EENT/Ophthalmologic Emergencies

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EENT/OPHTHALMOLOGIC EMERGENCIES

EENT Emergencies

I. THE EAR

A. Auricle

1. Auricular hematoma
   a. Blunt trauma (classically in wrestlers and boxers).
   b. Collection of blood between the perichondrium and the cartilage.
   c. Untreated—may result in cartilage necrosis ("cauliflower" ear).
   d. Diagnosis is clinical: pain, tenderness, swelling.
   e. Treatment: drainage (I & D or needle aspiration), possible anti-staphylococcus oral antibiotics, and a compressive dressing. Should be re-assessed in 24 hrs (re-accumulation).

2. Perichondritis and chondritis
   a. Infection of the auricular soft tissues.
   b. Causes include uncontrolled otitis externa, auricular hematoma, and auricular abrasions or lacerations.
   c. Treatment is admission for IV antibiotics broad coverage.
   d. Pseudomonas Aeruginosa—often causative agent.

3. Relapsing polychondritis
   a. Disease of unknown etiology which may mimic perichondritis.
   b. Characterized by inflammation and destruction of cartilaginous tissues throughout the body.
   c. Ears and nose are affected in 80-90% of patients, resulting in floppy ears and a collapsed nose.
   d. Labs—elevated erythrocyte sedimentation rate (ESR).
   e. Diagnosis—auricle is inflamed but the lobe (i.e., no cartilage) is spared. Confirmed by biopsy.
   f. Treatment: steroids.

B. External auditory canal

1. Otitis externa
   a. Infection of the auditory canal usually preceded by excessive moisture, abrasions, or lacerations.
   b. Presentation is pain and otorrhea.
   c. The auditory canal is inflamed, swollen with tenderness in auricular motion or tragal pressure.
   d. Pseudomonas aeruginosa is common pathogen and less commonly staph. aureus.
   e. Treatment is antibiotic/steroid combination ear drops.
(Cortisporin otic suspension) or an acetic acid solution (Vosol).

f. If the canal is too swollen to allow penetration of antibiotics, insert a compressed cellulose wick (i.e., “Pope” ear wick).
g. If cellulitis or periauricular adenopathy is present, the patient should be started on an oral antibiotic.

2. Malignant otitis externa
   a. Immunocompromised patients (i.e., elderly, diabetic, chemotherapy, high dose oral steroids) are at risk.
   b. Most commonly *Pseudomonas aeruginosa*.
   c. Classical finding is granulation tissue on the floor of the auditory canal at the bony-cartilage junction.
   d. Facial nerve paralysis ensues as the disease reaches the stylomastoid foramen. The disease can progress to multiple cranial nerve involvement and meningitis.
   e. Treatment may include immediate referral to an otolaryngologist for surgical debridement and IV antibiotics.

3. Herpes zoster (Ramsay-Hunt Syndrome)
   a. Infection of the geniculate ganglion resulting in painful vesicular rash of the external auditory canal, auricle, and surrounding area.
   b. Usually an associated sensorineural hearing loss and facial nerve paralysis.
   c. Treatment is admission for IV antivirals.

4. Foreign body
   a. Most common source of unilateral hearing loss is Cerumen Impaction.
   b. Tools for removal include irrigation (e.g., partially obstructing FB), alligator forceps, suction, hook, or cerumen loop.
   c. Do not irrigate vegetable matter because it may expand.
   d. Live insects should be stupefied by either lidocaine or mineral oil prior to removal.
   e. Removal can be complicated by traumatic tympanic membrane perforation and ossicular disruption; therefore, proximal foreign bodies or those in uncooperative patients should be removed under anesthesia by an otolaryngologist.

C. Tympanic membrane

1. Perforation
   a. Caused by sharp instrumentation, blunt trauma, or change in pressure.
   b. Most injuries occur to the anterior inferior portion of the TM (pars tensa).
   c. Findings include bloody otorrhea and partial conductive hearing loss. Weber tuning fork test will lateralize to the side of injury.
d. Clean injury - no antibiotic is required and 95% will heal spontaneously.

e. Contaminated injuries require antibiotics (e.g., injury sustained while water skiing).

f. Ossicular disruption is much more likely if the perforation is in the posterior superior quadrant (pars flaccida). Associated with pronounced hearing loss and possibly vertigo. They do not require immediate repair.

g. Treatment is the same as above but otolaryngology referral is mandatory.

h. With profound hearing loss (i.e., sensorineural) and vertigo, a perilymph fistula should be suspected. This results from displacement of the stapes from the oval window. This condition requires immediate otolaryngology referral and hospital admission.

2. Bullous myringitis
   a. Characterized by clear or hemorrhagic blebs on the TM.
   b. Present with otalgia and usually have an associated URI.
   c. Etiologies are viral (most common) and mycoplasma.
   d. Treatment consists of systemic analgesics, macrolides.

D. Middle ear

1. Acute suppurative otitis media
   a. Most common between 6-36 months of age.
   b. Most common organisms in the pediatric age group are Streptococcus pneumoniae (29%), Haemophilus influenzae-nontypeable (23%), and Branhamella catarrhalis (13%).
   c. Treatment – antibiotics (amoxicillin).
   d. Most common complication is TM perforation, which usually heals spontaneously.
   e. Most serious complication is mastoiditis. Symptoms include purulent otorrhea with TM perforation, sagging of the posterior-superior external auditory canal, tenderness over the mastoid prominence, and post-auricular fluctuance. Radiography of the mastoid will reveal loss of normal air cells and a “ground glass” appearance. Treatment is admission for IV antibiotics and possible mastoidectomy. Complications include extension to the inner ear, meningitis, intracranial abscess, and lateral sinus thrombophlebitis.

2. Otitis media with effusion
   a. Presents with a dull, often retracted, poorly mobile tympanic membrane. Bubbles or an air-fluid level may be visualized.
   b. Pneumatic otoscopy confirms decreased TM mobility.
   c. In children, it is usually associated with a URI, but allergy, immunologic disorder, and submucosal cleft palate can also be etiologies.
   d. Antihistamines and decongestants have been demonstrated to
be ineffective.
e. Although as many as 80% will spontaneously resolve within 2 months, most clinicians will treat with oral antibiotics. This is supported by a 48-66% positive culture rate of middle ear aspirates.
f. In adults, antihistamines and decongestants may be useful, especially when associated with upper respiratory allergies.
g. Unilateral effusion may be the presenting sign of a nasopharyngeal tumor.

3. Barotrauma
a. Caused by rapid changes in atmospheric pressure such as in flying or scuba diving.
b. Complains of a plugged feeling, pain, and decreased hearing.
c. Treatment consists of analgesics, oral decongestants, and topical nasal spray decongestants.
d. Antibiotics are not helpful unless secondary infection is suspected.
e. Severe cases may require myringotomy for symptomatic relief.

E. Inner ear

1. Presents with painless hearing loss developing over minutes to hours.
   a. Tinnitus and/or vertigo may be present.
   b. The etiology for unilateral loss is viral neuritis, acoustic neuroma, and Ménière’s disease.
   c. The etiology of bilateral loss is ototoxic drugs (aminoglycosides, erythromycin, vancomycin, antimalarials, ASA, NSAIDs, furosemide, ethacrynic acid, cisplatin) and loud noise.
   d. Refer to an otolaryngologist.

2. Perilymph fistula
a. Sudden onset hearing loss with tinnitus and severe vertigo is indicative of a perilymph fistula.
   b. The oval or round window is disrupted. This often occurs while straining (i.e., heavy lifting, coughing, barotrauma valsalva).
   c. Pressure applied with a pneumatic otoscope will induce vertigo, nystagmus, and sensorineural hearing loss. Straining (coughing, sneezing, and lifting) exacerbates symptoms.
   d. Treatment is usually conservative but surgical intervention may be necessary.

3. Acoustic neuroma
a. A rare cause of sensorineural hearing loss, the cerebellopontine angle tumor (i.e., acoustic neuroma).
   b. Symptoms include tinnitus followed by a gradual unilateral hearing loss over many months to years.
c. Late symptoms include a constant, mild vertigo and finally, facial paralysis as the eighth and seventh cranial nerves, respectively, are compressed in the internal auditory canal.

d. It should be suspected in an elderly patient with unilateral sensorineural hearing loss.

4. Weber and Rinne Tests
   a. Weber Test
      i. 512 Hz tuning fork on the patient's forehead. With a unilateral conductive hearing loss, the tone is perceived as louder in the ear with the hearing loss.
      ii. In a unilateral sensorineural hearing loss, the patient hears the tone louder in the better ear.
   b. Rinne Test
      i. 256 Hz tuning fork placed on the patient’s mastoid and then near their ear. The purpose is to compare loudness between the fork placed on the skin over the mastoid cortex (i.e., bone conduction) and the same fork held in the air near the patient's ear canal (i.e., air conduction). Normal is for air conduction to be louder than bone conduction.
      ii. Air conduction (AC) is louder than bone conduction (BC). This is because the tympanic membrane and ossicles amplify sound to the inner ear.
      iii. With a conductive hearing loss (i.e., disruption of the TM or ossicles), it will be heard louder over the mastoid cortex.
      iv. Sensorineural hearing loss - the Weber test lateralizes to the better ear. The Rinne test will be louder in the air than on the mastoid cortex.

EXAMPLES:

<table>
<thead>
<tr>
<th>RIGHT SIDED UNILATERAL CONDUCTIVE HEARING LOSS</th>
<th>RIGHT SIDE UNILATERAL SENSORINEURAL HEARING LOSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weber lateralizes to right</td>
<td>Weber lateralizes to left</td>
</tr>
<tr>
<td>Rinne BC &gt; AC</td>
<td>Rinne AC &gt; BC</td>
</tr>
</tbody>
</table>

II. NOSE AND PARANASAL SINUSES

A. Epistaxis

1. Anterior most common due to erosion of superficial blood vessels near the anterior end of the nasal septum (i.e., Little's Area or Kiesselbach's Plexus).
2. Etiologies are as follows:
3. Local
   a. Excessive dryness (mostly seen in winter months when there
is low humidity).
   b. Digital trauma (i.e., nose picking) or nose blowing.
   c. Upper respiratory infection.
   d. Nasal trauma.
   e. Nasal tumors.
   f. Nasal foreign bodies.
4. **Systemic**
   a. Hypertension.
   b. Arteriosclerosis.
   c. Blood dyscrasia.
   d. Coagulation disorder.
   e. Drugs (i.e., aspirin, Coumadin).
   f. Hereditary hemorrhagic telangiectasia (Osler-Weber-Rendu Syndrome). Autosomal dominant trait characterized by multiple mucosal (i.e., nose, oral cavity, stomach, colon, lungs) and cutaneous telangiectasias.
5. If significant bleeding or a clotting disorder is suspected, then laboratory studies (i.e., CBC, PT< PTT) are indicated.
6. Management of anterior nasal bleeds:
   a. Patient in upright position and pinch nose for 10-15 minutes.
   b. If continued bleeding, inspect nose and cauterize bleeding site with silver nitrate or electrocautery.
   c. If bleeding continues, pack the nose with Vaseline strip gauze or a commercially available device.
7. Complications of anterior nasal packings include sinusitis, toxic shock syndrome. Applying antibiotic ointment may prevent the latter. Any patient with a packing for greater than 24 hours should be put on oral antibiotics.
8. Posterior nasal bleeds are usually seen in the elderly, diagnosed by failure of anterior nasal packs to control the hemorrhage. Management is as follows:
   a. Posterior nasal packing/intranasal balloon device or a Foley catheter
   b. Admitted for humidified oxygen, analgesics, and antibiotics. Posterior packing may lead to hypoxemia.
   c. For uncontrollable hemorrhage, patients may require arterial ligation or arteriography with embolization.

B. **NASAL FOREIGN BODIES**

1. Most common in children and the mentally ill.
2. Patients present with a malodorous, purulent, unilateral rhinorrhea.
3. Diagnosis is by inspection.
4. Treatment is removal with a nasal speculum, suction, forceps, and/or ear curette or right-angled hook.
C. SINUSITIS

1. Acute sinusitis (less than 3 weeks duration) most commonly caused by Haemophilus influenzae, Streptococcus pneumoniae, Group A Streptococcus, Staph. aureus, and Moraxella catarrhalis.
2. Chronic sinusitis (greater than 3 weeks) is more likely caused by anaerobic bacteria, fungi, and mixed flora.
3. Complications of acute sinusitis result from extension of infection into contiguous structures—bone, CNS, eye, or vascular system.
4. Acute maxillary sinusitis - facial pain below the eyes, fever, purulent nasal discharge, and upper dental pain. Pain is often accentuated by leaning forward.
5. Acute ethmoid sinusitis is a disease of children, has a propensity to spread into the orbit or CNS. Complications include periorbital cellulitis, orbital abscess, meningitis, and cavernous sinus thrombosis.
6. Cavernous sinus thrombosis: high fevers and appear toxic. There is eyelid edema, proptosis, and chemosis third and sixth nerve palsies, pupillary dysfunction, and papillary edema occur. CNS symptoms include lethargy, coma, or seizures. Diagnosis may be confirmed by CT scan or MRI.
7. Acute frontal sinusitis presents with frontal headache, fever, purulent rhinorrhea. The frontal sinus begins to develop at ages 6-8 and may never develop in a small proportion of the population. Therefore, frontal sinusitis is not seen in young children. The infection may cause an osteitis of the anterior sinus wall (Pott's puffy tumor).
8. Acute sphenoid sinusitis is an uncommon disease. Pain is poorly localized to the vertex, occiput, or mastoid area of the skull.
9. CT of sinuses most sensitive for diagnosing sinus disease.
10. Treatment of acute sinusitis is topical nasal decongestants for 2-3 days, analgesics and oral decongestants. Antibiotics are indicated for severe or persistent symptoms > 1 week.
11. Immunocompromised patients are prone to a highly invasive rhinocerebral fungal sinusitis caused by the Phycomycetes class of fungi (e.g., Mucormycosis).
   a. Exam reveals nasopharyngeal necrosis, dark nasal discharge, ocular findings, and cranial nerve palsies.
   b. X-rays may show bony destruction.

III. SALIVARY GLANDS, OROPHARYNX, AND HYPOPHARYNX

A. Sialadenitis and sialolithiasis

1. Sialadenitis refers to an infection of the salivary glands. It is most commonly seen in debilitated patients (i.e., elderly,
dehydrated, diabetic).

2. Presents as a painful swelling of either the submandibular gland (most common), parotid.

3. Purulent discharge can often be seen from Stenson's or Wharton's duct.

4. *Staph. aureus* is the most common pathogen.

5. Treatment is hydration and anti-staphylococcus oral antibiotics.

6. *Mumps* (paramyxovirus-most common viral pathogen) is usually seen in children ages 5-15 but may be seen at any age.
   a. Typically a prodrome of low grade fever, anorexia, malaise, and headache, followed by bilateral diffuse, tender parotid swelling.
   b. The disease is usually mild, self-limited and treatment is symptomatic.
   c. Orchitis is a common complication in postpubertal men and occurs with a 25% incidence.
   d. Unilateral hearing loss may occur at all ages with a 4% incidence. It is usually temporary.
   e. Encephalitis is a rare complication.

7. Sialolithiasis. - obstruction of a salivary duct by a stone.
   a. 90% are located in Wharton’s duct, and 10% in Stenson’s.
   b. X-ray may be diagnostic since the majority of stones are radiopaque.
   c. Most pass spontaneously and treatment is sialogogues (i.e., lemon drops) to induce salivation.
   d. Antibiotics are reserved for secondary infection.

B. Pharyngitis

1. Group A streptococci (i.e., Streptococcus pyogenes) accounts for 20-30% of all cases of acute pharyngitis.
   a. Treat because of risk of acute rheumatic fever.
   b. Rapid strep detection tests have a false negative rate of up to 20%.
   c. Antibiotic treatment is advocated for the following reasons:
      i. Shortens the course of illness.
      ii. Prevents suppurative complications (i.e., peritonsillar abscess and cellulitis, retropharyngeal abscess).
      iii. Prevents acute rheumatic fever (antibiotic treatment within 9 days of symptomatic pharyngitis has been proven effective).
      iv. *Acute glomerulonephritis* is not prevented by treatment with antibiotics.

2. Mononucleosis usually presents with exudative pharyngitis and fever.
   a. Splenomegaly occurs in approximately 50% of patients and predisposes to splenic rupture.
   b. Severe tonsillar swelling and exudate may rarely cause upper
airway obstruction.
c. Diagnosis is confirmed by a positive monospot test.
d. Avoidance of contact sports is recommended when splenomegaly is present.

3. Gonococcal pharyngitis occurs from orogenital contact.
a. It is usually asymptomatic but may present with tonsillar swelling, erythema, and exudate with cervical lymphadenopathy.
b. Treatment - antibiotics

d. Diphtheria caused by Corynebacterium diphtheriae.
a. An exudative pharyngitis with production of an exotoxin affecting the myocardium and peripheral nervous system.
b. Characteristically, there is a blue-white membrane in the pharynx composed of bacteria, fibrin, and necrotic debris.
c. Sudden airway obstruction may ensue from pharyngeal swelling and copious exudate.
d. Mortality is directly related to delay in treatment with an antitoxin.
e. Additional management includes antibiotics (i.e., penicillin or erythromycin), and admission for cardiac monitoring.

C. Deep tissue infections

1. Peritonsillar abscess is usually a complication of acute suppurative tonsillitis.
a. Present with severe sore throat, fever, odynophagia and drooling, "hot potato" voice, and variable degrees of trismus.
b. Treatment is IV antibiotics (i.e., penicillin) and drainage.

2. Ludwig's angina is a bilateral cellulitis of the floor of the mouth involving the sublingual and submandibular spaces.
a. True emergency because rapidly progressive pharyngeal swelling and displacement of the tongue leads to upper airway obstruction.
b. Most common in elderly, debilitated men.
c. Usually caused by dental infections (lower molars) and bacterial cultures grow mixed anaerobic and aerobic flora.
d. Diagnosis is made clinically by verifying brawny edema of the submandibular area in a febrile patient with a protruding elevated tongue and respiratory distress.
e. Treatment is IV antibiotics (clindamycin or cefoxitin or pen +metronidazole) and the airway must be secured to prevent pending obstruction.

3. Retropharyngeal abscess is most common in children under 3 years of age (6 months–3 years).
a. Present with fever, neck pain, muffled voice, dysphagia and snoring or stridorous breathing.
b. Patients prefer to lie supine and forced sitting can increase airway compromise.
c. Diagnosis is confirmed by soft tissue X-ray of the lateral
neck.
  d. CT scan may be helpful to assess the extent of involvement.
  e. Treatment is IV antibiotics, admission, and ENT referral for surgical drainage.

IV. SUPRAGLOTTIC LARYNX

A. Adult epiglottitis (pediatric epiglottitis is discussed elsewhere)

  1. In contrast to children, complete upper airway obstruction is infrequent probably because of a larger, more rigid airway. Peak incidences: age 20-40 years.
     a. Should be suspected in cases where symptoms of sore throat and dysphagia are out of proportion to findings on pharyngeal examination.
     b. Adults will often have prodrome of 1-2 day URI symptoms
     c. H. influenzae is the most common pathogen, but adults have a greater incidence of gram positive and Branhamella catarrhalis infections.
     d. Lateral soft tissue neck X-rays reveal classic finding of “thumbprint-like” epiglottis
     e. Airway equipment at bedside, ICU, immediate ENT consult, antibiotics.

B. Croup

  1. Inflammation of the larynx and subglottic airway.
  2. Parainfluenza virus most common. Also RSV, adenovirus
  3. Children ages 3 to 36 months. Rare after age six.
  4. Treatment-steroids, humidified oxygen (warm vs. cool), racemic epinephrine.
  5. A randomized trial of a single dose of oral dexamethasone for mild croup
  6. For children with “mild” croup, use of a single dose of dexamethasone (0.6mg/kg) results in significant benefits, including being less likely to return for croup problems within seven days.

V. DENTAL EMERGENCIES

A. Nontraumatic

  1. Dental caries
     a. Most common cause of odontogenic pain
     b. Tooth decay should be evident on examination.
     c. Treatment: analgesics (or nerve block), antibiotics and referral to a dentist.
2. Alveolar osteitis (dry socket)
   a. Severe pain associated with a foul order and taste in the mouth two to three days after an extraction.
   b. Cause is loss of the healing blood clot and localized osteomyelitis.
   c. Treatment - saline irrigation of the socket and application of a medicated dental packing or iodoform gauze slightly dampened with eugenol (oil of cloves).
   d. Dental referral.
3. Periodontal abscess
   a. Swelling of the gingiva secondary to entrapment of plaque and debris between the tooth and the gingiva.
   b. Treatment consists of warm saline irrigation and antibiotics (i.e., penicillin or tetracycline).
4. Acute necrotizing ulcerative gingivitis (ANUG or trench mouth, Vincent angina - extension to the pharynx and tonsils)
   a. An acute destructive disease in which bacteria invade non-necrotic tissue.
   b. Etiology is Fusobacterium and Spirochetes.
   c. Gingiva appears edematous and fiery red; interdental papillae are swollen and covered with a grayish pseudomembrane.
   d. Accompanied by systemic illness including fever, malaise and regional lymphadenopathy.
   e. Treatment is antibiotics, warm saline rinses, systemic analgesics, and application of topical local anesthetics such as viscous lidocaine.

B. Traumatic

1. Tooth fractures:
   a. Ellis Class I fractures - only involve the enamel portion of the tooth. This requires no treatment in the emergency department.
   b. Ellis Class II fractures - involve the enamel and the underlying dentin. There may be sensitivity to heat, cold or even air.
      i. Under the age of 12, place dressing of a calcium hydroxide paste on the exposed dentin which is then covered by dry gauze, aluminum foil or dental dry foil.
      ii. > 12 years of age patients are advised to avoid extremes in temperature and to seek dental care the following day.
   c. Ellis Class III fractures - involve the enamel, dentin and pulp. This is a true dental emergency and requires immediate attention from a general dentist or endodontist. If a dentist is not immediately available, cover the tooth with aluminum foil or seal with “cavet,” a temporary root canal sealer.
2. Tooth avulsion
   a. Avulsed primary teeth in the pediatric population (i.e., ages 6
months to 5 years) are not replaced into their sockets.
b. One percentage point for successful replantation is lost each
minute that tooth is absent from the oral cavity.
c. Do not handle any portion of the tooth other than the crown -
disrupts periodontal ligament need for reimplantation.
d. The tooth should be transported either in the patient’s mouth
or in a cold glass of milk.
e. Successful reimplantation is associated with survival of the
periodontal ligament fibers on the root.
f. Hank’s solution has been shown to maintain viability of the
periodontal ligaments for four to six hours or longer. If a
tooth has been avulsed for longer than 30 minutes, there is
evidence that soaking in Hank’s solution for 20 to 30 minutes
prior to replantation may improve survival.
g. The avulsed tooth should be replaced in the socket in the
emergency department and seen by dentist within 24 hours
for stabilization.

3. Temporomandibular Joint Dislocation
   a. Occur secondary to yawning, laughter, or trauma.
   b. If unilateral, the jaw deviates to the opposite side.
   c. To reduce, operator must overcome masseter contraction.
   d. Post reduction, avoid extreme opening of mandible, laughing
      or yawning. Soft diet for 1 week, warm backs, NSAID.
   e. Patients with chronic dislocations maybe helped with a
      Barton bandage.

VI. VERTIGO

A. Vertigo is characterized by an illusion of motion where no motion
exists (i.e., spinning sensation, imbalance or sensation of being
pulled to one side or the other). Once it has been determined that the
“dizzy” patient has vertigo, the history and physical should focus on
differentiating central from peripheral etiologies.

Differentiating factors are as follows (see chart on next page):
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<thead>
<tr>
<th></th>
<th>CENTRAL</th>
<th>PERIPHERAL</th>
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<tbody>
<tr>
<td>Vertigo</td>
<td>Mild/constant</td>
<td>Severe/intermittent</td>
</tr>
<tr>
<td>Nausea &amp; vomitting</td>
<td>Intermittent</td>
<td>Frequent</td>
</tr>
<tr>
<td>Hearing loss &amp; tinnitus</td>
<td>Absent</td>
<td>May be present</td>
</tr>
<tr>
<td>Nystagmus</td>
<td>Multidirectional, nonfatigable, not positional, not inhibited by ocular fixation, may be vertical</td>
<td>Unidirectional, fatigable, horizontal or rotary vertical, positional, inhibited by ocular fixation, never vertical</td>
</tr>
<tr>
<td>Neurological symptoms</td>
<td>May be associated with ataxia, diplopia, cranial nerve findings, hemiparesis</td>
<td>None</td>
</tr>
<tr>
<td>Onset</td>
<td>Slow</td>
<td>Sudden</td>
</tr>
<tr>
<td>Etiologies</td>
<td>Brainstem infarct or tumor</td>
<td>Vestibular neuritis</td>
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<tr>
<td></td>
<td>Cerebellar infarct or bleed</td>
<td>Labyrinthitis</td>
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<td></td>
<td></td>
<td>Perilymph fistula</td>
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<td>Ménière’s disease</td>
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<td></td>
<td>Posttraumatic vertigo</td>
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<td></td>
<td></td>
<td>Acoustic neuroma</td>
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</table>

B. If the history and physical do not clearly differentiate a peripheral etiology: CT scan.

C. Several features to remember are as follows:

1. Ménière’s disease or endolymphatic hydrops is characterized by recurrent attacks of vertigo with a progressive, fluctuating hearing loss. Tinnitus is usually present during attacks. ED treatment consists of medications shown to inhibit vertigo (i.e., meclizine, Valium, droperidol).
2. Acute labyrinthitis is presumed viral but the etiology is often unknown. The illness is self limited.
3. A perilymph fistula presents with severe vertigo and sensorineural hearing loss. Straining (i.e., coughing, sneezing, and lifting) exacerbates symptoms. Diagnosis can be presumed if symptoms worsen with pneumatic otoscopy.
4. Posttraumatic vertigo is common following closed head trauma. It is due to concussion of the labyrinth.
5. Benign positional vertigo is a self limited disease (i.e., few weeks) seen most commonly in the elderly. Patients have brief, repeated attacks of vertigo associated with movement or changes in head position. There is no hearing loss or tinnitus. Treatment
is symptomatic and an exercise program designed to repetitively induce symptoms may be helpful.

6. Central-Wallenberg Syndrome - infarct of brain stem (lateral Medullary). Symptoms include numbness, Horner’s, contralateral loss of pain, temp.

7. Other central-vertebral basilar insufficiency - multiple sclerosis

Ophthalmologic Emergencies

I. PHYSICAL EXAM

A. Visual acuity - best corrected response

1. Pinhole can approximate prescriptive eyewear (object is centered over visual axis through mid lens and to fovea) – squinting.
2. Snellen at 20 feet/Rosenbaum at 14 inches.
3. If necessary, document counting fingers (CF), hand motion (HM), or light perception (LP).

B. Pupils recall Marcus-Gunn pupil (afferent pupil defect) and Adies pupil (syphilis pupil - one that "accommodates but does not react").

II. EYELID DISEASE

A. Blepharitis

1. Inflammation of eyelids may be chronic.
   a. Scaly, erythematous, greasy lid margins.
   b. *S. aureus* most common agent.
   c. Symptoms - pruritus, redness, irritation, AM crustiness.

2. Treatment
   a. Warm soaks/lid scrubs frequently (baby shampoo ideal).
   b. May consider sulfacetamide drops or antibiotic ointment to eyelid margins (erythromycin or bacitracin).

B. Hordeolum (sty)

1. Acute inflammation of lid margin. *S. aureus* most common.
   a. Internal
      i. Infection meibomian gland.
   b. External
      i. Eyelash follicle or lid margin tear gland.

2. Symptoms - redness, focal swelling with a tender nodule or pustule on the eyelid usually close to the margin, pain.

3. Treatment
   a. Warm compresses.
   b. Soaps.
c. Topical sulfa/erythromycin 7 days.
d. May need incision and drainage if no improvement.

C. Chalazion

1. Chronic granulomatous inflammation of Zeis or Meibomian tear gland.
2. Inflamed, nontender, lesion.
3. Commonly seen in patients with:
   a. Blepharitis
   b. Rosacea
4. Treatment
   a. Warm compresses and massage
   b. Incision and Curettage/ steroid injection by ophthalmologist
   c. If recurrent
      i. Sebaceous cell, basal cell or meibomian gland carcinoma.

D. Dacryocystitis - acute infection of lacrimal sac, in infants and adults > 40 years of age

1. Painful, red, swollen below medial canthus.
2. Most commonly Staph. aureus then staph. epidermidis, strep, H. flu.
3. Referral to ophthalmology, warm soaks, and systemic broad spectrum antibiotics (Augmentin), topical antibiotics.

E. Preseptal cellulitis

1. Lid erythema, warmth, tenderness
2. Absence of proptosis, restricted eye movement, pain with eye movement - if any of these think orbital cellulitis.

III. THE RED EYE

A. Painless

1. Conjunctivitis - most common cause of red eye.
   a. Definition - conjunctival inflammation which typically spares the cornea.
   b. Symptoms - itching, burning, tearing, F.B. sensation, gritty.
   c. Signs - redness, exudate, chemosis, follicular hyperplasia (cobblestoning), normal cornea, normal visual acuity.
   d. Viral - most common of all conjunctivitis
      i. Initially unilateral (bilateral within 24-48 hours).
      ii. Copious clear secretions.
      iii. Contagious, viral prodrome, preauricular lymphadenopathy.
      iv. Agents – adenovirus is most common, Coxsackie,
Enterovirus.
- Epidemic keratoconjunctivitis (EKC) differs in that this may present with photophobia and corneal involvement.

v. Treatment - cool compresses, antihistamine for pruritus.

e. Bacterial
  i. Similar to viral, discharge can be purulent, AM crust.
  ii. Different from Blepharitis in discharge continuous through the day.
  iii. Agents - Staph, Strep, H. flu, pneumococcus, Moraxella, or mixed.
  iv. Treatment
     - Broad spectrum antibiotics drops every 2 hours; ointment every 6 hours.
     - Local hygiene.
     - No steroids, no patching.

v. Neisseria Gonorrhea - real potential for vision loss
- Can ulcerate or perforate cornea; true ocular emergency.
- Adults - parenteral ceftriaxone and topical antibiotics. Treat for concomitant Chlamydia infection; ocular irrigation; consult ophthalmology; admit all but mildest cases. Concurrent urethritis common.

vi. Neonatal (ophthalmia neonatorum) conjunctivitis within first month of life. N. Gonorrhea first 2-4 days (ceftriaxone) Chlamydia 5-13 days-topical erythromycin.

vii. Chlamydial - not as serious as N. gon
- Erythromycin P.O. and topical for 14 days.
- Maybe cause for refractory conjunctivitis, leading cause of preventable blindness worldwide.
- Must treat sexual contact(s).

viii. Allergic - chief complaint is itching
- Clear watery discharge with cobblestoning; bilateral.
- Typically seasonal, environmental.
- May see chemosis.

ix. Treatment
- Cold compresses.
- Topical decongestant (naphazoline) and/or antihistamine (pheniramine) - Naphcon A.

B. Painful

1. Iritis - (AKA uveitis, iridocyclitis)
   a. Definition - internal inflammation without infection
   b. Etiology - allergic, infectious, post-traumatic, foreign body, most commonly idiopathic.
   c. Symptoms - dull ocular pain, may or may not have blurred vision, reddened eye, photophobia.
d. Signs - pupil constricted (secondary to spasm), injected bulbar conjunctiva, perlimbal/ciliary flush, anterior amber with flare and cell (F/C).

e. Clues – will have consensual photophobia, pain not relieved with topical anesthetic.

f. Differentiate from acute glaucoma in that iritis has "normal" cornea, constricted to mid-range pupil, and normal intraocular pressure.

g. Treatment – cycloplegics such as homatropine, may use steroids after consulting ophthalmology, referral.

2. Acute narrow angle glaucoma (ANAG)

a. Leading cause of blindness in the U.S.

b. Definition - acute flow obstruction at canal of Schlemm in patients with congenital defect of angle or predisposed with shallow anterior chamber.

c. Symptoms - severe unilateral ocular pain, red eye, blurry vision, photophobia, halos around lights, headache, nausea/emesis, cephalgia, abdominal pain (systemic symptoms often "cloud" syndrome).

d. Signs - corneal edema, ciliary flush, increased IOP (>40mmHg), rock hard globe, mid-range pupil, sluggish or nonreactive pupil, injected bulbar conjunctiva, decreased visual acuity.

e. Treatment – EMERGENT consultation during treatment

i. Constrict pupil (remove iris from meshwork) pilocarpine 2% 1 drop every 15 minutes for 2 hours

ii. Decreased aqueous humor production

• Beta blockers – Timolol 0.5% 1 drop and repeat in 10 minutes (beware of cardiac and pulmonary contraindications).

• Acetazolamide (CAI - carbonic anhydrase inhibitor) - Diamox - 500mg IVPB.

• Adrenergic-imodipine 0.1% drop.

iii. Hyperosmotics

• Glycerol 50% 1-1.5 mg/kg P.O. (dilute with juice and remember diabetics), or

• Mannitol 20% 1-2gm/kg IV over 30 minutes (beware of osmolarity).

iv. Antiemetics

v. Consult ophthalmology for surgery - peripheral iridectomy, laser iridotomy.

C. Corneal disorders

1. Foreign body (F.B.)

a. Symptoms - history usually guides; burning, redness, tearing, irritation.

b. Signs - may visualize in upper/lower lids, embedded within
cornea, or positive fluorescein staining; if none of the above, visualize all eyelashes.


d. Rust ring – iron containing FB, can cause chronic irritation, visual acuity disturbance, corneal staining, remove after 24 hours.

e. Refer deeply embedded F.B., old F.B., and that large F.B.s over the visual axis.

f. Antibiotics, analgesics, tetanus immunization and referral.

2. Corneal abrasion
   a. Symptoms similar to foreign body.
   b. Normal exam unless abrasion over visual axis, positive fluorescein.
   c. Antibiotic, cycloplegics, topical anti-inflammatories, analgesics, tetanus immunization, potential referral (“dirty” abrasions from human or animal causes may require more aggressive therapy and referral).
   d. Avoid eye patching.

3. Contact lens syndrome.
   a. Very common.
   b. Painful, red eye; may have iritis.
   c. Usually not infected.
   d. Injected conjunctiva with fluorescein positive keratopathy
   e. Stop lens usage, antibiotics and may need cycloplegic; referral.
   f. Ulcers almost invariably pseudomonas a. and require Ophthalmologic consultation and frequent antibiotics (ciprofloxacin a good choice).

4. UV keratitis (welders, sunbathers, skiers, tanning booths, high altitude)
   a. Typically bilateral, painful, red eyes; usually presents 6-8 hours after incident.
   b. Injected conjunctiva; decreased visual acuity, diffuse, punctate keratopathy with fluorescein; possible iritis.
   c. Antibiotics, analgesics, topical cycloplegic agent referral if iritis.
   d. Topical anesthetics unjustifiable - falsely protects and known cellular toxin.
   e. Oral pain management may be needed.

5. Viral corneal infection
   a. Herpes simplex infection
      i. May be primary outbreak or reactivation.
      ii. Symptoms - foreign body sensation, tearing, photophobia, pain.
      iii. Signs-may have typical vesicles on lids, conjunctiva; cornea may have dendritic or ulcerative process with fluorescein uptake; decreased visual acuity if over visual axis.
iv. Treatment – referral to ophthalmologist, topical antiviral agents such as trifluridine or vidarabine, cycloplegics.

6. Herpes zoster ophthalmia - varicella virus
   a. Symptoms - paraesthesia, burning, pain, rash; most common form of recurrent zoster.
   b. Signs - vesicular eruptions along CN V₁, unilateral involvement, keratitis, scleritis, conjunctivitis, dendritic defect, lesions to the tip of the nose (Hutchinson’s sign) signal nasociliary nerve involvement and high likelihood of ocular lesions.
   c. Treatment
      i. Oral acyclovir or famciclovir.
      ii. Topical steroids may decrease neuralgia but consult ophthalmologist.
      iii. Referral.

7. Pterygium
   a. Fibrovascular tissue, usually wedged shaped.
   b. Extends onto cornea.
   c. Treatment - artificial tears, non-emergent referral.

D. Pupillary syndromes

1. Horner’s Syndrome
   a. Ptosis
   b. Miosis
   c. Anhydrosis
   d. Opiates, brain stem stroke

2. Argyll Robertson
   a. Small irregular pupil
   b. Neurosyphilis
   c. Accommodates but doesn’t react

3. Marcus Gunn
   a. Afferent pupillary defect
      i. Inadequate response to light in affected eye
   b. MS, optic neuritis, retinal artery/vein occlusion, globe retina disease

IV. OCULAR TRAUMA

A. Orbital fracture

1. Blunt more common than penetrating trauma.
2. 10-25% have associated globe injury.
3. Blow-out fracture
   a. Floor and medial wall most susceptible.
   b. Entrapment (fat, inferior rectus, and inferior oblique muscles)
   c. Hypesthesia ipsilateral cheek and lip, diplopia and limited upward gaze.
d. Antibiotics only if fracture involves infected sinus.

e. Surgical repair if persistent diplopia, cosmetic.

f. Usually delayed 7-10 days.


B. Retrobulbar hemorrhage

1. Orbital hemorrhage in potential space surrounding globe
   a. May occlude central retinal artery (pressure phenomenon).
   b. Clinically - proptosis, visual loss, increased IOP.
   c. Diagnosis – CT scan.
   d. Treatment – CAI, beta blockers, mannitol, lateral canthotomy, immediate optho consult.

C. Lids/conjunctival injury

1. Lid injuries typically from penetrating trauma; most primarily repaired but refer following:
   a. Lid margin injuries - require multilayer closure and often cosmetically poor result.
   b. Canalicular involvement - medial 1/3 of lid (upper or lower) can involve lacrimal system and may need stenting.
   c. Levator/canthal tendon involvement - ptosis often results with poor repair.
   d. Puncture/laceration through orbital septum (fat protrusion in wound) - risk of infection.
   e. Rule out penetrating globe injury/ foreign body
   f. Laceration/avulsion - those with significant skin loss.

2. Conjunctival injuries
   a. Less than 1 cm left alone.
   b. Repair those greater than 1 cm.
   c. More important not to miss a foreign body or associated globe injury.

D. Anterior segment injury

1. Corneal laceration
   a. Symptoms - decreased vision, pain
   b. May have shallow anterior chamber, tear drop iris, leaky aqueous humor, or prolapsed iris.
   c. Treatment - stop further exam, rigid metal eye shield and referral.

2. Scleral laceration/perforated globe
   a. True ocular emergency.
   b. Blunt or penetrating trauma with significant force, commonly located in inferior aspect.
   c. Up to 20% of globe ruptures have no signs of perforation.
d. Tear drop pupil, bloody chemosis, decreased visual acuity, flattening of anterior chamber, small fragments of iris at wound edges on exam.
   i. Seidel test – positive if fluorescein stain reveals efflux of aqueous humor in “river like” pattern from laceration on slit lamp exam.

e. Treatment
   i. Halt exam, no pressure to eye, metal eye shield, tetanus immunization, parenteral antibiotics, immediate referral, nothing topically.

f. Sympathetic ophthalmia
   i. Seen with severe injuries.
   ii. Occurs in unaffected eye.
   iii. Mechanism - autoimmune granulomatous reaction affecting contralateral eye forcing enucleation of injured eye if vision is to be preserved.

3. Hyphema - anterior chamber hemorrhage
   a. Patient sitting up, blood layers and form meniscus.
   b. Blunt much more common than penetrating.
   c. 25-35% have an associated eye injury.
   d. Symptoms - pain, photophobia, blurry vision best examined in sitting/upright position.

e. Complications
   i. Rebleed in 2 to 5 days with worse prognosis.
   ii. Corneal staining.
   iii. Secondary glaucoma
   iv. Anterior and posterior synechia

f. Treatment
   i. Small size, reliable patient outpatient, all others admitted
   ii. Analgesics but avoid salicylates/NSAIDs, platelet inhibitors.
   iii. Referral; may or may not hospitalize.
   iv. Rest with head elevated 45 °.
   v. Cycloplegics, miotics, mydriatics, antifibrinolytics, steroids.
   vi. Sickle cell – beta blockers, alpha agonist, CAI.

4. Lens injury
   a. Dislocated/subluxed.
   b. Invariably visual disturbance-monocular diplopia.
   c. Iridodoniorsia-trembling of iris after rapid eye movements.
   d. Blunt trauma, Marfans, Syphilis.
   e. Funduscopic exam different from contralateral eye, may be anterior or posterior dislocation.
   f. Immediate ophthalmology consult.

5. Pupil injury
   a. Traumatic mydriasis.
   b. Often associated with blunt injury with selective neurapraxia of parasympathetic fibers of CN III affecting constrictors.
(hence dilated) and accommodation (hence visual disturbance).
i. Note that mydriasis can imply
   • Significant intracranial pathology - "blown pupil".
   • Atropine administration.
   • Accidental Neo-Synephrine administration when vasoconstricting nasal mucosa prior to nasotracheal intubation.
   • Can reverse mydriasis caused by intracranial mass with pilocarpine; the same will not work initially for a. and b. above.
   • Treatment - referral; typically spontaneously resolves

c. Traumatic miosis
   i. Selective neurapraxia to sympathetic fibers to pupil dilators (hence unopposed constriction); may see with Horner's Syndrome.
   ii. Treatment - referral; typically spontaneously resolves.

6. Subconjunctival hemorrhage
   a. Very common - typically asymptomatic.
   b. Can occur with minor (sneezing, screaming, Valsalva, coughing) or major (globe rupture) trauma.
   c. If history and physical examination dictate benign process then reassure that this entity will spontaneously resolve within 10-14 days.
   d. May have associated facial/lid petechia.

E. Posterior segment injury

1. Intraocular foreign body
   a. History more helpful than physical examination.
   b. Search for entry wound, i.e. grinding wheel, working with metal.
   c. X-rays, sonography, CT, MRI, dictated by suspicion, exam, and type of F.B.
   d. Treatment, immediate referral, tetanus immunization, metal shield, antibiotics.

2. Vitreous hemorrhage
   b. Symptoms – sudden painless unilateral loss of vision, floaters, visual disturbance.
   c. Signs - visual acuity deficit, may see hemorrhage.
   d. Treatment - rest, head elevation, immediate referral.

3. Preretinal, superficial retinal, and/or chorioretinal injury
   a. Shaken baby syndrome.
   b. Retinal - tear/detachment.
   c. Treatment - rest, referral.

4. Complications
   a. Infection.
b. Ulcerations.
c. Endophthalmitis— infection of deep eye structure, pain, decreased visual acuity.
   i. Treatment— intraocular and systemic antibiotic.
d. Sympathetic ophthamia.

V. SUDDEN VISION LOSS

A. Trauma (see IX A-D)

B. Vascular

1. Central retinal artery occlusion (CRAO)
   a. Symptoms— sudden, painless, unilateral vision loss.
   b. Risks— carotid artery disease, sickle cell, acute glaucoma, retrobulbar hemorrhage, exophthalmos.
   c. Signs
      i. Severe decreased visual acuity.
      ii. Afferent pupil defect.
      iii. Optic disk pallor, macular edema, bloodless arterioles, dark veins, "cherry-red spot" (choroidal vessels supply macula).
   iv. Treatment— (ischemic time 30-60 minutes) goal is to restore retinal artery blood flow by dislodging clot, dilating the artery and lowering IOP.
      • Immediate referral
         •• Vigorous massage (5 second intervals).
         •• Enhance vasodilation— carbogen or paper bag breathing (beware of hypoxemia with latter).
         •• Acetazolamide and a topical β blocker.
      • Surgical paracentesis of anterior chamber
   v. Prognosis

2. Central retinal vein occlusion (CRVO)
   a. Symptoms— sudden, painless, unilateral vision loss typically less severe than CRAO.
   b. Etiology— thrombosis of the central retinal vein.
   c. Signs
      i. Decreased visual acuity
         • "Blood and thunder" retina, engorged veins, retinal hemorrhage.
         • Differential diagnosis includes pseudotumor cerebri and papilledema.
   d. Treatment— referral, treat underlying cause, poor prognosis.

3. Miscellaneous— TIA’s, ocular migraine, vitreous hemorrhage.
C. Idiopathic

1. Retinal detachment
   a. Symptoms - painless "veil over eyes" or "drawn curtain;" can have prodrome of floaters, cloudy vision, flashing lights, spider webs; typically >50 year old patients.
   b. Etiology - unknown cause for separation between sensory and pigmented retina.
   c. Signs
      i. Decreased visual acuity if macula involved.
      ii. Detached undulating gray retina.
      iii. Tear, hole, bulla, fold.
   d. Treatment – immediate referral, rest; spontaneous reattachment rare.

2. Hysterical blindness
   a. Normal exam except for complaint.
   b. Occipital CVA only confounder but differentiate with optokinetic reflex.
   c. A normal pupillary reaction, funduscopic exam, and lack of afferent pupillary defect is very suggestive of hysteria/conversion disorder or malingering.

D. Inflammatory

1. Optic neuritis
   a. Symptoms - sudden, unilateral vision loss, can have pain with EOM
   b. Signs - loss of central retinal vision with intact peripheral vision (central scotomata); decreased color vision; normal exam - "the patient sees nothing and the doctor sees nothing."
   c. An association with multiple sclerosis; 25-65% will develop MS.
   d. Treatment – emergent referral, systemic and/or retrobulbar steroids.

2. Temporal (giant cell) arteritis
   a. Vasculitis of medium and large arteries that can cause optic nerve infarction and permanent vision loss, female predominance, most > age 50.
   b. Symptoms - unilateral, boring pain; tenderness; may have sudden onset, may have flu-like prodrome consistent with polymyalgia rheumatic; visual disturbance that progresses;
   c. Signs - erythema, swelling, tenderness, and nodularity of artery involved; funduscopic exam can reveal pallor, hemorrhage, exudates; iritis; ESR > 70; temporal artery biopsy for diagnosis.
   d. Treatment - referral; high dose systemic steroids.
VI. OCULAR BURNS

A. Acid (the only eye emergency requiring treatment prior to visual acuity evaluation)

1. *Coagulation necrosis* of epithelium and usually self limiting
2. Less devastating than alkaline burns.
3. Treatment - "irrigation, irrigation, irrigation;" fluorescein staining, cycloplegics, +/- antibiotics, +/- referral, reassess pH (Nitrazine paper), no neutralization.

B. Alkaline

1. Drain cleaners, chemical detergents, fertilizers, ammonia derivatives.
2. Initially conjunctivitis but liquefaction necrosis continues burn process until alkali removed.
3. Signs - perilimbal blanching and corneal edema are poor prognostic indicators.
4. Treatment - copious irrigation; referral mandatory if any signs if injury from alkaline burn; reassess pH; no neutralization.
5. Long term complications-perforation, adhesions, glaucoma, cataracts.

C. Thermal

1. Rare due to Bell's phenomenon - in response to stimulus, eyes blink and roll up assess lid closure - if cornea is exposed, it must be kept moist.
EENT/OPHTHALMOLOGIC EMERGENCIES

PEARLS

EENT Emergencies

1. An auricular hematoma must be emergently drained and a compressive dressing applied to avoid the complication of “cauliflower ear.”

2. The most common pathogen in otitis externa is Pseudomonas aeruginosa followed by Staphylococcus aureus.

3. Relapsing polychondritis is an autoimmune inflammatory disease of cartilage. When the auricle is affected the ear lobe is spared since it does not have cartilage.

4. The classic physical finding in malignant otitis externa is granulation tissue on the floor of the auditory canal at the bone-cartilage junction.

5. Malignant otitis externa is an osteomyelitis seen in immunocompromised patients requiring surgical debridement and IV antibiotics covering pseudomonas.

6. Herpes zoster of the geniculate ganglion (Ramsay-Hunt Syndrome) may present with painful rash, hearing loss, and facial nerve paralysis.

7. Traumatic perforation of the tympanic membrane will heal spontaneously in 95% of patients within 3 months. Profound hearing loss or vertigo should raise suspicion of ossicular disruption and should be referred to ENT.

8. The most common pathogen in otitis media of children is Strep. pneumoniae followed by H. influenzae.

9. The most common site of nosebleeds is the anterior nasal septum (Kiesselbach's plexus or Little's area).

10. Patients with posterior nasal packings are at risk for hypoxemia and must be admitted to a monitored setting.

11. The most common pathogen in acute sinusitis is H. influenzae and Strep. pneumoniae. (Chronic sinusitis is caused by allergic, then infectious mixed flora, anaerobes and fungi.)

12. Cavernous sinus thrombosis is a complication of ethmoid sinusitis and presents with eyelid edema, proptosis, chemosis, 3rd & 6th cranial nerve palsies, pupillary dysfunction, and papillary edema. Diagnosis is
confirmed by CT scan or MRI and treatment is IV antibiotics, not surgical.

13. Frontal sinuses develop at ages 6-8; therefore, frontal sinusitis is not seen in children.

14. Ludwig's angina is a cellulitis of the floor of the mouth. It is most common in older males with bad teeth. Treatment is IV antibiotics, possible intubation, possible surgery.

15. Retropharyngeal abscess is commonly seen in children less than 3 years of age due to atrophy of the retropharyngeal nodes with aging.

16. Antibiotic treatment of strep pharyngitis within 9 days of the onset of symptoms will prevent acute rheumatic fever, but not acute glomerulonephritis.

17. A permanent tooth avulsed intact should be replaced into the socket as soon as possible. The chance of survival drops approximately 1% every minute the tooth remains out of socket. Do not replace primary teeth in children.

18. Avulsed teeth should be transported to the ED in milk or the patient's mouth.

19. Bullous myringitis is most commonly caused by viruses but also may be caused by Mycoplasma pneumoniae.

20. The most reliable sign of AOM is decreased mobility of the tympanic membrane on pneumatic otoscopy.

21. The most common source of posterior nosebleeds is the sphenopalatine artery.

**Ophthalmologic Emergencies**

1. The only indication for the emergent use of a miotic agent (green caps) is for acute angle closure glaucoma (pilocarpine 2%).

2. Topical corticosteroids can cause HSV reactivation.

3. S. aureus is the most common agent causing blepharitis and hordeolum (sty).

4. The most common cause of a painless red eye is viral conjunctivitis and the most common etiology is adenovirus.
5. Neisseria gonorrhea ophthalmic infection can cause loss of vision and perforate an intact cornea and is considered an ocular emergency. In general should be admitted for parenteral ceftriaxone and topical antibiotics.

6. The most common cause of a painful red eye is iritis - (AKA uveitis/iridocyclitis).

7. Classic iritis presents with the following signs: constricted pupil, injected conjunctiva (bulbar), flushed perilimbus and inflamed anterior chamber (flare/cell).

8. Differentiate iritis from acute angle closure glaucoma by iritis having a normal cornea, small pupil, and normal tonometry.

9. Typical signs of acute narrow angle glaucoma (ANAG) include: corneal edema, ciliary flush, decreased visual acuity, mid-range and sluggish pupil, and increased IOP (>50 mmHg).

10. Treatment for ANAG includes: consultation, pupillary constriction, decrease aqueous humor production, hyperosmotics, antiemetics, and surgery.

11. Most common form of recurrent zoster is herpes zoster ophthalmia (varicella virus). Lesions on the tip of the nose (Hutchinson’s sign) from nasociliary nerve involvement indicate high likelihood of ocular lesions.

12. Ten to twenty percent of orbital fractures have an associated globe injury.

13. Complications of hyphema are re-bleed (2 to 5 days), corneal staining, and glaucoma.

14. Subconjunctival hemorrhage is very common, typically asymptomatic, and resolves without sequelae.

15. Central retinal artery and vein occlusions can present as sudden painless unilateral loss of vision.

16. Central retinal vein occlusion presents with decreased visual acuity and a blood and thunder appearance on fundoscopic exam.

17. Of all eye exposure injuries, alkaline injuries carry poorest prognosis due to the mechanism of liquefaction necrosis.
EENT Emergencies


Ophthalmologic Emergencies


