MED 546 B Lecture 5

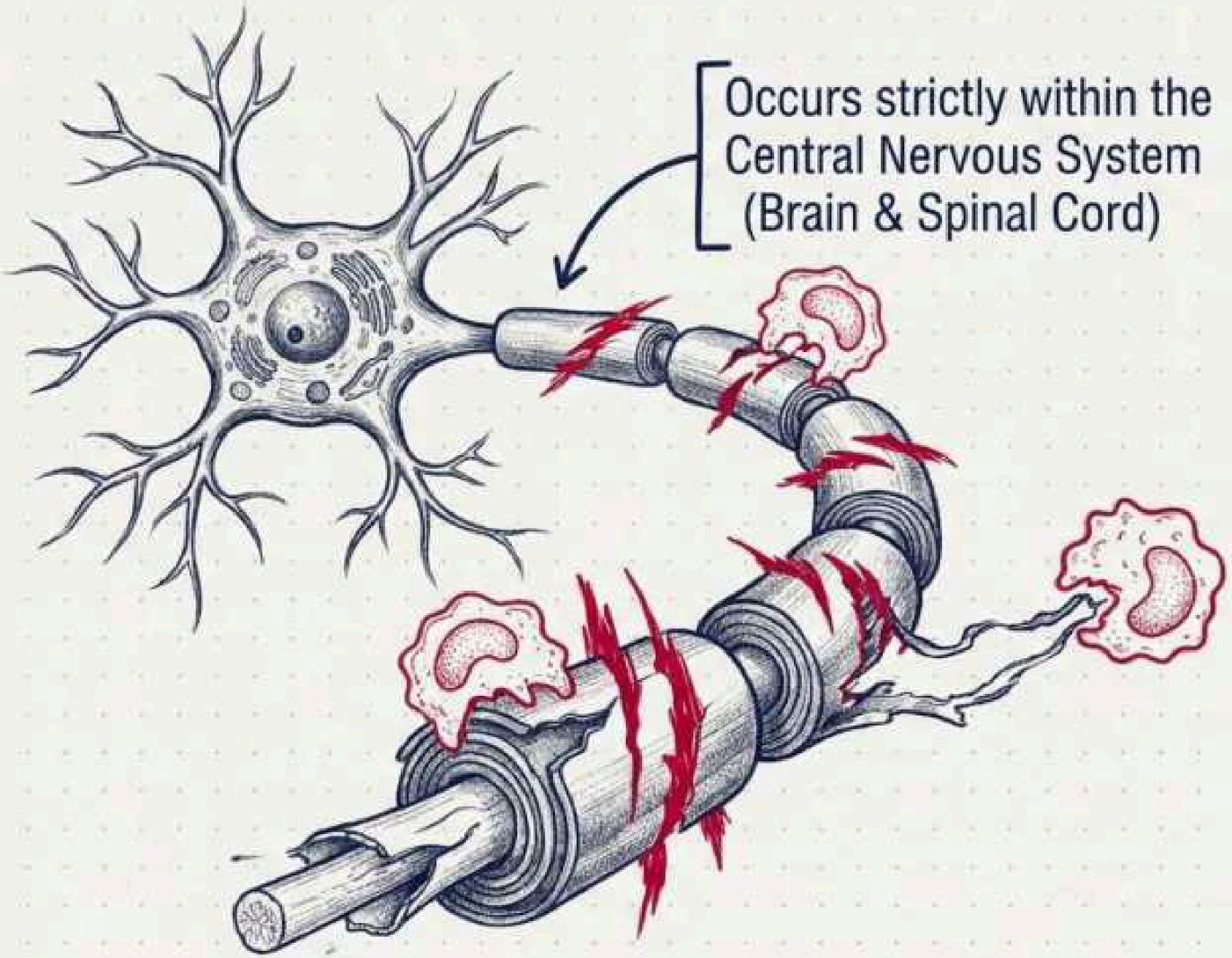
Multiple Sclerosis and Movement Disorders



At a Glance

- Multiple Sclerosis: Clinical course, diagnosis, and disease-modifying treatment
- Parkinson's Disease: Pathology and levodopa intervention
- Essential Tremor & specific movement disorders

Multiple Sclerosis: The Inflammatory Demyelinating Mechanism



Demographic Profile

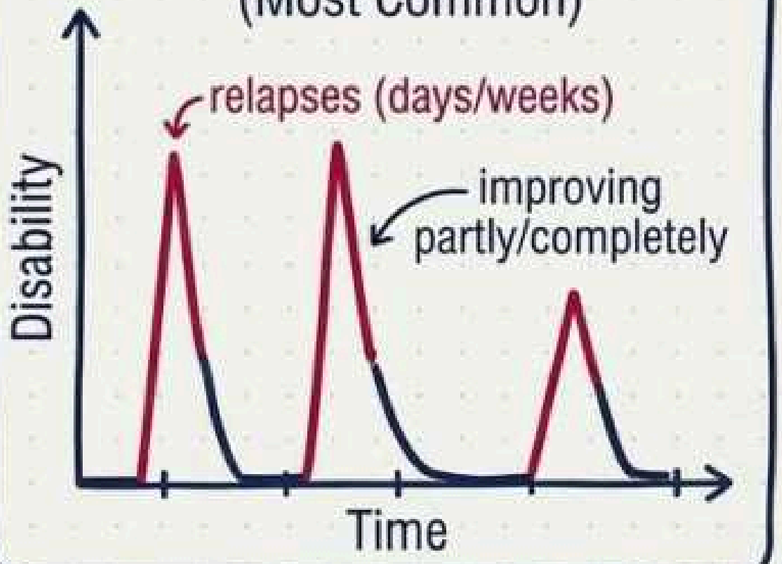
→ **Primary Status:**
↳ Commonest cause of disability in young adults in many countries.

→ **Age of Onset:**
↳ 20 – 40 years old.

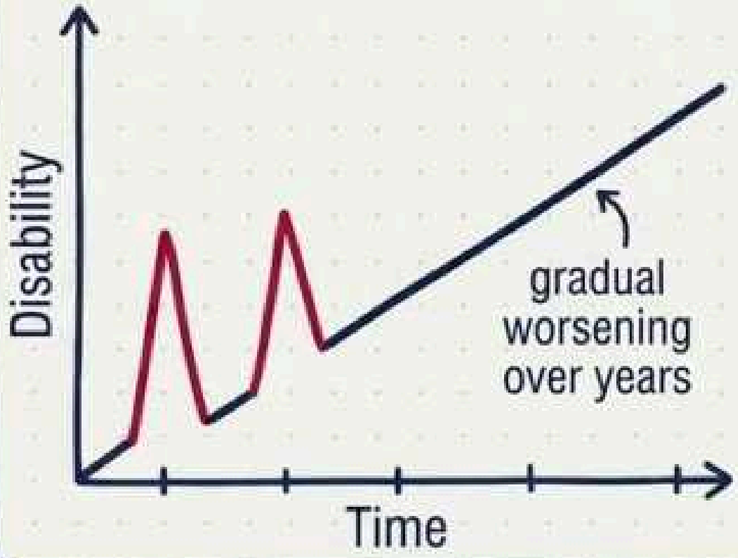
→ **Sex Ratio:**
↳ Women : Men = 3 : 1

Mapping Clinical Courses and Early Symptomatology

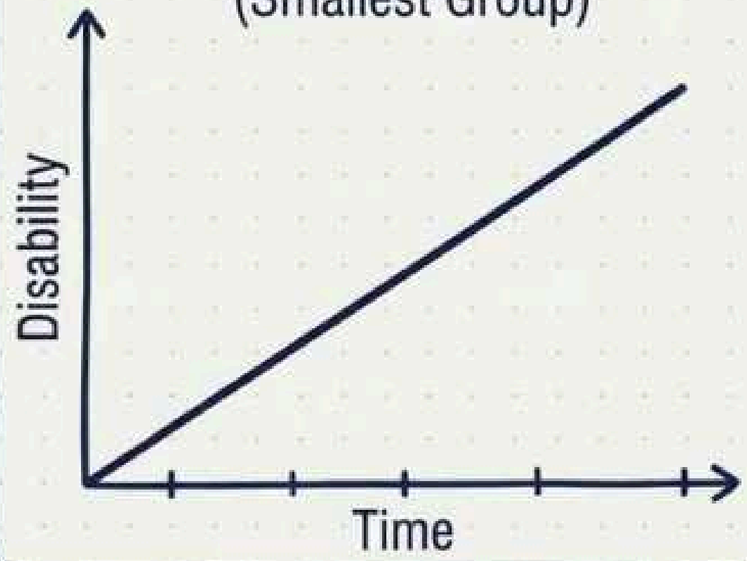
Relapsing-Remitting
(Most Common)



Secondary Progressive



Primary Progressive
(Smallest Group)



First Symptoms Checklist



Optic neuritis (painful blurred vision in one eye)



Numbness or tingling



Weakness



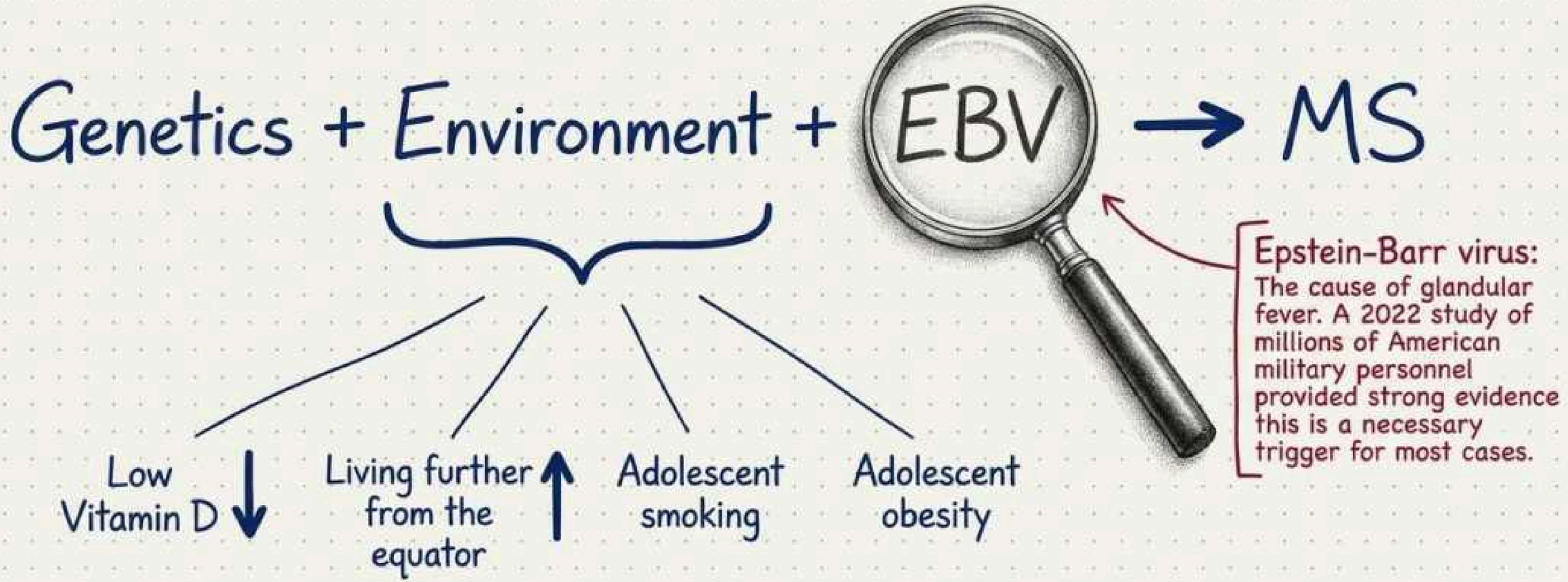
Diplopia (double vision)



Balance problems

The Etiopathogenesis Equation for Multiple Sclerosis

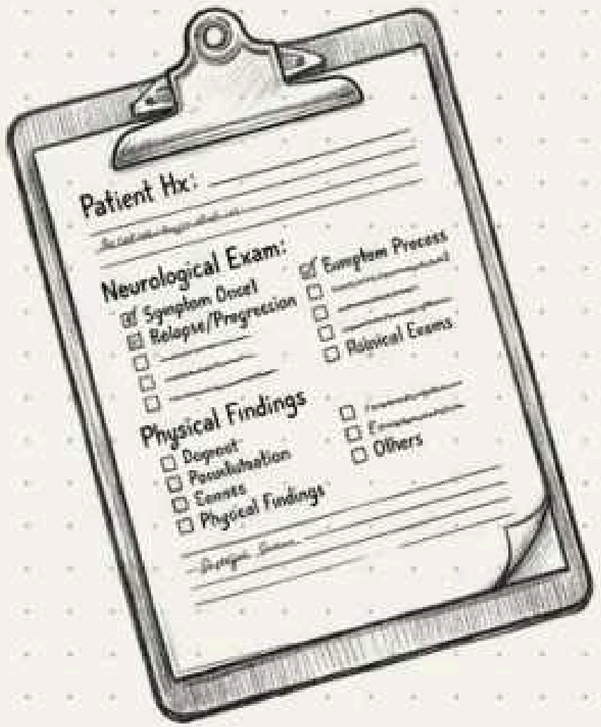
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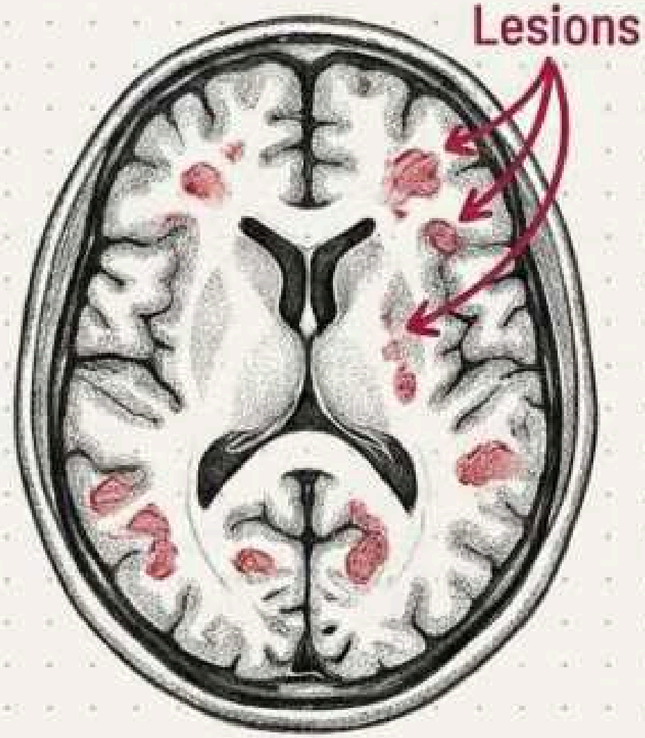
Diagnostic Criteria Dictated by Space and Time

Requires evidence of damage in different parts of the nervous system at different times.

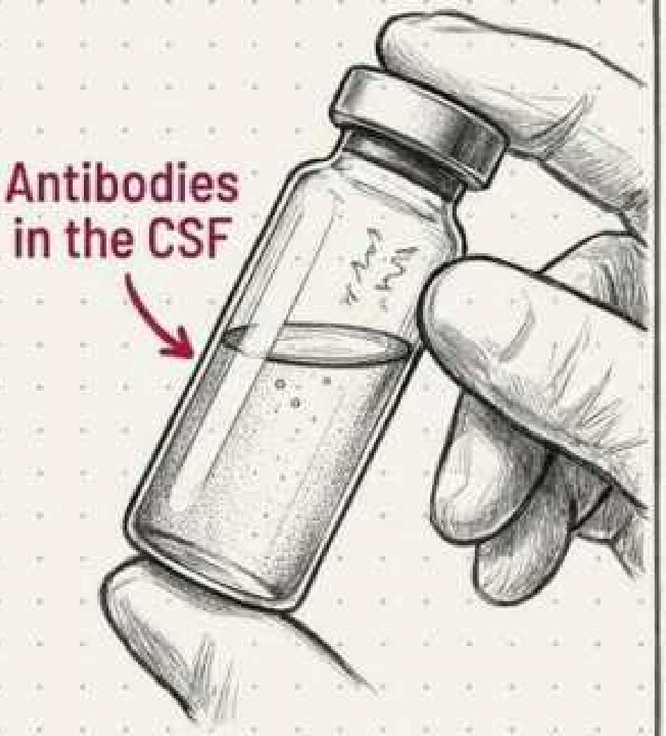
1. Clinical Features



2. MRI



3. Lumbar Puncture



The Evolution and Stratification of MS Therapeutics

¶ 5.5

1993: Interferon beta

Today: High-efficacy Monoclonal Antibodies targeting immune cells

Increasingly used early, especially in active disease.

Pillar 1: Disease-Modifying Therapies (DMTs)

Preventative. Function to reduce relapses and slow disability.

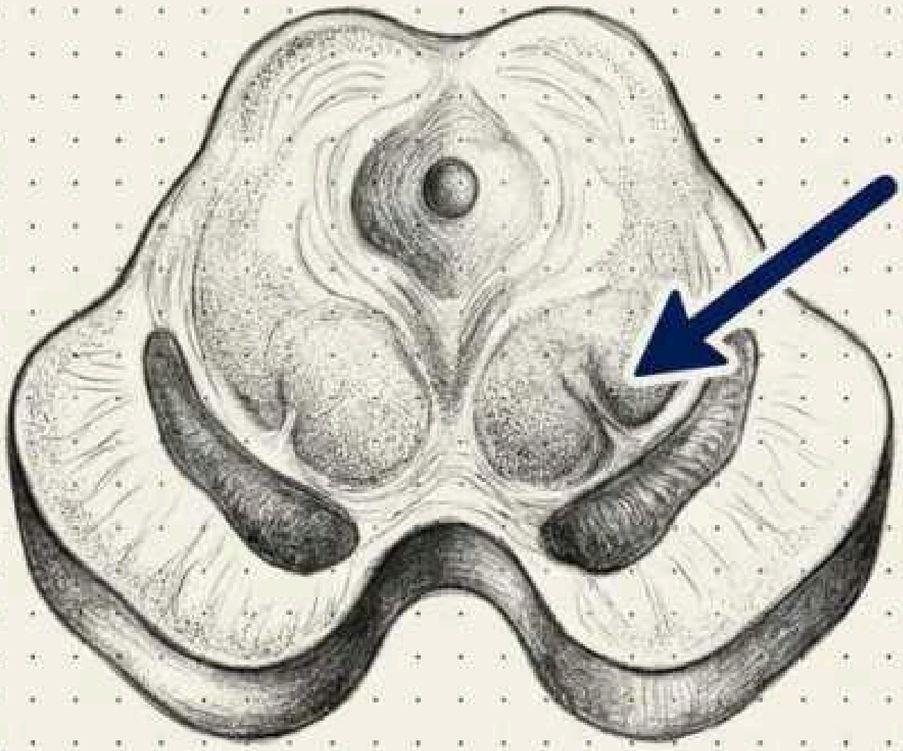
Pillar 2: Acute Relapse

Short courses of steroids.

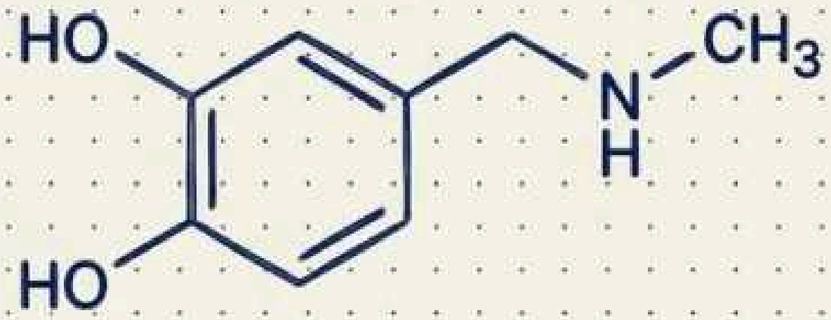
Pillar 3: Symptomatic & Rehab

Targeted treatments for fatigue, spasticity, and bladder problems to improve Quality of Life.

Parkinson's Disease: The Dopaminergic Deficit



Substantia Nigra: Loss of dopamine-producing nerve cells.



Dopamine ($C_8H_{11}NO_2$)

Chemical messenger strictly required for smooth, controlled movement

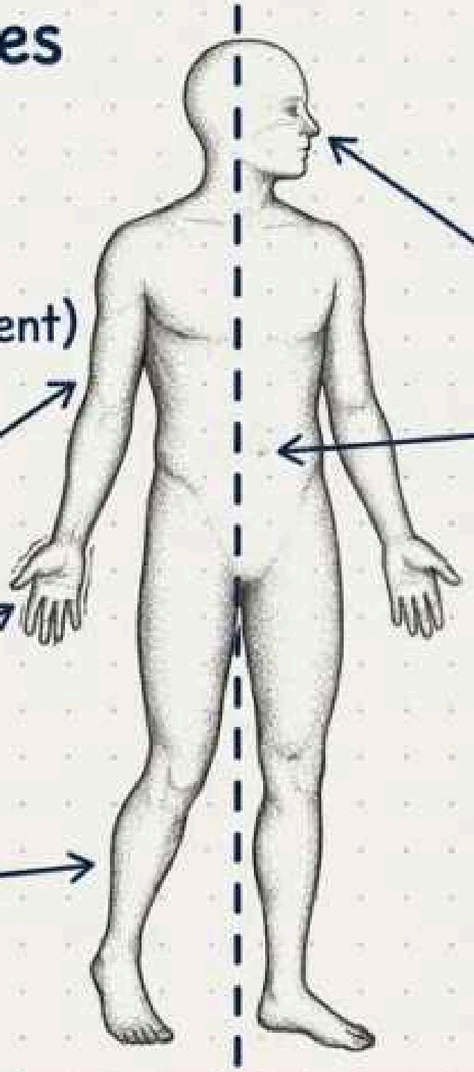
Epidemiological & Historical Context

- Fastest-growing neurological condition worldwide (driven by aging populations).
- First described by James Parkinson in 1817 (An Essay on the Shaking Palsy).

Clinical Manifestations: Motor vs. Non-Motor Timelines

Motor Features

- Bradykinesia (slowness of movement)
  ★ essential for diagnosis
- Rigidity (muscle stiffness)
- Tremor at rest (often begins in one hand)
- Late stage: problems with balance, walking, shuffling gait, freezing



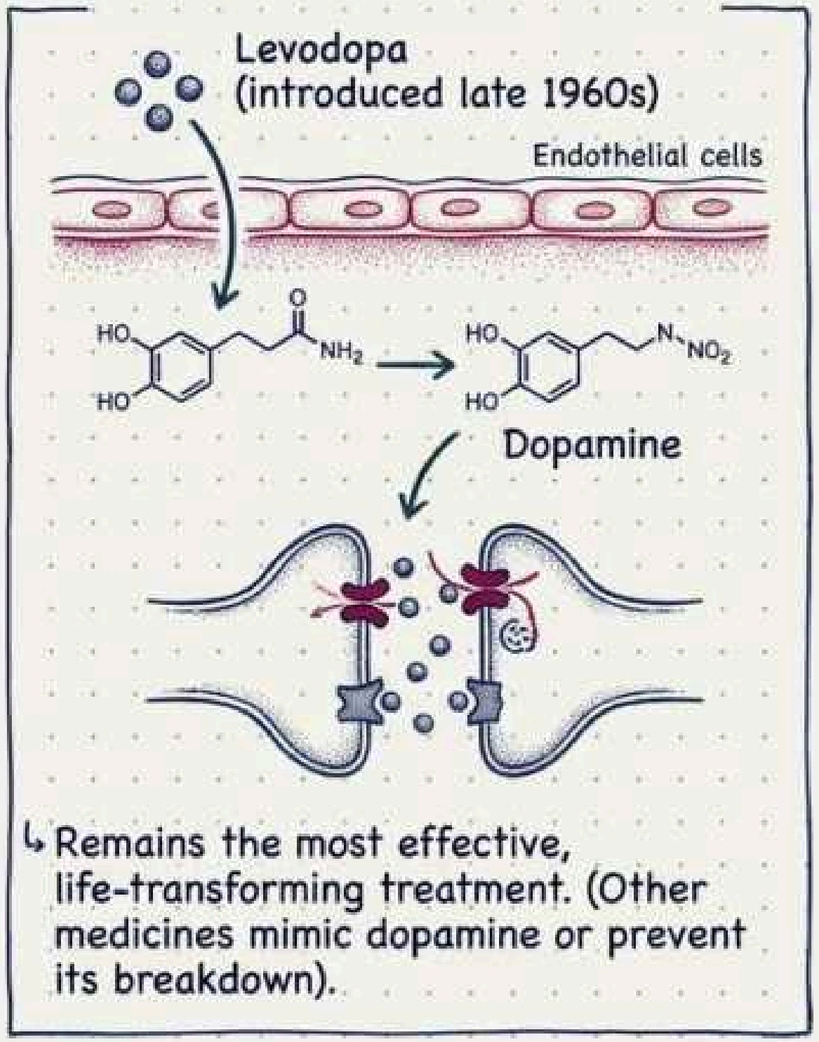
Non-Motor Features

- Anosmia (loss of smell)
- Constipation
- Sleep disorders
- Depression
- Cognitive decline (later stage)

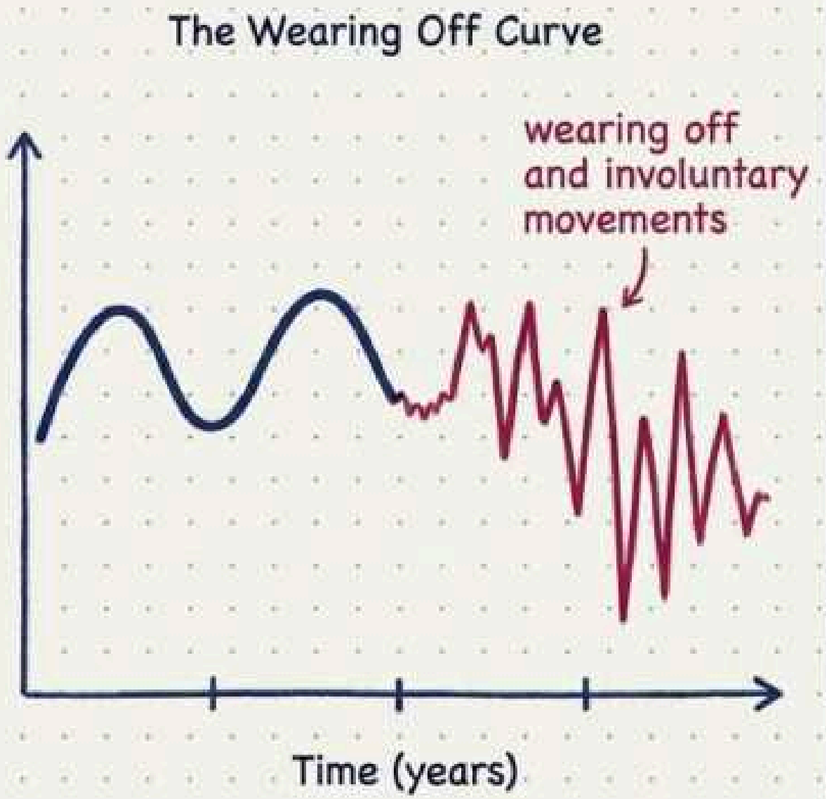
Non-motor symptoms frequently precede motor features by years.

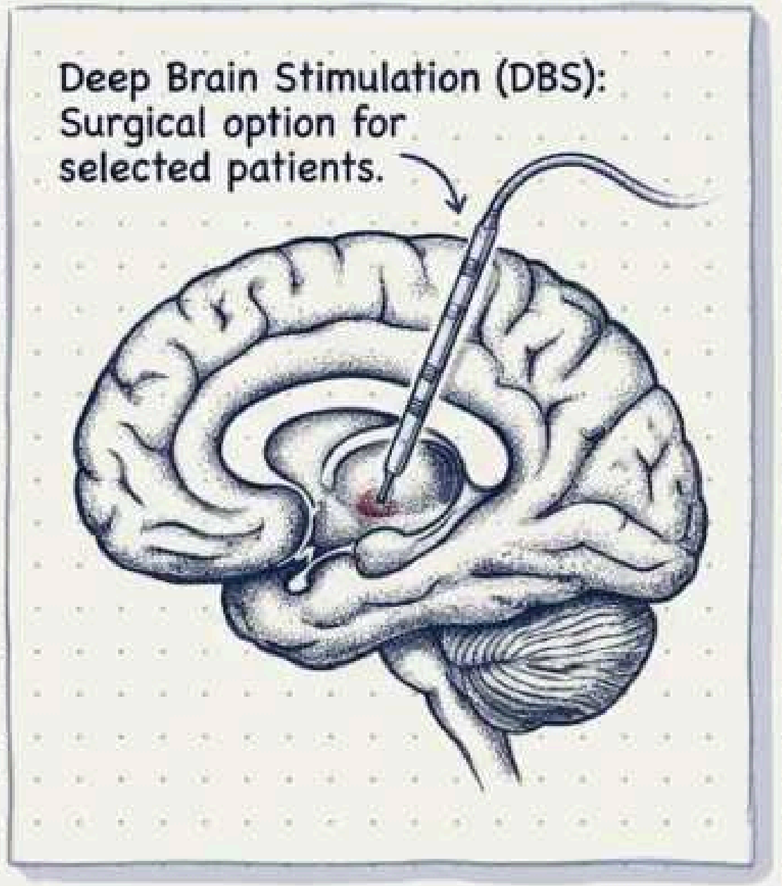
Pharmacological Mechanisms and Surgical Interventions

Clinical Prerequisite: Parkinson's disease is diagnosed clinically.

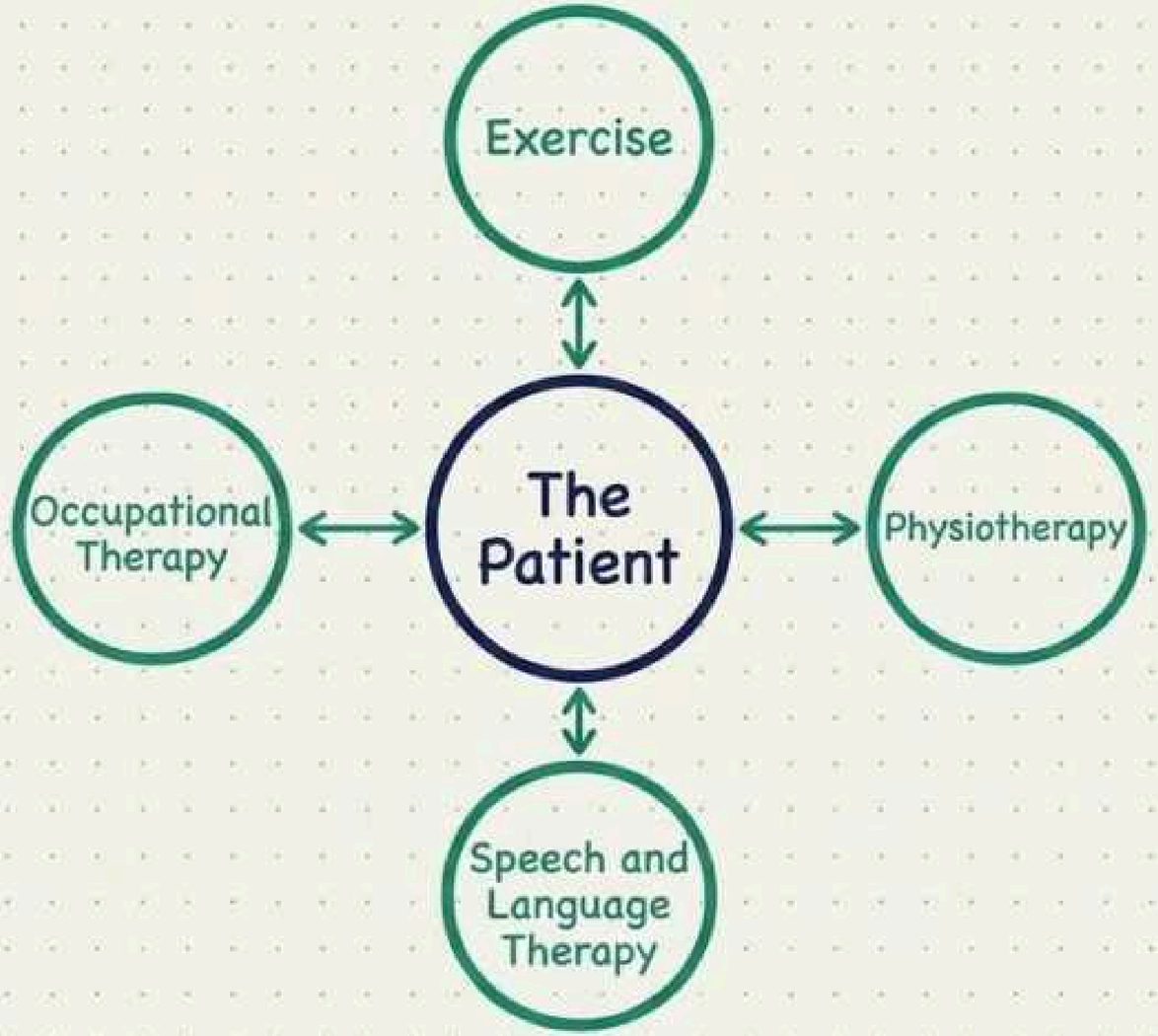


↳ Remains the most effective, life-transforming treatment. (Other medicines mimic dopamine or prevent its breakdown).





Holistic Disease Management and Trajectory



While Parkinson's disease is strictly progressive, centralizing this multidisciplinary care enables many people to live well for many years.

Differential Diagnosis of Other Movement Disorders

Essential Tremor (Commonest)	Tremor of hands/head/voice during action (e.g., holding a cup), NOT at rest. Often familial. May improve with small amounts of alcohol.
Dystonia	Sustained muscle contractions resulting in abnormal postures.
Huntington's Disease	Inherited condition (Cross-reference: Medicine 503 B).
Tics	Rapid, repetitive movements or vocalizations (e.g., Tourette syndrome).

Lecture 5 Synthesis and Forward Trajectory

Pillar 1: Multiple Sclerosis

Inflammatory disease of young adults

↓

Targets Myelin

↓

Defined by increasingly effective DMTs.

Pillar 2: Parkinson's Disease

Loss of dopamine-producing cells

↓

Targets Substantia Nigra (aging populations)

↓

Responds well to Levodopa.

Pillar 3: Movement Disorders

Distinguished by highly specific clinical patterns (Rest vs. Action tremors; Posture vs. Tic).

Lecture 6 Preview: Dementia, Nerve and Muscle Disease, and Functional Disorders