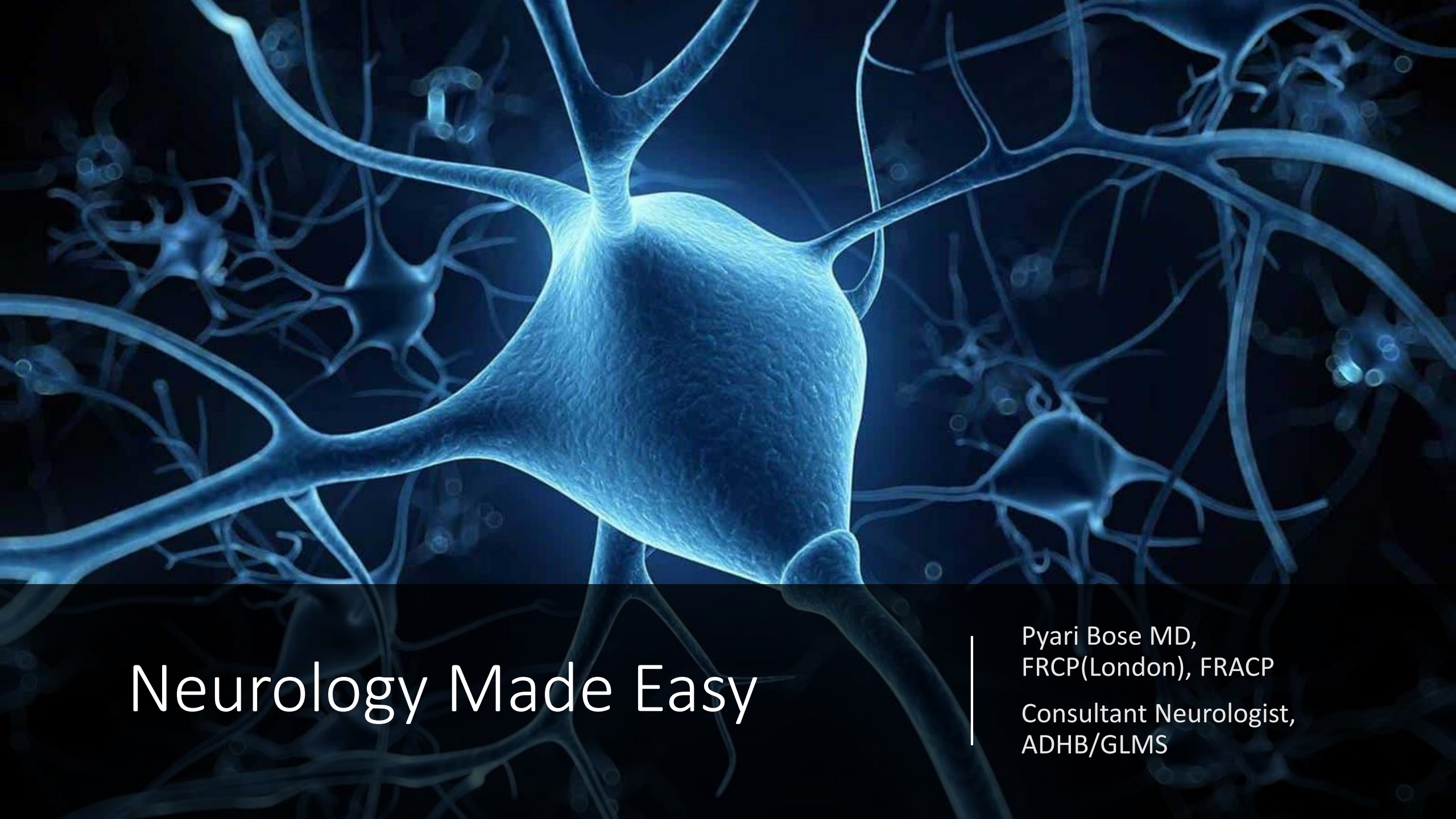

Neurology Made Easy

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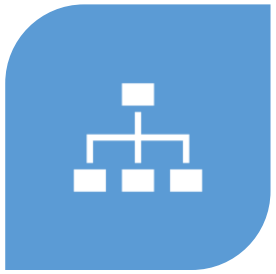
AIMS

COMMON NEUROLOGICAL PRESENTATIONS

PERTINENT HISTORY

CLINICAL SIGNS



*MANAGEMENT

NEUROLOGICAL PRESENTATIONS

- Epidemiological data in NZ limited
- UK – 0.6% annual incidence/6% lifetime prevalence[1]
- Costly
- 13 % total health expenditure[2]

[1]MacDonald BK, et al., Brain. 2000

[2]Blakely et al., An analysis of publicly funded health events from New Zealand. PLoS Med 2018

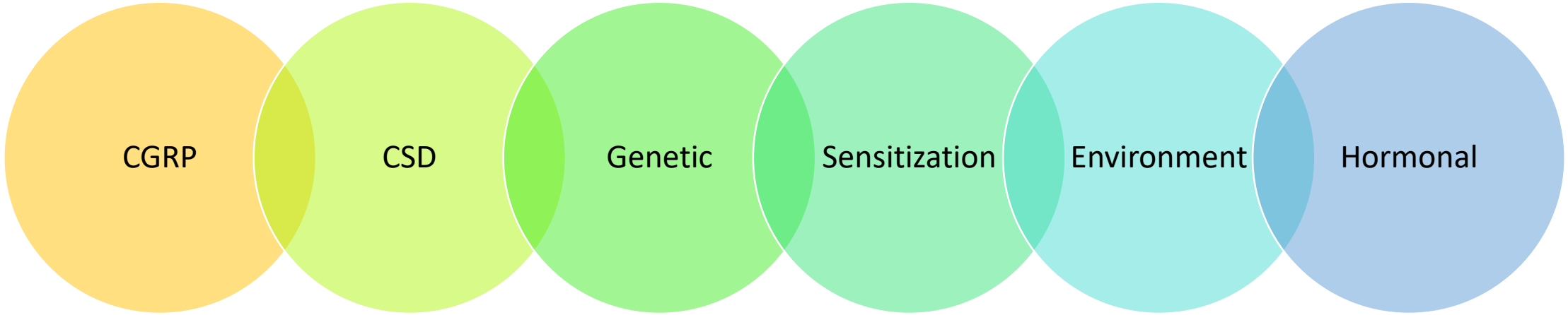
Common presentations

- Headache (25-33%)
- Loss of consciousness (25%)
- TIA/Stroke
- Tremor
- MS

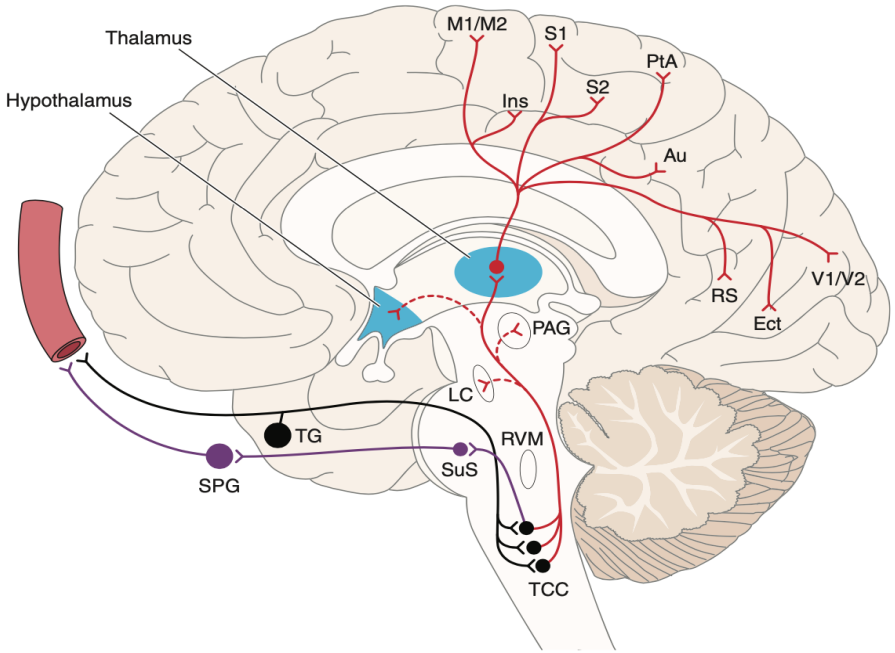
- Migraine- 12% general population[1]
- Migraine is more prevalent than diabetes, epilepsy and asthma combined[2]
- Costly
- NZ- 3431 discharges Migraine (others- 592)[3]
- Majority 20-49 age group
- Maori - 497 migraine discharges

- [1]Lipton *et al.,* Headache. 2001
- [2]Natoli JL *et al.,* Cephalalgia. 2010
- [3]Ministry of Health NZ data 2016/17

Primary neuronal dysfunction



CGRP- Calcitonin gene related peptide
CSD- Cortical spreading depression
Genetic- FHM1,2,3, TRESK
Hormonal- Serotonin, Oestrogen

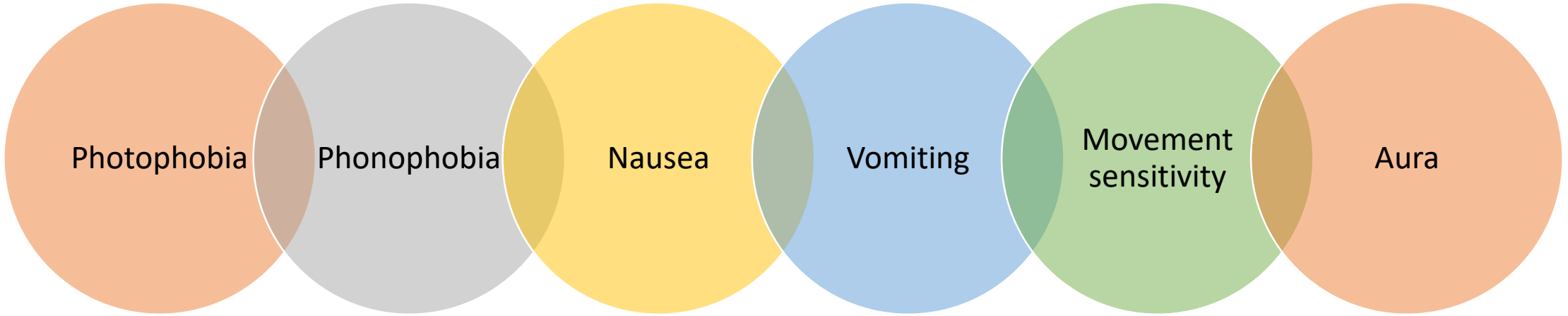


Presenting symptoms

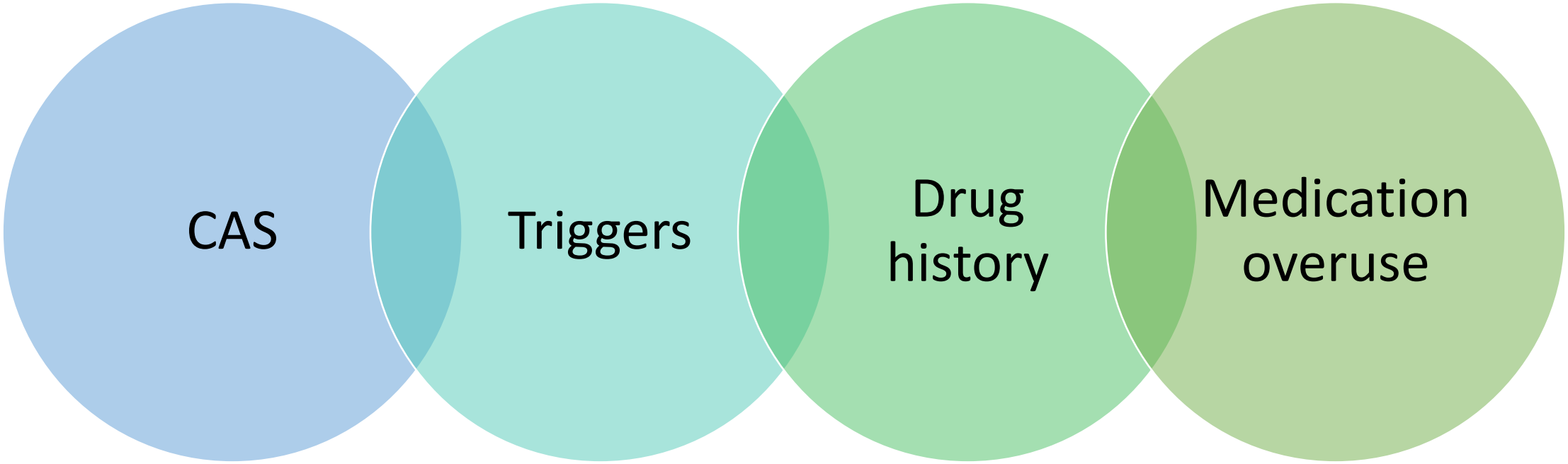
Number of headache days out of 30 per month
Crystal clear days[1]
Site/Character/Duration
Circadian/Circannual periodicity[2]
Thunderclap?
Valsalva
Postural variation

[1]Khalil *et al.,* Prospective analysis of the use of Onabotulinumtoxin A (BOTOX) in the treatment of chronic migraine J Headache Pain. 2014
[2]May A. Cluster headache: pathogenesis, diagnosis, and management. Lancet. 2005

Associated features



OTHERS



CAS (Cranial autonomic symptoms - ptosis/red eyes/watering/rhinorrhea)
Drug History- ? Max dose of preventives/ ? Side-effects
Medication overuse– Paracetamol/NSAIDS 15/30, Opiates- 10/30, Triptans 10/30

Examination

Changes to behavior/personality

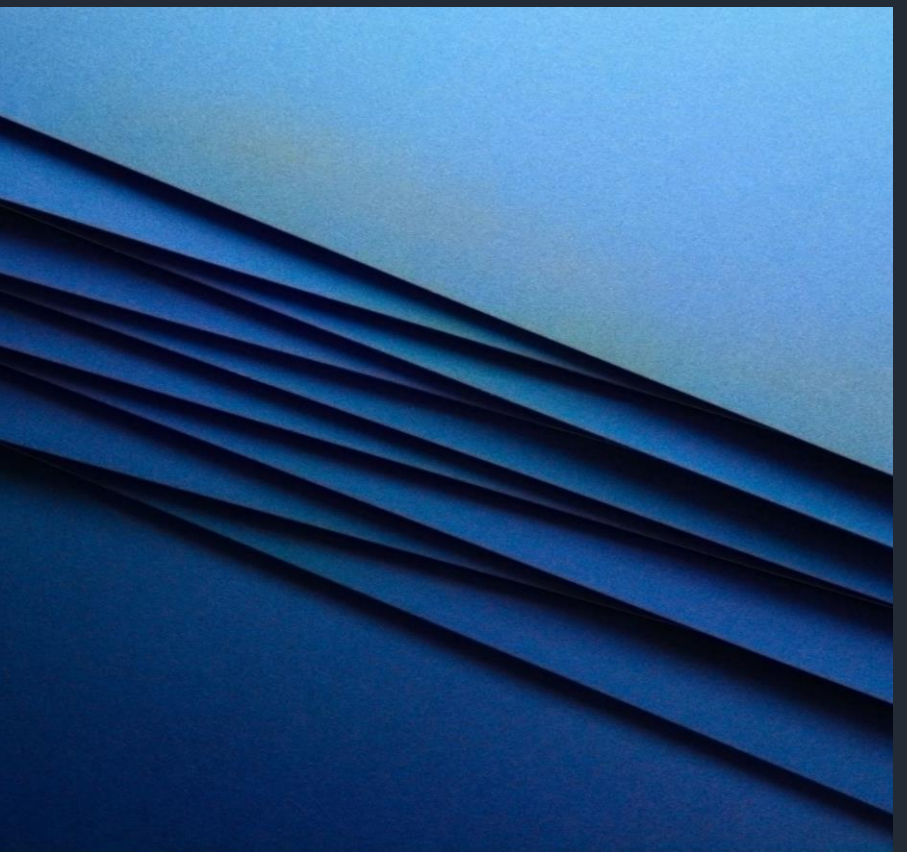
Confusion

Papilloedema

Ophthalmoplegia

Focal neurological deficits

CASE 1



35 year old female

Presents to neurologist with headache

Patient has googled her disorder

Neurologist disagreed

Symptoms

- 2 year history
- Headache
- Photophobia
- Phonophobia
- Neurologist- Migraine

Symptoms

- 2 year history
- Headache- Right sided retro-orbital

Sharp/piercing pain

Lasts around 1 hour

Usually at 2 am

With unilateral cranial autonomic symptoms

Lasts 6-8 weeks

Completely symptom free in between.

- Photophobia- Right sided
- Phonophobia- Right sided

RED FLAGS- SNOOP

- **S**ystemic symptoms including fever
- **N**eoplasm history/Neurological deficit
- **O**nset sudden, **O**lder age (onset after age 50 years)
- **P**attern change, **P**recipitated by sneezing, coughing, or exercise
- **P**rogressive headache, **P**regnancy or puerperium
- **P**ainful eye with autonomic features
- **P**athology of the immune system such as HIV

Red and orange flags for secondary headaches in clinical practice: SNNOOP10 list. Do et al., Neurology. 2019

MIGRAINE

- >5 attacks
- 4-72 hours
- 2 of (unilateral, pulsating, moderate to severe, aggravation with activity)
- Nausea/Vomiting
- Photophobia/Phonophobia

ICHD-3 Criteria

Cluster Headache

- ‘Suicide headaches’
- >5 attacks
- Very severe unilateral orbital/supraorbital/temporal pain
- 15-180 mins
- Ipsilateral cranial autonomic symptoms
- Restlessness or agitation during attacks

ICHD-3 Criteria

*Migraine Management – Acute (Non-triptan)

Drug	Dose	Max dose 24 hours
Paracetamol	1000 mg	4000 mg
Ibuprofen	400-600mg	2400 mg
Aspirin	600-1000 mg	4000 mg
Naproxen	250-500 mg	1000 mg

* Based on RCT data / At least 2 international treatment guidelines

*Migraine Management – Acute (Triptans)

- * Based on RCT data / At least 2 international treatment guidelines
- **Drug interaction Rizatriptan/Propranolol- use 5 mg instead

Drug	Dose	Max dose 24 hours
Sumatriptan oral	50-100 mg	300 mg
Sumatriptan injection	6mg	12 mg
Rizatriptan**	10 mg	20 mg

Preventives- Episodic and Chronic Migraine

Drug	Dose	Titration	Trial Study dose
Amitriptyline	10-25 mg	10-25 mg	25-150 mg
Propranolol	10 mg BD	10-20 mg	120-240 mg
Topiramate	25 mg	25 mg	25-200 mg
Candesartan	2 mg	2 mg	8-16 mg
Botox*	155 u every 3/12		

Based on RCT data / At least 2 international treatment guidelines
Sodium valproate/Pizotifen- weight gain
*Chronic migraine

Cluster headache – Acute Treatment

- High Flow oxygen 15L/min- nonrebreathing facial mask
- Sumatriptan injection
- Avoid oral triptans

Cluster Headache - Preventives

- Based on RCT data / At least 2 international treatment guidelines
- Sodium valproate/Pizotifen- Limited evidence
- Lithium – narrow therapeutic window
- Galcanezumab – CGRP monoclonal antibody

Drug	Dose	Titration	Max dose
Verapamil	80 mg TDS	80 mg	960 mg
Topiramate	25 mg OD	25 mg	200 mg
Prednisolone	60mg OD- 5 days	Reduce by 10mg/day	10-day course
Greater occipital nerve block	Methylpred-80mg Lignocaine 2%		

CASE 2

68 yr old female

On holiday in Spain

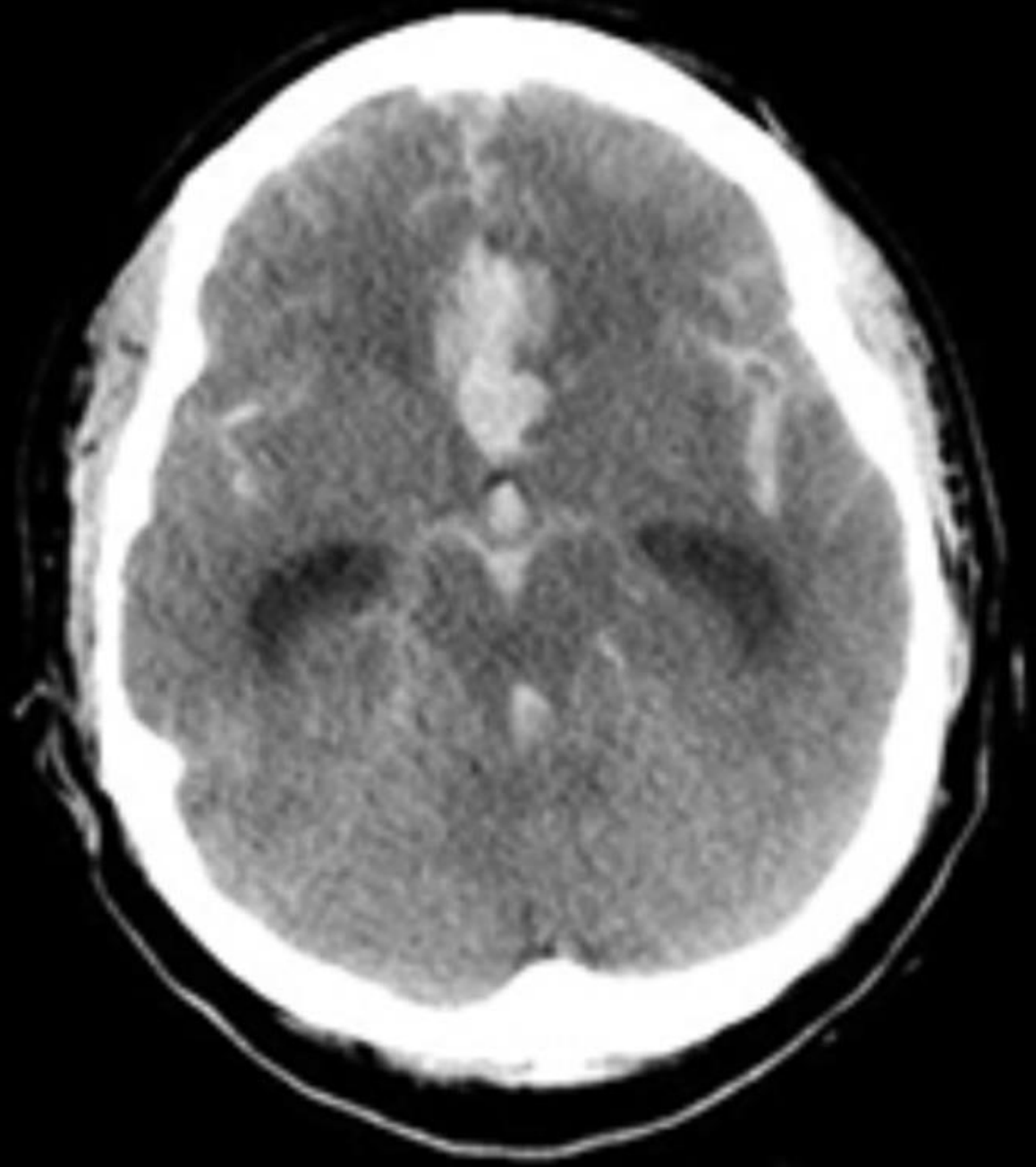
Sunbathing at onset of headache

Abrupt onset of headache

Left occipital region, throbbing, photophobia, lightheaded

ED in Spain – diagnosed migraine and discharged with analgesia

Represented to ED in UK



TIA/Stroke

TIA- Transient neurological dysfunction

Focal brain, spinal cord, or retinal ischemia

Without acute infarction

Arbitrary end point ≥ 24 hours = stroke

Biological end point = tissue injury

RISK FACTORS

- Hypertension
- Diabetes mellitus
- Smoking
- Dyslipidemia
- Physical inactivity
- *Age/race/genetic- non modifiable

HOSPITAL OR TIA CLINIC? – ABCD2 score

- Age (≥60 years = 1 point)
- BP (SBP ≥140 mmHg or DBP ≥90 mmHg = 1 point)
- Clinical features (unilateral weakness = 2 points; isolated speech disturbance = 1 point; other = 0 points)
- Duration (≥60 minutes = 2 points; 10 to 59 minutes = 1 point)
- Diabetes (1 point)

SCORING

Score 6 to 7: High two-day stroke risk (8 percent)

Score 4 to 5: Moderate two-day stroke risk (4 percent)

Score 0 to 3: Low two-day stroke risk (1 percent)

*Recurrent TIA - Hospital

Stroke/TIA mimics

- Seizures
- Migraine auras
- Syncope
- Peripheral vestibulopathies
- Metabolic*
- Transient global amnesia

*Hypoglycaemia, hepatic, renal, and pulmonary encephalopathies

Differentiating between TIA/stroke and migraine with aura

TIA/Stroke	Migraine with Aura
Negative symptoms	Positive, then negative symptoms
All symptoms at onset	Gradual spread over minutes
Symptoms clear together in TIA	Symptoms may clear in one modality before onset of symptoms in another modality
Can affect more than one modality simultaneously	Spreads from one modality to another
Duration up to 30 min most common in TIA, but can last hrs; enduring deficits in stroke	20-30 min aura is most common, usually followed by headache
Usually >40 yrs old	Often begins in teens or twenties
Stroke risk factors present	Often a personal/family history of migraine

Adapted from Imitators of Epilepsy, 2nd Edition. Kaplan PW, Fisher RS, editors. New York: Demos Medical Publishing; 2005

Syncope

Transient loss of consciousness
Inadequate cerebral blood flow
Reflex, orthostatic, cardiac
Duration- usually seconds (<1min)
Provoking factors
Associated symptoms
No confusion after

Syncope- Management

- Exclude cardiac – Chest pain/Heart failure/Heart sounds/ECG (**ALL**)
- Exclude bleeding- Gastrointestinal/trauma/Obstetric/Gynaecological
- Exclude Pulmonary embolism/CNS
- Other tests- 24 hour Holter, blood sugar, echocardiogram (low yield)

Seizures

Electrical hypersynchronization of neuronal networks

Types: Acute symptomatic/Unprovoked/Epilepsy

Acute symptomatic: eg stroke, encephalitis, or acute head injury

EPILEPSY

- 2 unprovoked seizures/24 hours apart
- 1 unprovoked seizure plus recurrence risk ≥60 percent
- Epilepsy syndromes
- Investigations- LP/EEG/MRI brain
- Driving ban - Acute symptomatic 6 months/ Otherwise 1 year

Tremor

- Involuntary, rhythmic, and oscillatory movement
- Ask: Resting, Action, Intention, Orthostatic
- Body parts involved- Head/symmetrical upper limbs (ET)
  Leg tremor/asymmetric upper limbs (PD)
- Relief with alcohol (ET)

Essential Tremor

- Postural bilateral upper limb tremor
- 5% of adults over 60
- 30 to 70 percent- Family history
- Improvement with alcohol
- Check TSH/? Copper studies (<40 years age)
- Treatment: Propranolol, Primidone

- https://youtu.be/SFnWlqQ1z60?t=30

Parkinson's Disease

- Tremor, bradykinesia, and rigidity
- 'Pill-rolling' rest tremor
- Hypomimia
- Shuffling/festinating gait

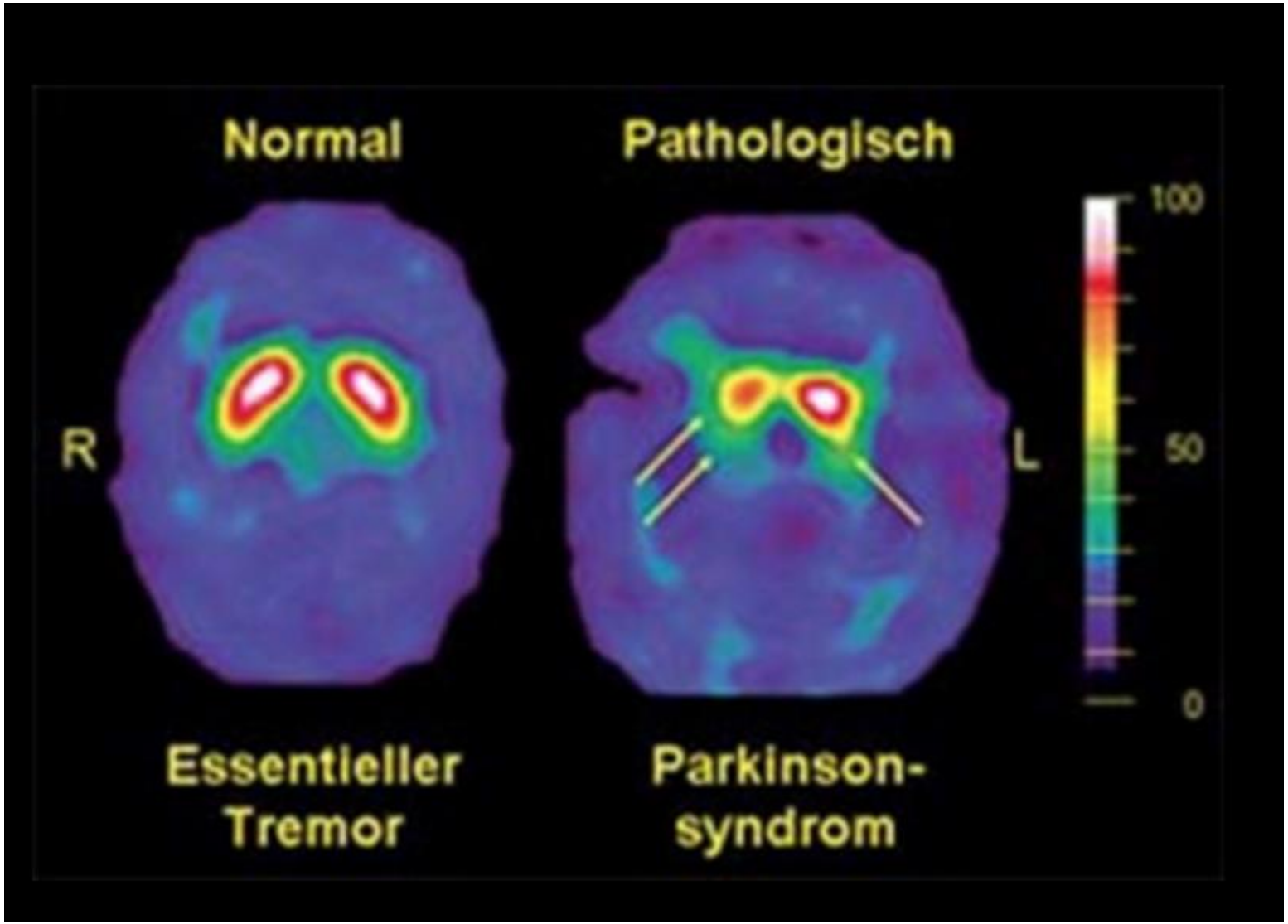
Non-motor symptoms PD

- Cognitive dysfunction
- Psychosis and hallucinations
- Mood disorders
- Sleep disturbances (REM sleep behaviour disorder)
- Fatigue

Parkinson’s

- https://youtu.be/JgzGWhSPa5U?t=29

DaT scan


Normal
Pathologisch
R
L
100
50
0
Essentieller Tremor
Parkinson-syndrom

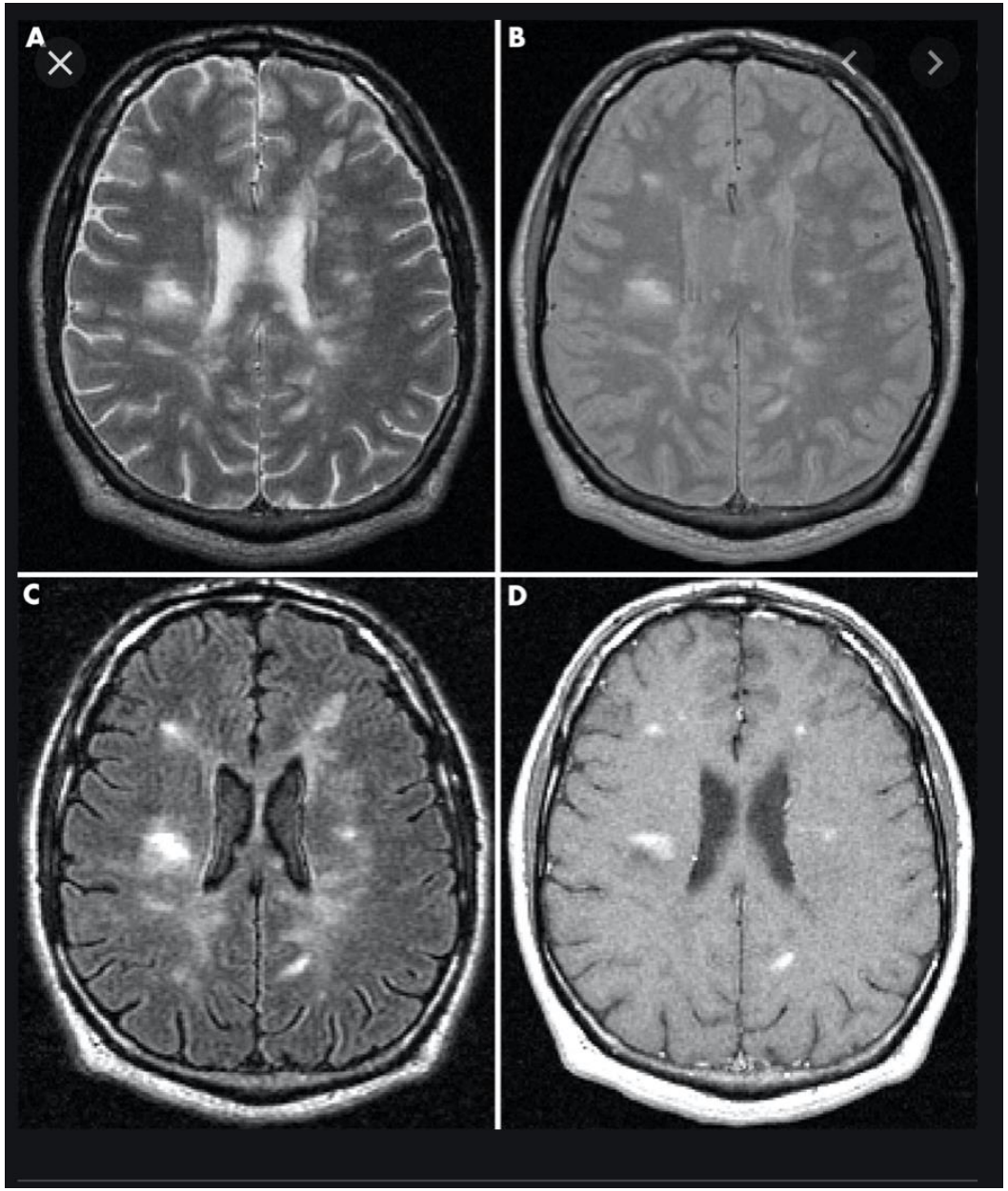
Multiple Sclerosis

- Relapses and remissions
- Onset between ages 15 and 50 years
- Optic neuritis
- Lhermitte sign
- Internuclear ophthalmoplegia
- Fatigue
- Heat sensitivity (Uhthoff phenomenon)

TYPES

- Clinically isolated syndrome*
- Relapsing-remitting MS
- Secondary progressive MS
- Primary progressive MS

MRI findings



TAKE HOME MESSAGES

- Headache is common - red flags
- TIA (High grade- hospital/Low- clinic)
- Syncope/Seizures
- Tremor- PD/ET
- MS - relapse history