

Project: Ghana Emergency Medicine Collaborative

Document Title: Ear and Sinus Emergencies

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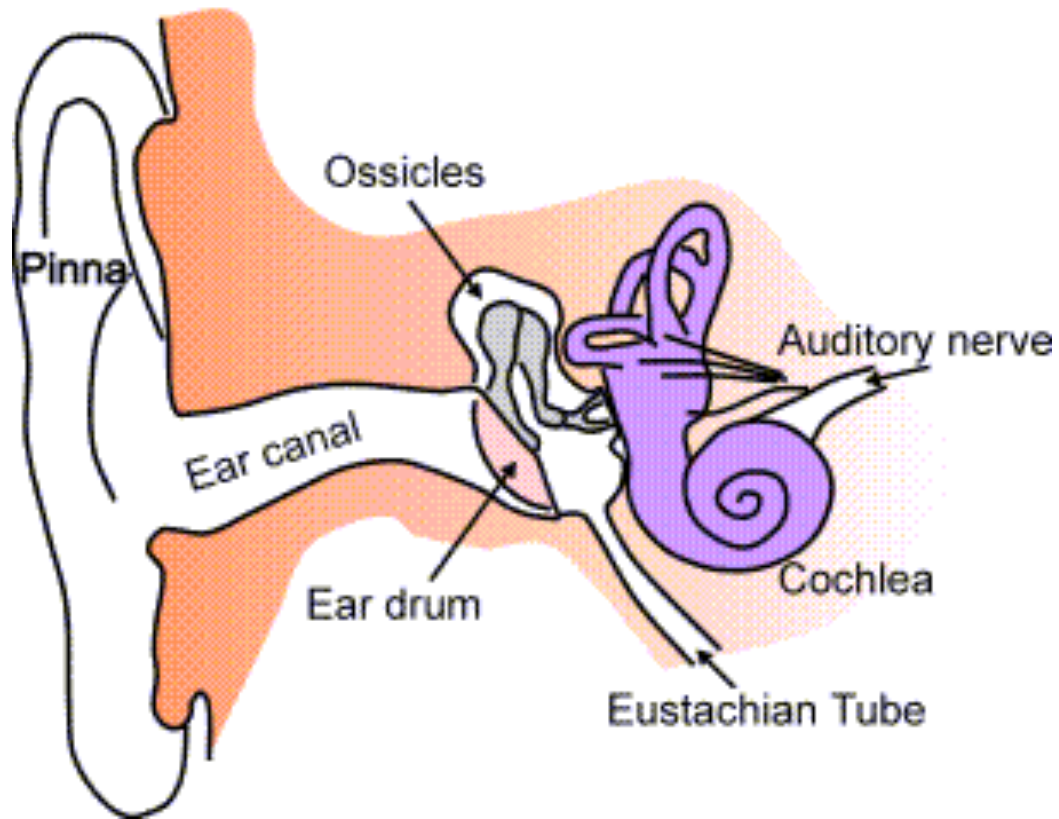
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Ear and Sinus Emergencies

- Objectives
 - Describe the evaluation and treatment of ear disorders
 - Describe the evaluation and treatment of sinus disorders

Ear Anatomy

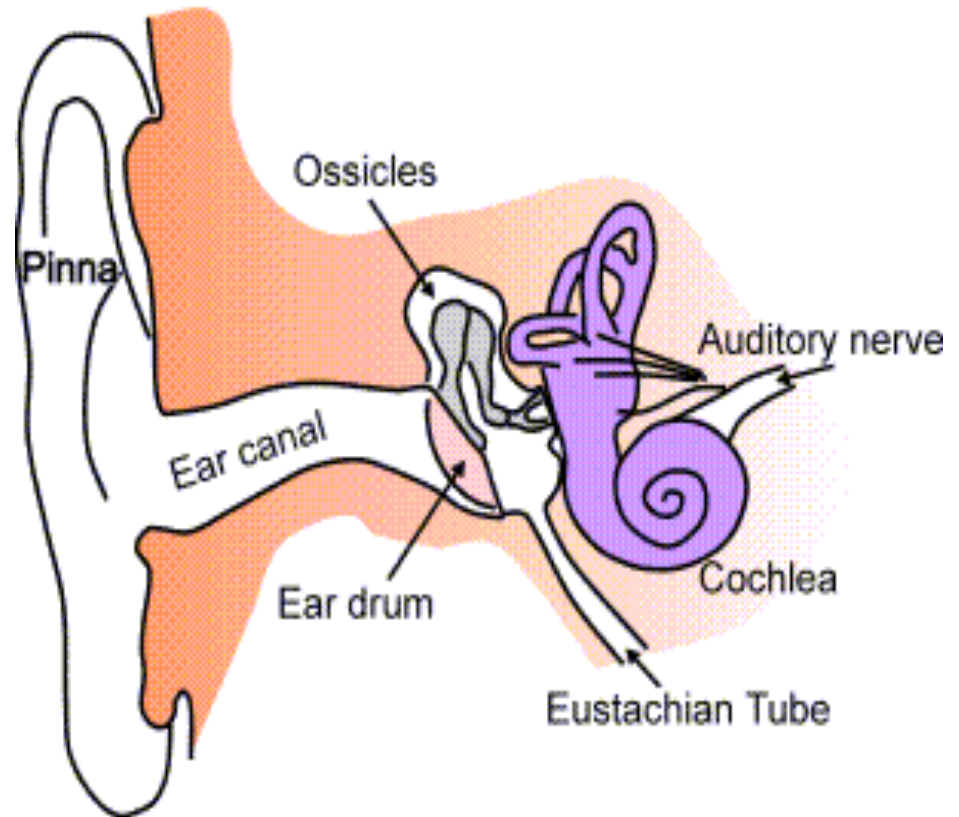


External Ear

Cerumen Impaction

- Cerumen
 - Cerumen glands
 - Sebaceous glands
 - Desquamated epidermis
- Normal clearing
 - Hair follicles
 - Epidermal migration
 - Chewing

Ear Anatomy

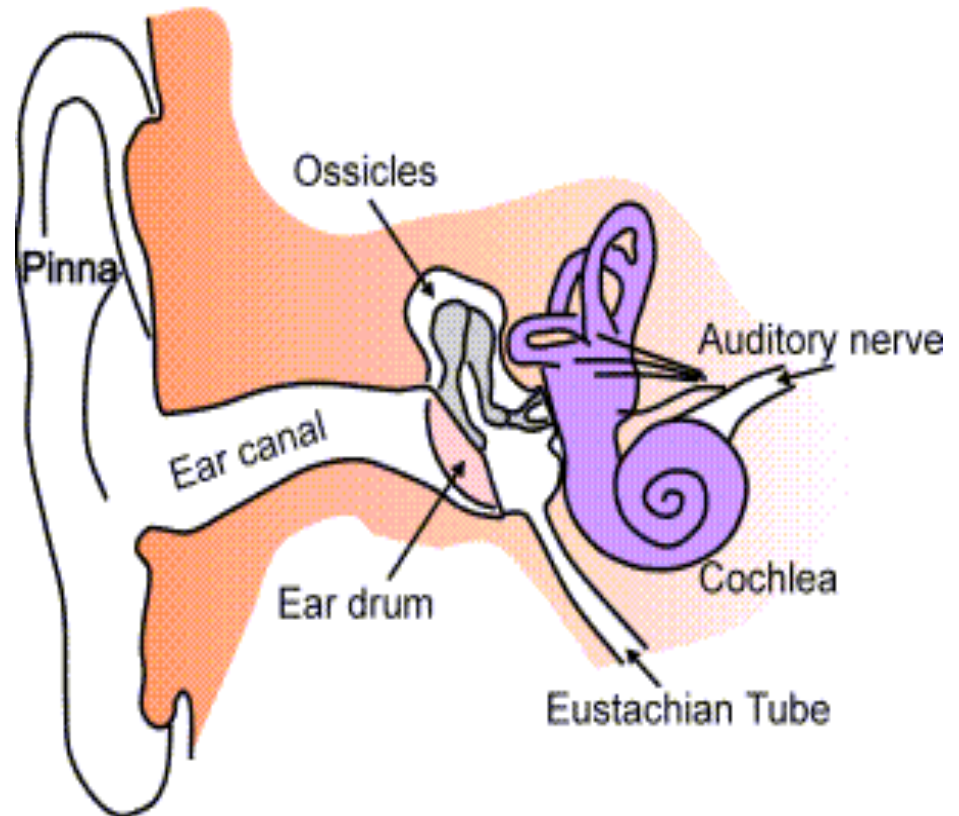


External Ear

Cerumen Impaction

- Cerumen accumulation that is
 - Symptomatic
 - Sufficient to prevent adequate ear examination
- Causes
 - Canal obstruction
 - Foreign body
 - Canal instrumentation
 - Aging

Ear Anatomy

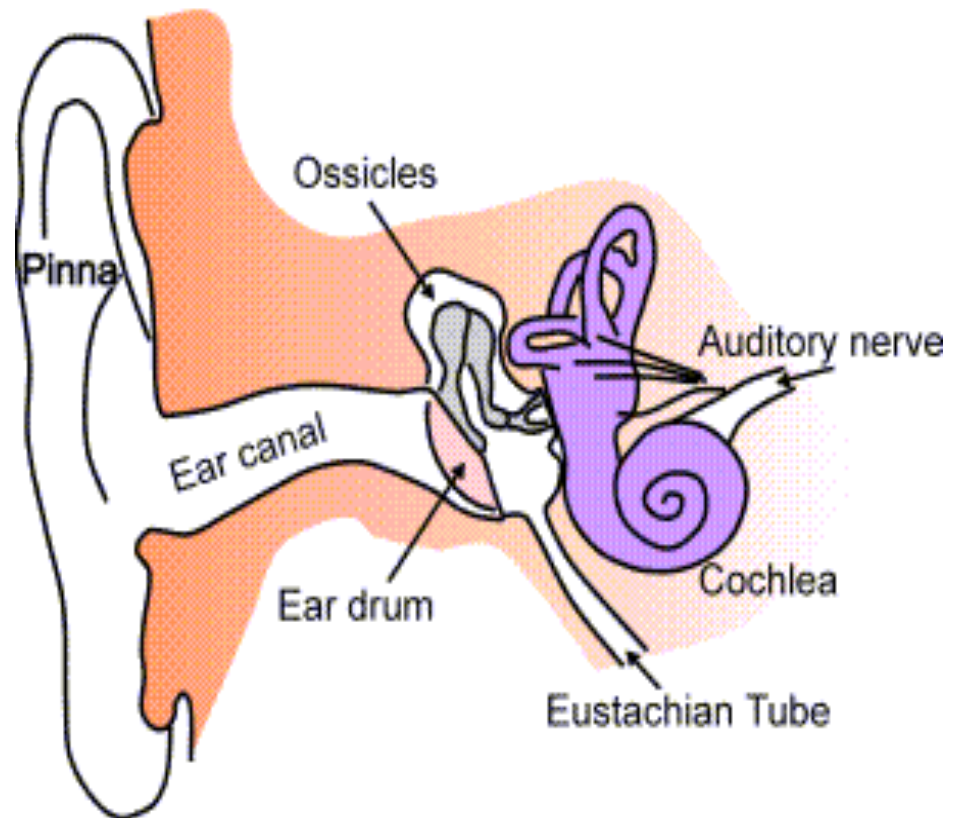


External Ear

Cerumen Impaction

- Cerumenolytic agents
 - Saline/water
 - Hydrogen peroxide
 - Mineral oil
- Irrigation
 - Syringe
 - Syringe plus butterfly
- Mechanical removal
 - Currettes

Ear Anatomy

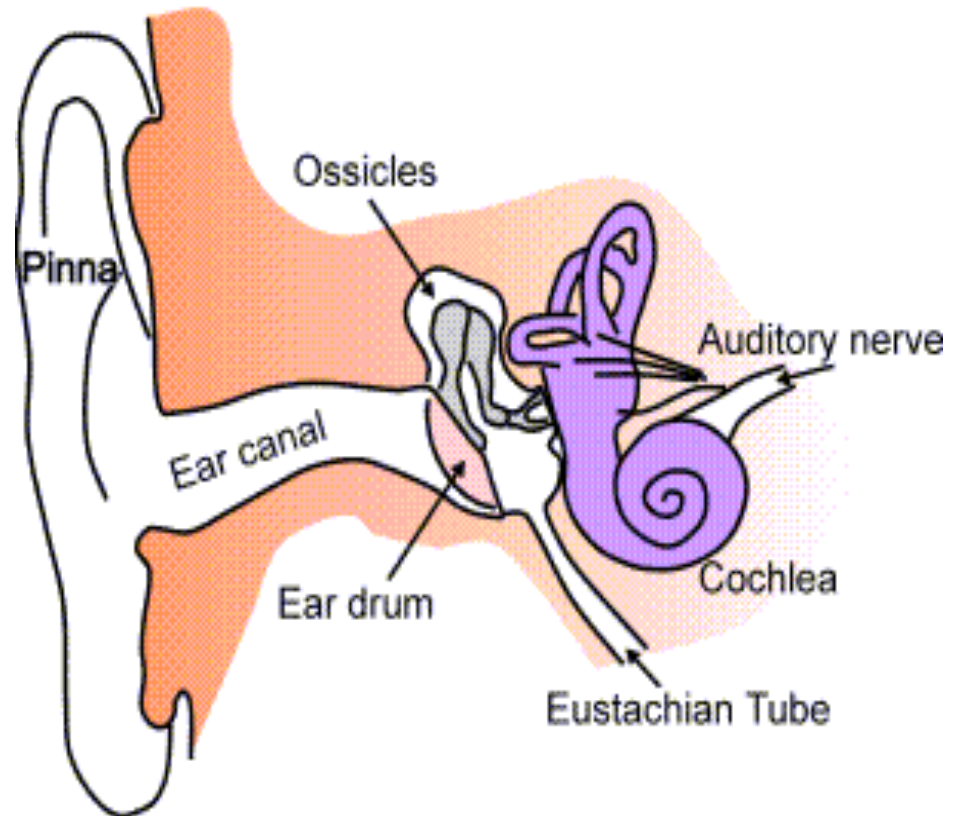


External Ear

External otitis

- Inflammation of the external ear
- Breakdown of normal skin/cerumen barrier
 - Excessive cleaning
 - Swimming
 - Foreign body
 - Hearing aids

Ear Anatomy

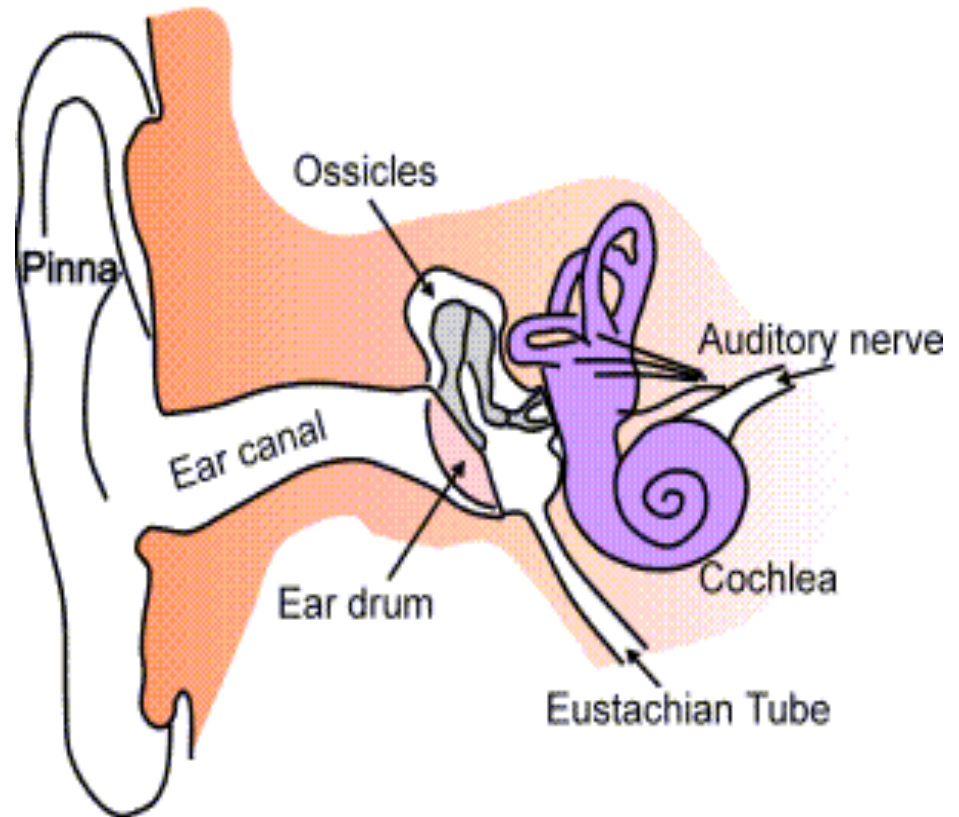


External Ear

Otitis Externa

- 41% Pseudomonas
- 15% S. aureus
- 22% Peptostreptococcus
- 11% Bacteroides

Ear Anatomy

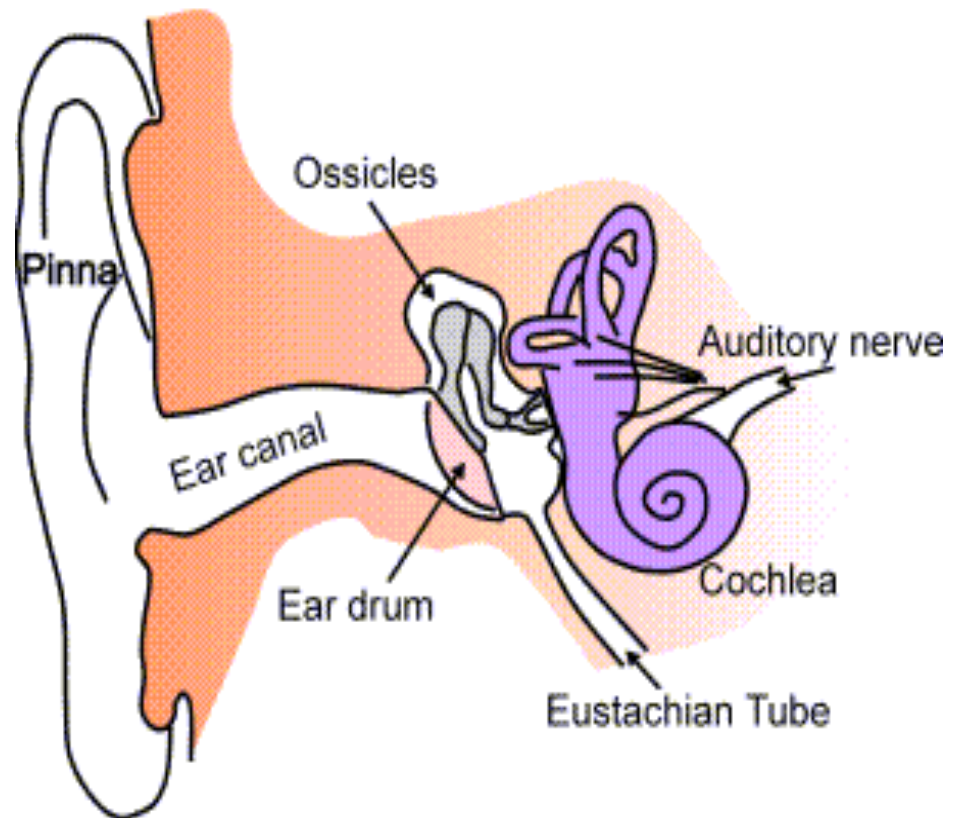


External Ear

External otitis

- Symptoms
 - Pain
 - Discharge
 - Hearing loss
- Exam
 - Swelling
 - Redness
 - Drainage
 - Distinguish from otitis media with perforation

Ear Anatomy

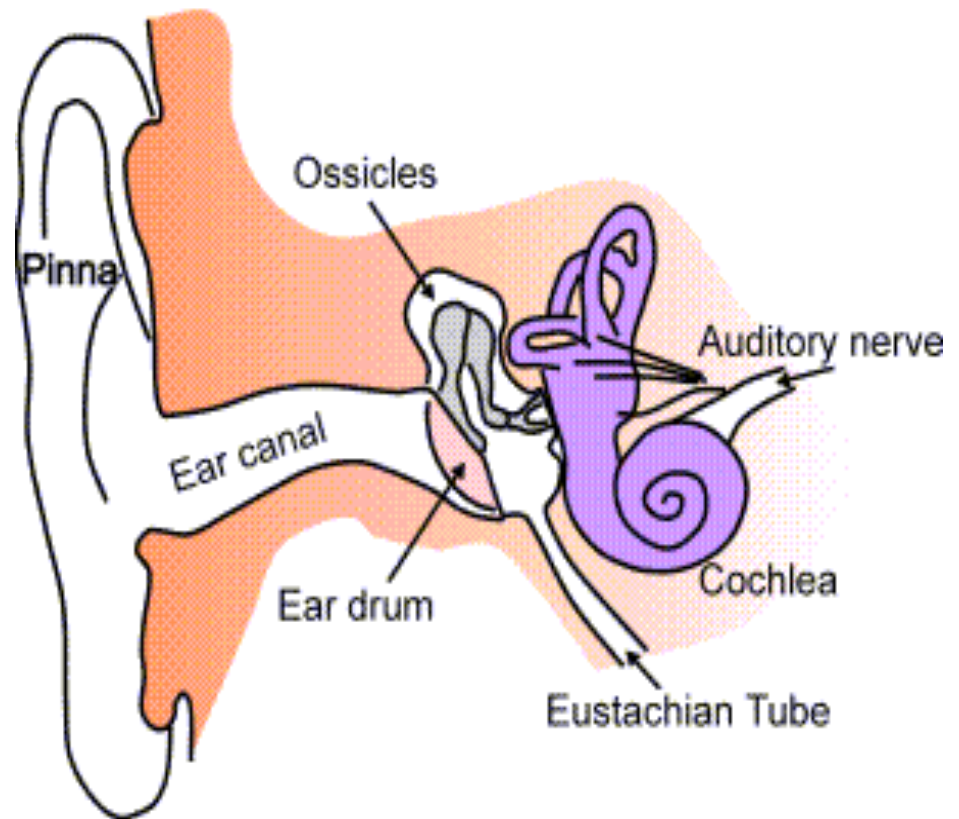


External Ear

External otitis

- Treatment
 - Remove debris in canal
 - Topical treatments
 - Acidifying agents
 - Antiseptics
 - Anti-inflammatory
 - Antibiotics
 - Control pain
 - Consider culture if severe
 - Prevent further injury

Ear Anatomy



External Ear

Acidifying agents

- Acetic acid
 - VoSol
 - VoSol HC
- Boric Acid
 - Domeboro Otic
- Sulfuric acid
- Hydrochloric acid

Antiseptic

- Alcohol
- Thimerosal
- Thymol
- Gentian Violet

External Ear

Anti-inflammatory

- Hydrocortisone
- Prednisolone
- Dexamethasone
 - Decadron Ophthalmic Solution

Antibiotics

- Multiple agents

Product name (preparation)	Antibiotic	Anti-inflammatory	Acid	Antisept	pH
Cortisporin Otic Suspension (ear)	Polymyxin B; Neomycin	Hydrocortisone	Sulfuric	Alcohol	3
Cortisporin Otic Solution (ear)	Polymyxin B; Neomycin	Hydrocortisone	Hydrochloric		2
Coly-Mycin S Otic (ear)	Colistin; Neomycin	Hydrocortisone	Acetic		5
Tobradex (eye)	Tobramycin	Dexamethasone	Sulfuric		6.0-8.0
Genoptic solution (eye)	Gentamicin		Hydrochloric	Alcohol	7.2-7.5
Pred-G (eye)	Gentamicin	Prednisolone	Hydrochloric	Alcohol	5.4-6.6
Vasocidin solution (eye)	Sulfacetamide	Prednisolone	Boric		6.2-8.2
Gantrisin Ophthalmic (eye)	Sulfisoxasole				7.2-7.9
Terra-Cortril Suspension (eye)	Oxytetracycline	Hydrocortisone			7.4
Chloramycetin HC (eye)	Chloramphenicol	Hydrocortisone	Boric		7.1-7.5
Chloramycetin Ophthalmic Solution (eye)	Chloramphenicol		Boric		7.0-7.5
Cipro HC Otic (ear)	Ciprofloxacin	Hydrocortisone		Alcohol	4.5-5.0
Ciloxan (eye)	Ciprofloxacin		Hydrochloric		4.5
Floxin Otic (ear)	Ofloxacin				
Ocuflox (eye)	Ofloxacin		Hydrochloric		6.0-6.8
Chibroxin (eye)	Norfloxacin				

External Ear

- Cochrane Database Systematic Review 2010
- 19 RCT with 3382 patients
- Trials were of low quality
- Conclusions
 - Topical antimicrobials + steroids vs. Placebo
 - OR 11 (2.0 – 60.57)
 - In general, no difference in cure rate related to topical agent
 - Acetic acid less effective than antibiotics/steroids OR 0.29 (0.13 – 0.62) at 2 weeks
 - Antibiotics + steroids quicker symptomatic relief

External Ear

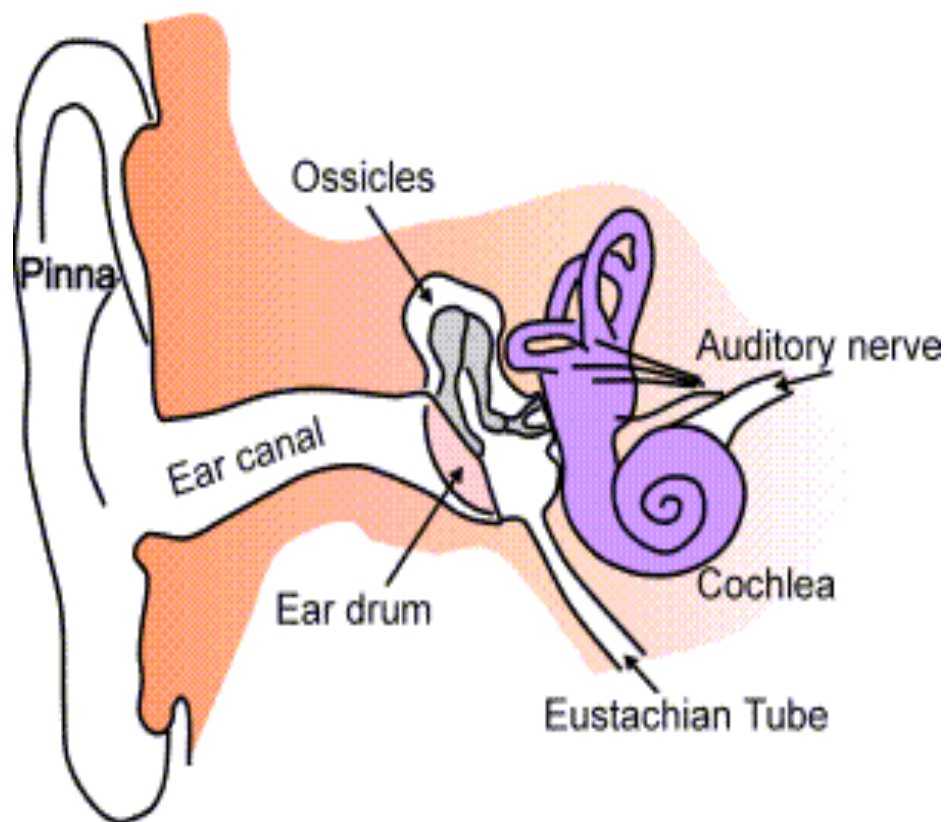
- External Otitis
 - Mild disease
 - Topical drops
 - 20 minute dwell time
 - 7 day course, continue additional 7 days as needed
 - Treat pain
 - Severe disease
 - Consider wick
 - Consider systemic antibiotics
 - Consider alternate diagnoses

External Ear

Malignant (Necrotizing) OE

- Invasion of infection beyond the ear
 - Elderly diabetics
 - Immunocompromised
- Severe pain
- Significant drainage
- Granulation tissue
- CT/MRI
- Admission, anti-pseudomonas antibiotics

Ear Anatomy

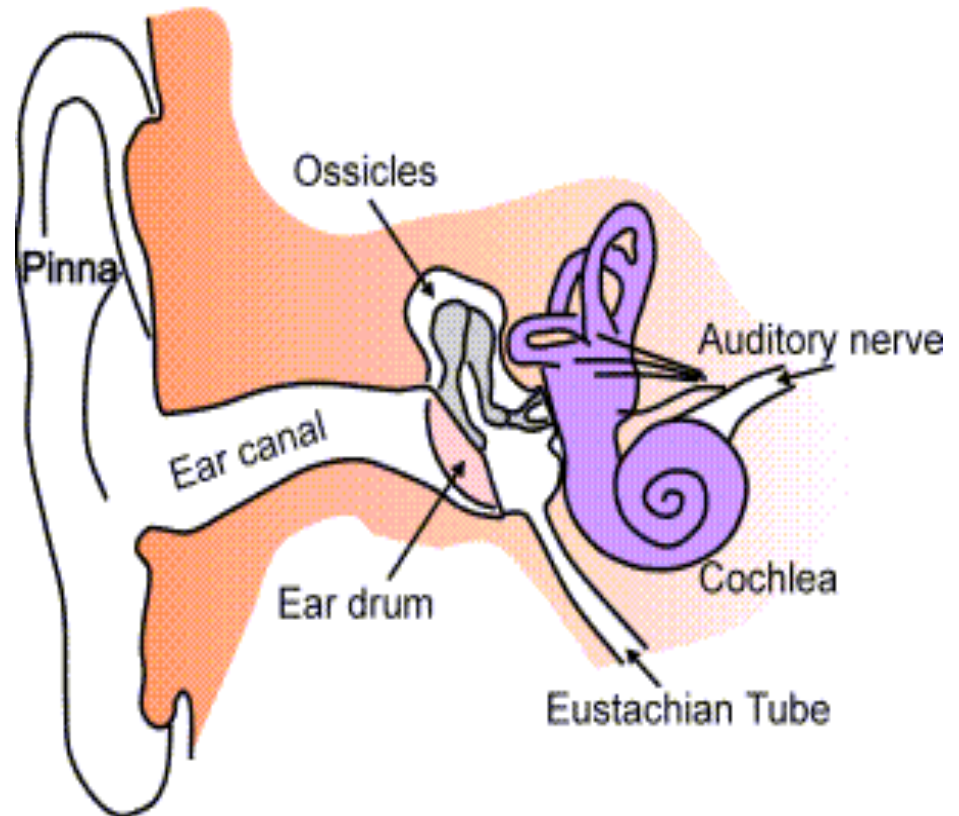


Tympanic Membrane

Barotrauma

- Pressure difference between middle ear and external ear
- Flying
- SCUBA diving
- Direct blow to ear
- Blast injury

Ear Anatomy



Tympanic membrane

Barotrauma

- Ruptured TM
 - Pain
 - Bleeding from canal
 - Hearing loss
 - Tinnitus
 - Inspection identifies tear
- Treatment
 - Avoid water to the ear
 - Decongestants
 - Outpatient referral



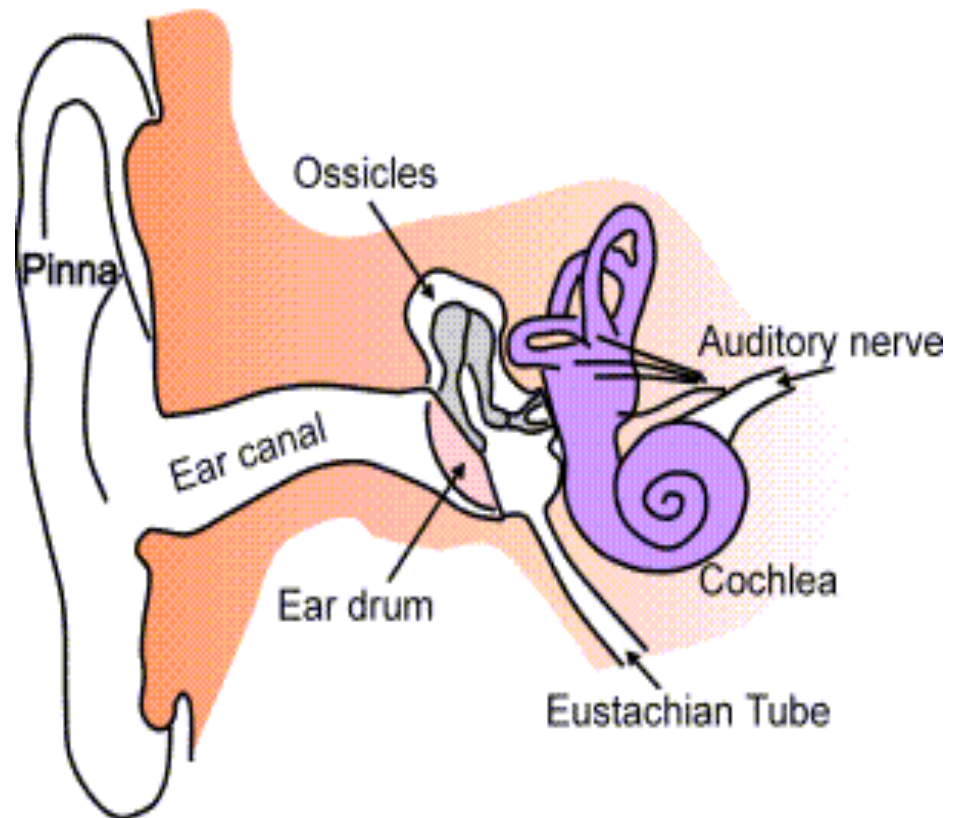
Wellcome Images

Middle Ear

Otitis Media

- Eustachian tube blockage
 - Fluid build-up
 - Secondary bacterial infection
- Symptoms
 - Prodromal symptoms
 - Pain
 - +/- Fever
 - +/- Hearing loss
 - Rupture of TM
- Exam
 - Dull/red/bulging TM

Ear Anatomy



Middle Ear

- Otitis Media
 - Treatment
 - Antibiotics
 - Amoxicillin 500 mg BID
 - Amoxicillin 875 mg BID
 - If penicillin allergy
 - Cephalosporins – 2nd generation
 - Azithromycin
 - Treatment failure
 - Augmentin
 - Cephalosporins – 2nd generation

Middle Ear

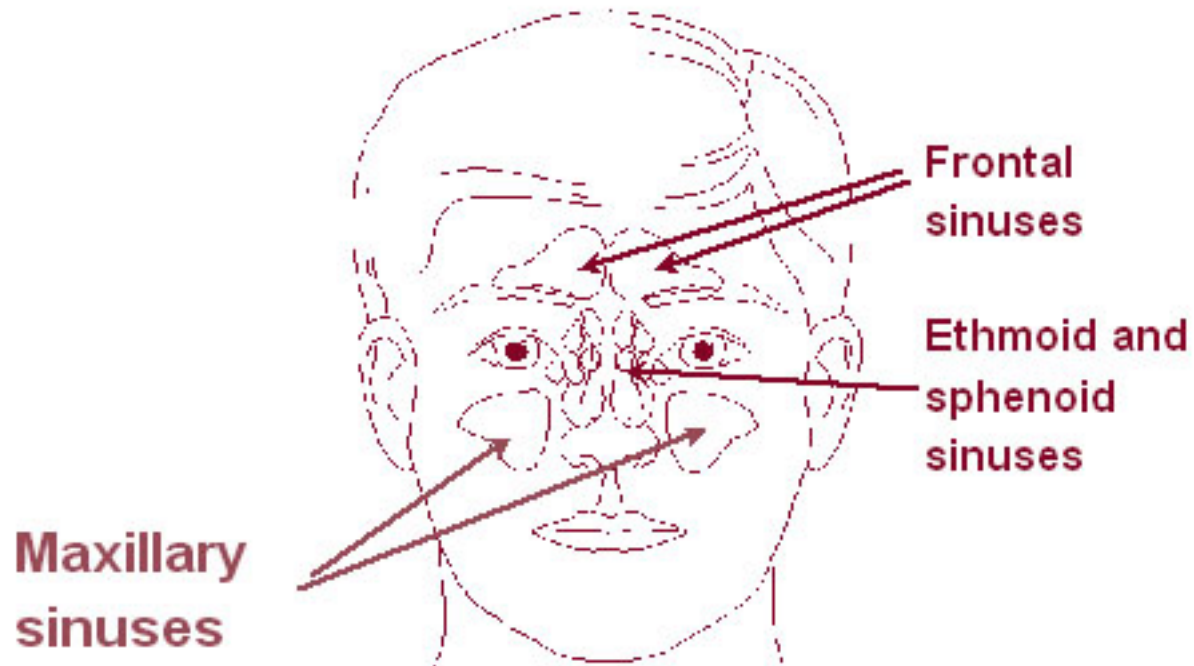
- Otitis Media with TM rupture
 - Add topical antibiotic
 - Avoid
 - Alcohol
 - Aminoglycoside
 - Avoid water in the ear until healed

Product name (preparation)	Antibiotic	Anti-inflammatory	Acid	Antisept	pH
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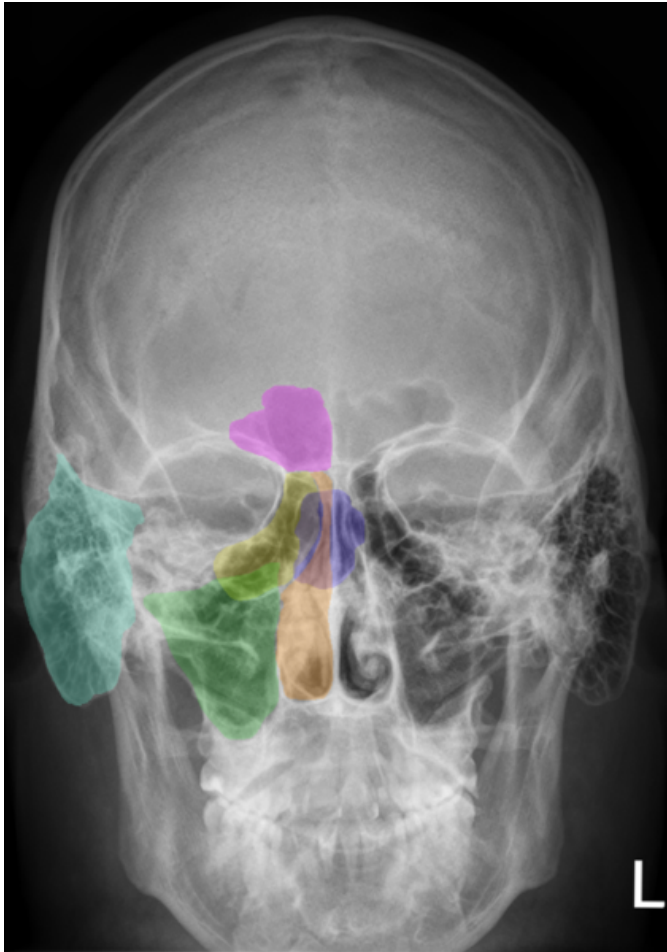
Middle Ear

- Otitis Media with Effusion
 - Fluid in middle ear without infection
 - Oral decongestants
 - Most resolve
- Mastoiditis
 - Pre-antibiotic complication of AOM in 20%
 - Modern era incidence of 0.5%
 - CT scan for diagnosis
 - Admission and IV antibiotics

Paranasal Sinuses



Paranasal Sinuses



Sinusitis

- Acute inflammation of the para-nasal sinuses
- Rhinosinusitis
 - Acute rhinosinusitis
 - Acute viral rhinosinusitis
 - Rhinovirus, Influenza, Parainfluenza
 - Acute bacterial rhinosinusitis as complication in 0.5% to 2% of cases
 - 85% to 98% of patients prescribed antibiotics (2001)

Acute Rhinosinusitis

- Symptoms of ARS
 - Nasal congestion and obstruction
 - Purulent nasal discharge
 - Maxillary tooth discomfort
 - Facial pain or pressure, worse when bending forward
 - Fever
 - Fatigue
 - Cough
 - Hyposmia or anosmia
 - Ear pressure or fullness
 - Headache

Acute Rhinosinusitis

- Hickner JM, et al. *Ann Intern Med.* 2001;134(6):498-505
 - American Academy of Family Physicians
 - American College of Physicians
 - American Society of Internal Medicine,
 - Centers for Disease Control,
 - Infectious Diseases Society of America
- Diagnosis of ABRS with
 - ≥ 7 days of symptoms
 - maxillary pain or tenderness in the face or teeth (especially when unilateral)
 - purulent nasal secretions
- Observation for ARS and mild ABRS
- Antibiotic therapy
 - moderately severe symptoms
 - clinical diagnosis of ABRS
 - severe rhinosinusitis symptoms regardless of duration

Acute Rhinosinusitis

- Rosenfeld RM, et al. Otolaryngol Head Neck Surg. 2007;137(3 Suppl):S1-31.
- American Academy of Otolaryngology
 - Diagnosis of ABRS with presence of symptoms for 10 days *or* less than 10 days with worsening of symptoms after initial improvement
 - Symptomatic treatment for AVRS
 - May treat ABRS symptomatically for mild disease:
 - Mild pain, temperature < 38.3 (101)
 - No imaging required
 - First line treatment is amoxicillin; macrolide if allergic
 - Reassess if worse or no improvement at 7 days

Acute Rhinosinusitis

- Treatment
 - Analgesics/NSAIDs
 - Mechanical irrigation of sinuses
 - Topical corticosteroids
 - Decongestants
 - Topical
 - Oral
 - Antihistamines
 - Mucolytics
 - Zinc preparations

Acute Rhinosinusitis



Wellcome Images

Acute Rhinosinusitis

- Treatment
 - Analgesics/NSAIDs
 - Mechanical irrigation of sinuses
 - *Topical corticosteroids
 - *Decongestants
 - * Topical
 - (*) Oral
 - Antihistamines
 - Mucolytics
 - (-) Zinc preparations

Acute Rhinosinusitis

- Complications of ABRS
 - Rare
 - Local extension
 - Meningitis
 - Peri-orbital cellulitis
 - Orbital cellulitis

Rhinosinusitis

- Acute Rhinosinusitis
- Subacute Rhinosinusitis 4-12 weeks
- Chronic Rhinosinusitis >12 weeks
- Recurrent ARS 4+ episodes in one year