Hoarseness

- Voice production
  - Generator (lungs): power source of voice
  - Oscillator (larynx): tone and pitch to voice
  - Resonator (pharynx/sinuses): shape, resonate and articulate sound into individual voice

- Laryngeal anatomy
  - Paired vocal folds
    - Complex layered anatomy
      - Mucosa
        - Epithelial cover: stratified squamous, non-keratinizing
        - Superficial lamina propria: amorphous grnd substance, few fibrils (elastin, structured proteins)
        - Intermediate lamina propria: bundles of elastin, some collagen
        - Deep lamina propria: densely crowded collagen fibers → vocal ligament
      - Thyroarytenoid muscle
    - Abducted for breathing
    - Adducted for sound production
  - Vocal fold vibration
    - Periodic vibration required for voice production → interruption leads to hoarseness
    - Edges vibrate together to produce the sounds of speaking or singing
    - Superficial LP allows mechanical uncoupling
    - Cover-body theory
      - Cover: epithelium, SLLP
      - Transitional layer: vocal ligament
      - Body: thyroarytenoid muscle
  - Glottal (Phonatory) Cycle
    - Opening phase: subglottal air pressure
    - Closing phase: Bernoulli effect, myoelastic properties

- Stroboscopy
  - Clear voice = periodic vocal fold vibration
  - Voice frequency captured by microphone
  - Intermittent light applied to vibrating larynx
  - Sequentially different portions of glottic cycle are illuminated → representation
  - Visual illusion of slow motion

- Common cause of hoarseness
  - Neurological injury (esp RECURRENT LARYNGEAL NERVE INJURY)
    - Iatrogenic injury (surgical)
    - Neoplasm
    - Viral neuropathy
    - Idiopathic injury
  - Alterations of vocal fold lining
    - Non-lesional
      - Conditions that effect voice
        - GERD/LPR
          - GERD assoc symptoms: hoarse rough voice, heartburn, foreign-body sensation, frequent throat clearing, excessive phlegm production
          - LPR manifestations: vocal process granulomata, infraglottic edema, posterior laryngeal inflammation, vocal fold lesions?
        - Sinus dz / allergic rhinitis
        - Dehydration
        - General health and wellness
  - Lesions
    - Nodules, polyp, cyst, hemorrhage, carcinoma
      - Carcinoma:
        - Hoarseness is primary symptom
        - Risk factors – tobacco, alcohol;
        - Excellent cure rates if found early
        - Common assoc with symptoms – lumps in neck, persistent sore throat, ear ache, wt loss
        - PATIENTS WITH HOARSENESS LASTING MORE THAN 2 WKS W/O PLAUSIBLE EXPLANATION REQUIRES LARYNGOSCOPY
      - Cause of most benign vocal fold lesions is phonotrauma
Hearing Loss

- Anatomy: 3 distinctive areas
  - **External**
    - Auricle develops from 6 mesenchymal proliferations (hillocks) of the 1st and 2nd pharyngeal arches
    - Developmental abnormalities are frequently and isolated findings
    - EAC develops from 1st pharyngeal cleft
  - **Middle**
    - Eustachian tube is derived from the first pharyngeal pouch and its distal part, the tubotympanic recess
    - Tympanic membrane forms at the junction of the tubotympanic recess and the EAC
    - Malleus and incus are derived from the cartilage of the 1st pharyngeal arch and the stapes from the 2nd arch
  - **Inner**
    - Otic placodes invaginates to form the otic pit, then vesicle
    - Otic vesicle develops into the utricle, saccula, semicircular canals, and cochlea
    - Membranous inner ear formed by 10 wks of fetal life, and adult size at birth

- **Audiogram**
  - Each ear tested at various frequencies for pure tone detection
  - Discrimination tests how well the patient understands words presented at audible level
  - Can distinguish between conductive and sensorineural hearing loss: sound introduced into the EAC vs vibration of the mastoid bone, directly vibrating the cochlea
  - Can test the hearing of any aged person

- **Tympanograms**
  - Tympanometers increase air pressure in the EAC and record the resulting pressure changes as the TM moves
  - A: normal movement with no middle ear fluid
  - B: no movement, usually due to fluid in middle ear or hold in eardrum
  - C: retracted TM

- **Conductive hearing loss**
  - Caused by disruption of sound vibration traveling through EAC, or vibration of ossicles
  - Involves the external and middle ear
  - Causes
    - **External ear**
      - Obstruction of EAC (atresia, stenosis, foreign bodies, cerumen, otitis externa, skin lesions)
      - Skin condition (eczema, contact dermatitis, skin cancers)
    - **Middle ear**
      - Fluid in the middle ear, tympanosclerosis, or a large TM perforation can attenuate TM vibration
      - Middle ear fluid, otitis media, ossicular discontinuity, malformation of ossicles, cholesteatoma, otosclerosis can interrupt ossicular vibration
    - **Eustachian tube dysfunction**
      - Normally:
        - The tube is closed and opens with tensing of the palate
        - Cells of the middle ear space absorb gases, and generate a negative pressure in the middle ear space
        - Opening equalizes the pressure and can be felt as ear popping
      - Negative pressure can pull fluid into the middle ear space → otitis media with effusion
        - Fluid can become infected → acute otitis media
          - Bugs are usually: Strep pneumo, H. flu, Moraxella catarrhalis
        - Antibiotics can clear infection, but fluid can remain for wks → most of the time clears
      - Negative pressure in middle ear space can lead to retraction of TM
        - If continues → squamous containing lateral TM can be pulled into space → **cholesteatoma**
          - Collection of squamous skin debris in middle ear space
          - Acquired cholesteatoma can be caused by chronic infection, TM perforations, ETD, and ear surgery
        - Retraction pockets – retraction of pars flaccida → middle ear space may become atelectatic, with TM draped over promontory and ossicles
    - **Tympanosclerosis**
      - Deposits of calcium in TM, usually assoc with recurrent acute infections or surgical scarring
      - Usually benign, but if cover a large % of TM → HL
    - **Tympanic membrane perforations**
      - Caused by infections, trauma, ETD
      - >30% TM perforations cause conductive HL
- If ear with perforation becomes infected → drains
- Many heal spontaneously

- **Otosclerosis**
  - Bony proliferation within temporal bone, leading to fixation of stapes footplate in oval window
  - Strong genetic predisposition
  - Treat with hearing aid or stapedotomy

- **Tumors**
  - Treatment
    - Infections
      - Otitis media: 1st line amoxicillin or trimethoprim/sulfadiazine
      - Otitis externa: ear drops
    - ETD: pressure equalization tubes
    - Surgery: tympanoplasty to repair non-healing perforations, removal of cholesteatomas, ossicular reconstruction
    - Hearing aids: all types of hearing loss; cost is a big problem

- **Sensorineural**
  - Caused by change in the cochlea, auditory nerve or auditory brain centers
  - Cochlear physiology
    - Scala tympani, scala vestibule filled with perilymph (high Na+, low K+)
    - Scala media houses Organ of Corti and filled with endolymph (low Na+, high K+)
    - Vibrations of basilar membrane causes channels to pen in hair cells → K+ flows in → neural signaling
  - Causes
    - Hereditary: connexin26 gene
    - Congenital: children of all ages can be tested!
    - Noise-induced:
      - Can occur with single exposure to very loud sounds or daily exposure to sound >85 dB
      - Loss usually begins at high frequency and is frequently worse at 4000 Hz
      - Irreversible
    - Presbycusis
      - Assoc with aging
      - High frequencies affected 1st
      - Patients have discrimination problems
  - Treatment
    - Hearing aids (do not work well with poor discrimination)
    - Cochlear implants (linear array of electrodes surgically implanted to directly stimulate remaining auditory nerves)

**Pediatric Otolaryngology**
- **Otitis media**
  - Acute Otitis Media
    - More frequent infection in children after infection of the rhinopharynx
    - Occurs most often after viral pharyngitis (RSV, rhinovirus, adenovirus, influenza)
    - Alteration in ET which permits subsequent bacterial infection (H. flu, Strep, Moraxella)
    - Diagnosis: middle ear fluid + ear pain + abnl TM
    - Treatment: amoxicillin vs observation
  - Recurrent Acute Otitis Media
    - Factors for the otitis prone patient: 6-18 mts (maternal immunity), males, Native Americans, Eskimos, genetics, <6 mts old, air pollution, tobacco smoke, NOT breast fed, seasons, craniofacial anomalies, daycare attendance
    - Prophylaxis: works but long term medical therapy, 2ndary infections, resistance
    - Ear tubes as treatment (surgical)
  - Otitis Media with Effusion
    - Expected sequellum of AOM
    - Commonly assoc with viral URI
    - Tympanic membrane bubbles or air-fluid interfaces + dull, opaque, or abnl color
    - TM IMMOBILE TO PNEUMATIC OTOSCOPY → type B tympanogram
    - Treatment: abx vs observation
  - Complications
    - Tympanic membrane perforation
      - Majority assoc with mild hearing loss only and will heal spontaneously within 3 mts
• Problems arise with exposure to external environment (water) + establishment of pathway for migration of epithelial cells into middle ear space (cholesteotoma)
  • **Cholesteotoma**
    • Skin growing in wrong place
    • Makes osteolytic enzymes → can erode into bone → conductive HL, SNHL, balance problems, CN VII paresis, intracranial complications
    • Can also cause pressure necrosis
    • TREATMENT IS ALWAYS SURGICAL

• **Tonsils and Adenoids**
  • Lymphoid tissue related to GALT
  • Tonsillectomy + Adenoidectomy
    • Obstructive sleep apnea
      • Loud snoring
      • Apneic pauses
      • Cyanosis
      • Enuresis
      • Continuous symptoms (whether sick or well)
    • Recurrent pharyngitis
      • 6 episodes in one year
      • If adenoids regrow after taken out → think HIV

• Foreign bodies in ear and nose

• **Stridor**
  • Abnl sound due to airway obstruction
  • Airway endoscopy
  • Assoc dz
    • Laryngomalacia
      • Floppy voice box
      • Variable harsh inspiratory stridor
      • Starts soon after birth
      • Worse with crying/feeding
      • Well, thriving child usually
    • Acute epiglottitis
      • Rapid progression
      • Supraglottic obstruction
      • H. flu B → rare now b/c of HiB vaccine
      • STRIDOR, PAINFUL SORE THROAT, DROOLING
      • Requires intubation
    • Croup
      • Slow onset
      • Subglottic obstruction
      • Viral, parainfluenza, RSV
  • Airway foreign body aspiration → “all that wheezes is not asthma”

• Neck masses
  • Vast majority are benign
  • Ominous/cardinal signs: dysphagia, globus sensation, hoarseness, stridor, wt loss, night sweats, odynophagia, hemoptysis, fatigue, voice change, otalgia

• Congenital nasal mass
  • Nasal polyps in peds → cystic fibrosis
  • All pediatric nasal masses should be imaged prior to surgical diagnostic or therapeutic measures → could be glioma, meningocele, meningocehalocele, demoid

• Tongue tie

• **Rhinosinusitis**
  • URI infections, usually in winter
  • Viral vs bacterial → differentiation is clinical, based on duration/severity of symptoms
  • Frequently difficult to distinguish rhinosinusitis from adenoiditis → rarely sinus surgery indicated in peds
  • Allergic dz may be underlying factor in chronic rhinosinusitis; possibly and immunodeficiency, systemic problem
  • Complications: orbital cellulitis, orbital abscess, osteomyelitis, others

**ENT Emergencies**

• Airway obstruction
  • Supraglottitis/Epiglottitis
Formerly seen in children, now more often in adults
- Dx: fever, stridor, dyspnea, drooling, posture
- Bacterial infection: H. flu
- Treatment: airway control, IV Abx, steroids
- DON’T EXAMINE THE CHILD

- Angioneurotic edema
  - Acute swelling of the tongue, can affect lip, pharynx, supraglottic tissues
  - Dx: occurs “out of the blue”
  - Can be assoc with meds/foods: ACE inhibitors, ASA, penicillin, others
  - May not be able to intubate b/c of too much tongue swelling
  - Treatment: airway control, steroids, ICU observation

- Foreign body
  - Multiple sites: ear, nose, oropharynx, hypopharynx, larynx, trachea, bronchi
  - Most often occurs in children
  - Treatment: recognition, removal of foreign body

- Bleeding
  - Epistaxis (bloody nose)
    - Very common
    - Usually 2ndary to dryness, digital trauma, or superficial vessels; occasionally from coagulation disorders, neoplasms
    - Winter >> summer
    - Potentially life-threatening
    - Anterior bleeding >> posterior
    - Acute management: vasoconstriction, septal cautery, packing placement, endoscopic artery ligation
    - Intervention: arteriography with embolization, surgical ligation of blood vessels

- Infections
  - Peritonsillar abscess
    - Accumulation of pus b/t the tonsil and superior constrictor muscle
    - Dx: sore throat, fever, odynophagic, trismus, “hot potato voice”, drooling
    - Exam: UNILATERAL tonsillar-palatal swelling, uvular deviation
    - Grp A Strep, Strep viridans, others
    - Treatment: hydration, Abx, needle aspiration, I&D of abscess
  - Ludwig’s Angina
    - Infection of the sublingual/submandibular space
    - Dx: swelling of the floor of mouth, tongue pushed up and back
    - Odontogenic source/tooth abscess
    - Treatment: IV abx, trach, I&D
  - Otitis media complications
    - Facial nerve paralysis, coalescent mastoiditis (OM + swelling behind ear)
    - Intracranial: meningitis, epidural/subdural abscess, sigmoid sinus thrombosis, brain abscess
    - Dx: earache, fever, assoc symptoms
  - Invasive fungal sinusitis
    - Immunocompromised patient
    - Dx: significant pain, usually not much fever or WBC elevation (immunocompromised)
    - Exam: GRAY OR BLACK MUCOUS MEMBRANES, usually nasal cavity, palate, usually unilateral
    - Time-sensitive, life-threatening
    - Vascular invasion by fungal elements, ischemic necrosis
    - Treatment: emergency debridement, IV amphotericin B

- Trauma
  - Neck injuries
    - Blunt injuries to anterior neck may be assoc with laryngeal fractures, tracheal injuries
    - Penetrating injuries may cause airway compromise, perforation, major vascular injuries
    - Laryngeal injuries: hoarseness, stridor, dyspnea, soft tissue findings (swelling, bruises), crepitance
    - C-spine injuries

- Neurologic
  - Facial paralysis
    - Distinguish b/t central and peripheral → forehead sparing with central
    - May be partial or complete
    - NOT ALL FACIAL PARALYSIS IS BELL’S PALSY
Eval:
- History of onset, progression
- Look for middle ear fluid, middle ear mass, parotid tumor, neck mass

DDx: trauma, infectious, neoplastic, congenital, idiopathic (Bell’s Palsy)

Causes
- Bell’s Palsy (viral neuropathy – herpetic):
  - Usually sudden onset, but gradual recovery
  - Often noticed on awakening
  - Dx must be made quickly with rapid institution of therapy (<3 days)
  - Rx: prednisone, antiviral drugs
  - Medical therapy diminishes incidence of incomplete recovery
  - NOT BELL’S PALSY: gradual onset of symptoms, no recovery in 3-6 mts, recurrent paralysis
- AOM: facial nerve is dehiscent in middle ear in 40% of patients
- Benign tumors of middle ear, mastoid, CP angle
- Cancer of parotid gland
- Blunt head trauma

Treatment
- Correct underlying problem
- Keep eye moist and protected

### Dizziness and Vertigo

**Anatomy**
- Peripheral vestibular system
  - Semicircular canals: horizontal, superior, posterior
  - Otolithic organs: saccule, utricle
  - Vestibular nerves: superior, inferior
    - Superior innervates: superior, horizontal canals, utricle
    - Inferior innervates: posterior canal, saccule
  - Stapes vibrates over vesicular organs
  - Ampullae of canals = sensors
  - Macula of utricle = sensor → calcium carbonate crystals
  - Central connections
    - Afferent system: 8th nerve, vestibular nuclei
    - Efferent system: vestibulo-ocular (CN III, IV, VI), vestibulospinal, vestibuloreticular, vestibulocerebellar, commissural (vestibulovestibular)

**Function**
- Visual stabilization
- Maintenance of posture

Lesions cause asymmetry of firing (perceive motion) → nystagmus

“Dizziness”
- Vertigo: sense of motion when not being moved (sense of spinning, tumbling or falling)
- Imbalance: +/- vestibular
- Lightheadedness, weakness, foggy/unclear mind, passout/near syncope, panic, nervousness → non-localizing
- Etiology
  - Cardiovascular: carotid artery dz, arrhythmia, hypotension, CHF, anemia → lightheaded, near-syncope, syncope
  - Neurological: brainstem, cerebellum, cortex → memory loss, discoordination, CN disorders, speech abnl, TIA, seizures, stroke
  - Metabolic: thyroid dz, anemia, glucose intolerance
  - MSK: arthritis, myopathy, cervical spine degenerative dz → weakness and 2nd imbalance (wobbling)
  - Vestibular:
    - Inner ear (90% of vertigo)
      - Semicircular canal: Benign Paroxysmal Positional Vertigo
        - Posterior semicircular canal cupulo- or canal- lithiasis
        - Dx: positional vertigo, seconds duration, comes and goes, no hearing symptoms, positive Dix-Hallpike Maneuver, torsional nystagmus
        - More common in elderly and with trauma
        - Treatment: Canalith Repositioning maneuver (CRP), Brandt-Darroff Exercises
      - Membranous labyrinth: Meniere’s Dz
        - Endolymphatic hydrops of the membranous labyrinth
- **Dx:** episodic vertigo lasting minutes to hours, tinnitus, hearing loss, pressure, low freq hearing loss, nystagmus
- **Treatment:** diuretics, low salt diet, vestibular suppressants, endolymphatic sac decompression, intratympanic gentamicin, vestibular nerve section, labyrinthectomy
  - **Vestibular nerve**
    - **Vestibular neuronitis**
      - Probably HSV of vestibular nerve(s)
      - **Dx:** severe vertigo, nausea, vomiting x days, vestibular nystagmus, normal hearing
      - **Treatment:** steroids, antivirals, vestibular suppressants, vestibular rehab
      - Sensory nerve usually does not recover → imbalanced
    - **Vestibular schwannoma**
      - Benign 8th nerve tumor (acoustic neuroma)
      - **Dx:** positional unsteadiness, occasional vertigo, imbalance, asymmetric hearing loss, facial numbness
      - **Treatment:** observation, surgery, radiation
  - **Labyrinthine fistula**
    - Chronic otitis media, cholesteatoma, trauma, spontaneous
    - **Dx:** intermittent vertigo, imbalance, asymmetric hearing loss, abnl ear exam
    - **Treatment:** bed rest, head elevation, stool softeners, surgery
  - **Otolithic organs**
    - **CNS (10% of vertigo)**
      - Brainstem/cerebellum
      - Migraine (vestibular-variant)
      - Cerebrovascular accident (stroke)
      - Microvascular compression of 8th nerve
      - Demyelination: MS, others

**Sinusitis**
- **DDx of runny, stuffy nose**
  - Inflammatory – allergy, infection, polyps, CF
  - Structural – septal deviation, valve collapse, CSF leak/encephalocele
  - Systemic/Autoimmune – Wegener’s, Sarcoidosis, Tb, SLE, syphilis
  - Neoplastic – cancer (SCC, adenocarcinoma, lymphoma, sarcoma, inverted papilloma), dental (dentigeous cysts, ameloblastoma)
- **Hx:** pain, congestion, runny nose, bleeding, post-nasal drip
- **Endoscopic exam:**
  - Inferior meatus: Nasolacrimal duct
  - Middle meatus: anterior ethmoids, maxillary, frontal
  - Superior meatus: posterior ethmoids
  - Sphenoid sinus drains directly into nose thru sphenoid
- **Infections**
  - Viral infections
    - Common cold – rhino, adeno, coxsackie, echo
    - Influenza – rhinitis of viral exanthems
      - Antivirals/vaccination
    - Zinc used as a treatment?
    - **Cure?**
      - Maintain temp 65-70 deg
      - Humidity near 45%
      - Sudden changes encourage infection
    - Body chilling (esp hands and feet) → vasoconstrict nose, ↓ nasal mucosa temp, ↑ risk of infection (viral attachment)
  - **Bacterial**
    - ANTERIOR ETHMOID SINUSES
    - Acute sinusitis = pus in sinuses
      - S. pneumo, M. catarrhalis, H. Flu
      - **Dx:** H&P, x-rays
• Treatment: Abx (amoxicillin/bactrim), decongestants, mucolytics, +/- antihistamines
  o Surgery only if unresponsive to others or if complications arise

  ▪ Chronic (>3 mts)
    • Underlying etiology: allergy, polyps, CF, immunodeficiency
    • Organisms: also staph, anaerobes, gram neg (pseudomonas)
    • Dx: H&P, CT scans
    • Treatment: manage underlying dz, Abx for longer (3-4 wks), steroids (intranasal and/or systemic), surgery (unresponsive to meds)

  ▪ 7 deadly sins
    o Cavernous sinus thrombosis
    ▪ Develops from any mid-face infection or sinusitis
    ▪ Outcome: death
    ▪ Prevention: any cellulitis, furuncle, etc gets Abx and close follow-up
    o Toxic shock syndrome
    ▪ Can develop from presence of any packing material, stent in nose
    ▪ Outcome: death
    ▪ Prevention: with any foreign body in nose, give anti-staph coverage
    o Septal hematoma
    ▪ Develops after trauma to nose
    ▪ Outcome: saddle nose nasal deformity
    ▪ Prevention: look at septum of every patient who has nasal trauma
    o Brain abscess / meningitis / orbital abscess
    ▪ Develops in complicated sinusitis
    ▪ Outcome: death
    ▪ Prevention: neuro exam and eye exam
    o Fungal sinusitis
    ▪ Develops in DIABETICS, IMMUNOCOMPROMISED
    ▪ Outcome: death
    ▪ Prevention: suspect in all immunocompromised who aren’t getting better ➔ black eschars on septum and turbinates
    o CF
    ▪ Pathognomnemonic in children with polyps < 10 yo
    ▪ Prevention: suspect ➔ send for sweat test
    o Sinus/nasal cancer
    ▪ Suspect in presence of UNILATERAL polyps
    ▪ Prevention: suspicion

Neck Masses

  ▪ Ominous/Cardinal Signs: Dysphagia, Globus sensation, Hoarseness, Stridor, Wt loss, Night sweats, Odynophagia, Otalgia, Voice change, Hemoptysis, Fatigue
  ▪ Diagnostic procedures: Flexible fiberoptic endoscopy and Fine needle aspiration biopsy
  ▪ Salivary Gland Dz
    o Major glands: parotid, submandibular, sublingual
    o Minor glands
    o Bilateral swelling
    ▪ Viral
    ▪ Mumps
    ▪ HIV: lymphoepithelial cysts of the parotid
    ▪ Autoimmune disorders: Sjogrens
    o Bacterial parotitis
    ▪ Staph aureus
    ▪ Swelling, pain, heat, redness
    ▪ Pus from Stentsen’s duct
    ▪ Stone vs dehydration
    ▪ Treatment: heat, sialagogues, hydration, Abx (long term Staph coverage)
    o Sialolithiasis (salivary gland stones)
      ▪ Typically in submandibular duct
      ▪ Can palpate lateral to lingual frenulum
      ▪ Stasis may lead to 2ndary infection (backflow of spit)
      ▪ Tender swollen SMG
      ▪ Treatment: removal of stone (sialodochoplasty), removal of gland
    o Neoplasms
- Smaller the gland, the more likely to be malignant
- Masses in front of ear or at the angle of mandible = parotid lesion until proven otherwise
- Benign: pleomorphic adenoma, others
- Malignant: adenoid cystic (perineural spread + skin lesions), mucoepidermoid carcinoma
- Metastatic: SCCA most common
- Dx: FNA diagnose 95% of masses, surgical removal is best diagnostic step
- Treatment: superficial parotidectomy (trace facial nerve, do not enucleate tumor – recurrence, nerve injury)

- Thyroid cancer
  - Papillary
    - Often metastasize to lymph nodes, can be multifocal, LN mets don’t affect survival
    - Prognosis: better if <1.5 cm and no capsule involvement; more indolent when age <30-40 (recurrence rates high b/c they live longer)
    - Treatment: total thyroidectomy, radioactive iodine and hormone suppression
      - Surgical risk: recurrent laryngeal nerve injury, hypoparathyroidism
      - Modified neck dissection if N+
  - Follicular
    - Microinvasive vs macroinvasive
    - Post-surgical diagnosis: must see capsule or vascular invasion (can’t see on FNA)
    - Metastasizes via bloodstream
    - Treatment: total thyroidectomy, hormone suppression
  - Medullary
    - Familial (MEN IIa/b) vs sporadic
    - Cell of origin: Parafollicular cells / C-cells
    - All patients should get urinary metanephrine \( \rightarrow \) i/o pheo
    - 1st degree relatives should be tested for calcitonin levels
    - RET proto-oncogene + in most
    - May produce amyloid
    - Treatment: total thyroid with elective neck dissections, follow post-op calcitonin levels (radiate if levels remain high or elevate), radioactive iodine not useful
  - Anaplastic
    - Rare, dismal prognosis, secure airway
    - Lymphoma tough to distinguish \( \rightarrow \) typically arise with bkgd of Hashimoto’s thyroiditis

- Head and Neck Cancer
  - Associated sx of concern: hoarseness > 2 wks, otalgia, dysphagia, persistent oral ulcer, unilateral serous otitis
  - 95% is SCCA
  - Originates from cuboidal cells along BM of mucosa
  - Treatment: treat primary lesion, neck metastasis treated with neck dissection, post op radiation

- Pediatric Neck Mass
  - Most likely benign (unlike adults)
  - Congenital
    - Hemangioma
      - Most common tumor in infants
      - Most not present at birth
      - Proliferative phase
      - Eventual involution
      - Management depends on size, location, other symptoms
    - Vascular malformations
      - Present at birth
      - Gradual progression over lifetime
      - Expand rapidly with trauma, inflammation, hormonal changes
    - Aneurysm
      - May be 2ndary to trauma, infectious, host factors
      - Pulsatile (thrill), bruit to auscultation
      - Mobile laterally not superoinferiorly
    - Glomus tumors
      - Paragangliomas/chemodectoma/glomus tumors
      - May be multicentric, familial
      - May secrete vasoactive cathecholamines

| Women > Men, Older > Younger in frequency |
| Women < Men, Older < Younger in malignancy (>40) |
Branchial anomalies
- Cyst: external opening
- Fistula: from aero-digestive tract to skin
- Sinus: internal opening
- 2nd: ant to SCM = most common

Thyroglossal duct cysts
- Remnants of thyroid anlage as thyroid descends from foramen cecum to lower neck
- Paramidline mass, elevate with tongue protrusion
- Need to excise middle 3rd of hyoid with cyst

Infectious
- Most common = adenopathy assoc with tonsillitis or pharyngitis
- Lymph nodes can become infected: Staph, Strep, H. Flu
- Cat Scratch Dz: Bartonella henselae
  - Granulomatous
  - Afebrile, non-tender
- Tuberculosis: Classically occurs in multiple nodes
- Atypical TB: confined to 1-2 areas, non-painful
- Retropharyngeal Cellulitis or Abscess
  - Inflammation on anterior spinal ligament and skull base causes stiff neck (mенингизмус)
  - Abscess needs surgical drainage
  - Abx coverage for Staph, H. flu, anaerobes

Neoplastic
- Vast majority are benign
- Lymphoma (Hodgkin’s > NHL)
- Rhabdomyosarcoma

Head and Neck Cancer: SCC
- Most commonly presents at ages 55-84, with a peak at ages 70-74
- Tobacco, alcohol (cocarcinogen), genetic predisposition (ARF oncogene), viruses (HPV, EBV – nasopharyngeal cancers only), diet (nasopharyngeal cancer and nitrates)
- Premalignant lesions: leukoplakia, erythroplakia (a lot more risky than white)
- Lip and oral cavity cancer: lip, buccal, floor of mouth, oral tongue, hard palate, gingivae
- Pharynx: nasopharynx (endemic in SE Asia, EBV related, dietary nitrates, genetic predisposition), oropharynx, hypopharynx
- Larynx: supraglottic, glottic, subglottic
- Speech Rehab: buccal, pharyngeal, esophageal speech; artificial larynx
- Common signs and symptoms
  - Hoarseness > 2wks
  - Dysphagia
  - Odynophagia
  - Neck mass
  - Hemoptysis
  - Weight loss
  - Painful mass or ulcer in mouth/throat
- Eval: thorough head and neck exam with indirect laryngoscopy and palpation; CT, FNA/biopsy/panendoscopy
- Treatment: surgery, radiation, organ preservation protocols, palliative chemo