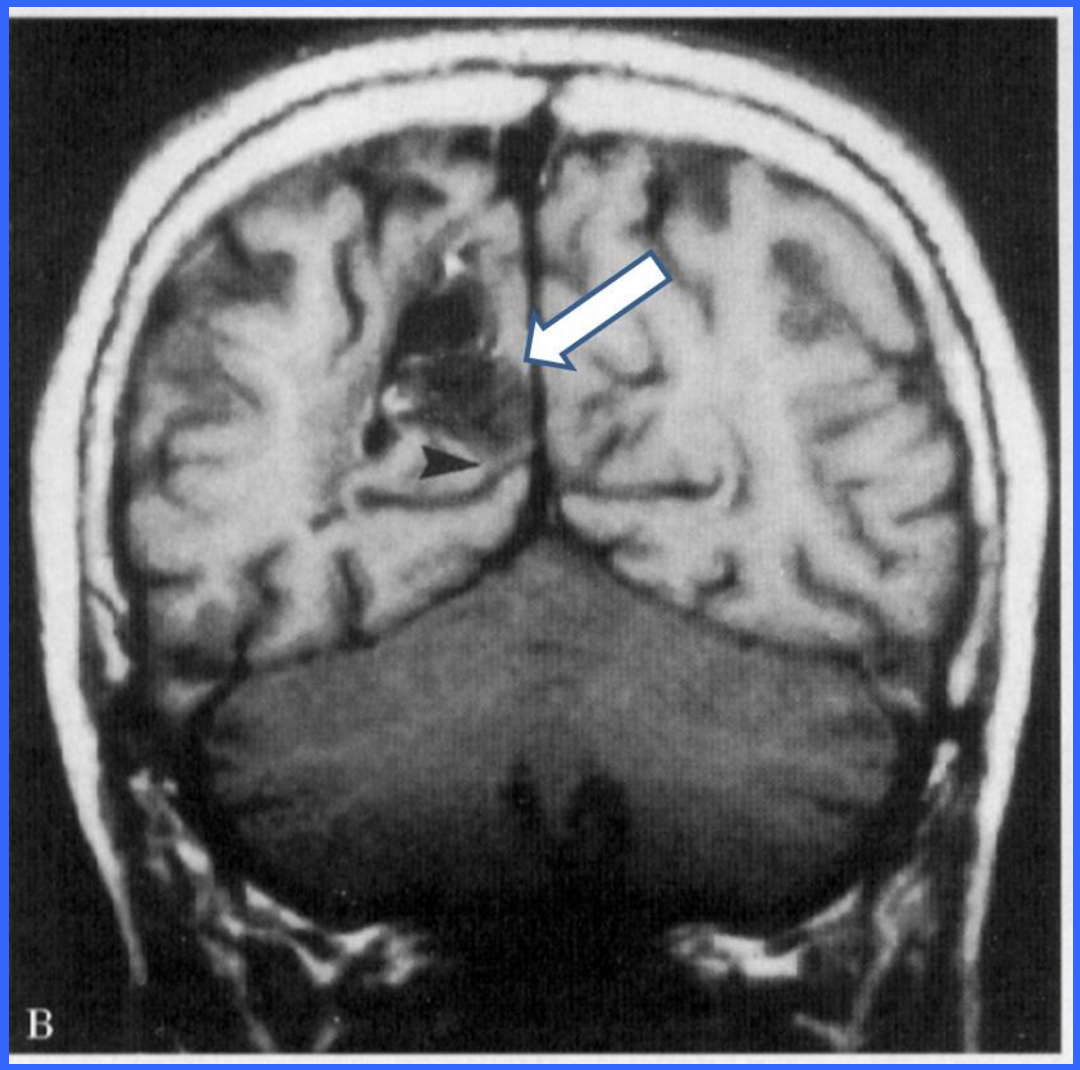
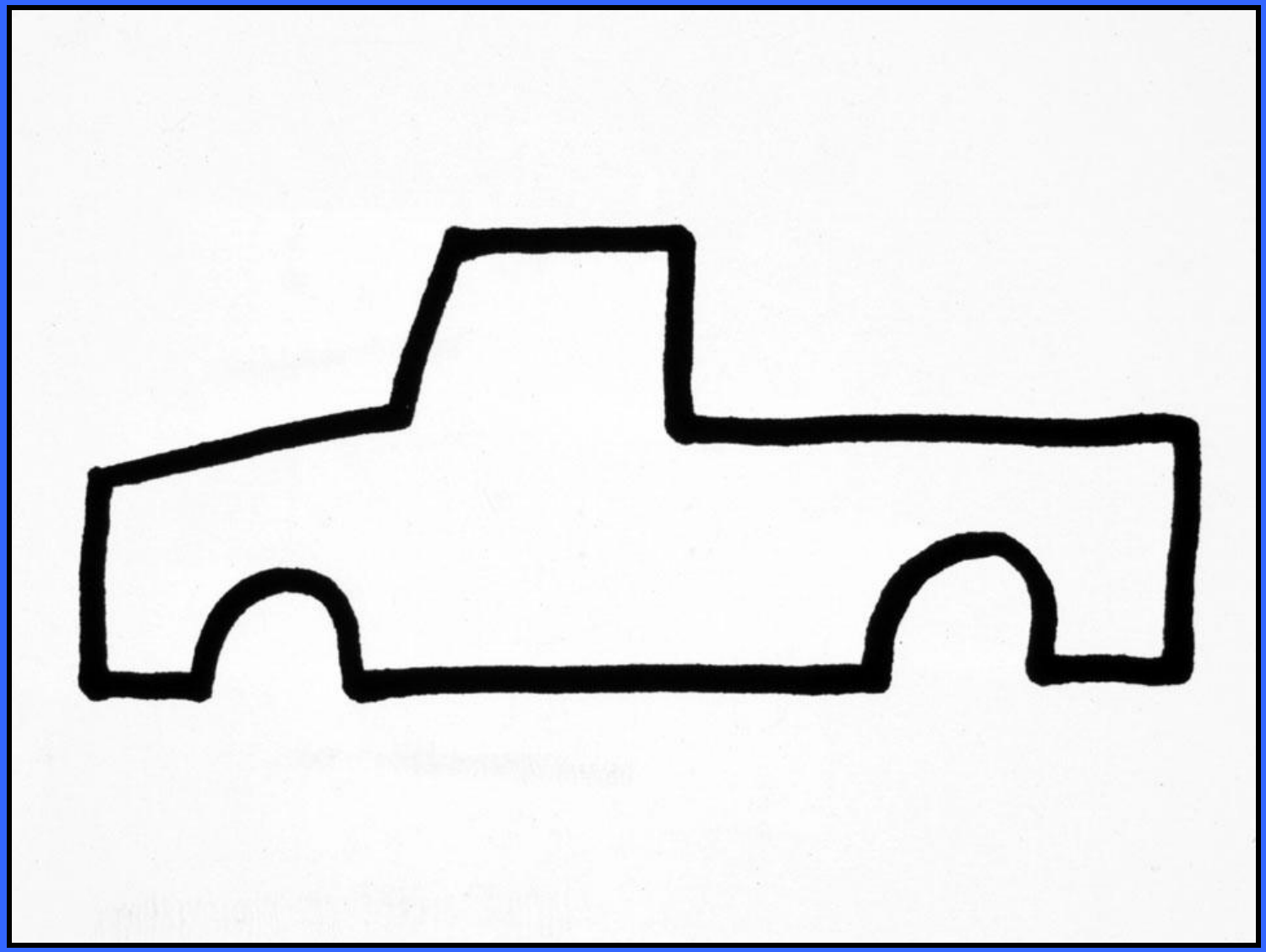
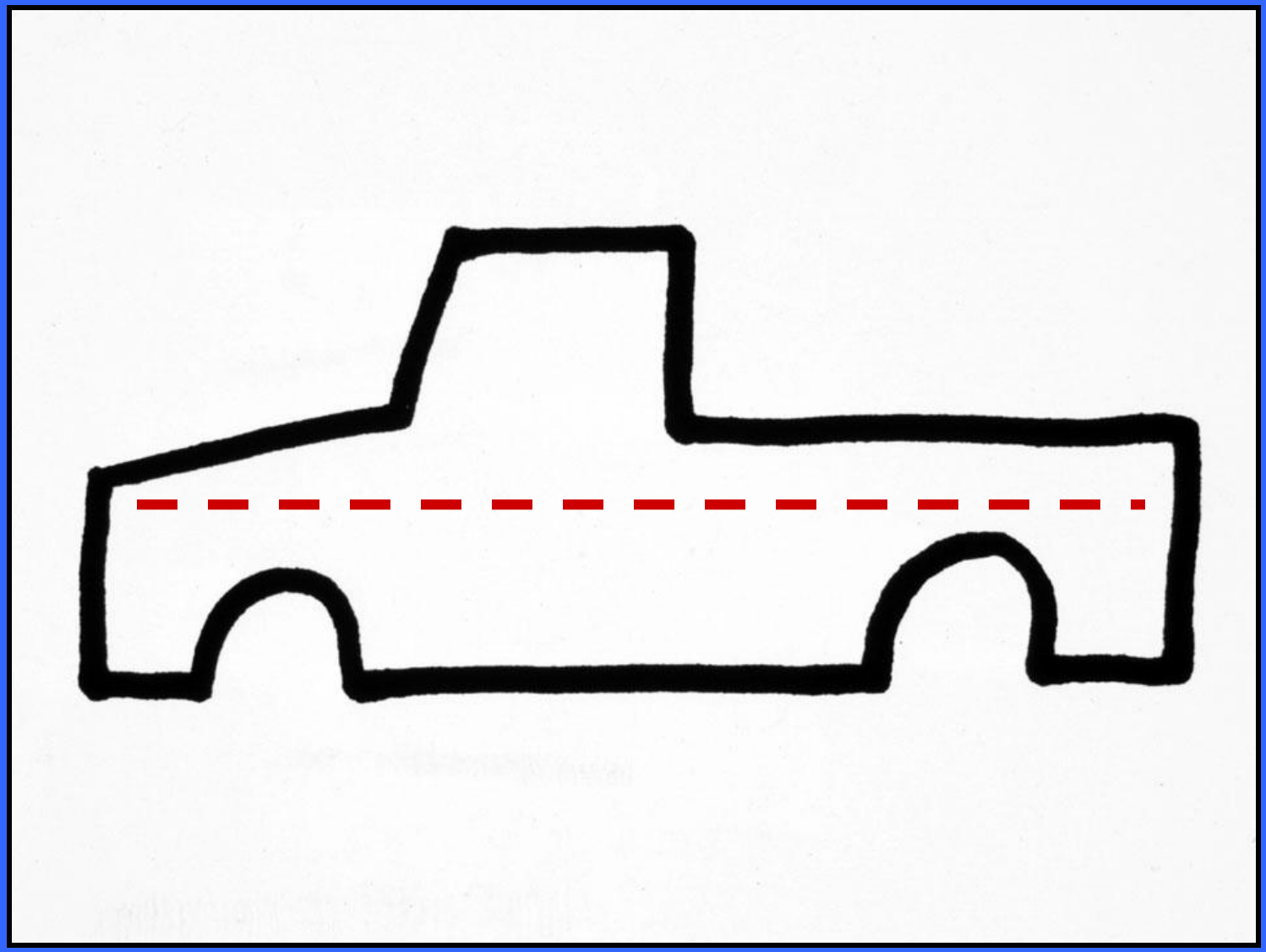
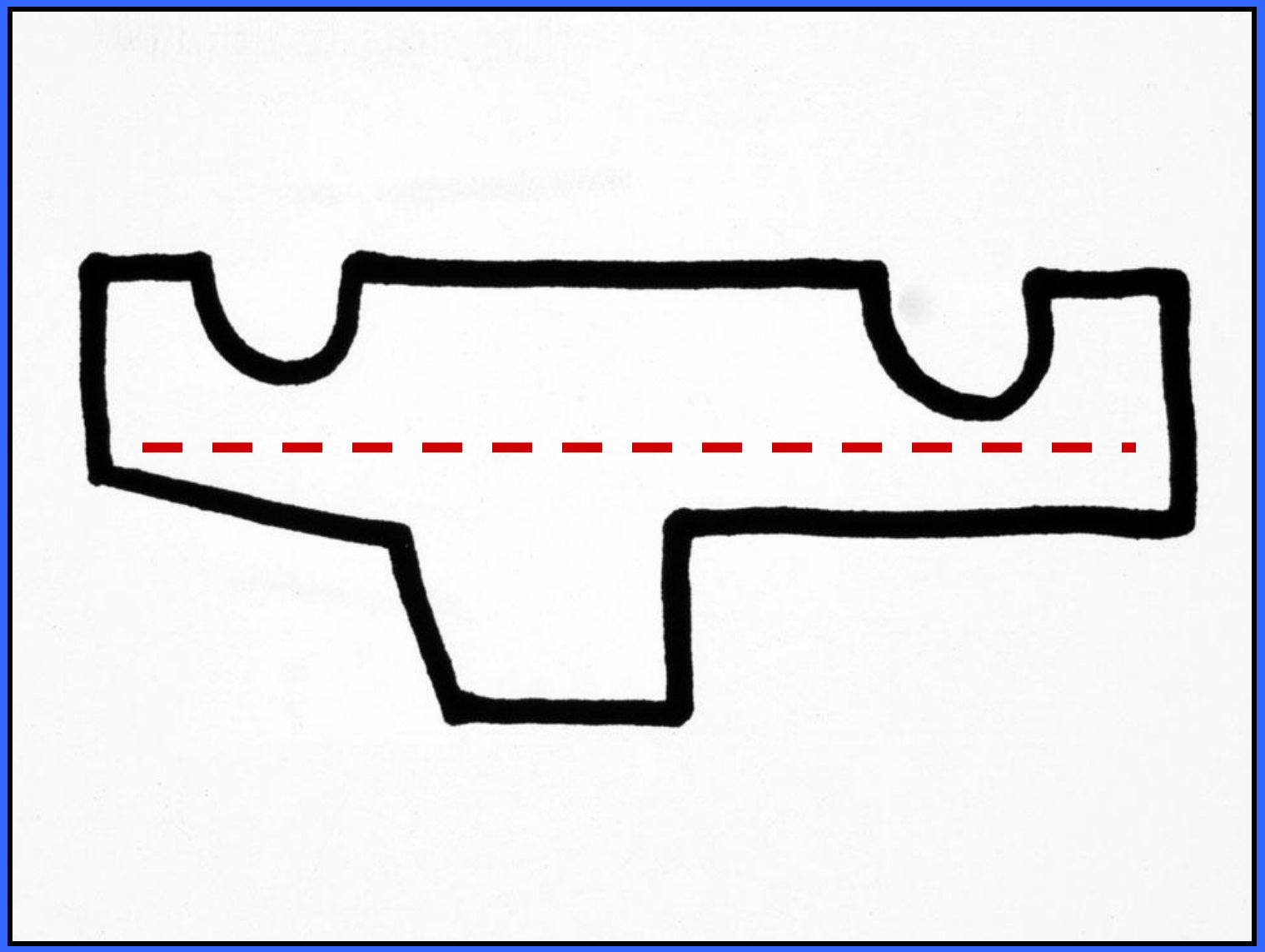
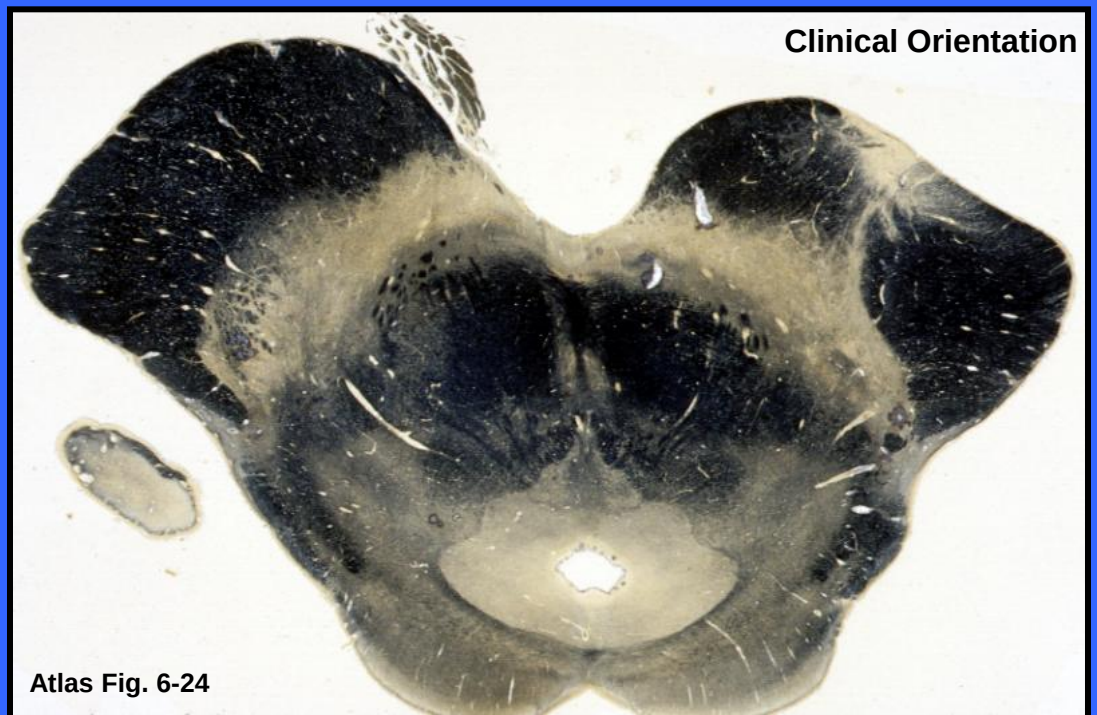

B



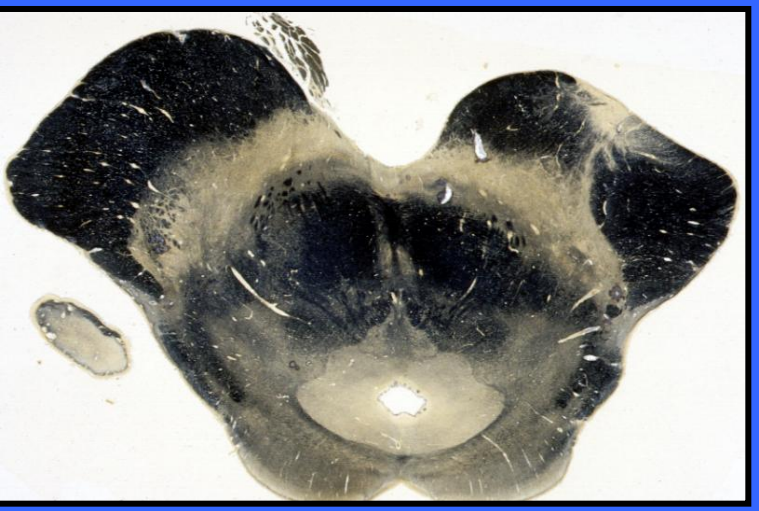


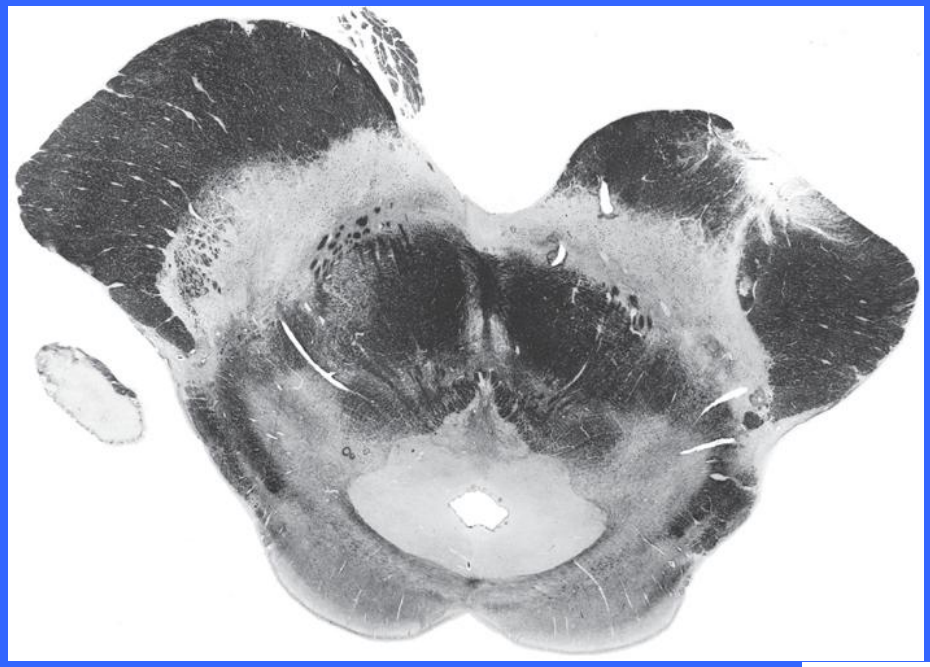


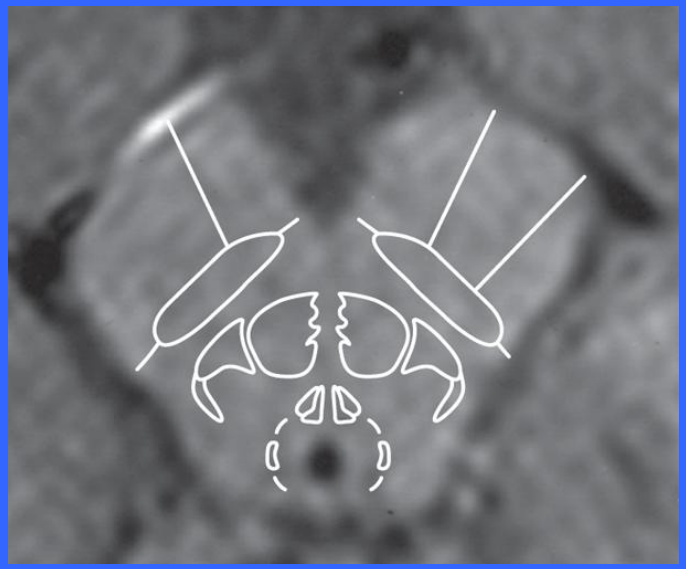

Anatomical Orientation

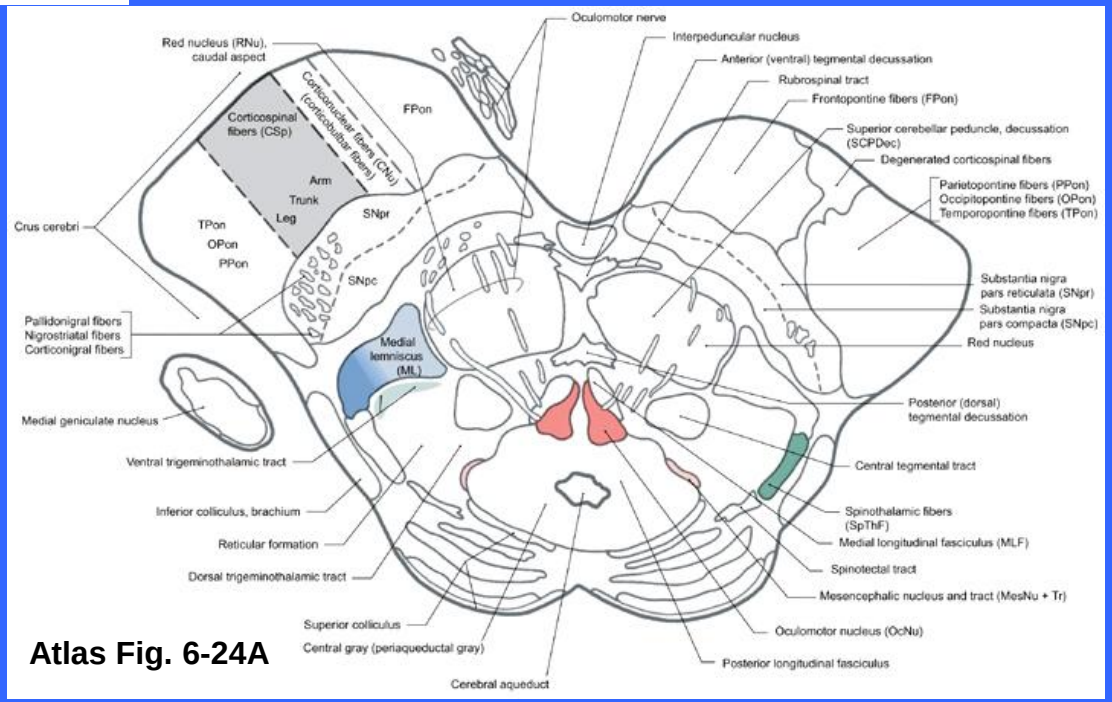

Clinical Orientation
Atlas Fig. 6-24

The Reality of the Clinical Environment





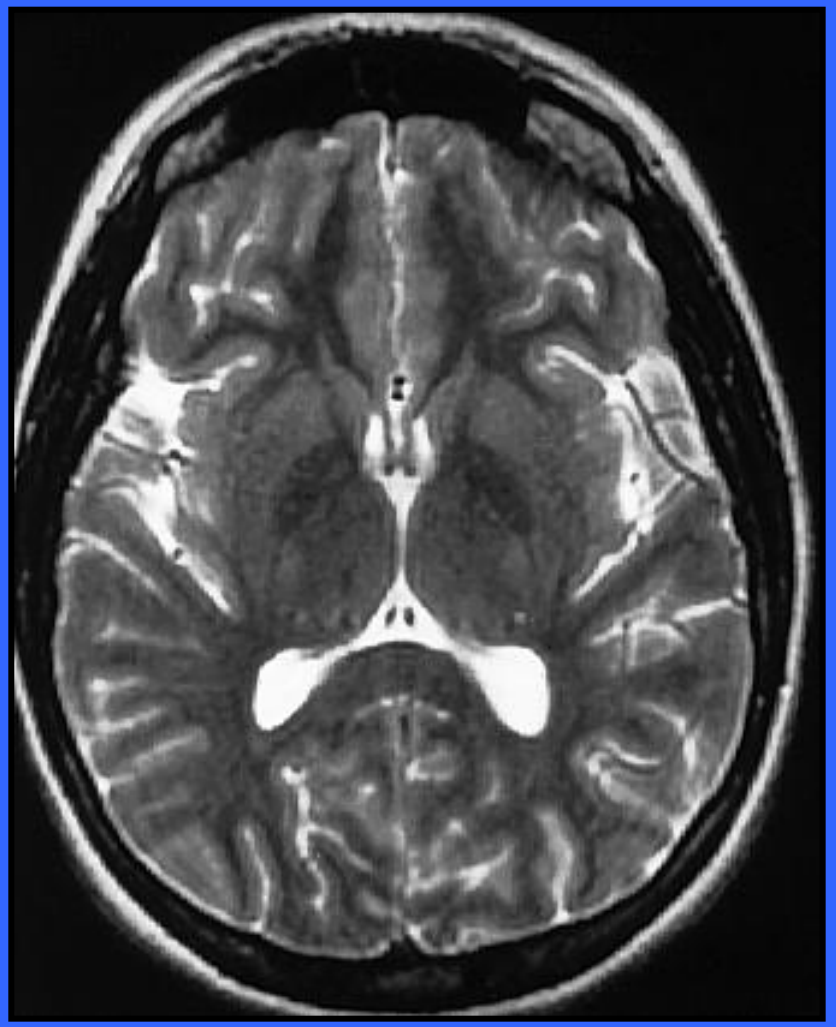




Atlas Fig. 6-24A

One Cardinal Plane to Learn AND Understand - Midsagittal

A Second Cardinal Plane to Learn AND Understand–Mid-Axial



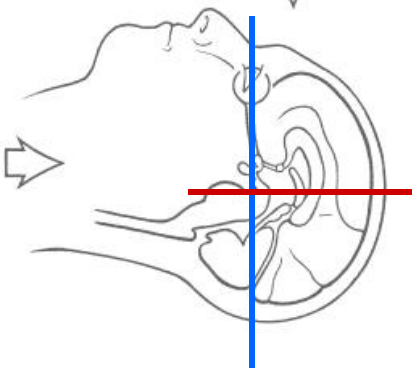
CT & MRI

Remember, Your Right is the Patient's Left

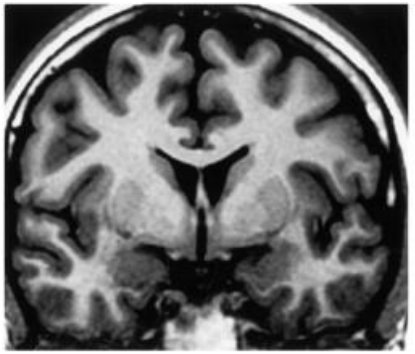
Patient

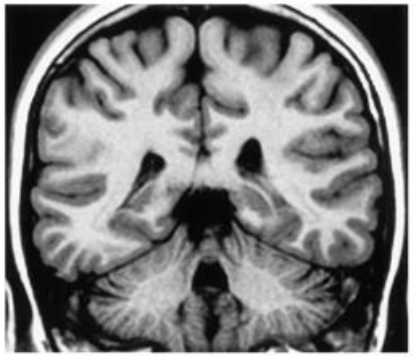
You

Axial



Coronal





Patient

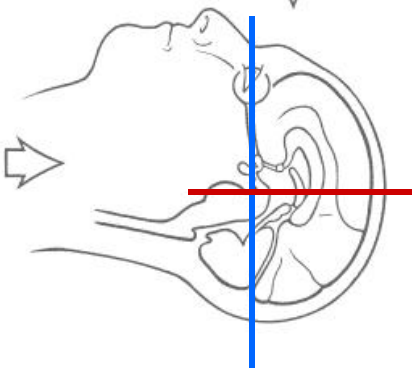
You

Remember, Your Right is the Patient's Left

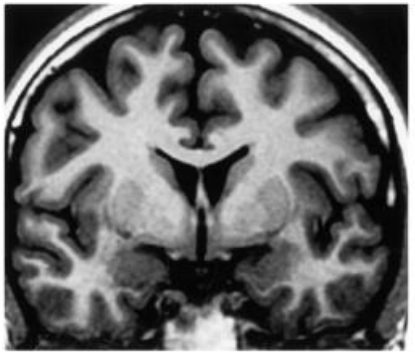
Patient

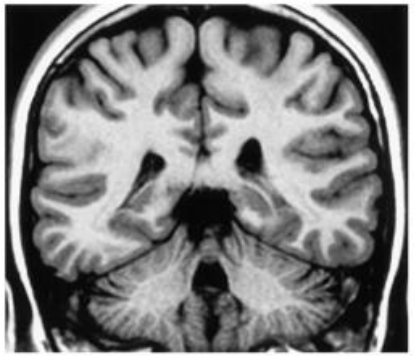
You

Axial



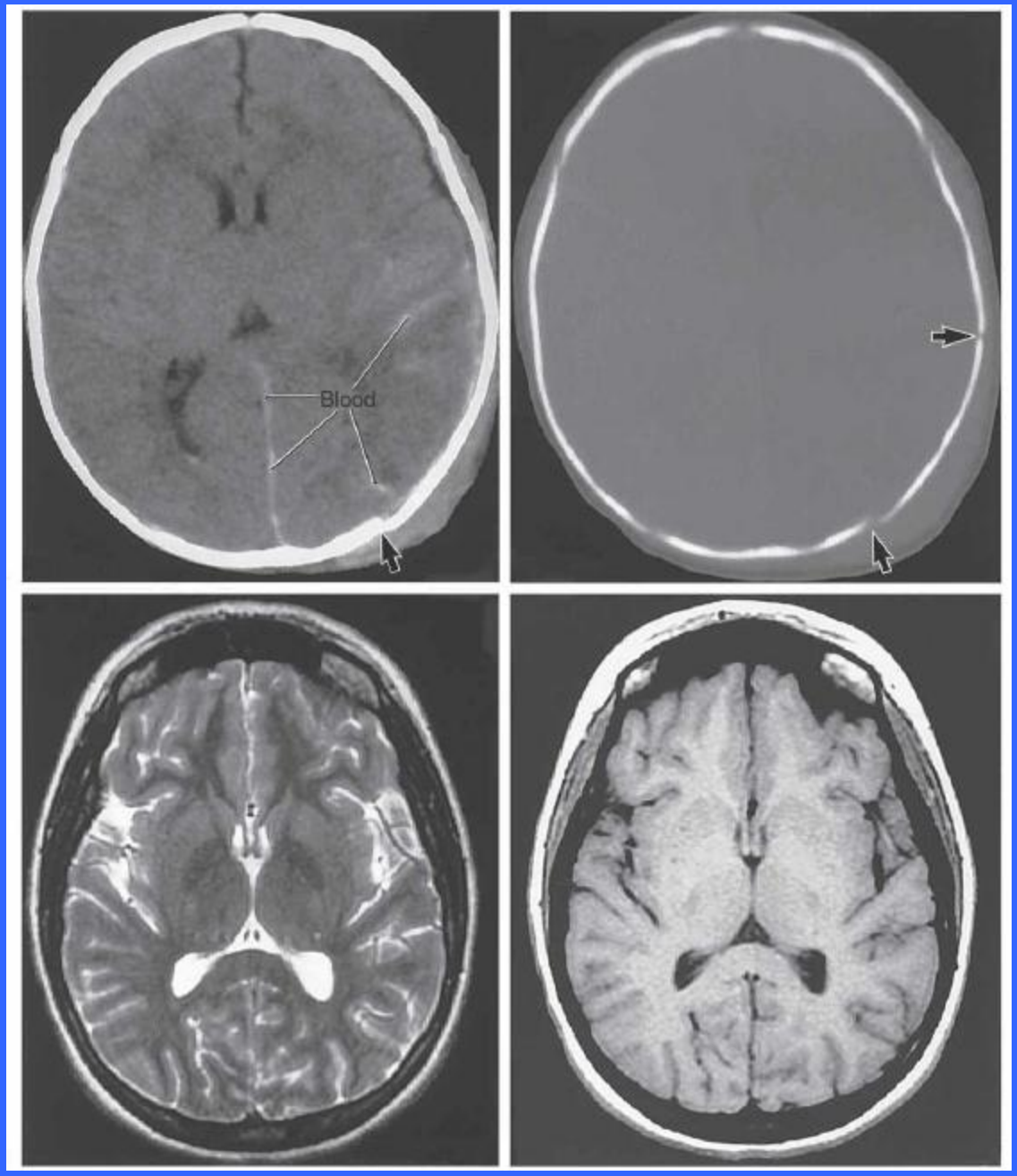
Coronal





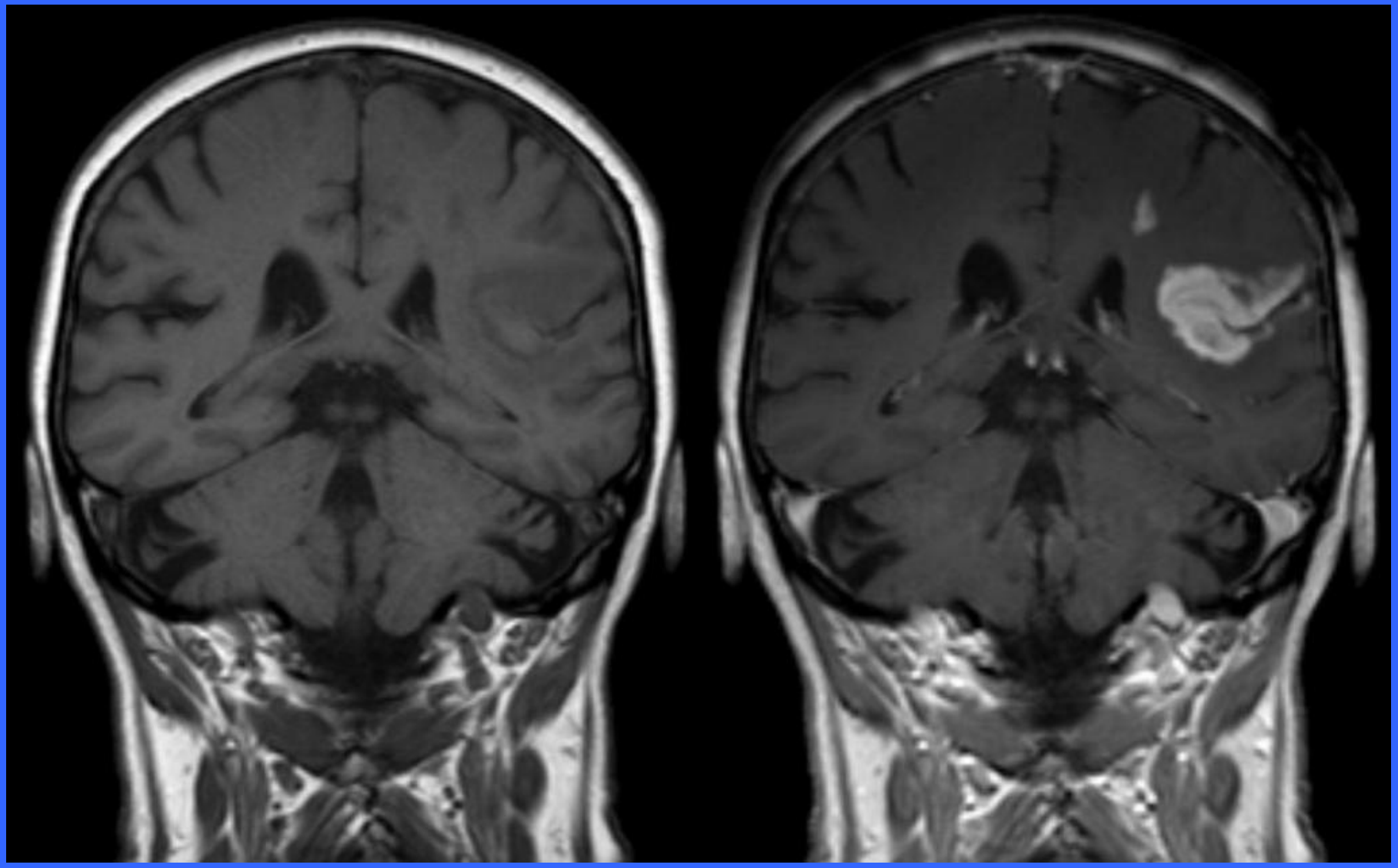
Patient

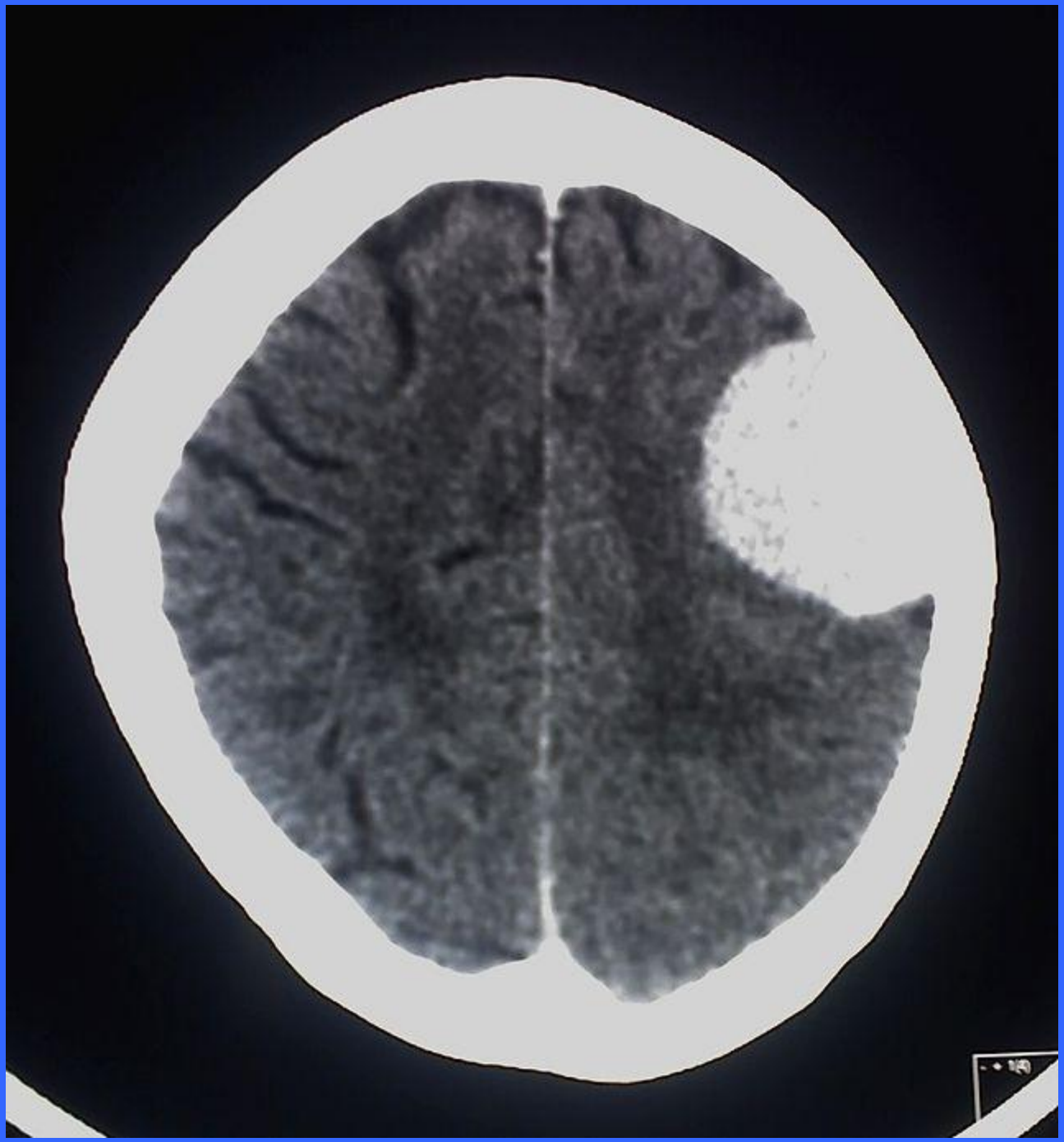
You

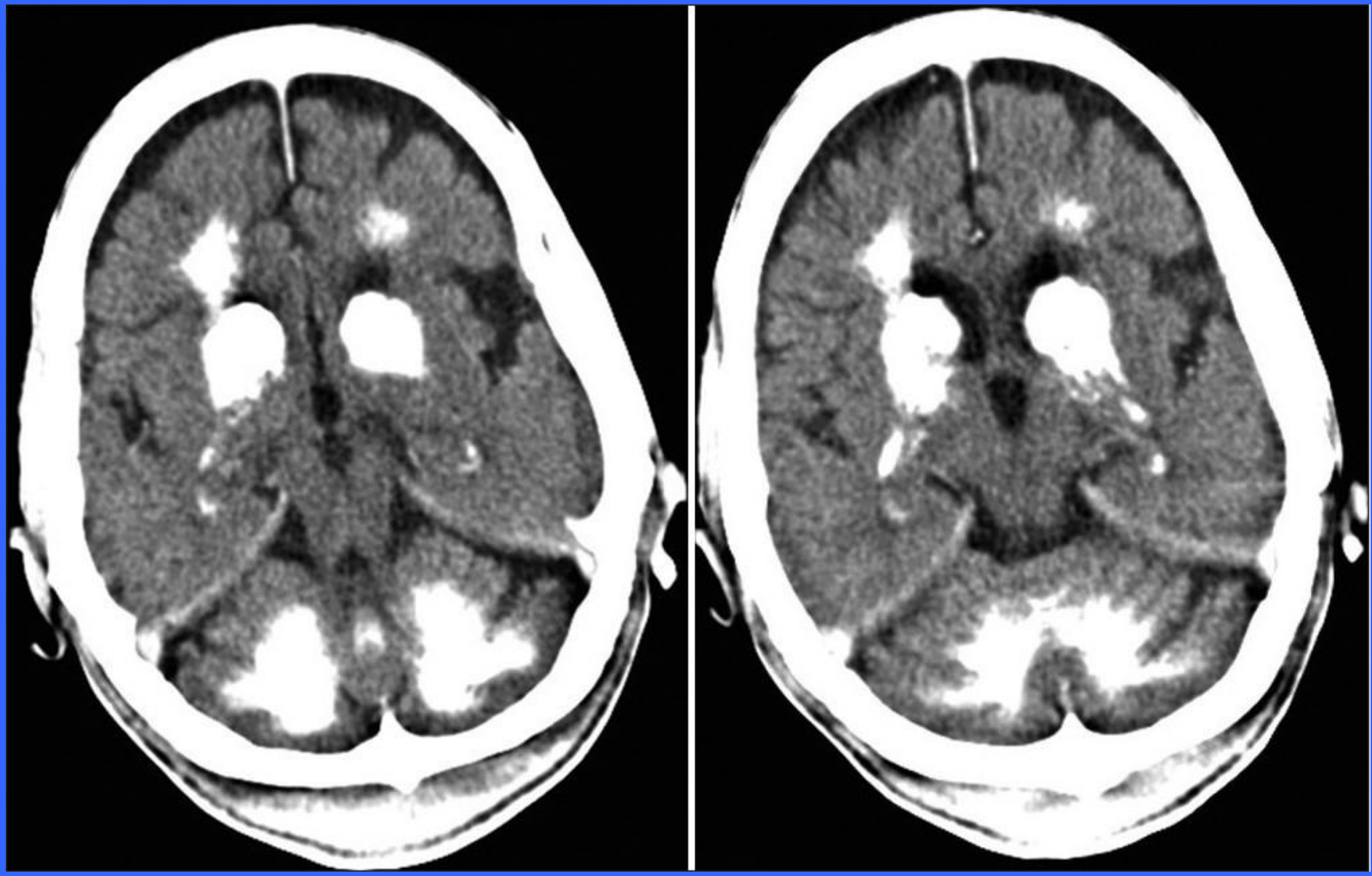

Blood

infarction

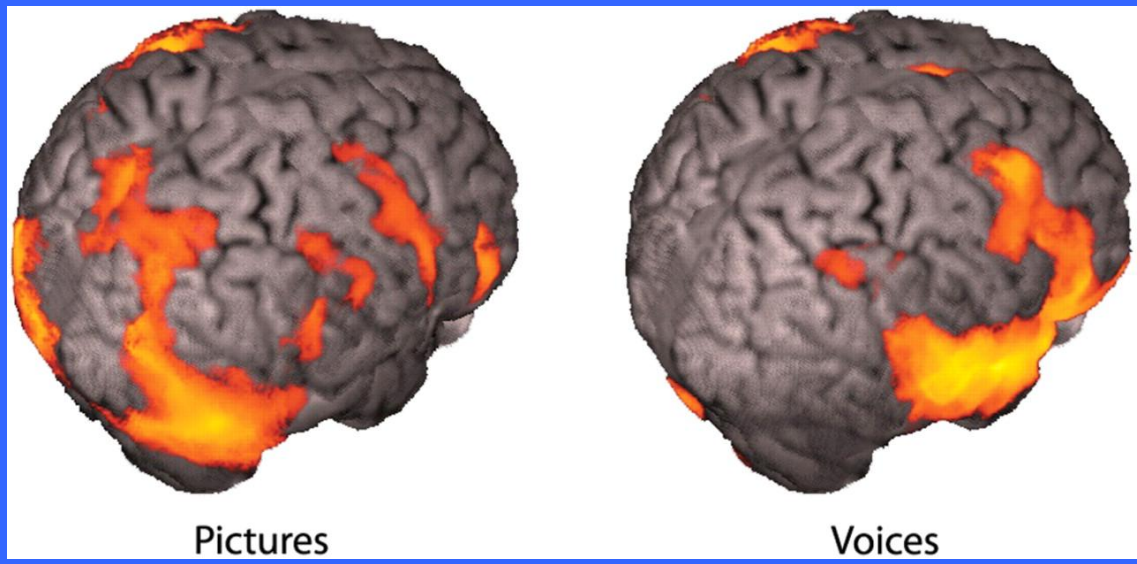
tumor

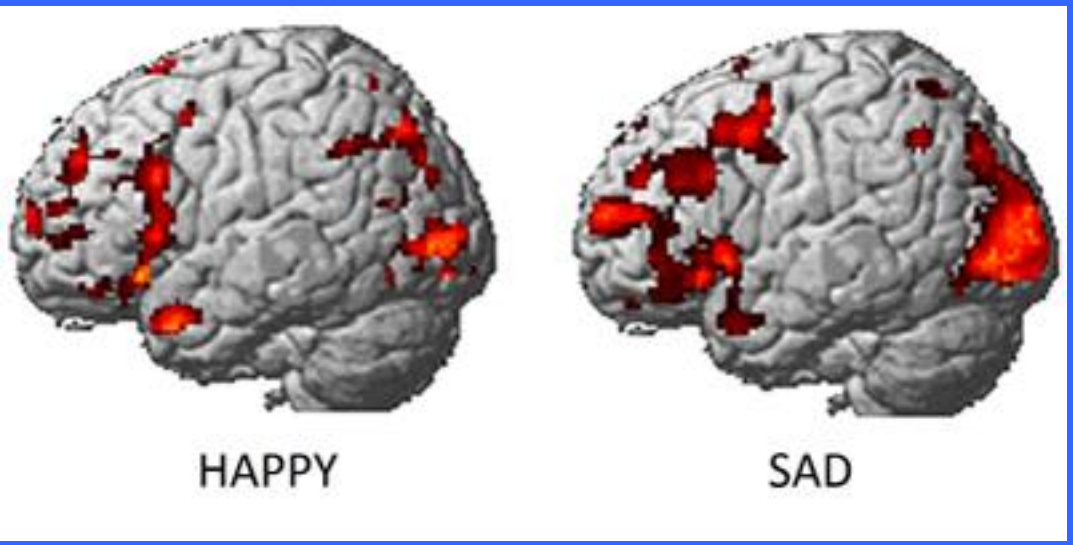




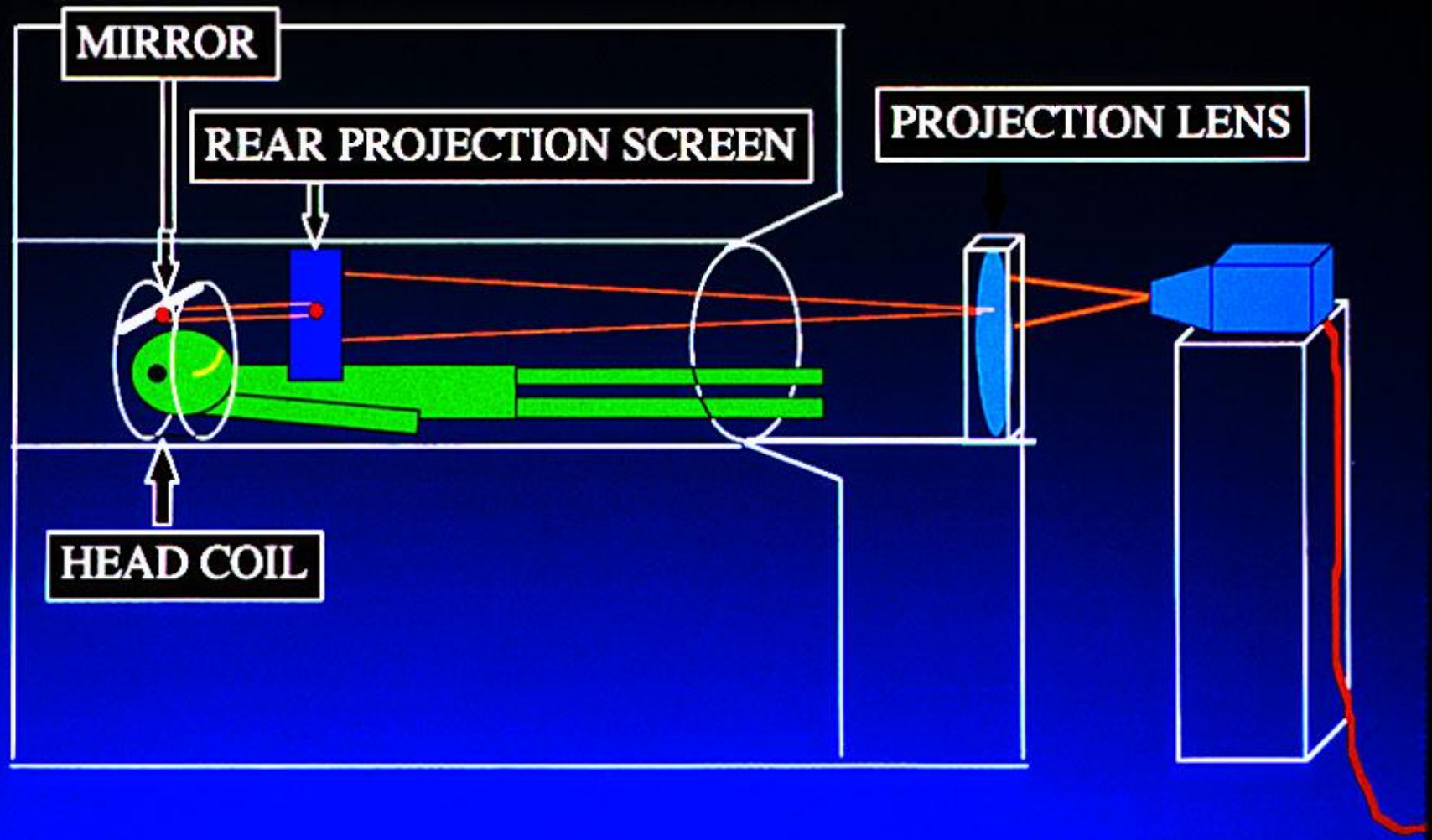


Functional MRI

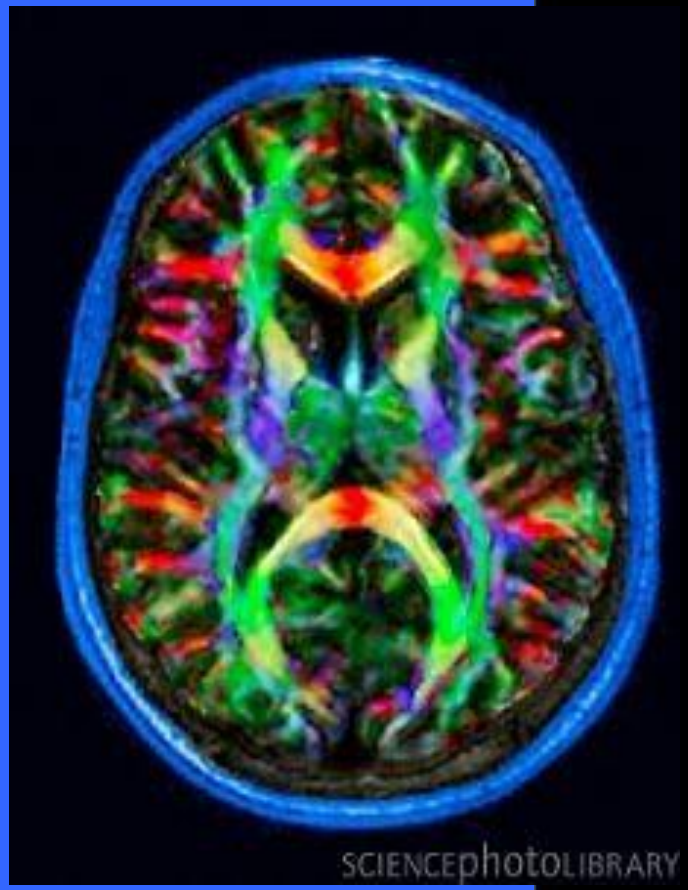


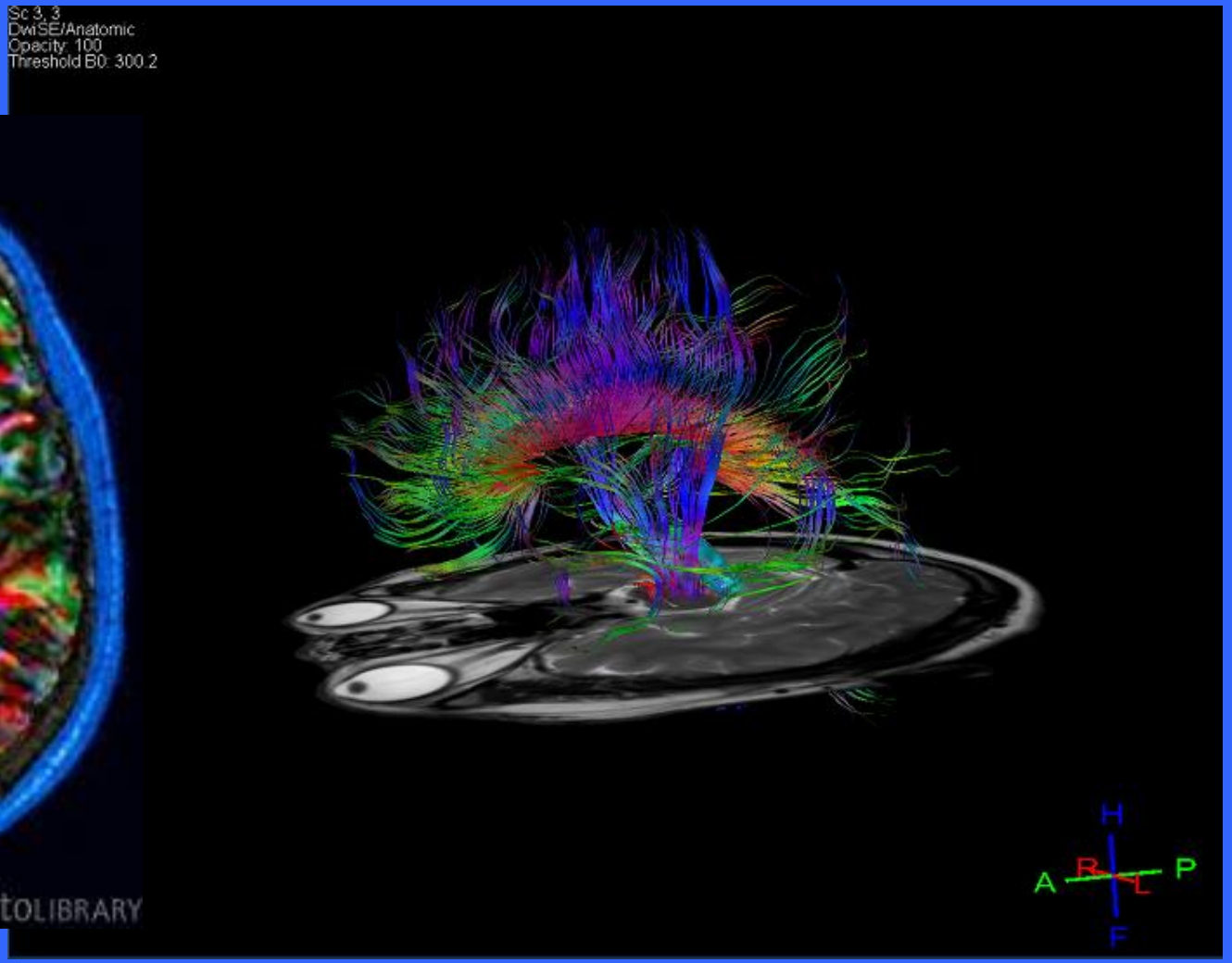


Methods: fMRI Testing Environment

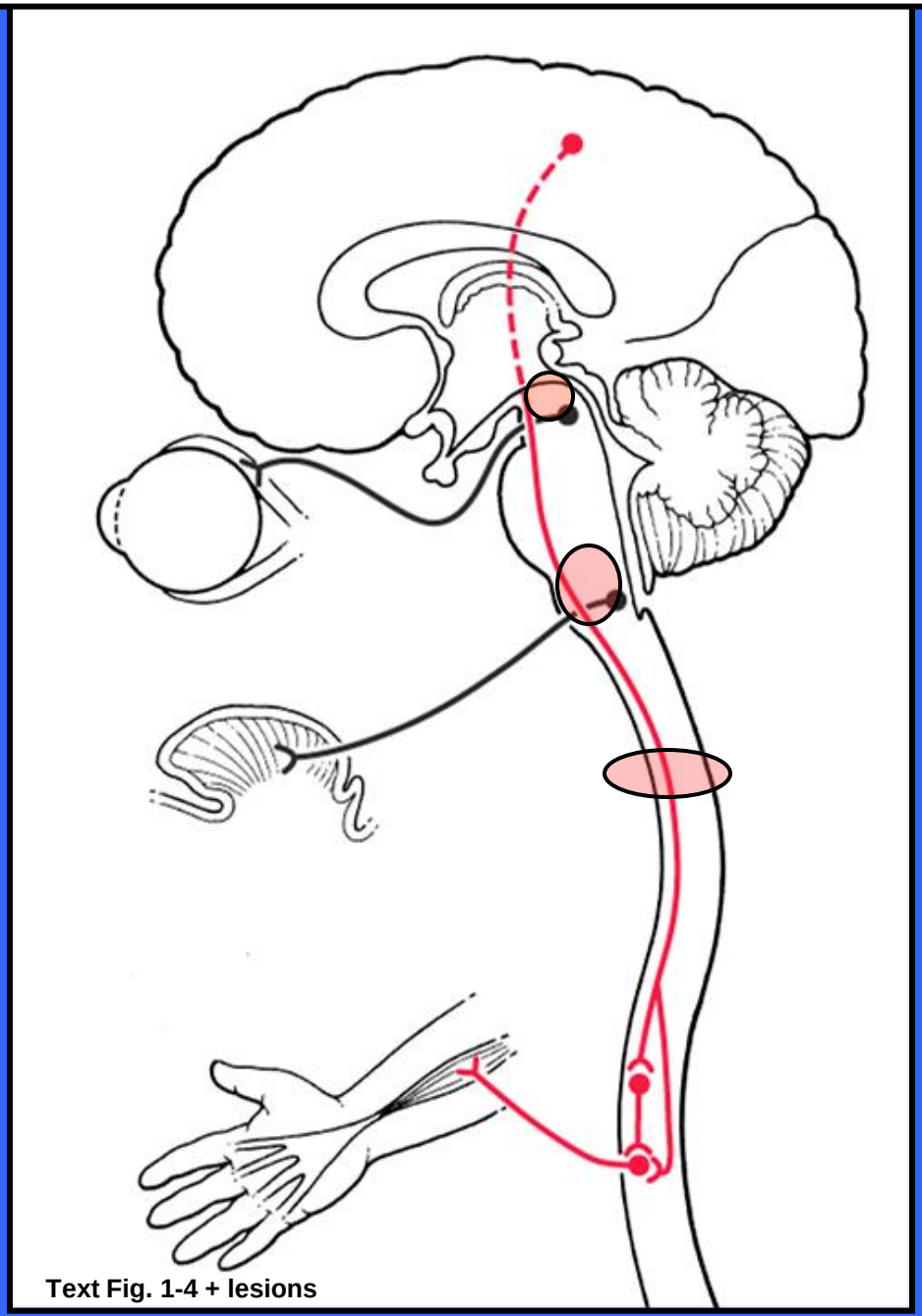


Diffusion MRI

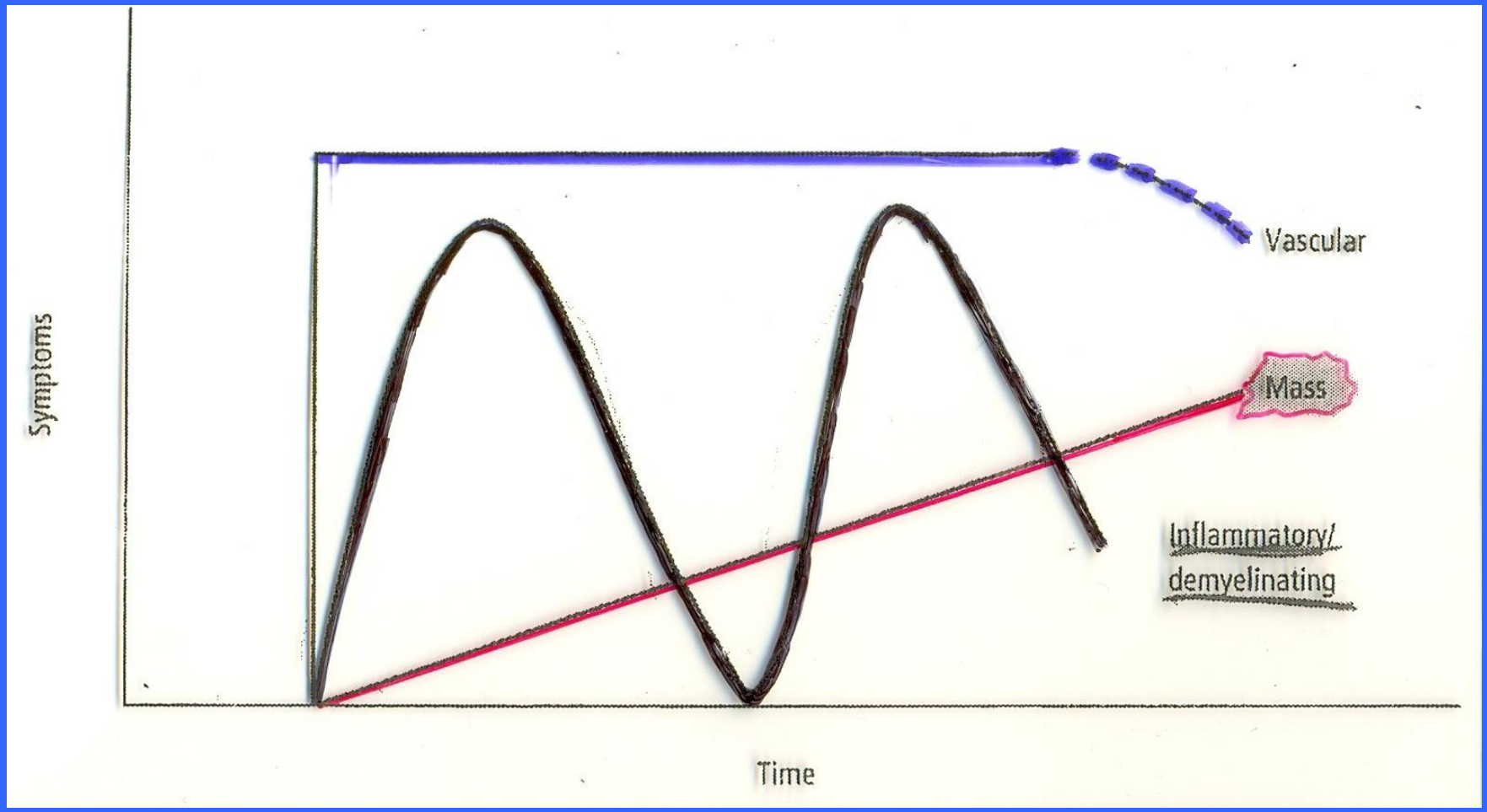




Lesions: localization and types in nervous system



Text Fig. 1-4 + lesions


Symptoms
Vascular
Mass
Inflammatory/
demyelinating
Time

Types of sensation

- types of sensations
  - General sensation
    - Somatic
    - visceral
  - Special senses
    - Smell, taste, vision etc

Types of sensation

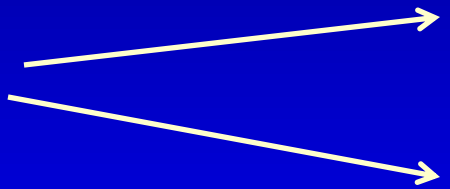
- types of sensations

Types of sensation

- types of sensations
  - General sensation
    - Somatic → exteroceptor
    - visceral → proprioceptor
  - Special senses
    - Smell, taste, vision etc

Types of sensation

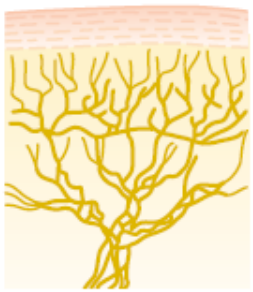
- types of sensations
  - General sensation
    - Somatic
    - visceral
  - Special senses
    - Smell, taste, vision etc



exteroceptor

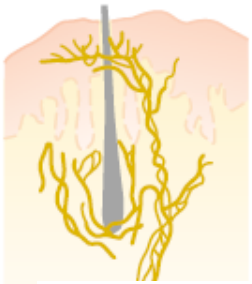
Proprioceptor : muscle length and tension, joint position and their motion

Sensations receptors



Free nerve endings

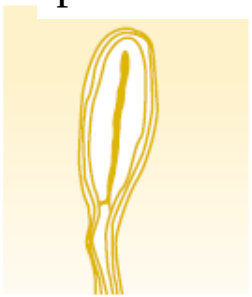
Expanded tip receptor



Hair root plexus

Pacinian corpuscle

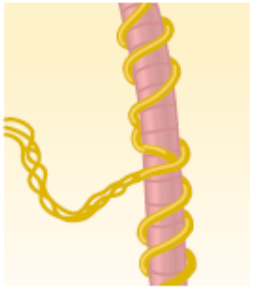
Meissner's corpuscle



Merkel discs

Ruffini's end-organ

Golgi tendon apparatus



Muscle spindle

Types of Sensory Receptors

- Mechanoreceptors
  - detect deformation
- Thermoreceptors
  - detect change in temperature
- Nociceptors
  - detect damage (pain receptors)
- Electromagnetic
  - detect light
- Chemoreceptors
  - taste, smell

Classification of Somatic Sensations

- mechanoreceptive - stimulated by mechanical displacement.
  - tactile
    - touch
    - pressure
    - vibration
    - tickle and itch
  - position or proprioceptive
    - static position
    - rate of change

Classification of Somatic Sensations

- thermoreceptive.
  - detect heat and cold.
- nociceptive.
  - detect pain and are activated by any factor that damages tissue.

Receptor Excitation

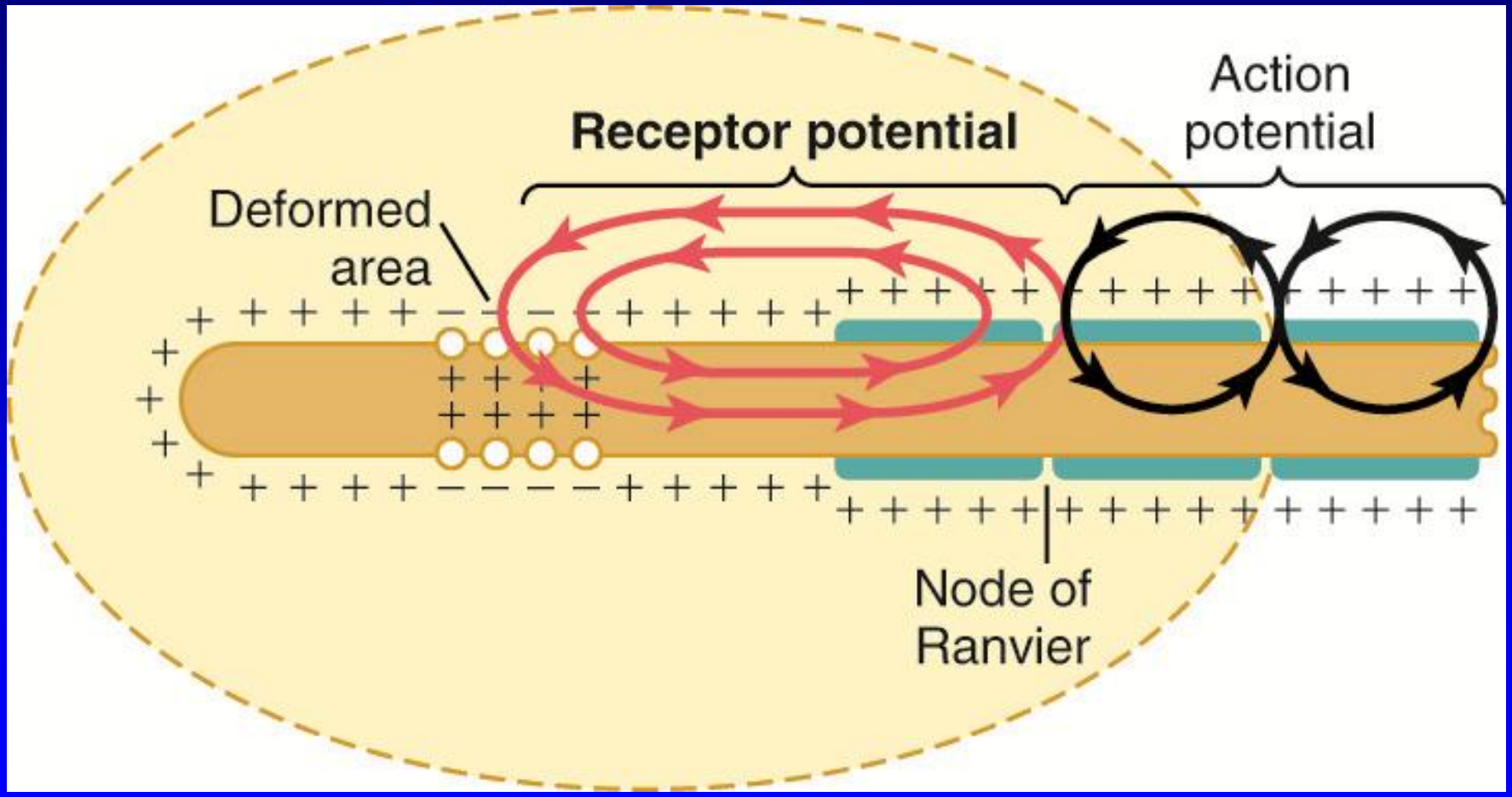


Figure 46-03

Receptor Potential

- the membrane potential of the receptor.
  - excitation of the receptor results from a change in this potential.
  - when the receptor potential rises above the threshold, action potentials appear and the receptor is active.
  - the greater the intensity of the stimulus, the greater the receptor potential, and the greater the rate of action potential generation.

Relationship between receptor potential and action potentials

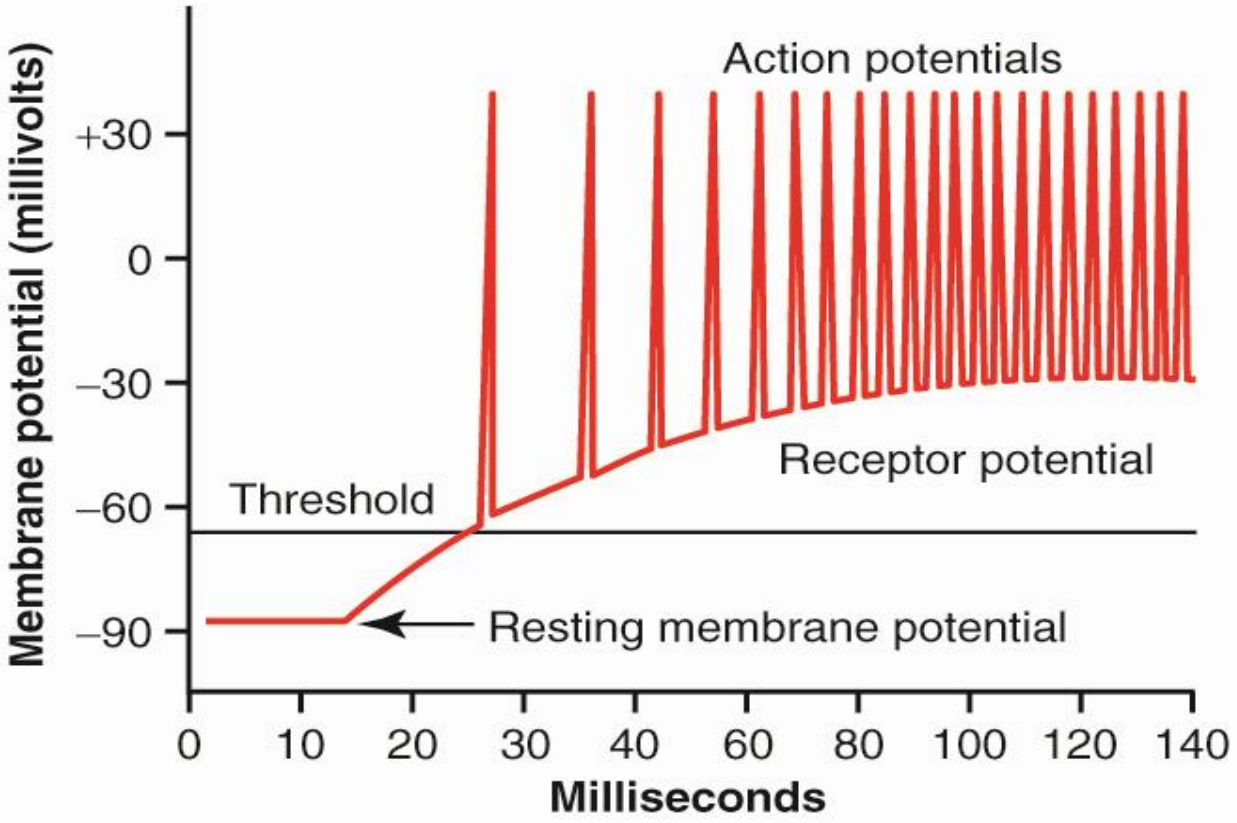


Figure 46-2

Adaptation of Receptors

- when a continuous stimulus is applied, receptors respond rapidly at first, but response declines until all receptors stop firing.

Adaptation of Receptors

- when a continuous stimulus is applied, receptors respond rapidly at first, but response declines until all receptors stop firing.

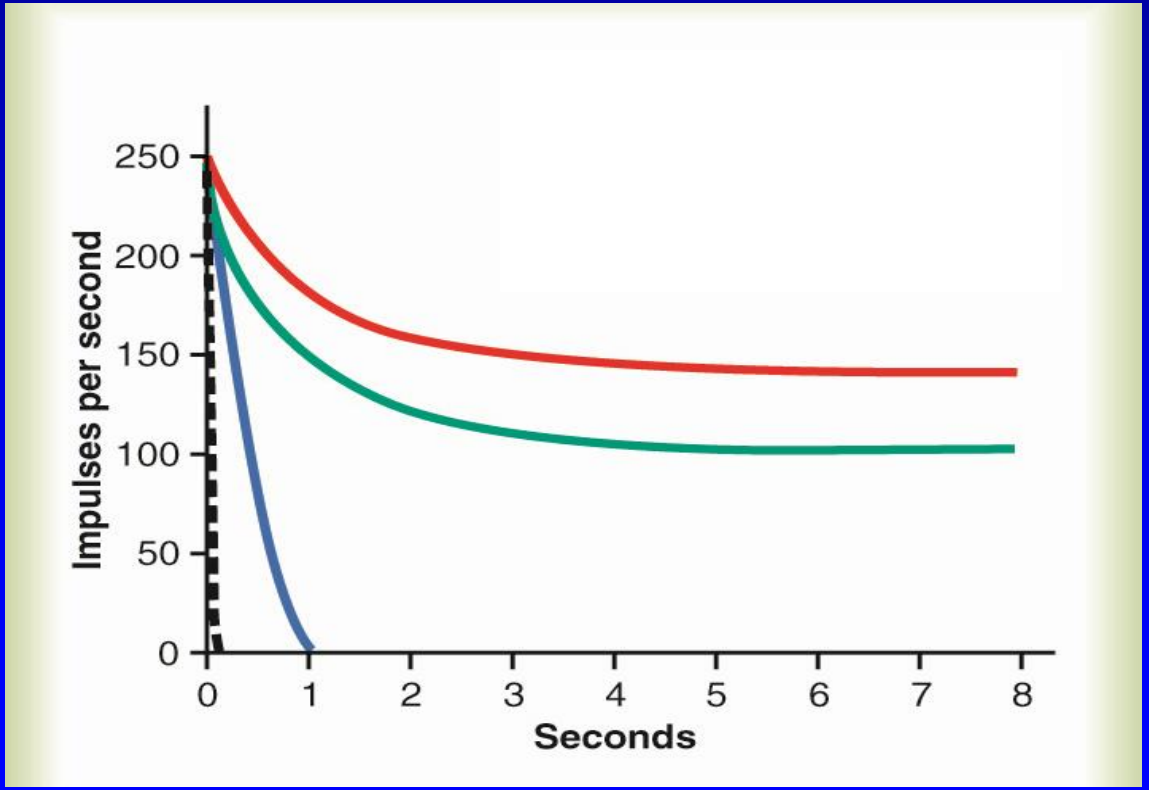
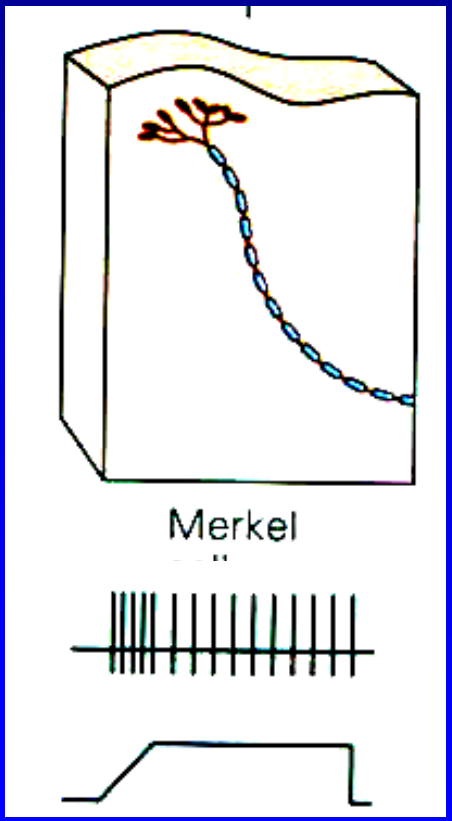


Figure 46-5

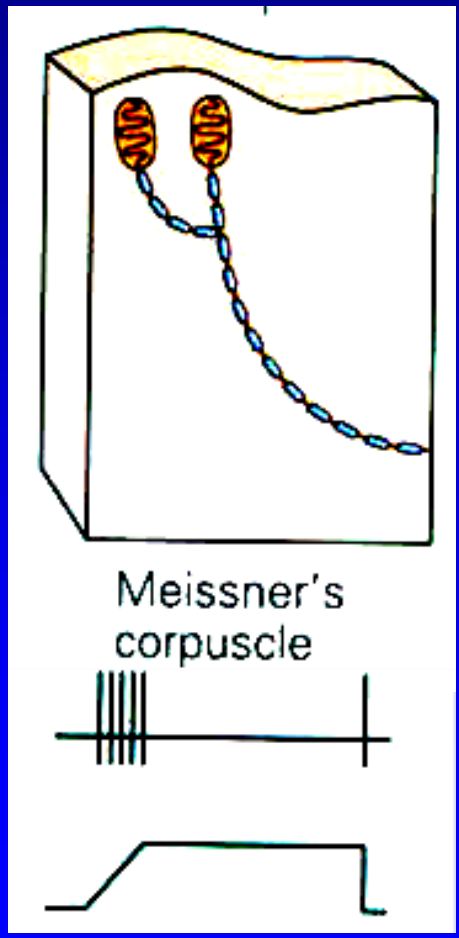
Slowly Adapting (Tonic) Receptors

- continue to transmit impulses to the brain for long periods of time while the stimulus is present.
- keep brain apprised of the status of the body with respect to its surroundings.
- will adapt to extinction as long as the stimulus is present, however, this may take hours or days.

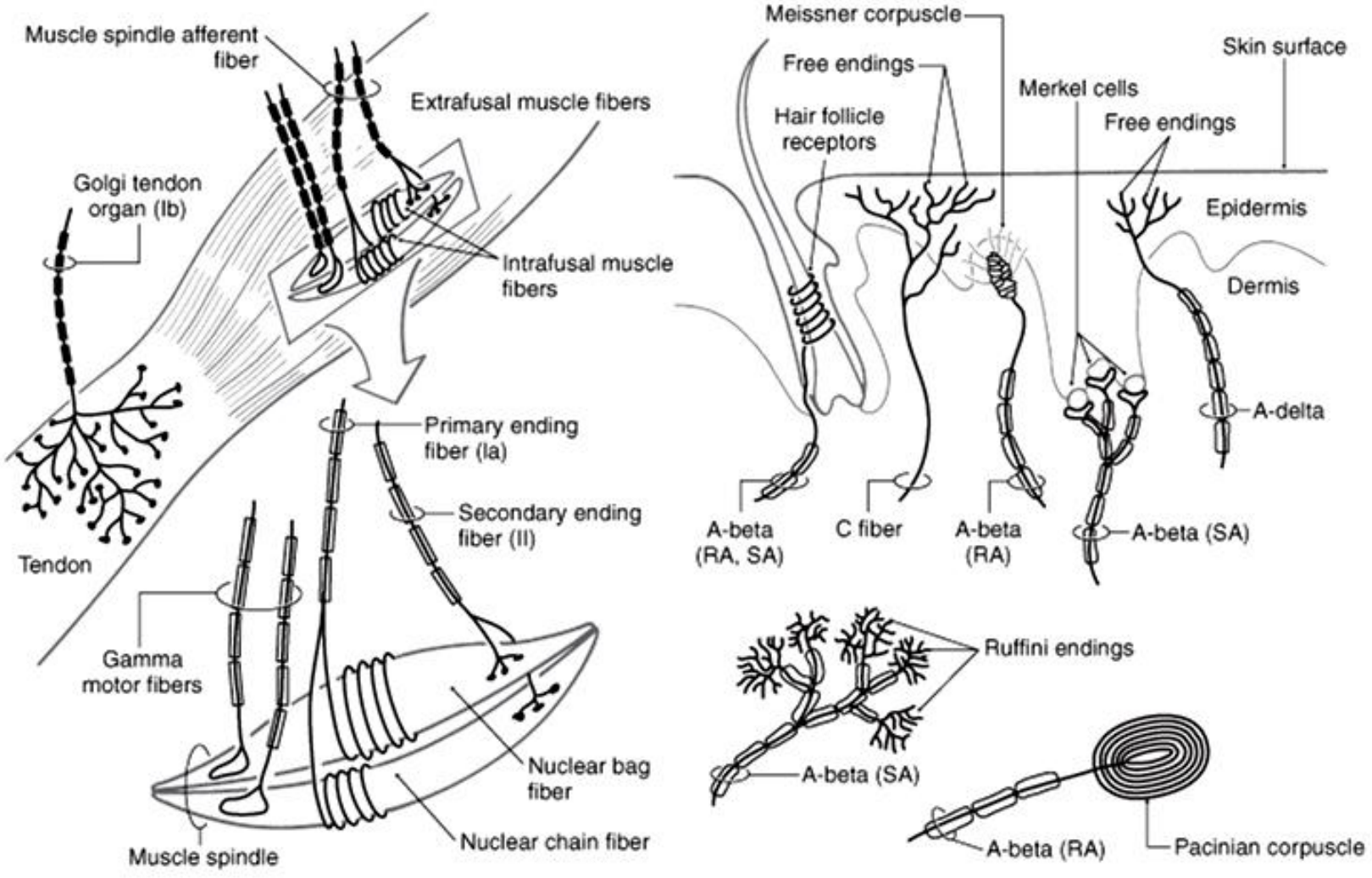


Rapidly Adapting (Phasic) Receptors

- respond only when change is taking place.
- rate and strength of the response is related to the rate and intensity of the stimulus.
- important for predicting the future position or condition of the body.
- very important for balance and movement.



Sensations receptors



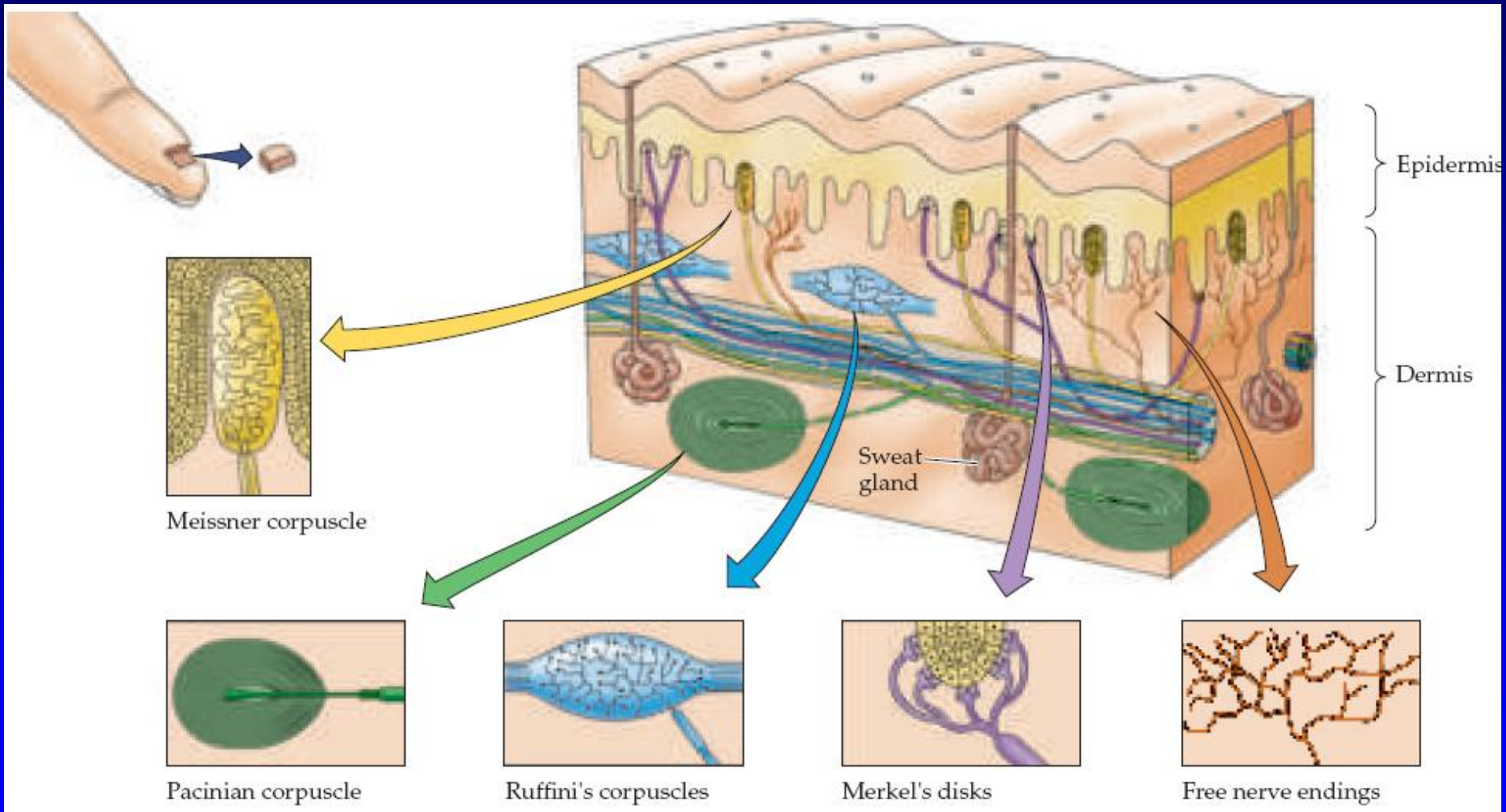

Epidermis
Dermis
Sweat gland
Meissner corpuscle
Pacinian corpuscle
Ruffini's corpuscles
Merkel's disks
Free nerve endings

TABLE 8.1

The Major Classes of Somatic Sensory Receptors

Receptor type	*Anatomical characteristics*	*Associated axons[a] (and diameters)*	*Axonal conduction velocities*	*Location*	*Function*	*Rate of adaptation*	*Threshold of activatio*
Free nerve endings	Minimally specialized nerve endings	C, Aδ	2–20 m/s	All skin	Pain, temperature, crude touch	Slow	High
Meissner's corpuscles	Encapsulated; between dermal papillae	Aβ 6–12 μm		Principally glabrous skin	Touch, pressure (dynamic)	Rapid	Low
Pacinian corpuscles	Encapsulated; onionlike covering	Aβ 6–12 μm		Subcutaneous tissue, interosseous membranes, viscera	Deep pressure, vibration (dynamic)	Rapid	Low
Merkel's disks	Encapsulated; associated with peptide-releasing cells	Aβ		All skin, hair follicles	Touch, pressure (static)	Slow	Low
Ruffini's corpuscles	Encapsulated; oriented along stretch lines	Aβ 6–12 μm		All skin	Stretching of skin	Slow	Low
Muscle spindles	Highly specialized (see Figure 8.5 and Chapter 15)	Ia and II		Muscles	Muscle length	Both slow and rapid	Low
Golgi tendon organs	Highly specialized (see Chapter 15)	Ib		Tendons	Muscle tension	Slow	Low
Joint receptors	Minimally specialized	—		Joints	Joint position	Rapid	Low