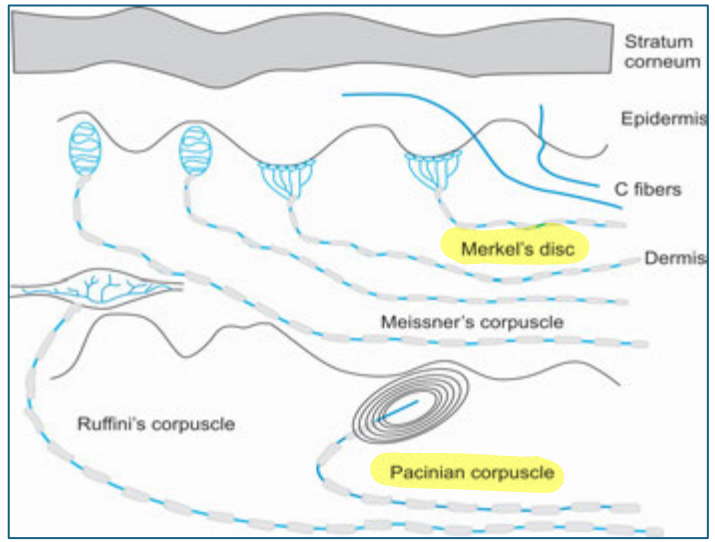
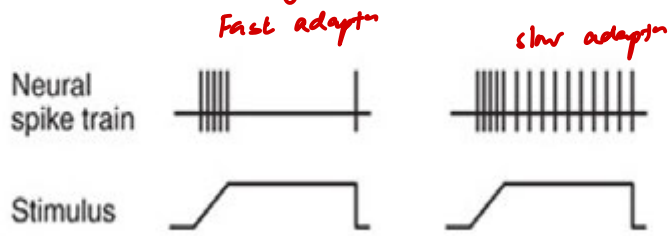
INTEGRATED NEUROLOGY

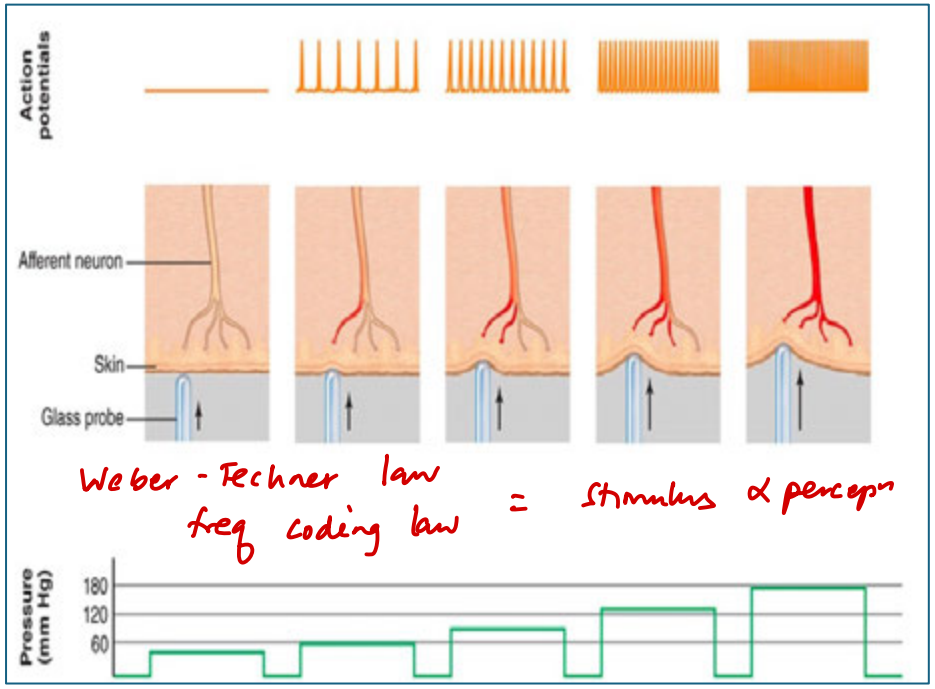
Sensory Receptors

RECEPTOR	ADAPTATION	REMARKS
Meissner	FAST	Most numerous Non-hairy skin only Fast moving touch, dynamic two-point discrimination, low frequency vibration
Pacinian	FAST	Largest receptor Most sensitive HIGH FREQUENCY VIBRATION, Pressure
Hair end organs	FAST	Hair movement
Merkel	SLOW	Epidermis- Edge, static two-point discrimination BRAILLE
Ruffini	SLOW	Skin stretch, pressure Maximum in joint capsule
type c	SLOW unmyelinated	Itching, Slow pain (Substance P)





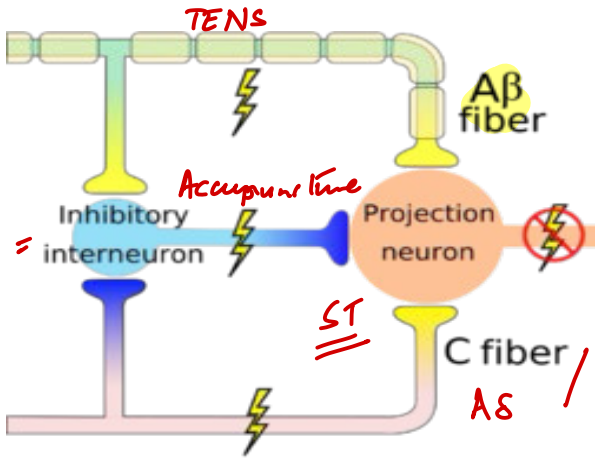
vs Fast pain
↳ Glutamate



Weber - Fechner law = Stimulus & percep
freq coding law

- Hyperalgesia pain → ↑↑ painful
- Allodynia touch → pain
- Gating theory of pain- Melzack/Wall

TENS / Accupuncture



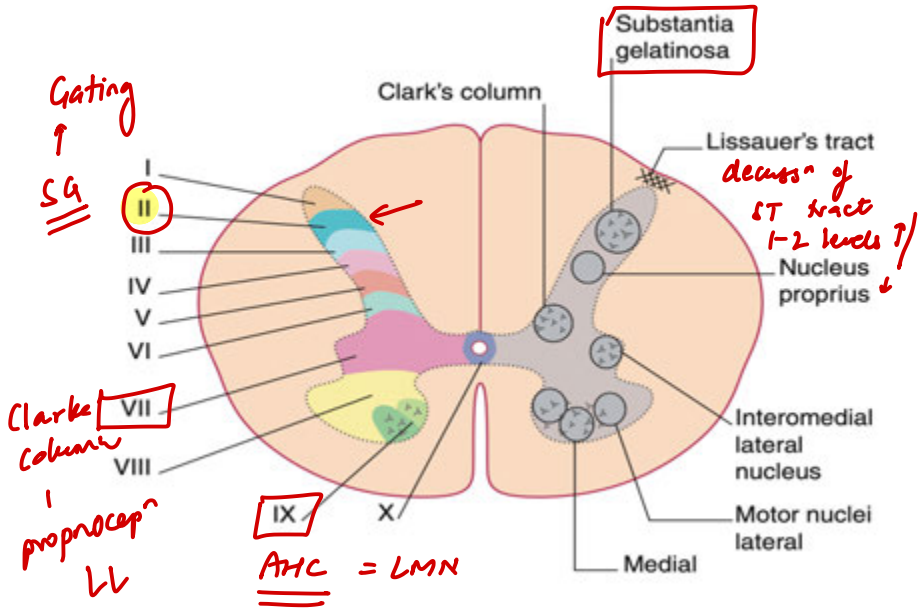
Structure	PAIN INHIBITION
Periaqueductal gray (PAG)	Activates descending inhibition pathways
Nucleus raphe – 5HT	inhibits pain at spinal level
Locus ceruleus-NE	
Interneurons in dorsal horn	Release enkephalins, dynorphins

A 30-year-old female went on vacation and fell asleep while sitting on a beach. After some time she woke with sunburn. Later when she went back home, she experienced pain while taking a warm bath (40°C). Which of the following receptors is responsible for the pain?

A. Innocuous thermal receptor - allodynia
B. Innocuous thermal receptor - hyperalgesia
C. Thermal nociceptor - allodynia
D. Thermal nociceptor – hyperalgesia

>49°C

injury → ↑excitability "sensitization"
sunburn
↓
innocuous stimuli "bath" - pain



Erlanger-Grasser: Nerve fibres

Fiber type		Functions	Conduction velocity (m/sec)	Diameter (μm)
A	Alpha	Proprioception; somatic motor	70-120	12-20
	Beta	Touch, pressure	30-70	8
	Gamma	Efferent to muscle spindles	15-30	5
	Delta	Fast Pain(Glu), temperature (cold)	12-30	2-5
B		Preganglionic autonomic	3-12	3
C	Unmyelinated	Slow Pain, temperature (warm), Postganglionic sympathetic	0.5-2	1

- Cold sensation: Aδ
- Warm, burning pain and freezing pain: C
- Local anaesthetic: Aγ and Aδ>> Aα and Aβ >> B >>C (Aα; physiology: 'GAD')
- Pressure: A > B > C
- Hypoxia: B > A > C

NT changes in diseases

CAG

	Locations of synthesis	Anxiety	Depression	Mania	Schizophrenia	Alzheimer disease	Huntington disease	Parkinson disease
Acetylcholine	Basal nucleus of Meynert	-	↑	↓	-	↓	↓	↑
Dopamine	Ventral tegmentum, SNc	-	↓	↑	↑	-	↑	↓
GABA	Nucleus accumbens	↓	↓	↓	-	-	↓	-
Norepinephrine	Locus ceruleus	↑	↓		-	-	-	-
Serotonin	Raphe nuclei (medulla, pons)	↓	↓		-	-	-	-

Hypothalamic nuclei QQ

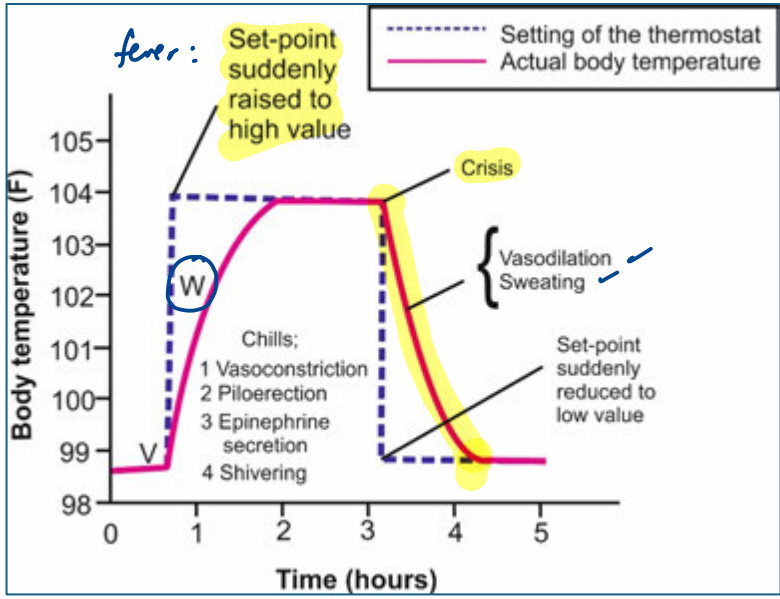
Lateral nucleus Stimulated by ghrelin	→ ⊕ Hunger / anger ← PAG = rage / punishment centre
Ventromedial nucleus Stimulated by leptin	→ ⊕ Reward centre / satiety
Anterior nucleus "AC"	→ ⊕ cooling → vasodil / sweating "FLUSH"
Posterior nucleus	→ ⊕ heat → shivering / VC / piloerection
Suprachiasmatic nucleus	- circadian rhythm (24hrs) Retina light → SCN ↓ Pineal ↓ Melatonin
Supraoptic nucleus SAD	→ ADH
Paraventricular nuclei POX	→ oxytocin

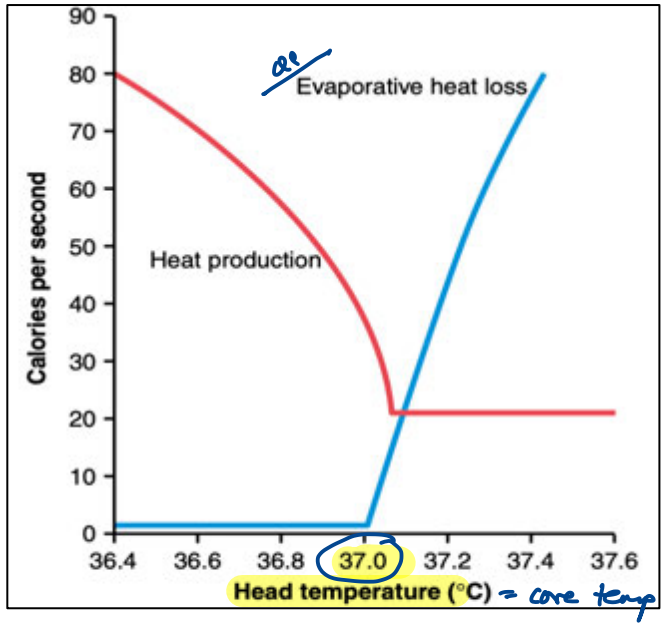
post pit – T1 hot spot

∴ Stalk → DI

Preoptic nucleus	→ Thirst / sexual fn
Arcuate nucleus QQ	control Hunger / satiety PUBERTY

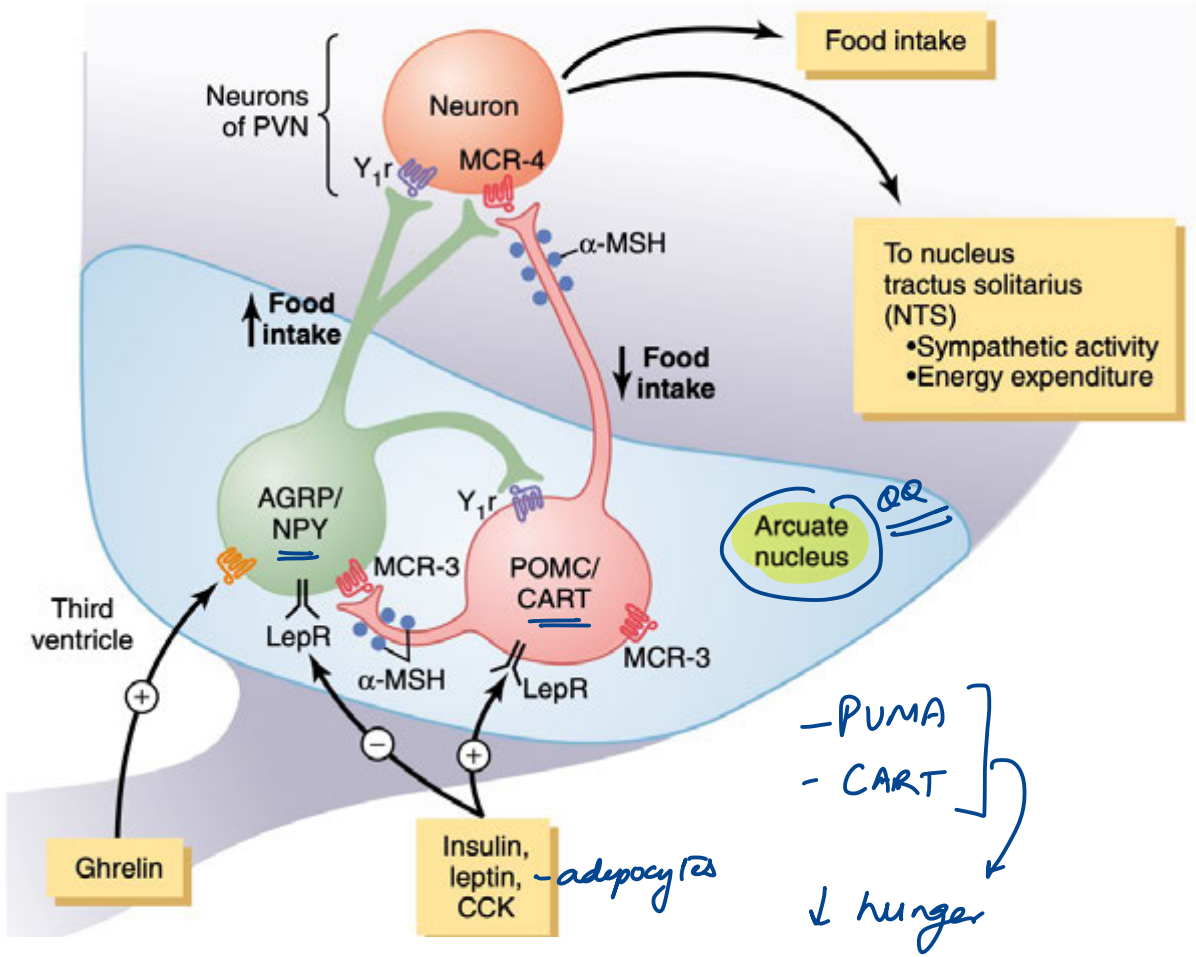
- Pulsatile release of GnRH- Kisspeptin (∵ kallman Sx)
- Permissive role in puberty- Leptin (∵ anorexia)





Satiety

Decrease Feeding (Anorexigenic)	Increase Feeding (Orexigenic)
α-Melanocyte-stimulating hormone (α-MSH)	Neuropeptide Y (NPY)
Leptin	Agouti-related protein (AGRP)
Serotonin	Melanin-concentrating hormone (MCH)
Norepinephrine	Orexins A and B
Corticotropin-releasing hormone (CRH)	Endorphins
Insulin	Galanin (GAL)
Cholecystokinin (CCK)	Amino acids (glutamate and γ-aminobutyric acid)
Glucagon-like peptide (GLP)	Cortisol
Cocaine- and amphetamine-regulated transcript (CART)	Ghrelin
Peptide YY (PYY) wai -wai	Endocannabinoids



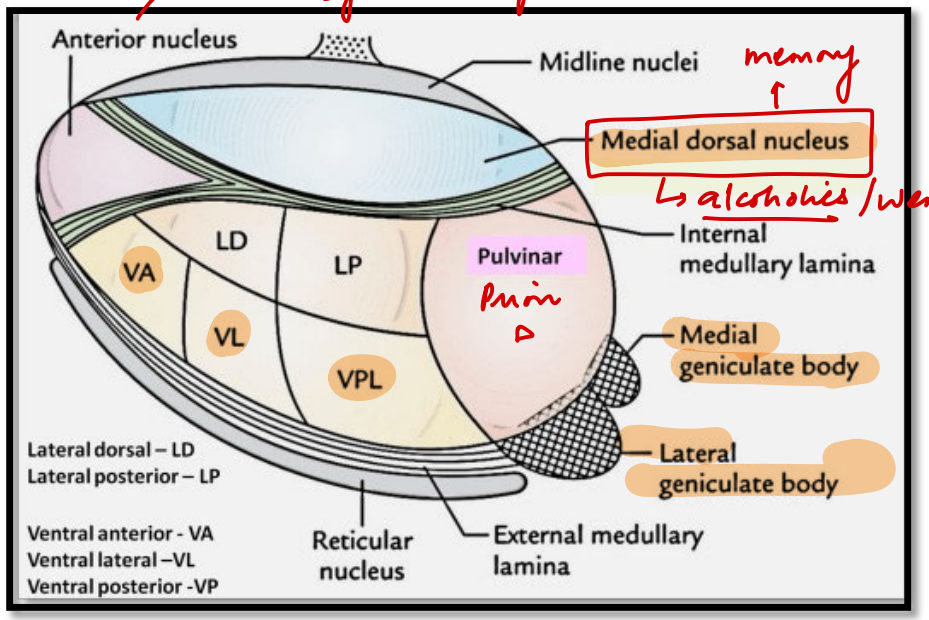
Adiponectin: adipocytes – ↑ insulin sn

Thalamic nuclei

"relay" to cx [except → smell]

Nuclei	Input	Senses	Destination
Ventral Postero-Lateral	S/T tract / DC	pain/temp — proprioceptive touch	3, 1, 2
Ventral Postero-Medial	V N / CT / IX / X	touch/sn face + taste	3, 1, 2 taste: 43
Lateral geniculate nucleus	optic tract → SC	vision	visual cx – 17
Medial geniculate nucleus	LL → IC	music	auditory cx – 41/42
Ventral anterior/ lateral	BG / cerebellum	motor	4, 6 motor cx

Limbic System = Papez circuit



memory

↳ alcoholics / Wernicke's

EE CO LIMA

Memory

Declarative / Explicit Memory:

- **Semantic (factual):** Prefrontal cx / ant + lat temporal
- **Episodic (events):** Hippocampus (B/L xx → AGA), medial temp, neocortex

Nondeclarative / Implicit Memory:

- **Procedural (skills, habits):** Striatum / Cerebellum
- **Priming and perceptual:** "clue" – neocortex
- **Associative learning (classical/ operant conditioning):** amygdala / cerebellum
  ↕ B/L
  Kluver-Bury Sp
  ↑ aggression
  ↑ sexuality
- **Non-associative learning**
  - **Habituation** "sense of smell" ↓response (persistent) → ↓Ca^{2+} influx ↓Glu
  - **Sensitisation** ↑response – TSHT ↑Ca^{2+} influx ↑Glu "sunburn"

Short term memory: 30 - 300s

Long-term potentiation / depression

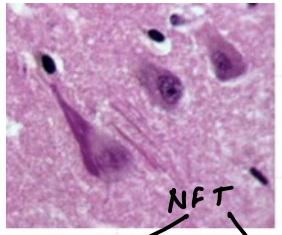
∵ Glutamate (NMDA) - slow ⊕

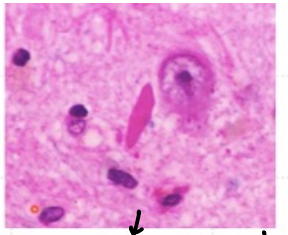
Revision → Hippocampus CA1

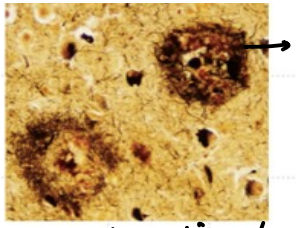
vs - AMPA - EPSP ↑
Glutamate
fast

Dementia "cognitive decline"

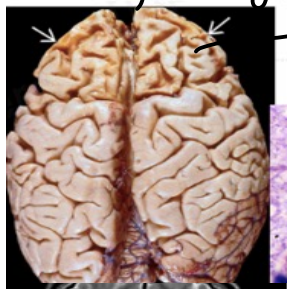
Alzheimer's disease	Early short-term memory loss, spatial (T) (P) disorientation -> personality changes (F) Down syndrome (APP-Chr 21) Apo E2 Apo E4 Mild: Donepezil (AchE ⊖) Severe: Memantine (NMDA ⊖) Lecanemab, Aducanumab αB ↓ Transdermal patch: Rivastigmine
Vascular dementia (Binswanger's D)	Stepwise decline – small vessels → denyel" Deep white matter changes on neuroimaging
FTD = Pick's D	Early personality changes (F) Apathy, disinhibition & compulsive behavior
NPH	Wet-Wacky-Wobbly (incontinence, ataxia) HAKIM's Shuffling gait with preserved arm swing (magnetic) gait apraxis
Prion D misfolded prot $PrP^C \rightarrow PrP^{SC}$	Behavioral changes, Myoclonus Rapidly progressive 14-3-3 in CSF, Periodic sharp wave EEG neuroSx / ep Corneal transplant
HIV assn neuro-cognitive disorder "HAND"	HIV + Global atrophy

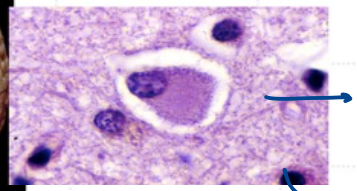


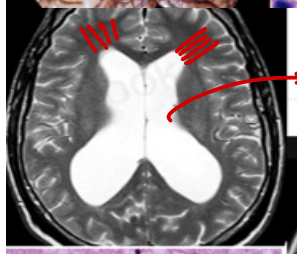


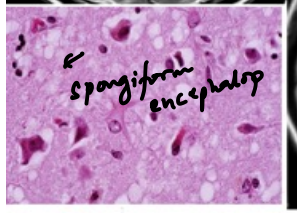


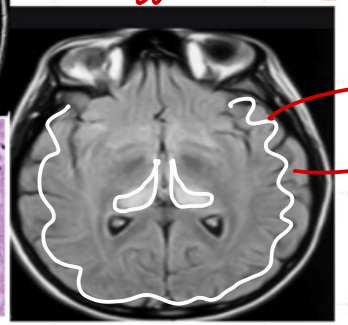
Neuritic plaques
αB 42
(vs) αB 40 → CAA
elderly + multiple Lobar hge

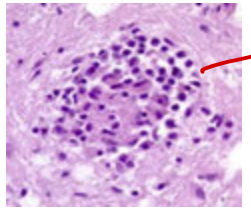












Basal Ganglia

Caudate — Striatum
Putamen — Striatum
Gpi — Lentiform N
Gpe — Lentiform N
SNpr — GABA → 'GAP' → ATHETOSIS

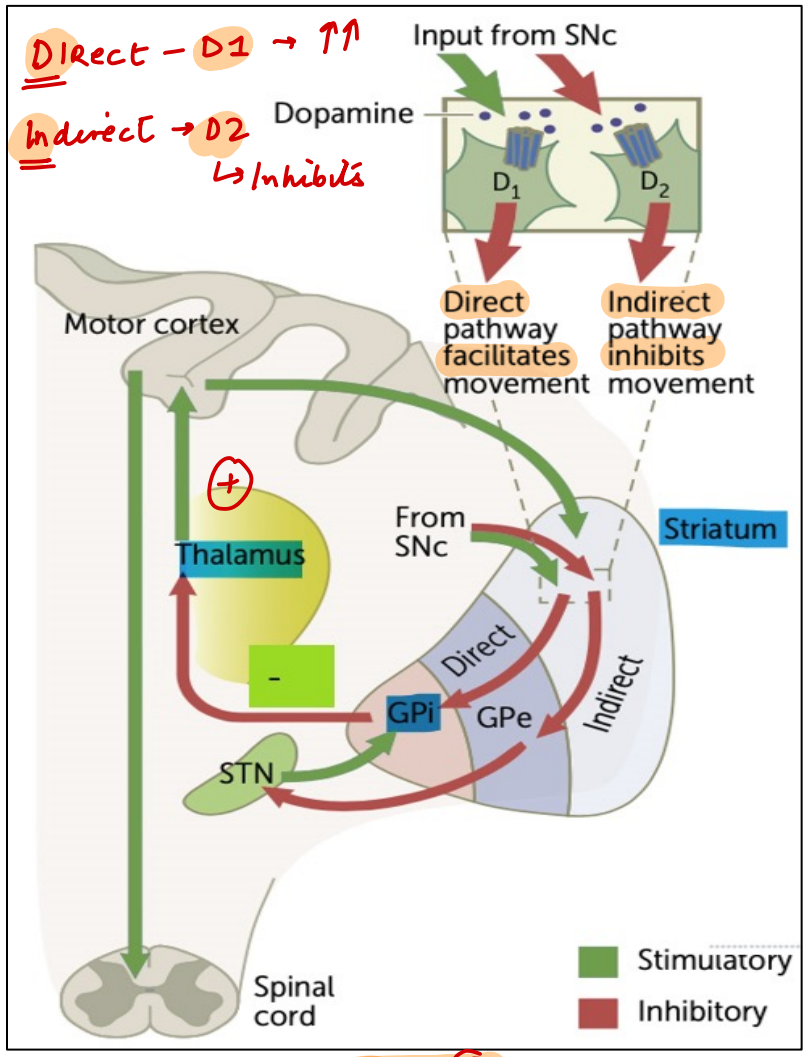
Striatum → GABA → ✕ → CHOREA

SNpc → Dopamine → ✕ → Parkinsonism

STN → Glutamate → ✕ → C/L Hemi-ballismus

Essential tremor

High-frequency tremor (6-10Hz) with sustained posture
Tremor increases with activity, anxiety
Decreases with alcohol
Familial
DOC: Propranolol



Direct: Cortex → (−) GPi (−) → Thal (+) → cortex

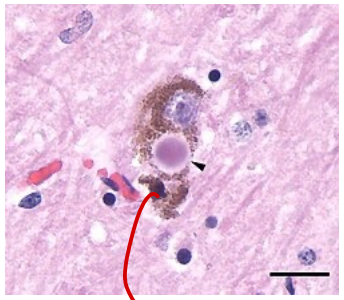
Indirect: cortex → (−) GPe (−) → STN → (+) GPi

Movement disorders

Parkinson's D

Tremors (3-6Hz) 'TRAP'
Rigidity ↳ Rest / pill-rolling
Akinesia
Postural instability
Micrographia
Mask like facies
Shuffling gait
Late-
Dementia, Depression

CORE: Lewy body D
- Fluctuating cognition
- Visual hallucinations
- REM sleep behavior disorder (RBD)
- Spontaneous Parkinsonism

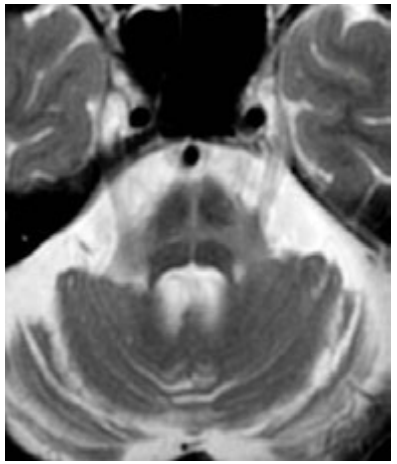


Lewy bodies
α-synuclein aa

Synucleinopathies:
- Parkinson's disease
- Dementia with Lewy bodies
- Multiple system atrophy

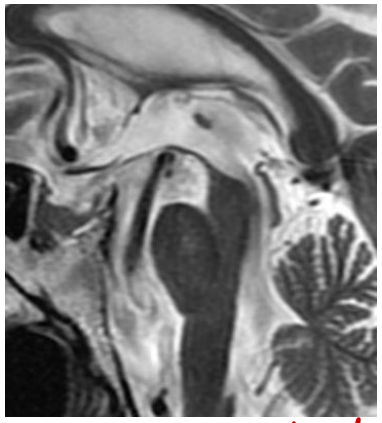
'P Plus'
↳ x respond to Dopa / tremor ++

Autonomic ++



MSA-C
"Hot cross bun"

Impaired downward gaze



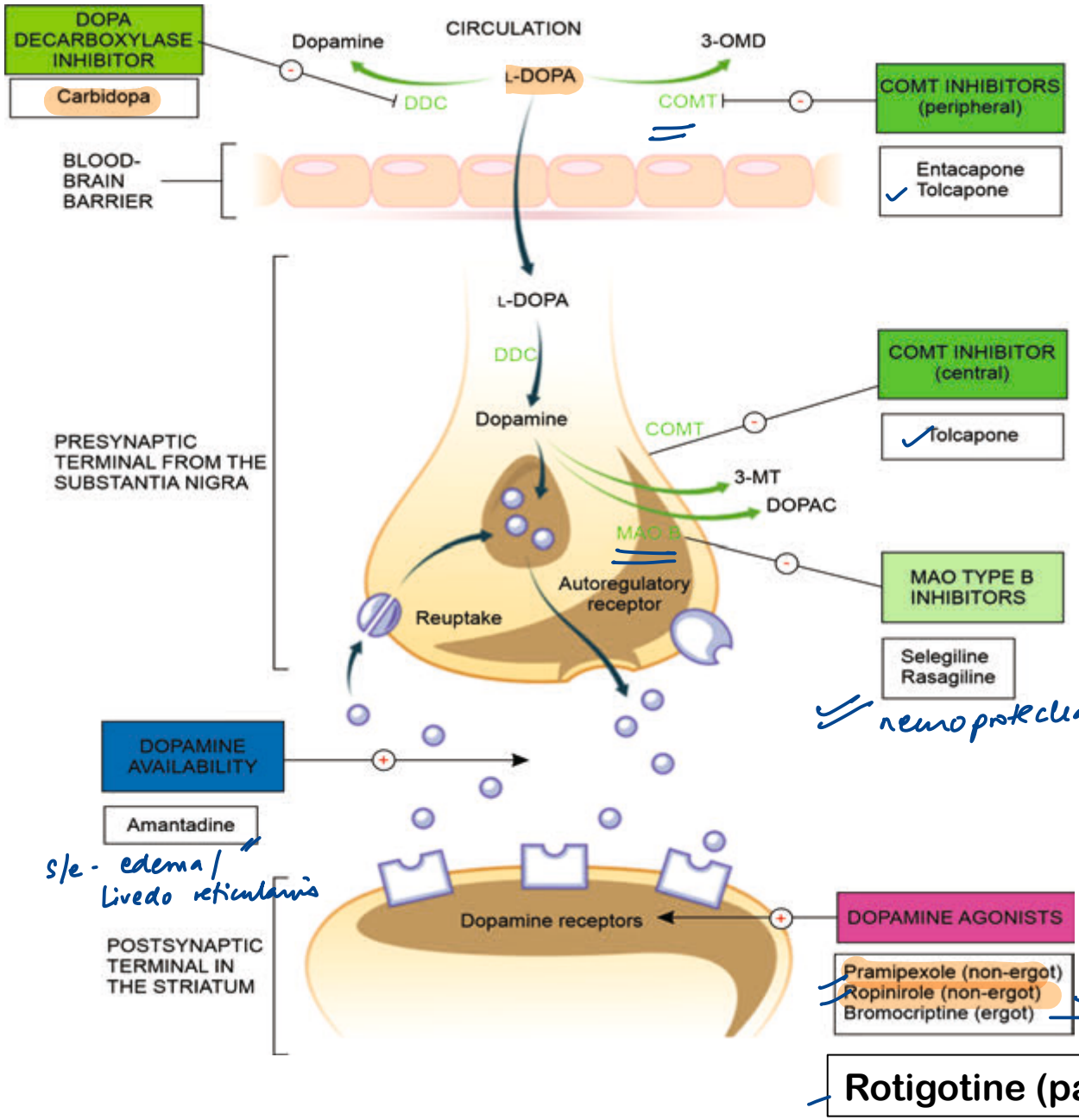
Humming bird sign
PSNP

Alien limb phenomenon

"cortico-basal degener"

Tauopathies:
- Progressive supranuclear palsy
- Corticobasal degeneration
- Alzheimer's disease
- Pick's disease
- Chronic traumatic encephalopathy
- Pantothenate kinase-associated degeneration
- Subacute sclerosing panencephalitis (SSPE)

Parkinson Disease Mx



FIRST LINE: Syndopa : L-Dopa + Carbidopa

"on-off phenomenon" — LID "L-dopa induced dyskenesia"

Rx – COMT⊖ / MAO⊖ B — Rx – Amantadine

FIRST LINE IN YOUNG: Dopa agonist ⊕

DOC for drug induced PD / tremors predominant:
Benztropine, Trihexphenidyl — anticholinergic ⊖

Istradefylline: Adenosine [A_{2A}] receptor antagonist

DBS: STN / Gp ⊕⊕

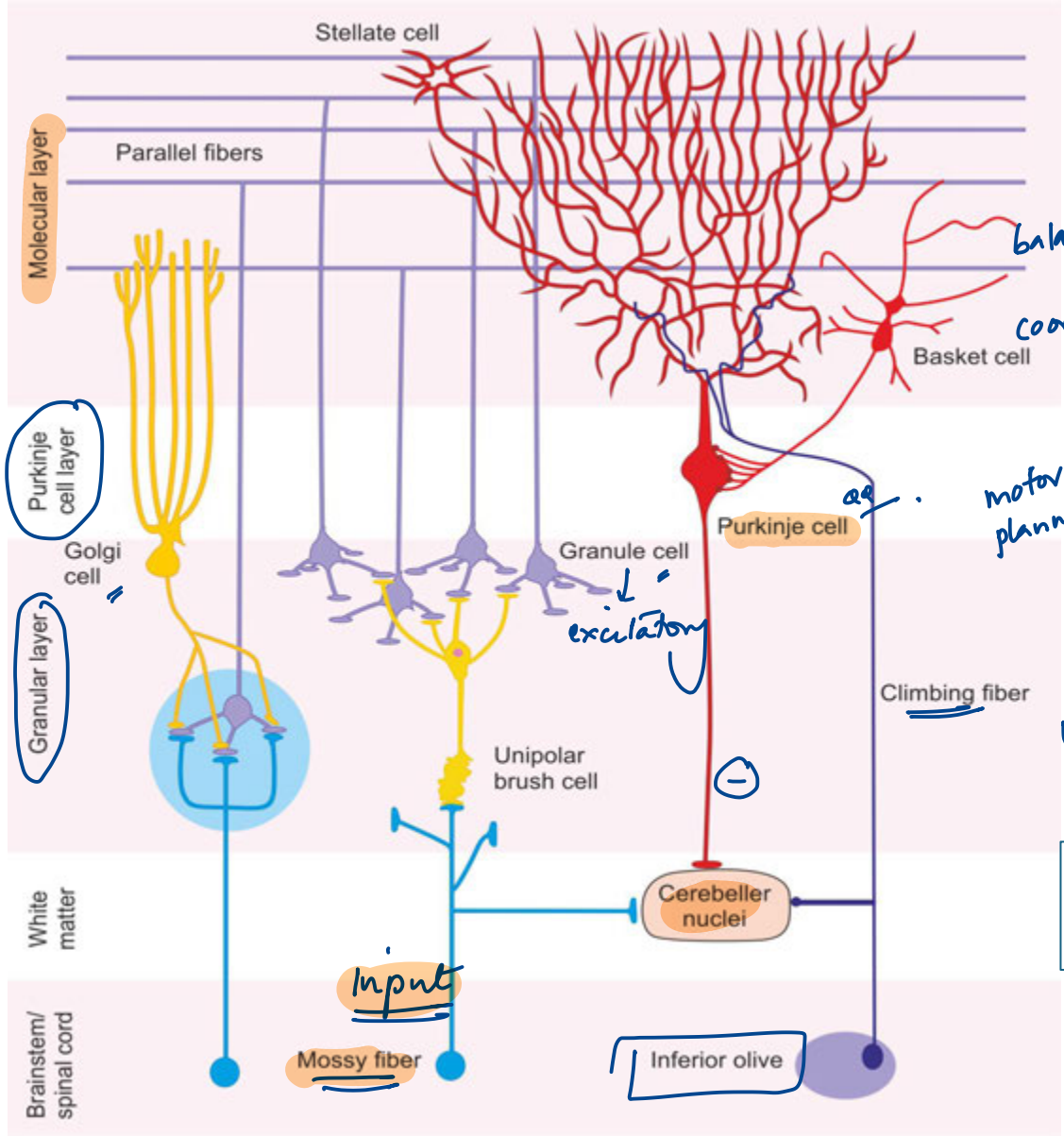
s/e - edema / Livedo reticularis

Pramipexole (non-ergot), Ropinirole (non-ergot) → s/e : pathological gambling

Bromocriptine (ergot) → s/e : vcl / ♡ valve fibrosis

neuroprotection

Cerebellum



Cerebellar Part	Lesion Features
Vermis	Truncal ataxia, staggering gait, nystagmus Alcoholics +
Flocculonodular lobe (vestibulocerebellum)	
Anterior lobe (spinocerebellum)	
Dentate nucleus (lateral hemisphere / cerebro-cerebellum)	Dysmetria, intention tremor, dysdiadochokinesia

balance
coordin
motor planning

Input { MCP - largest ← PONS - cortico
ICP ← spinal cord / vestibulo

(Lateral to medial)
dentate, emboliform, globose, fastigial

Rubro → Thalamic tract (VA/VL) — output (SCP)

APPROACH TO HEADACHE

UNILATERAL

Pulsatile
4-72hrs
Nausea
AURA

Migraine

Repetitive
Periorbital + lacrimation + Horner

Male > female
15min-3hrs

Cluster headache

2-30min
Response to indomethacin

Paroxysmal hemicrania

5-200s
Burning, stabbing pain

SUNCT

Short-lasting, Unilateral, Neuralgiform headache attacks with Conjunctival injection and Tearing

5-200s
V2/V3
Triggered by chewing/touch

Trigeminal neuralgia

Rx. Carbamazepine
↓x
Gamma knife

BILATERAL

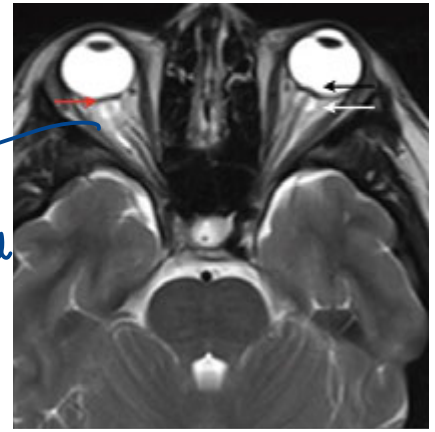
Pseudotumor cerebri

Band-like
4-6hrs

tension headache

Dull-aching
Papilledema
6th CN palsy
Tetracycline, Obesity
Vit A, Danazol

Idiop Intra cr Hyten



ON Sheath dilated

MIGRAINE
Acute attack: First line: NSAIDs
DOC: 5HT1B/1D+ : Sumatriptans (ergot)
S/e: VC — CI - angina / PAD
5HT1F + : LASMIDITAN (acute) x VC
Prophylaxis:
DOC: Propranolol
Topiramate / Valproate
CGRP-: RimeGEPANT, AtoGEPANT (oral-acute/prophylaxis)
ERENUMAB, GALANEZUMAB, FREMANEZUMAB, EPTINEZUMAB

CLUSTER HEADACHE
DOC: 100% O_2 (15L/min) + Triptans
Prophylaxis: CCB ag

TENSION HEADACHE
DOC: NSAIDs
Prophylaxis: ≥15d/mon - TCA

Weight loss, acetazolamide, invasive procedures → LP

Meningitis

	Colour	WBC (cells/ul)	Glucose (mg/dl)	Protein (mg/dl)	Opening Pressure (mm Hg)
Normal	Clear	0-5	40-70	<40	50-180
Bacterial	turbid	↑↑↑ (N)	↓↓	↑↑	↑↑
TB (Lobweb coagulum)	"	↑↑↑ (L)	"	"	"
Viral (-chiki ENTEROV)	clear	↑ (L)	N → ↓	↑	N
Fungal (-cryptococcal, HIV / AIDS)	clear	↑ (L)	N → ↓	↑	N
GBS	-	N	-	↑	-
MS	oligo-clonal bands.				

→ molecular mimicry → Schwann cells

h/o prior GI / STD aq - C.jejuni
GBS demyelinn AIDP
B/L Acute ascending Flaccid paralysis + Areflexia
Monophasic course <4weeks
>8 weeks/3 or more relapses: 'CIDP'
Anti GM1 antibodies
Brighton criteria
MCC of death- Resp muscle weakness
Vital Capacity < 20 mL/kg
Maximal Inspiratory Pressure (MIP) < –30 cm H_2O
Maximal Expiratory Pressure (MEP) < 40 cm H_2O
Rx: ~~STEROIDS~~ Plasmapheresis / IVIG ✓

elective intubn

aq

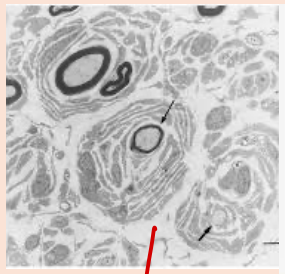
Miller fisher syndrome (MFS):

Ophthalmoplegia, ataxia, areflexia

Anti GQ1b antibodies (90%)

Charcot - Marie - Tooth

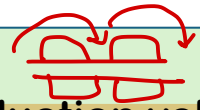
Hereditary SM demyelinating
AD CMT1A-PMP22
- Distal muscle weakness and atrophy
- Areflexia
- Foot drop
- Pes cavus/ Hammer toes



onion - bulbs

inverted champagne bottle

NCV studies aq

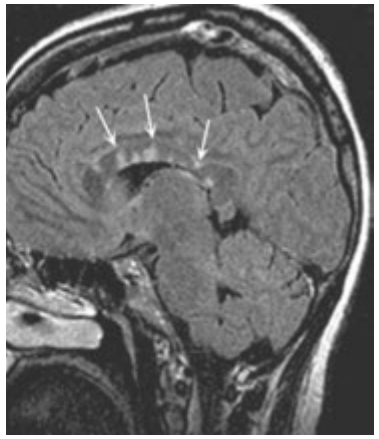


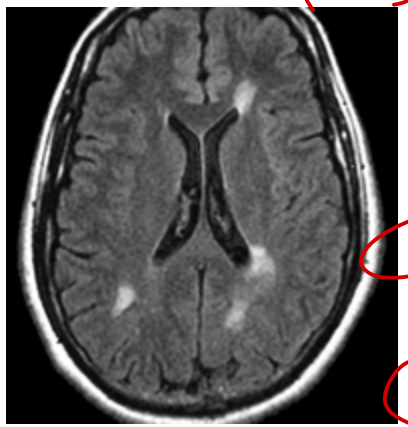
Demyelination: Conduction velocity reduced, Distal latencies
Axonal: Low amplitude → AMAN / ASMAN
↳ anti - Gd 1a

Demyelinating disorders

MULTIPLE SCLEROSIS

20-40yrs, Females MC
Away from equator, Low Vit D
RELAPSING REMITTING (RRMS)
McDonald criteria - dissem in time & space
Charcot triad: SIN - Scanning speech / Intention tremor / Nystagmus
Lhermitte sign
Uthoff sign 'hot shower' - worsening
ON : U/L, asymmetrical
Spinal cord: Short segment (≤ 3 vertebral segments)
Rx: Acute-steroids
RRMS: β-interferon, Natalizumab, (α4β1 integrin ⊖) s/e: PML
Mitoxantrone, Fingolimod, Alemtuzumab
~~OR~~ PPMS (ORATORIO Trial): Ocrelizumab (CD52 / CD20)

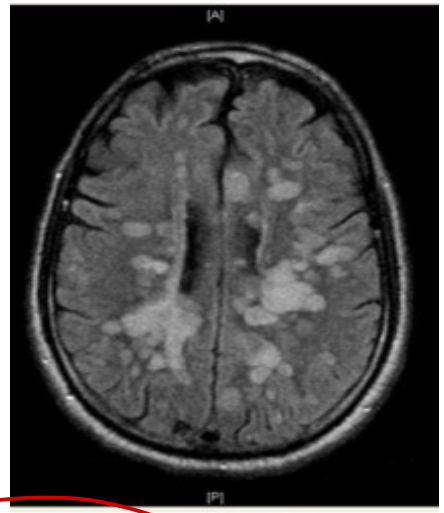




IOC: CE-MRI
Dawson fingers (periventricular WM)

ADEM

<20yrs
Antecedent infection
Monophasic
ON : B/L
Spinal cord: Long segment

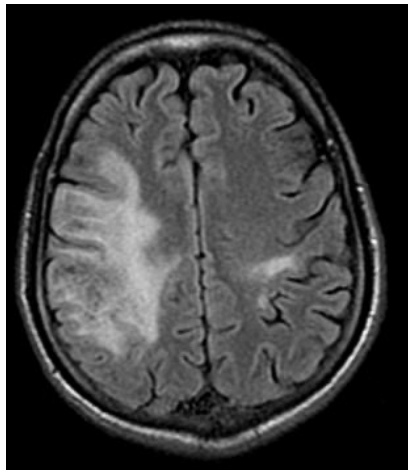


NMO = DEVIC's Disease

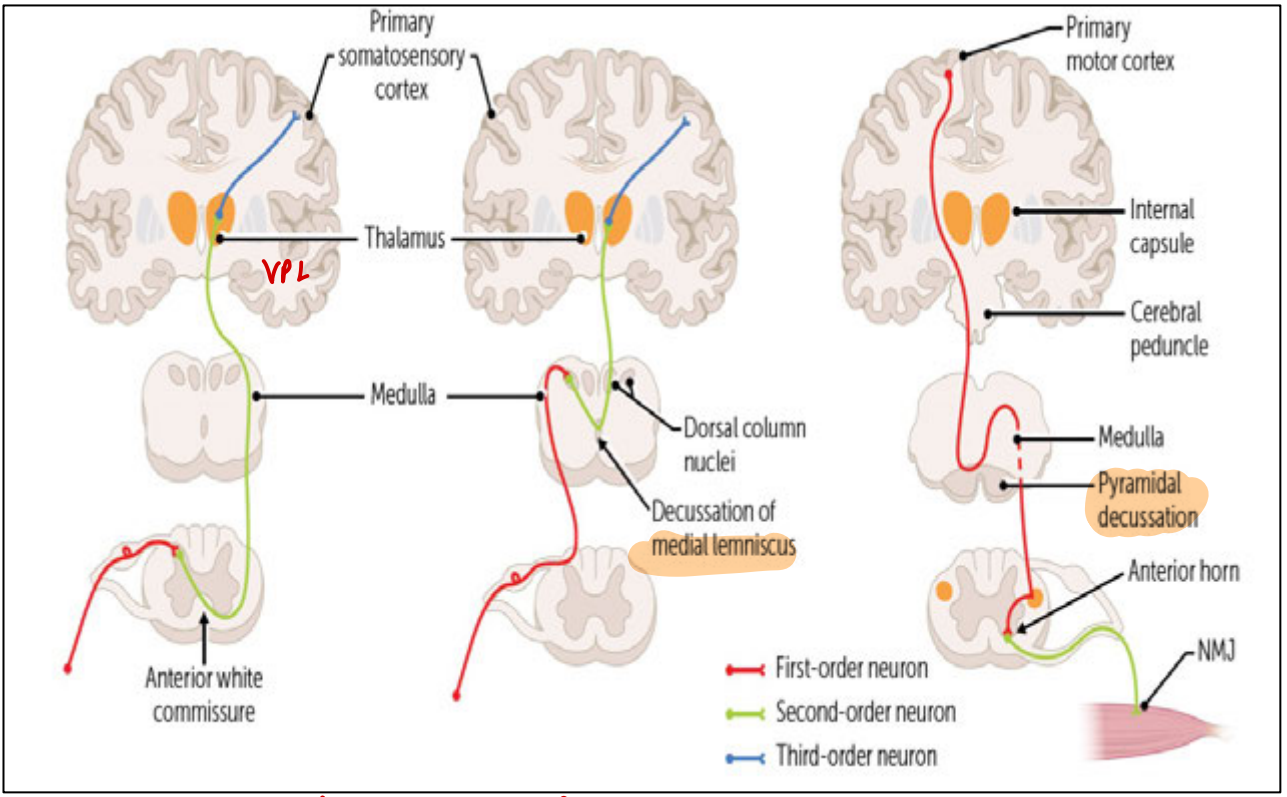
20-40yrs
ON: B/L
Spinal cord: Long segment
Antibody: Anti-Aqp4
Area prostema syndrome
Diencephalon syndrome
Acute myelitis
ON

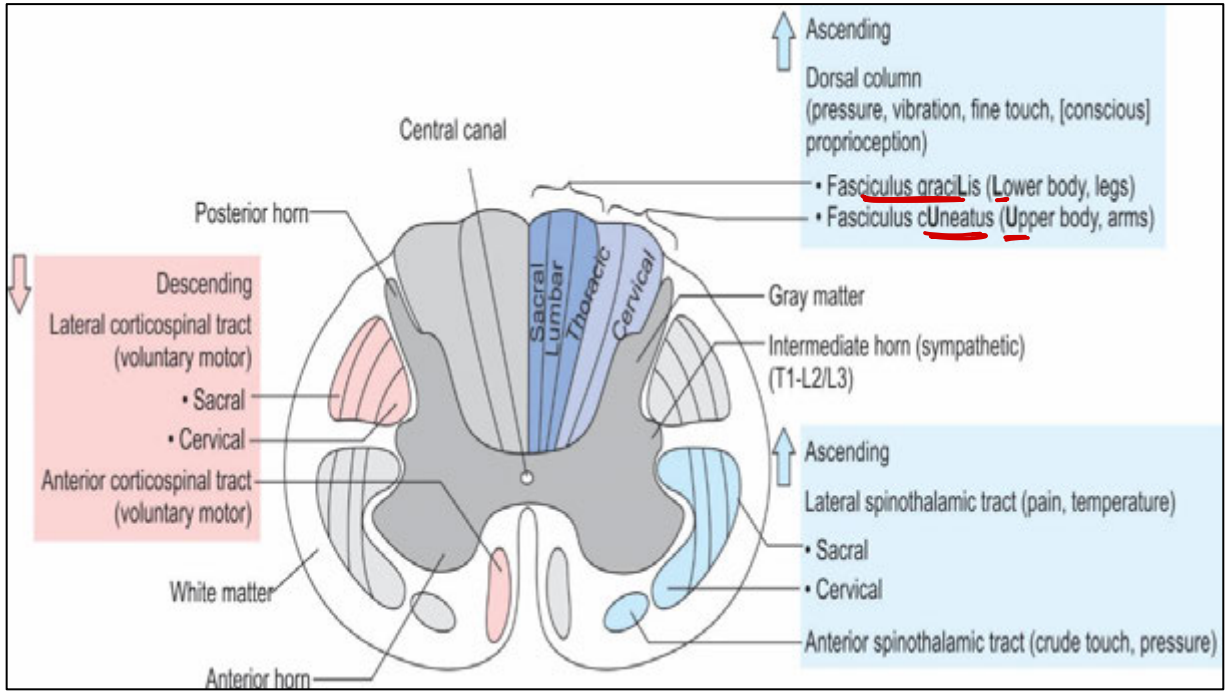
PML - JC virus

HIV +
Asymmetric



Spinal cord tracts





Spinothalamic tract

ant
crude touch
pressure
itch

lat
pain
temp

Dorsal column

Fine touch
proprioception
vibration
pressure
2pt discrm°

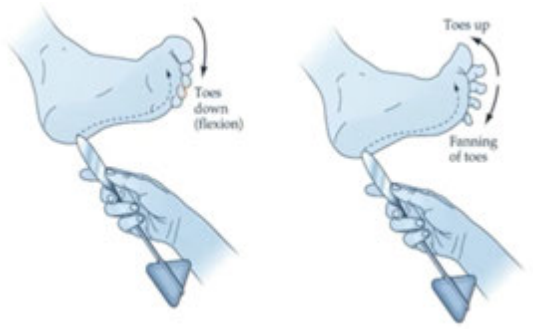
C/S tract

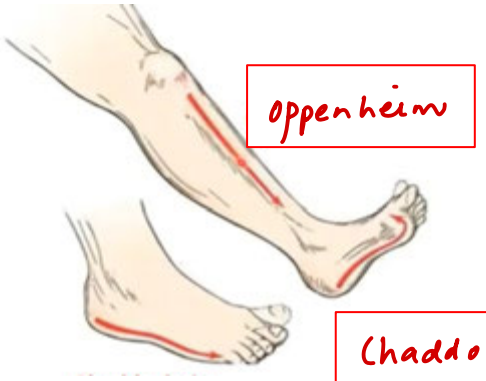
+ve ROMBERG SIGN → DC xx

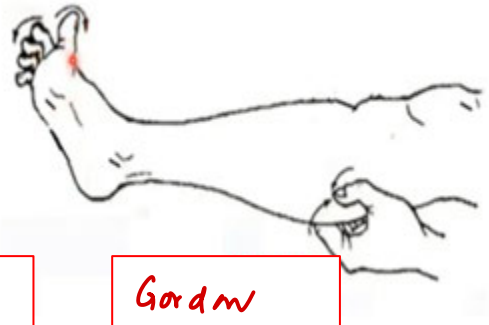
UMN VS LMN

	Pseudobulbar (UMN: 5,7,10,11,12)	Bulbar (LMN: 9,10,11,12)
Gag reflex	↑↑	absent
Jaw jerk	⊕⊕ exaggerate	⊖
Tongue	spasticity	"fasciculations"
Speech	Laboured/spastic	Nasal twang Nasal regurgitation

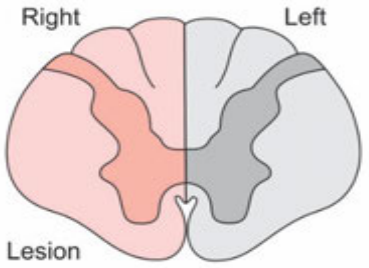
SIGN	UMN	LMN
Weakness	+	+
Reflexes	↑	↓
Tone	Spastic	Flaccid
Babinski	+	-
Atrophy Fasciculations	-	+



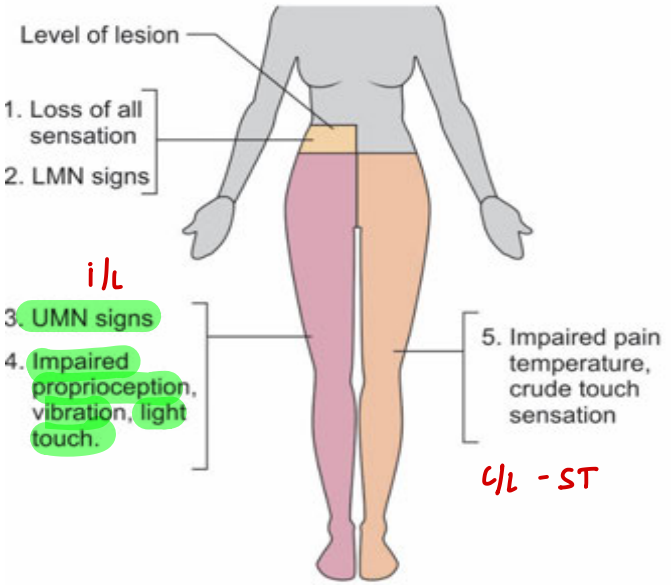


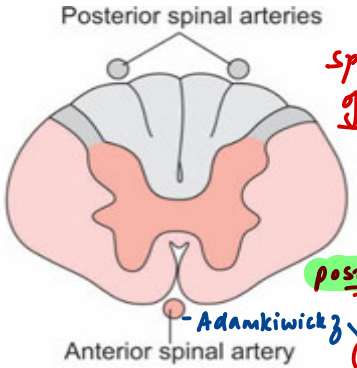


SPINAL CORD LESIONS



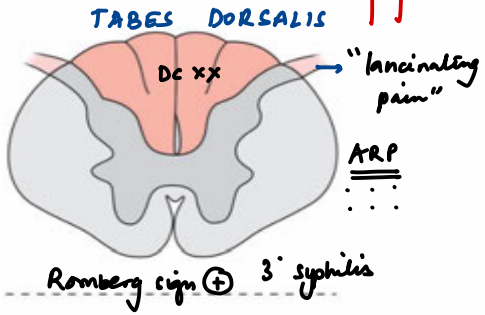
Brown-Sequard Sx

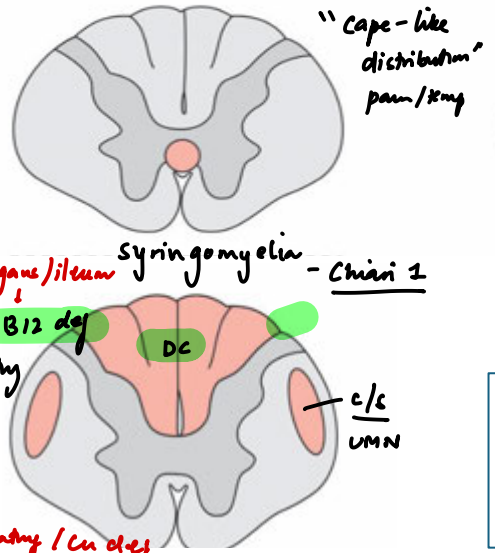


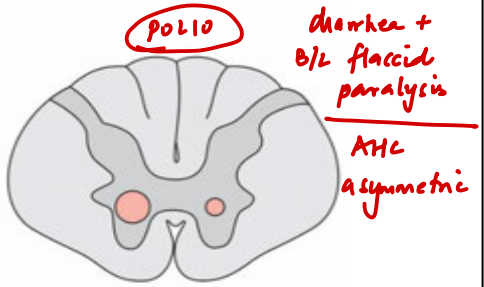


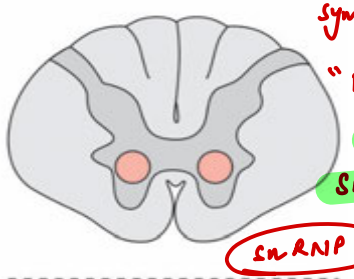
sparing of DC

post EVAR - Adamkiewicz

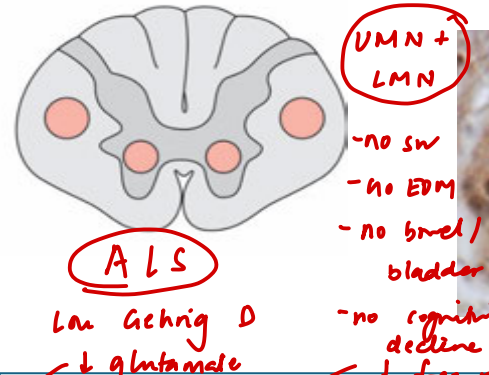


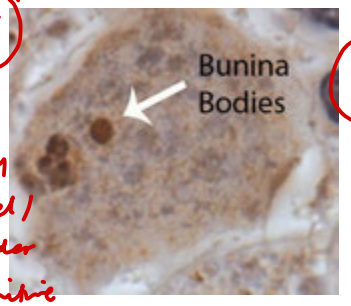






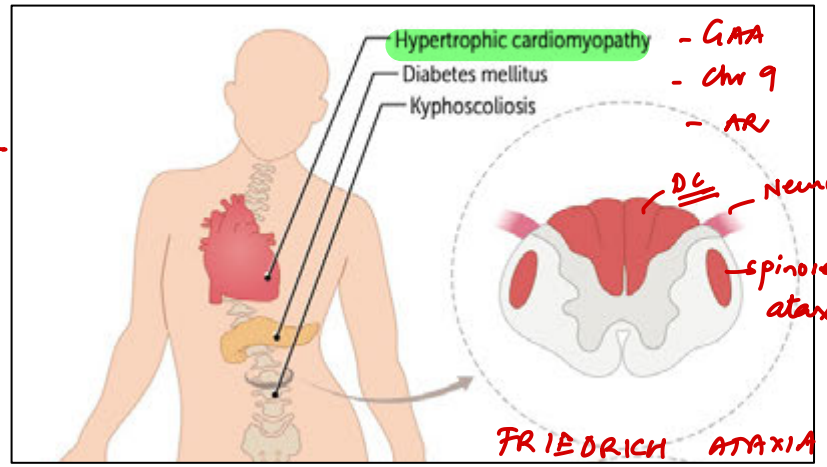
Nusinersen / Onasemnogene/ Zolgensma/ Risdiplam





TDP-43 Inclusions
ALS Pick

Riluzole, Edavarone
Sodium phenylbutyrate-Tururs odiol
Tofersen



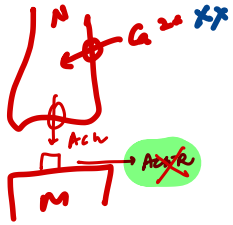
FRIEDRICH ATAXIA
(Vit E def

Myasthenia gravis

Weakness, ptosis, diplopia more in evening
Improves with rest
Sensory/ Autonomic/ DTR/ Bowel bladder/ Pupil (N)
Ice-pack improvement
IOC: anti-Ach R↓ Generalised MG / Anti Ach R-ve → anti-MUSK 40%.
Repetitive nerve stimulation |||| → |ıı (decremental)
VS LEMS: anti-Ca^{2+} (small cell ca lung)
presynaptic
RNS – incremental ||||
DOC: AchE-: Pyridostigmine
IVIG/ plasmapharesis in crises
Rozanolixizumab ↓Fc neonatal Ig
Avoid Bblocker, CCB, FQ, Blactams, Aminoglycosides
D/D: Critical illness myopathy/ neuropathy
(proximal muscle/axonal degeneration)

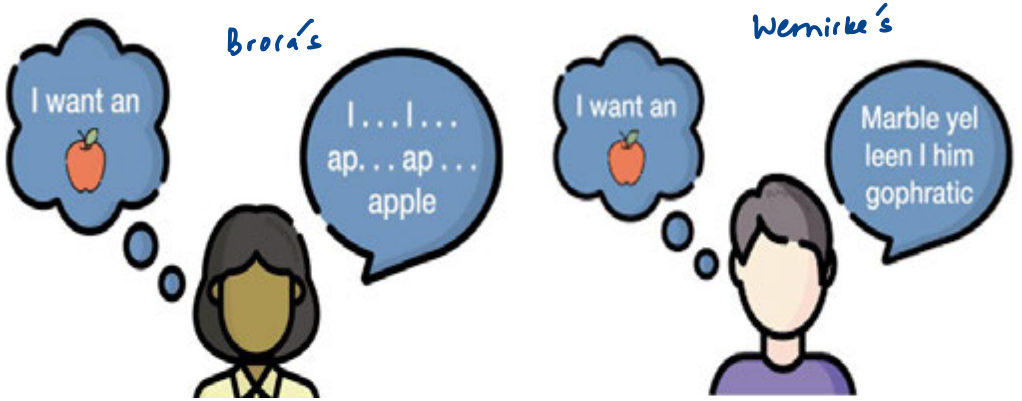
Thymoma

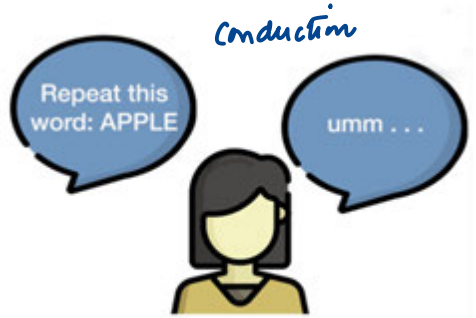
myasthenic ← improves ← Endrophonium / Tensilon (↑Ach)
cholinergic ← worsens

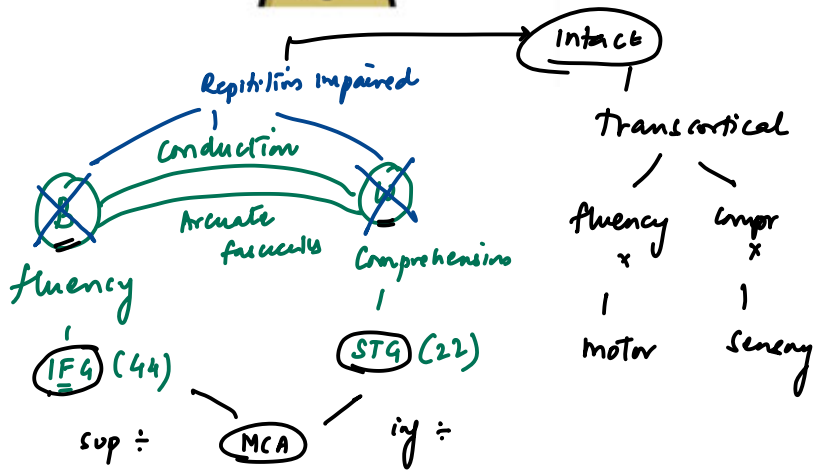


Aphasia

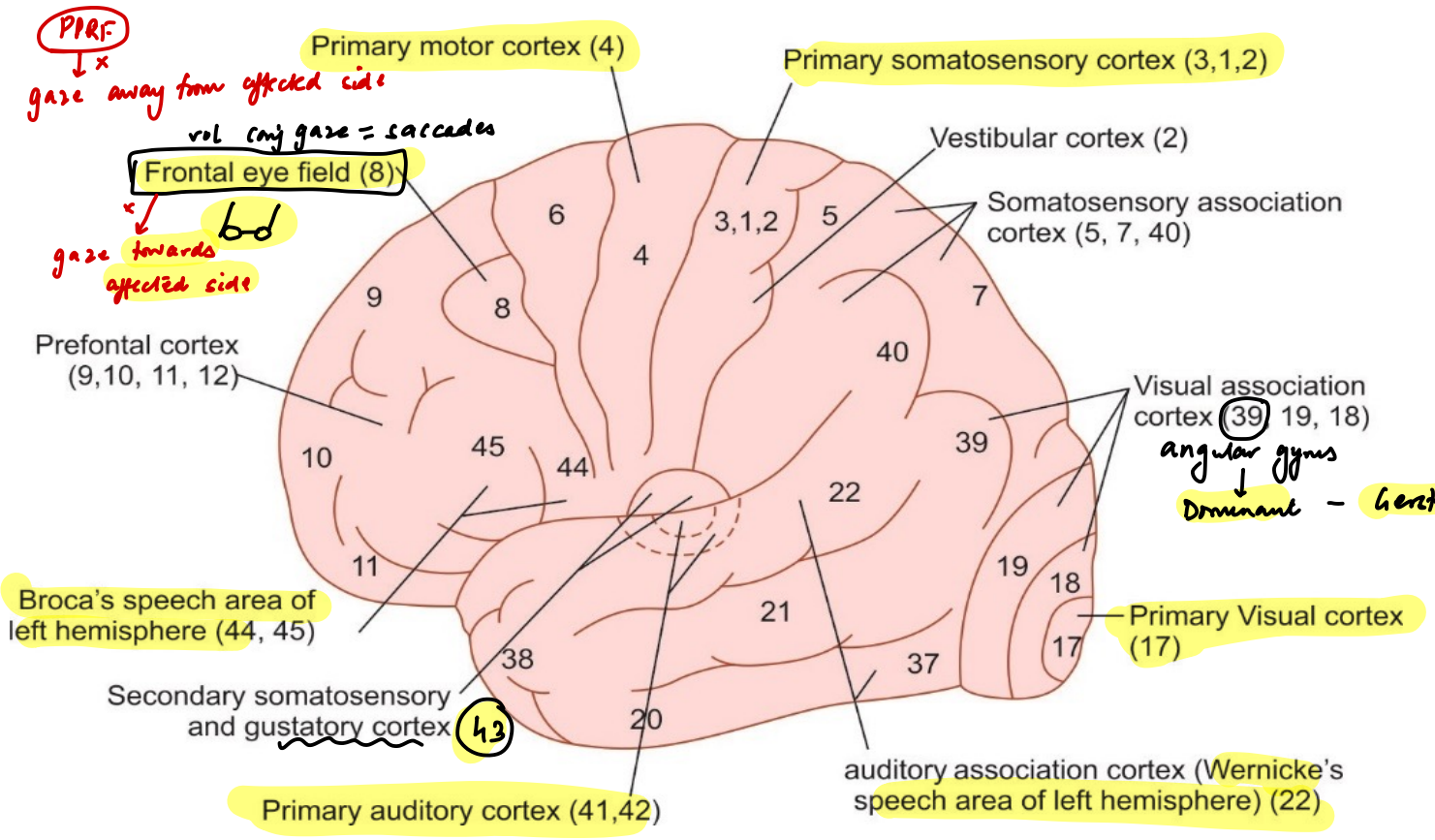
Dominant (Lt)

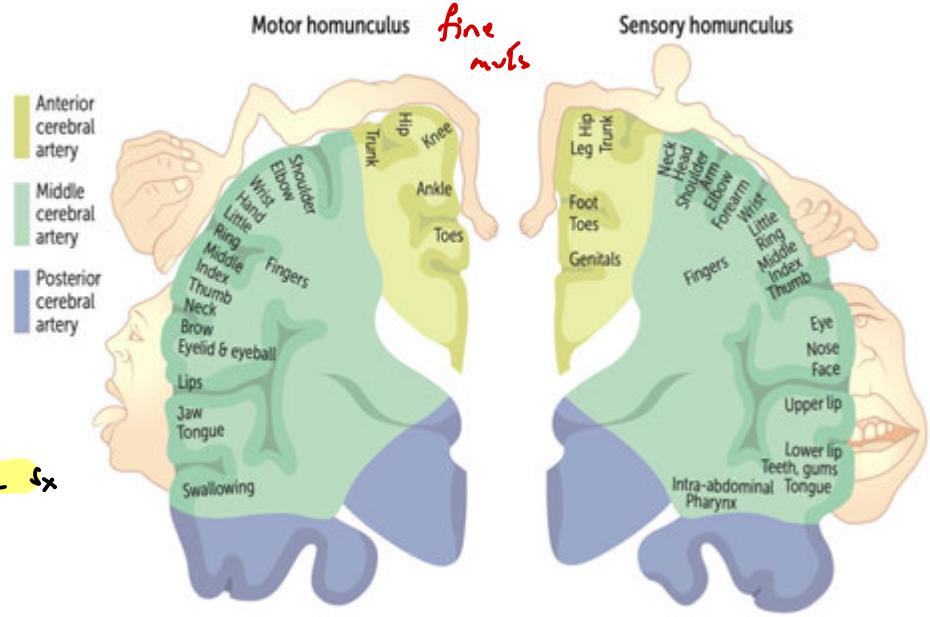






Brodmann areas





Agraphia, acalculia, finger agnosia, R-L disorientation

Phantom limb pain

Law of projection: Sensory perception is always **projected to the site of the receptor**, even if stimulation occurs elsewhere along the sensory pathway.

Cortical plasticity-Reorganization of the primary somatosensory cortex S1

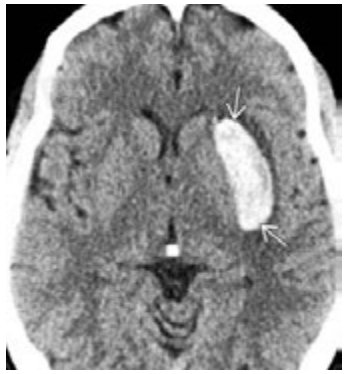
STROKE-APPROACH

FACE – One side of face drooping
ARMS – Weakness in arm
SPEECH – Slurred speech
TIME – Time to call EMS

Focal neurological deficit

↓

1st: NCCT
Best/ Most sn: MRI - DWI

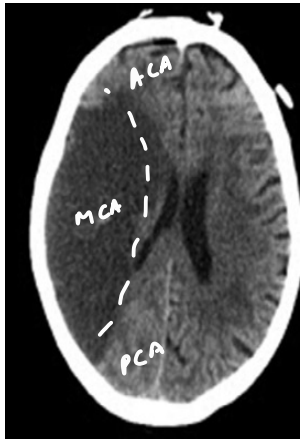


Hemorrhage

- Putamen - mc
- Hytn mc A/F
- "dense hemiplegia"

Ischemic

Window: 4.5 hrs
CI to thrombolytic? No



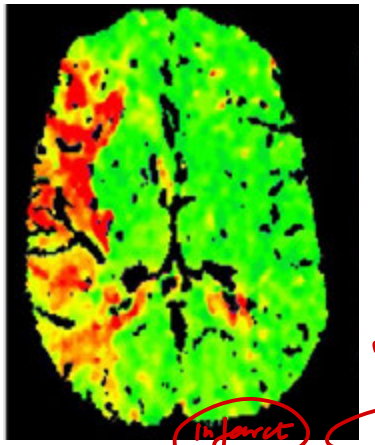
"Last seen well"

BP > 185/110 — CI to thrombolytics
Bleeding diathesis
Recent head injury or ICH
Major surgery in last 2 weeks
GI bleed in 3 weeks
Recent MI

> 1/3 MCA → relative CI to thrombolytics
ASPECTS Score ≤ 4

iv thrombolytic (± tPA)
Dose (alteplase): 0.9 mg/kg
a/ 10% - 1 min - bolus
90% - 1 hr.

CTA + CTP
angiography perfusion



Penumbra+ major vessel:
Mechanical thrombectomy (DSA)

Brief, reversible with normal MRI : TIA

ABCD 2

- **Age ≥ 60 years** – 1 point
- **BP ≥ 140/90 mmHg** at initial evaluation – 1 point

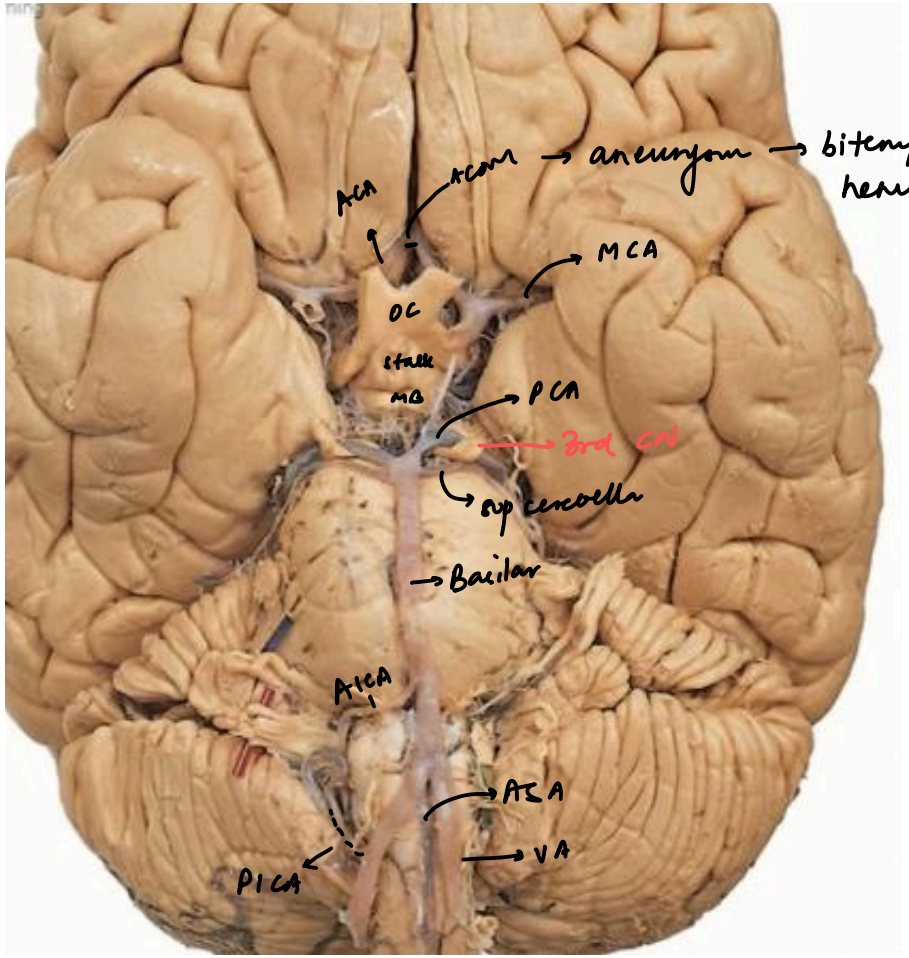
Clinical features of TIA

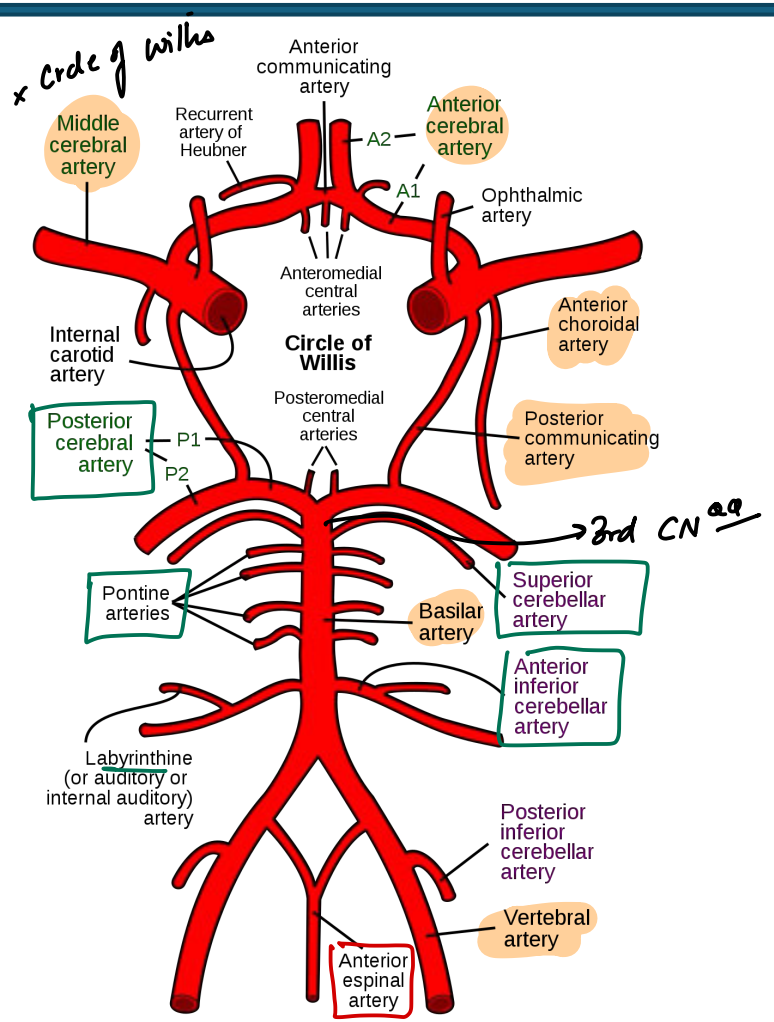
- **Speech disturbance without weakness** – 1 point
- **Unilateral weakness** – 2 points

Duration of symptoms

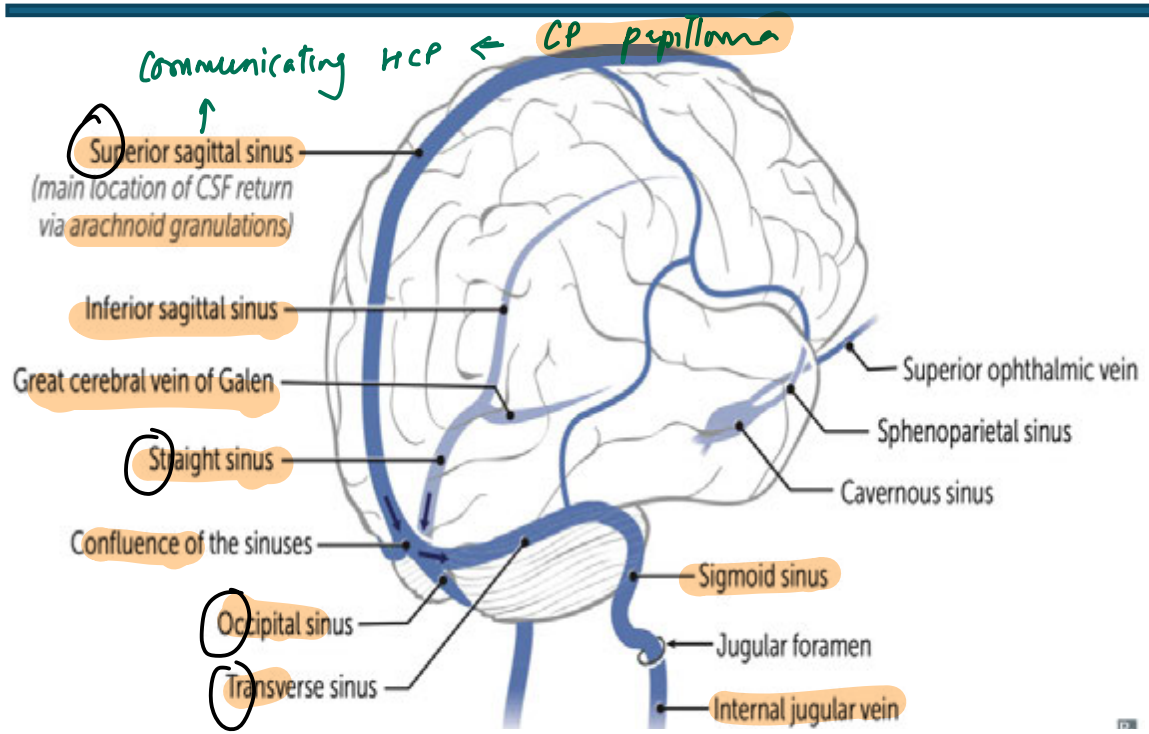
- **10–59 minutes** – 1 point
- **≥ 60 minutes** – 2 points
- **Diabetes mellitus** in patient's history – 1 point

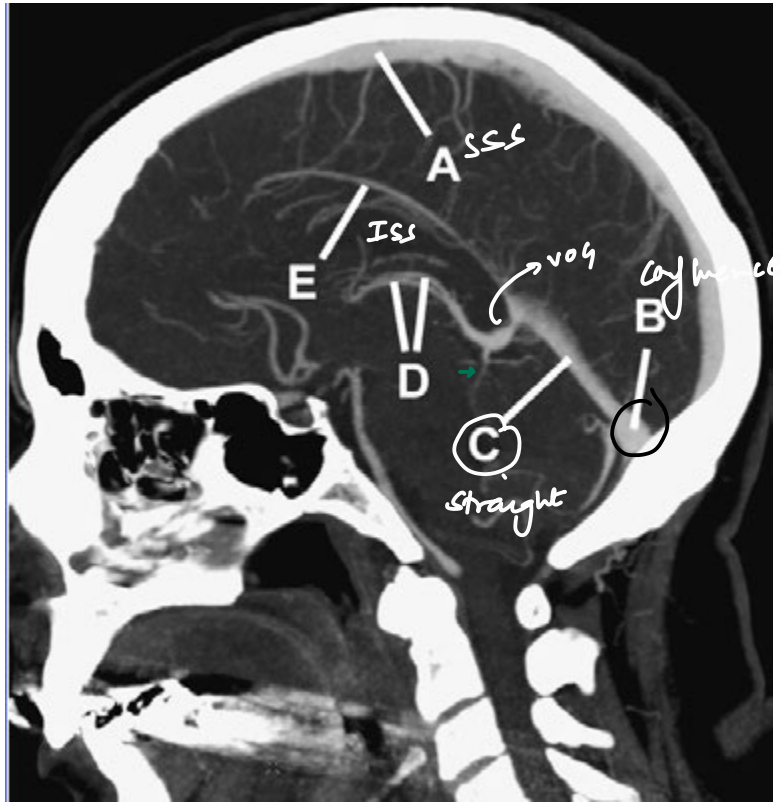
VASCULAR ANATOMY OF BRAIN

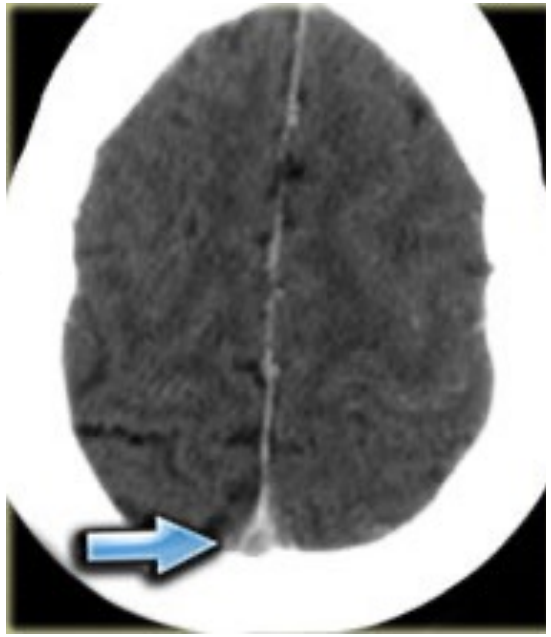




Dural venous sinuses

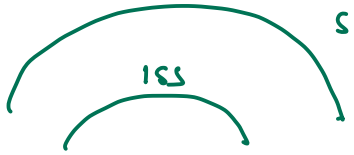






→ empty delta sign

SSS thrombosis



TOSS
- SSS
- Straight
- transverse
- occipital

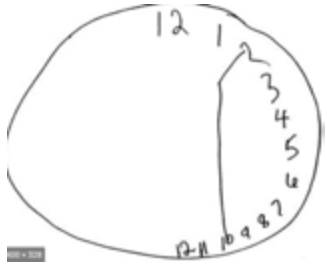
Int cerebral veins + Basal vein of Rosenthal = VOG + ISS → straight

STROKE LOCALISATION

C/L paralysis and sensory loss: lower limb + Urinary incontinence + Personality changes — ACA

C/L paralysis and sensory loss: face and upper limb + Aphasia — MCA - Dominant (LE)

C/L paralysis and sensory loss: face and upper limb +



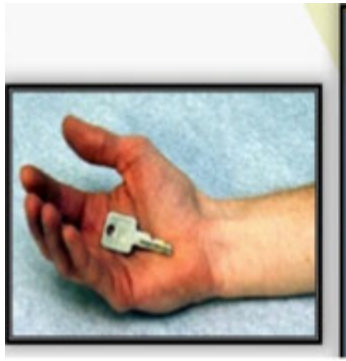
MCA - Nondominant (RE)
└ Parietal
Hemi-neglect

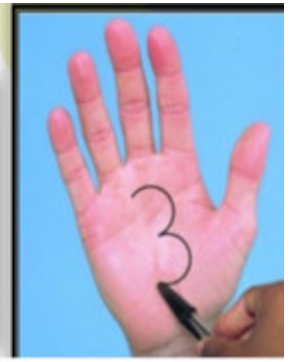
Anton Sx

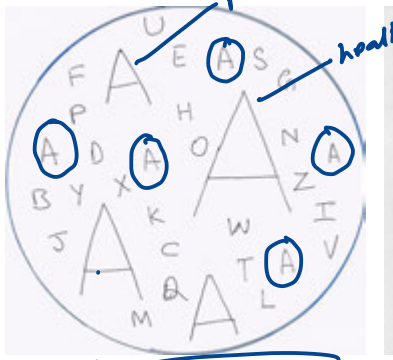
C/L hemianopia + Denial of blindness + Alexia without agraphia (Dominant) — PCA

✗ read ✓ write → Splenium

C/L hemisensory loss followed by an agonizing, burning pain in the affected areas — Djerine-Roney Sx (Thalamic)



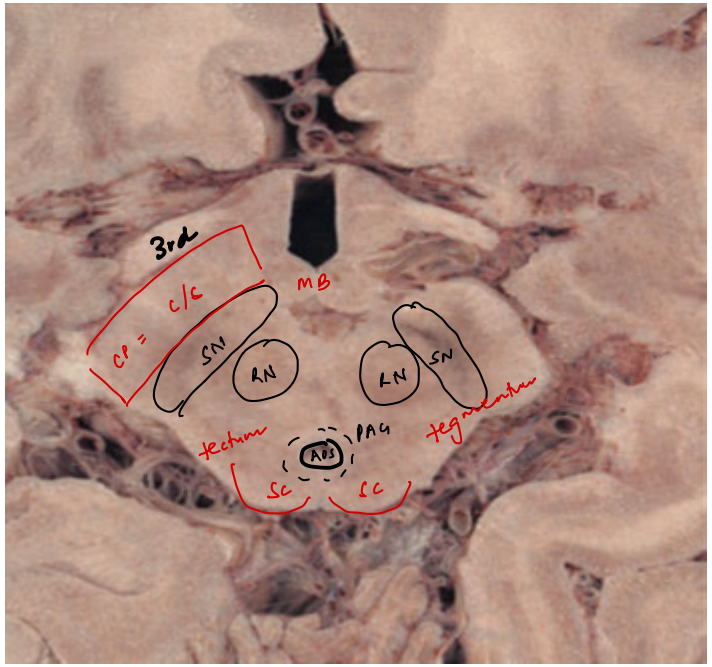


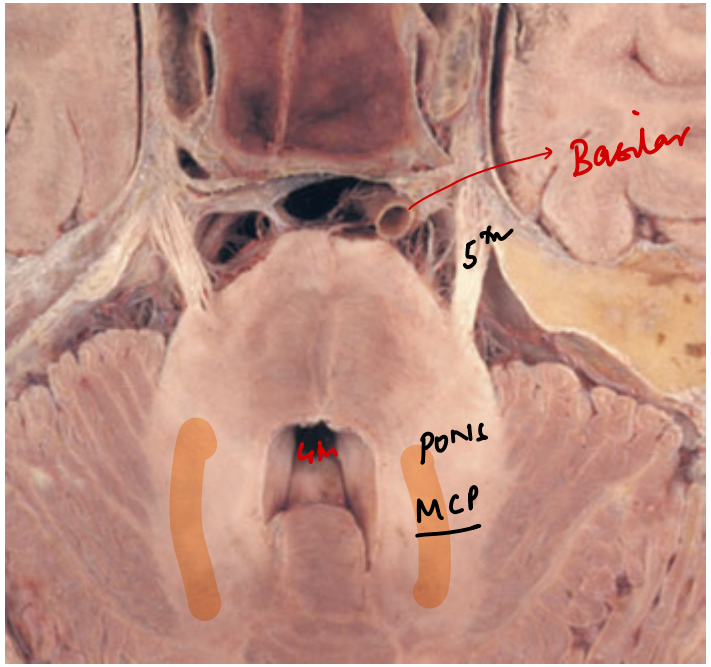


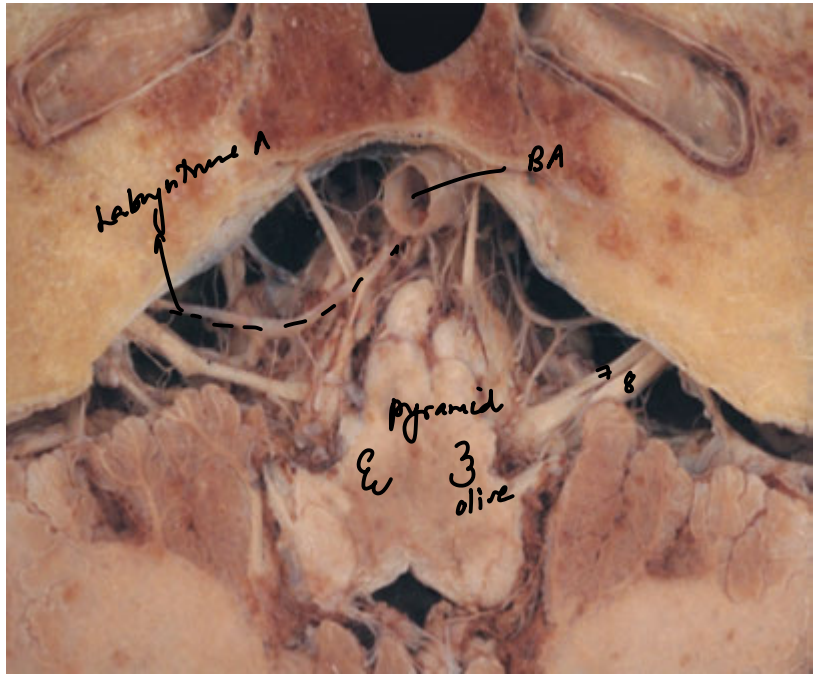
Stereognosis — Graphesthesia — Simultagnosia — Prosopagnosia

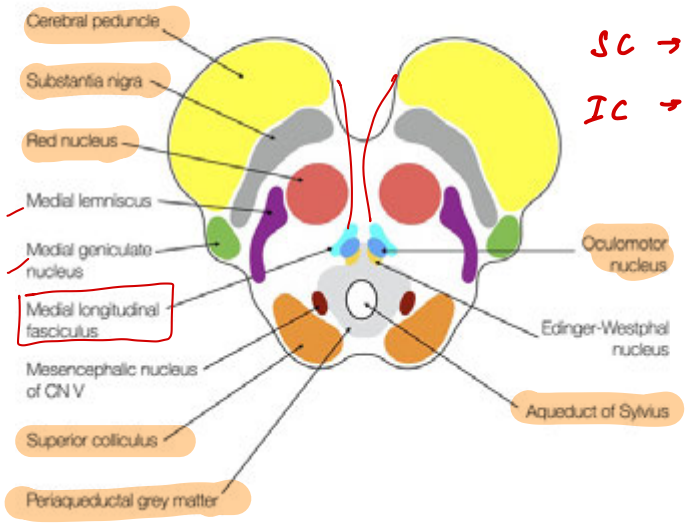
Parietal lobe — Temporo-occipital

BRAINSTEM-ANATOMY





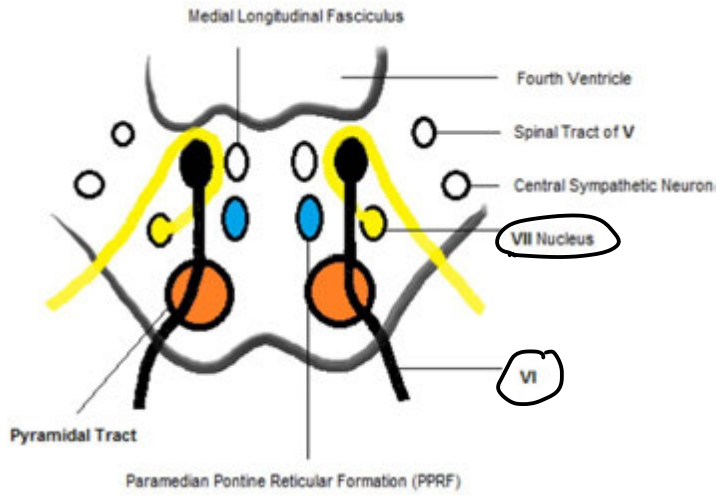


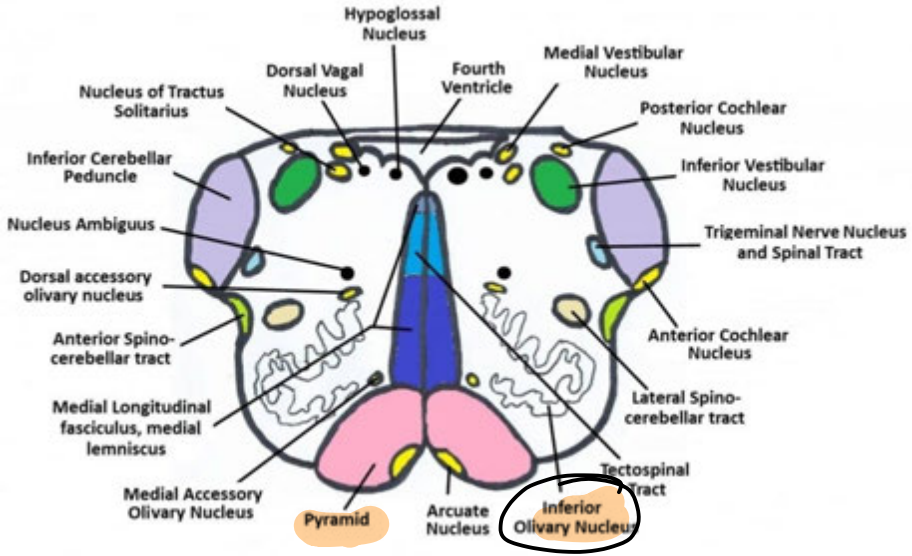


MB

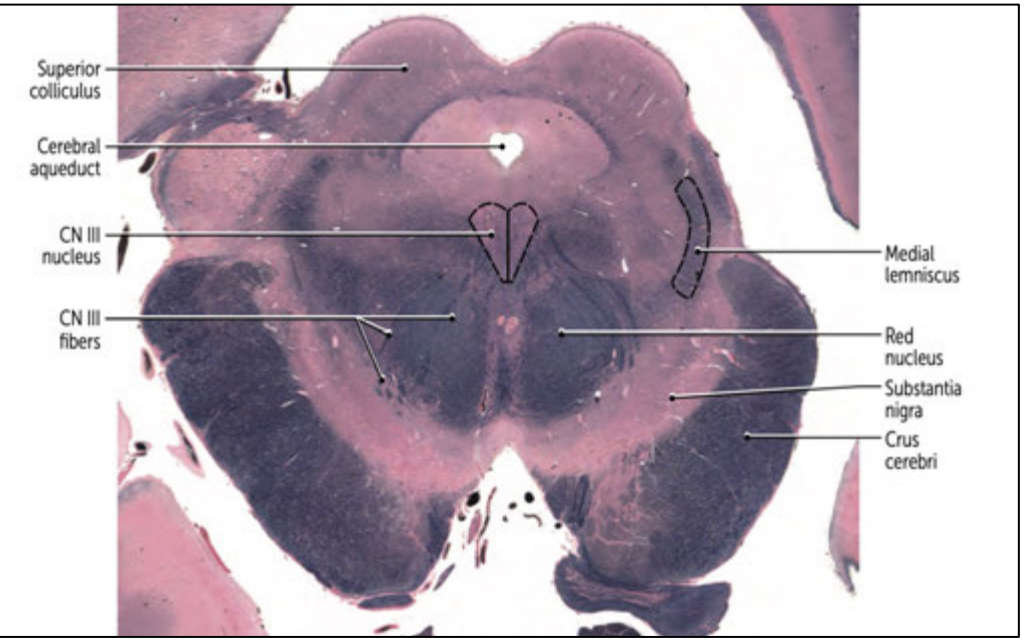
SC → IIIrd

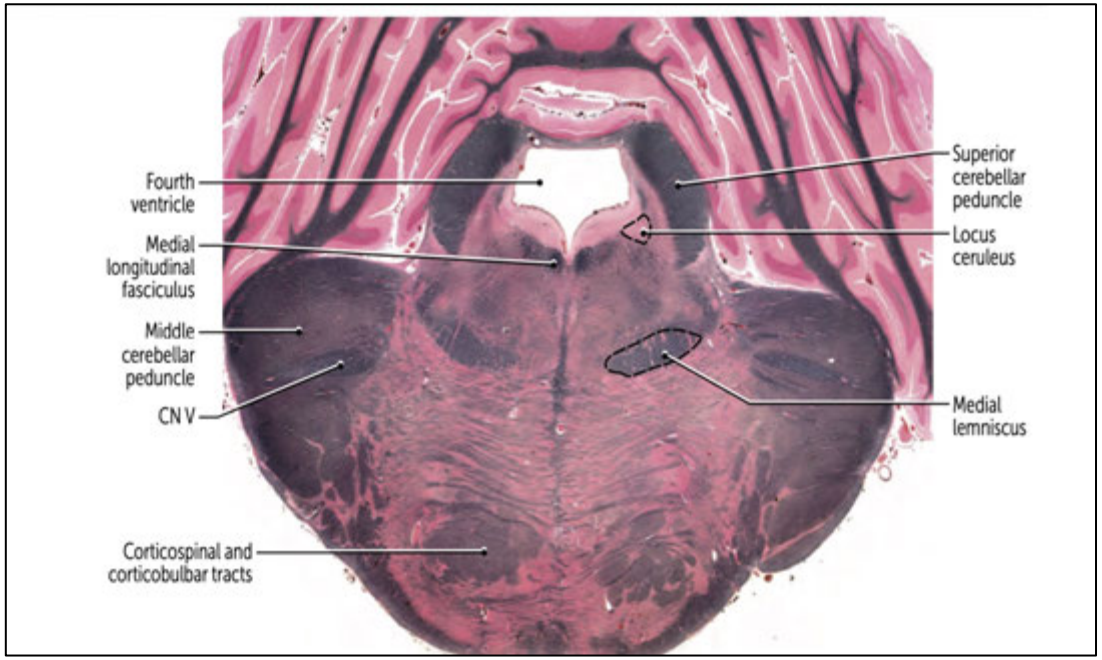
IC → IVth

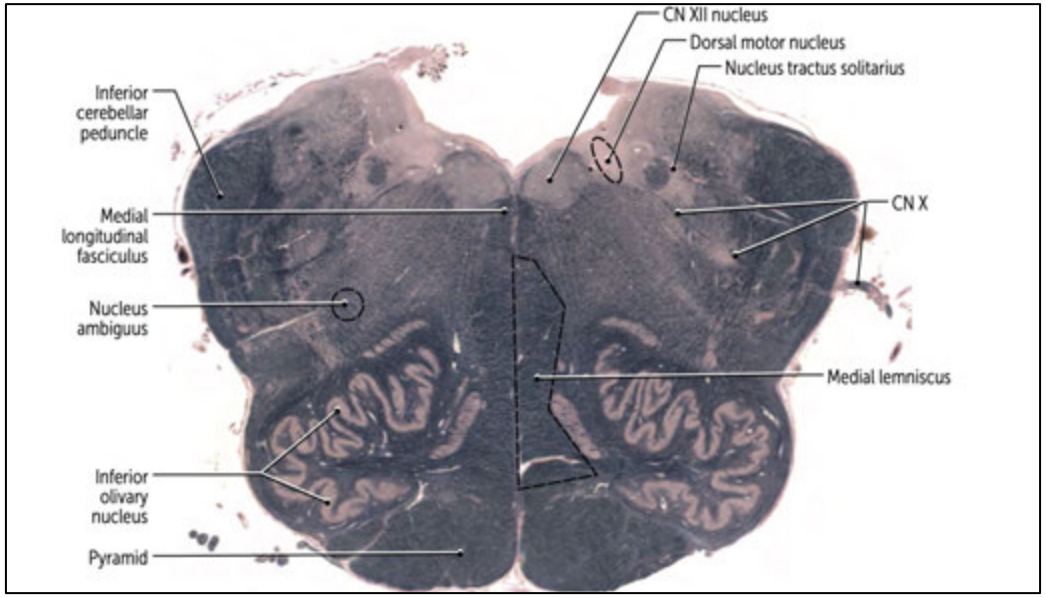




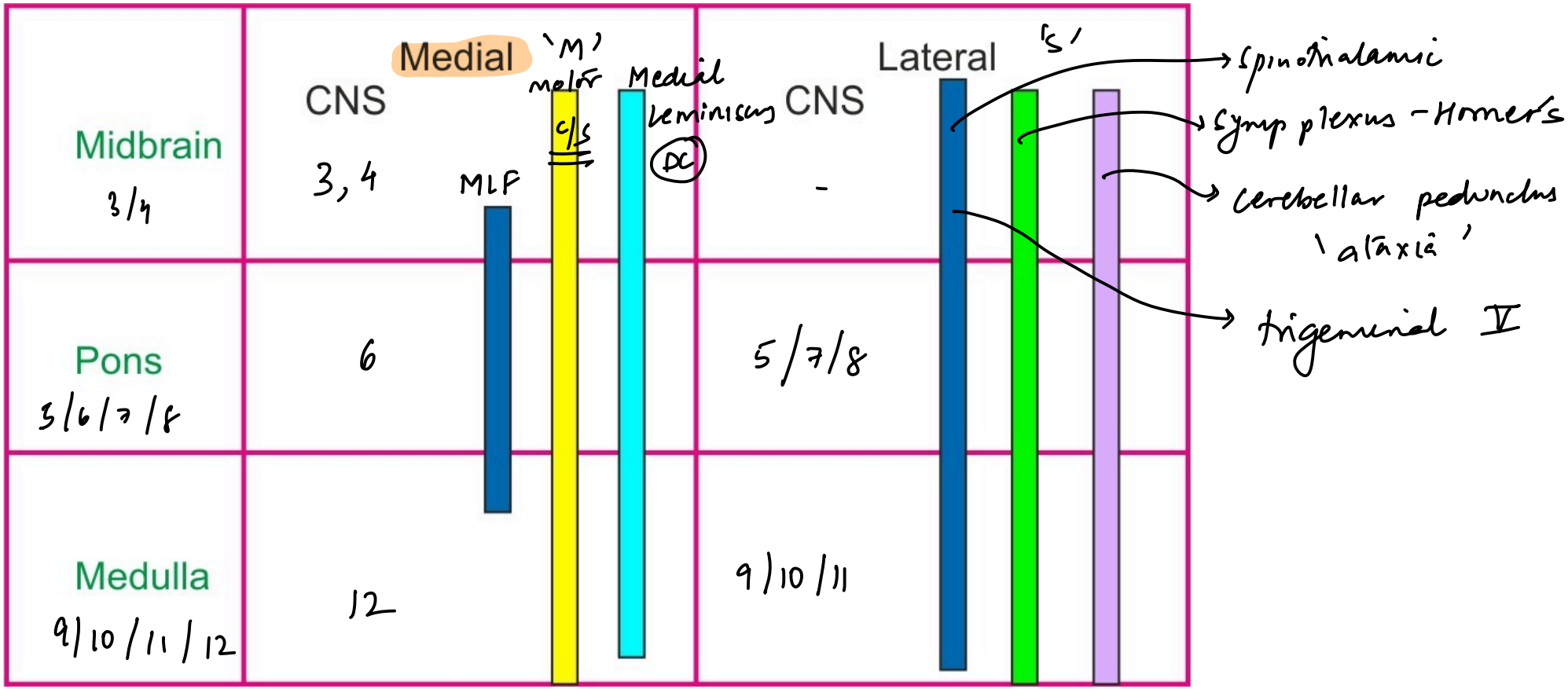
BRAINSTEM-HISTOLOGY







BRAINSTEM STROKE



BRAINSTEM STROKE SYNDROMES

C/L hemiplegia + I/l down and out pupil — Weber Sx

C/l hyperkinesis, chorea, tremor (red n)+ i/l down and out pupil — Benedict Sx

I/L cerebellar ataxia (SCP) + i/l down and out pupil — Nothnagel Sx

C/L hyperkinesis, chorea (Red), tremor + ataxia (SCP) + i/l down and out pupil — Claude Sx

Upward gaze palsy + Collier sign-eyelid retraction — "tectal plate" → Parinaud Sx - pinealoblastoma

C/l hemiplegia+ i/l CN 6 + 7 — Millard-Gubler Sx

C/l hemiplegia, hemisensory loss+ i/l CN 6 + 7 + 8 CN palsy + Horizontal gaze palsy ('PPRF') — 'Foville' Sx

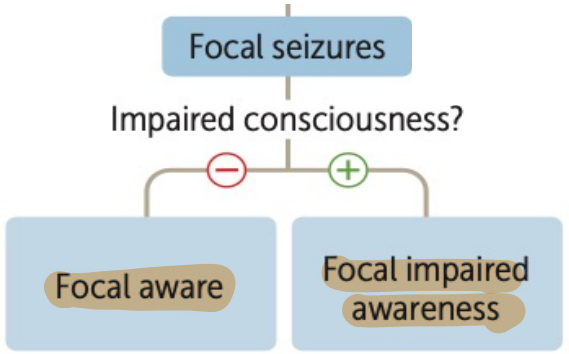
C/l hemiplegia+ i/l CN 6 palsy — Raymond Sx

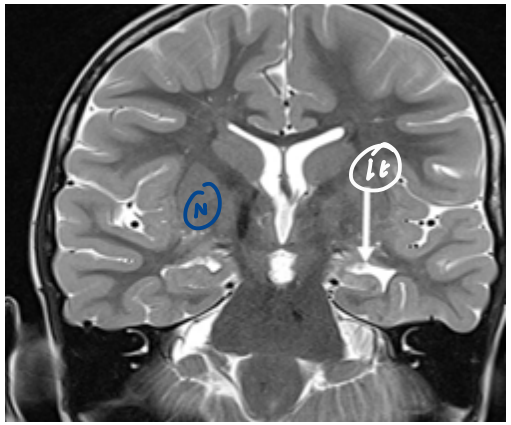
C/l hemiplegia + i/l tongue deviation — medial medullary = Dejerine Sx ← ASA

Loss of pain, temp from c/l body, i/l face, Horner's, Dysphagia, hoarseness, loss of gag — Lat medullary = Wallenburg Sx ← PICA / VA

S/T

Seizures





mesial temporal lobe sclerosis

DOC - MRI

refractory to AED

Jacksonian march distal → proximal

Todd palsy transient

DOC focal seizure Carbamazepine

DOC focal seizure in elderly Lamotrigine

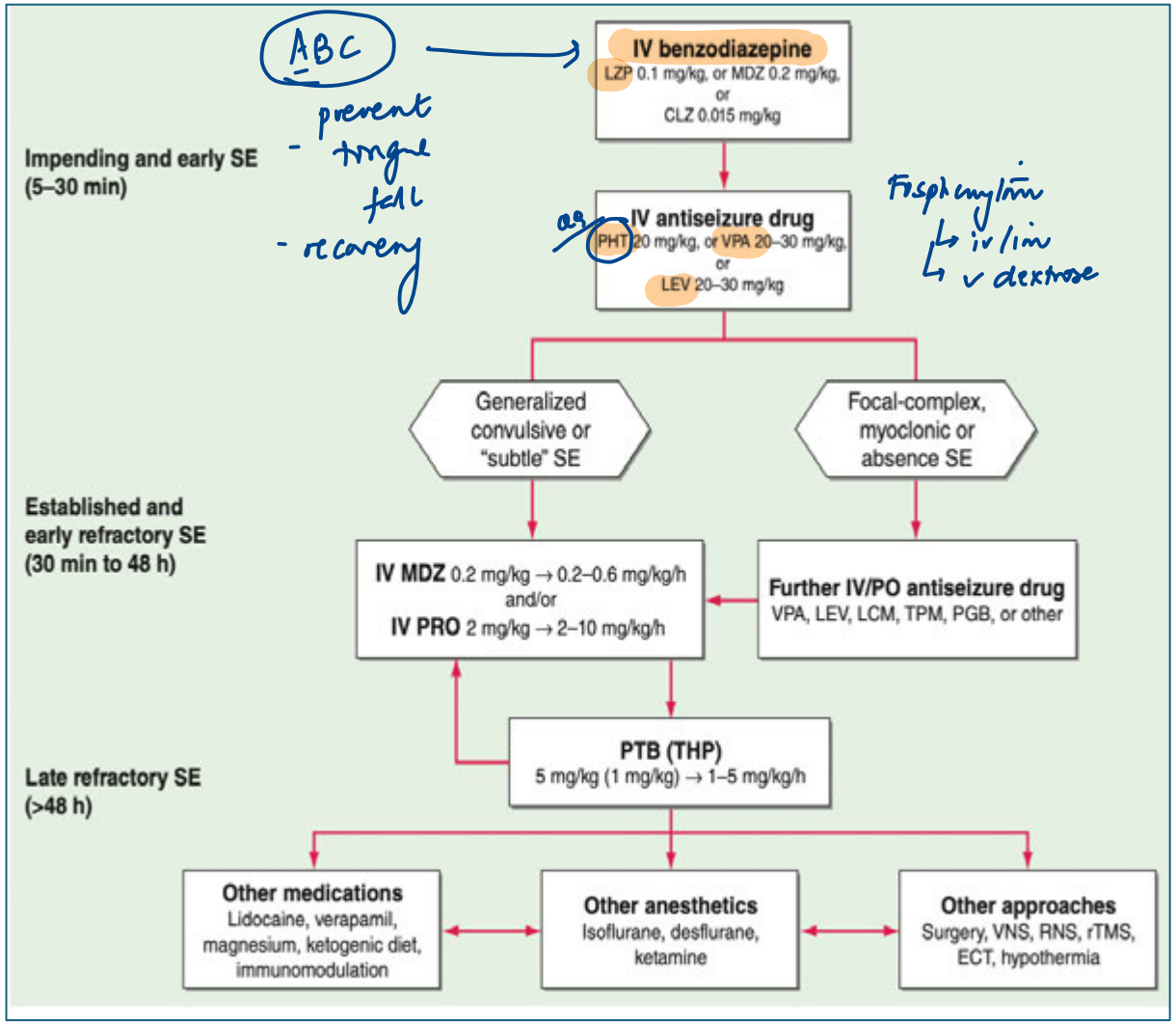
When to discontinue:

Seizure freedom > 2 years

Poor prognosis:

- Age ≥ 16 years
- More than one AED required
- Seizures after starting AED therapy
- History of generalized tonic–clonic seizures
- History of myoclonic seizures / JME
- Abnormal EEG in the prior year

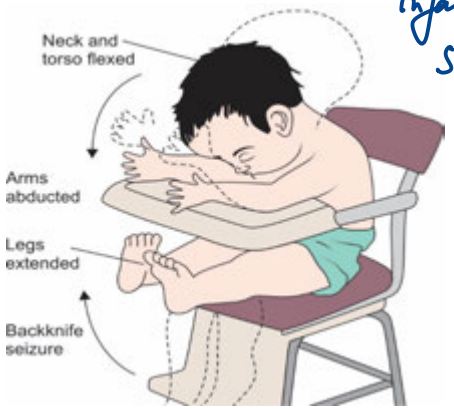
Status epilepticus — continuous seizures lasting ≥ 5 minutes or recurrent seizures without return to baseline consciousness between episodes



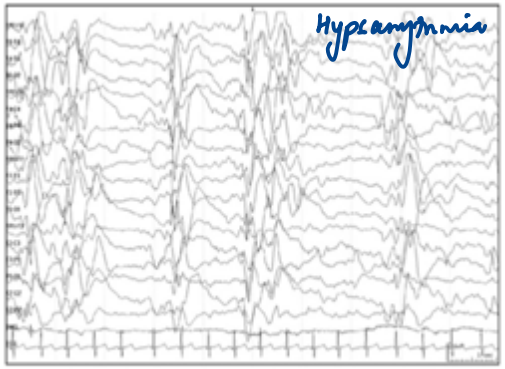
EPILEPSY SYNDROMES

West Sx

Infant + Global developmental delay
DOC: ACTH
DOC in TSC: Vigabatrin

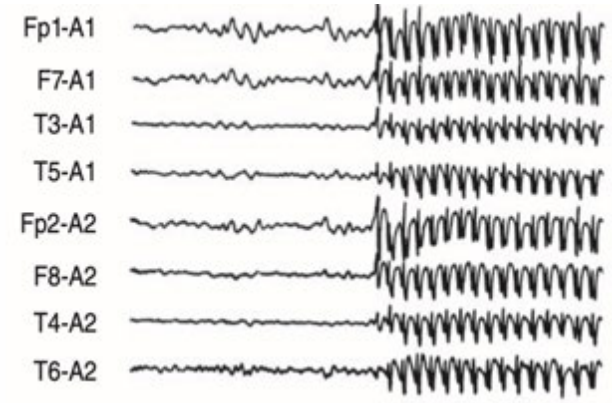


Infantile / Salaam spells



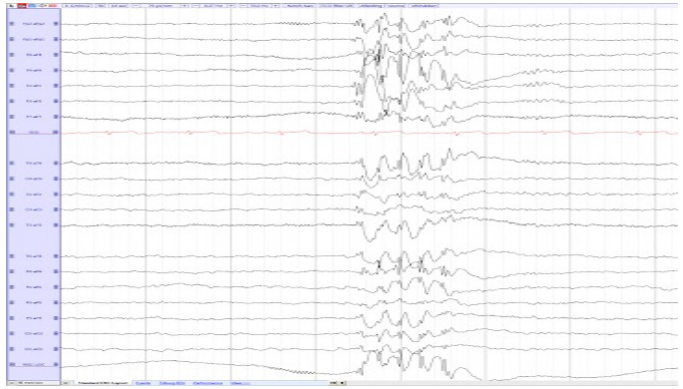
Absence Sz

-Transient loss of consciousness (1-2s)
-No loss of postural control
-3Hz Spike and slow wave pattern ↑ Hyperventil°
DOC Typical: Ethosuximide (T-type Ca2+)
DOC Atypical: Valproate



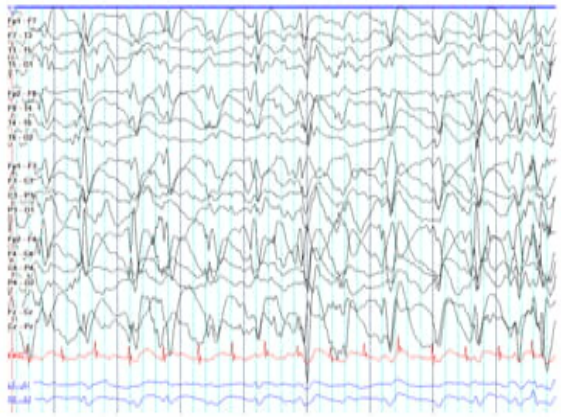
JME

MC in Adolescent
Early morning "clumsy"
3-6 Hz generalized polyspike and wave discharge
GABRA1,CLCN2
DOC: Valproate



Lennox - Gastaux

Multifocal sz
1-2Hz spike and wave pattern
DOC: Valproate
BZD approved: Clobazam



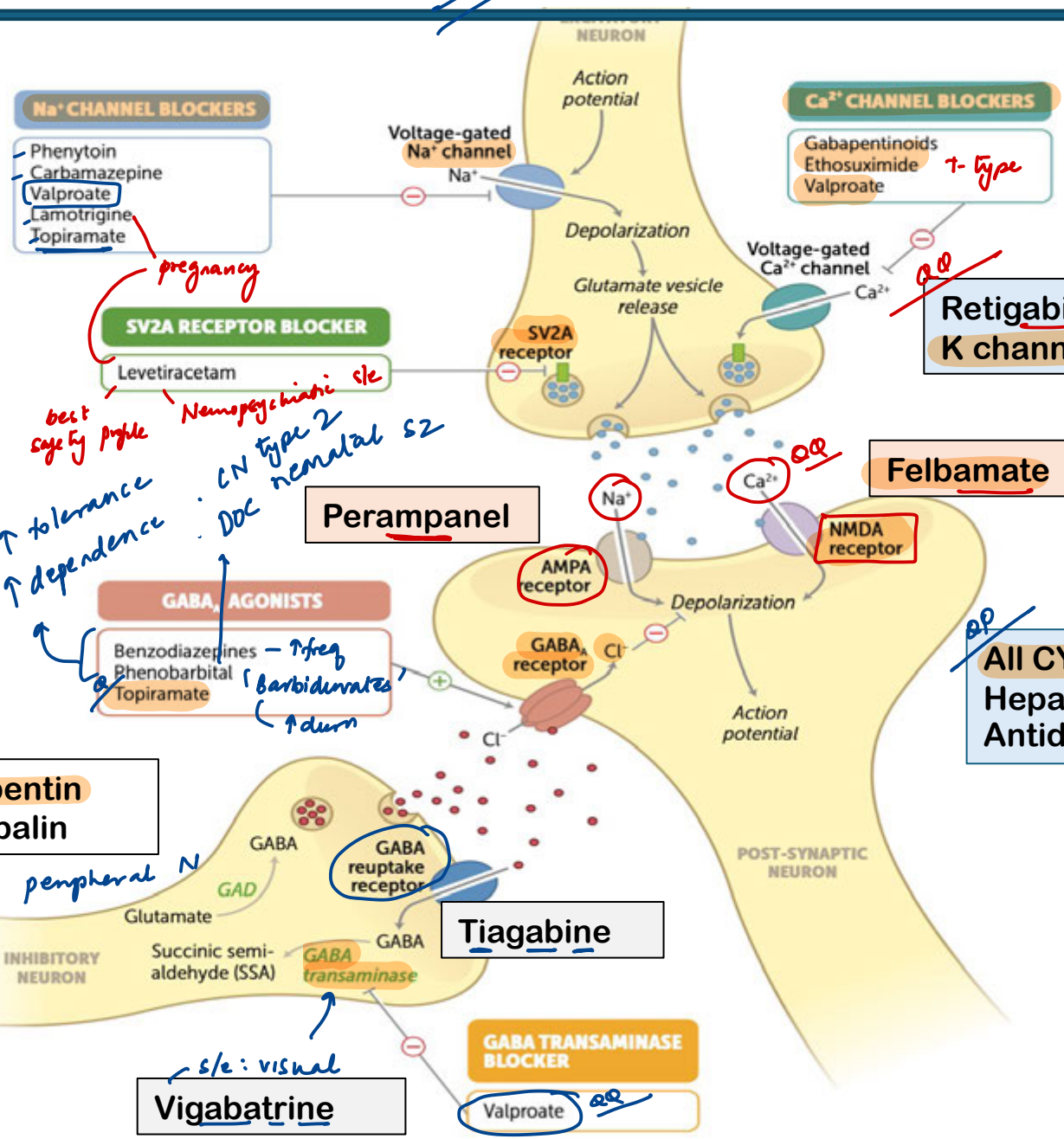
SLC2A1: GLUT1 → Rx- ketogenic diet
SCN1A: Dravet syndrome Rx – valproate

ANTI-EPILEPTIC DRUGS QQ

s/e Agranulocytosis, SJS - Carbamaz
SIADH - Oxcarbamazepine
Stones / ACG/ wt loss: Topiramate
Phenytoin

Cerebellar toxicity, gingival (PCV) hypertrophy, hirsutism, hepatotoxicity, osteoporosis, NTD, Purple glove Sx, Pseudo-lymphoma, megaloblastic anemia

Lacosamide → slow Na+ (−)



Retigabine/Ezogabine
K channel opener

Felbamate

Perampanel

↑ tolerance
↑ dependence
: CN type 2
DOC neonatal S2

Gabapentin
Pregabalin

DOC
Diabetic N/
post shingles
spinal trauma
peripheral N

Tiagabine

Vigabatrine
s/e: visual

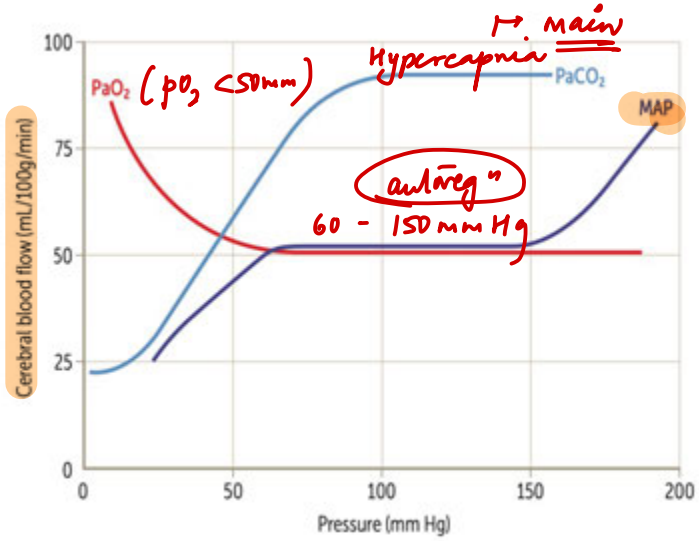
All CYP inducers except: VALPROATE
Hepatotoxicity, pancreatitis, PCOD
Antidote: L-carnitine (gender sp)

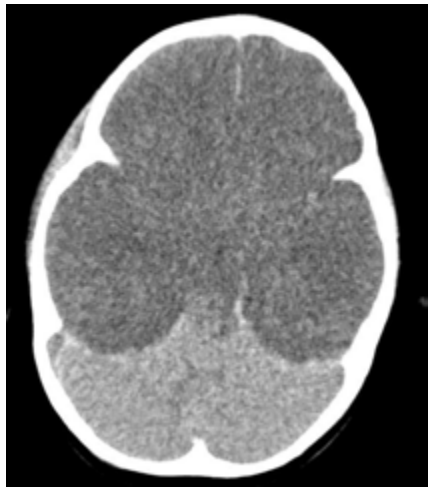
Raised ICP – Brain death

Cushing triad: Hytn + Bradycardia + ↑RR Baroreceptors
CPP=MAP-ICP ↑ICP → CPP↓
Target: ICP<20mm and CPP >60mm

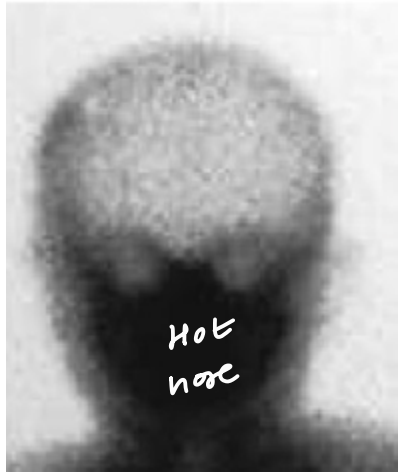
1. Elevate head end
2. Ventriculostomy
3. Mannitol
4. Steroid –CI in head trauma / stroke/ hemorrhage –Use in tumor, abscess
5. Hyperventilation ↓CO_2 – ↓CBF
6. Vasopressors ↓CBF ↑MAP

cytotoxic
Vasogenic





white cerebellum signs

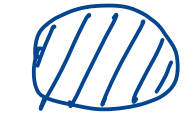


Tc^{99m} – HMPAO

GCS 3/15 + BRAIN DEATH
Apnea test
(Preoxygenate -> pCo2 >60mm)
Brainstem reflex: absent
Spinal reflex: may be present
No motor function or posturing
EEG silent

Purposeful blinking, vertical gaze
Quadriparesis x facial x horiz gaze MB
Self-awareness+ RAS
Normal respiration/EEG/metabolism

Locked - in Sx



Pons xx
. C/s – C/B tract
. PPRF xx

Posture	Level of lesion	Tracts affected
Decorticate	Above red nucleus (midbrain)	C/S disrupted Rubrospinal tract active
Decerebrate	At or below red nucleus	C/S and rubrospinal tracts disrupted (vestibulospinal dominance)