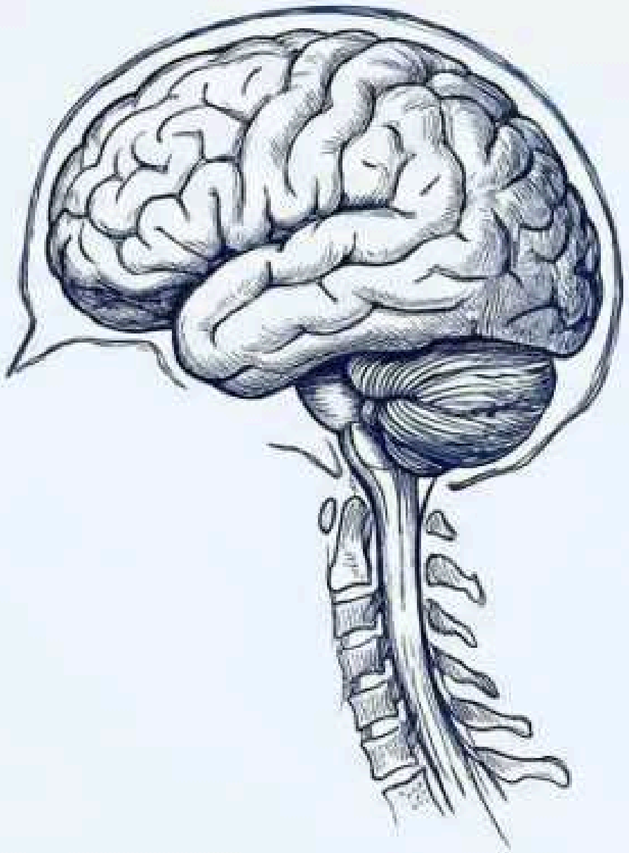
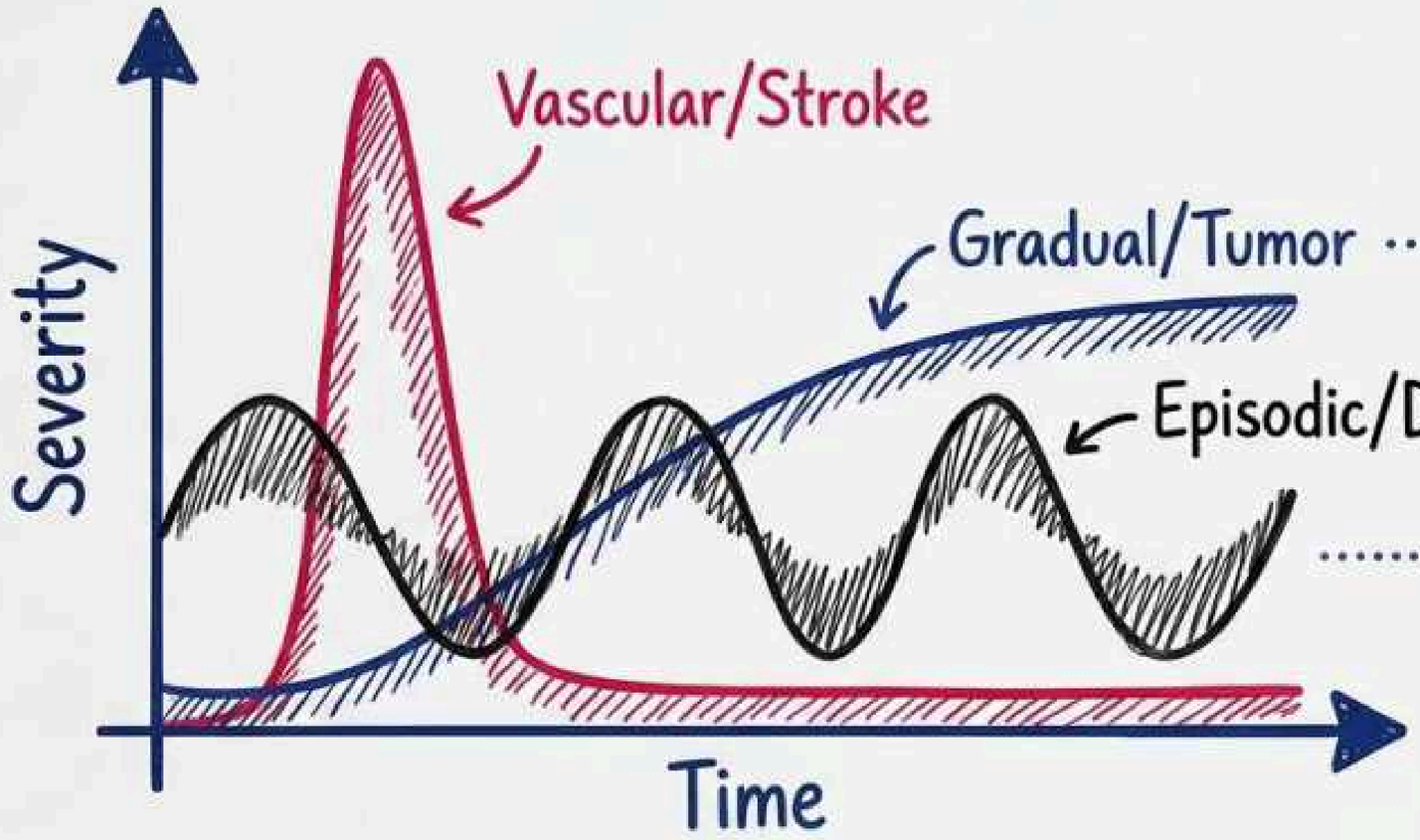
The Neurological Assessment



Lecture 1: History, Examination, Localisation, and Investigation

Capturing the Patient's Experience and Time Course



Neurologists rely on the patient's exact own words.

Witness accounts are invaluable (especially for blackouts and seizures).

$$\text{Diagnosis} = \int (\text{Symptoms})\, dt$$

Precision in Symptom Vocabulary

Weakness = Loss of Power

- ≠ ~~Numbness~~
- ≠ ~~Clumsiness~~
- ≠ ~~Tiredness~~

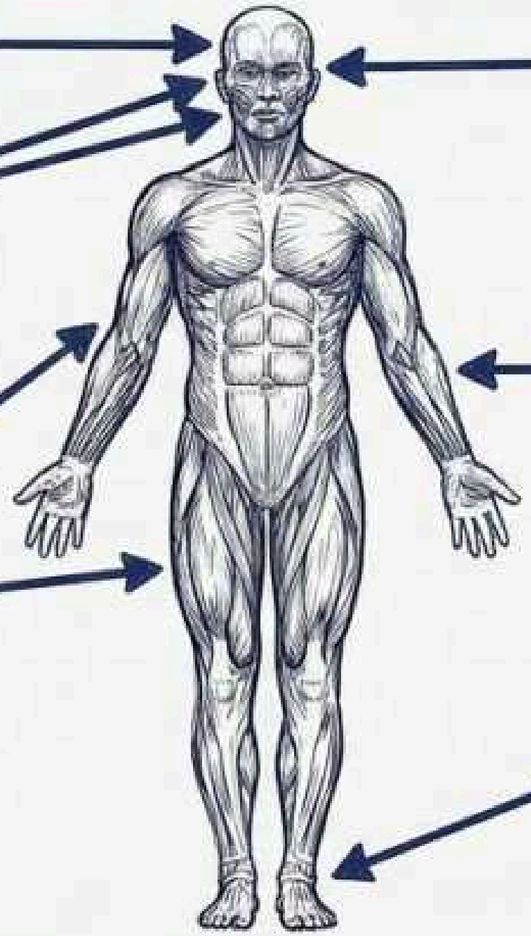
Dizziness

- Vertigo (Spinning sensation)
- Light-headedness
- Unsteadiness

Patients' words must be clarified, never assumed.

The Six Pillars of the Neurological Examination

1. Mental State & Speech
2. Cranial Nerves
   (Eyes, face, hearing, tongue, swallowing)
3. Motor System
   (Muscle bulk, tone, power, reflexes)



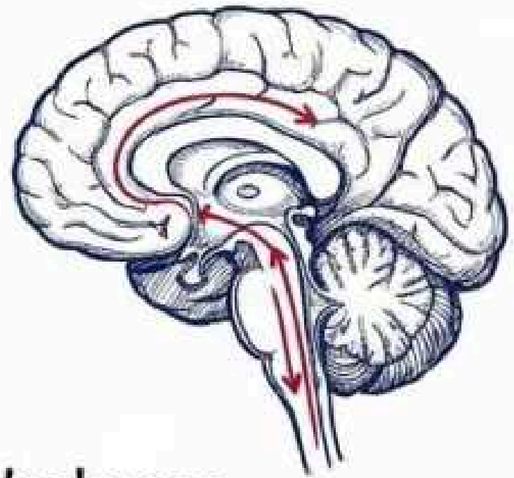
4. Sensation
5. Coordination
6. Gait
   (Walking posture)

"Watching a person walk can reveal a great deal."

¶ 1.4

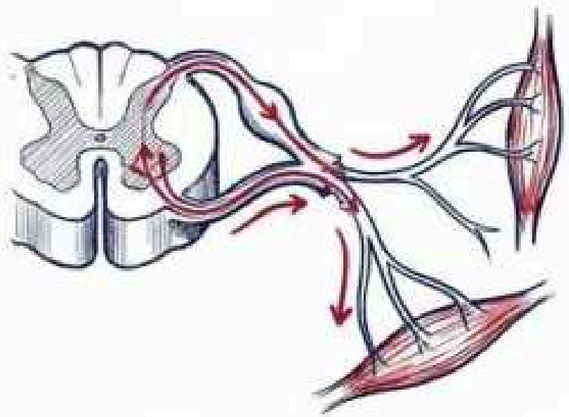
Distinguishing Upper and Lower Motor Neuron Signs

Upper Motor Neurons (Brain & Spinal Cord)



- Weakness
- ↑ Increased Tone
- ↑ Brisk Reflexes
- Babinski + (upgoing toe)

Lower Motor Neurons (Peripheral Nerves)



- Weakness with Muscle Wasting
- ↓ Reduced Tone
- ↓ Absent Reflexes

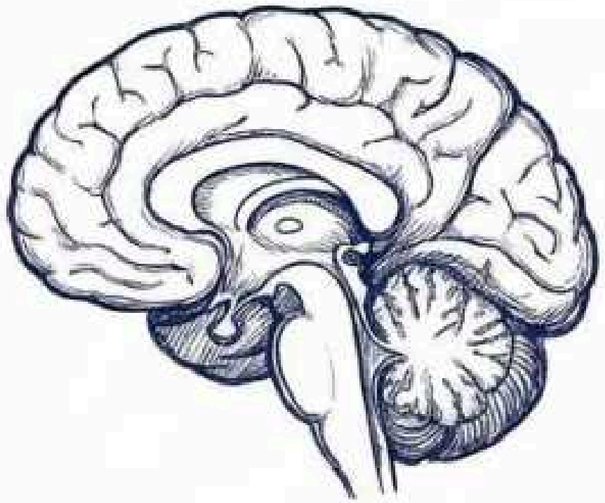


The Babinski Sign

Localisation Through Clinical Patterns

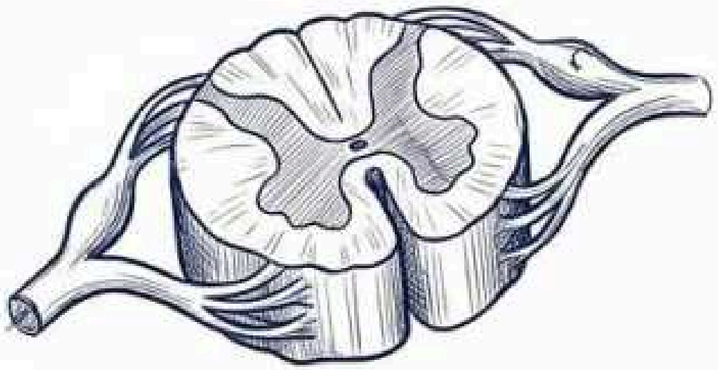
¶ 1.5

A. Unilateral weakness + face/speech involvement



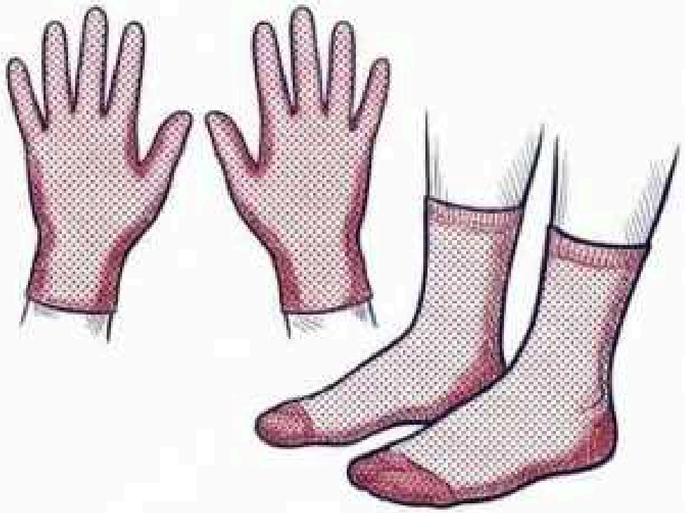
➡ ⇒ Lesion in Opposite Brain

B. Bilateral leg weakness + a distinct sensory level loss



➡ ⇒ Lesion in Spinal Cord

C. Numbness in a glove-and-stocking pattern



➡ ⇒ Disorder of Many Peripheral Nerves

Pattern(findings) ≡ Location(lesion)

First-Line Investigations

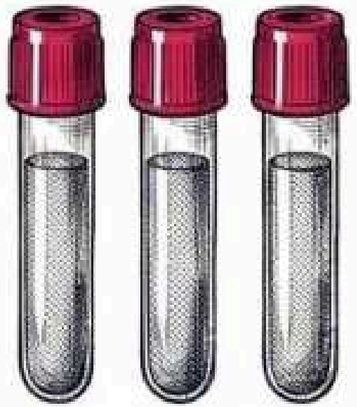
¶ 1.6

Clinical Assessment

IMAGING

- MRI (High detail: Brain and Spinal Cord)
- CT (Emergencies: Suspected Stroke or Head Injury)

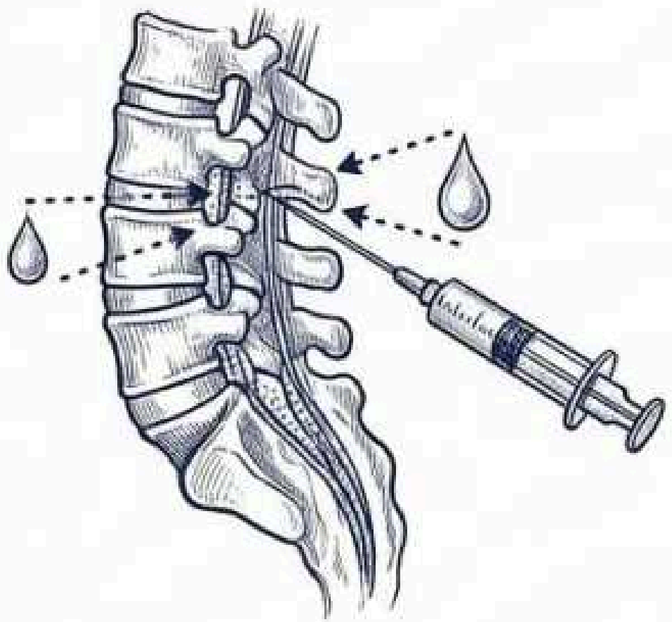
BLOODS



$\sum$ (Vitamin Deficiencies, Infection, Inflammation)

Specialized Neurological Testing

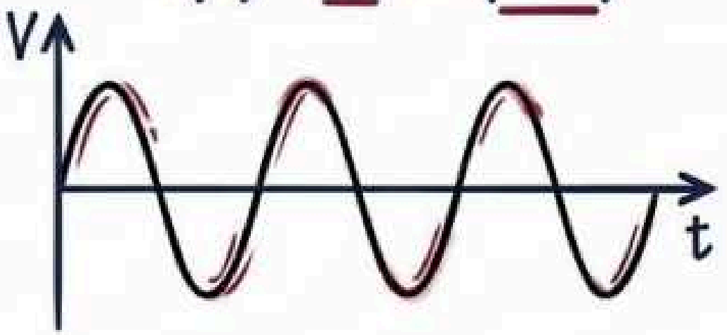
Lumbar Puncture



Samples fluid around brain/cord to diagnose meningitis, bleeding, and inflammatory conditions.

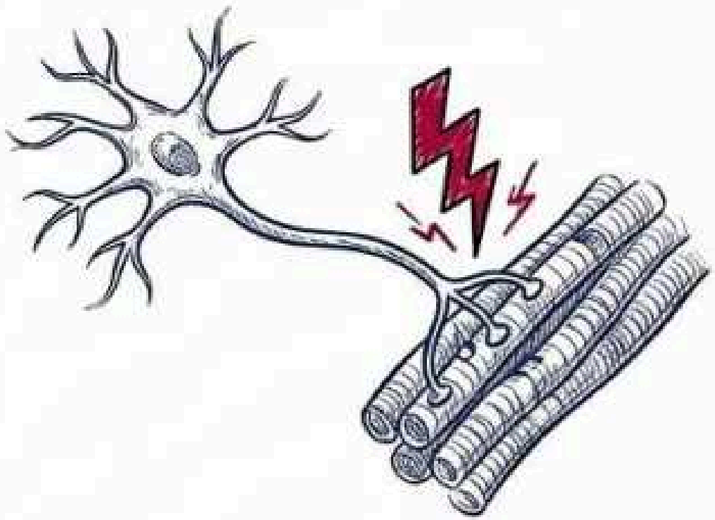
Electroencephalography (EEG)

$$f(t) = A \sin(\omega t)$$



Records the brain's electrical activity; used in epilepsy.

Nerve Conduction & EMG



Tests the function of peripheral nerves and muscles.

Clinical Interpretation Versus Artifact



MRI often shows minor changes in healthy people, especially with age, that can be mistaken for disease.

Treat the patient, not the scan.

The Complete Diagnostic Workflow

¶ 1.9

