Pediatric ENT Emergencies

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Baylor College of Medicine

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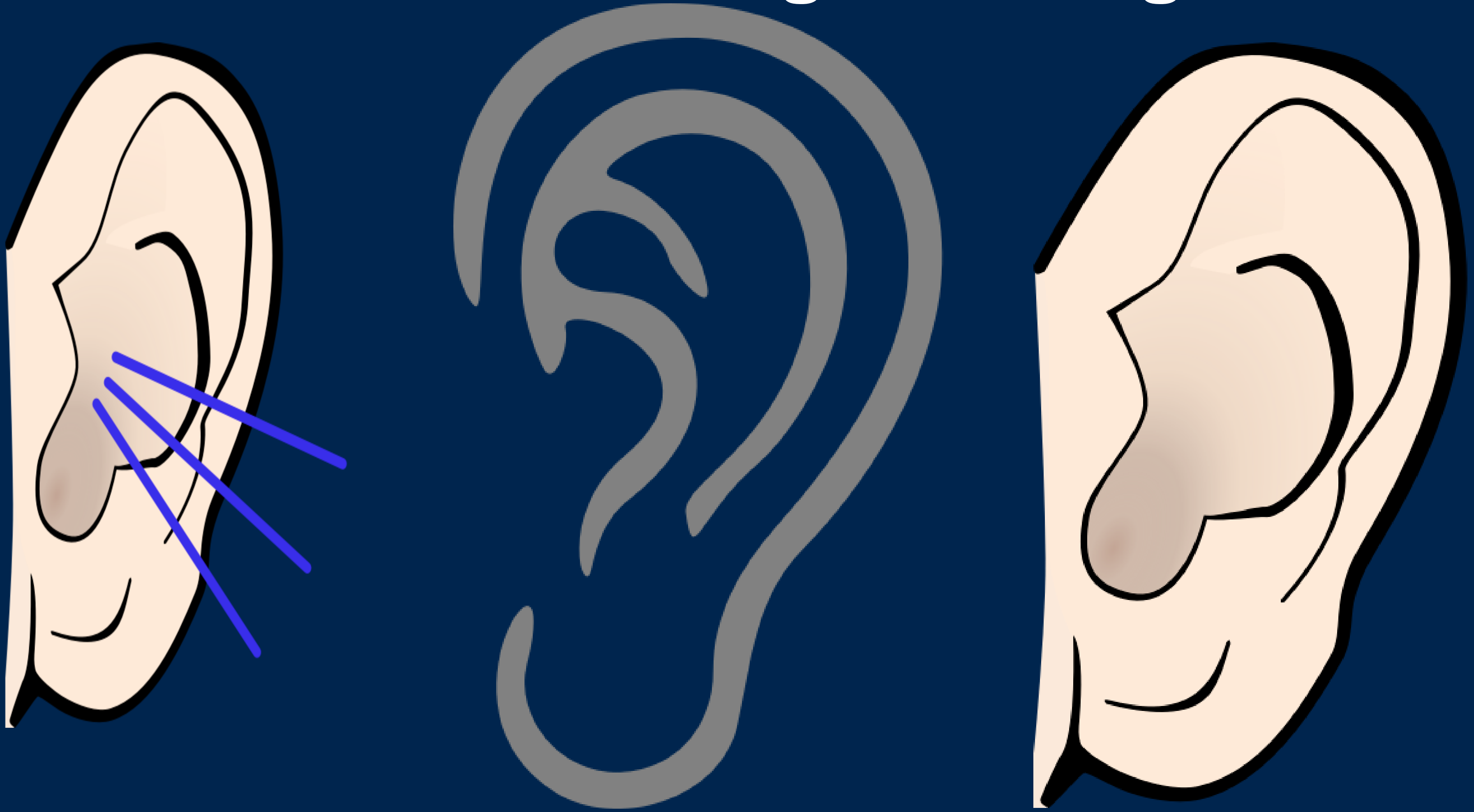
I've never seen the inside of my ear, but all I hear are good things!



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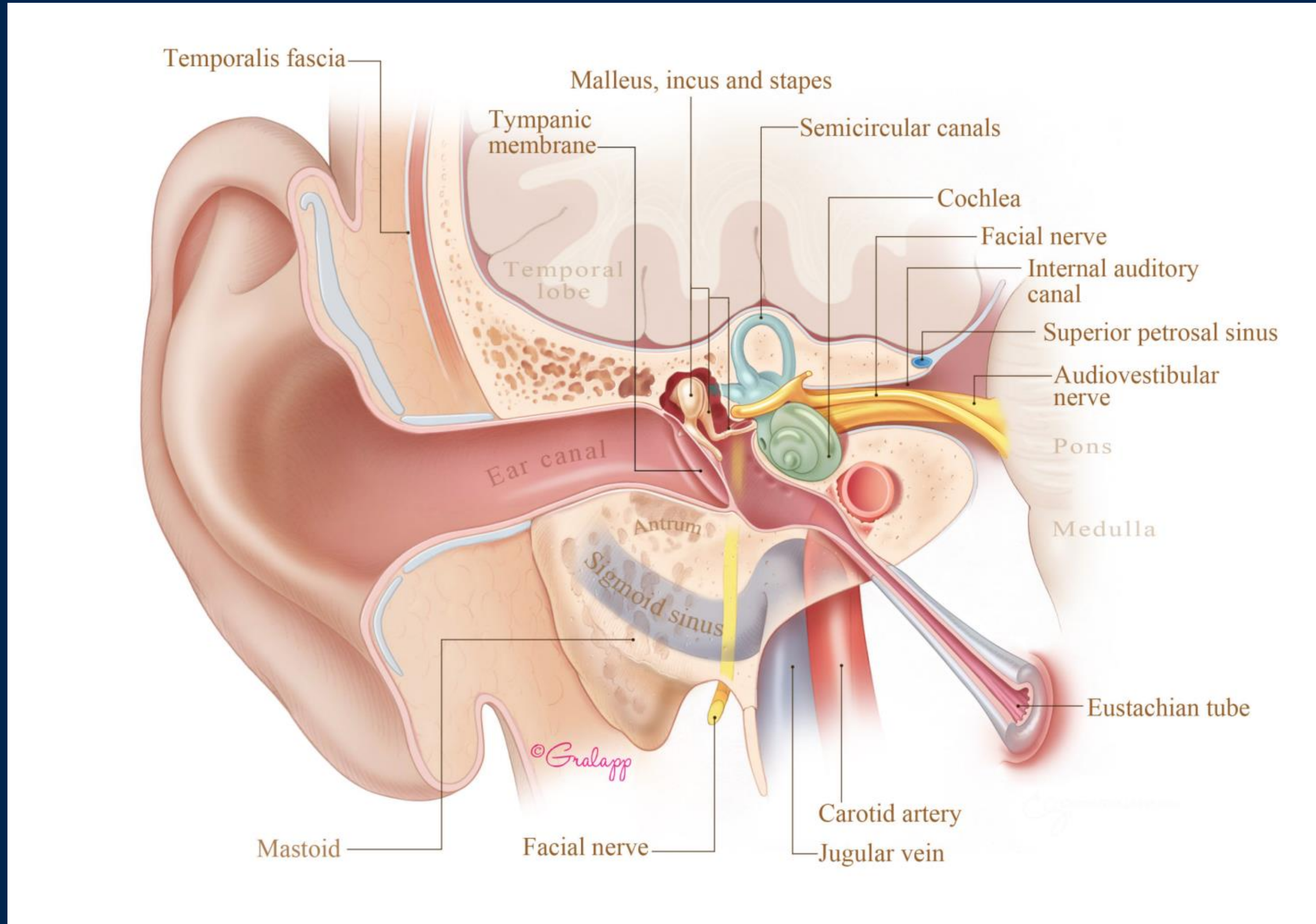
8 year old female

- CC: right ear pain
- 2 days
- History of otitis media as an infant- none since then.
- Otherwise healthy
- Attends school, on swim team.

Ear Anatomy



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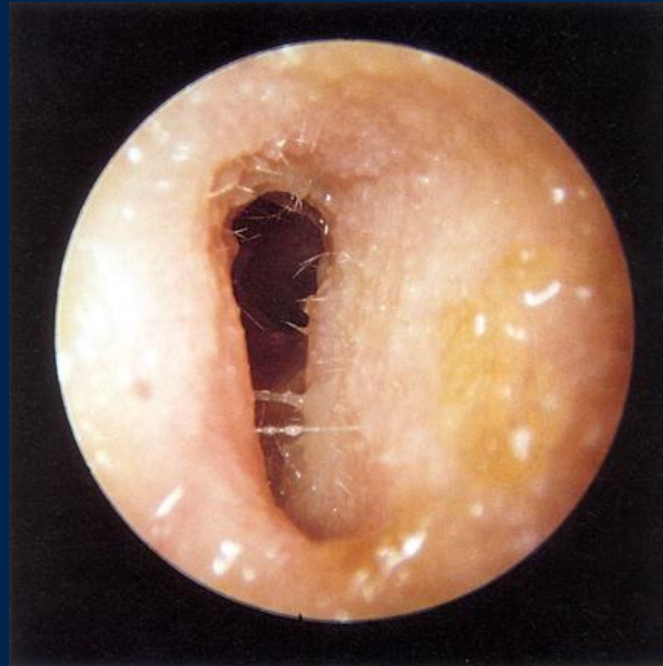
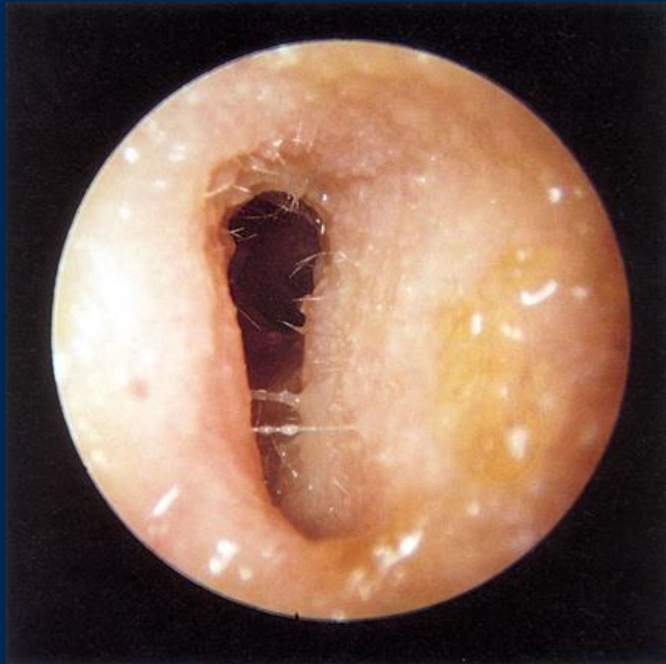
Ear exam: pain on otoscopy



Ear exam: pain on otoscopy



Tip: If pain on manipulation of pinna- most likely otitis externa.

Otitis Externa aka “Swimmer’s Ear”

- Water in ear canal → Bacterial overgrowth
  - Also consider ear phone / air pod usage
- Most common
  - *Pseudomonas aeruginosa*
  - *Staph aureus*

Otitis Externa aka "Swimmer's Ear"

- Symptoms
  - Acute onset
  - Otalgia
  - Itching or fullness in ear
  - Hearing loss
  - Pain with chewing
- Signs
  - Erythema / swelling of external auditory canal
  - Pain on palpation of tragus
  - Purulent drainage

Otitis Externa aka "Swimmer's Ear"

- Treatment
  - **Topical** antibiotics x 10 days
    - Needs to have coverage against *P. Aeruginosa* and *S. Aureus*
      - Ofloxacin (Floxin®)
      - Ciprofloxacin-Dexamethasone (Ciprodex®)
      - neomycin / polymyxin B / hydrocortisone (Cortisporin®, Otosporin®)
        - If you cannot see the TM or see TM perforation do not use Cortisporin / Otosporin secondary to ototoxicity and increased irritation

Otitis Externa aka “Swimmer’s Ear”

- Treatment: Drop Installation
  - Lay on side with ear in air
  - Instill drops
  - Pump the tragus if possible
  - Lay on this side for 3-5 minutes
  - Repeat on other side if indicated
  - If ear canal swollen closed place ear wick:

Otitis Externa aka “Swimmer’s Ear”

- Key Step of Treatment
  - **KEEP EAR DRY FOR ENTIRE COURSE OF TREATMENT**
  - **Dry Ear Precautions**
    - **No swimming**
    - **When bathing, take cotton ball and roll in petroleum jelly. Place in ear**

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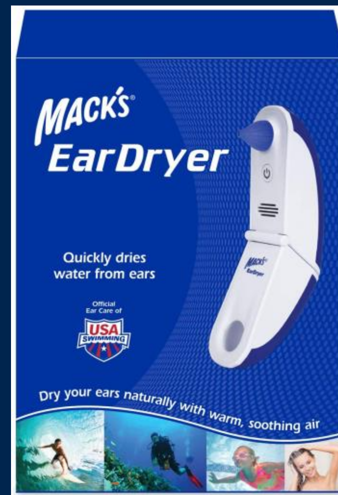
Swimmers ear prevention



Tip: make your own: 50 / 50 rubbing alcohol and white vinegar (acetic acid)

15 month old male

- Current URI
- Waking at night
- Tugging on ear
- Fever

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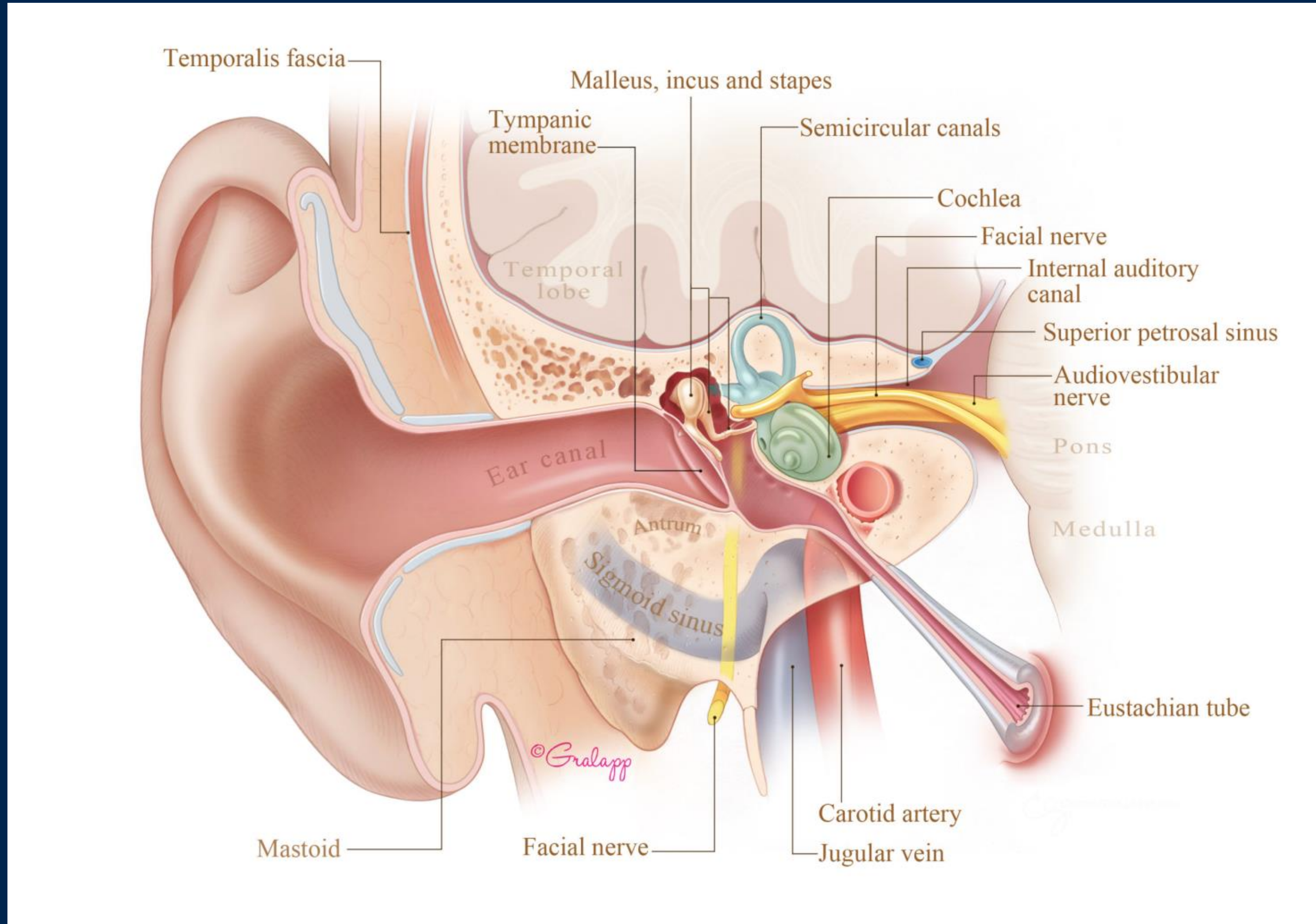
Ear Anatomy



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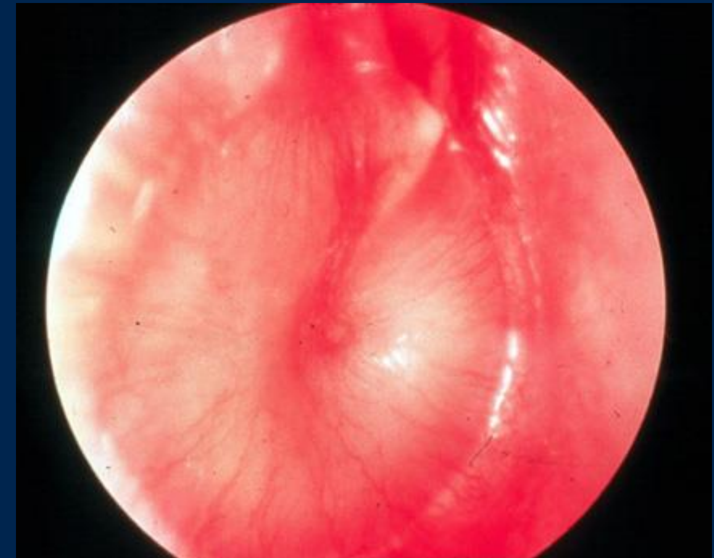
15 month old male

- Ear exam: No pain on pinna / tragus



Otitis Media

- #1 bacterial infection encountered in pediatrics in the US
- Most children will have 1 episode of AOM by age 3
- 40% will have 3 episodes of AOM by age 6

Otitis Media

- Microbiology
  - Shift in microbiology after the pneumococcal conjugate vaccine (PCV) in 2000 – previously most common organism was *Strep pneumoniae*
  - After vaccine approval, increase *in Haemophilus influenza* and *Moraxella catarrhalis*
  - Role of viruses – predispose patients to otitis media

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Otitis Media

- Diagnosis – Requires a good view of the tympanic membrane
  - Tips:
    - Use largest speculum possible
    - Posterior traction on pinna to straighten ear canal
    - Brace otoscope on child's head

Tip: a red ear drum does not mean otitis media is present. By definition need fluid in the middle ear. TMs can be red with crying.

Acute Otitis Media (AOM)

- First Line Agents
  - Amoxicillin – 90 mg/kg/day – divided BID
  - Amoxicillin-clavulanate – 90 /mg/kg/day (amoxicillin component) – divided BID
    - Frequently given when patient has received another antibiotic in previous 30 days

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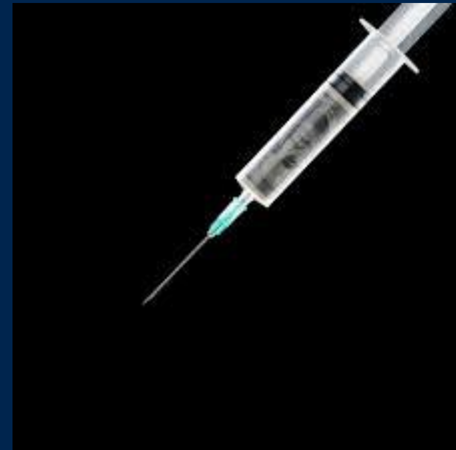
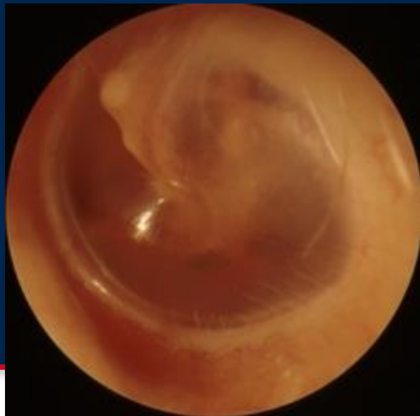
Acute Otitis Media (AOM)

- Alternatives for children with mild / remote PCN allergy
  - Cefdinir – 14mg/kg/day – 1-2 doses per day
  - Ceftriaxone – IM – 50 mg/kg
    - Frequently used when amoxicillin fails

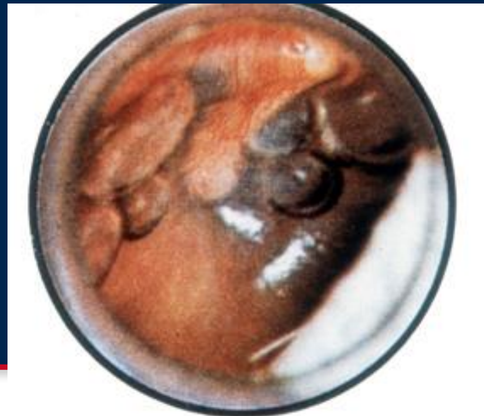


Otitis Media with Effusion (OME)

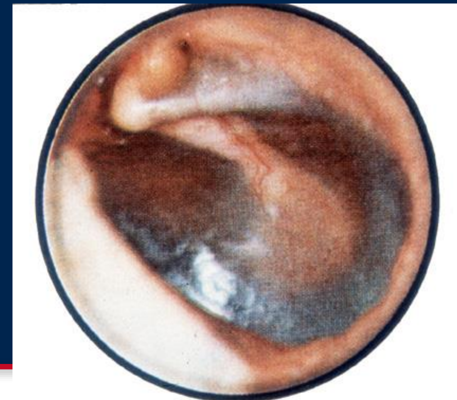
- Patient presentation – decreased hearing, asymptomatic
- Serous OME
  - Yellow / amber tympanic membrane, normal / retracted position, mobility impaired
- Mucoid OME
  - Yellow / white / creamy colored TM with normal / retracted position. Mobility decreased



normal



Serous ome



Mucoid ome

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Otitis Media with Effusion (OME)

Antibiotics are ***NOT*** necessary

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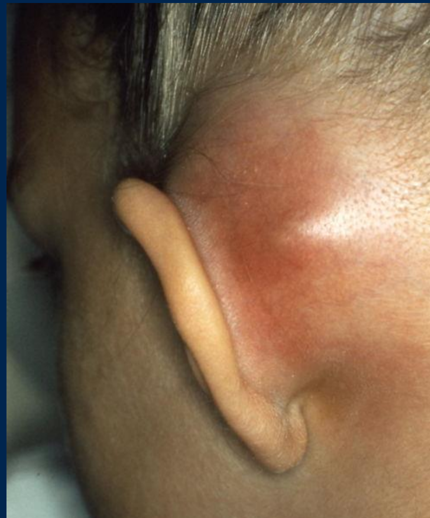
Myringotomy / Tympanostomy Tube

- Allows for drainage /aeration for middle ear
- Acute Otitis Media
  - $\geq$ 3 distinct episodes within 6 months or $\geq$ 4 episodes within 12 months
- Otitis Media with Effusion
  - Hearing Loss / Speech / Language Problems
  - Bilateral OME $\geq$ 3 months, Unilateral OME $\geq$ 6 months
- Retraction of TM

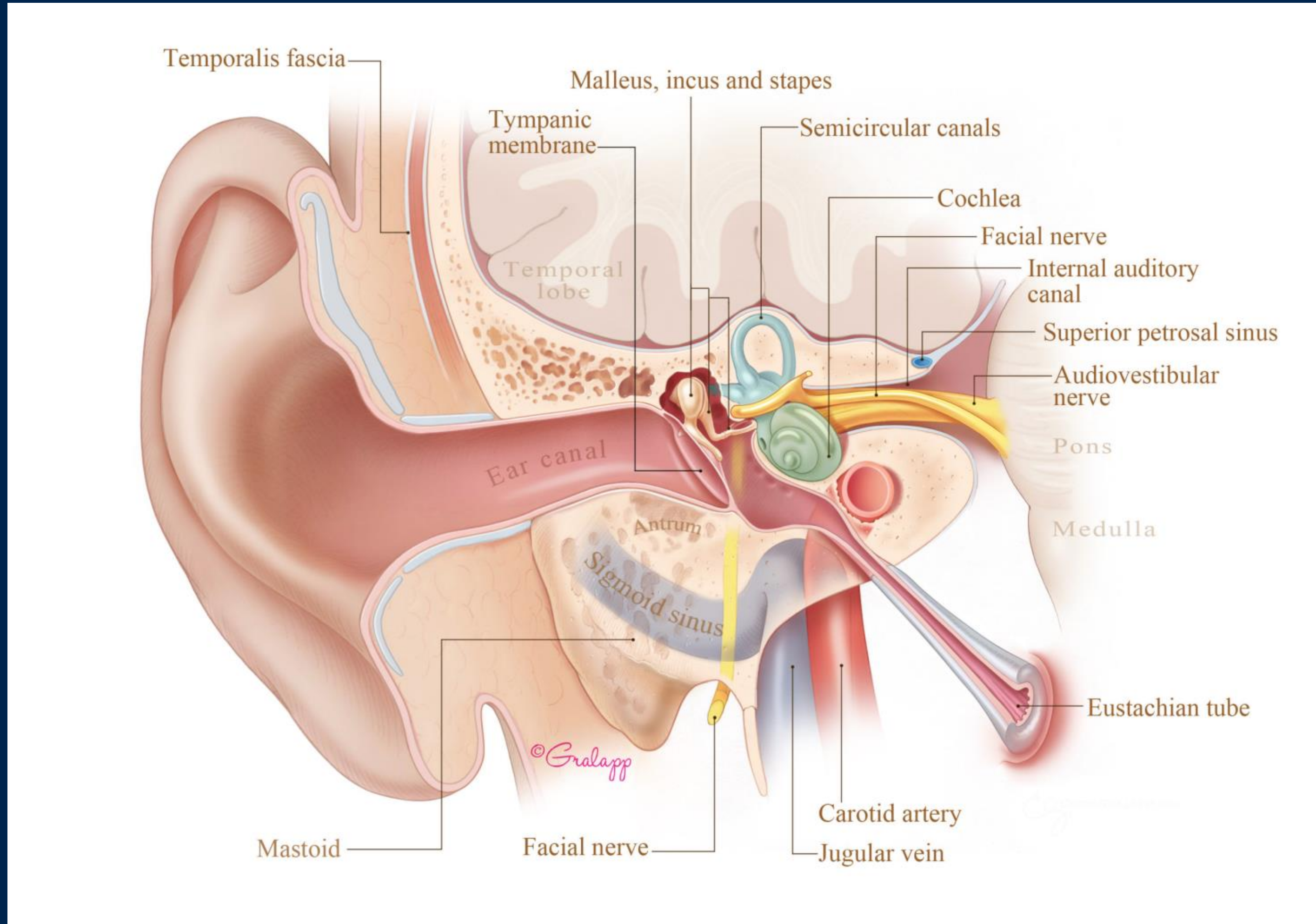
1 year old male

- Recent URI
- Fever
- Ear protrusion – redness behind ear – tender - fluctuant



Welleschik, B. “Mastoiditis with Subperiosteal Abscess.” *Mastoiditis*, Wikipedia, 1 Jan. 2007, en.wikipedia.org/wiki/Mastoiditis#/media/File:Mastoiditis1.jpg.

Ear Anatomy



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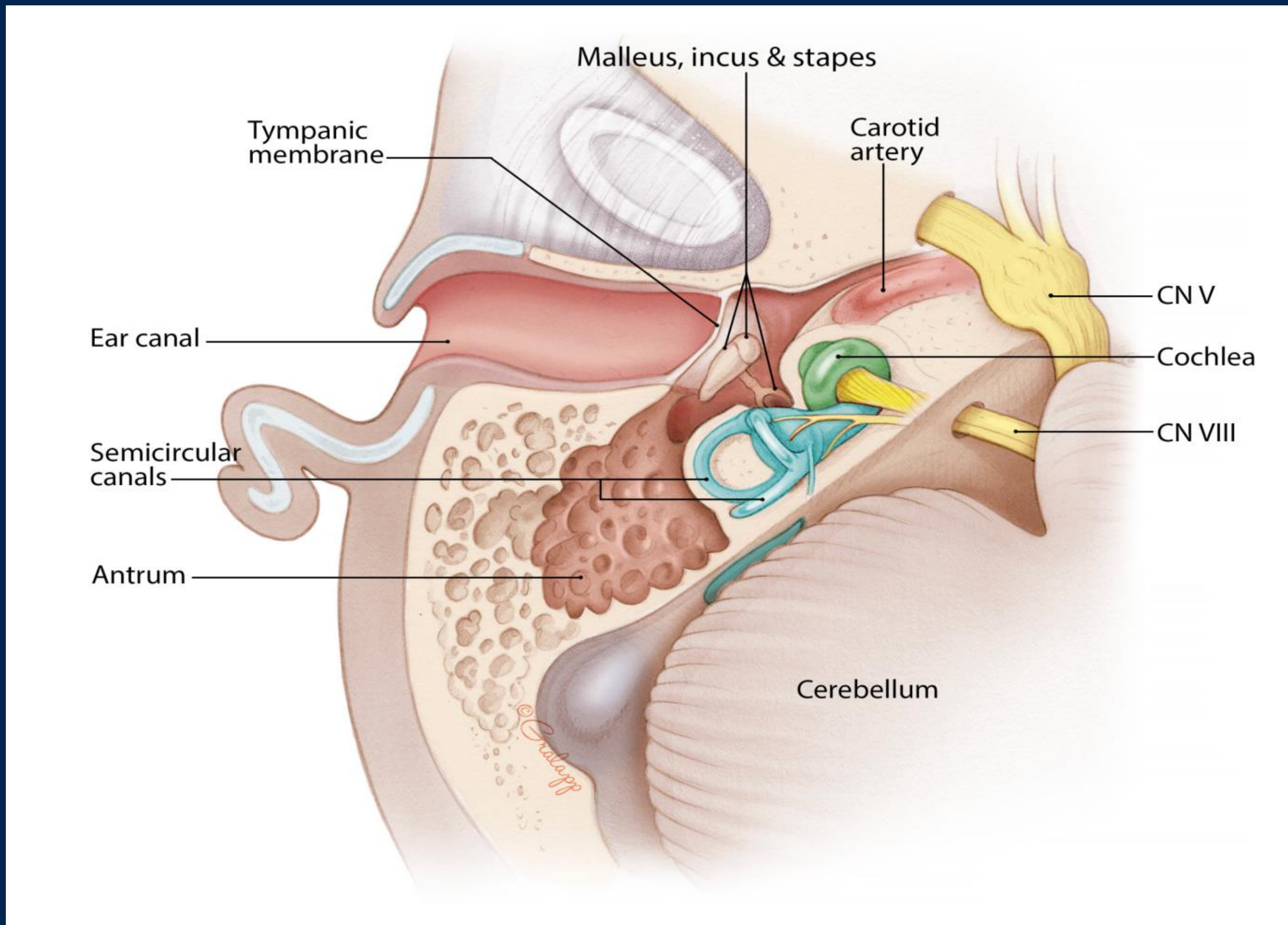

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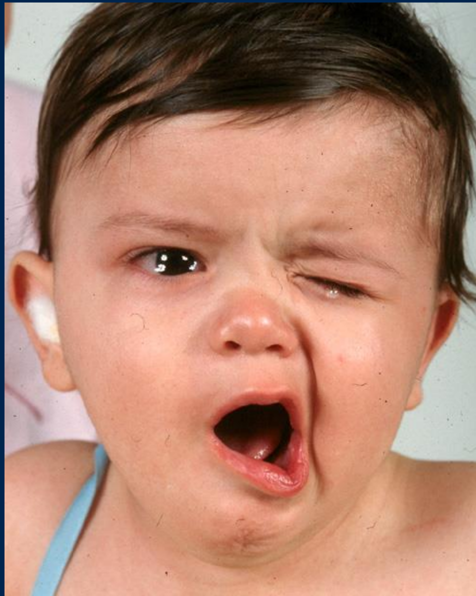
Mastoiditis

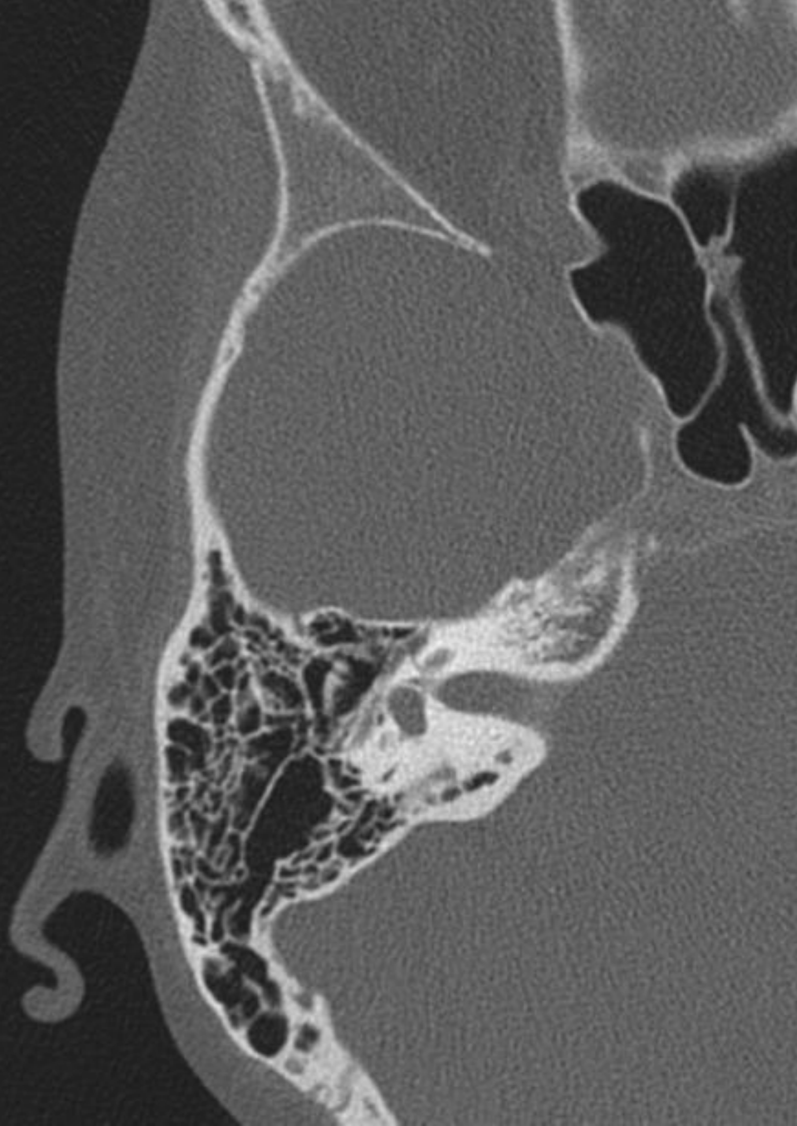
- Why is this concerning?
  - Can lead to meningitis or intracranial abscess or facial paralysis

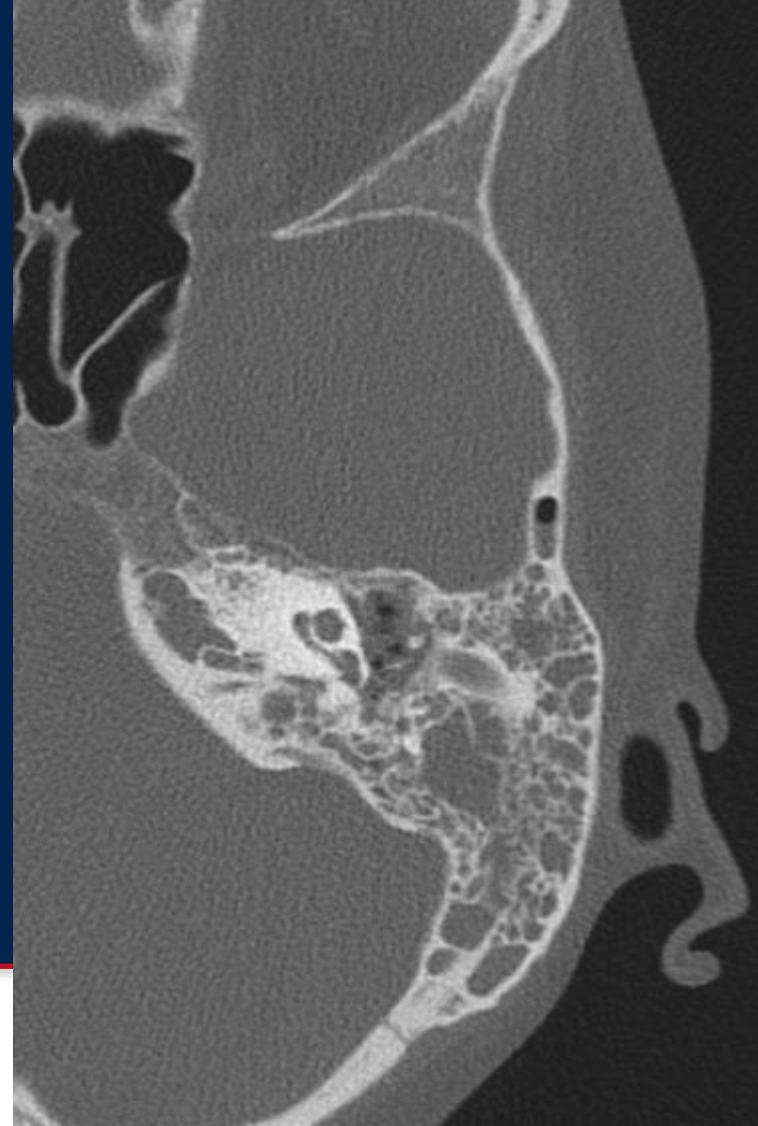


Mastoiditis

- Imaging - CT scan of the temporal bone

- Knipe H, Otomastoiditis. Case study, Radiopaedia.org (Accessed on 17 May 2023) https://doi.org/10.53347/rID-53000





Prior to antibiotics:

PRE-ANTIBIOTIC PATIENTS. *In the bad (for young otitis media patients) old days before the advent of penicillin these eight children with their heads swaddled in thick bandages were photographed recovering from mastoidectomies at the Cook County Contagious Disease Hospital in 1912. The procedure, rarely required today, accounted for only 60 of more than 10,000 operations at the Manhattan Eye, Ear and Throat Hospital in 1977 and 144 of some 5000 ear operations at the New York Eye and Ear Infirmary in 1978.*

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Acute Mastoiditis Treatment

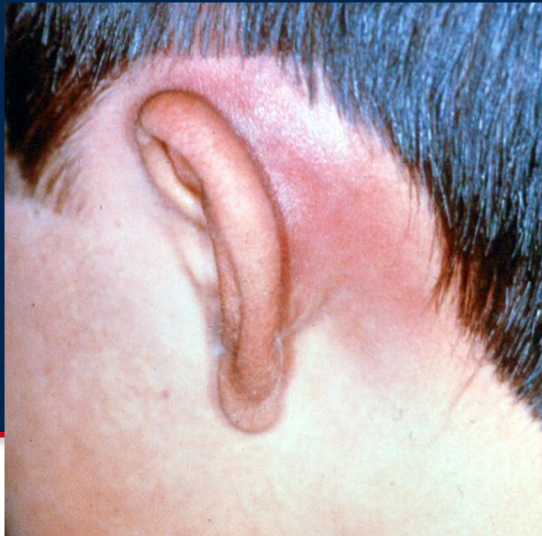
- Antimicrobial Treatment: IV required
  - Vancomycin OR Clinda + Ceftriaxone
  - If intracranial involvement– add metronidazole
  - Covering S. pyogenes, S. Pneumoniae, other beta hemolytic Streptococcus and S. aureus

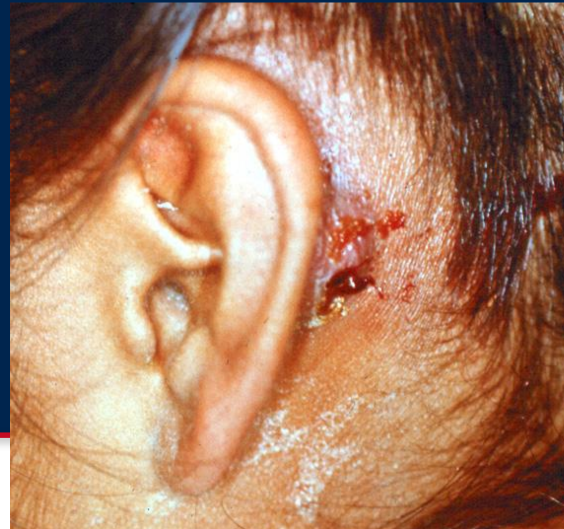
Chronic Mastoiditis Treatment

- Patient with chronic mastoiditis or in patient with recurrent otitis media
- Antimicrobial Treatment: IV required
  - Vancomycin OR Clinda + Cefepime (or Ceftazidime)
  - If intracranial involvement– add metronidazole
  - Covering Pseudomonas sp, enteric gram negative bacteria, S. aureus, S. pneumoniae

Mastoiditis

- Immediate Otolaryngology consultation
- Surgical Intervention
  - Myringotomy
  - Tympanostomy tube insertion
  - Mastoidectomy





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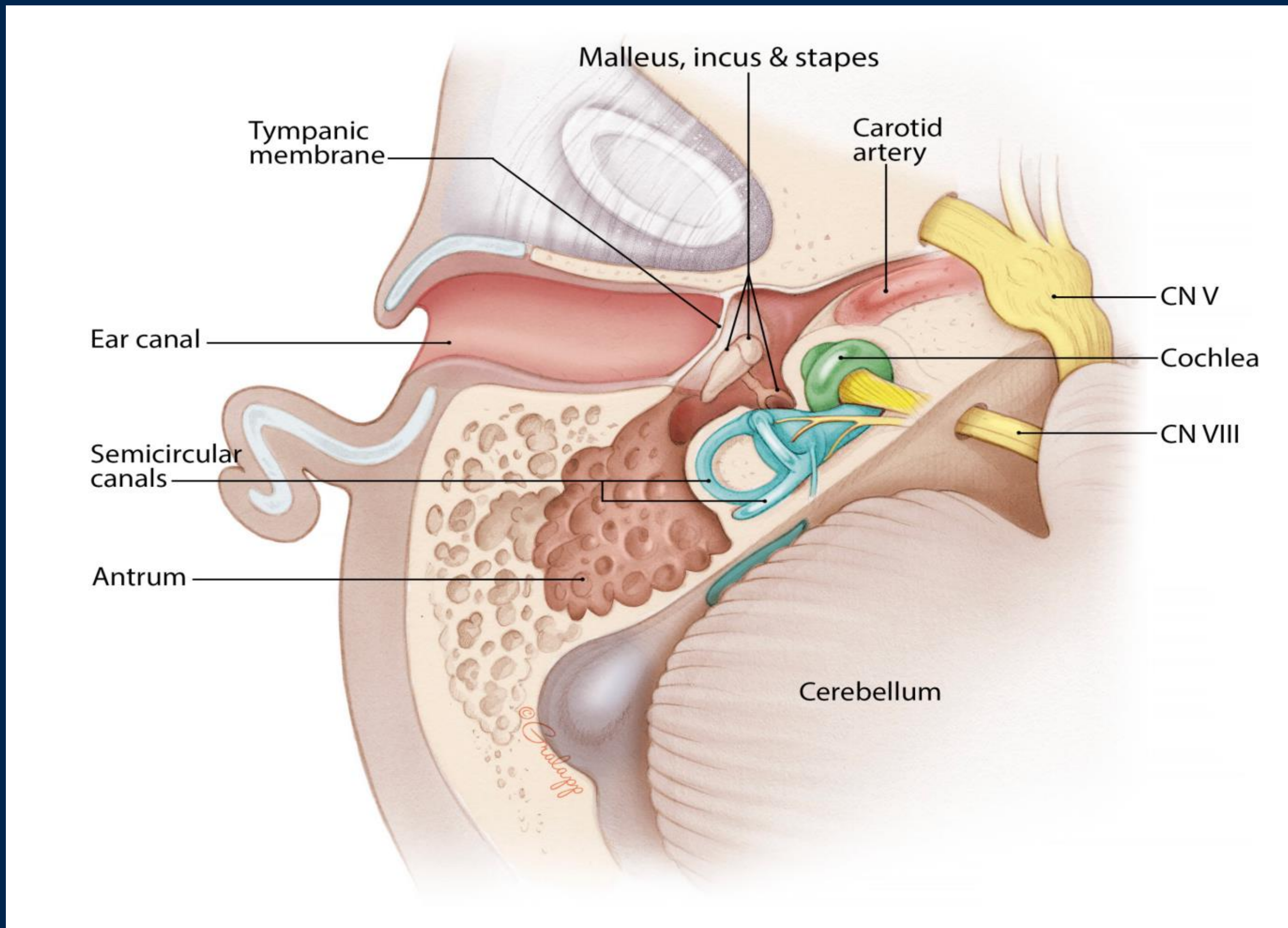

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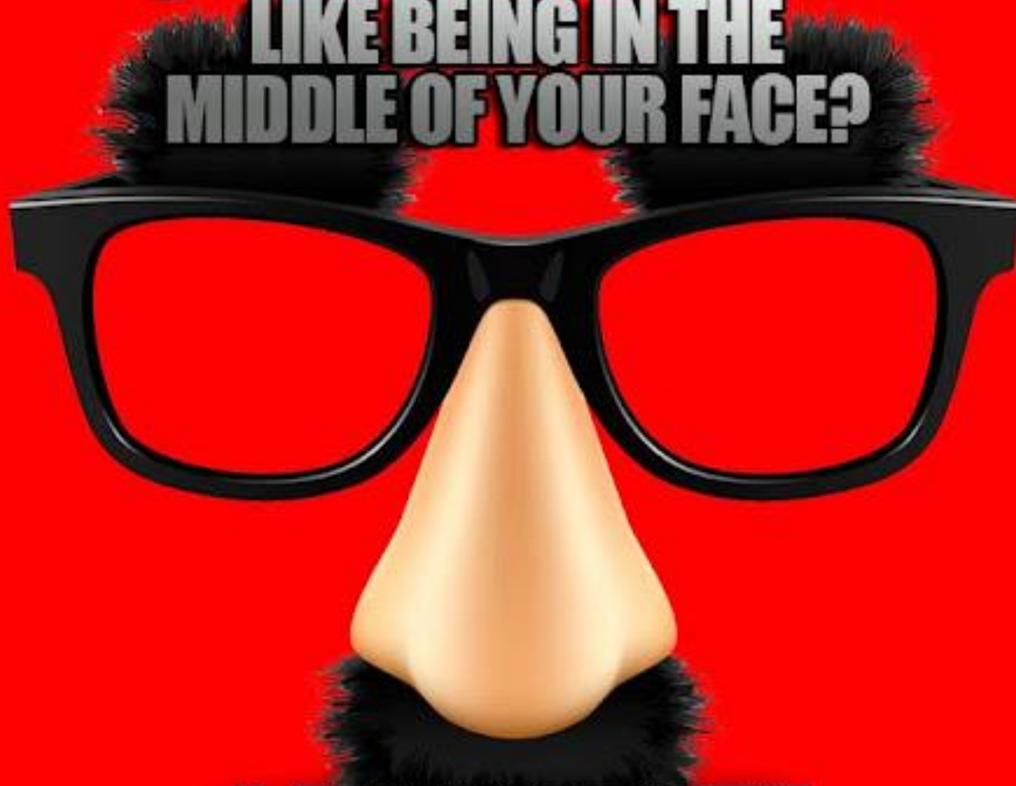
Q. WHY DOES YOUR NOSE LIKE BEING IN THE MIDDLE OF YOUR FACE?
A. BECAUSE IT'S THE SCENTER OF ATTENTION!
PAINFULPUNS.COM

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6 year old

- c/o nose bleed.
- Bleeding intermittently for the past 2 days
- Frequent history of nose bleeds in the past – most commonly at night
- Meds: fluticasone nasal spray for allergies

Epistaxis

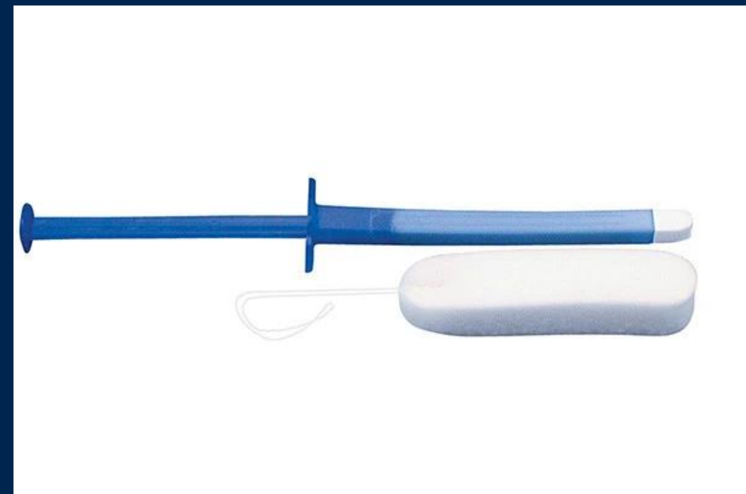
- Classified anatomically
  - Anterior (95%+) – Kiesselbach's plexus – on anterior nasal septum – common source of bleeding
  - Posterior – Woodruff's plexus – inferior to the posterior end of the inferior turbinate – more common in adults

Primary Epistaxis (80%)

- Start with the ABCs
- Have patient sit up, lean forward, pinch nose for 10 min
- +/- Vasoconstrictor – Oxymetazoline (Afrin®)

Primary Epistaxis

- SURGIFLO Hemostatic Matrix ®
- Nasal packing
  - Nasal pack – Rhino rocket
- Leave packing in place for 24 – 48 hours



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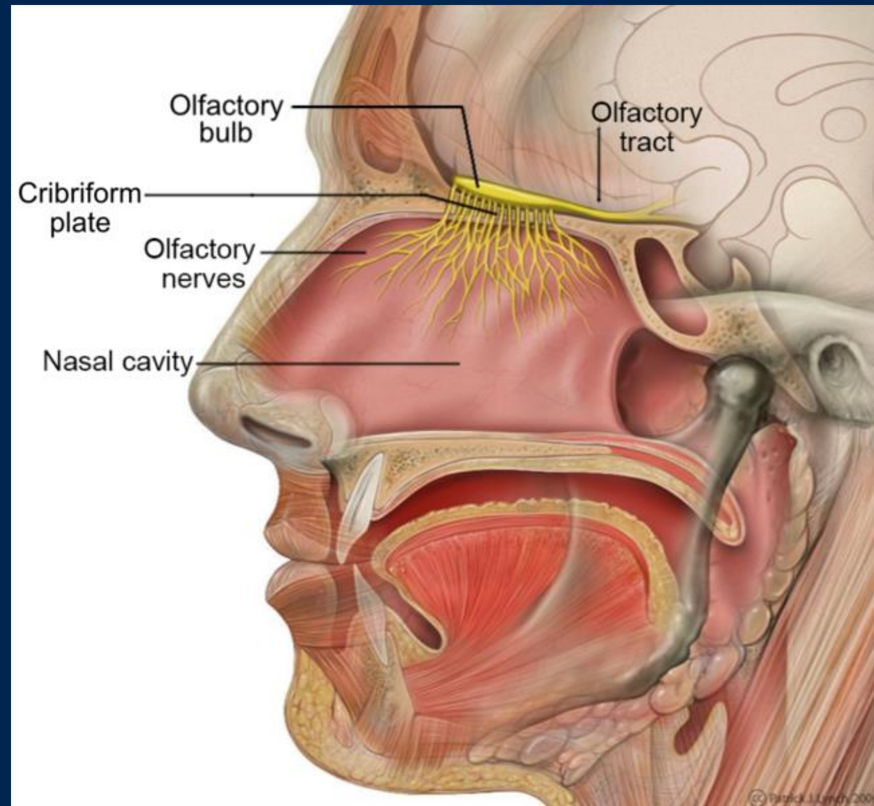

Lynch, Patrick J. "Head antatomy with olfactory nerve, including labels for the nasal cavity, olfactory bulb, and olfactory tract in English ." *Mastoiditis*, Wikipedia, 27 Dec. 2006, https://commons.wikimedia.org/wiki/File:Head_Olfactory_Nerve_Labeled.png.

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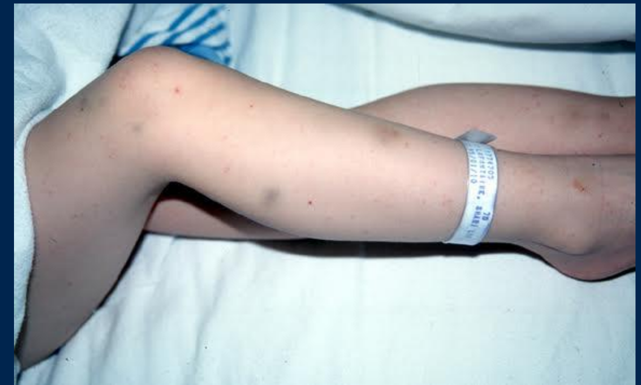
Secondary Epistaxis

- Treat the bleeding and treat the cause
- Causes – Trauma (consider nonaccidental trauma < 2 years old), coagulopathies, steroid nasal sprays, tumors, ITP or other malignancies

- Check for bruising and petichae
- Check coags
- Stop nasal steroid sprays
- Rule out nasal mass



Nasal exam

- Nasal exam key instruments

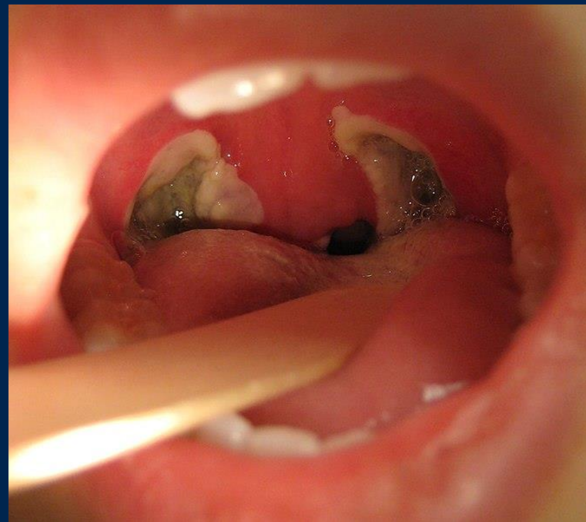
Epistaxis Prevention

5 year old s/p tonsillectomy 6 days ago

- Bleeding from mouth
- Started suddenly
- Father estimates 1 cup of blood.

Post Tonsillectomy Hemorrhage

- Approximately 3%
- Most common days 5 – 7 after surgery
- Result of sloughing of eschar from tonsillar fossa



James, Doc. "Tonsillectomy09.Jpg." *Tonsillectomy*, Wikipedia, 11 Feb. 2019, en.wikipedia.org/wiki/Tonsillectomy#/media/File:Tonsillectomy09.jpg.

Post Tonsillectomy Hemorrhage

- Exam Findings
  - Active bleeding? Clot?
- Lab Work
  - CBC, PT, PTT, INR +/- von Willibrand panel to be drawn in emergency department
- Treatment
  - Active bleeding requires cauterization in the OR
  - Resolved bleeding – admit for observation

Post Tonsillectomy Hemorrhage

- Pain Control
  - Acetaminophen 15 mg/kg Q6H
  - Ibuprofen 10 mg/kg Q6H
  - Dexamethasone or Prednisolone 0.5 mg/kg once daily as needed for pain not controlled with acetaminophen / ibuprofen
- Hydration

15 y.o. with sore throat

- Started as a sore throat
- Now with difficulty swallowing
- Occasional drooling
- Harder to open mouth
- Voice changes

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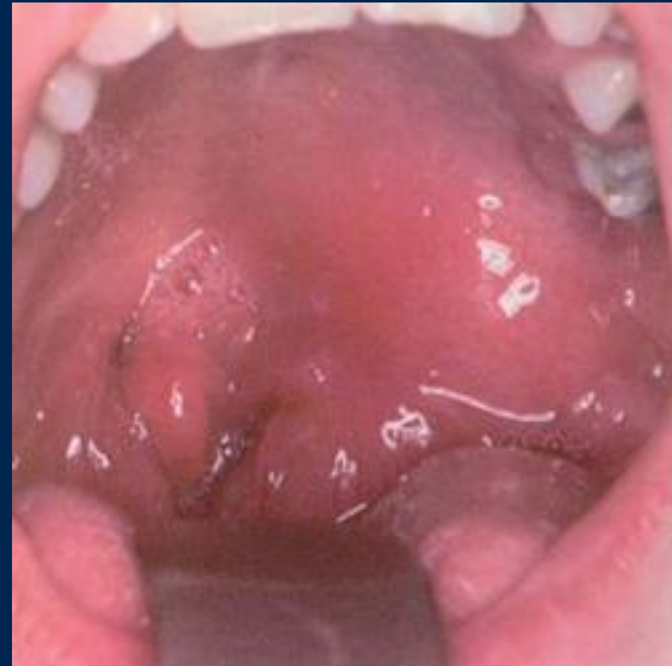
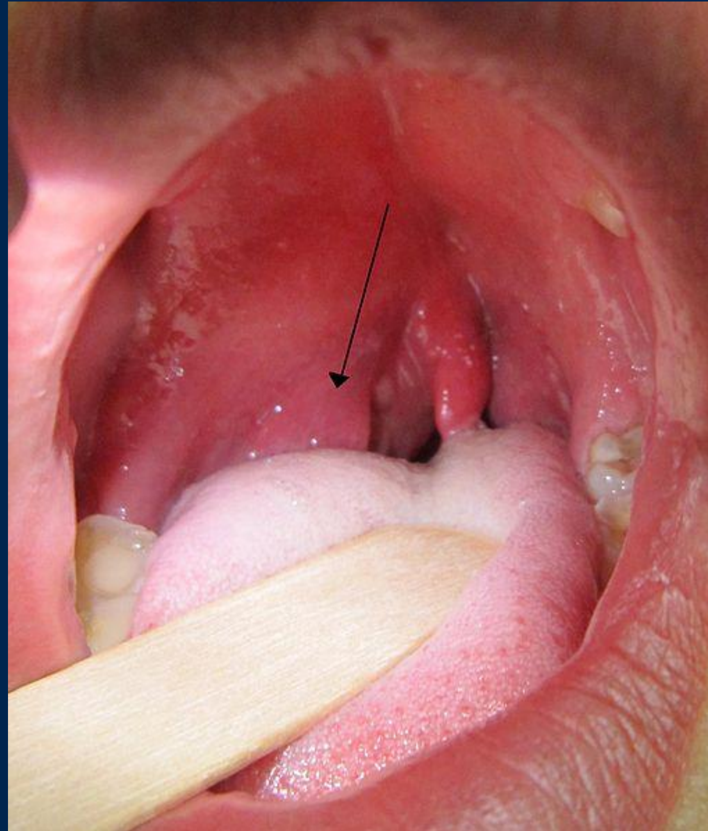
15 y.o. with unilateral sore throat

- Etiology?
- What now?



http://5minute consult.com

Peritonsillar Abscess



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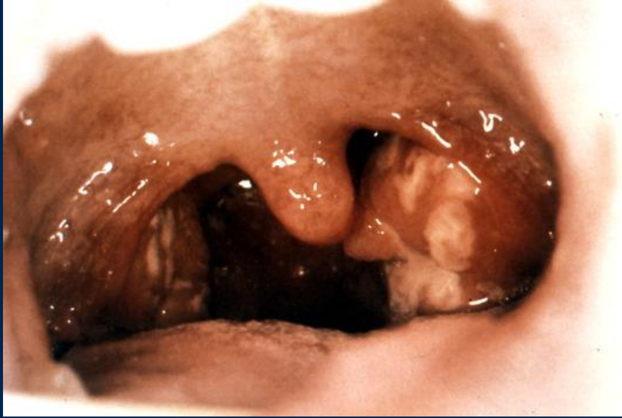
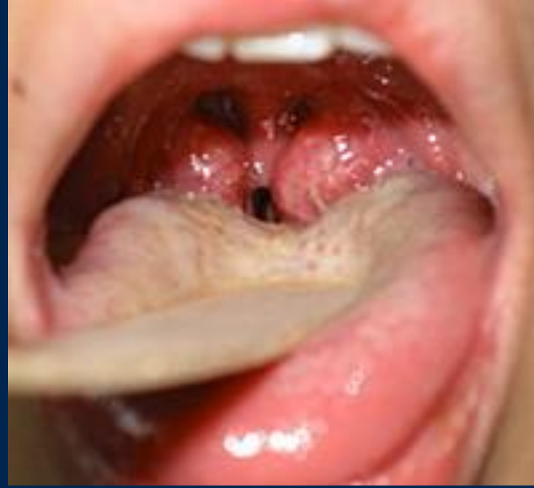
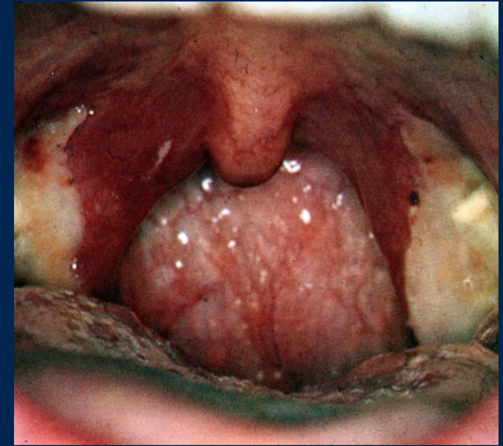
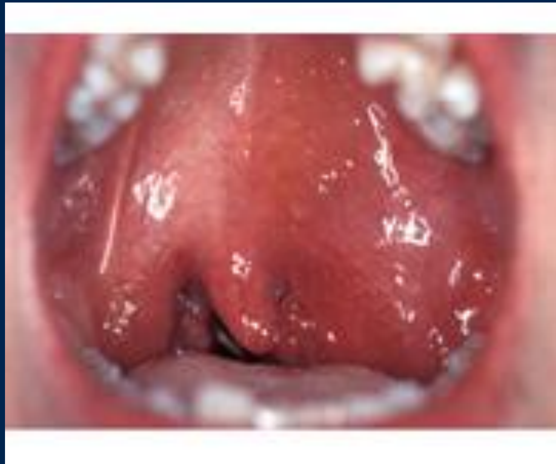
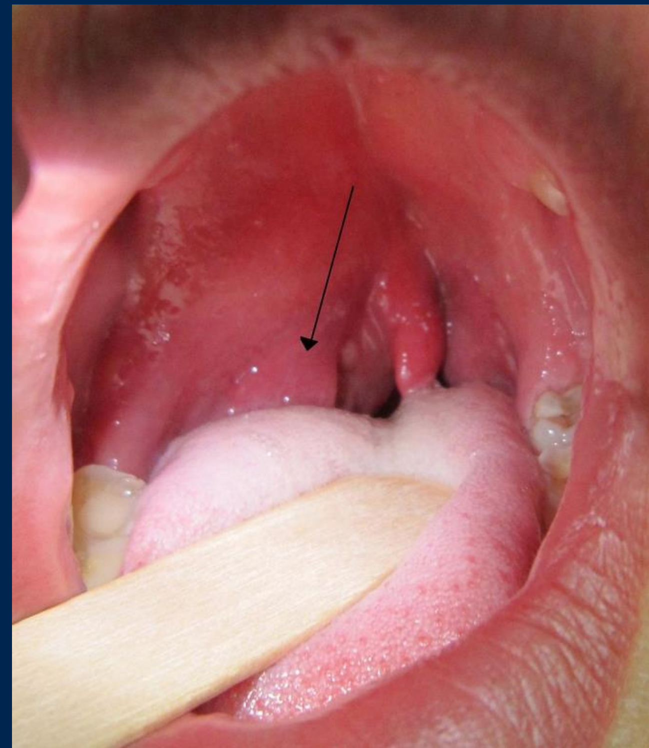






Peritonsillar Abscess

- Collection of purulence between tonsil and muscles surrounding the tonsil
- Tonsillar swelling
- Soft palate edema

Peritonsillar Abscess

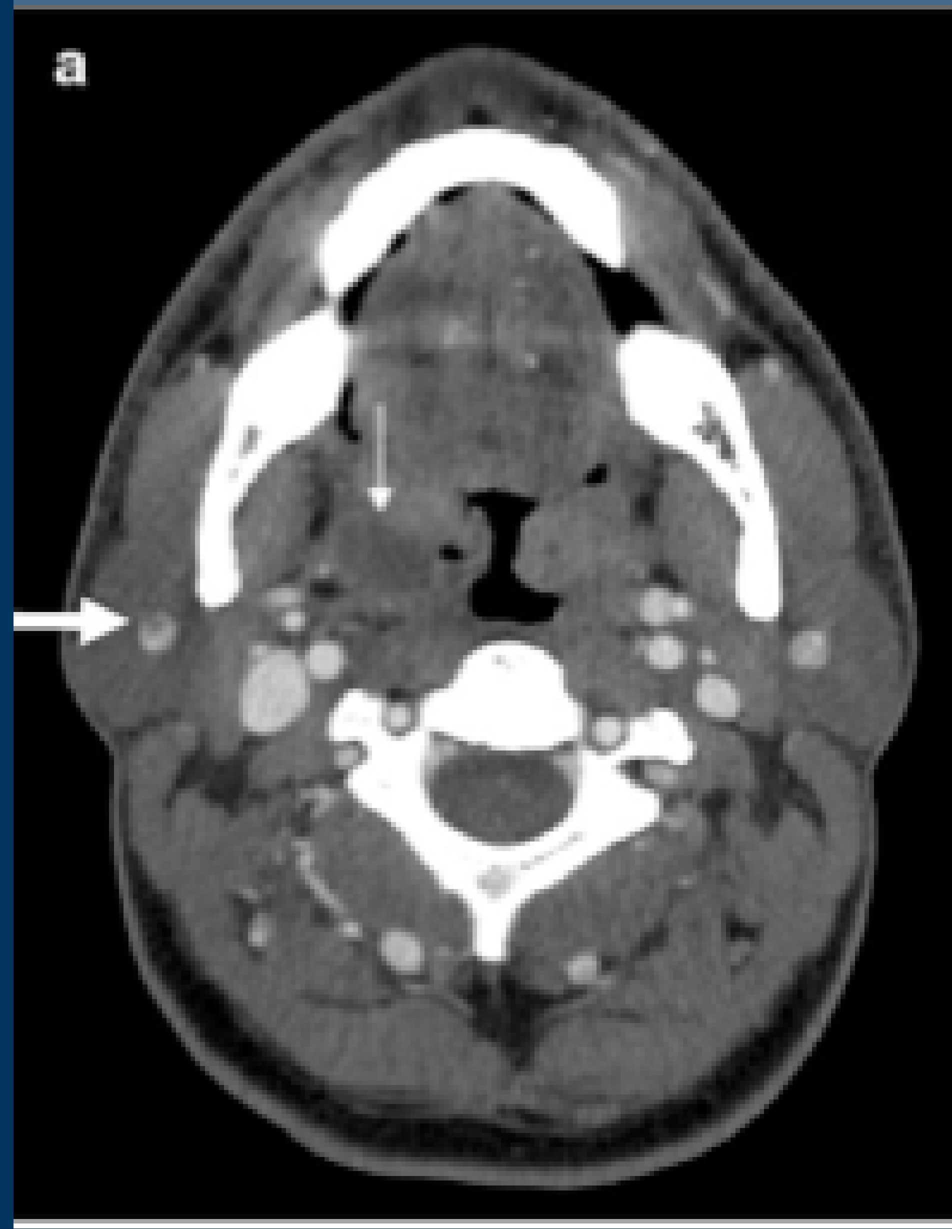
- Symptoms
  - Fever
  - Odynophagia
  - Trismus – key finding
  - Drooling
  - “Hot Potato” voice

Diagnosis

- Most common in late teens / early twenties
- Can be clinical
- Role of labs
  - Elevated CBC / CRP
- Role of imaging
  - CT scan helpful when unable to get a good exam (secondary to poor cooperation or trismus) – or when there is concern for disease process elsewhere

CT

- Usually not needed



- *CT from: Weeks DF et al Emerg Radiol 2010*

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Treatment

- Antibiotics – Ampicillin / sulbactam (1st choice) OR Clindamycin (if PCN allergy)
- Incision and drainage
  - OR vs bedside
  - Bedside
    - Supplies: Hurricane spray, lidocaine, scalpel, hemostat, culture swabs, suction, cold water, spit bucket

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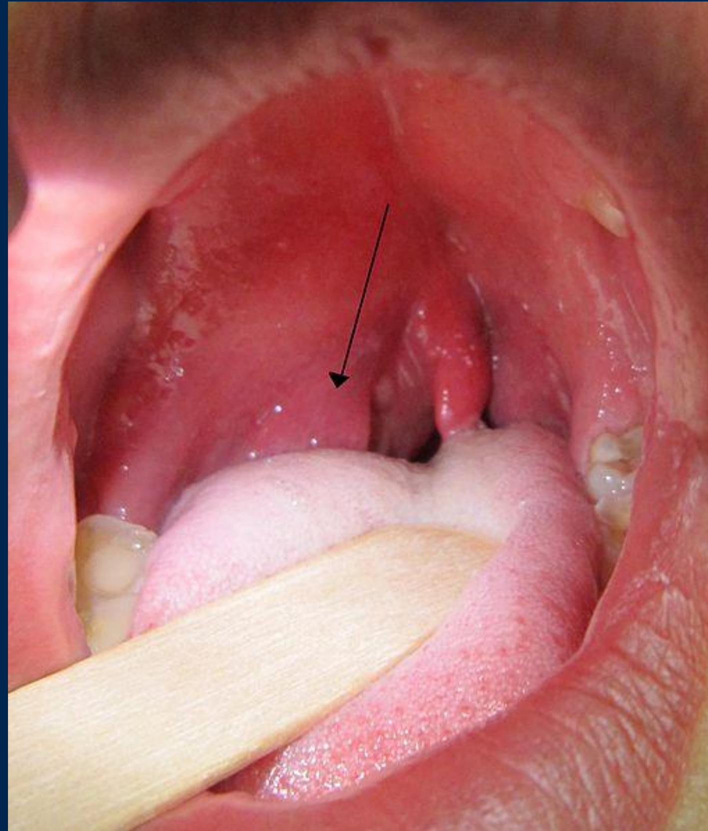
Peritonsillar Abscess



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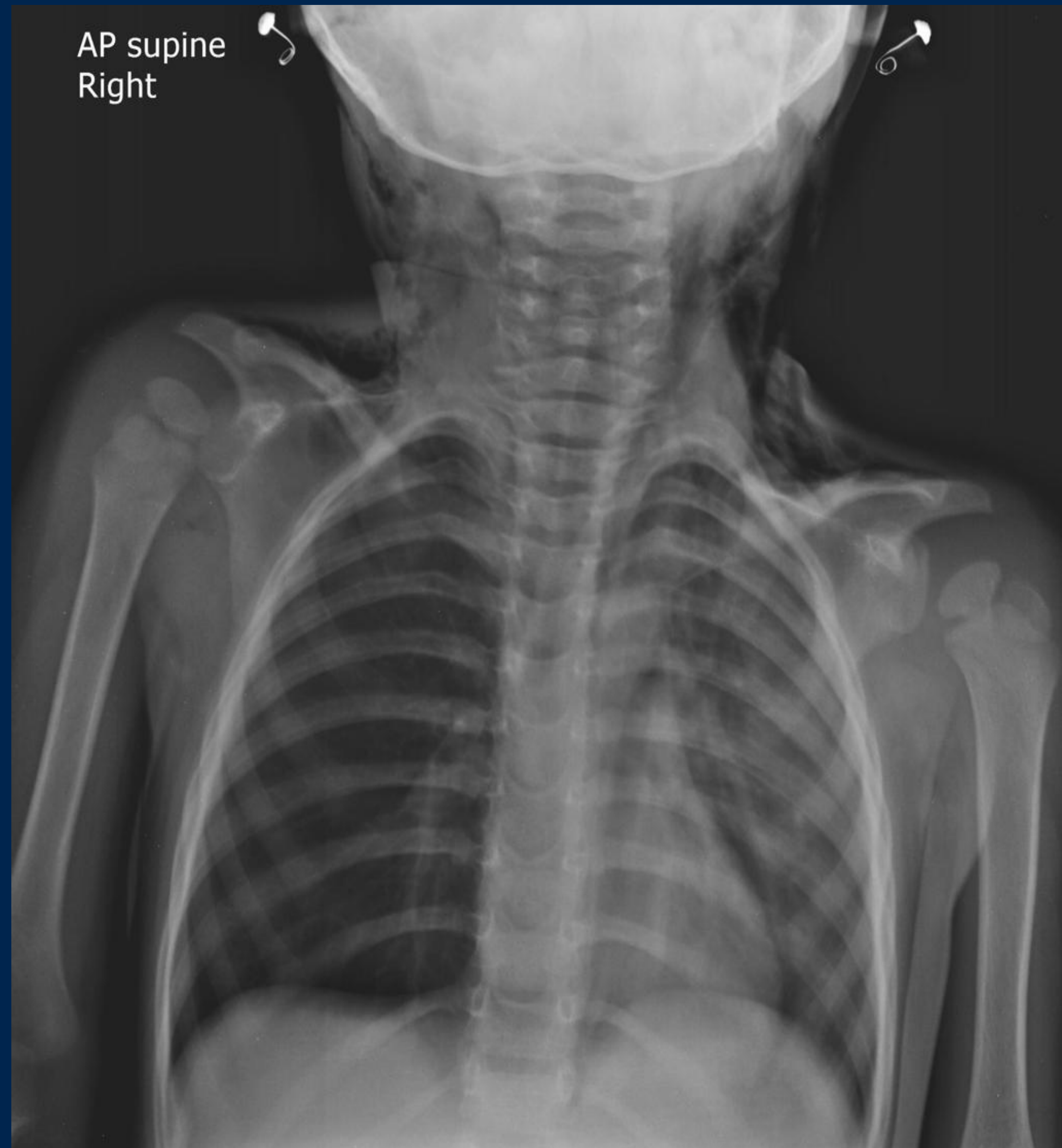
22 m.o. female

- Eating Cracker Jacks with big sisters when she suddenly started coughing and then developed noisy breathing

Radiology

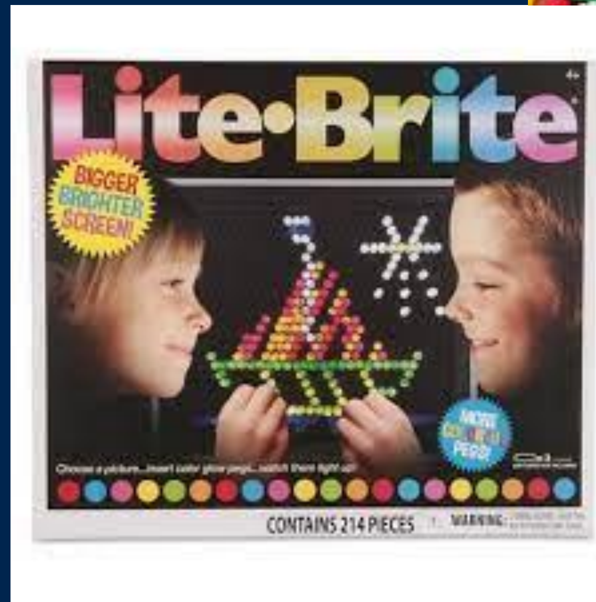
- Image on inspiration and expiration



Airway Foreign Bodies: Course

- "Choking" episode
- FB settles in the lungs – if not a total obstruction **latent period**
- Signs and symptoms:
  - Wheezing – Cough - Unilateral Decreased Breath Sounds – Stridor – Fever - Dyspnea

Common Airway Foreign Bodies



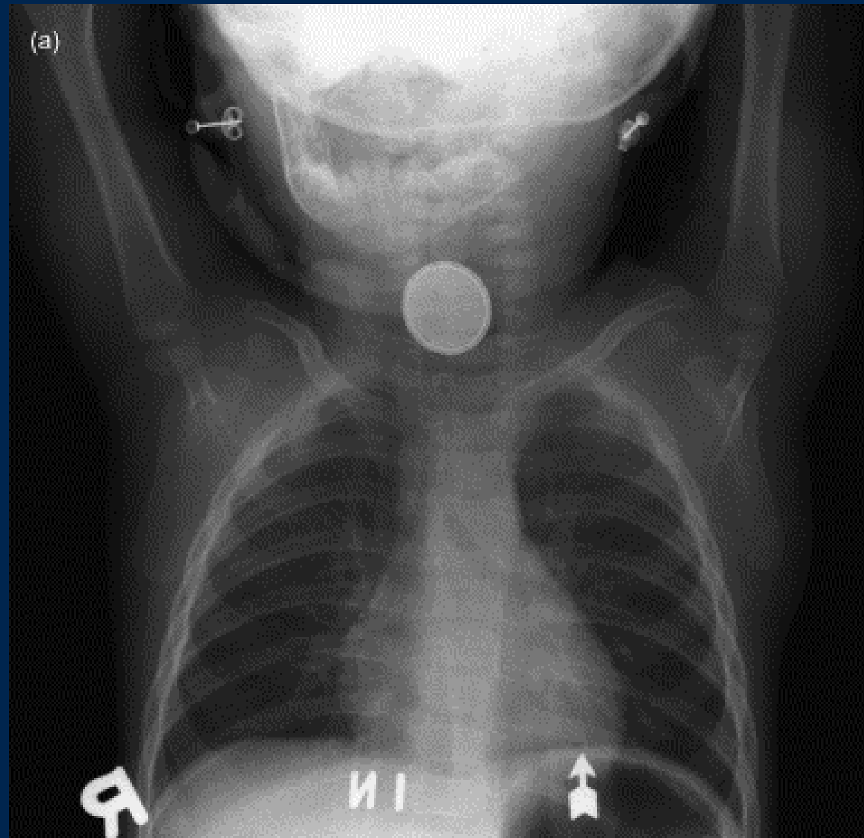
Airway Foreign Bodies: Course

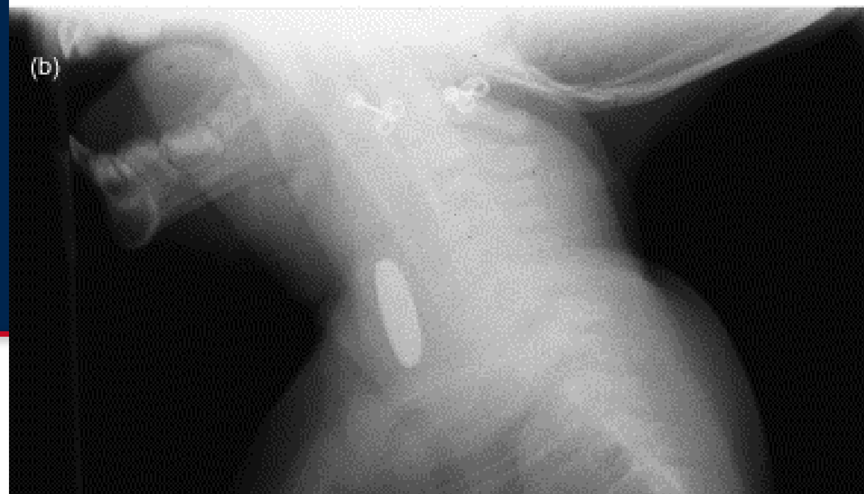
- When to do a bronchoscopy?
  - History of choking spell + 1 other thing (wheezing, asymmetric lung exam, cough, abnormal x rays)
  - Sudden onset asthma
  - Recurrent unilateral pneumonia
  - Persistent unilateral wheezing

1 year old male

- Increase in drooling over the past two days
- Occasional cough
- Difficulty swallowing when eating
- Youngest of three

Diagnosis?





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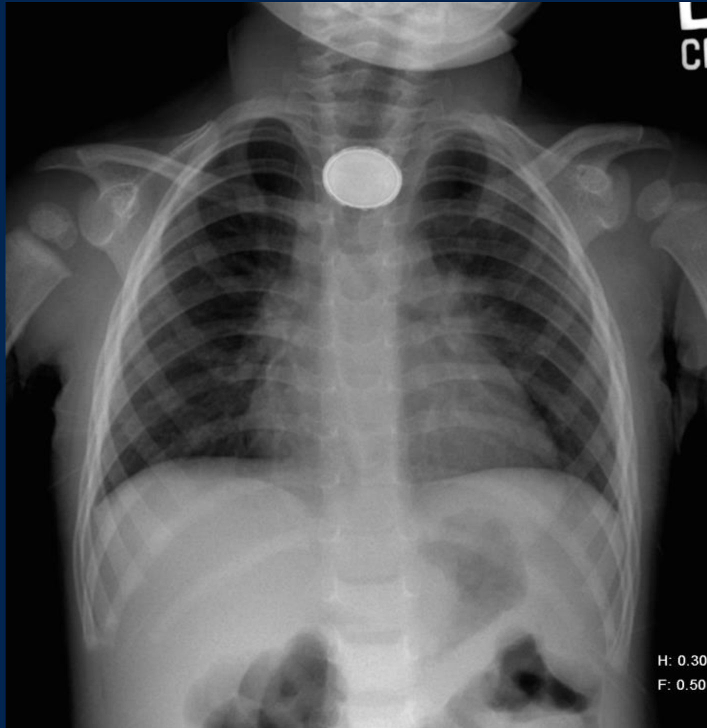
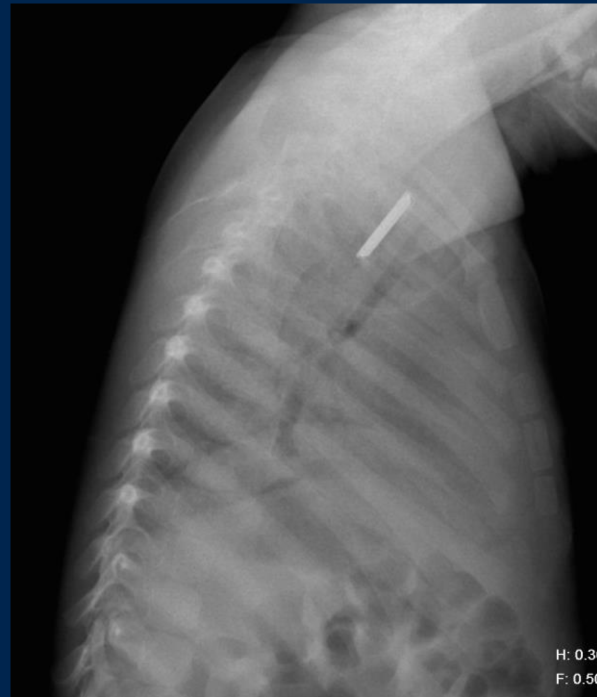
Esophageal foreign body





THE Laryngoscope FOUNDED IN 1896

Bronchoesophagology

pH-neutralizing esophageal irrigations as a novel mitigation strategy for button battery injury

Rachel R. Anfang MA, Kris R. Jatana MD, Rebecca L. Linn MD, Keith Rhoades BS, Jared Fry BS, Ian N. Jacobs MD

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Consider giving Honey, Carafate immediately

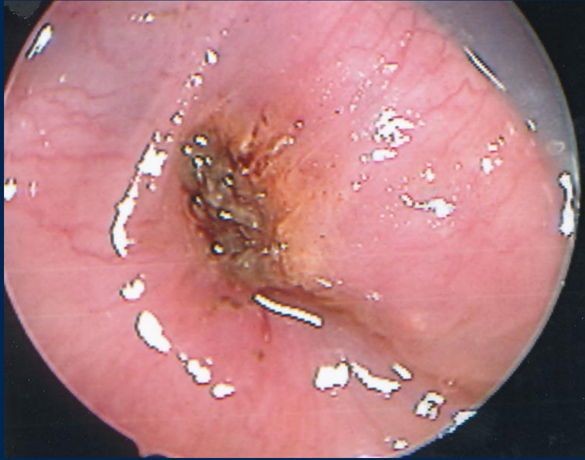
POISON CONTROL

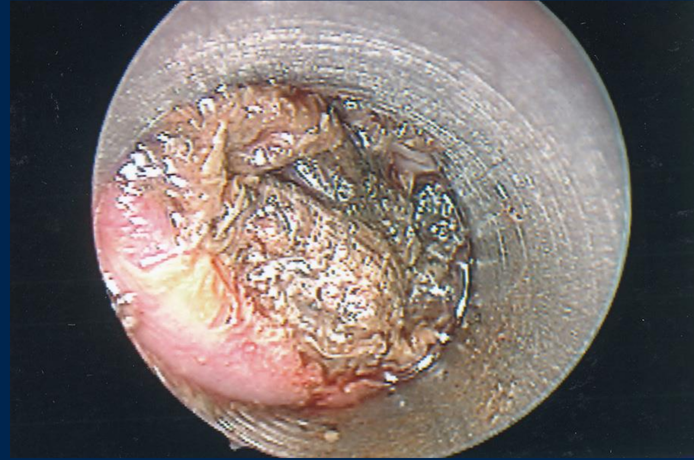
Esophageal battery protocol

- 3000 BB ingestions/year
  - 2006-2017: 6 fold increase in severe injuries; 12 fold increase in mortality
- **<u>Damage occurs in as little as 2 hours</u>**

Texas Children's Hospital
Baylor College of Medicine

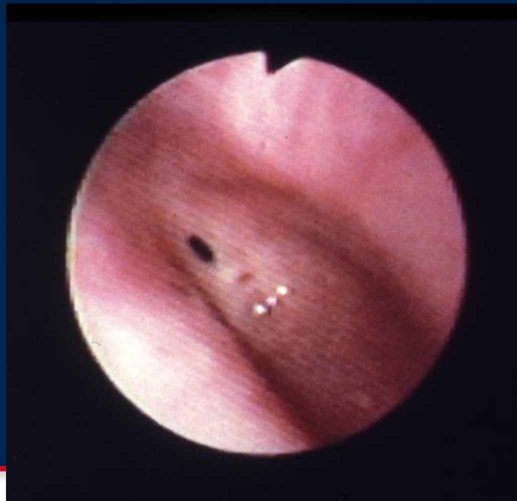
Esophagoscopy

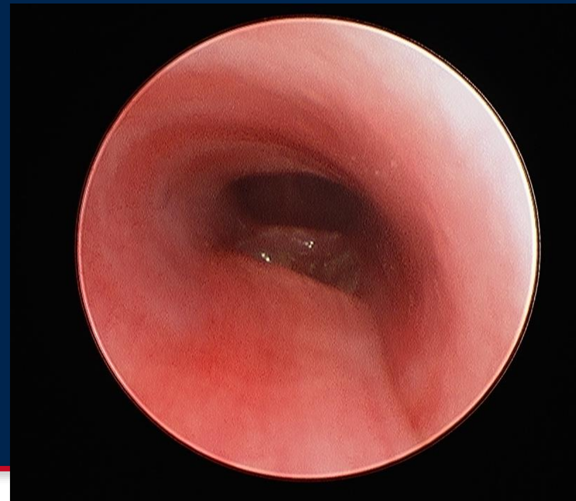


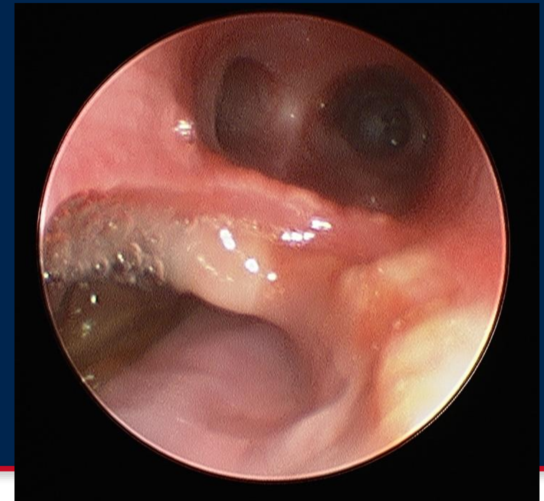


Complications following battery removal

- Esophageal stricture
- Vocal fold paralysis
- Tracheo-esophageal fistula
- Catastrophic hemorrhage



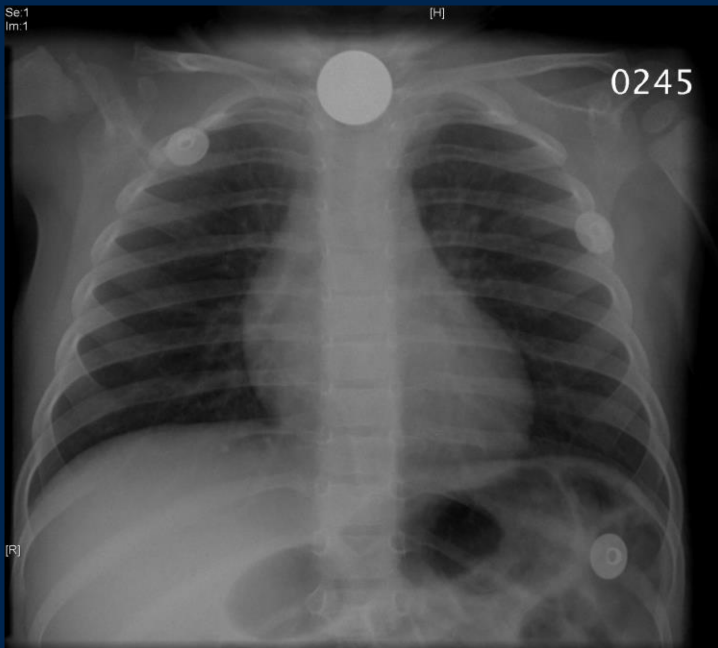


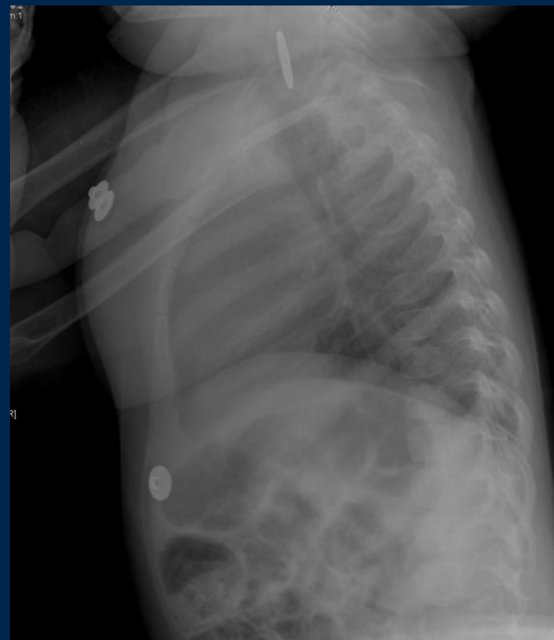


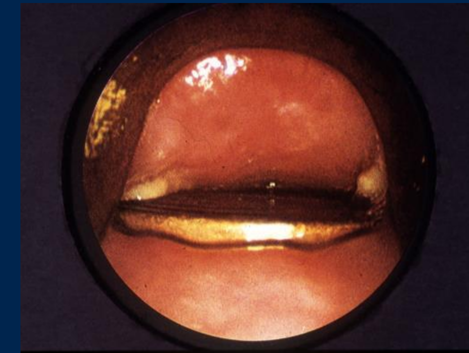
Button Batteries

- A true emergency when stuck anywhere
- Serious sequelae include:
  - Esophagus - esophageal burn, perforation, fistula
  - Nose - damage to nose, nasal septum
  - Ear - TM perforation, EAC burn

Classic coin
5 y.o. pretending to be a drink machine







Imaging

- Always get two view Xrays – AP and Lateral
- **Remember – not all ingested foreign bodies are radiopaque**

Ear

- Often asymptomatic
- Beads/crayons
- Putty (ear plugs)
- Bugs/roaches

Foreign body in nose

- Clinical presentation
  - Acute presentation – witnessed insertion
  - Delayed - Foul smelling unilateral nasal discharge
    - Foul smelling nasal drainage is foreign body until proven otherwise. Sinusitis doesn't stink!
  - Usually impacted between the anterior septum and inferior turbinate

Foreign body in ear and nose

- Preference – removal using ENT microscope, suction and probe
- In ear - easy to damage EAC and TM without the proper equipment
- Can try with headlight and probe / forceps – don't push the object farther in accidentally

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Questions?

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