---

**Inpt or Outpt? Med + route?**

Conjunctivitis

**Acute/Hyperacute Conjunctivitis**

**Bugs:**
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with **otitis media**
   --Adults with **chronic lung dz**

**Cultures/stains needed?**
--**No**, unless:
   1) **debilitated**
   2) **immunocompromised**
   3) **unresponsive to treatment**

**Treatment:**
--**Polytrim** (has good *H flu* coverage)
--Consider PO abx if *H flu* in kids
   (to prevent **otitis/pharyngitis**)

**Bugs:**
1) *N gonorrhea*
2) *N menigitidis* (much less common)

**Cultures/stains needed?**
--**Yes**

**Treatment:**
--*If no corneal involvement:*
   **Outpatient w/ 1g Rocephin IM x 1**
Acute/Hyperacute Conjunctivitis

Conjunctivitis

Acute

Bugs:
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with *otitis media*
   --Adults with *chronic lung dz*

Cultures/stains needed?
--No, unless:
   1) *debilitated*
   2) *immunocompromised*
   3) *unresponsive to treatment*

Treatment:
--*Polytrim* (has good *H flu* coverage)
--Consider PO abx if *H flu* in kids
   (to prevent *otitis/pharyngitis*)

Hyperacute

Bugs:
1) *N gonorrhea*
2) *N menigitidis* (much less common)

Cultures/stains needed?
--Yes

Treatment:
--*If no corneal involvement:*
   Outpatient w/ 1g Rocephin IM x 1
--*If with corneal involvement:*
   Inpt or Outpt? Med + route?
Conjunctivitis

Acute

1. **S pneumo**: #1
2. **S aureus**: Less severe
3. **H flu**
   - Kids with **otitis media**
   - Adults with **chronic lung** dz

**Cultures/stains needed?**
--No, unless:
   1. debilitated
   2. immunocompromised
   3. unresponsive to treatment

**Treatment:**
--**Polytrim** (has good **H flu** coverage)
--Consider PO abx if **H flu** in kids
   (to prevent **otitis/pharyngitis**)

Hyperacute

**Bugs:**
1. **N gonorrhea**
2. **N menigitidis** (much less common)

**Cultures/stains needed?**
--Yes

**Treatment:**
--If no corneal involvement:
   *Outpatient w/ 1g Rocephin IM x 1*
--If with corneal involvement:
   *Inpatient, 1g Rocephin IV q12o x 3d*
Conjunctivitis

**Acute/Hyperacute Conjunctivitis**

**Bugs:**
1) *S pneumo*: #1
2) *S aureus*: Less severe
3) *H flu*
   --Kids with **otitis media**
   --Adults with **chronic lung dz**

**Cultures/stains needed?**
--No, unless:
   1) debilitated
   2) immunocompromised
   3) unresponsive to treatment

**Treatment:**
--**Polytrim** (has good *H flu* coverage)
--Consider PO abx if *H flu* in kids
  (to prevent **otitis/pharyngitis**)

**Hyperacute**

**Bugs:**
1) *N gonorrhea*
2) *N menigitidis* (much less common)

**Cultures/stains needed?**
--Yes

**Treatment:**
--If no corneal involvement:
  Outpatient w/ 1g Rocephin IM x 1
--If with corneal involvement:
  Inpatient, 1g Rocephin IV q12h x 3d

*When ulcerative keratitis develops in gonococcal conjunctivitis, where is the ulcer likely to be located?*
Acute/Hyperacute Conjunctivitis

Conjunctivitis

Acute

Bugs:
1) *S. pneumoniae*: #1
2) *S. aureus*: Less severe
3) *H. influenzae*
   --Kids with *otitis media*
   --Adults with *chronic lung* dz

Cultures/stains needed?
--No, unless:
   1) debilitated
   2) immunocompromised
   3) unresponsive to treatment

Treatment:
--Polytrim (has good *H. influenzae* coverage)
--Consider PO abx if *H. influenzae* in kids
  (to prevent *otitis/pharyngitis*)

Hyperacute

Bugs:
1) *N. gonorrhoeae*
2) *N. meningitidis* (much less common)

Cultures/stains needed?
--Yes

Treatment:
--If no corneal involvement:
  Outpatient w/ 1g Rocephin IM x 1
--If with corneal involvement:
  Inpatient, 1g Rocephin IV q12h x 3d

When ulcerative keratitis develops in gonococcal conjunctivitis, where is the ulcer likely to be located?
In the corneal periphery, ie, they develop PUK
Acute/Hyperacute Conjunctivitis

Conjunctivitis

Acute

Hyperacute

Bugs:

1) N gonorrhea
2) N meningitidis (much less common)

Cultures/stains needed?
--Yes

Treatment:
--If no corneal involvement:
   Outpatient w/ 1g Rocephin IM x 1
--If with corneal involvement:
   Inpatient, 1g Rocephin IV q12h x 3d

But gonococcus is a venereal disease. How does it get in the eye?

--Polytrim (has good H flu coverage)
--Consider PO abx if H flu in kids
(to prevent otitis/pharyngitis)
**Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

- **Acute**
  - Bugs:
    1. *S. pneumo*
    2. *S. aureus*: Less severe
    3. *H. flu*
      - Kids with otitis media
      - Adults with chronic lung disease

  Treatment:
  - Polytrim (has good *H. flu* coverage)
  - Consider PO abx if *H. flu* in kids
    (to prevent otitis/pharyngitis)

- **Hyperacute**

  **Bugs:**
  1. *N. gonorrhoea*
  2. *N. meningitidis* (much less common)

  **Cultures/stains needed?**
  -- Yes

  **Treatment:**
  -- If no corneal involvement:
    **Outpatient w/ 1g Rocephin IM x 1**
  -- If with corneal involvement:
    **Inpatient, 1g Rocephin IV q12h x 3d**

---

*But gonococcus is a venereal disease. How does it get in the eye? Seriously?*
Conjunctivitis

Acute

H. flu -- Kids with otitis media
-- Adults with chronic lung disease

Hyperacute

Bugs:
1) *N. gonorrhea*
2) *N. menigitidis* (much less common)

Cultures/stains needed?
-- Yes

Treatment:
-- If no corneal involvement:
  
  Outpatient w/ 1g Rocephin IM x 1

-- If with corneal involvement:
  
  Inpatient, 1g Rocephin IV q12h x 3d

**But gonococcus is a venereal disease. How does it get in the eye?**

Seriously?

OK then, if we’re talking STDs here, should we be concerned about other ‘love bugs’?

-- *Polytrim* (has good *H. flu* coverage)
-- Consider PO abx if *H. flu* in kids
  (to prevent *otitis/pharyngitis*)
Conjunctivitis

Acute

But gonococcus is a venereal disease. How does it get in the eye? Seriously?

OK then, if we’re talking STDs here, should we be concerned about other ‘love bugs’?
Yes—about 1/3 of pts with GC conjunctivitis will have a concurrent Chlamydial infection.

Hyperacute

**Bugs:**
1) *N gonorrhoea*
2) *N meningitidis* (much less common)

**Cultures/stains needed?**
--Yes

**Treatment:**
--If no corneal involvement:
   Outpatient w/ 1g Rocephin IM x 1
--If with corneal involvement:
   Inpatient, 1g Rocephin IV q12h x 3d

**Polytrim** (has good *H influenzae* coverage)
--Consider PO abx if *H influenzae* in kids (to prevent otitis/pharyngitis)
**Conjunctivitis**

**Bugs:**
1) *S. pneumo*
2) *S. aureus* (less severe)
3) *H. flu*
   - Kids with otitis media
   - Adults with chronic lung dz

**Treatment:**
- Polytrim (has good *H. flu* coverage)
- Consider PO abx if *H. flu* in kids (to prevent otitis/pharyngitis)

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**Acute/Hyperacute Conjunctivitis**

**Bugs:**
1) *N. gonorrhea*
2) *N. meningitidis* (much less common)

**Cultures/stains needed?**
--Yes

**Treatment:**
- If no corneal involvement:
  - Outpatient w/ 1g Rocephin IM x 1
- If with corneal involvement:
  - Inpatient, 1g Rocephin IV q12h x 3d

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*But gonococcus is a venereal disease. How does it get in the eye? Seriously?*

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*Yes—about 1/3 of pts with GC conjunctivitis will have a concurrent Chlamydial infection.*

*In addition to Rocephin for the GC, they should receive an empirical dose of PO zithromycin.*
**Conjunctivitis**

**Acute**

**Bugs:**
1) *S. pneumo*
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**Hyperacute**

**Bugs:**
1) *N. gonorrhea*
2) *N. menigitidis* (much less common)

**Cultures/stains needed?**
-- Yes

**Treatment:**
-- If no corneal involvement:
   Outpatient w/ 1g Rocephin IM x 1
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**Acute/Hyperacute Conjunctivitis**

*But gonococcus is a venereal disease. How does it get in the eye?*

*Seriously?*

*OK then, if we're talking STDs here, should we be concerned about other 'love bugs'?*

*Yes—about 1/3 of pts with GC conjunctivitis will have a concurrent Chlamydial infection.*

*What implication does this have for managing GC conjunctivitis?*

*--Polytrim (has good H flu coverage)*
--Consider PO abx if H flu in kids
Conjunctivitis

Acute

Bugs:
1) S pneumo
2) S aureus: Less severe
3) H flu --Kids with otitis media --Adults with chronic lung dz

Treatment:
-- Polytrim (has good H flu coverage)
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Hyperacute

Bugs:
1) N gonorrhea
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Cultures/stains needed?
-- Yes

Treatment:
-- If no corneal involvement:
  Outpatient w/ 1g Rocephin IM x 1
-- If with corneal involvement:
  Inpatient, 1g Rocephin IV q12o x 3d (plus PO ‘just in case’)

Acute/Hyperacute Conjunctivitis

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OK then, if we’re talking STDs here, should we be concerned about other ‘love bugs’?
Yes—about 1/3 of pts with GC conjunctivitis will have a concurrent Chlamydial infection.

What implication does this have for managing GC conjunctivitis?
In addition to Rocephin for the GC, they should receive an empirical dose of PO azithromycin (plus PO ‘just in case’).
**Conjunctivitis**

**Acute/Hyperacute Conjunctivitis**

**Bugs:**
1) *S pneumo*
2) *S aureus*: Less severe
3) *H flu*: --Kids with otitis media --Adults with chronic lung dz

**Treatment:**
-- Polytrim (has good *H flu* coverage)
-- Consider PO abx if *H flu* in kids (to prevent otitis/pharyngitis)

---

**Acute/Hyperacute Conjunctivitis**

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**Acute/Hyperacute Conjunctivitis**

**Conjunctivitis**

**Acute**

**Hyperacute**

**Bugs:**

1) *S pneumo*
2) *S aureus*: Less severe
3) *H flu* --Kids with otitis media --Adults with chronic lung dz

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-- If with corneal involvement:
   **Inpatient, 1g Rocephin IV q12o x 3d**
   (plus azithromycin PO ‘just in case’)

**In addition to antibiotics, what therapeutic maneuver should be performed?**

Copious irrigation with normal saline to remove inflammatory debris, cells, and proteases from the ocular surface.
Conjunctivitis

**Acute/Hyperacute Conjunctivitis**

**Bugs:**
1) *S. pneumoniae*
2) *S. aureus*: Less severe
3) *H. influenzae*: --Kids with otitis media --Adults with chronic lung dz

**Treatment:**
--Polytrim (has good *H. influenzae* coverage)
--Consider PO abx if *H. influenzae* in kids (to prevent otitis/pharyngitis)

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**Acute**

**Hyperacute**

**Bugs:**
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--If no corneal involvement:
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