

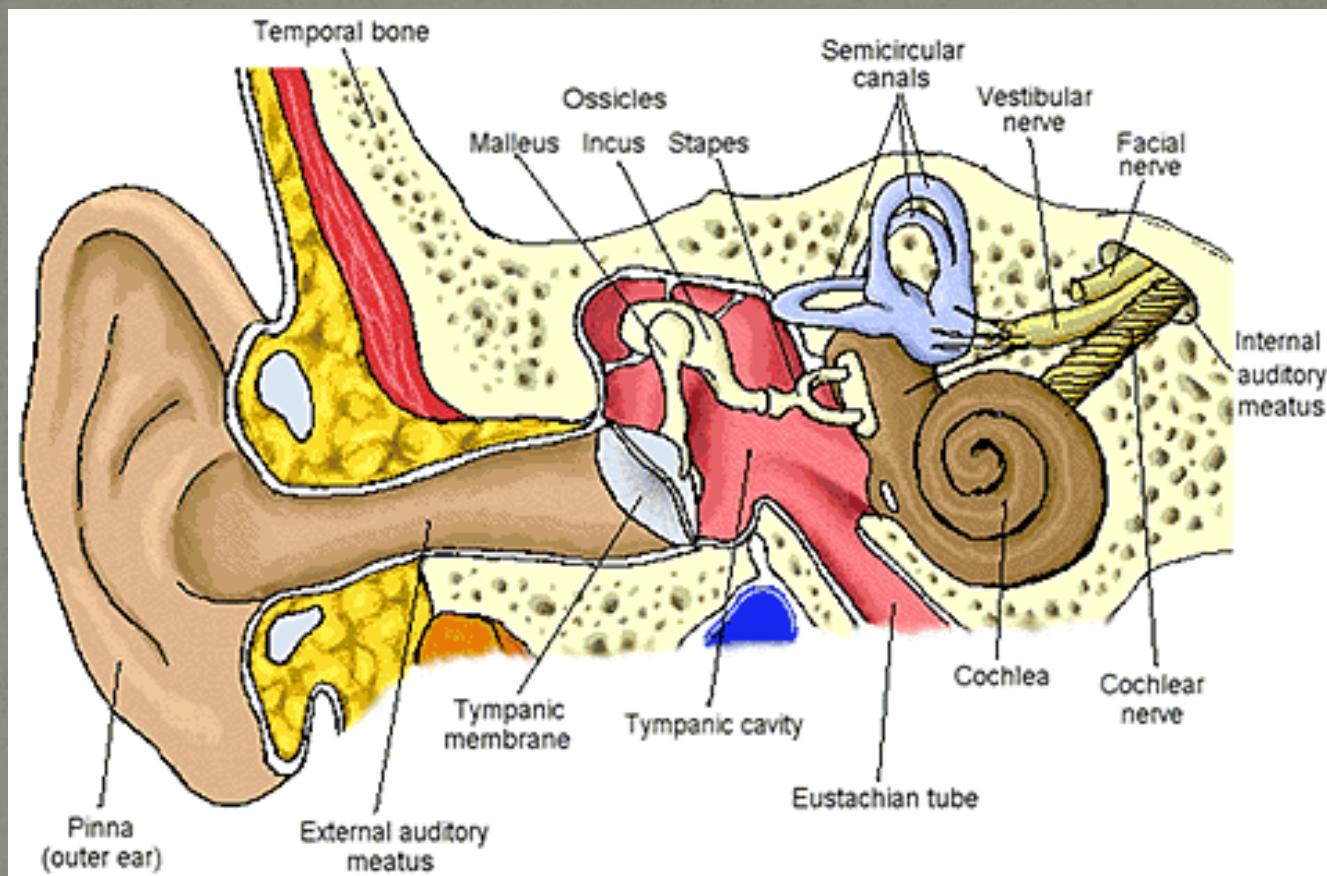
# Osteopathic Manipulation for Acute Otitis Media in the Pediatric Population



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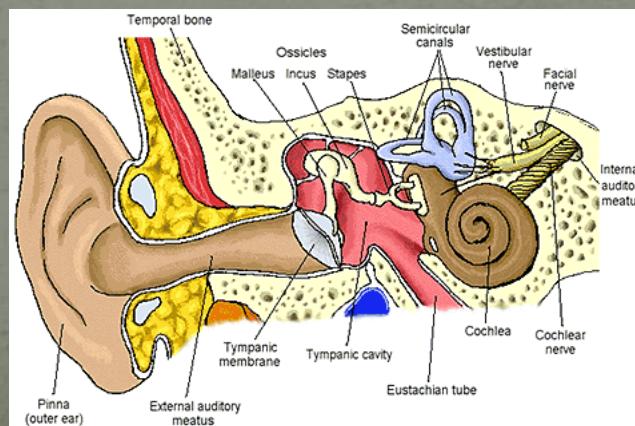
Dawn Dillinger, DO  
Kate Ruda Wessell, DO

# Ear Anatomy



# Ear Anatomy

- Outer Ear: Pinna, External Auditory Meatus, Outside of Tympanic Membrane
- Middle Ear: Inside of Tympanic Membrane, 3 ossicles; Malleus, incus, and stapes and Eustachian Tube
- Inner Ear: Cochlea, vestibule, and semi-circular canals



# Otitis Media

- Inflammation of the Middle Ear
- Location between the tympanic membrane and the inner ear including eustachian tube
- Signs/Symptoms
  - otalgia, fever, otorrhea, malaise, vertigo, hearing loss
- Diagnosis:
  - visualization of the TM, tympanic insufflator



# Etiology

- *S. pneumoniae* 30-50%
- Non-typable *H. flu* 20-30%
- *M. catarrhalis* 1-5%
- Former NICU=risk for *S. aureus*, GBBS, Gram (-) enteric pathogens
- Resistant organisms vary by region
- Viruses are causative or co-pathogenic
  - RSV
  - Rhinovirus
  - Influenza
  - Adenovirus
  - Enterovirus
  - Parainfluenza

# Pathophysiology

- Eustachian tube dysfunction
  - Child=more horizontal and shorter
  - Child=softer cartilage in Eustachian tube
  - Child=nasopharyngeal opening has more lymphoid follicles and larger adenoids obstructing
- Recurrent URI
  - Presence of viral infection shown to increase bacterial adhesion in nasopharyngeal tissue

# Progression of the AOM

- At an anatomic level, the tissues surrounding the Eustachian tube swell due to a URI, allergies, or dysfunction of the tubes. The Eustachian tube remains blocked most of the time. The air present in the middle ear is slowly absorbed into the surrounding tissues.
- A strong negative pressure creates a vacuum in the middle ear, and eventually the vacuum reaches a point where fluid from the surrounding tissues accumulates in the middle ear. The fluid may become infected by dormant bacteria behind the TM

# Kids > Adults. Why?



- Shorter Eustachian Tubes
  - 10mm in infancy to 18mm in adulthood
- A more horizontal angle of the Eustachian Tubes
  - 10 degrees to horizontal in infancy to 45 degrees in adulthood
- 2/3 of kids have at least one episode by 3 y/o
- 50% of kids have >2 episodes by 3 y/o
- Peak incidence between 6-13 m/o
- Decreased incidence after 6 y/o

# Increased Incidence of AOM

- Boys
- Daycare attendance
- Secondary smoke exposure
- Non-breast fed infants
- Winter season
- Prematurity
- Bottle propping
- HIV
- Immunocompromised
- FamHx of chronic AOM
- Crowded living conditions
- Cleft palate
- Craniofacial anomalies
- Pacifier use >6m/o

# Otitis Media Treatments

- Observation and Self-Limitation: based on diagnostic certainty, age, illness severity, and assurance of follow-up
- Pain Remedies: topical agents (Auralgan), oral agents
- Antihistamines, decongestants, steroids
- Antibiotics
- OMT
- Tympanostomy Tubes

# Treatment: Antibiotics

- Amoxicillin 80-90 mg/kg/day divided BID for 10 days in anyone <5 y/o, and 7 days if mild disease in someone >6 y/o
- Persistent middle ear effusion for 2-3 months after therapy for AOM is expected and does not require routine retreatment
- If effusion lasts greater than 3 months, tx for 10-14 days may be considered

# Recurrent AOM

- 3-4 episodes in 6 months              OR
- 6 episodes in 12 months
- Routine use of prophylactic antibiotics is in question due to antibiotic resistance and no proven benefit

# Strategies to reduce recurrent AOM

- Change daycare setting
- Discontinue second-hand smoke exposure
- Discontinue bottles in bed and bottle propping
- Potential benefit in treating for GERD
- Xylitol daily
- Give full Prevnar and Influenza immunization

# Use of OMT in Recurrent AOM

- Archives of Pediatrics and Adolescent Medicine, September 2003 studied effects of OMT as adjuvant therapy to routine care in recurrent AOM
  - Fewer episodes of AOM in intervention group
  - Fewer surgical procedures in intervention group
  - Increase in normal tympanograms with OMT
  - No adverse reactions reported

# Use of OMT in Recurrent AOM

- JAOA Vol 106 No 06 June 2006 *Osteopathic Evaluation and Manipulative Treatment in Reducing the Morbidity of Otitis Media: A pilot study.* Degenhardt, Kuchera pgs 327-334
  - Pilot cohort study with 1 year post-treatment follow up
  - For 3 weeks all subjects received weekly OMT, concurrently with traditional medical management
  - 62.5% had no recurrence of symptoms
  - Concluded that OMT may change the progression of recurrent AOM. There is a need for additional research

# OMT for Recurrent AOM

- Galbreath maneuver
- Auricular drainage technique
- Overall cranial evaluation focusing on temporal bones
- Treat cervical spine dysfunction
- Evaluate and treat dysfunction at sympathetic innervation to head and neck: T 1-4
- Evaluate and treat dysfunction at parasympathetic innervation to head and neck: CN III, VII, IX, X
- Lymphatic pumping



LYMPHATIC PUMP

# OMT: Galbreath Maneuver

- Galbreath Maneuver first described in 1929 by William Otis Galbreath, DO
- Galbreath Maneuver: simple mandibular manipulation, the eustachian tube is made to open and close in a "pumping action" that allows the ear to drain accumulated fluid more effectively

# Specifics of the Galbreath Maneuver

- The pediatric patient should be lying supine
- The physician places one hand on the chin, with thumb and forefinger resting along the lower jawbone. The other hand is placed on the forehead to hold the patient's head in place.
- As the child opens his/her mouth, the physician gently moves the lower jaw to the side away from the ear with AOM and holds it there for three to five seconds before releasing the jaw. The physician then repeats this maneuver three times.



## Galbreath Technique

# Reported Case Study

- *JAOA Vol 100 No 10 October 2000 Pratt-Harrington Review Article*
- 14 mo. old female with previous history of AOM treated with amoxil 10 day course, and repeat antibiotics for incomplete resolution. She presented with temp 102.8, pulse 118, RR 24, nose and pharynx erythematous and edematous. Right TM bulging, nonmovable with pneumatic otoscopy. Script for antibiotics written and Galbreath technique in office. Within 30min of tx, child's temp reduced to 99.2, and PE revealed decrease in erythema and edema of TM. Patient completed course of antibiotics and Galbreath Technique BID. Whenever symptoms revisited; mother performed Galbreath, and pt. was not placed on antibiotics since.

# Auricular Drainage Technique

- The pediatric patient lies supine
- The physician forms a “V” by separating their middle and ring fingers on the hand that is closer to the child’s feet. Placing the ear with AOM in the base of this “V” the physician places his or her other hand on the opposite side of the child’s head to provide support. The physician then gently but firmly massages the infected ear in a clockwise motion, then reverses direction, massaging the infected ear in a counter-clockwise direction.

## Auricular Drainage



# Question 1:

- What is the most common bacterial cause of AOM?
  - A. Haemophilus Influenza
  - B. Moraxella catarrhalis
  - C. Pseudomonas aeruginosa
  - D. Streptococcus pneumonia
  - E. Bordatella pertussis

## Question 2:

- Which of the following has been found to result from OMT for recurrent AOM?
  - A. Increased use of tympanostomy tubes
  - B. Increased use of pain medication with AOM episode
  - C. Decreased course of antibiotics for AOM episode
  - D. Decreased incidence of AOM
  - E. Flattening of a tympanogram with AOM

# Question 3:

- Which of the following will most likely help prevent recurrent AOM?
  - A. Oral antihistamines
  - B. Decongestants
  - C. OMT
  - D. Prophylactic daily antibiotics
  - E. Sleeping in the prone position

# Question 4

- Which of the following provides parasympathetic innervation to the head and neck?
  - A. Cranial nerve I
  - B. Cranial nerve II
  - C. Cranial nerve III
  - D. Cranial nerve IV
  - E. Cranial nerve V

# Question 5

- Which of the following areas needs treated to effect change in the sympathetic innervation to the head and neck?
  - A. C 3-5
  - B. T 1-4
  - C. T 5-9
  - D. T<sub>12</sub>-L<sub>2</sub>
  - E. L<sub>5</sub>-S<sub>1</sub>

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