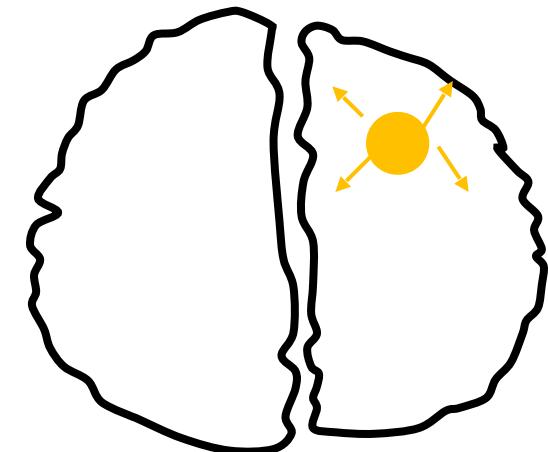


The Human Brain

Common Brain Pathologies:

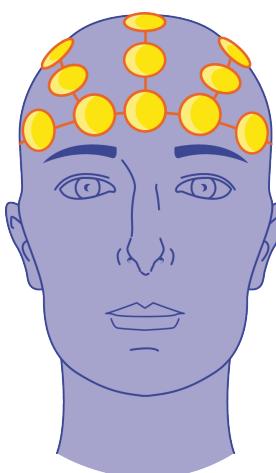
Epilepsy



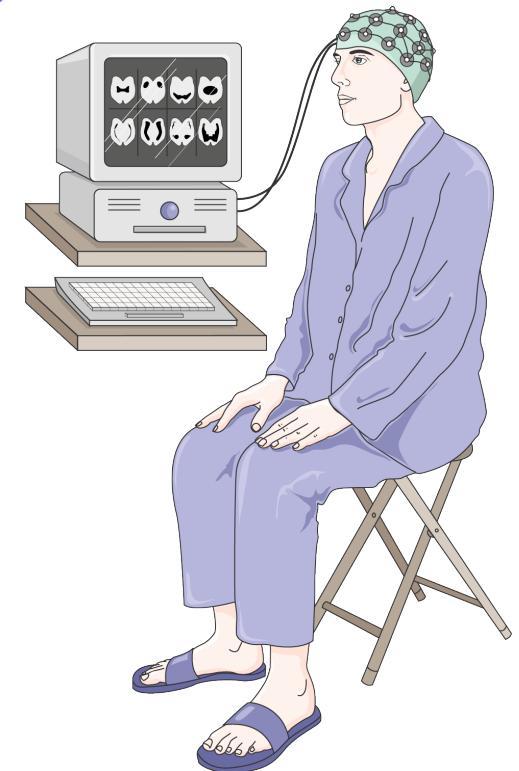
Dr. Bip Choudhury

Seizure

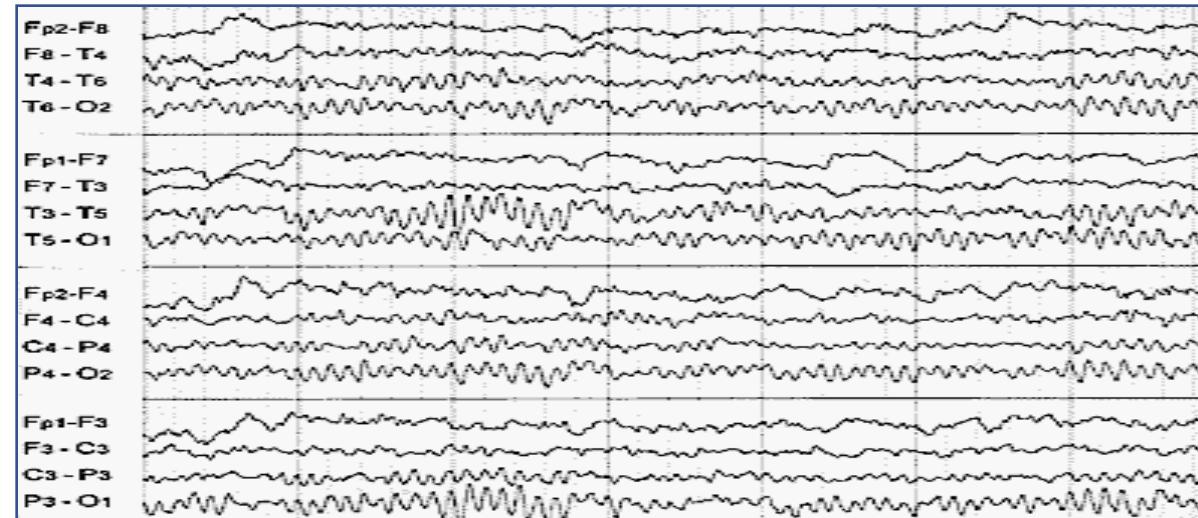
- Is the same a convulsion
- Transient abnormal event resulting from discharge of cerebral neurone.
- Epilepsy is the continued tendency to have such seizures



Electroencephalogram
(EEG)



Electroencephalogram Trace



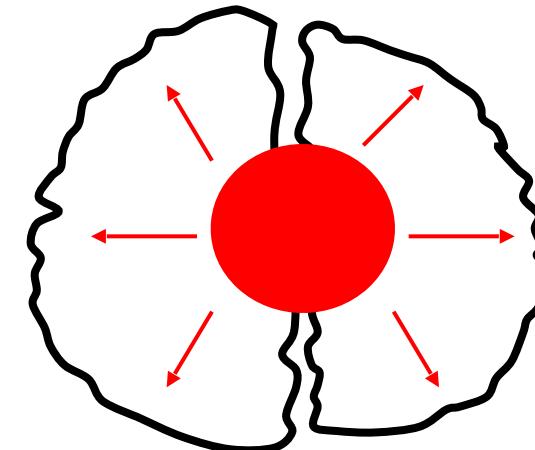
Normal



Not
Normal

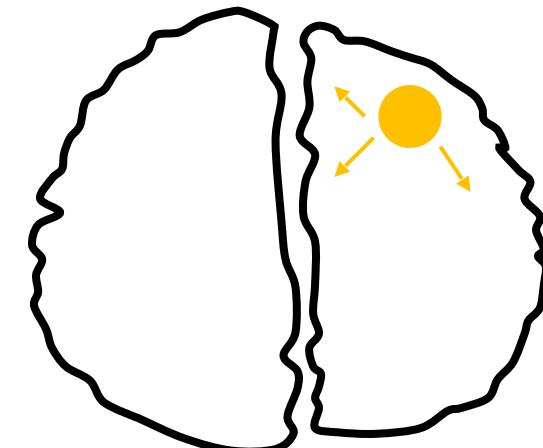
Features of seizures

- Tonic clonic (grand mal)
- Absence (petit mal)
- Myoclonic



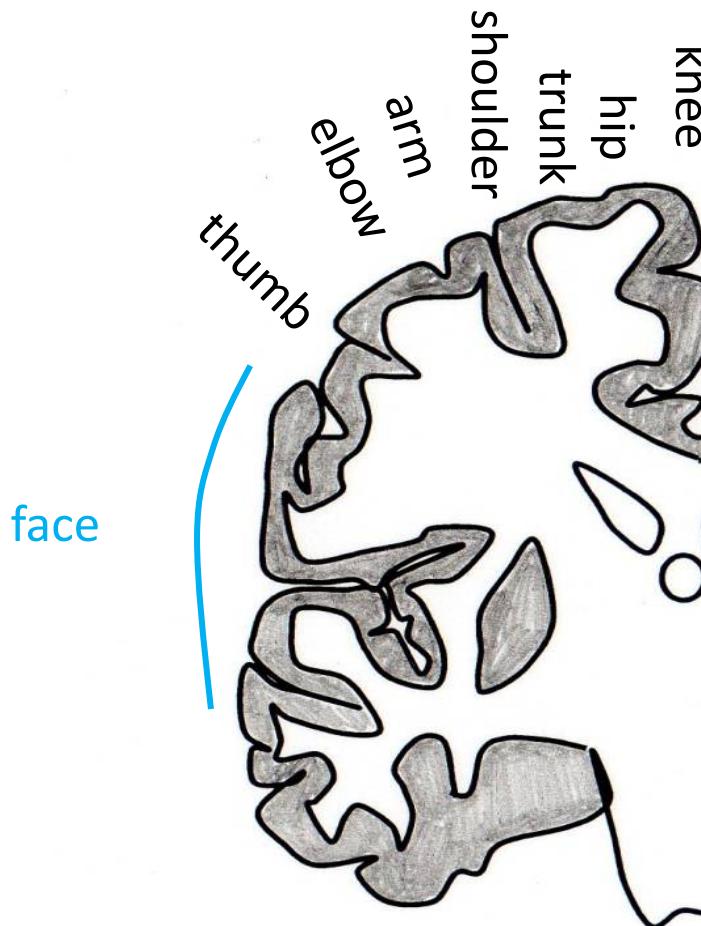
Generalised seizure

-
- ▶ Induced aura
 - ▶ Jacksonian seizure (motor cortex)
 - ▶ Todd's paralysis



Partial seizure

Seizures: symptoms



Symptoms manifested depends on where in the brain the seizure occurs.

Causes

Trauma

Depressed skull fracture, penetrating brain injury,
cerebral contusion, dural tear

Cerebrovascular

Following cerebral infarction

Alcohol induced

Hypoglycaemia (low blood sugar levels) → coma

Others include pyrexia (high fever) and brain tumours. In 2/3rds of cases,
no definite cause is found.

Diagnosis, Treatment & Prognosis

Rule out other causes of seizure

Eye witness account very helpful

Perform EEG

Keep safe when having seizure

Never restrain someone having a seizure

Immediate medication e.g. diazepam

Long term anti-epileptic medications

Most lead a normal life

Can have impact on employment

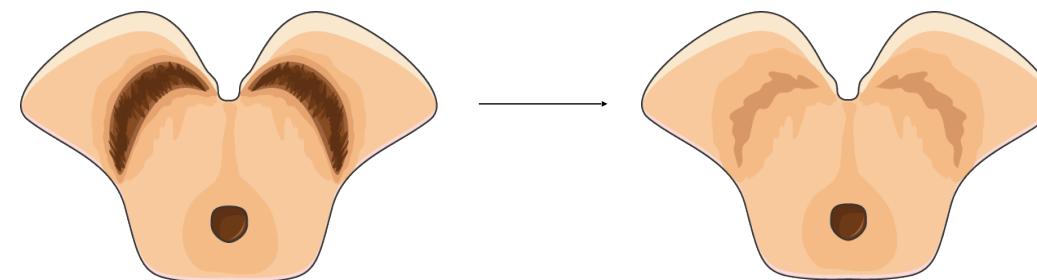
Status Epilepticus

Rare but life threatening

The Human Brain

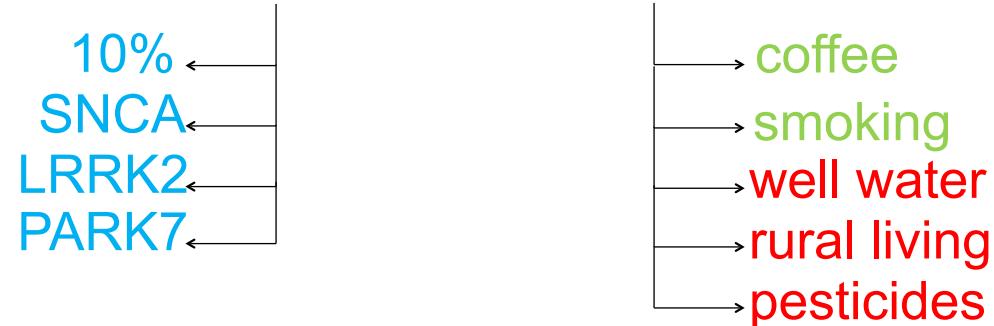
Common Brain Pathologies:

Parkinson's Disease

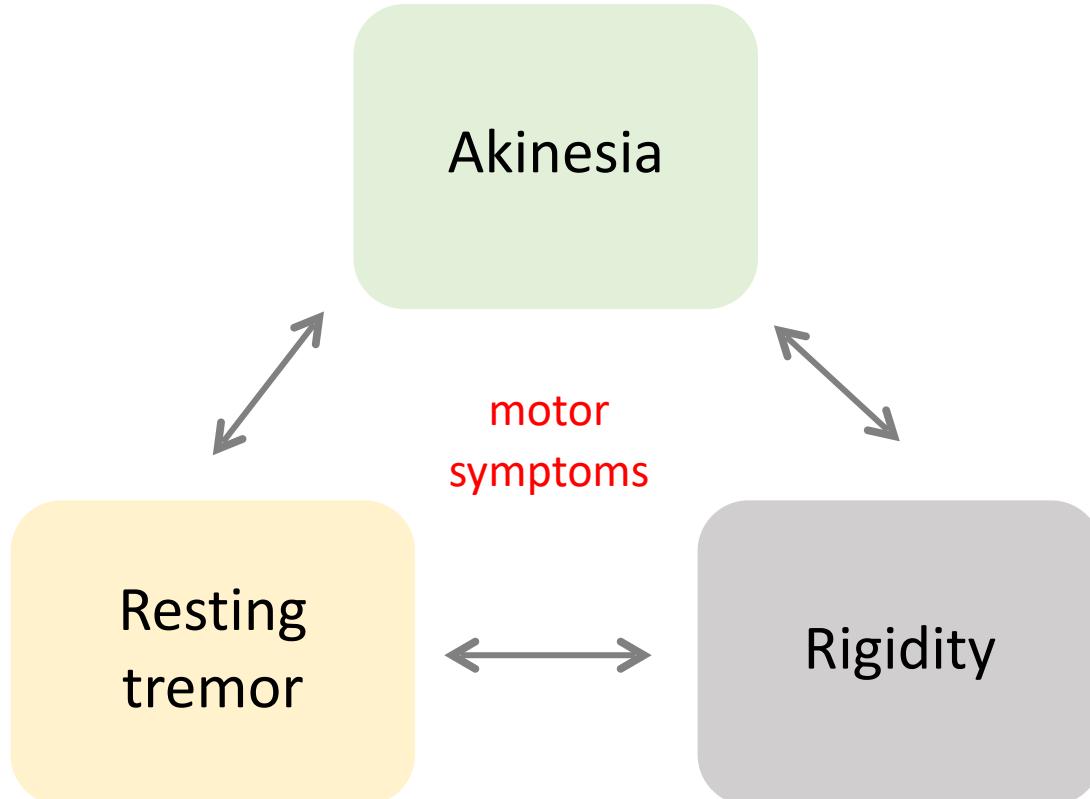


Parkinson's Disease

- Is a neurodegenerative disorder
- 145000 people have Parkinson's in the UK (Parkinsons.co.uk, 2021)
- Caused by genetic and environmental factors



Features of Parkinson's Disease

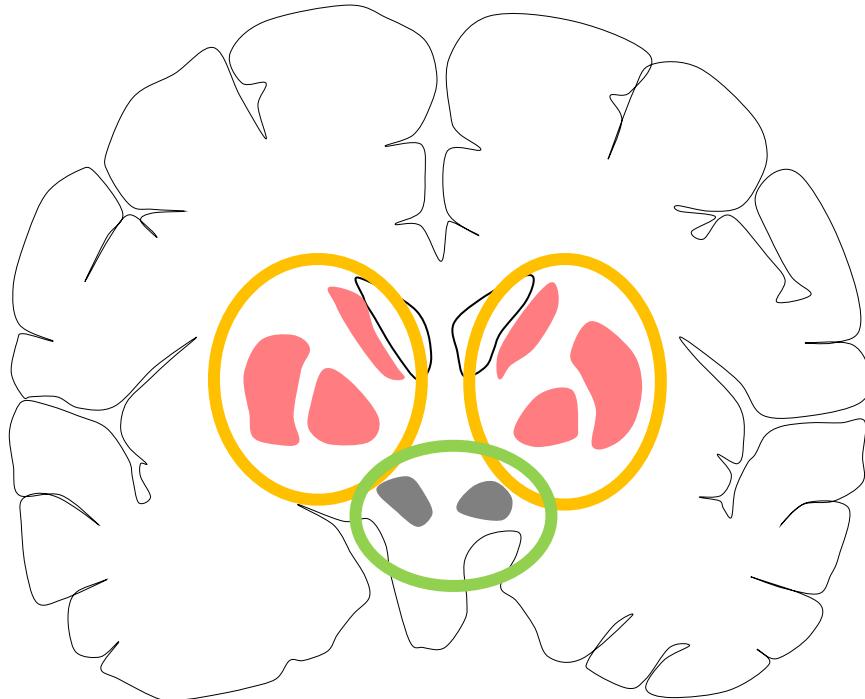


Other symptoms/features:

- Loss of smell
- Sleep disorders
- Constipation
- Depression
- Anxiety
- Mask like face

May also have a stooped posture and shuffling gait

Motor symptoms explained



Basal ganglia

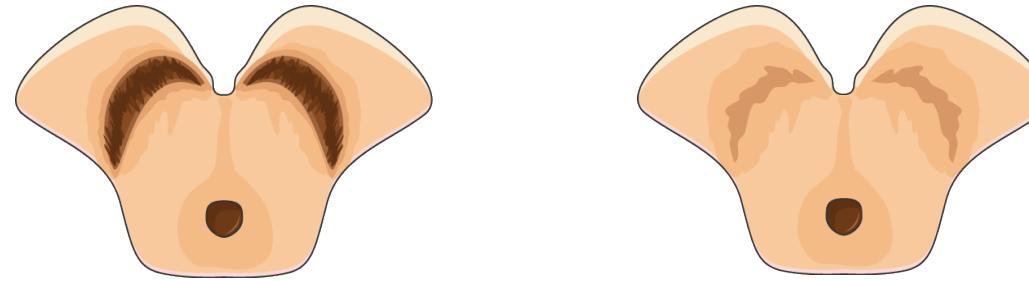
is responsible for subconscious control of movement & coordination of learned movement.

This collection of nuclei lie deep in the brain within the grey matter.

Substantia nigra
moderates the activity of the **basal ganglia** with the neurotransmitter dopamine.

Hallmarks of Parkinson's Disease

1. Loss of dopamine producing neurones in the substantia nigra

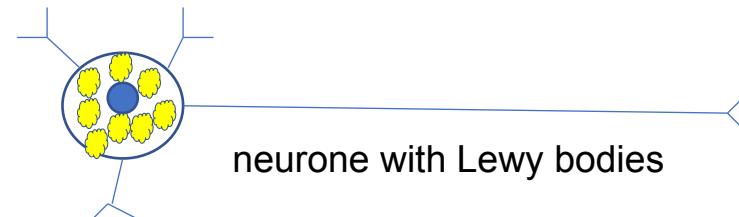
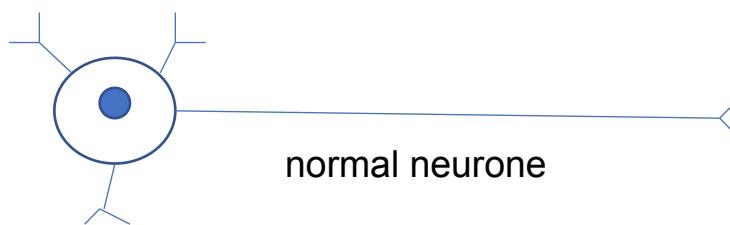


2. Lewy bodies within neurones

- they disrupt normal neuronal functioning
- α -synuclein is the main constituent

possible biomarker?

expense
sensitivity
?value of early diagnosis



Diagnosis & Treatment

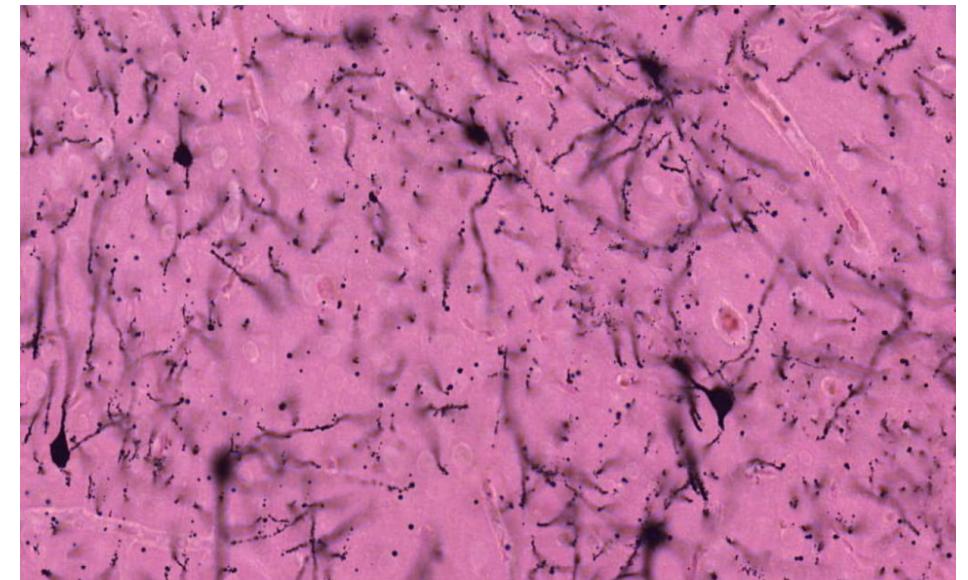
- It is a **clinical** diagnosis
- Patients live ~10-15 years from diagnosis
- Death usually caused by bronchopneumonia
- Can give dopamine agonists (e.g. levodopa)
- This produces striking improvements (initially)
- No drugs alter the course of the disease

The Human Brain

Common Brain

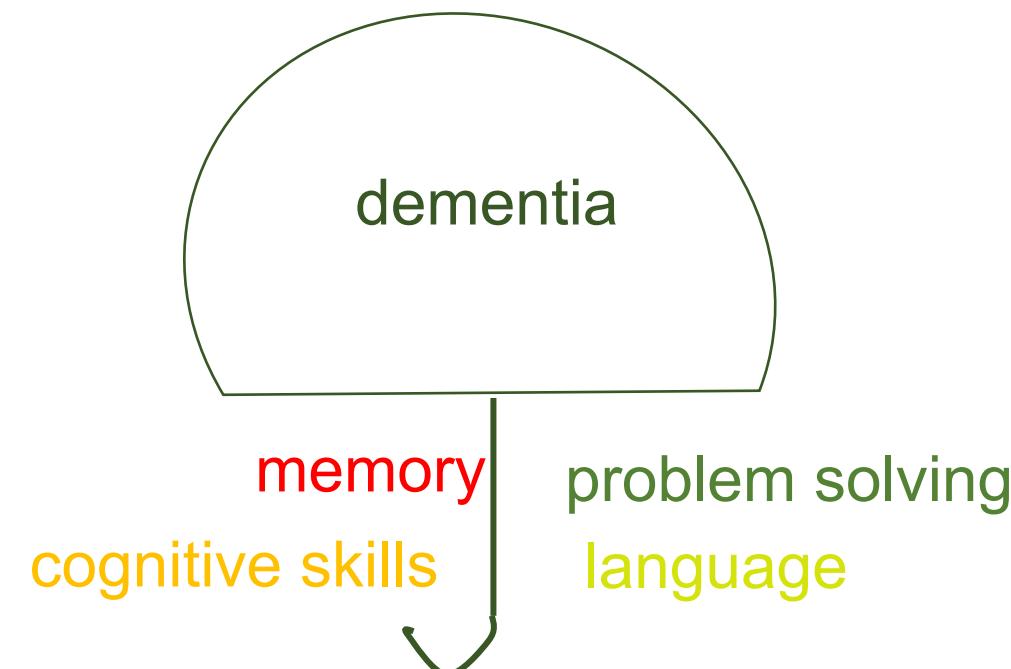
Pathologies

Alzheimers Disease



Alzheimer's Disease

- It is a degenerative brain disease and the most common cause of dementia
- 520000 people in the UK have it (Alzheimers Society, 2021)

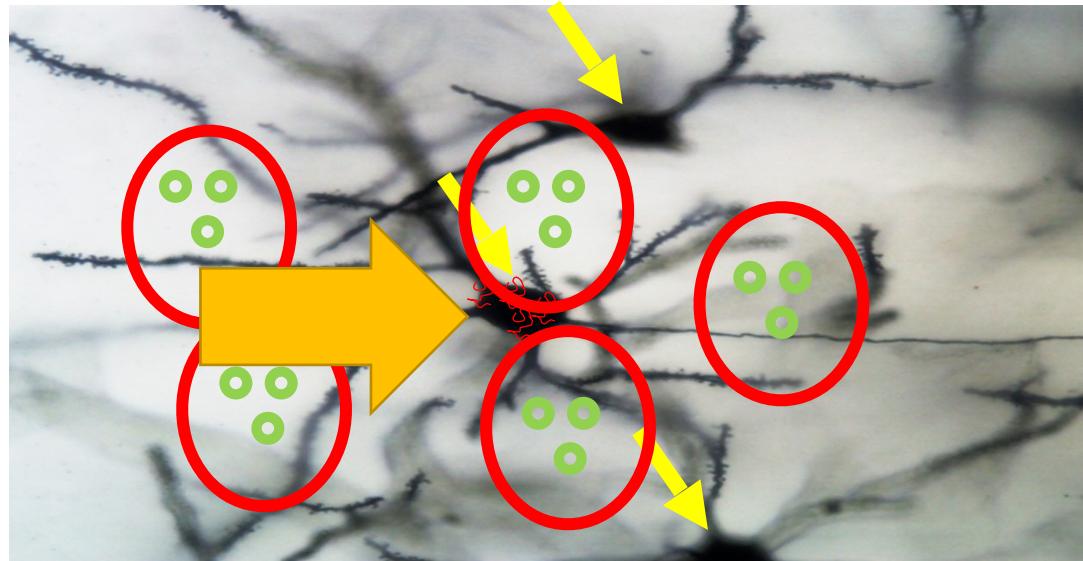


Causes of dementia

- **Degenerative causes:** Alzheimers (62%), lewy body dementia
- **Vascular:** multi infarct dementia
- **Infective:** CJD or ‘mad-cow disease’, AIDS, syphilis
- **Metabolic:** Vitamin B12 & folate deficiency, hypoglycaemia
- **Toxic:** alcohol/drugs
- **Space occupying lesion:** tumour, chronic haematoma

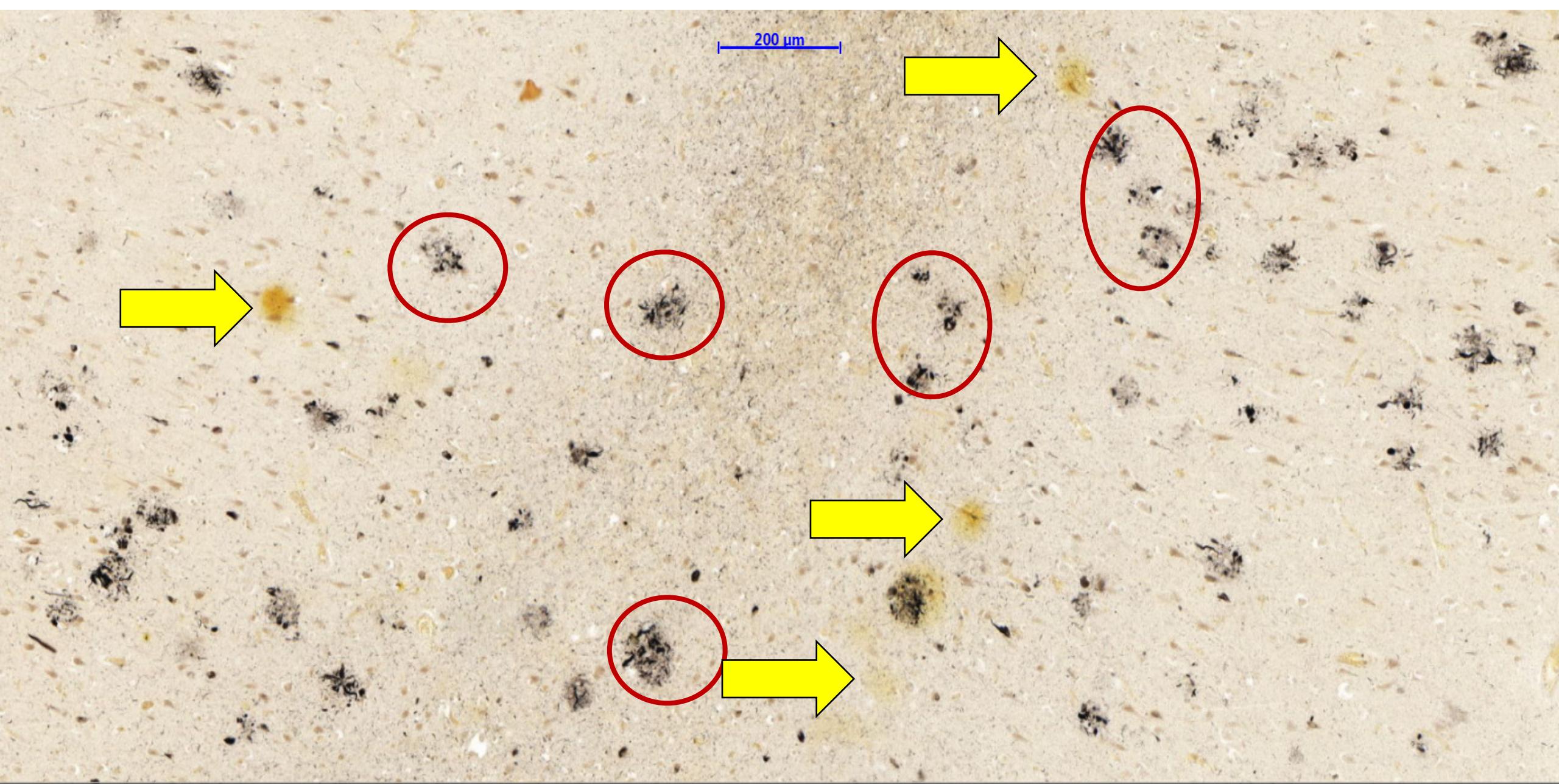
Hallmarks of Alzheimer's Disease

- β -amyloid **plaques** outside neurones
 - protein tau (**tangles**) inside neurones
 - block communication at synapses
 - block transport of nutrients into neurones
- } biomarkers?

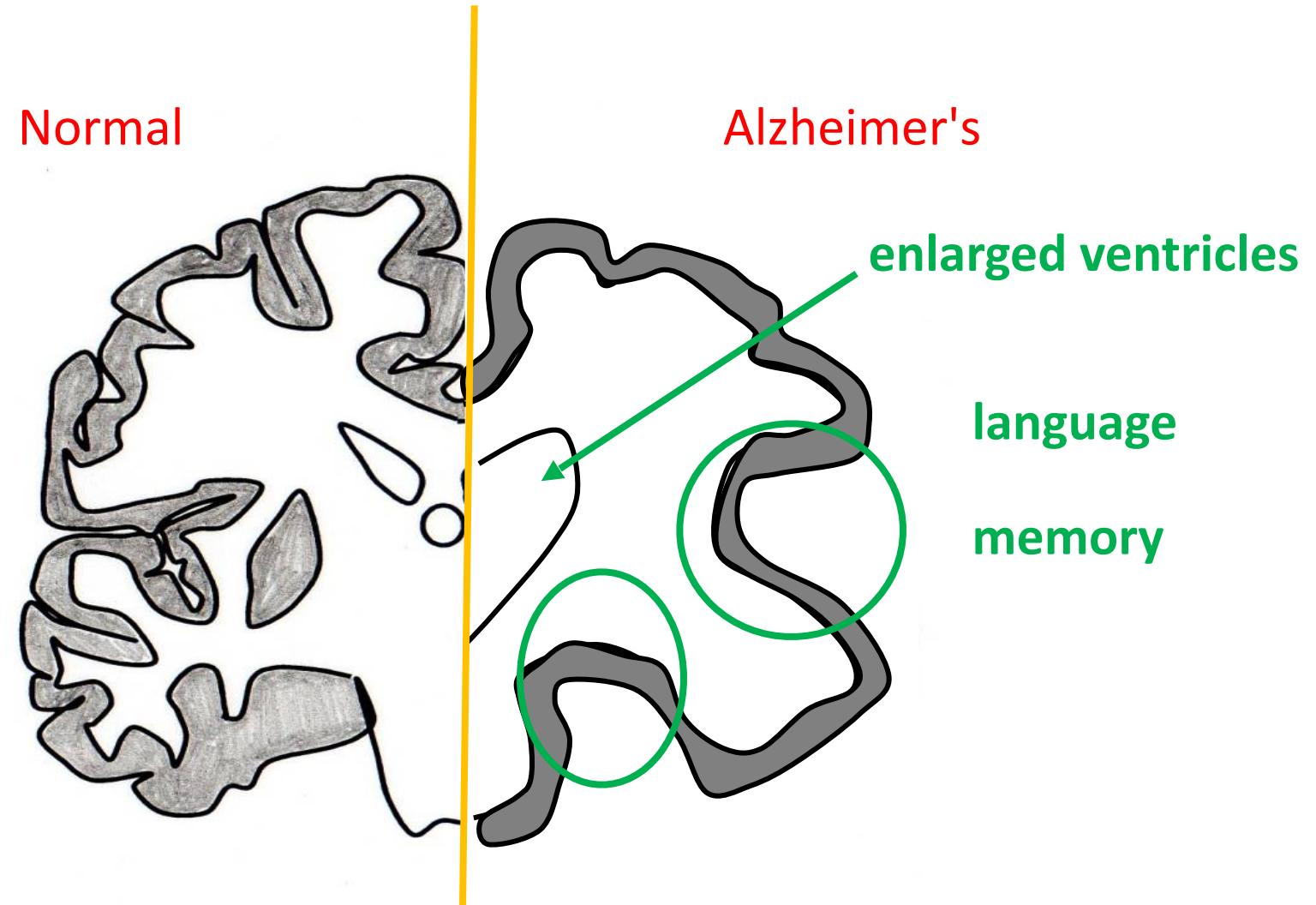


Risk factors

- Genetic
APP, presenilin 1 & 2
- Downs Syndrome
- Age
- Education



Effects on brain tissue



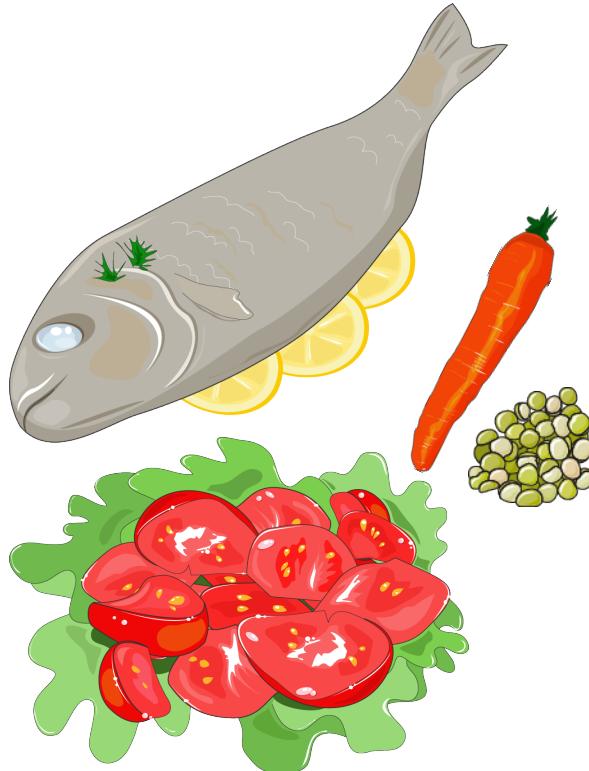
Cognitive and functional decline

Diagnosis & Treatment

- It is a **clinical** diagnosis
- Input from close friends & family, medical history
- Cognitive tests, neurological examination
- Blood tests to rule out other causes (e.g. B12 deficiency, cancers)
- Aim is to **maintain quality of life**
- Acetylcholine esterase inhibitor drugs (to keep neurotransmitter in **synapse for longer**)



Modifiable risk factors



Having good cardiovascular health protects against dementia

Brain health is affected by heart health