Otitis

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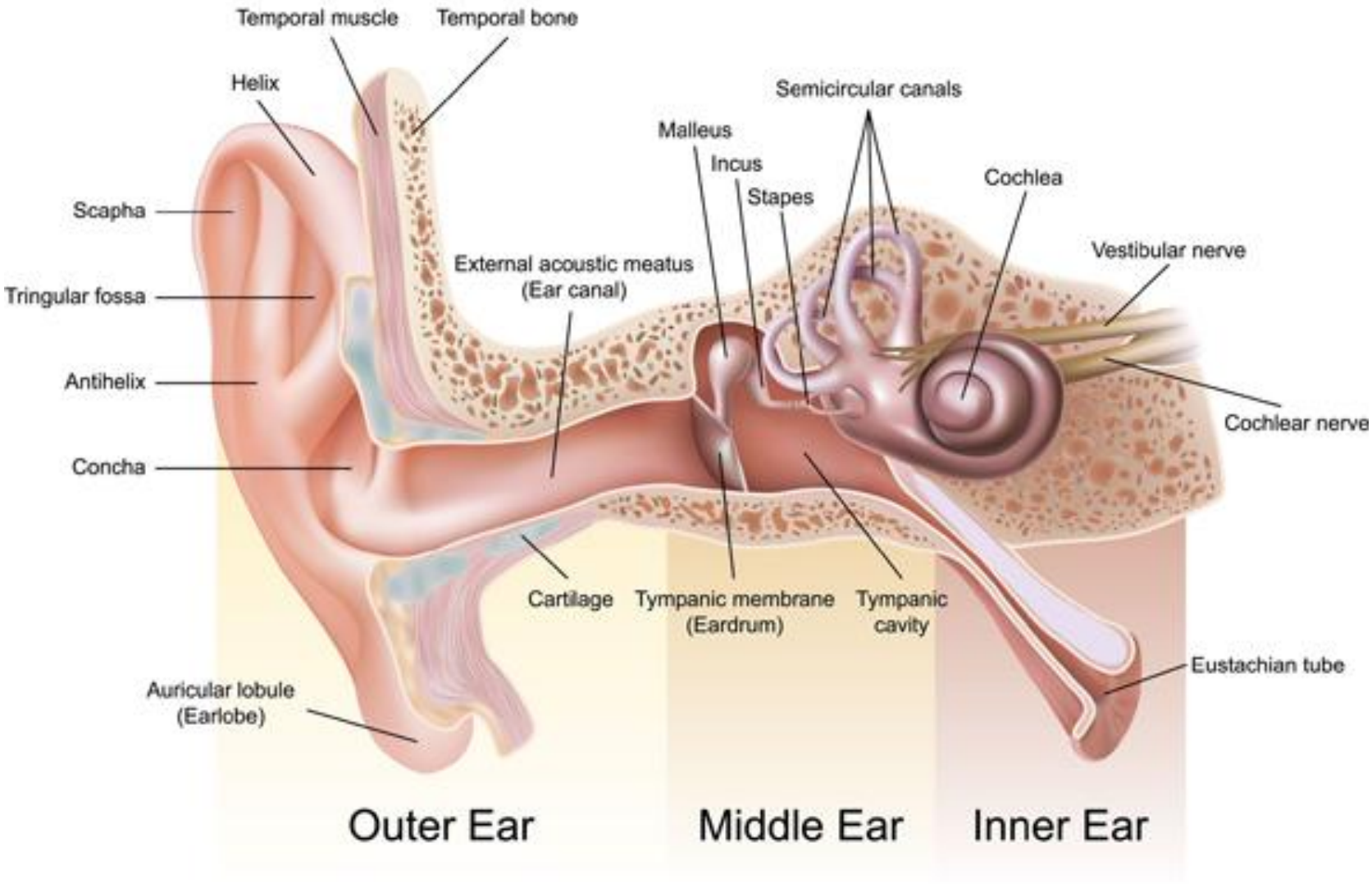
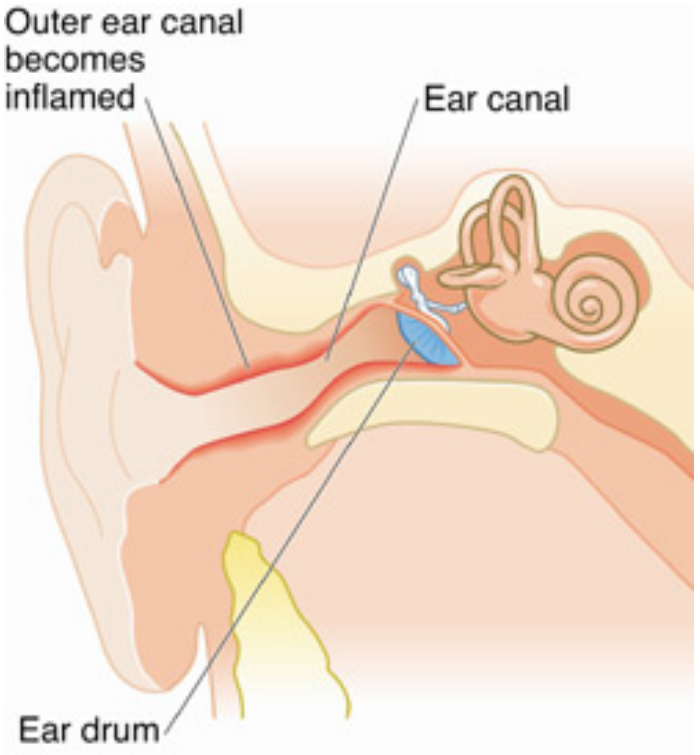
Summer 2015


Temporal muscle
Temporal bone
Helix
Semicircular canals
Malleus
Incus
Stapes
Cochlea
Scapha
External acoustic meatus
(Ear canal)
Vestibular nerve
Tringular fossa
Antihelix
Cochlear nerve
Concha
Cartilage
Tympanic membrane
(Eardrum)
Tympanic
cavity
Eustachian tube
Auricular lobule
(Earlobe)
Outer Ear
Middle Ear
Inner Ear

Otitis externa

- aka Swimmer's Ear
- History
  - swimming, jacuzzi, ear wax
  - Acute onset of ear pain, itching, drainage
- Pathogens:
  - Staph spp
  - Pseudomonas
  - P. acnes
  - others...
- DDx:
  - fungal
  - allergic
  - chronic middle infection
  - psoriasis
  - cancer



1. Gougen, *et al*. External otitis: Pathogenesis, clinical features and diagnosis. *Up To Date*. Accessed June 2015.

Otitis externa

- Diagnosis:

Rapid onset

Symptoms of inflammation

Signs of inflammation

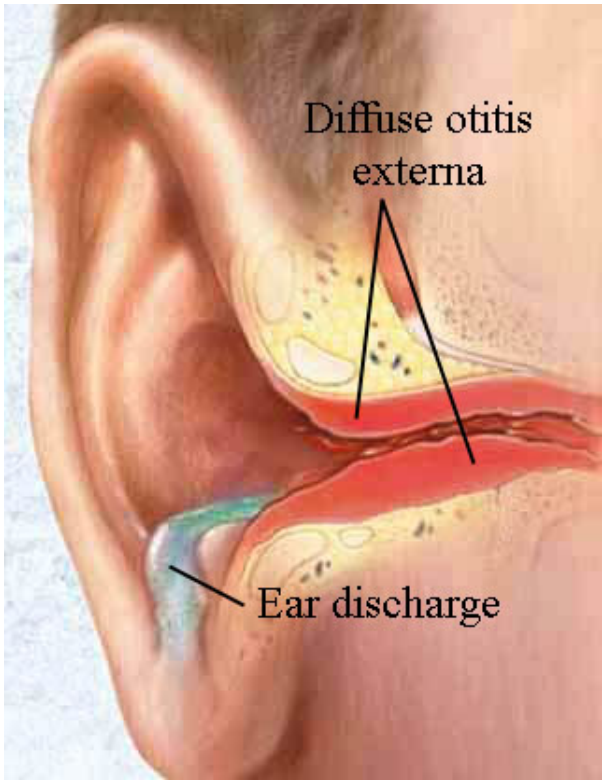
Table 1. Elements of the diagnosis of diffuse acute otitis externa.

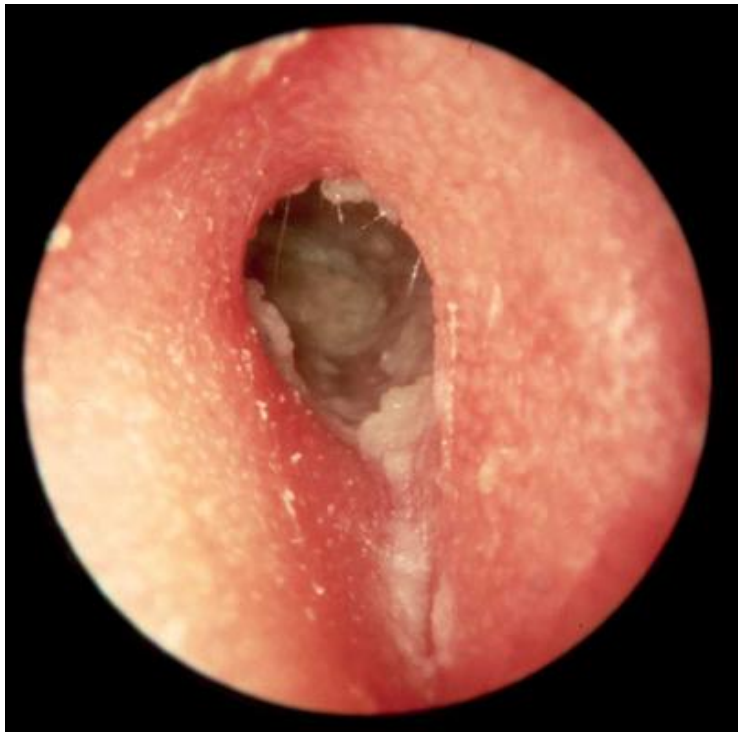
1. Rapid onset (generally within 48 hours) in the past 3 weeks, AND…
2. Symptoms of ear canal inflammation, which include: otalgia (often severe), itching, or fullness, WITH OR WITHOUT hearing loss or jaw pain,[a] AND…
3. Signs of ear canal inflammation, which include: tenderness of the tragus, pinna, or both OR diffuse ear canal edema, erythema, or both WITH OR WITHOUT otorrhea, regional lymphadenitis, tympanic membrane erythema, or cellulitis of the pinna and adjacent skin

[a]Pain in the ear canal and temporomandibular joint region intensified by jaw motion.

1. Rosenfeld, *et al.* Clinical Practice Guideline: Acute Otitis Externa. *Otolaryngol Head Neck Surg*. 2014, Vol150 (IS) S1-S24.

Otitis externa





Otitis externa

- Treatment:
  - ciprofloxacin-dexamethasone (Ciprodex)
  - polymixin B-neomycin-hydrocortisone (Corticosporin otic)
  - norfloxacin
  - ofloxacin
- Oral antibiotics for otitis externa
  - Rarely indicated
  - Only severe cases, refractory to topical treatment
  - Discuss case with physician

1. Gougen, *et al*. External otitis: Treatment. *Up To Date*. Accessed June 2015.

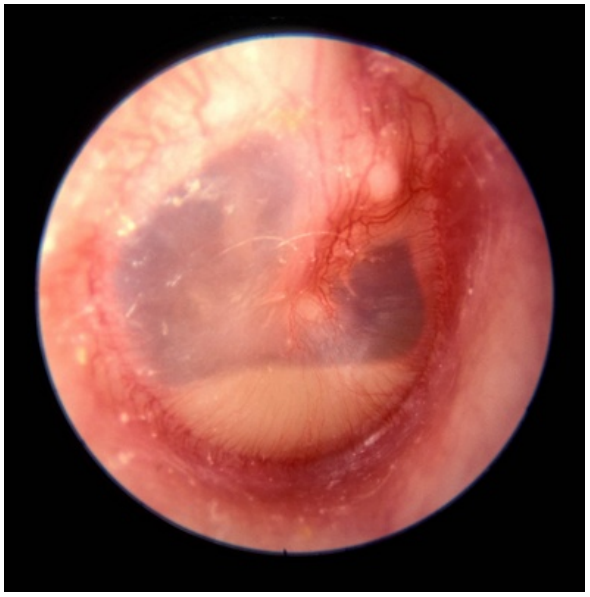
No Q-tips in the canal

Use of Q-tips → removal of wax → dry/irritated canal → doorway for bacteria, and itchy skin

“Otitis media”

Acute otitis media

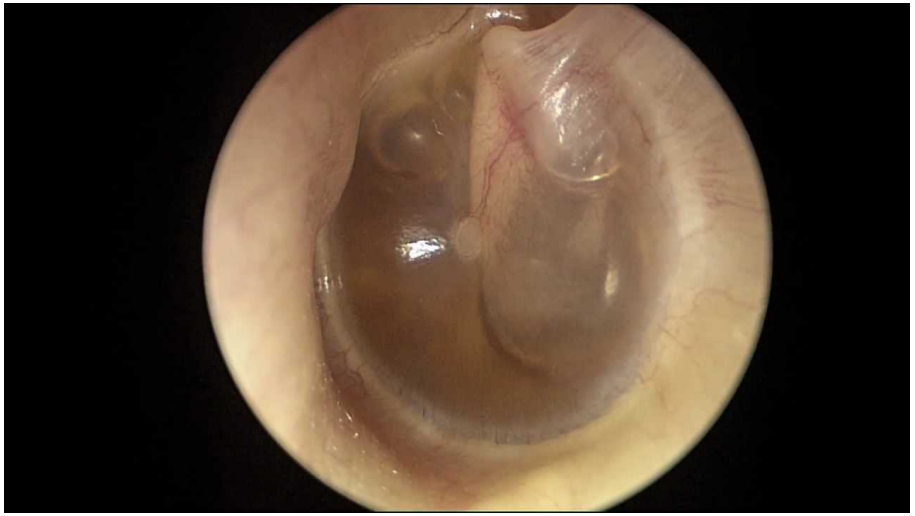
- Infection of middle ear
- acute onset of signs and symptoms
- *with* middle ear inflammation

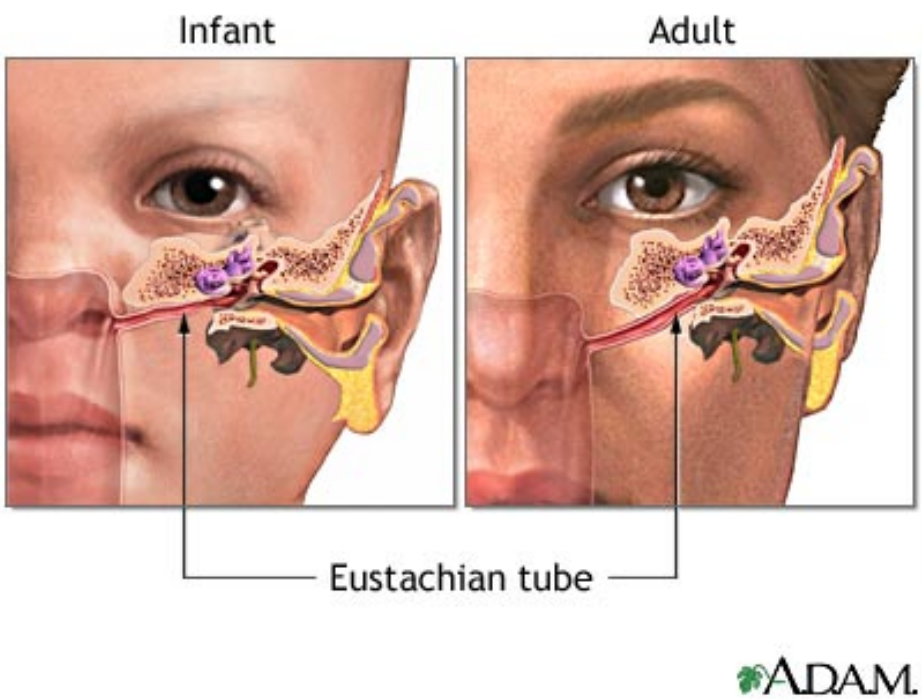


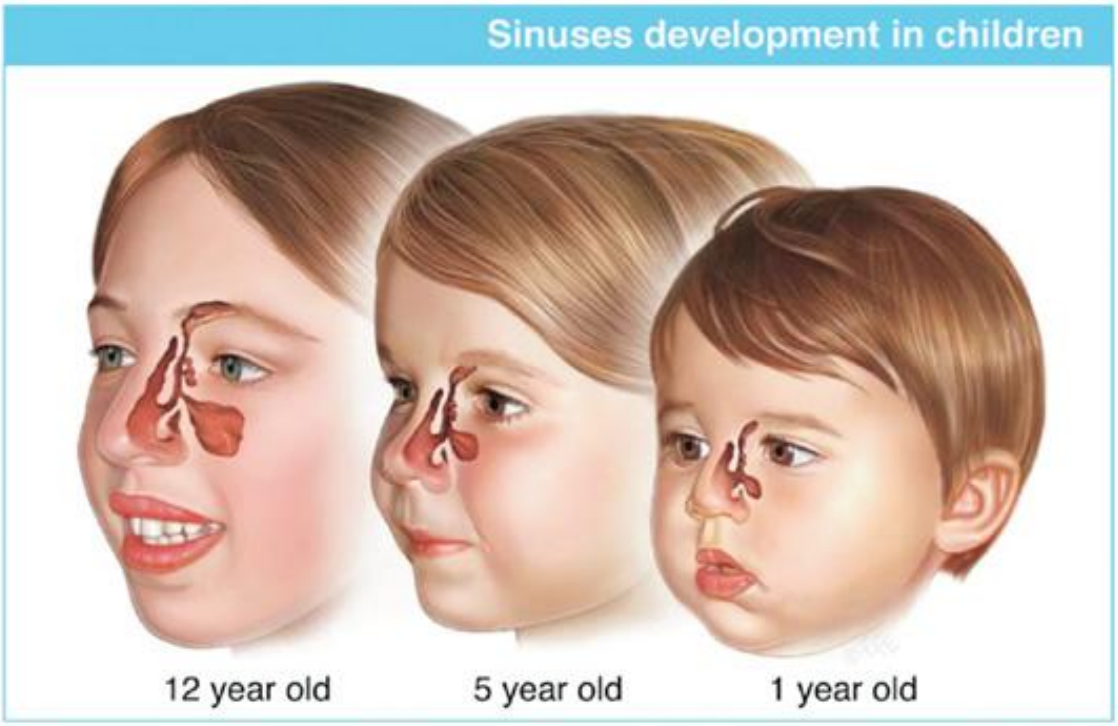
vs

Otitis media with effusion

- middle ear effusion
- *without* inflammation




Infant
Adult
Eustachian tube
A.D.A.M.


Sinuses development in children
12 year old
5 year old
1 year old

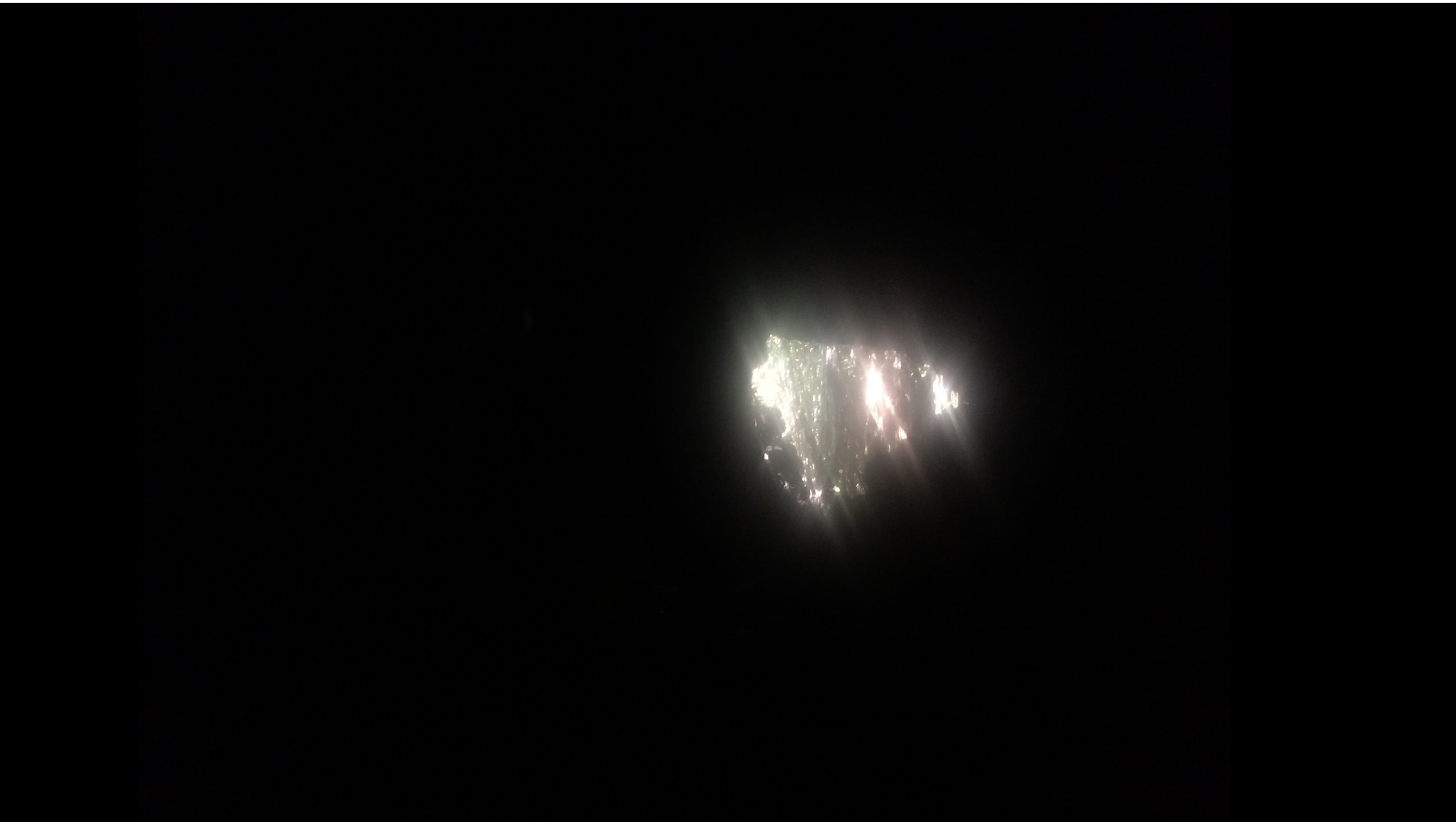
History

Acute Otitis Media (AOM)

- Symptoms of inflammation
  - Otalgia (earache)
  - Fever

Otitis Media with Effusion (OME)

- Typically preceded by URI, allergic, reflux, etc.
- Minimal symptoms caused by OME.
- Symptoms typically related to preceding cause



Get a good look

Snuggle up with mom

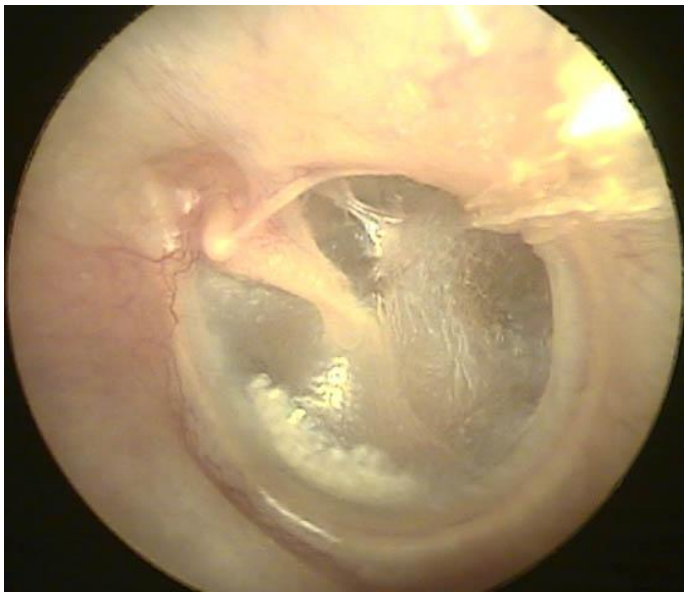
Firm surface opposite side of head (eg mom's shoulder)

Grasp pinna, elevate superior and posterior gently

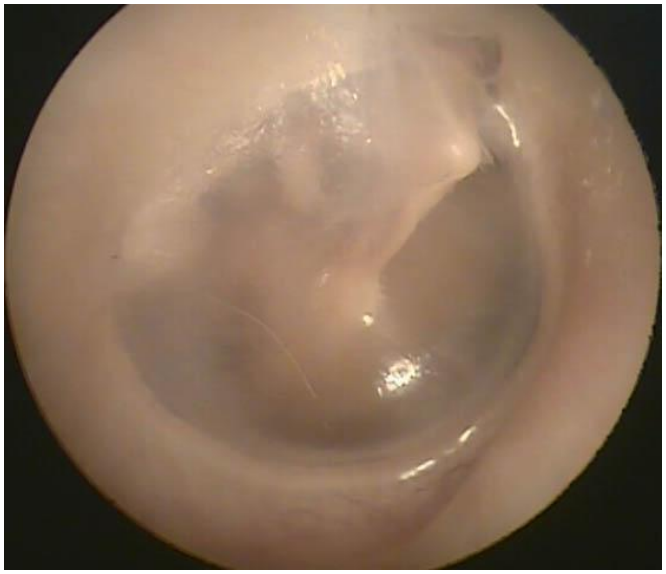
Rest fingers or heel of hand on infant's head


Default Setting
Focus / Zoom Adjustable
Tip Grip accepts both disposable & reusable ear specula.
Throat Illuminator
Optional Insufflation Bulb
Welch Allyn
CE

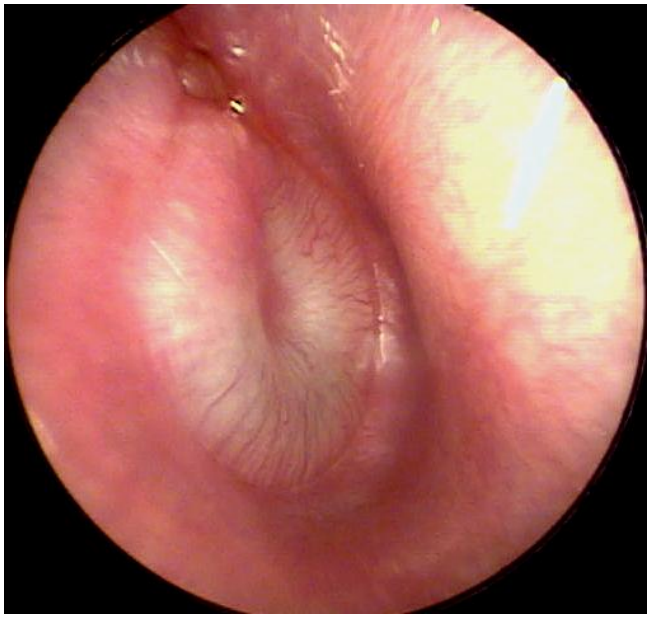
Exam: position



Retracted

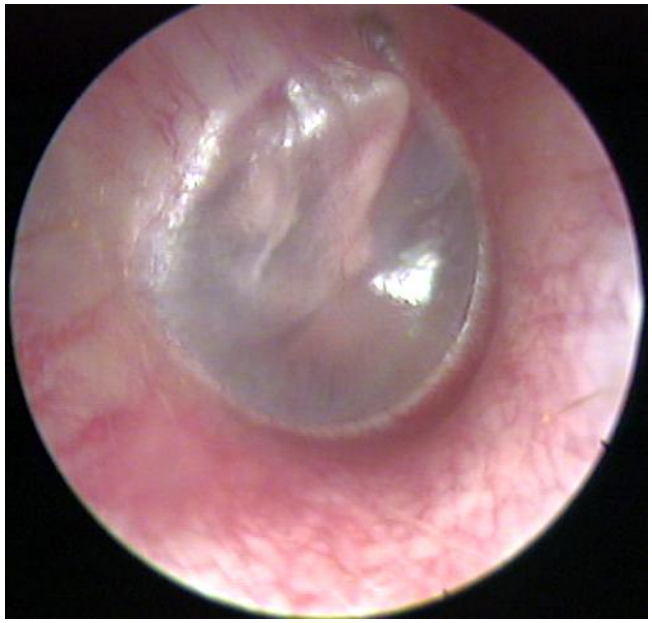


Normal

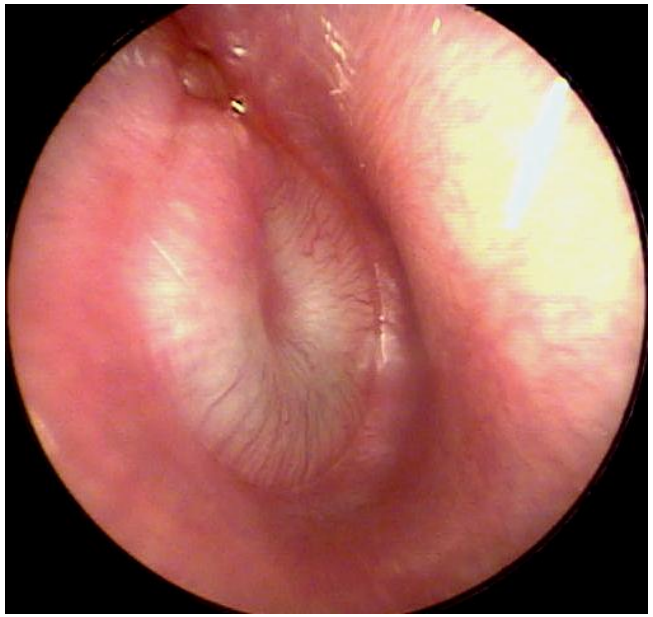


Bulging

Exam: translucency



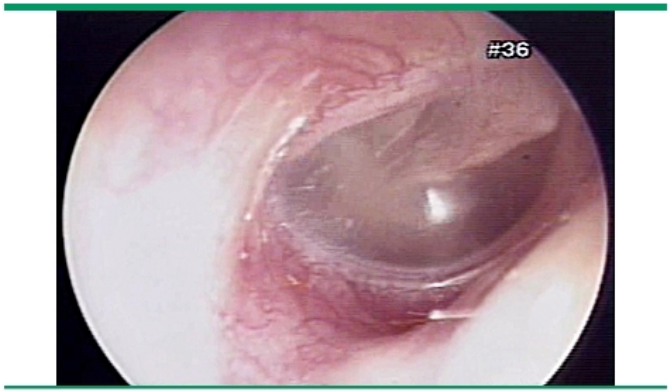
Clear



Pus

Exam: pneumatic otoscopy

Normal tympanic membrane mobility

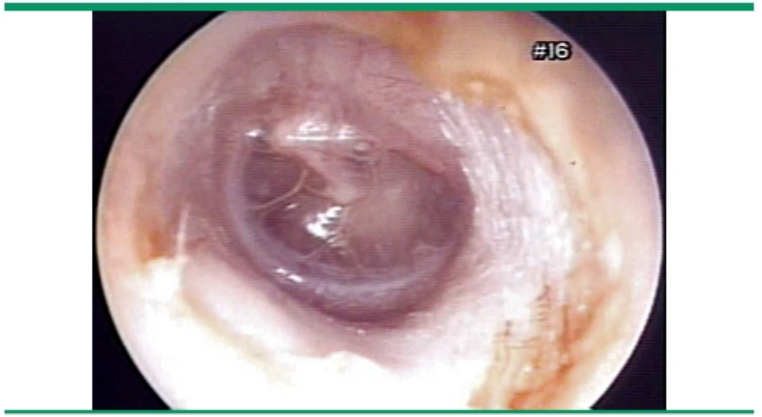


A normal tympanic membrane moves briskly in response to both positive and negative pressure. A good seal between the speculum and the external auditory canal is essential.

Courtesy of Ellen R Wald, MD.

[Normal]

Tympanic membrane with impaired mobility



A maximally retracted tympanic membrane may be unable to move away from the observer with positive pressure.

[Abnormal]

1. Gougen, *et al*. Acute Otitis Media in Children: Treatment. *Up To Date*. Accessed July 2015.

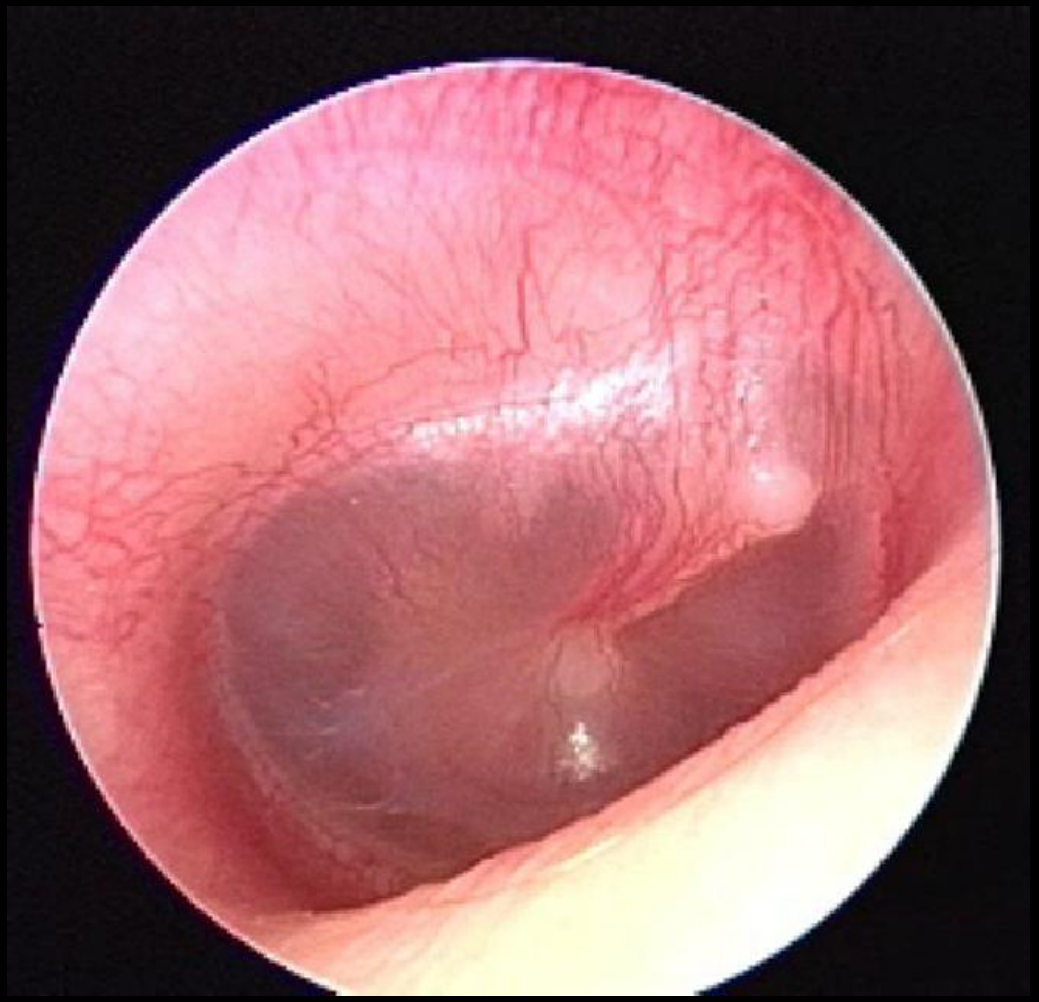
History

- ➔ 2-year-old girl
- ➔ Sick for 4 days
- ➔ Tm 101.7F
- ➔ Cough
- ➔ Sore throat
- ➔ Brother sick too
- ➔ Right ear pain

Exam

- ★ Screaming kid
- ★ Red TM
- ★ Decreased mobility

Diagnosis?



History
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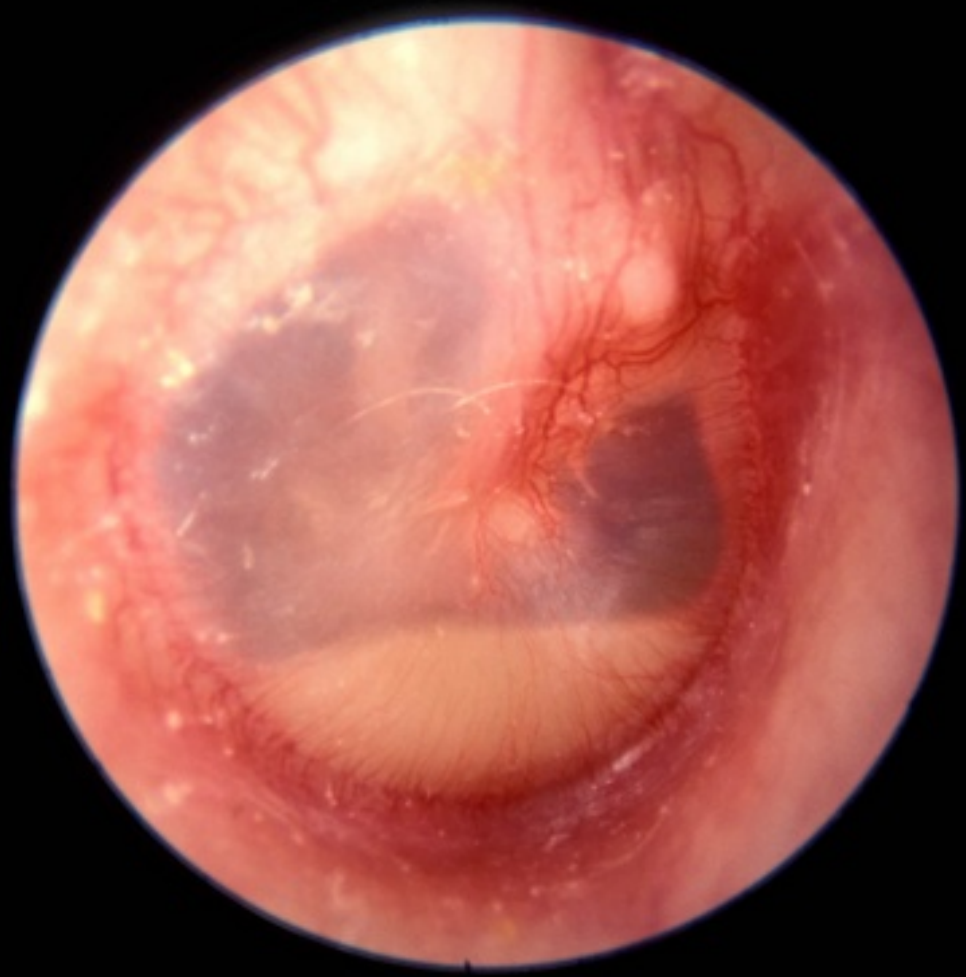
- ➔ Cough
- ➔ Sore throat
- ➔ Brother sick too
- ➔ Right ear pain

Exam
- ★ Screaming kid
- ★ Red TM
- ★ Decreased mobility
- ★ Air/fluid layer

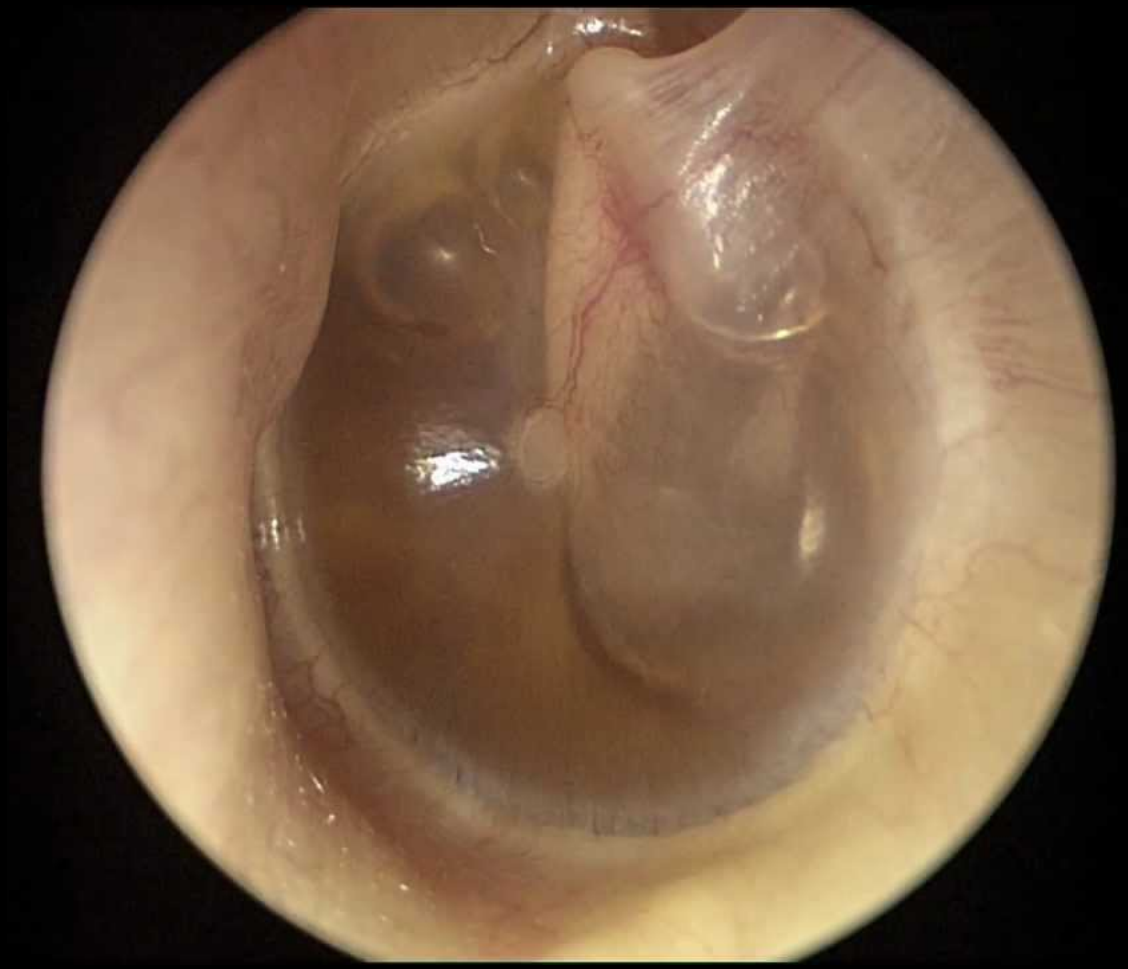
Diagnosis?



History
- ➔ 2-year-old girl
- ➔ Had an ear infection 3 weeks ago
- ➔ Afebrile
- ➔ No sick contacts

Exam
- ★ Decreased mobility
- ★ Air/fluid layer

Diagnosis?



AOM: Treatment

Symptomatic treatments to consider for all cases

- Otalgia treatments
  - Consider for all patients with earache
    - Ibuprofen
    - Acetaminophen
    - Auralgan (antipyrene & benzocaine)
- Nasal saline drops/spray

AOM: Microbiology

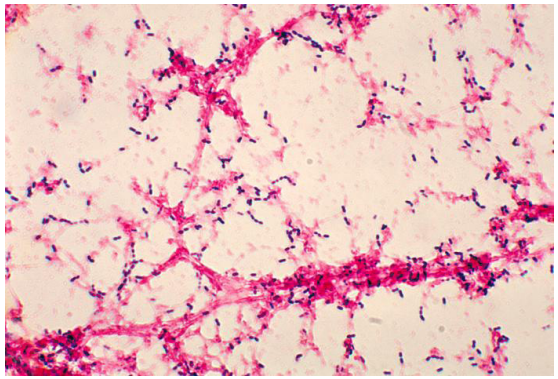
Top 3 bacterial culprets:

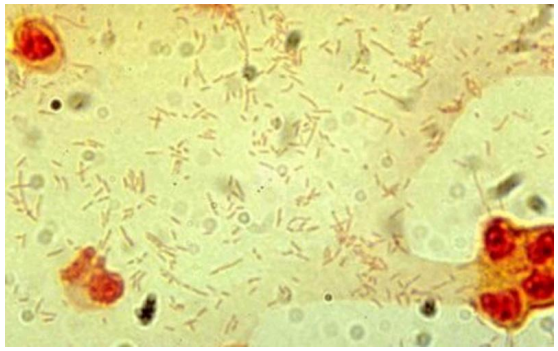
1. *Streptococcus pneumoniae* 31%
2. non-typeable *Haemophilus influenzae* (H.flu) 28%
3. *Moraxella catarrhalis* 14%

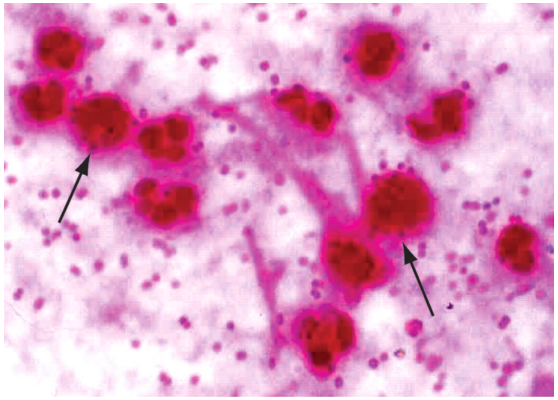
73%

Others:

- *Group A Strep*
- *Staphloycoccus aureus*
- *Mycoplasma*
- *Chlamydia*
- *Group B Strep*
- viruses







1. Klein, *et al*. Acute otitis media in children: Epidemiology, microbiology, clinical manifestations, and complications. *Up To Date*. Accessed Sept 2015.

AOM: Treatment

TABLE 4 Recommendations for Initial Management for Uncomplicated AOM[a]

Age	Otorrhea With AOM[a]	Unilateral or Bilateral AOM[a] With Severe Symptoms[b]	Bilateral AOM[a] Without Otorrhea	Unilateral AOM[a] Without Otorrhea
6 mo to 2 y	Antibiotic therapy	Antibiotic therapy	Antibiotic therapy	Antibiotic therapy or additional observation
≥2 y	Antibiotic therapy	Antibiotic therapy	Antibiotic therapy or additional observation	Antibiotic therapy or additional observation[c]

[a] Applies only to children with well-documented AOM with high certainty of diagnosis (see Diagnosis section).

[b] A toxic-appearing child, persistent otalgia more than 48 h, temperature ≥39°C (102.2°F) in the past 48 h, or if there is uncertain access to follow-up after the visit.

[c] This plan of initial management provides an opportunity for shared decision-making with the child's family for those categories appropriate for additional observation. If observation is offered, a mechanism must be in place to ensure follow-up and begin antibiotics if the child worsens or fails to improve within 48 to 72 h of AOM onset.

1. Lieberthal, et al. The Diagnosis and Management of Acute Otitis Media. Pediatrics. Vol 131; No 3; March 2013.

AOM: Treatment

Treatment	Observation
< 6 months	> 2 years
and/or	and
Toxic appearing	Non-toxic

1. Gougen, *et al*. Acute Otitis Media in Children: Treatment. *Up To Date*. Accessed Sept 2015.
2. Lieberthal, et al. The Diagnosis and Management of Acute Otitis Media. Pediatrics. Vol 131; No 3; March 2013.

AOM: Treatment

TABLE 5 Recommended Antibiotics for (Initial or Delayed) Treatment and for Patients Who Have Failed Initial Antibiotic Treatment

Initial Immediate or Delayed Antibiotic Treatment		Antibiotic Treatment After 48–72 h of Failure of Initial Antibiotic Treatment	
Recommended First-line Treatment	Alternative Treatment (if Penicillin Allergy)	Recommended First-line Treatment	Alternative Treatment
Amoxicillin (80–90 mg/ kg per day in 2 divided doses)	Cefdinir (14 mg/kg per day in 1 or 2 doses)	Amoxicillin-clavulanate[a] (90 mg/kg per day of amoxicillin, with 6.4 mg/kg per day of clavulanate in 2 divided doses)	Ceftriaxone, 3 d Clindamycin (30–40 mg/kg per day in 3 divided doses), with or without third-generation cephalosporin
or	Cefuroxime (30 mg/kg per day in 2 divided doses)	or	Failure of second antibiotic
Amoxicillin-clavulanate[a] (90 mg/kg per day of amoxicillin, with 6.4 mg/kg per day of clavulanate [amoxicillin to clavulanate ratio, 14:1] in 2 divided doses)	Cefpodoxime (10 mg/kg per day in 2 divided doses)	Ceftriaxone (50 mg IM or IV for 3 d)	Clindamycin (30–40 mg/kg per day in 3 divided doses) plus third-generation cephalosporin
	Ceftriaxone (50 mg IM or IV per day for 1 or 3 d)		Tympanocentesis[b]
			Consult specialist[b]

IM, intramuscular; IV, intravenous.

[a] May be considered in patients who have received amoxicillin in the previous 30 d or who have the otitis-conjunctivitis syndrome.

[b] Perform tympanocentesis/drainage if skilled in the procedure, or seek a consultation from an otolaryngologist for tympanocentesis/drainage. If the tympanocentesis reveals multidrug-resistant bacteria, seek an infectious disease specialist consultation.

1. Lieberthal, et al. The Diagnosis and Management of Acute Otitis Media. Pediatrics. Vol 131; No 3; March 2013.

AOM: Treatment

- Antibiotics
  - 1st line: *high-dose* amoxicillin (90 mg/kg/day divided BID)
  - 2nd line: augmentin (more expensive, tastes bitter)
  - 3rd line: cephalosporins (cefdinir, cefuroxime)

- Where are azithromycin and clindamycin?
  - not preferred agents
  - poor coverage of H.flu
  - ⅓ of pneumococcus is resistant to these

- How about trimethoprim/sulfa?
  - Some pneumococcal resistance to TMP/SMX
  - Cannot be used with perforation (possible Strep pyogenes)

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