Common Neurological Cases in Family Medicine Practice

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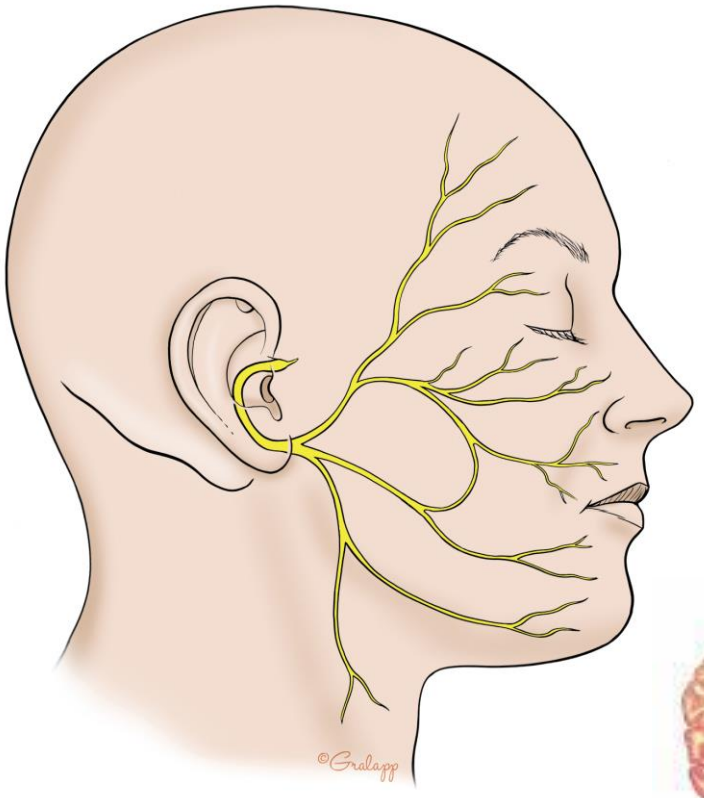
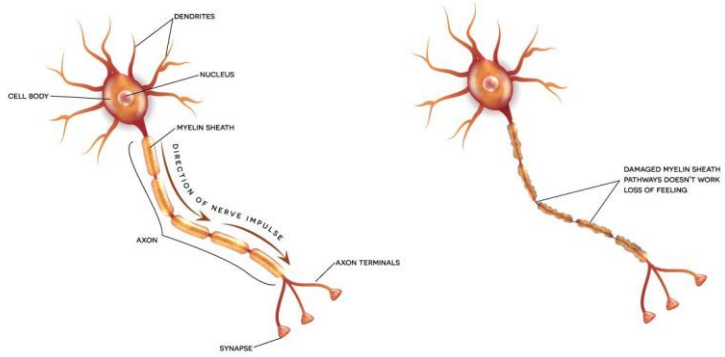
Neurologist



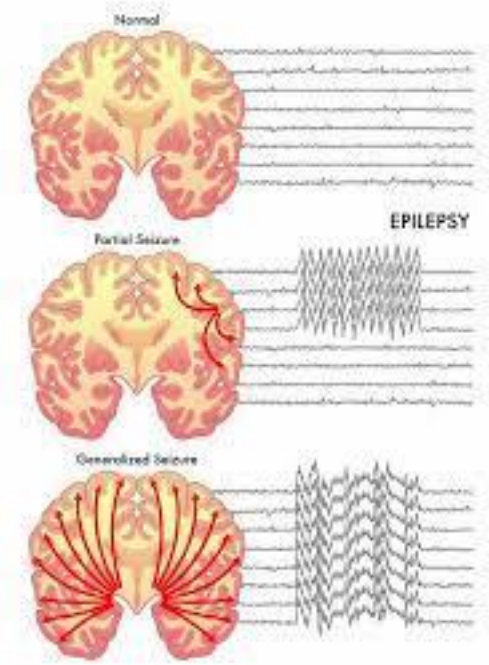
NEUROPATHY

NERVE DAMAGE



HEALTHY NERVE CELL

UNHEALTHY NERVE CELL



Seizure

- 8% to 10% of population will experience seizure
- 1 in 26 people will develop epilepsy in their lifetime
- seizures one of the most common neurologic problems

- Epilepsy: at least two unprovoked (or reflex) seizures occurring more than 24 hours apart

- Epilepsy mimics:
  - require prompt diagnosis to prevent adverse outcomes (prolonged QT syndrome).
  - pt should be asked to describe event from onset, including any auras or postictal symptoms
  - Hx of incontinence, tongue biting, more suggestive of seizure
  - rhythmic clonic versus irregular shaking

- Studies carried out in multiple settings have reported misdiagnosis rates ranging from 4.6% to 30%
- most common final diagnoses in misdiagnosed pts:
  - cardiovascular syncope
  - psychogenic nonepileptic events

CASE

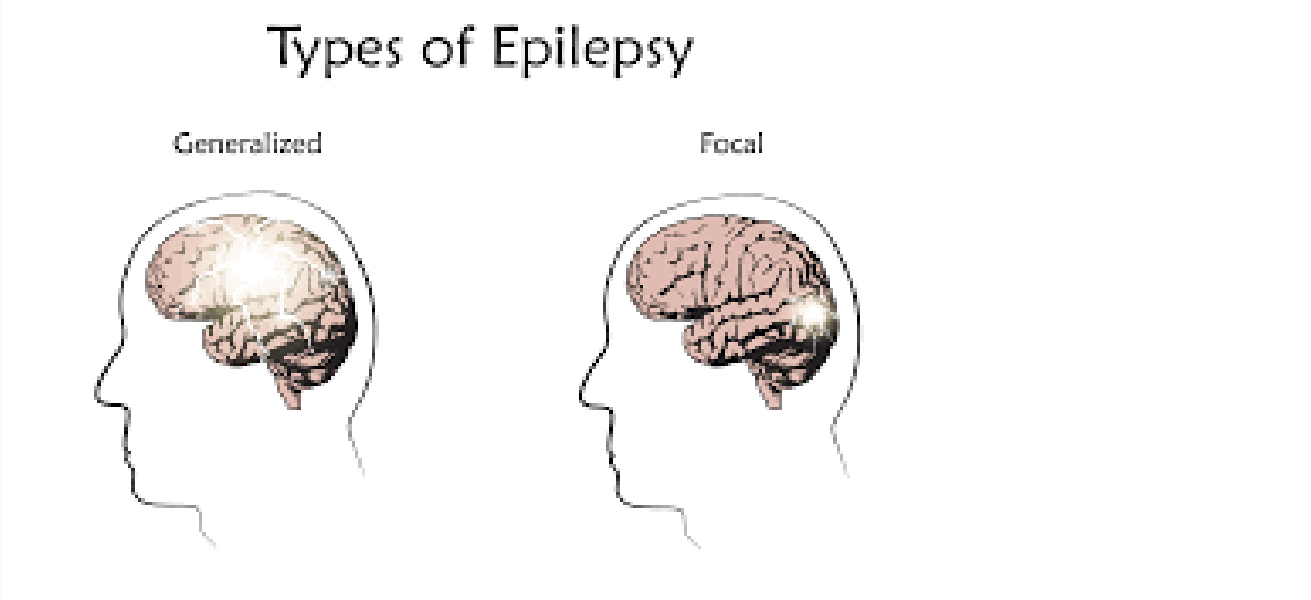
- 13 y/o girl presented with recurrent spells of lightheadedness without vertigo
- occurred more commonly when stood up too quickly, had 2 more severe events, one during discussion on frog dissection in biology class and another while she was getting her blood drawn
- Her examination was normal

- EEG: independent bitemporal sharp waves in drowsiness and sleep. She was diagnosed with focal epilepsy and was started on oxcarbazepine.
- lightheadedness persisted, she had 2 more spells; During these spells, she was said to feel “woozy,” look pale, and drop slowly to the ground.
- She lost consciousness and remained limp for about 30 seconds, then gradually recovered over about 2 to 5 minutes.

- She underwent video-EEG monitoring, found to be consistent with syncope, due to a cardiac cause, as opposed to seizure.
- careful hx taken from both pt and witness is the most critical aspect in distinguishing seizure from nonepileptic paroxysmal event.
- Dx of epilepsy cannot be made solely by relying on EEG findings.

Causes of Seizure

- causes of seizures & epilepsy are numerous, vary according to both setting of seizure (acute symptomatic versus unprovoked) & type of seizure (focal versus generalized onset).



Acute symptomatic seizures

- Acute ischemic or hemorrhagic stroke
- SDH / SAH
- Cerebral venous thrombosis
- Traumatic brain injury
- Brain abscess
- Meningitis or encephalitis

Acute symptomatic seizures

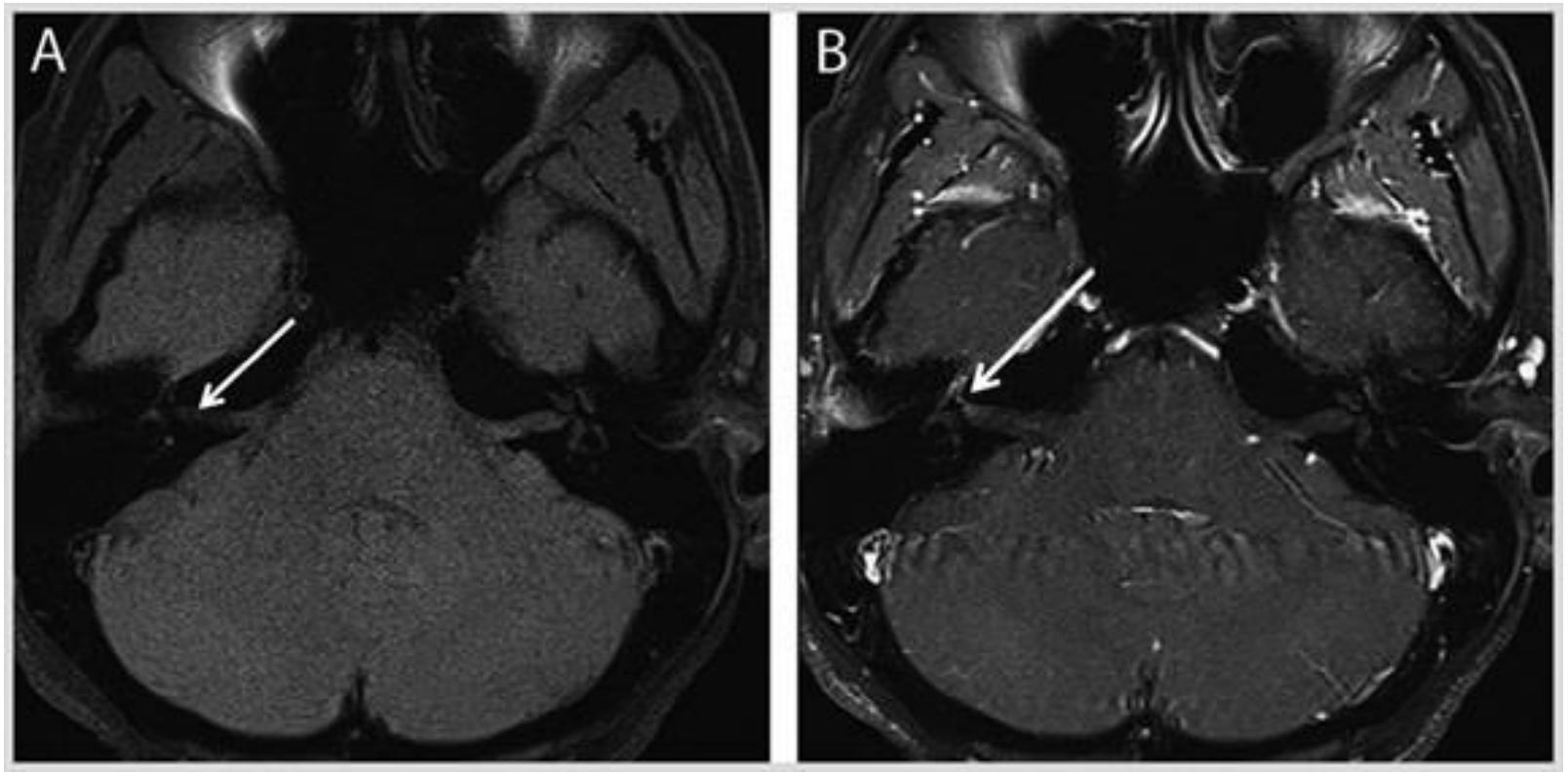
- Hypoglycemia
- Hyperglycemia
- Hyponatremia
- Hypocalcemia
- Hypomagnesemia
- Uremia
- Withdrawal states
- Drug intoxication, poisoning, and overdose

CASE

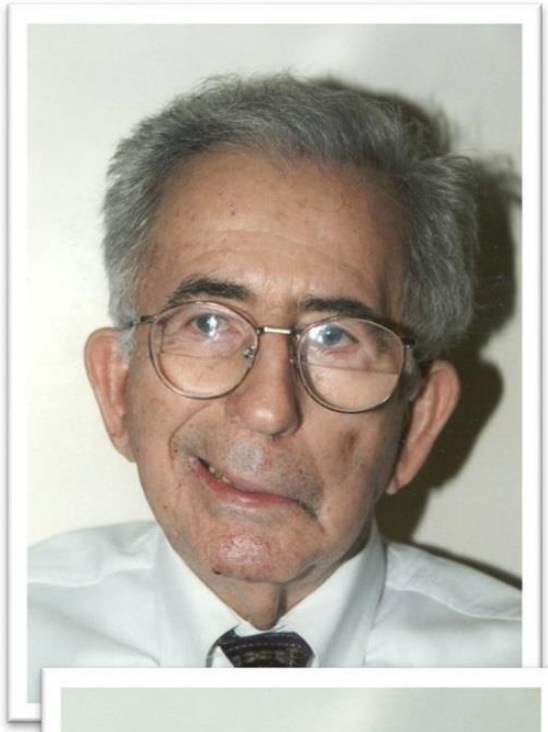
- 40 y/o woman presented to ER after noticing her face felt “swollen” upon awakening
- Rt side face felt “distorted and weak.” She noticed
- toothpaste leaking from Rt side of her mouth
- tearing of Rt eye
- inability to flair Rt nostril

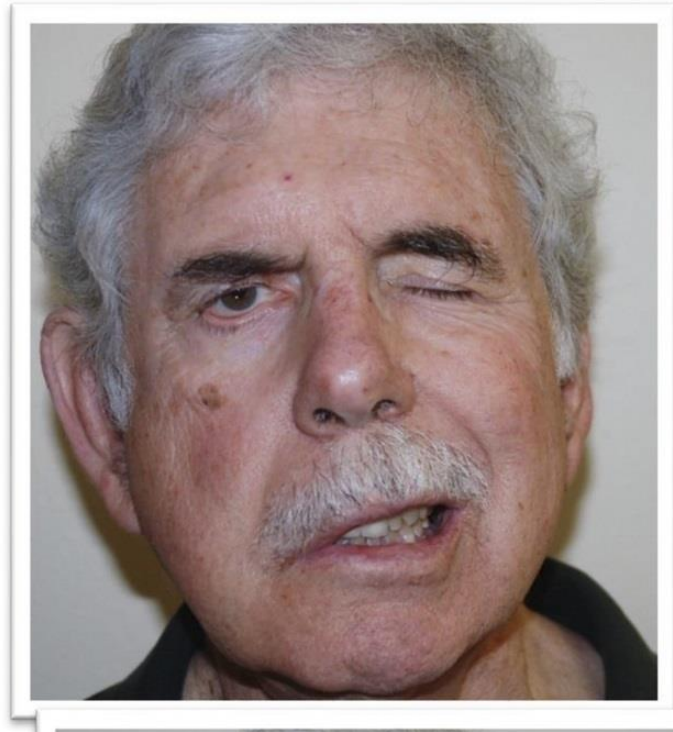
- O/E
- pt had mild Rt peripheral facial paresis with otherwise normal examination
- she was initially suspected of having a stroke, MRI done

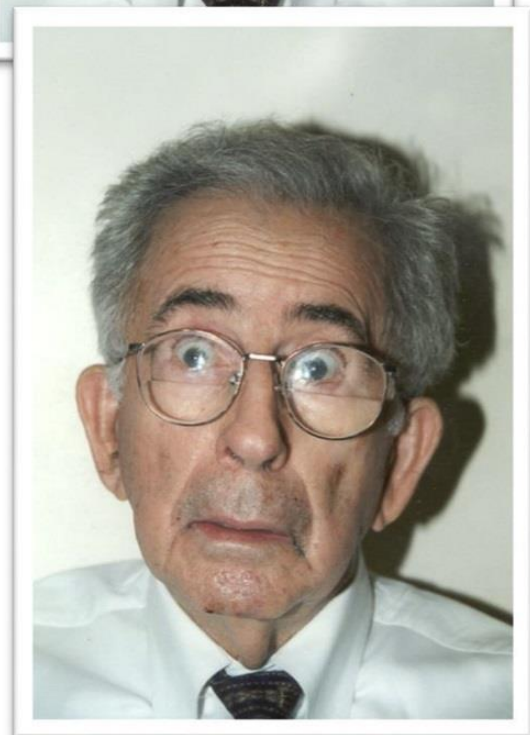
MRI

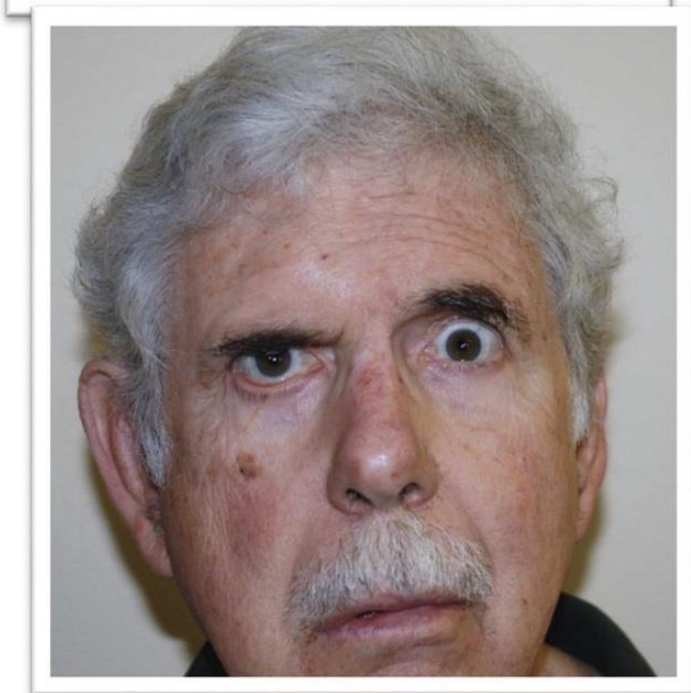


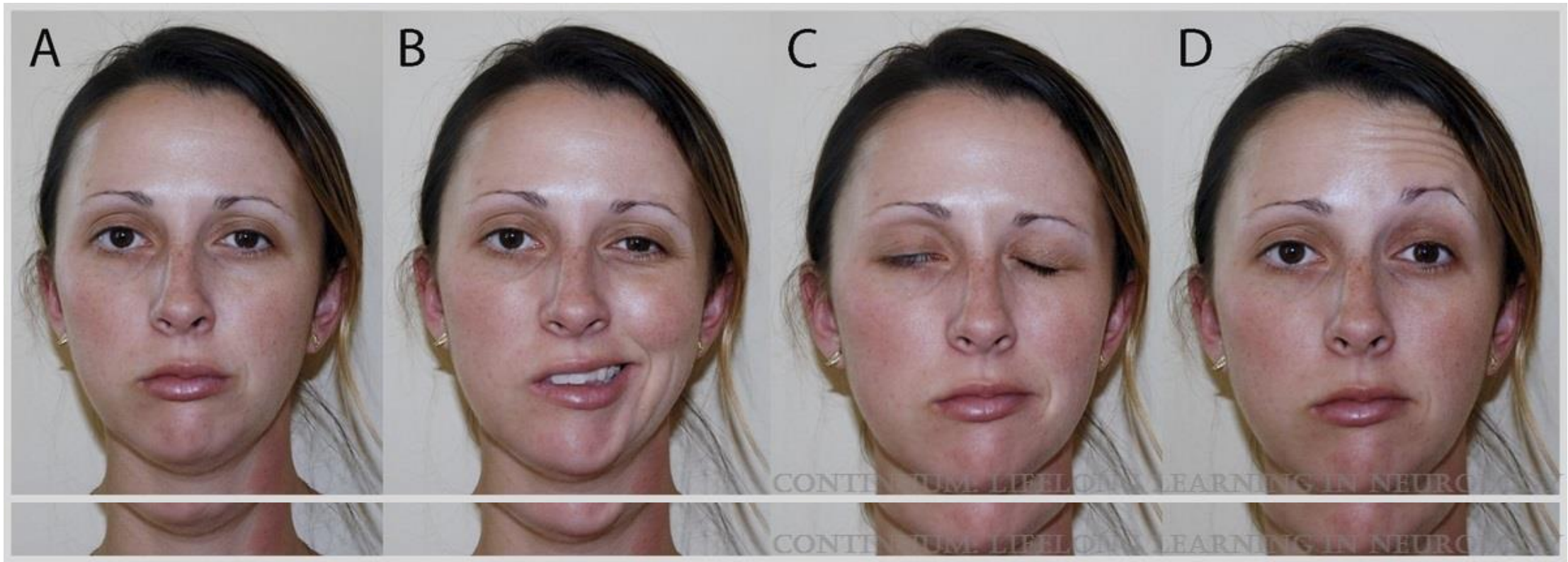
- She was treated with eye care, corticosteroids, and valacyclovir. She had complete resolution of her symptoms by 3 months










A
B
C
D

EVALUATION OF BELL'S PALSY

- Pts with Bell's palsy typically develop facial weakness over 1 to 2 days.
  - liquids, or food leak from affected side of mouth
  - eyelid does not close, more difficult to speak
  - leads many pts to ER for fear of stroke
- First step in evaluating pt to determine:
- facial weakness peripheral or central
- almost all pts with hemiparesis from stroke have facial weakness, it is rarely the presenting symptom and often noticed by others rather than pt

RED FLAGS

- Gradual onset
- Vertigo, hearing loss, tinnitus
- No improvement within 3 months
- Bilateral facial palsy
- Other cranial nerve involvement
- Limb or bulbar weakness
- Parotid gland enlargement
- Otitis media
- Vesicles in external auditory canal, tympanic membrane, or oropharynx
- Cervical adenopathy
- Facial swelling/fissured (scrotal) tongue
- Skin rash/other signs of Lyme disease or living in an endemic area
- Risk factors for human immunodeficiency virus
- Facial skin cancer
- Systemic cancer

- AAN evidence-based review gave level A recommendation to use of corticosteroids for Tx of Bell's palsy within 72 hours of onset. Continuing, they reiterated: adding antiviral to corticosteroid offers no significant benefit regarding facial recovery.
- However, 95% confidence interval of two Class I studies could not rule out modest effect of adding an antiviral and gave a Class C rating to combination.
- When discussing combination with pts, despite counseling that adding antiviral to steroid does not offer significant benefit (when also told that benefit, even modest at best, cannot be "ruled out").

HEADACHE

- The 3 major, most common primary headache disorders:
  - migraine
  - tension-type headache
  - trigeminal autonomic cephalalgias

- Although tension headache the most common primary headache in general population, migraine is overwhelmingly most common primary headache disorder presenting to clinicians.

HEADACHE

- Differentiate type of headache
  - Primary
  - Secondary

- Make right diagnosis , looks for red flags

Snoop: warning signals for sinister causes of headache that are associated with serious morbidity and mortality

Letter	Warning signal	Features	Differential diagnosis
S	Systemic symptoms	Fever, night sweats, chills, weight loss, jaw claudication	Metastases, giant cell arteritis, infection (central nervous system, systemic)
	Secondary diseases	Cancer, immunosuppression, chronic infection (human immunodeficiency virus [HIV], tuberculosis)	
N	Neurologic symptoms/signs	Confusion, focal neurologic symptoms/signs, diplopia, transient visual obscurations, pulsatile tinnitus	Mass lesion, structural lesion, stroke, hydrocephalus
O	Onset	Thunderclap	Reversible cerebral vasoconstriction syndrome (RCVS), stroke, subarachnoid hemorrhage, cerebral venous sinus thrombosis, arterial dissection, pituitary apoplexy, idiopathic intracranial hypertension
O	Older (age >50 years)	New onset, persistent/progressive headache	Mass lesion, giant cell arteritis
P1	Positional	Orthostatic, recumbent, or worsens with change in position	Low intracranial pressure (CSF leak), mass lesion, cerebral venous sinus thrombosis, sinus pathology
P2	Prior history	New onset or change to persistent/daily headache	Mass lesion, infection (central nervous system/ systemic)
P3	Pregnancy/ postpartum	New onset during pregnancy	Cerebral venous sinus thrombosis, preeclampsia, RCVS, pituitary lesion, stroke
P4	Precipitated by Valsalva	Cough, sneeze, bending, straining	Intracranial/posterior fossa mass, Chiari malformation

CSF = cerebrospinal fluid.
[a] Data from Dodick DW, Semin Neurol.[3]

Migraine without aura

A At least five attacks[b] fulfilling criteria B-D

B Headache attacks lasting 4-72 hours (untreated or unsuccessfully treated)[c,d]

C Headache has at least two of the following four characteristics:

1. Unilateral location
2. Pulsating quality
3. Moderate or severe pain intensity
4. Aggravation by or causing avoidance of routine physical activity (eg, walking or climbing stairs)

D During headache at least one of the following:

1. Nausea and/or vomiting
2. Photophobia and phonophobia

E Not better accounted for by another *ICHD-3* diagnosis

ICHD-3 = International Classification of Headache Disorders, Third Edition.

[a] Reprinted with permission from Headache Classification Committee of the International Headache Society, Cephalalgia.[4] © 2018 International Headache Society.

[b] One or a few migraine attacks may be difficult to distinguish from symptomatic migrainelike attacks. Furthermore, the nature of a single or a few attacks may be difficult to understand. Therefore, at least five attacks are required. Individuals who otherwise meet criteria for migraine without aura but have had fewer than five attacks should be coded probable migraine without aura.

[c] When the patient falls asleep during migraine and wakes up without it, duration of the attack is reckoned until the time of awakening.

[d] In children and adolescents (aged under 18 years), attacks may last 2-72 hours (the evidence for untreated durations of less than two hours in children has not been substantiated).

Case

- 28 y/o woman previously treated for generalized anxiety, presented with headache
- since her teens, increased in frequency ,intensity over past year, coinciding with job promotion & relocation.
- bilateral attacks of nonpulsating pain, lasted 12 to 24 hours
- once or twice weekly.

- At times , pain reached moderate to severe levels
- some sensitivities to light & noise
- no nausea
- significant tightness in her neck before & during headaches
- greatest concern: need for occasional bed rest and associated work absences.
- General physical, neurologic examinations were normal
- CT : normal

Tension headache

- Females have slightly higher prevalence of TH than males
  - ➢episodic
  - ➢Chronic

  In population-based study from the US, prevalence of episodic TTH peaked in 4^{TH} decade.

  Danish study found decreasing prevalence of TTH with increasing age.

- TH pain: nondescript: dull, pressure, head fullness,heavy weight on my head or shoulders.

- In three Danish studies, severe pain was found in 13%, pulsatile pain in 14 to 20%, unilateral pain in 10%

- Increased pericranial muscle tenderness most important abnormal finding.

Chronic tension-type headache diagnostic criteria

Description: A disorder evolving from frequent episodic tension-type headache, with daily or very frequent episodes of headache, typically bilateral, pressing or tightening in quality and of mild to moderate intensity, lasting hours to days, or unremitting. The pain does not worsen with routine physical activity, but may be associated with mild nausea, photophobia or phonophobia.
Diagnostic criteria:
A. Headache occurring on ≥15 days per month on average for more than three months (≥180 days per year) and fulfilling criteria B through D
B. Lasting hours to days, or unremitting
C. At least two of the following characteristics:
1. Bilateral location
2. Pressing or tightening (non-pulsating) quality
3. Mild or moderate intensity
4. Not aggravated by routine physical activity such as walking or climbing stairs
D. Both of the following:
1. No more than one of photophobia, phonophobia or mild nausea
2. Neither moderate or severe nausea nor vomiting
E. Not better accounted for by another ICHD-3 diagnosis

ICHD-3: International Classification of Headache Disorders, 3rd edition

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Tx Goals

- Reduce attack frequency, severity, and duration
- Improve responsiveness to treatment of acute attacks
- Improve function and reduce disability

PHARMACOLOGIC THERAPIES

- TCA, Amitriptyline
- Antidepressants, mirtazapine & venlafaxine
- Anticonvulsants, topiramate & gabapentin
- Muscle relaxant, tizanidine
- In contrast, the available evidence suggests selective serotonin uptake inhibitors are not effective for TH prophylaxis.

Non pharmacological Tx

- Regulation of sleep, exercise, and meals
- Cognitive-behavioral therapy
- Relaxation

APPROACH TO TREATMENT FOR MIGRAINE

- Educate migraine pts 7 encourage them to participate in their own management
- Use migraine-specific agents (triptans) for pts with more severe migraine and respond poorly to NSAIDs or combination analgesics.
- The early Tx for severe attacks provided best outcomes

Chronic migraine

- Start with one of first-line agents, based on individual pt factors
  - Propranolol
  - Topiramate
  - Amitriptyline
  - Valproic acid

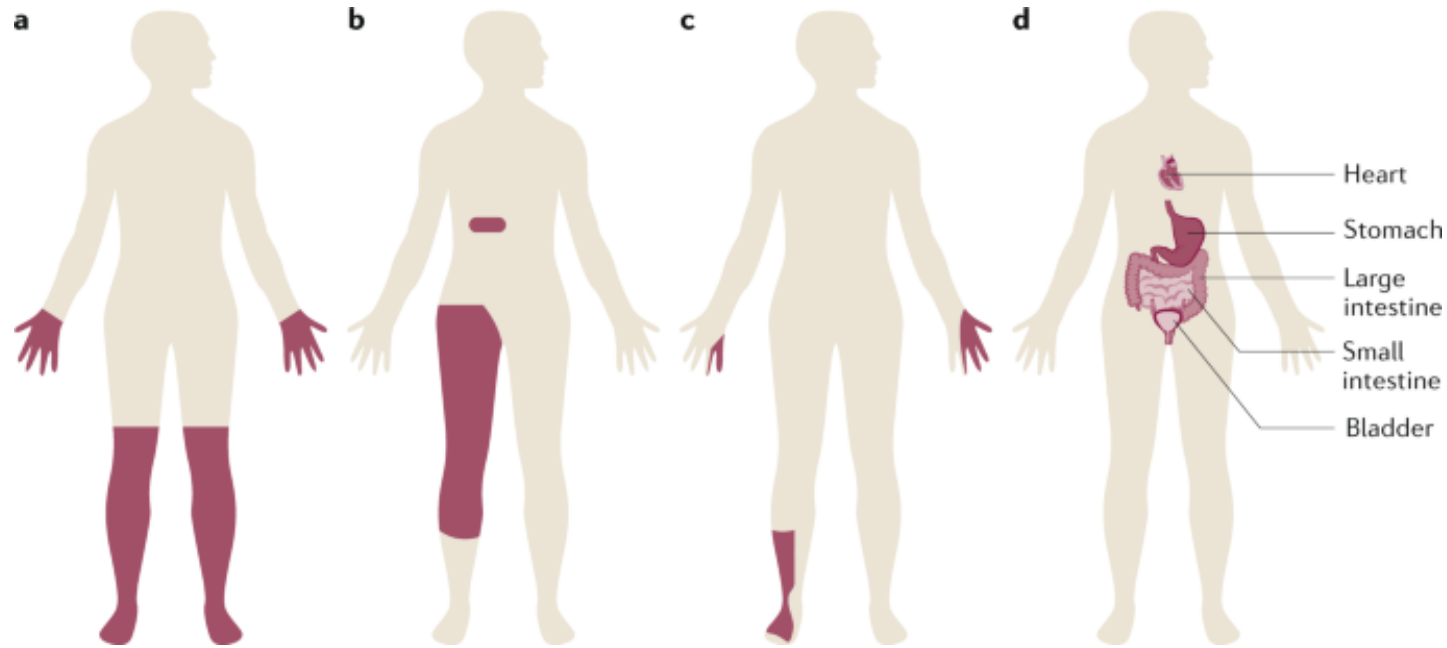
Second line Tx

- BotuliniumtoxinA
- Calcitonin gene-related peptide (CGRP) antagonists (erenumab)
- venlafaxine
- Verapamil
- Other beta blockers (atenolol, metoprolol)
- Gabapentin
- Magnesium
- Riboflavin
- Candesartan
- Other TCAs (nortiptyaline)

Neuropathic Pain

- common problem in clinical practice
- prevalence in general population between 7% & 10%
- In US, painful diabetic peripheral neuropathy alone affects approximately 10 million people
- one-third of pts with DM have painful diabetic neuropathy
- in 2014 the Centers for Disease Control and Prevention (CDC) estimated that 30 million people in US had DM, and this number rising.

- **Peripheral Neuropathic Pain**
  - Painful diabetic neuropathy
  - Human immunodeficiency virus–associated neuropathy
  - Chemotherapy-induced peripheral neuropathy
  - Postherpetic neuralgia
  - Trigeminal neuralgia
  - Complex regional pain syndrome
  - Compressive mononeuropathies
  - Radiculopathies
  - Inflammatory neuropathies (acute and chronic inflammatory demyelinating polyneuropathy)
  - Posttraumatic neuropathy
  - Phantom limb pain
- **Central Neuropathic Pain**
  - Spinal cord injury
  - Central poststroke pain
  - Compressive myelopathy
  - Multiple sclerosis–related pain
  - Syringomyelia



- important to recognize neuropathic pain affects many aspects of daily life, associated with:
  - poor general health
  - reduction in quality of life
  - poor sleep
  - higher anxiety and depression
- measures of quality of life in people with chronic neuropathic pain were rated as low as for pts with clinical depression, coronary artery disease, recent myocardial infarction, or poorly controlled DM

- **Positive Symptoms**
  - Tingling (pins and needles)
  - Prickling
  - Lightninglike or lancinating
  - Aching
  - Knifelike
  - Pulling or tightening
  - Burning or searing
  - Electrical
- **Negative Symptoms**
  - Numbness
  - Deadness
  - Feeling of wearing socks all the time

- Hyperesthesia: Increased sensitivity to stimulation
- Hyperalgesia: Increased response to a stimulation that is normally painful
- Allodynia: Pain due to a stimulus that typically does not provoke pain
- Paresthesia: An abnormal sensation (may be provoked or spontaneous)
- Dysesthesia: An unpleasant abnormal sensation
- Hypoesthesia: Decreased sensitivity to stimulation
- Hypoalgesia: Diminished pain in response to a normally painful stimulus
- Analgesia: Loss of pain sensation
- Anesthesia: Loss of sensation

CASE

- 65 y/o man with hx of pre–diabetes mellitus presented with numbness & tingling in his feet that had been slowly progressive for past 5 years.
- he has unpleasant sensation when bedsheets touched his skin or when wearing socks.
- His pain interfered with physical activity & exercise
- he had gained weight, feeling down, lacked interest in activities that used to enjoy.

O/E

- full strength throughout
- normal deep tendon reflexes.
- Sensation to pinprick decreased in lower extremities to midcalves bilaterally
- decreased vibration & proprioception at great toes bilaterally

was started on duloxetine with improvement , still frequently up at night because of painful sensations

Gabapentin was added before bedtime

- **Comment**
- Due to coexisting depression, duloxetine initially chosen for neuropathic pain control
- After partial response, low-dose gabapentin was added to help with neuropathic pain and sleep
- combination of two first-line medications is often effective in controlling neuropathic pain

Painful Peripheral Neuropathy

In general, Tx options for diabetic and nondiabetic painful peripheral neuropathy are similar

- **Painful Diabetic Neuropathy**

  First line: pregabalin, duloxetine, gabapentin, tricyclic antidepressant, venlafaxine

  Second line: capsaicin, opioids, valproic acid, venlafaxine

  Other: spinal cord stimulation

- **Postherpetic Neuralgia**

  First line: gabapentin, pregabalin, tricyclic antidepressants, topical lidocaine

  Second line: opioids and topical capsaicin

  Other: valproic acid, botulinum toxin

- **Central Pain**

  First line: gabapentin, pregabalin (spinal cord injury), tricyclic antidepressants

  Second line: duloxetine, lamotrigine, opioids, tramadol, cannabinoids (multiple sclerosis)

- **Human Immunodeficiency Virus–Associated Neuropathy**[a]

  Capsaicin 8% patch, lamotrigine, cannabinoids

- **Cancer Neuropathic Pain**[a]

  Gabapentin, tricyclic antidepressants, pregabalin, opioids

- **Phantom Pain**[a]

  Opioids, gabapentin

- **Posttraumatic Neuropathic Pain**[a]

  Pregabalin, tricyclic antidepressants, venlafaxine, topical capsaicin

- **Complex Regional Pain Syndrome**[a]

  Physical and occupational therapy, corticosteroids, tricyclic antidepressants, gabapentin, pregabalin, duloxetine, bisphosphonates, calcitonin, opioids, sympathetic nerve blocks, spinal cord stimulation

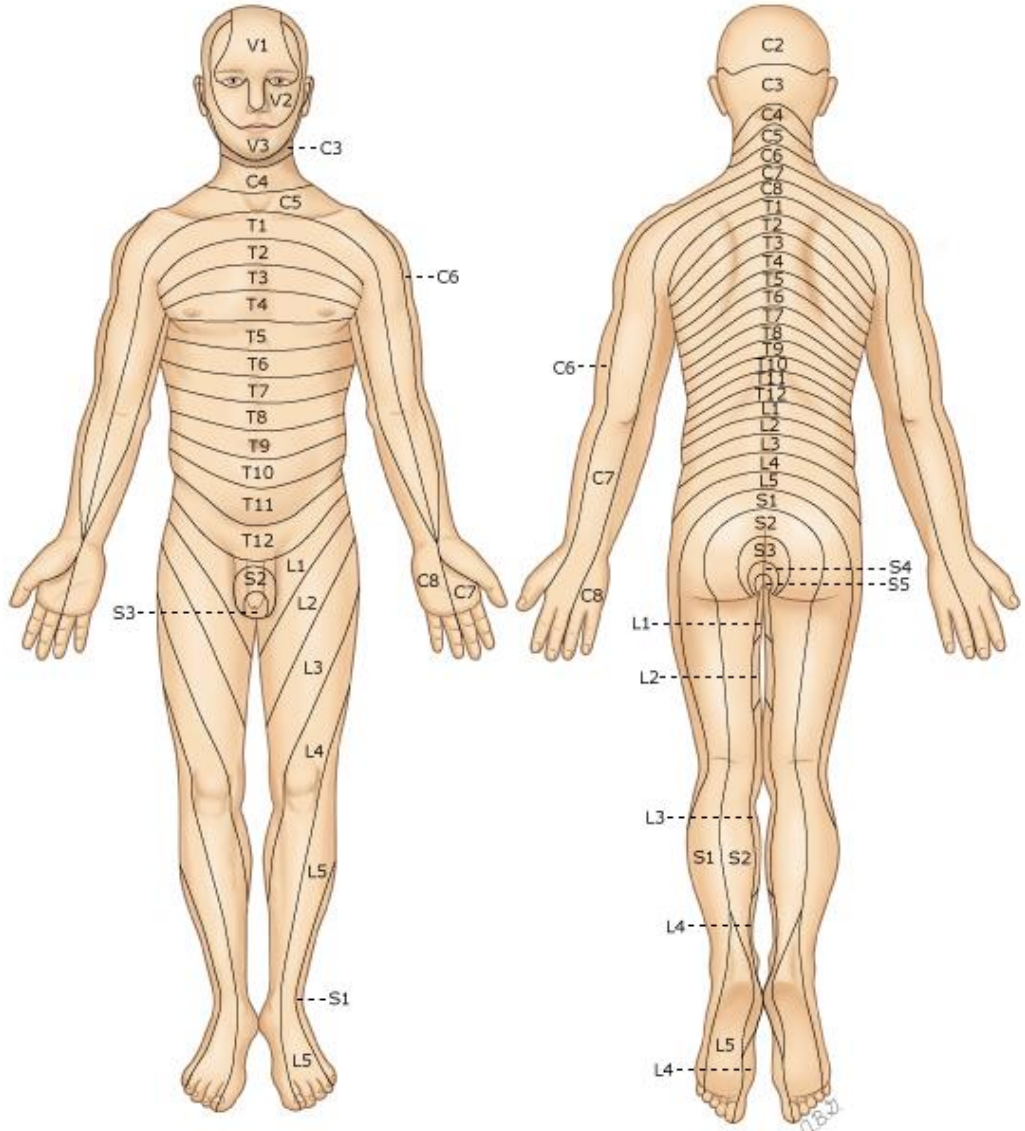
- **Radiculopathy and Failed Back Surgery Syndrome**[a]

  Physical therapy, pregabalin, duloxetine, gabapentin, tricyclic antidepressants, venlafaxine, spinal cord stimulation (failed back surgery syndrome)

[a] Neuropathic pain conditions that lack high-quality evidence for treatment recommendations.

Postherpetic Neuralgia

- Diagnosis of PHN is made when localized neuropathic pain persists beyond 3 months in the same distribution as preceding documented episode of acute herpes zoster
- Pain of PHN can be burning, pruritic, sharp, or stabbing and constant or intermittent, > 90% of pts with PHN also report allodynia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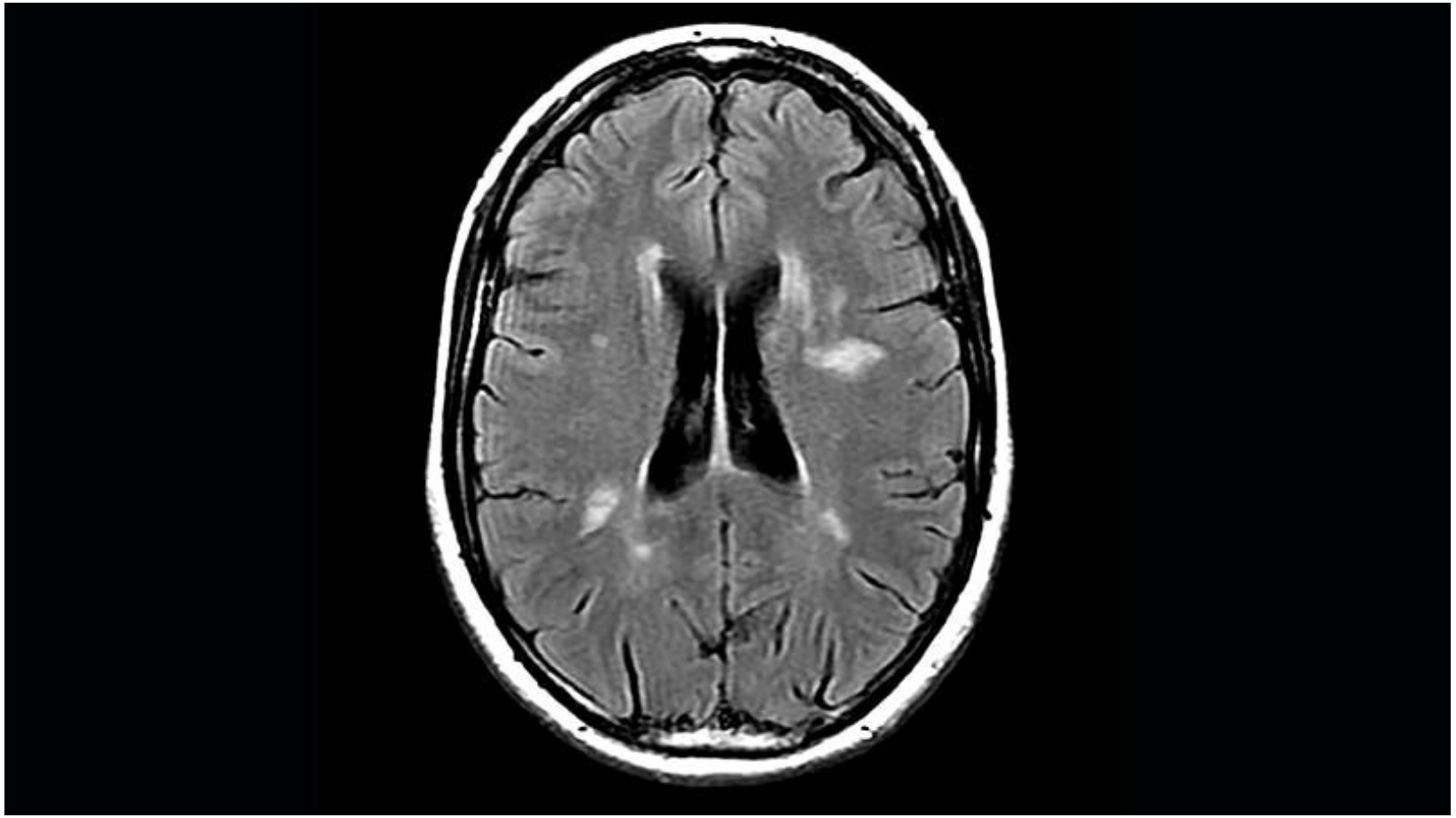
Tx of PHN

- Drugs of first choice in treatment
  - TCA
  - gabapentin
  - pregabalin
- Other medications shown to be beneficial:
  - opioids
  - topical capsaicin
  - topical lidocaine
- Benefit may exist from valproic acid and botulinum toxin

Weakness

- Onset : acute vs gradual
- Distribution
- Associated symptoms
- Quick assessment
- Stabilization (ABSD)
- Stroke (hemorrhagic vs ischemic)
- Candidate for tPA
- Ct bain

MULTIPLE SCLEROSIS (MS)



- Risk factors: genetic, envirinmental , EBV, Vit D deficiency, obesity
- Female to male: 3:1
- Mean age: 20 to 40 (but can be at any age)
- Family hx
- Other autoimmune disease

hx

- Remote hx: visual symptoms
- Urinary
- Cognition
- Imbalance
- Weakness
- Sensory symptoms
- Onset gradual

THANK YOU