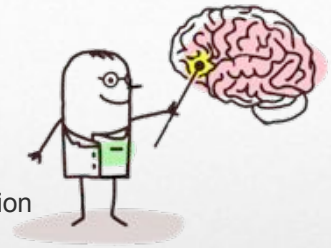
Module 20

HEENT & Neurology; Assessment, Common and Emergency Presentations

Artist: Moses Amik

Part One: Neurology

- Introduction to CNS
- Neurological history
- Mental Status Exam
- Montreal Cognitive Assessment (MoCA)
- Neurological and Cranial Nerve examination



1B: Neurological Conditions

- Bell's Palsy
- Headache (tension, cluster, migraine)
- Temporal Arteritis

1C: Neurological Emergencies

- Meningitis
- Seizures
- Stroke/ Intercranial hemorrhage
- Coma (Not yet diagnosed)
- Head Trauma

1D: Paediatric Considerations

- Hypotonia of the Infant or child
- Febrile seizures

Overview – Part 1 - Neurology

Part 2: HEENT Assessment

Advanced Assessment Techniques

- Red Eye Reflex
- Fundoscopy
- Otoscopy
- Tonsil Size
- Cervical Lymph Nodes

Overview – Part 2 – HEENT Assessment

Part 3: Ophthalmology

3A: Ophthalmic Conditions

- Conjunctivitis
- Red Eye
- Glaucoma

3B: Ophthalmic Emergencies

- Blunt Ocular Trauma
- Chemical Burns
- Corneal Abrasion
- Corneal Ulcer
- Foreign Body

Overview – Part 3 - Ophthalmology

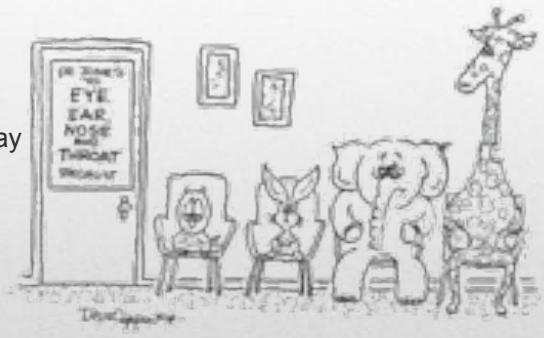
Part 4: Ears, Nose and Throat

4A: ENT Common Conditions

- Otitis (media/ externa)
- Sinusitis
- Pharyngitis
- Infectious Mono
- Dental Abscess and Decay

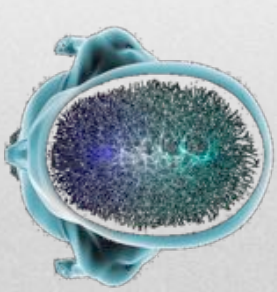
4B: ENT Emergencies

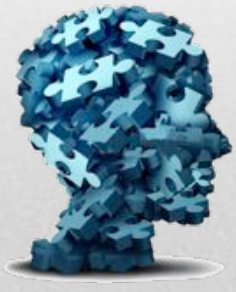
- Peritonsillar Abscess
- Posterior Epistaxis
- Emergency Dental

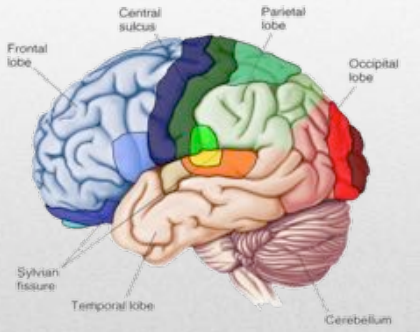


Overview – Part 4 - Otorhinolaryngology

Part 1: Neurology







"OPQRST" HPI

Onset of symptoms:
- # of days, sudden vs. gradual?

Provocation:
- what makes it worse vs. better?

Quality of Pain or symptoms:
- dull vs. sharp?

Region/Radiation:
- do the symptoms radiate?

Severity:
- 0-10 scale

Time:
- when did it start? Has it changed? (improving vs. deteriorating?)

History of Presenting Illness (HPI)

Personal History

- Seizures
- Head trauma
- Metabolic disease
- Cardiac disease
- Transient ischemic attack
- Demyelinating diseases
- ETOH or illicit drug use
- Chronic headaches
- Psychiatric illness
- Bell's palsy
- Recent infection
- Review of medications

Family History

- Seizures
- Metabolic disease
- Cardiac disease
- Demyelinating diseases
- Migraine headaches
- Cerebral aneurysms, arteriovenous (AV) malformations
- Psychiatric illness

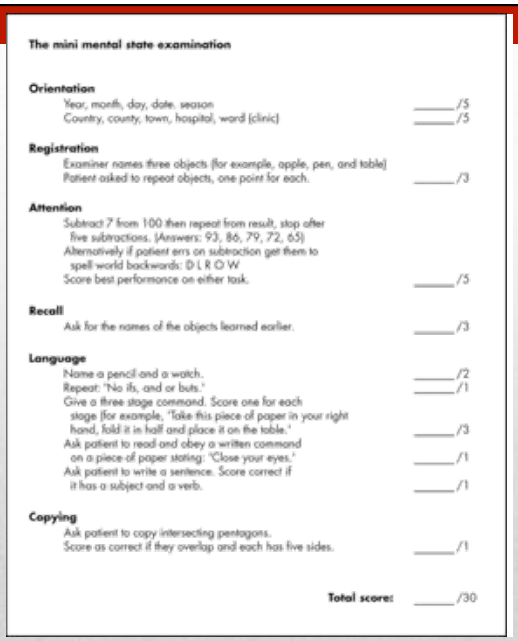
CNS History

- Mental Status Examination (MSE)
- Cranial nerve assessment
- Motor system assessment
- Sensory system assessment
- Reflexes

Complete Neurological Examination

- **Appearance**
  - Basic grooming and hygiene
- **Gait & Motor coordination**
  - Specific movements (see guide)
- **Behaviours**
  - Eye contact
  - Specific behaviours (see guide)
- **Speech**
  - Rate
  - Volume
  - Enunciation
  - Tempo
- **Mood and Affect**
  - Expressed mood (see guide)
  - Specific affect (see guide)
- **Thought Processes and Content**
  - Orientation
  - Reasoning
  - Flight of ideas
  - Illogical thinking (see guide)
- **Perception**
  - Abstract thinking
  - Concentration and Attention
  - Hallucinations and Delusions
- **Cognition**
  - Recall and memory
  - Comprehension
- **Insight and Judgment**
  - Intellectual ability
  - Impulsivity

Mental Status Examination



The mini mental state examination

Orientation
Year, month, day, date, season _____/5
Country, county, town, hospital, ward (clinic) _____/5

Registration
Examiner names three objects (for example, apple, pen, and table)
Patient asked to repeat objects, one point for each. _____/3

Attention
Subtract 7 from 100 then repeat from result, stop after five subtractions. (Answers: 93, 86, 79, 72, 65)
Alternatively if patient errs on subtraction get them to spell world backwards: D L R O W
Score best performance on either task. _____/5

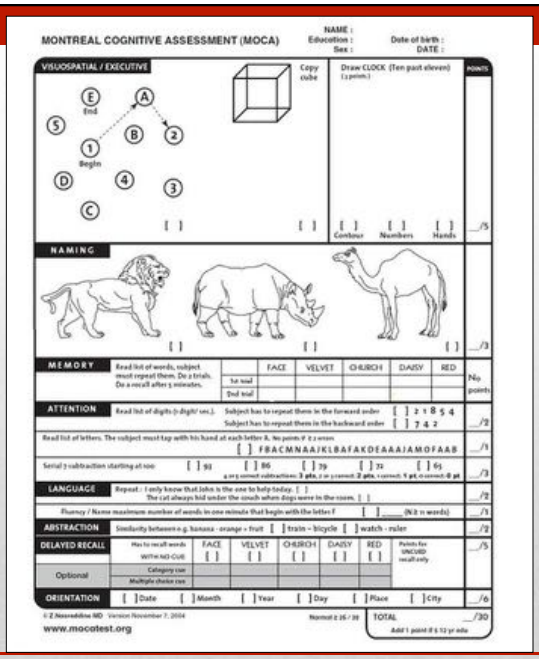
Recall
Ask for the names of the objects learned earlier. _____/3

Language
Name a pencil and a watch. _____/2
Repeat: 'No ifs, and or buts.' _____/1
Give a three stage command. Score one for each stage (for example, 'Take this piece of paper in your right hand, fold it in half and place it on the table.' _____/3
Ask patient to read and obey a written command on a piece of paper stating: 'Close your eyes.' _____/1
Ask patient to write a sentence. Score correct if it has a subject and a verb. _____/1

Copying
Ask patient to copy intersecting pentagons.
Score as correct if they overlap and each has five sides. _____/1

Total score: _____/30

Mini Mental Status Exam (MMSE)



MONTREAL COGNITIVE ASSESSMENT (MOCA)

NAME :
Education :
Sex :
Date of birth :
DATE :

VISUOSPATIAL / EXECUTIVE — Copy cube — Draw CLOCK (Ten past eleven) — POINTS

NAMING

MEMORY — Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes. — FACE | VELVET | CHURCH | DAISY | RED — No points

ATTENTION — Read list of digits (1 digit/ sec.). — Subject has to repeat them in the forward order [ ] 2 1 8 5 4 — Subject has to repeat them in the backward order [ ] 7 4 2 — /2

Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors. [ ] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B — /1

Serial 7 subtraction starting at 100 [ ] 93 [ ] 86 [ ] 79 [ ] 72 [ ] 65 — 4 or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt — /3

LANGUAGE — Repeat : I only know that John is the one to help today. [ ] — The cat always hid under the couch when dogs were in the room. [ ] — /2

Fluency / Name maximum number of words in one minute that begin with the letter F [ ] ____ (N≥ 11 words) — /1

ABSTRACTION — Similarity between e.g. banana - orange = fruit [ ] train – bicycle [ ] watch - ruler — /2

DELAYED RECALL — Has to recall words — FACE [ ] | VELVET [ ] | CHURCH [ ] | DAISY [ ] | RED [ ] — Points for UNCUED recall only — /5

Optional — Category cue | Multiple choice cue

ORIENTATION — [ ] Date [ ] Month [ ] Year [ ] Day [ ] Place [ ] City — /6

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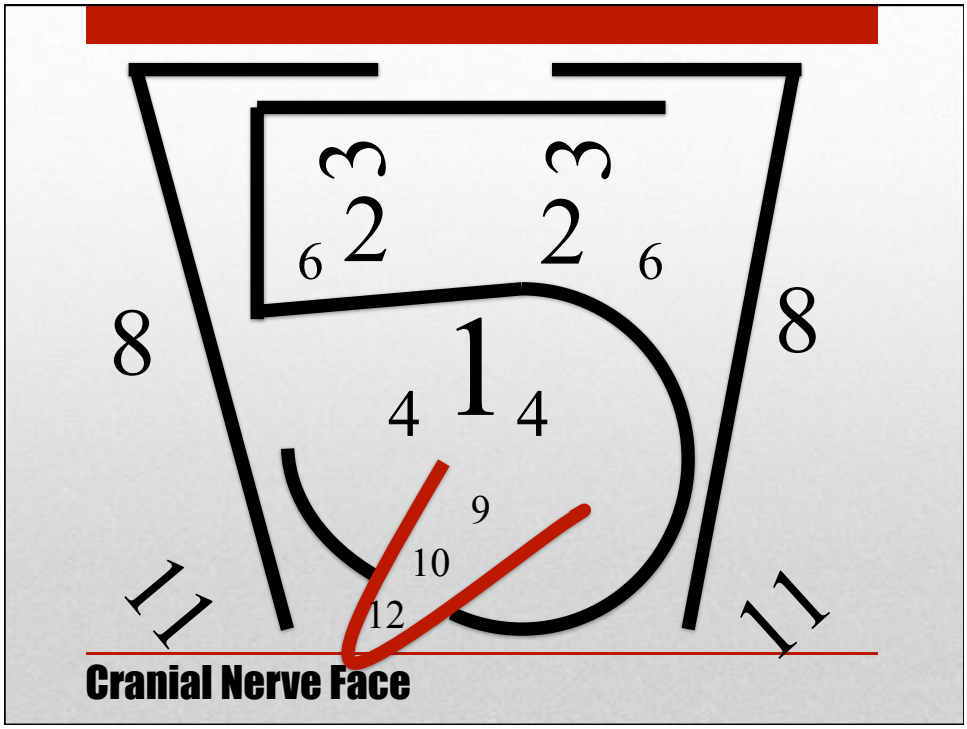
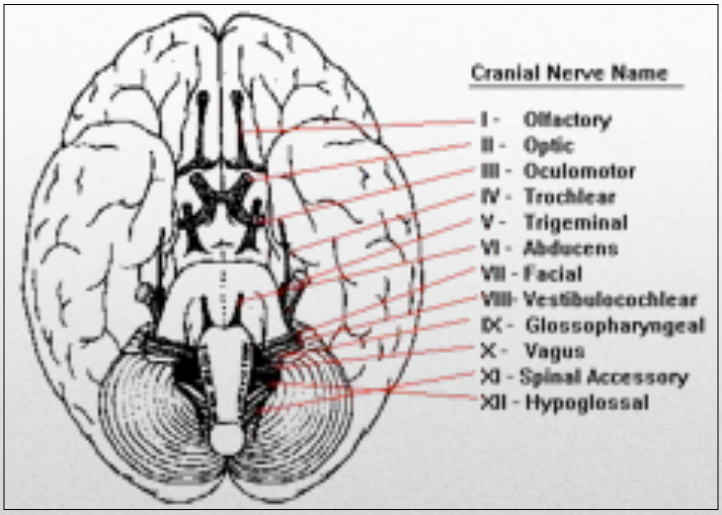
Montreal Cognitive Assessment (MoCA)



Cranial Nerve Face



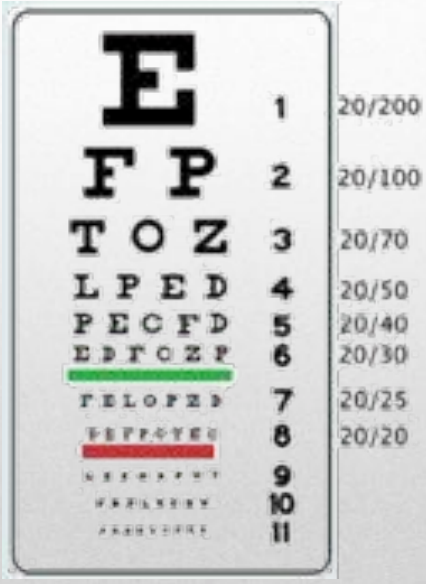
On Old Olympus Towering Top A Famous Vocal German Viewed Some Hops
Some say money matters, but my brother says big brains matter more.

Cranial Nerve Examination

Sensory
- Assess smell

I - Olfactory

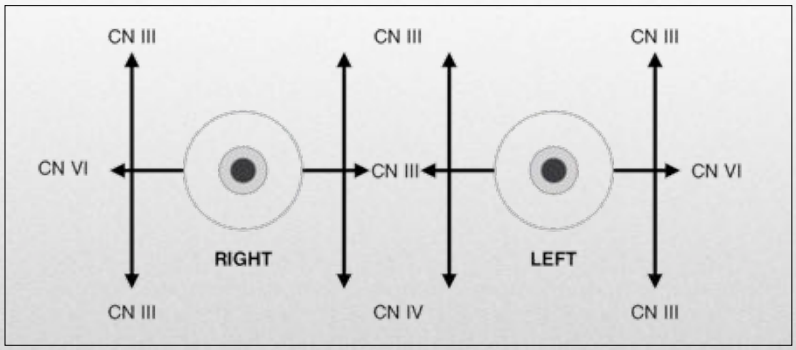
Sensory
- Visual Acuity
- Visual Fields



II - Optic

Motor

- 6 cardinal directions • PERRLA



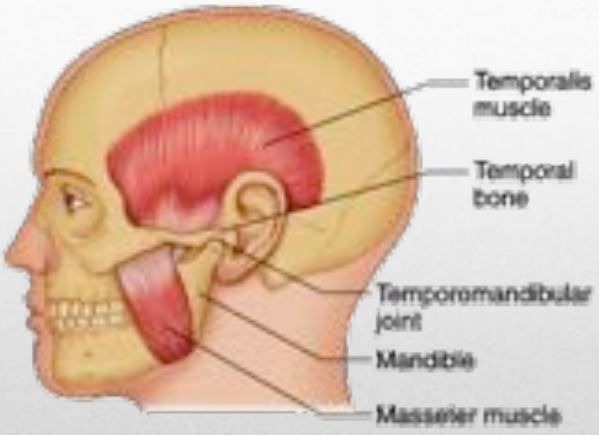
III - Oculomotor
IV - Trochlear
VI - Abducens

Sensory

- Light touch test

Motor

- Clench and grind teeth



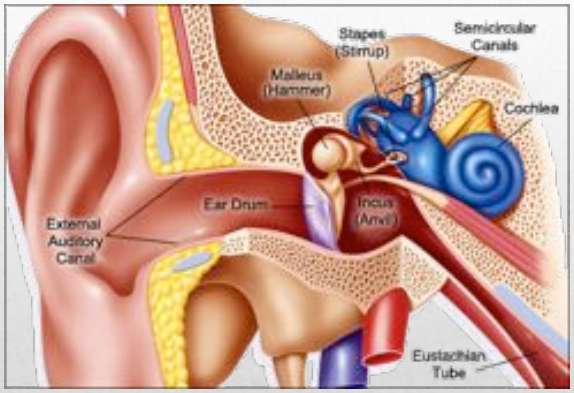
V - Trigeminal

Sensory
- Anterior 2/3rd taste

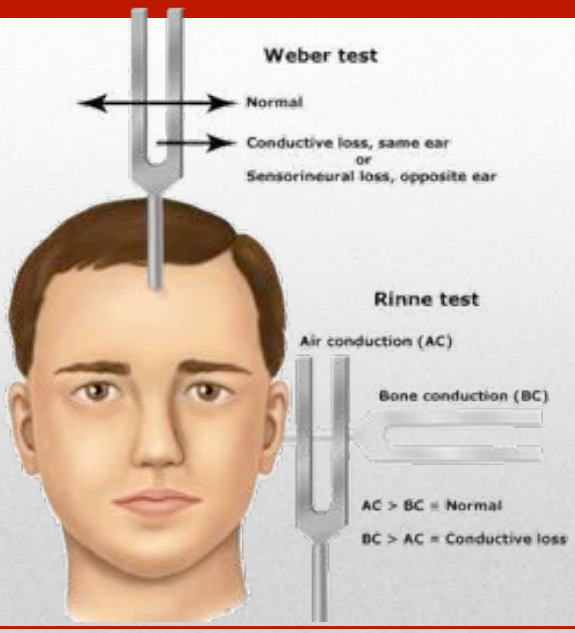
Motor
- Assess facial symmetry
- Muscles of facial expression

VII - Facial

Sensory
- Assess hearing
- Whisper test
- Weber test



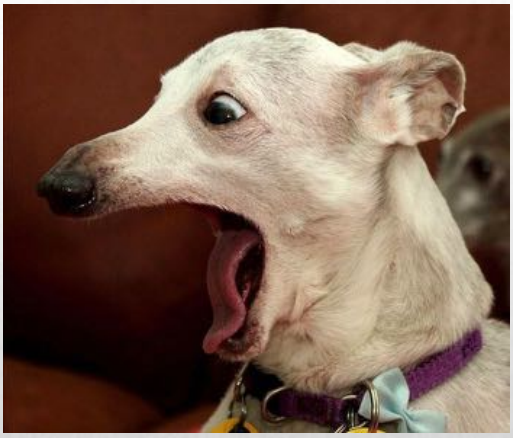
VIII - Acoustic (Vestibulocochlear)



Weber and Rinne tests

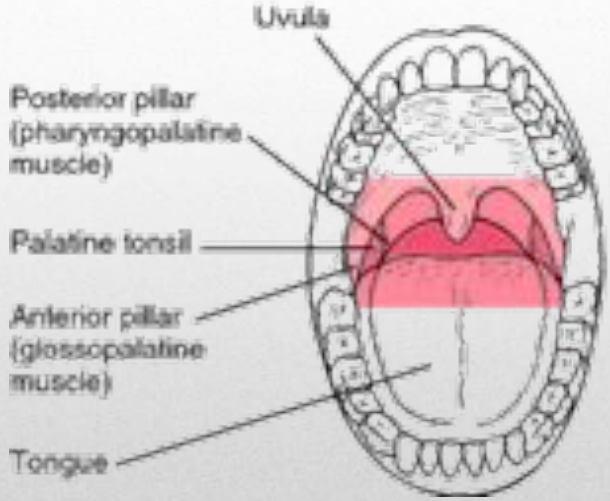
Sensory
- Posterior 1/3rd taste

Motor
- Say ahhhh



IX - Glossopharyngeal

Sensory/Motor
- Gag reflex
- Assess voice



X - Vagus

Motor
- Neck strength
- Shoulder strength

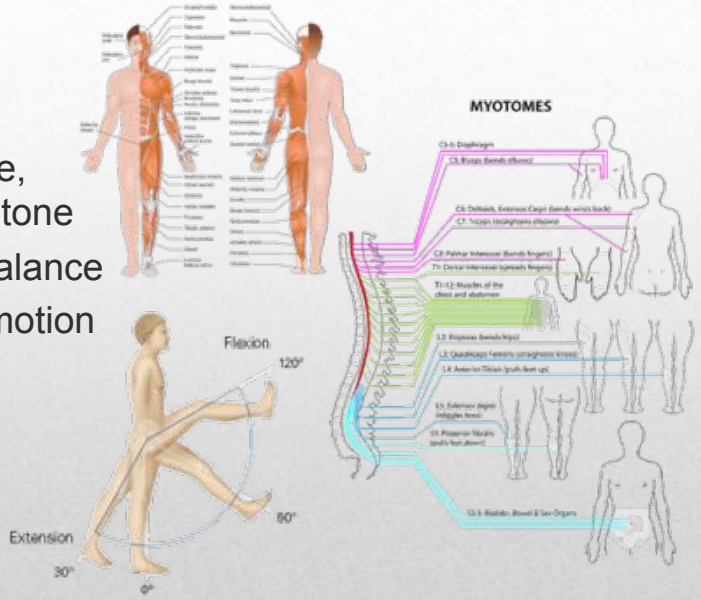
XI - Spinal Accessory

Motor

- Uvula and tongue midline

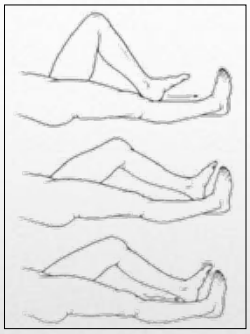
XII - Hypoglossal

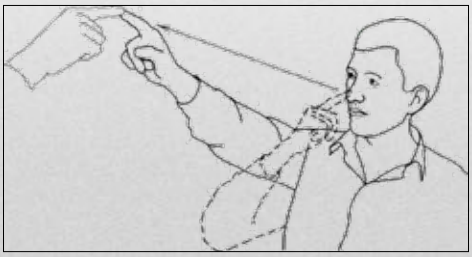
- Muscle size, strength & tone
- Gait and balance
- Range of motion
- Myotomes



Motor System Assessment

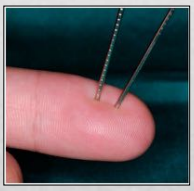
- Gait & balance
  - Heel to toe walk
  - Romberg's test
- Coordination & Skilled movements
  - Rapid alternating movements

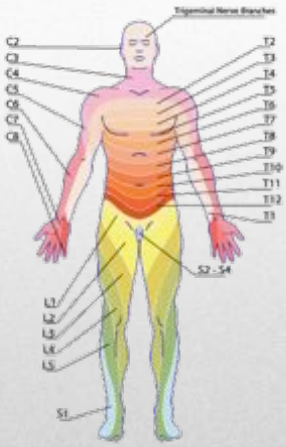


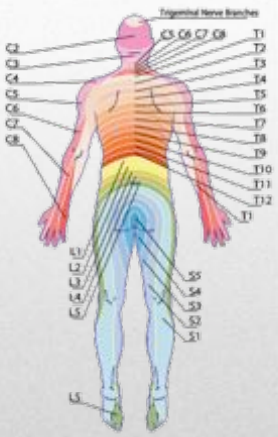


Cerebellar Assessment

- Superficial pain
- Light touch and vibration
- Position sense
- 2 point discrimination







Sensory System Assessment

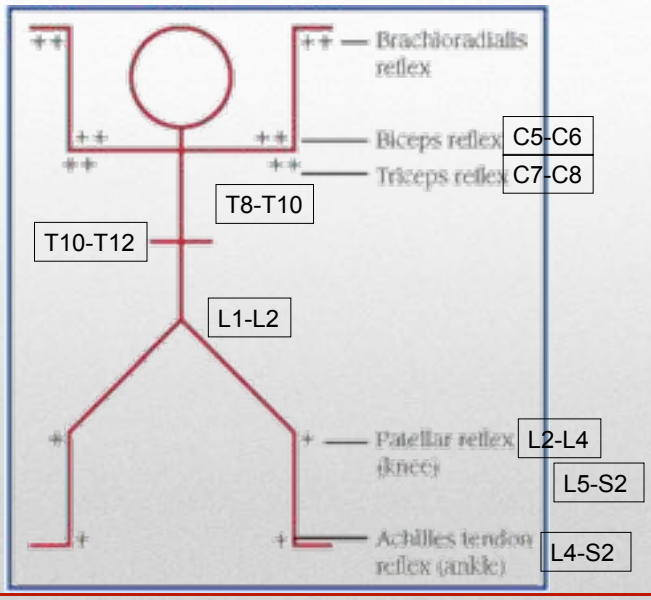
Types of Reflexes

- Deep Tendon
  - Patellar
- Superficial
  - Corneal
- Visceral
  - PERRLA
- Pathologic
  - Babinski

Grading Reflexes

- Compare Right and Left Sides
- **Deep Tendon Reflexes**
  - 4+ very brisk, hyperactive with clonus
  - 3+ brisker than average
  - 2+ average, normal
  - 1+ diminished, low normal
  - 0 No response
- **Superficial Reflexes**
  - 0 absent
  - + present

Reflexes



Reflexes

Part 1B: Common Neurological Conditions

Causes:

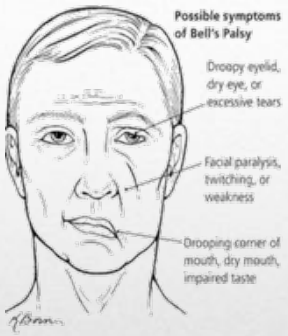
- Unknown, possible viral infection

Differential Dx:

- Stroke, cerebral tumour, meningitis

Management:

- Consult MD immediately
- Prednisone 60-80mg/day PO x 5/7



Physical Findings:

- Flat nasolabial fold
- Unable to close eye, raise eyebrow or smile to affected side
- Taste affected to 2/3 of tongue

Bell's Palsy

Primary

- Tension
- Cluster
- Migraine
- Other
  - Benign cough-related
  - Benign exertional
  - Post traumatic

Secondary

- Cerebral
  - brain tumour
- Meninges
  - meningitis
- Extracranial
  - dental, TMJ
- Metabolic
  - medications, toxins
- Vascular
  - HTN

Headache

Causes:

- Stress, anxiety, poor posture, jaw clenching

History:

- Bilateral, wax and wane
- Dull, tight, band-like
- Not worse with activity
- Associated symptoms

Management:

- Acetaminophen 325mg i-ii tabs Q4-6hrs (max 4g/day)
- Stress management

Tension Headache

Causes:

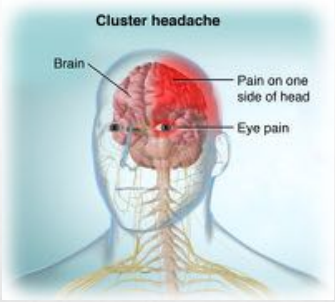
- Unknown

History:

- Unilateral, sudden onset
- Begins dull then increases
- Usually resolves 30-120 minutes
- Cyclic or seasonal patterns

Management:

- Oxygen (high flow) 100% by NRB 6-10L/min
- Serotonin receptor agonist ("triptans")



Physical Findings:

- conjunctival injection
- rhinorrhea
- lacrimation
- ptosis

Cluster Headache

Causes:

- Constriction and dilation of intracranial and extra-cranial arteries
- Triggers: foods, menstrual cycle, fatigue, excessive sleep, stress, light

History:

- Unilateral or diffuse
- Pulsatile, peaks within 1hr
- Worsens with activity
- Associated symptoms

Management:

- Mild, Moderate, Severe
- Rest in dark, quiet room
- Treat symptoms
- Advil 400mg i-ii tabs Q6hours with food
- Serotonin receptor agonist ("triptan")

Migraine Headache

Migraine Headache Dx.

Aura

- **2 attacks** when untreated or unsuccessfully treated last 4-72hrs **with neurological dysfunction**

Have at least 2 characteristics:

- Unilateral (30-40% have bilateral)
- Pulsating quality (50% report non-throbbing pain)
- Moderate to Severe (interferes with ADLS)
- Pain aggravated by activity

At least 1 of the following:

- Nausea and/or vomiting
- Photophobia and phonophobia
- No evidence of other disease

without Aura

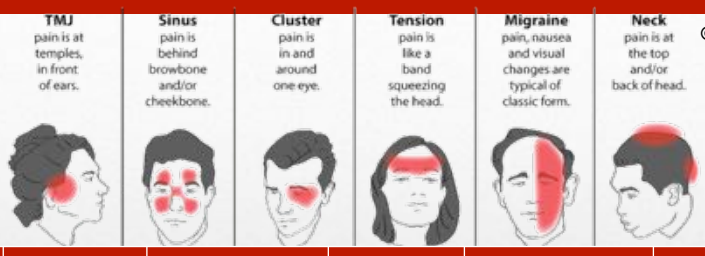
- **5 attacks** when untreated or unsuccessfully treated last 4-72hrs

Have at least 2 characteristics:

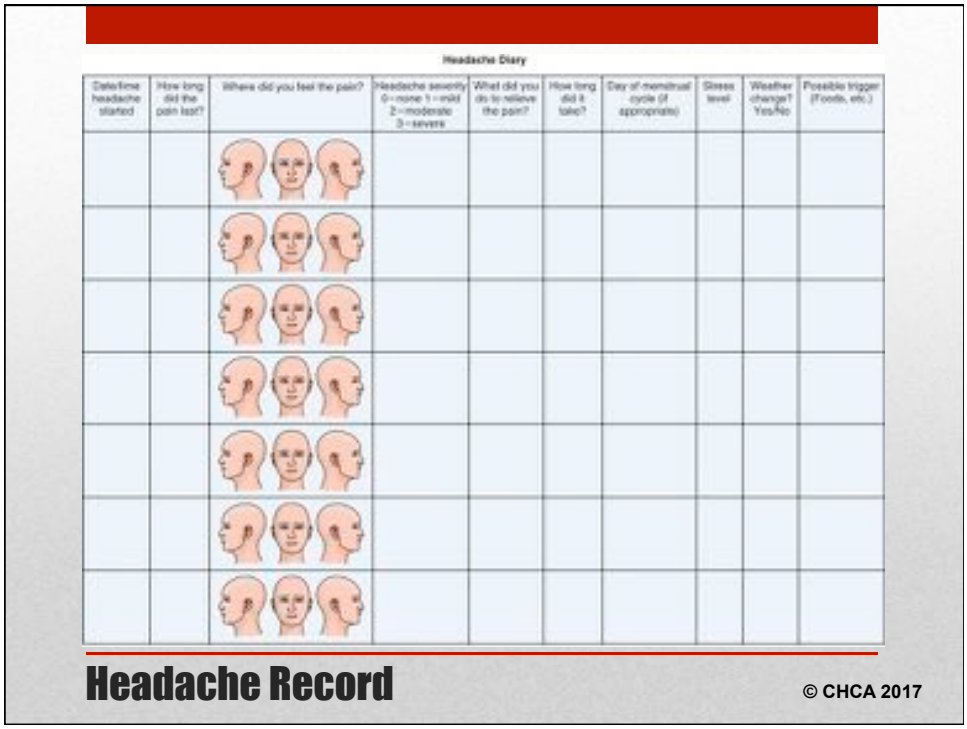
- Unilateral (30-40% have bilateral)
- Pulsating quality (50% report non-throbbing pain)
- Moderate to Severe (interferes with ADLS)
- Pain aggravated by activity

At least 1 of the following:

- Nausea and/or vomiting
- Photophobia and phonophobia
- No evidence of other disease



	Duration	Frequency/ Timing	Severity	Quality	Associated Features
Tension	30min x 1/52	Varies	Dull to moderate ache	Tight pressure around head	Tight or sore shoulder muscles
Cluster	30min – 120min	1-8 times daily	Very severe	Boring, stabbing, piercing	One sided tearing, nasal congestion
Migraine	4-72hr	Varies	Moderate to very severe	Steady, pulsing, strong	Light/Sound sen., N/V, vision chnge
Cervico-genic	1-6hrs	Daily	Moderate to severe	Dull ache to severe	Neck pain, occ. nausea



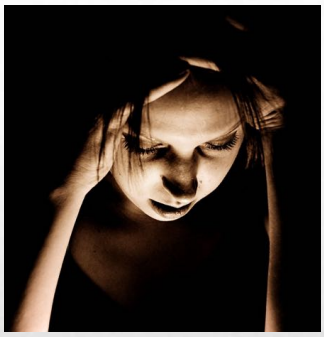
- Vascular causes (leading to migraine) and muscle contraction (leading to tension headaches) are the most common cause of headaches in children.

Vascular Lesions	Muscle Contraction	Infection	Trauma	Toxic Effects	Psychogenic	Other
Arterio-venous malformation Berry aneurysm Cerebral infarction Intracranial hemorrhage	Tension	Brain abscess Dental infection Encephalitis Meningitis Sinusitis	Neck injury Post-concussion syndrome Subdural hematoma	Carbon dioxide Heavy metal poisoning Excess vitamins Non-medicinal agents	Conversion Depression factitious	Food allergies Refractive error Ocular muscle imbalance TMJ dysfunction

Headache - Paediatric Considerations

- A 35 year old female presents to the clinic with a "band like" headache.

What additional information would you want to know?



Your most likely diagnosis is:

A. Migraine
B. Tension Headache
C. Cluster Headache
D. Pseudo-migraine

Clinical Case

History:

- Possibly autoimmune

History:

- Age >50 years
- Pain becomes more severe and constant over several days
- Headache unilateral or bilateral

Physical Findings:

- Scalp tenderness
- Claudication of extremities and jaw
- Bruits over carotid, axillary, brachial and subclavian arteries

Management:

- Physician consult
- Rx. Prednisone

Temporal Arteritis

Part 1C: Neurological Emergencies

DDx. Of Acute Unconsciousness	
Metabolic Disturbances	Hypo perfusion
A: Anoxia E: ETOH intoxication I: Insulin excess (hypoglycemia) O: Overdoses (drugs) U: Uremia S: Seizure	• Stroke • Hypotension • Hypovolemia • Arrhythmias • Head trauma

Cause:

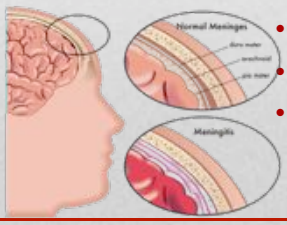
- Often respiratory infection

History:

- High fever
- Headache (severe and worse with movement)
- Vomiting +/- nausea
- Photophobia
- Decreased LOC Possible seizures

Physical Findings:

- Triad: fever, nuchal rigidity and altered mental status
- Tachycardia or bradycardia with increased ICP
- BP may be normal
- Moderate-acute distress
- Flushing
- Focal neurological signs
- Photophobia
- Petechial rash



Meningitis

Differential Diagnoses:

- Bacteremia
- Sepsis
- Brain Abscess
- Encephalitis
- Seizure

Diagnostics:

- CBC
- Blood C&S x 3
- Urine C&S
- CSF C&S

Treatment:

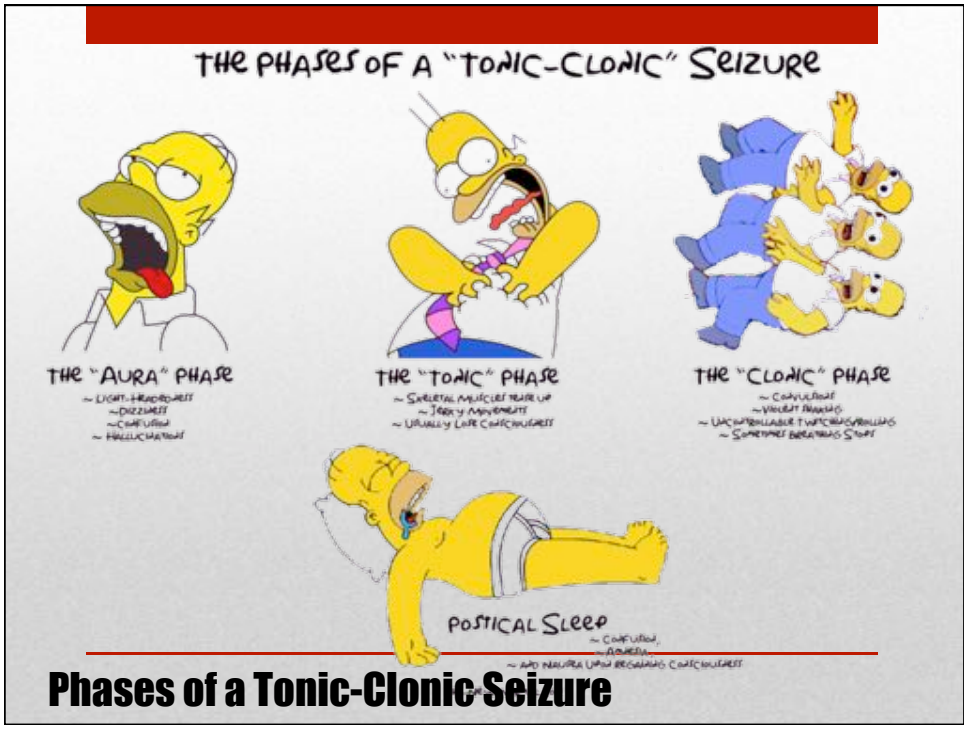
- *MD consult immediately for medevac*
- Bed rest, isolate, NPO, IV
- Antipyretic for fever
- Antimicrobials
  - Ceftriaxone 2g STAT and
  - Vancomycin 1g STAT
  - If immune compromised ADD Ampicillin 2g STAT

Petechial Blanching using a glass

Meningitis

- Generalized tonic-clonic (“Grand Mal”)
- Focal
- Absence (petit mal)
- Complex partial
- Partial
- Myoclonic
- Infantile spasm
- Unclassified
- Status epilepticus

Seizures



Phases of a Tonic-Clonic Seizure

Causes

- Personal history of
- Epilepsy
- Drugs
- Hypoxia
- Brain tumor
- Cerebral infection
- Metabolic disturbance
- Head injury
- Stroke, TIA
- Malignancy
- Narcolepsy

History

- Personal history of Seizure
- Family history
- Description of seizure activity
- Loss of bowel or bladder control
- HX of aura prior to onset of Seizure
- Drugs (prescription, non prescription, recreational

Physical Findings:

- Fever?
- Postictal state (drowsiness, confusion, behavioral changes)
- Evidence of trauma (tongue laceration)

Seizures

Diagnostics:

- Attach Cardiac Monitor
- ECG (>50years)
- Blood Glucose
- Urinalysis
- Toxicology screen

Management:

- *Consult immediately for medevac ASAP*
- ACLS or PALS if needed
- O_2, 2 large bore IV's
- Continuous cardiac monitor
- Administer Benzodiazepines
- Long acting Anticonvulsants
- Monitor VS, NVS

Acute Seizure Management

Diagnostics:

- CBC, glucose, extended lytes, renal and hepatic
- CXR
- Toxicology screen
- LP
- EEG

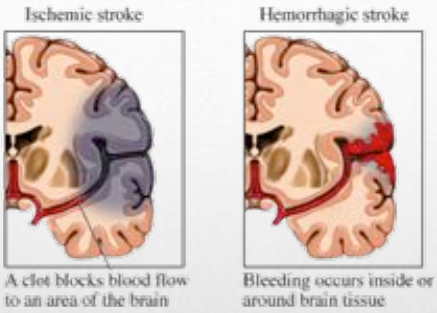
Management:

- MD Consult for previously undiagnosed seizures, or history of breakthrough seizures
- Identify trigger factors
- Reinforce adherence to anticonvulsant therapy
- Follow up Q6months with MD, and for blood work

Chronic Seizure Management

Progressing Stroke:

- neurological dysfunction
- headache absent
- involves progressively more of the body
- progression stepwise
- LOC may be reduced or altered



Completed Stroke:

- abrupt onset
- symptoms maximal in few minutes
- one-sided neurologic deficits
- LOC may be reduced or altered

Intercranial Hemorrhage:

- coma, vomiting, severe headache,
- hx of anticoagulant use,
- hx of vascular anomaly,
- sys BP > 220mmHg
- subarachnoid hemorrhage

Stroke (Cerebrovascular Accident)

Physical findings:

- Possible tachycardia, irregular pulse
- BP variable
- Moderate-acute distress
- LOC variable
- Possible aphasia
- Bladder or bowel incontinence
- Neurological findings
- Possible carotid bruits, murmurs

Differential Diagnosis:

- Seizure disorder
- Complicated migraine
- Drug Toxicity
- Hypersensitive encephalopathy
- Bell's palsy
- Subdural hematoma
- Head injury
- Tumor
- Psychiatric
- Meningitis
- Cerebral venous thrombus
- Brain abscess
- Epidural hematoma
- Viral encephalitis

Stroke

Diagnostics:

- Blood Glucose (POC)
- ECG
- CBC, INR/PTT, Alb, Electrolytes, RFT and LFT, FBG, Cholesterol
- CK, Troponin (POC)
- Toxicology screen
- CXR

Management:

- *Consult immediately for medevac ASAP*
- ACLS or PALS
- O2, initiate two large bore IV, Cardiac monitor
- Pharmacotherapy?
- Monitor VS, NVS, I&O

Stroke

- Deepest state of unconsciousness
- Symptom, not a disease
- Results from an under lying process

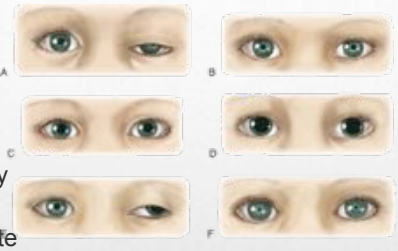
Causes:

- Structural or Surgical
  - Ischemic stroke
  - Intracerebral Hemorrhage
  - Trauma
  - Brain tumors
- Metabolic or Medical
  - Drug overdose
  - Infection
  - Endocrine disorder
  - Poisoning

Coma (Not Yet Diagnosed)

Physical Findings:

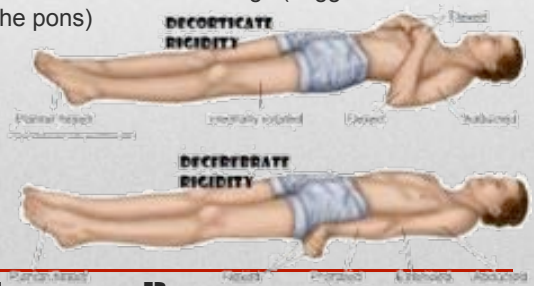
- Loss of Consciousness
- Airway status, Respiratory status & pattern
- Ocular findings:
  - Dilation of pupils in alert patient is not likely related to increased ICP and herniation
  - Dilation of unconscious patient may indicate imminent uncal herniation
  - Small restrictive pupils may indicate metabolic or diencephalic lesion
  - Unilateral, dilated, fixed pupils indicate 3rd nerve or uncal lesion
  - Bilateral pinpoint indicate pontine lesion
  - Pupils fixed midposition indicate midbrain lesion
  - Bilateral large, fixed pupils indicate tectal lesion
  - Pupils deviated to side may indicate cerebral or brainstem lesions



Coma (Not Yet Diagnosed)

Physical Findings

- Muscle tone (flaccidity, hypotonia, hypertonia, spasticity or rigidity)
- Reflexes
- Posturing
- Spontaneous- without regard to external stimuli
- Localization- extremity opposite side crosses midline to remove stimuli
- Withdrawal- extremity receiving stimuli flexes to avoid stimuli
- Decorticate- flexion of upper extremities with extension of the lower extremities (suggests cerebral cortex and subcortical white matter)
- Decerebrate- rigid extension of the arms and legs (suggests brainstem involvement at level of the pons)



Coma (Not Yet Diagnosed)

No CNS Signs or Symptoms

- Metabolic insult
  - hypoglycemia,
  - uremia
  - Addison's disease
  - Diabetic ketoacidosis
  - Hypothyroidism
  - Liver disease
- Respiratory problem
  - Hypoxia
  - Hypercapnia
- Intoxication
  - Barbiturates
  - ETOH
  - Opiates
  - Carbon monoxide
  - Benzodiazepines
- Infection
  - Sepsis
  - Pneumonia
  - Typhoid
- Shock
  - Hypovolemic
  - Cardiogenic
  - Septic
  - Anaphylactic
- Epilepsy
- Hypertensive encephalopathy
- Hyperthermia

Coma (Not Yet Diagnosed)

With meningeal irritation without localizing signs

- Meningitis
- Subarachnoid hemorrhage
- Ruptured aneurysm
- Arteriovenous malformation)

Focal brainstem or lateralizing signs

- Pontine hemorrhage
- Stroke
- Brain abscess
- Subdural or epidural hemorrhage

Appears awake but unresponsive

- Abulic state
- Locked in syndrome
- Psychogenic state

Coma (Not Yet Diagnosed)

Management

Consult with physician ASAP

Non-pharmacological

- Assess and stabilize ABC
- Assess changes in neurological status
- Stabilize cervical neck (until trauma is ruled out)
- Maintain surveillance for complications
- Insert oral airway
- Place in recovery position (unless contraindications)
- POC random glucose

Adjuvant Therapy

- O2 @ 10-12L/min via NRB mask (keep O2 sat > 97%)
- Initiate 2x large-bore IV lines with NS or RL

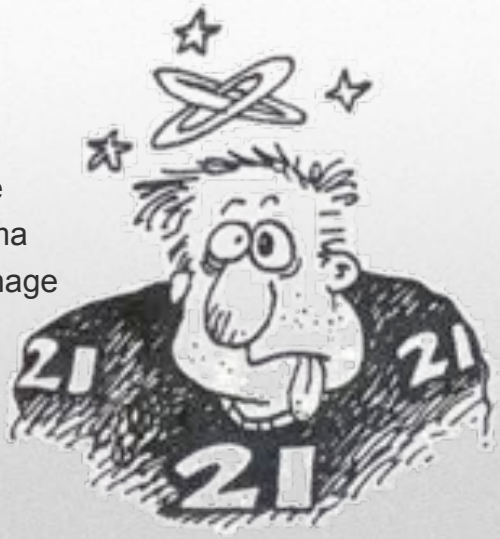
Coma (Not Yet Diagnosed)

Management

- Pharmacological
  - Rapid administration: **Thiamine 100mg** IV (prevention of Wernicke-Korsakoff encephalopathy)
  - Rapid administration: **Dextrose 50%**, 25-50ml preloaded IV (treat hypoglycemia)
  - Suspected Opioid Intoxication: **Naloxone 0.4-2mg** IV, SC or IM (consider restraints if withdrawal suspected)
  - Suspected Meningitis: **Ceftriaxone 2g IV stat + vancomycin 1g IV stat**
  - Consider anticonvulsant therapy (to prevent further injury to the brain)

Coma (Not Yet Diagnosed)

- Concussion
- Cerebral contusion
- Intracranial hemorrhage
- Acute epidural hematoma
- Acute subdural hemorrhage



Head Trauma

- Blunt , forceful injury to the soft tissues or bony structures of the scalp, skull or brain
- Bruising causes vasodilation, increasing blood flow to the area, causing pressure to surrounding brain tissue
- Cerebral edema does not occur immediately
- Early efforts to decrease vasodilation can save a person's life

Head Trauma

Glasgow Coma Scale		
Response	**Scale**	**Score**
Eye Opening Response	Eyes open spontaneously	4 Points
	Eyes open to verbal command, speech, or shout	3 Points
	Eyes open to pain (not applied to face)	2 Points
	No eye opening	1 Point
Verbal Response	Oriented	5 Points
	Confused conversation, but able to answer questions	4 Points
	Inappropriate responses, words discernible	3 Points
	Incomprehensible sounds or speech	2 Points
	No verbal response	1 Point
Motor Response	Obeys commands for movement	6 Points
	Purposeful movement to painful stimulus	5 Points
	Withdraws from pain	4 Points
	Abnormal (spastic) flexion, decorticate posture	3 Points
	Extensor (rigid) response, decerebrate posture	2 Points
Minor Brain Injury = 13-15 points; **Moderate Brain Injury** = 9-12 points; **Severe Brain Injury** = 3-8 points		

- Concussion
  - No sig brain injury
  - Brief LOC
  - Short term retrograde amnesia
  - Dizziness
  - Headache
  - Nausea
  - Tinnitus
- Cerebral contusion
- Acute epidural hematoma
- Acute subdural hematoma

Head Trauma

Minor:

- Observe for 12-24 hours for signs/ symptoms of brain injury

Major:

- *Consult MD and Medevac ASAP*

Step 1:

- Provide O_2 10-12L/min NRB
- Hyperventilate at 24 breaths/min with BVM
- Assess and manage uncontrolled hemorrhage with direct pressure
- Assess neurological status

Step 2:

- Stabilize on spine board
- Apply cervical spine collar
- Keep HOB elevated (unless contraindicated)

Step 3:

- Record baseline observations
- Record Vital signs q15 mins
- Serial GCS assessments
- Initiate IV TKVO
- Insert Foley catheter and monitor output
- Prevent hyperthermia
- Consider MD consult for Rx anticonvulsants (prevent seizure)
- Consider MD consult for Rx osmotic diuretics (reduce brain edema)

Mannitol 1g/kg IV over 20 minutes

Head Trauma

Lower than normal muscle resistance to passive movement of a joint

History:

- Onset, duration, progression
- Obstetrical history
- Past medical history
- Family history

"Hypotonic child should be evacuated for evaluation and investigation."

Physical Findings:

- Vital signs
- Well infant/child examination
- Dysmorphic features
- CNS examination
- Assessment of developmental milestones
- Assessment of primitive reflexes

Hypotonia of Infant or Child

Non-pharmacological

- Maintain side-lying position
- Keep child warm
- Give nothing by mouth until child has fully recovered

***Medevac** for diagnostic workup if this is a previously undiagnosed seizure or suspicion of meningitis or metabolic cause.*

Pharmacological

- Lorazepam 0.05-0.10mg/kg IV (max 4 mg /dose); may repeat once in 10 min PRN

OR

- Diazepam 0.3mg/kg IV; max 5 mg/dose (<5y) and max 10mg/dose (>5y); may repeat in 10 minutes (max 3 doses)

* Check drug class to ensure authority to administer

May be administered via rectum if no IV access

Seizures - Paediatric Considerations

Cause:

- Related to quick rise in body temperature associated with febrile illness
- Usually occurs within the first 24 hours of febrile illness
- Most common type of seizures during childhood (6m-5y)
- Usually fever > 38C
- Children < 6 years
- No previous history of seizures
- Often familial

Physical Findings:

- Seizures are < 5 minutes
- Tonic-clonic movements
- Bilateral

**Always consider meningitis in a child with an apparent simple febrile convulsion.*

Febrile Seizures – Paediatric

PART 2:

ASSESSMENT OF THE HEAD, EARS, EYES, NOSE AND THROAT

Eyes:

- examine the bony orbit, lids, lacrimal apparatus, conjunctiva, sclera, cornea, iris, pupil, lens, and fundi.
- Note visual acuity, redness, swelling, discharge, discolouration
- History includes: eye disease, surgery, corrective glasses, STIs, exposure to eye irritants, allergies

Ears:

- inspect pinna, canal, and ear drum for lesions, discharge, swelling, colour
- Palpate for tenderness of tragus, mastoid process, and upon manipulation of pinna

Nose:

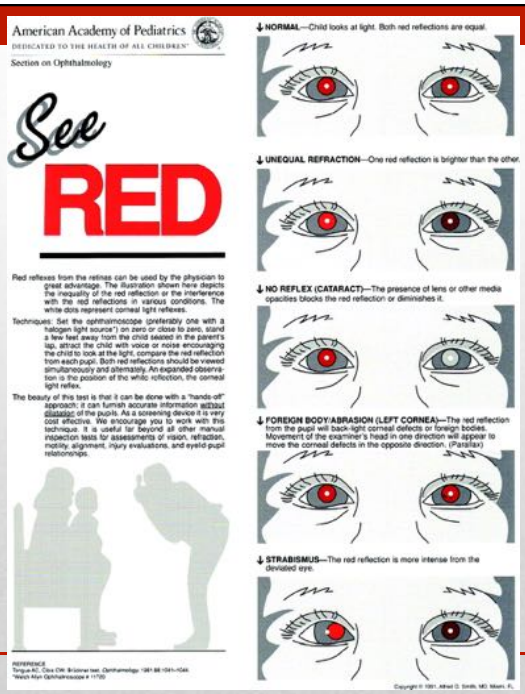
- internal and external examination for inflammation, deformity, colour of mucosa. Palpate for tenderness.

Mouth and Throat:

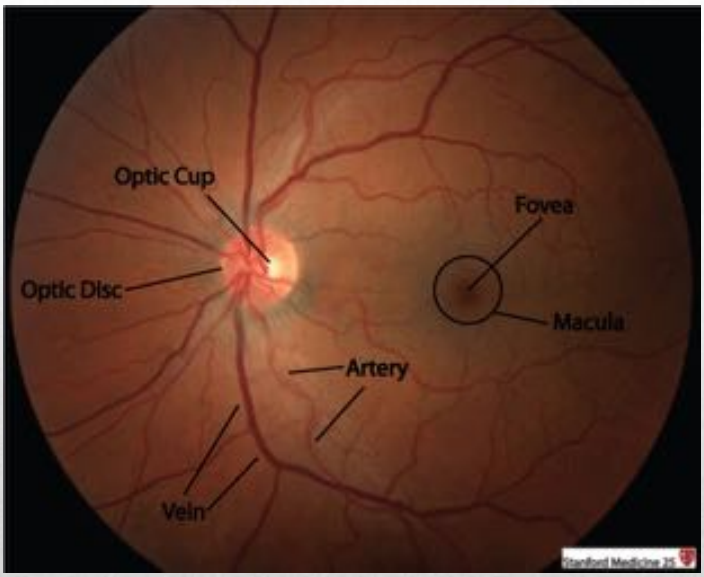
- inspect lips, oral mucosa and tongue, gums, teeth, throat for colour uniformity, breath odour, redness, swelling

http://www.youtube.com/watch?v=FHWw8opmQdg

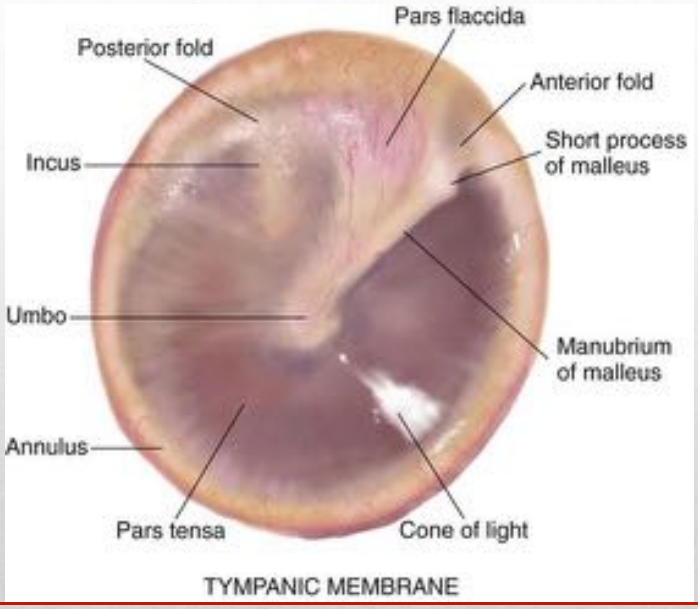
Advanced HEENT Assessment



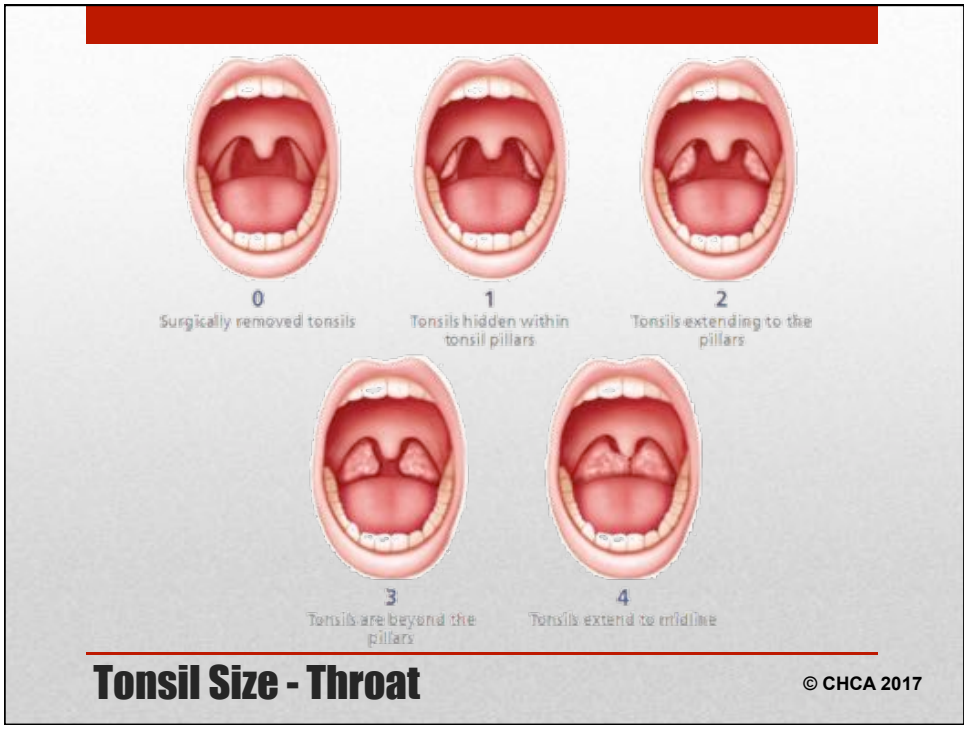
Red Reflex



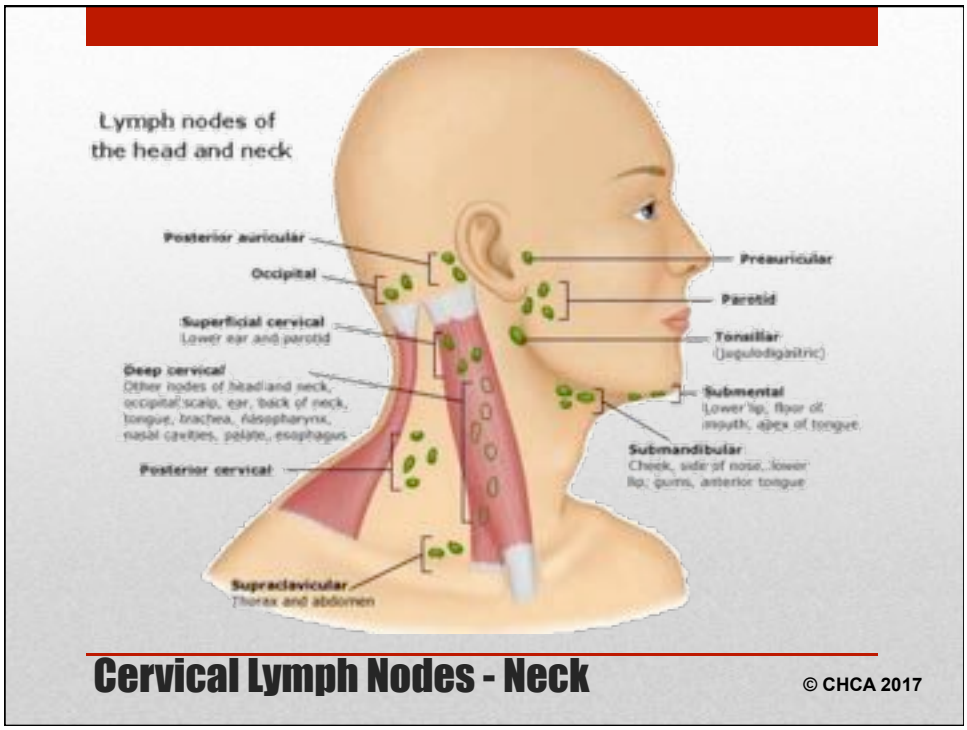
Fundoscopic Exam - Eye



Otoscopic exam - Ear



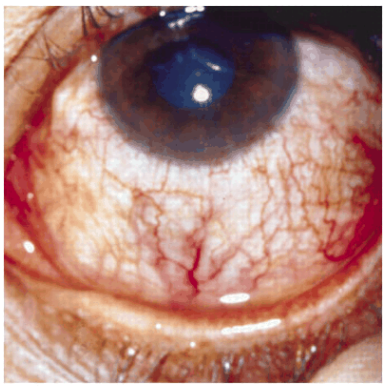
Tonsil Size - Throat



Cervical Lymph Nodes - Neck

PART 3A: OPHTHALMOLOGY

Common conditions of the Eye



Conjunctivitis

- characterized by dilatation of the superficial conjunctival blood vessels, resulting in hyperemia and edema of the conjunctiva, with watery discharge.

Viral TX:

- Self limiting, if there is no improvement in 7 to 10 days, the patient should be referred to an ophthalmologist.
- Antibiotics are not helpful and not indicated. Cool compress may provide symptomatic relief in the interim.

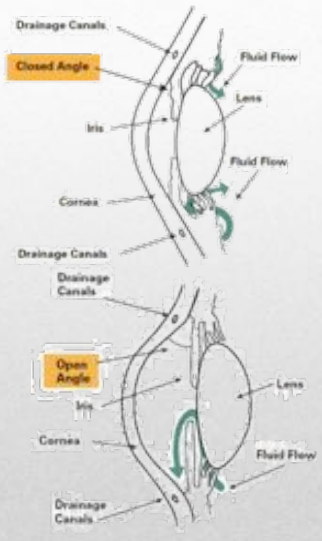
Bacterial Tx:

- Can use 2-3 drops of Polysporin eye drops for 5-7 days if the infection is mild.
- 7-to-10-day course of gentamicin (0.3 percent) or tobramycin (0.3 percent) eye drops.

The Eye - Conjunctivitis

	Conjunctivitis			Corneal Injury or Infection	Uveitis	Angle Closure Glaucoma
	Bacterial	**Viral**	**Allergic**			
History	Sudden onset, exposure to infection			Trauma, pain	Sudden onset, may be recurrent	Fast onset
Bilateral Eyes	Often	Often	Yes	Not usually	Occasionally	Rarely
Vision	Normal	Normal	Normal	Reduced if central	Reduced	Very reduced
Pain	-	-	-	+++	+	+++
Photophobia	+/-	-	-	+	++	-
Foreign-Body Sensation	+/-	+/-	-	+	-	-
Itch	+/-	+/-	++	-	-	-
Tearing	+	++	+	++	+	-
Discharge	Mucopurulent	Mucoid	Watery	Watery or mucopurulent	Watery	Watery
Pre-auricular adenopathy	-	+	-	-	-	-
Pupils	Normal, reactive	Normal, reactive	Normal, reactive	Normal, reactive	Small, sluggish, irregular shape	Moderately dilated and fixed, oval
Conjunctival hyperemia	Diffuse	Diffuse	Diffuse	Diffuse with ciliary flush	Ciliary flush	Diffuse with ciliary flush
Cornea	Clear	Sometimes faint staining	Clear	Irregular light reflex with abrasion	Clear or lightly cloudy	Cloudy
Intraocular Pressure	Normal	Normal	Normal	Normal	Reduced, normal, or increased	Increased

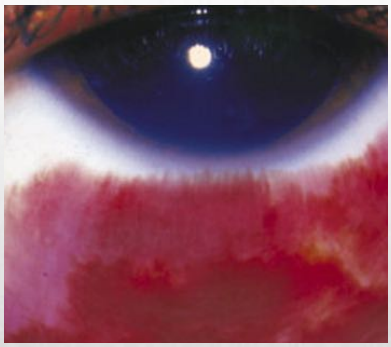
The Red Eye



- Progressive damage occurs to the optic disk with an open angle between the iris and cornea that can lead to loss of vision.
- **Signs**: Peripheral and central fields of vision and visual acuity decreased, cupping of the optic disc, flame-shaped disc haemorrhages
- Need to be screened if risk factors are present
- **Treatment**: topical beta blockers, topical carbonic anhydrase inhibitors, prostaglandin analogues, topical cholinergic agonists and topical adrenergic agonists (prescribed by ophthalmologist)

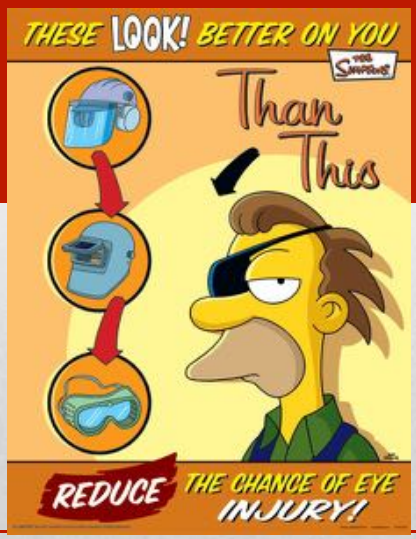
The Eye - Glaucoma

- Subconjunctival hemorrhage is often the cause of acute ocular redness.
- Diagnosis is based on simple observation of the characteristic features of such a hemorrhage: the redness, which is unilateral, the underlying sclera is not visible
- No Discharge
- No inflammation
- TX: normally clears within 2-3 weeks



The Eye - Subconjunctival Hemorrhage

PART 3B: OPHTHALMIC EMERGENCIES



Eye Emergencies - Inverting the Eyelid

- Contusion of globe and/or orbital tissues, orbital fractures, laceration of the ocular adnexa, intraocular hemorrhage, retinal detachment

Signs

- Pain and swelling around eye, deformity of bone, tenderness, decreased visual acuity

Treatment:

- Cover eye with gauze to prevent eye from further injury
- Acetaminophen with codeine (Tylenol #3), 1–2 tabs PO q4h prn for moderate or severe pain control

Eye Emergencies - Blunt Ocular Trauma

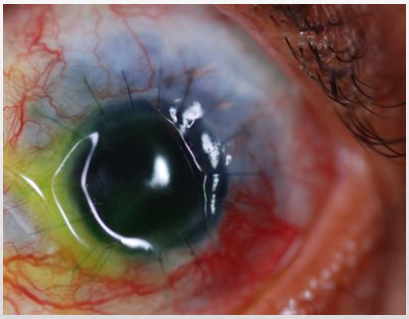
- Ocular injury from acidic or alkaline liquids or powders

Signs:

- Elevated HR or BP (due to pain and fear), lid spasm, photophobia, reduced vision, haziness, blurring of pupillary outline

Treatment:

- Irrigate the eye immediately with large amounts (1–2 litres) of normal saline IV solution; continue irrigation for 20 minutes.
- Topical eye anaesthetic: tetracaine 0.5% (Pontocaine), 2 drops, stat dose only.



Eye Emergencies - Chemical Burns

1. Use topical ophthalmic anaesthesia
2. Attach Morgan lens to IV tubing or syringe
3. Using 0.9% saline or Ringer's Lactate, start flow.
4. Have patient look down, insert lens under upper lid similar to a contact lens, the look up to insert under lower lid.
5. Ensure absorbent padding is placed to catch fluid.
6. Adjust flow for comfort. Do not allow to run dry.

Eye Emergencies - Morgan Lens

- Superficial corneal defect due to scraping or rubbing of the corneal epithelium, caused by a trauma or foreign body

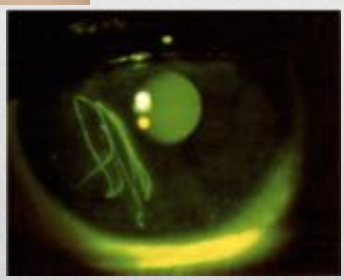
Signs:

- Visual acuity may be blurred in the affected eye, diffuse conjunctival injection, presence of foreign body in the eye, pupils reactive to light
- Fluorescein stain with cobalt lamp.

Treatment:

- **Do not patch the eye**
- Tetracaine 0.5% eye solution (Pontocaine), 2 drops, stat dose only; irritation should resolve in 1-2 min
- Antibiotic eye ointment in the lower conjunctival sac: erythromycin (Diomycin) eye ointment, 1.25 cm ribbon qid for 5–7 day

Eye Emergencies - Corneal Abrasion



Fluorescein Staining

Eye Emergencies - Corneal Abrasion

- Central or marginal infection that results in the breakdown of the protective epithelial barrier
- Common cause is bacterial; may be viral (herpes simplex)

Signs: conjunctiva and eyelid inflamed, mucopurulent discharge, decreased visual acuity if ulcer is central

Treatment:

- Do not patch the eye
- Tetracaine 0.5% eye solution (Pontocaine), 2 drops, stat dose only; irritation should resolve in 1-2 min
- Antibiotic eye ointment in the lower conjunctival sac: erythromycin (Diomycin) eye ointment, 1.25 cm ribbon qid for 5–7 days

Eye Emergencies - Corneal Ulcer

- Foreign object on the conjunctiva or cornea
- **Signs**: visual acuity normal, PERRLA, foreign body may be found in lower conjunctival sac or under the upper lid
- **Treatment**: tetracaine 0.5% (Pontocaine), 2 drops, stat dose only
- Suggest the client wear protective glasses to prevent foreign bodies being lodged in the eye in the future

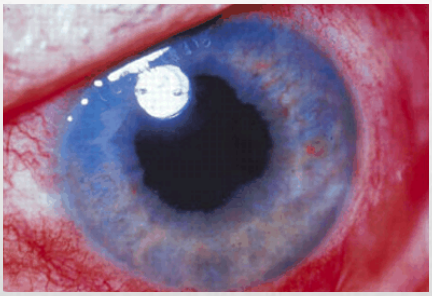
Eye Emergencies - Foreign Body

Symptoms

- Headache and eye pain
- Often nausea and vomiting
- Redness of the eye
- Occasionally rainbow halo around lights (cause: corneal edema)
- Visual impairment

Tx: Reduce intraocular pressure

- May include drugs such as miotic, topical beta-blockers, topical steroids (e.g. prednisolone) and systemic carbonic anhydrase inhibitors (e.g. acetazolamide).



Eye Emergencies - Acute Angle-Closure Glaucoma

PART 4A: OTORHINOLARYNGOLOGY

Ears, Nose and Throat

Otitis: acute inflammation of the middle ear

- **Etiology**: *S. Pneumo, H. Influenza*. *Viral*
- **Diagnostic:** Triad of otalgia, fever (especially in young kids) and conductive hearing loss. Eustachian tube dysfunction.
- **Infants/Toddlers**: ear-tugging, hearing loss, balance disturbance, irritability, vomiting and poor appetite, otorrhea if TM perforated
- **Otoscopy:** Hyperemia, bulging, loss of landmarks
- WATCHFUL WAITING: symptoms persist x 48 hrs in kids 6mos and older.

What is the Pharm: 1st line for AOM?

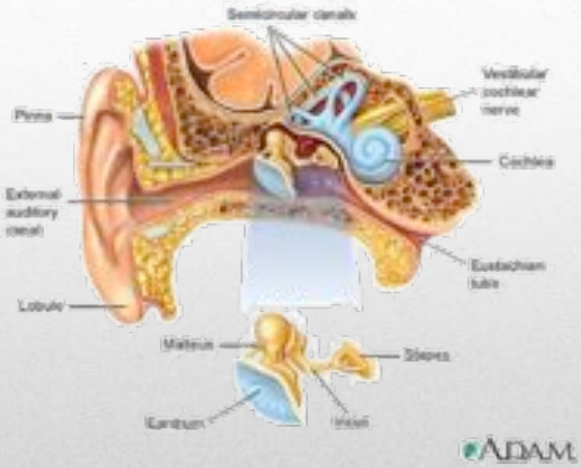
- **Acute:** Amoxicillin as per guidelines
- If penicillin allergic: clarithromycin/ azithromycin or Septra.
- Antipyretics: Tylenol/ Motrin

Acute Otitis Media/ Externa

- Hard to see – Hx. of drainage
- Usually from middle ear pressure secondary to fluid or barotrauma
- Sometimes from external trauma
- Most heal uneventfully but all need otology follow-up
- Perforations with vertigo and facial nerve involvement need immediate referral
- Treat with antibiotics
- Drops controversial but indicated for purulent discharge (avoid gentamycin drops)

Tympanic Membrane Perforation

- BPPV causes brief episodes of mild to intense dizziness.
- Usually triggered by specific changes in the position of the head.
- Rarely serious except when it increases the chance of falls



Symptoms:

- Dizziness
- A sense of spinning or moving (vertigo)
- A loss of balance or unsteadiness
- Nausea
- Vomiting
- Nystagmus with Dix Hallpike Maneuver

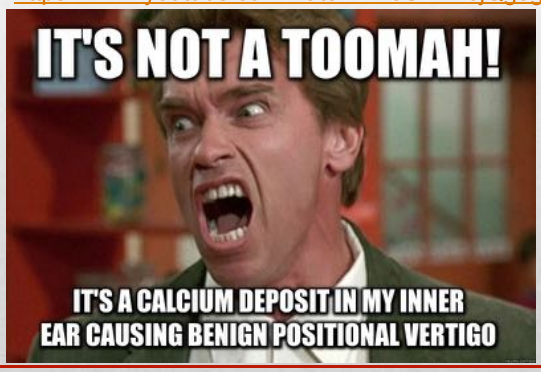
https://www.youtube.com/watch?v=wgWOmuB1VFY

Benign Paroxysmal Positional Vertigo

Treatment:

- Epley Manoeuvre employs gravity to move the calcium crystal build-up that causes the condition.
- Can be performed during a clinic visit, or taught to patients to practice at home, or both.
- Postural restriction after the Epley manoeuvre increases its effect somewhat.

https://www.youtube.com/watch?v=9SLm76jQg3g



Benign Paroxysmal Positional Vertigo

Sinusitis: inflammation of the sinuses due to bacterial, viral, or fungal infection, or allergic reaction

- **Etiology**: *S. Pneumo, H. Influenza*.
- **Diagnostic:** Facial pain (tap on sinuses), purulent nasal discharge, ear or dental pain
- **Viral vs. bacterial?** First 3 days symptoms same: cough, fever, sore throat, nasal discharge, and >70% of patients improve after 7 days without antibiotics. Bacterial worsens at 5-7 day mark.

What is the Pharm: 1st line for acute and chronic Rhinosinusitis?

- **Acute:** If symptoms remain unresolved after 10 days, amoxicillin (Amoxil), 500 mg PO tid for 10 days
- **Chronic:** prolong course of antibiotic treatment; amoxicillin/clavulanate (Clavulin), 875 mg PO bid for 21 days

Acute and Chronic Rhinosinusitis

1. Persistence of symptoms longer than 1 week without improvement
2. Respiratory difficulty, particularly stridor
3. Difficulty in handling secretions
4. Difficulty in swallowing
5. Severe pain in the absence of erythema
6. A palpable mass
7. Blood in the pharynx or ear

Seven Danger Signs of a"sore throat"

Symptom	Points
Cough Absent?	1
History of Fever >38ºC?	1
Tonsillar Exudate?	1
Swollen, tender anterior nodes?	1
Age 3-14 yrs?	1
Age 15-44 yrs?	0
Age >45 yrs?	-1

SCORE:	0	1	2	3	4
Chance pt has strep:	2-3%	3-7%	8-16%	19-34%	41-61%
Suggested Action:	NO culture or antibiotic		Culture all, treat only if culture positive		Culture all, treat with antibiotics on clinical grounds

Sore Throat Score

- Pharyngitis is an inflammation or infection of the mucous membranes of the pharynx.
- May be bacterial or viral.
- Characterized by red and swollen posterior pharynx, enlarged tonsils, purulent exudate, and elevated temperature and pulse.
- **Irritants:** reflux, trauma, gases
- **Viruses:** EBV, adenovirus, coxsackie
- **Bacterial:** Group A β-hemolytic Strep, mycoplasma, gonorrhea, diphtheria, pertussis
- Administer
  - Tylenol, 325 mg, 1–2 tabs q4h or
  - Motrin 200 mg, 1–2 tabs q6h for fever;
  - Antibiotics as per guidelines

Pharyngitis

- Incubation in adults 4-6 weeks
- Prodrome (1-2 weeks before illness) fatigue, malaise, myalgias

Symptoms

- Sore throat, malaise, headache, abdominal pain, nausea/ vomiting, chills

Signs

- Lymphadenopathy, fever, pharyngitis, splenomegaly, hepatomegaly, rash, periorbital edema, palatal exanthem, jaundice.

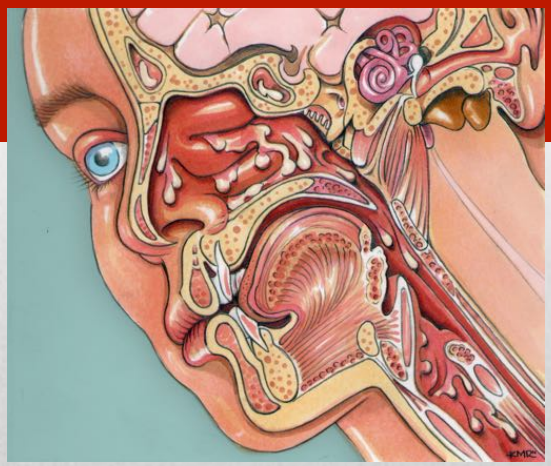
Infectious Mononucleosis

Diagnostics

- Lymphocytosis (>50% Lymphs)
- Atypical lymphocytes (>10%, mostly CD8+ T cells)
- Monospot -rapid agglutination assay
- LFTs abnormal in 90%

Infectious Mononucleosis

Part 4B: ENT Emergencies



- Bleeding from the back of the nose

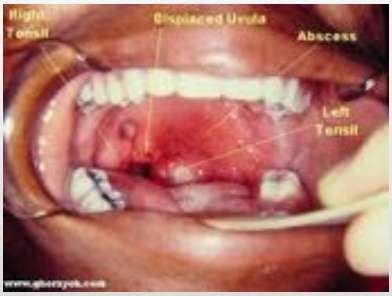
Signs: Bright red bleeding from nares (unilateral or bilateral), bleeding site not visible, blood running down back of throat; client is anxious and sweaty if blood loss is significant

Treatment: Start IV therapy, apply pressure to nose, use a Foley catheter (see next slide)

Posterior Epistaxis

1. Place a 12–16 French catheter with a 30-cc balloon into the nose along the floor of the nasopharynx, until the tip is visible in the posterior pharynx.
2. Slowly inflate the balloon with 15 mL of sterile water, pull it anteriorly until it firmly sets against the posterior choanae.
3. Maintain catheter traction and stretch slightly.
4. Insert an anterior nasal pack next (½ x 72 inch [1.25 x 180 cm] ribbon gauze impregnated with petroleum jelly).
5. Place an umbilical cord clamp across the nostril against the anterior pack so that the elasticity of the catheter compresses the balloon against the anterior pack.
6. Protect facial skin from clamp by padding with 2 x 2 inch (5 x 5 cm) gauze.
7. Drape rest of catheter over ear on same side and tape in place.

Foley Catheter technique



- **Peritonsillar abscess** is cellulitis of the space behind the tonsillar capsule, extending into the soft palate, leading to an abscess.
- **Moderate-severe** characterized by acute illness, drooling, difficulty swallowing, fever, swelling and redness of the soft palate or tonsils, difficulty breathing, and/or inability to open mouth. *Risk of airway compromise*

Treatment

- Antibiotics: penicillin V potassium, 300 mg PO qid or 600 mg bid for 10 days
- Analgesics for pain and fever: acetaminophen (Tylenol), 325 mg, 1–2 tabs PO q4h prn

Peritonsillar Abcess

Avulsed tooth: lost tooth due to trauma; the tooth can be rinsed off with warm water and re-implanted in its socket by a nurse if it is within 20–30 minutes of the accident.

Fractured tooth: cracked or broken teeth; dentist will restore the tooth

Oral trauma: with trauma, a tooth may fracture, become non-vital (and abscess) or oral mucosa may be damaged or ulcerated.

- Rinse with warm saline 4 times daily for traumatic ulcers

Emergency Dental

Wrap up discussion?
Questions and comments?

Discussion or Clarification?