- Primary
  - **Tension**
    - RFs: stressful day, depression, poor sleep
    - Etiology: unknown by likely similar to migraine pathophysiology
    - S/S: gradual onset viselike headache encircling entire head w/ focal intensity around neck and back of head, associated w/ back neck muscle contraction, rarely there is N/V/photophobia
    - Px: massage, relaxation, stress reduction and if they occur >2d/wk then start Rx w/ amitriptyline/mirtazipine/tizanidine/gabapentin b/c you want to avoid rebound headaches
    - Tx: Mild (NSAIDs, Tylenol), Severe (Migraine Tx)
  - **Cluster**
    - RFs: adult men
    - Etiology: variant of migraine but begins in **hypothalamus** (hence autonomic Sx)
    - S/S: cluster (same time of year and hour of day esp before/during/after sleeping) of frequent (several times a day) for a few weeks, paroxysmal (no prodrome but sometimes alcohol is a trigger), short acting (15min-3hrs) headaches characterized as VERY severe unilateral peri/retro-orbital burning/searing/stabbing pain, awakens pt up from sleep, worse w/ alcohol, accompanied by conjuctival injection w/ lacrimation, nasal congestion w/ rhinorrhea, facial flushing/diaphoresis, unilateral Horner's syndrome (mitosis/ptosis/anhydrosis), NB worse w/ immobility!!! and thus pts often cannot keep still often hitting their head (very different than migraine headaches) DDx: SAH
    - Dx: +PET scan (increased activity in hypothalamus)
    - Px: 1° Verapamil 2° Lithium, Steroids, AEDs (topiramate)
    - Tx: 1° Oxygen, -ergotamines/-triptans 2° Opiates
  - **Migraine**
    - Epidemiology: 10% of population
    - RFs: young women, FHx, stress, lack of sleep, hunger, foods (alcohol, milk products, chocolate, MSG), fatigue, alcohol, menstruation (2d before to the last day, 2/2 estrogen withdrawal), exercise, changes in weather
    - Etiology: various triggers (below) → release of inflammatory neuropeptides (substance P, neurokinin A and CGRP) from brainstem esp trigeminal neuro center → meningeal vasodilation and extravasation of inflammatory cells aka sterile inflammation → headache
    - S/S
      - Prodrome (50% of pts) excited CNS (elation, irritability, increased appetite, etc) or depressed CNS (sleepiness, fatigue, cognitive slowing, etc) which can precede headache up to 24hrs but usually w/in 1hr →
      - Aura (25% of pts called "Classic" but if no aura than called "Common") aura aka focal neurologic deficits (1° scintillating scotomata aka bright flashing crescent shaped images w/ jagged edges, blind spots, numbness, weakness, etc lasting minutes to 1hr but if these neuro deficits last >24hr then there is concern for true ischemic damage then it is called "Complicated Migraine")
      - Headache (90% of pts, if no headache then called "Acephalic Migraine" or "Migraine Equivalent") severe, unilateral (can occur anywhere on head, 1/3 bilateral, can sometimes switch sides during episode), throbbing/pulsatile headache lasting 4-72hrs, accompanied by N/V, etc, headache is aggravated by any movement, light (photophobia), sound (phonophobia), smell (osmophobia), etc →
      - Postdrome (50% of pts) fatigue and confusion often feels like pt is "hung over"
    - Px **(indication: if frequent = >4 HAs/mo, if long lasting = >3d, if debilitating)**
      - Eliminate Precipitant
      - Rx (low dose): 1° TCA (amitryptiline), BB (propranolol), 2° CCB (verapamil), AED (divalproex sodium, topiramate), SSRI (fluoxetine), NB cyproheptadine in children, NB Mefenamic Acid for menopause induced and NOT OCPs b/c 2x increased r/o ischemic CVA, etc
      - BoTox Injections
      - Herbals: Mg + Vit B2 + Feverfew (Migrainall), Coenzyme Q10, Petasite Herb, Riboflavin
      - Other: meditation, acupuncture, PT, etc
    - Tx
      - **Abortants during Prodrome/Aura** (**stimulates 5-HT1** receptors on trigeminal nerve inhibiting further release of neuropeptides and thus subsequent vasodilation and sterile inflammation, contraindicated in any vascular dz state like CVD, CAD, PVD and even pregnancy b/c of the **vasoconstriction** that results, can result in **serotonin syndrome** if used w/ MAOIs/TCAs/SSRIs, etc, SEs: N/V/D/Dizziness/Somnolence/Tingling/Numbness/Flushing/Esophageal-Spasm, only to be used <2x/wk, various t1/2 and durations)
        - 5-HT$1_{\#}$ Agonists (-ergotamines): ergotamine (Cafergot), dihydroergotamine (Migranol IV, SQ, INH)
        - 5-HT$1_{B/D}$ Agonists (-triptans): sumatriptan (Imitrex, PO, SQ, INH), almotriptan (Axert), eletriptan (Relpax), frovatriptan (Frova), naratriptan (Amerge), rizatriptan (Maxalt), zolmitriptan (Zomig)

- **Treatments during Headache** (also still always try abortants, also Tx N w/ antiemetics esp phenergan which can also help pts sleep)
    - Mild: Aspirin + Tylenol + Caffeine (Excedrin Migraine), Aspirin + Butalbital + Caffeine ± Codeine (Fiorinal w/ or w/o Codeine), Acetaminophen + Butalbital + Caffeine ± Codeine (Esgic, Fioricet w/ or w/o Codeine), Acetaminophen + Aspirin + Caffeine (Excedrin Migraine), Acetaminophen + Butalbital (Phrenillin), Acetaminophen + Dichloralphenazone + Isometheptene (Midrin), Butorphanol (Butorphanol Nasal Spray)
    - Severe (status migrainous w/ S/S lasting over 72hrs, never mix, just give separately in buttock): Migranol IV/SQ/INH + Toradol IV + Reglan/Phenergan/Zofran IV + Decadron IV + Magnesium Sulfate IV + Benadryl IV + Haloperidol IV + Ativan IV
- New Meds: Calcitonin Gene Related Peptide (CGRP) receptor antagonist (eg. -cegapants)

- Other: thunderclap headache, headache on awakening, headache w/ sexual activity, exercise induced headache, benign cough headache

- Secondary
    - Vascular: **stroke, HTN emergency, unruptured aneurysm, ruptured aneurysm w/ SAH, venous thrombosis, subdural/epidural hematoma, pituitary apoplexy, thalamic pain syndrome** (unilateral headache wks-yrs following thalamic infarct)
    - Infection: **meningitis, encephalitis, abscess**
    - Tumor: **any tumor**
    - CSF: low ICP (**post-LP**) vs high ICP (**hydrocephalus vs psuedotumor cerebri aka idiopathic intracranial hypertension** (RFs: young obese female w/ vitamin A intoxication and tetracycline/OCP/glucocorticoid use, S/S: headache worse w/ coughing/supine and during morning + blurred peripheral vision 2/2 papillodema + horizontal diplopia 2/2 CN4 problem, Mech: high ICP but no evidence of an intracranial process and thus very likely 2/2 decreased CSF absorption, Dx: CT/MRI nl or will show slit like ventricles but NO hydrocephalus, CSF >25 cm H_2O, Tx: therapeutic LP, avoid steroids, acetazolamide to reduce CSF production, weight loss and if no improvement then optic nerve sheath fenestration and VP shunt)
    - Extracranial: **obstructive sleep apnea, sinusitis, TMJ syndrome, temporal arteritis, shingles, trigeminal neuralgia, dental disease, glaucoma**
    - Meds: **nitrates, alcohol withdrawal, caffeine withdrawal, chronic analgesic abuse w/ rebound** (consider in pt who have frequent refractory headaches that occur when pt awakes, use of analgesics >2d/wk even med likes triptans, PUD, etc Tx start prophylactic Tx first then taper off the abused acute Tx over 1mo while also giving prednisone and dihydroergotamine)
    - Other: **post-coital** (seen in men close to orgasm, resolves after a few minutes, benign but if it doesn't resolve suspect SAH)