None of the planners or presenters of this session have disclosed any conflict or commercial interest.
OBJECTIVES:

1. Discuss the anatomy and physiology of children of varying ages that predispose them to ENT disorders.

2. Discuss treatment by the PCP for common disorders seen in every day practice.

3. Identify when to refer to a specialist based on poor response to standard treatment or unclear/unusual diagnosis.
Otolaryngology Pathology in Children

- Neck Masses
- Sleep Disordered Breathing/OSA
- Pharyngitis
- Otitis Media/Cholesteatoma
- Airway
Neck Masses

- Inflammatory masses
- Congenital masses
  - Branchial Cleft Cyst
  - Thyroglossal Duct Cyst
  - Teratoma
  - Lymphangioma (Cystic Hygroma)
  - Hemangioma
  - AVM
- Neoplasms
  - Cancer
  - Thyroid goiter/nodule
# Neck Masses – Work Up

## History
- Duration
- Size trend
- Pain
- Fever
- Constitutional Symptoms

## Physical
- Size
- Erythema
- Tenderness
- Firmness
- Location
# Neck Masses – Work Up

<table>
<thead>
<tr>
<th>Radiology</th>
<th>Lab tests</th>
</tr>
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<tbody>
<tr>
<td>Ultrasound</td>
<td>CBC</td>
</tr>
<tr>
<td>Cons: Less illustrative of anatomy</td>
<td>ESR</td>
</tr>
<tr>
<td>CT scan of neck with contrast</td>
<td>Bartonella titers</td>
</tr>
<tr>
<td>Cons: Radiation exposure</td>
<td>PPD</td>
</tr>
<tr>
<td>MRI with gadolinium</td>
<td></td>
</tr>
<tr>
<td>Cons: May need general anesthesia</td>
<td></td>
</tr>
</tbody>
</table>
Inflammatory/Infectious Masses

- Palpable LNs in children are common.
- Differential Diagnosis
  - Reactive LN
  - Lymphadenitis
  - Suppurative lymphadenitis
  - Retropharyngeal or parapharyngeal space abscess
  - “Cat scratch” disease
  - Atypical Mycobacterium
Inflammatory/Infectious Masses

- **Reactive LNs**
  - Palpable without fixation, redness, tenderness, fluctuance.
  - Management - Watch and wait.

- **Lymphadenitis**
  - One or more of the abnormal findings.
  - Consider treating with a strong PCN analog such as Augmentin.
  - Close followup.
  - Consider referral to Otolaryngologist if not improving or appears unwell.
Inflammatory/Infectious Masses

- **Symptoms of Suppurative Lymphadenitis/Abscess**
  - Large, red, fluctuant.
  - Symptoms of being “sick”
  - Torticollis
  - May not have tonsillitis or other head and neck infection.

- **Management Options**
  - Aspiration
  - Incision and Drainage
  - Consider admission to Hospital for IV antibiotics
**Branchial Cleft Cyst**
- Incomplete obliteration of a branchial cleft during embryonic development.
- **Lateral Neck** mass anterior to SCM.
- Generally presents with infection.
- Difficult to distinguish from suppurative lymphadenitis on exam.
- Ultrasound and CT scan help differentiate it.
- Referral to Otolaryngologist for excision.

**Thyroglossal Duct Cyst**
- Incomplete obliteration of tract as thyroid descends from base of tongue to base of neck.
- **Midline Neck** mass.
- Passes through middle of Hyoid bone (above thyroid cartilage).
- Moves with swallowing.
- Ultrasound to define mass and ensure normal thyroid gland is present.
- Sistrunk procedure
  - Body of hyoid bone removed.
Head and Neck Cancers in Children

- No. 1 fear of a parent
- Rare - 5% of pediatric cancers.
- Most common Pediatric H&N cancers
  - Lymphoma >50%
  - Rhabdomyosarcoma
  - Thyroid
- Less common
  - Nasopharyngeal, Salivary gland, Malignant teratoma, other sarcomas, neuroblastoma.
## Lymphoma

<table>
<thead>
<tr>
<th>Non Hodgkin's Lymphoma</th>
<th>Hodgkin's Lymphoma</th>
</tr>
</thead>
<tbody>
<tr>
<td>More common</td>
<td>Less common</td>
</tr>
<tr>
<td>Peak incidence 7-11 yo</td>
<td>Peak incidence 15-20 yo</td>
</tr>
<tr>
<td>Tonsil asymmetry, neck mass</td>
<td>Firm, rubbery neck mass</td>
</tr>
<tr>
<td>Fever</td>
<td>Fever</td>
</tr>
<tr>
<td>weight loss</td>
<td>weight loss</td>
</tr>
<tr>
<td>night sweats</td>
<td>night sweats</td>
</tr>
<tr>
<td>malaise</td>
<td>malaise</td>
</tr>
</tbody>
</table>
Sleep Disordered Breathing (SDB)

- Abnormal respiratory patterns while sleeping
- Spectrum
  - Snoring to Obstructive Sleep Apnea (OSA)
- Snoring: 10%-20% of children
- OSA: 2%-4% of children
Sleep Disordered Breathing (SDB)

- Children who snore vs. non-snorers have lower scores on tests of *
  - Attention
  - Verbal skills
  - Academic and Executive function
- Children with OSA have even worse scores. *

- Negative effects of SDB in children without OSA *
  - Increased Anxiety
  - Increased Depression scores
  - Increased Social problems


Sleep Disordered Breathing (SDB)

- Sleep study is not necessary unless (AAO guidelines)
  - Moderate to severe OSA suspected
  - age <3
  - craniofacial anomalies
  - Down syndrome

- Adenotonsillectomy is effective in children.
  - Not as effective in children who have
    - Craniofacial anomalies
    - Down syndrome
    - Moderate to severe OSA
Signs & Symptoms of OSA (AAP Guideline)

- **History**
  - Snoring > 3 nights/week
  - Labored breathing while asleep
  - Gasping, snorting, witnessed apneas
  - Secondary sleep enuresis
  - Abnormal sleep positions
  - Cyanosis
  - ADHD
  - Learning difficulties

- **Physical Exam**
  - Over or underweight
  - Tonsil hypertrophy
  - High-arched palate
  - Hypertension
  - Micrognathia/Retrognathia
  - Mouth breathing
Recurrent Acute Pharyngitis

- Natural History – will resolve on own
- Paradise Criteria for Tonsillectomy
  - 7 episodes in one year
  - 5+ episodes in each of last two years
  - 3+ episodes in each of last three years

- Clinical features of an episode: Sore throat + one of below features:
  - Temp >100.9 degrees F
  - Cervical adenopathy (tender LN or LN>2cm)
  - Tonsillar exudate
  - Culture positive for group A B- hemolytic streptococcus
Recurrent Acute Pharyngitis

- **Modifying factors – Earlier tonsillectomy**
  - Multiple antibiotic allergies
  - Episodes are severe or poorly tolerated
  - PFAPA (Periodic Fever, Aphthous stomatitis, Pharyngitis, Adenitis)
  - Peritonsillar abscess
  - PANDAS (Pediatric Autoimmune Neuropsychiatric Disorders Assoc. with Strep.)

- **Other indications (Must weigh against risks of surgery)**
  - Malocclusion
  - Halitosis
  - Tonsillithiasis
  - Febrile seizures
Peritonsillar Abscess

- **Symptoms**
  - Muffled (Hot Potato) voice
  - Uvular deviation (Asymmetric oropharynx)
  - Trismus
- **Treatment**
  - Drainage
  - Oral antibiotics
  - Steroids
- **Tonsillectomy after 2\textsuperscript{nd} episode**
Ear Pathology

- Otitis Media
  - Recurrent Acute Otitis Media
  - Chronic Otitis Media
  - Complications of Otitis Media

- Tympanic Membrane Perforation
  - Spontaneous rupture with AOM
  - Chronic

- Cholesteatoma

- Hearing loss
Otitis Media Definitions

- **Recurrent AOM**
  - >3 separate AOM episodes within 6 months.
  - >4 separate AOM episodes within 12 months with 1 in the past 6 months.

- **Otitis Media with Effusion (OME)**
  - Presence of serous or mucoid effusion
  - No AOM

- **Chronic Otitis Media (COM)**
  - OME > 3 months
Recurrent Acute Otitis Media

- Pneumococcal Conjugate Vaccine – decreases incidence.
- Breast feeding – decreases incidence.
- Prophylactic antibiotic therapy – not effective.
- Chiropractic therapy – not effective.
- Recurrent AOM will eventually resolve.
- PE tube placement (AAO guidelines)
  - Recurrent AOM with effusions present at time of evaluation.
    - Mean decrease of three episodes of AOM per year after PETs.
    - Ability to treat additional episodes with antibiotic ear drops.
Chronic Otitis Media

- OME usually resolves within 3 months.
- May cause dizziness, hearing loss, discomfort, poor school performance.
- Minimal effectiveness found with using nasal balloon inflation.
- PE tubes recommended for OME > 3 months duration with:
  - Hearing loss
  - Other symptoms
  - Speech delay
- May elect to perform earlier in children with Down syndrome, congenital malformations or other risk factors.
Tympanostomy Review

- **Indications:**
  - Recurrent AOM with effusion
    - 3 or more episodes in 6 months
    - 4 or more episodes in 12 months
  - Chronic OM > 3 months
  - At risk children
  - Mean decrease of three episodes of AOM per year after PETs.
  - Up to 50% of patients need a 2nd set of tubes
  - Adenoidectomy with 2nd set of tubes
  - Risks - perforation and cholesteatoma

- **Q6 month surveillance.**
Tympanic Membrane Perforation

- AOM with spontaneous rupture – perforation will heal with treatment of AOM.
  - Bloody otorrhea or blood in meatus is not a cause for concern.
- Chronic TM perforation symptoms
  - Hearing loss
  - Recurrent OM
- Causes
  - Tympanostomy, Trauma
- Treatment options
  - Myringoplasty – small perforations
  - Tympanoplasty – large perforations
Cholesteatoma

- **What is it?**
  - Expanding keratinizing squamous epithelial tumor

- **Symptoms**
  - Asymptomatic, Hearing loss, Recurrent OM, Chronic otorrhea

- **Etiology**
  - Congenital, TM perforation, TM retraction

- **Congenital**
  - Asymptomatic “pearl” in intact TM
Sensorineural Hearing Loss

- Congenital
  - Hereditary or maternal infection
- Acquired
  - Trauma, hereditary, iatrogenic, infection, noise exposure
- CPA tumor, Pendred syndrome, Jervelle and Lange-Neilsen Syndrome, etc.
- Treatment options
  - Hearing aids, FM system
  - Cochlear implants
Conductive Hearing Loss

- Middle ear effusion – most common
- Cerumen
- TM perforation
- Cholesteatoma
- Rare
  - Ossicular chain discontinuity, Aural atresia

- Treatment options
  - Hearing aids, FM system
  - Surgery
Airway Obstruction

- Nasal
- Laryngeal
- Esophageal

Symptoms
- Respiratory distress
  - Stridor, Retractions
- Drooling/Dysphagia
- Unilateral rhinorrhea
- Infection that does not resolve with treatment
Airway Obstruction

- Foreign body
- Infection
  - URI – RSV, etc.
  - Croup
  - Epiglottitis
- Trauma

- Neoplasm
  - Subglottic hemangioma
  - Teratoma
  - Dermoid cyst
- Congenital
  - Choanal atresia
  - Laryngomalacia
  - Laryngotracheal anomaly
Toddlers – Foreign Body

- Laryngeal, Nasal, Aural, Esophageal
- Symptoms
  - Sudden Stridor, Unilateral Rhinorrhea, Dysphagia, Drooling, Ear infection
  - Unresolving “Infection”
- Suspected laryngeal FB is an EMERGENCY.
  - Send to ER
- Suspected Battery FB is an EMERGENCY
  - Send to ER
- Nasal/Ear FB
  - Can be handled in office.
Infections

- **Epiglottitis – EMERGENCY**
  - Fever
  - Drooling
  - Tripodding, Respiratory distress
  - Much less common since Hib vaccine
- **Diphtheria**
  - Uncommon
- **Croup**
  - Viral
  - Symptom management, May need admission for treatment
Neonatal period - Neoplasm

- **Subglottic hemangioma**
  - May resolve as they get older.
  - Treated with B-blockers or surgery.
- **Teratoma**
- **Dermoid cyst**
- **Endoscopy or Imaging**
Neonatal period - Laryngomalacia

- Stridor when feeding or lying down
- Generally self-resolving by Age 2.
- Fiberoptic laryngoscopy is diagnostic
- "Floppy" epiglottis and larynx
- Surgical intervention RARE
- May be associated with other congenital anomalies
- Referral to Otolaryngologist for endoscopy
Neonatal period – Choanal Atresia

- Bilateral
  - Life threatening
- Unilateral
  - Unilateral rhinorrhea
- Unable to pass catheter through one or both nasal passages.
- CT scan of sinuses
- Referral to pediatric otolaryngologist