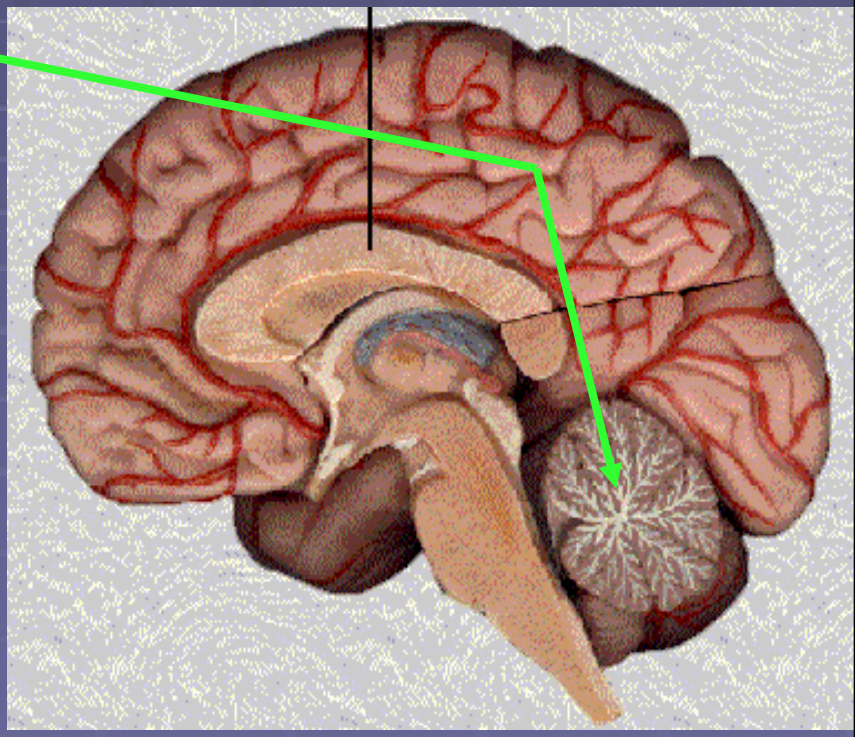
The motor regulator

2) The cerebellum

Motor control systems outside the cortex

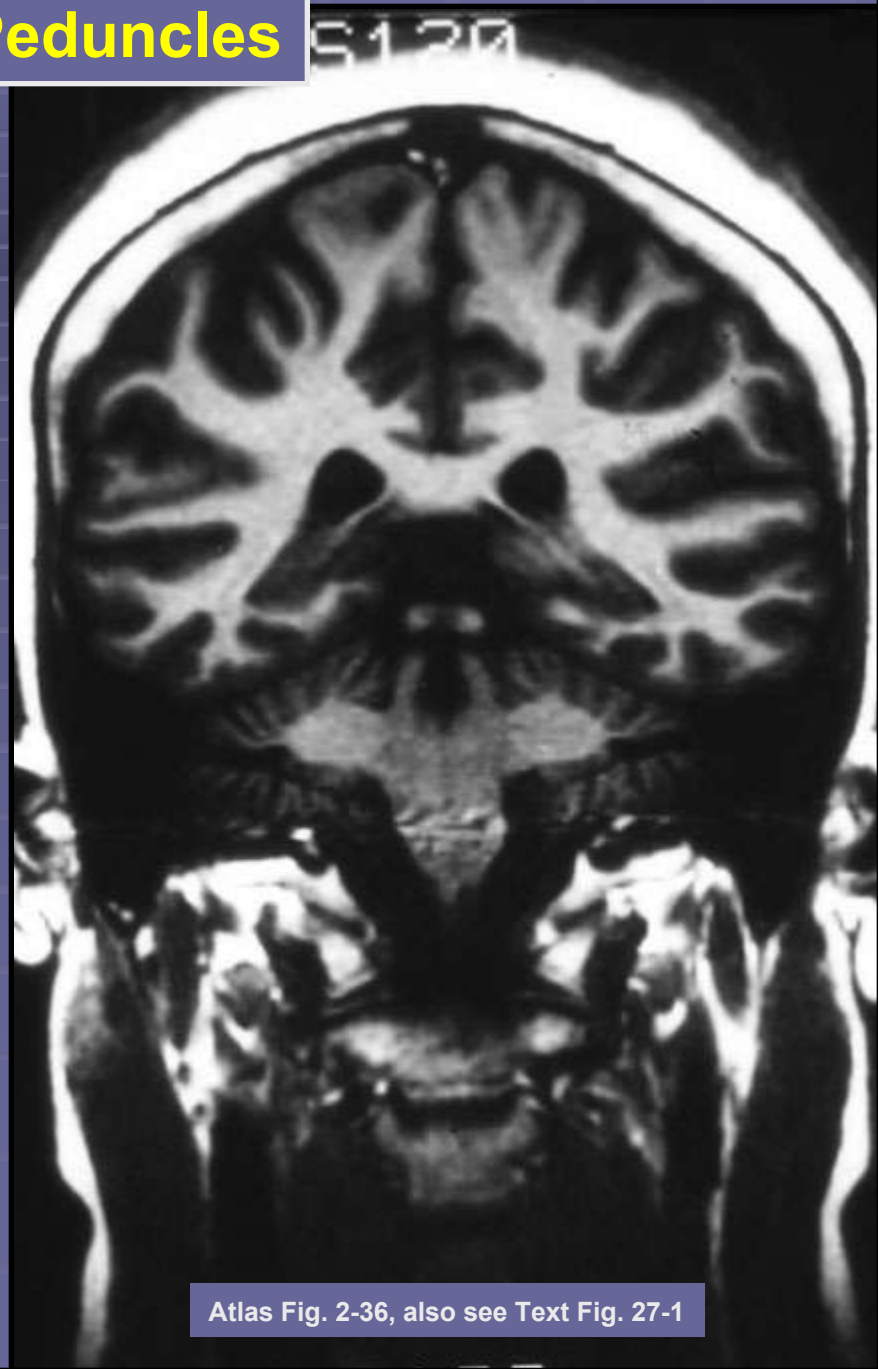
Cerebellum

-controls neural ‘programs’ for the executionl of skilled movements



Cerebellar Peduncles

Atlas Fig. 2-31



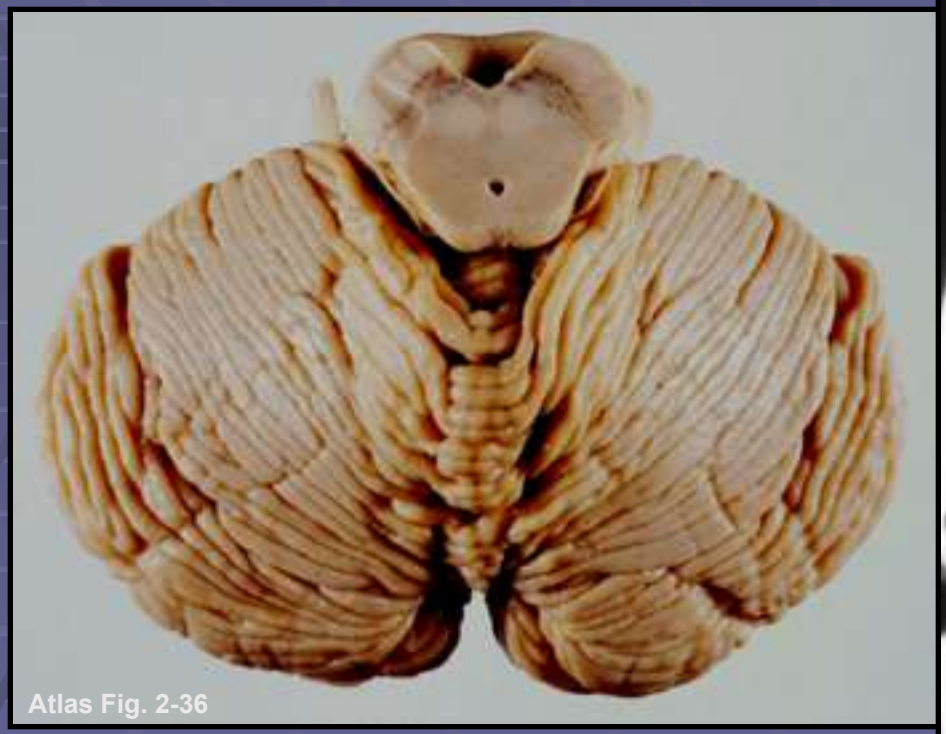
Atlas Fig. 2-36, also see Text Fig. 27-1

The Cerebellum – Mid-sagittal view

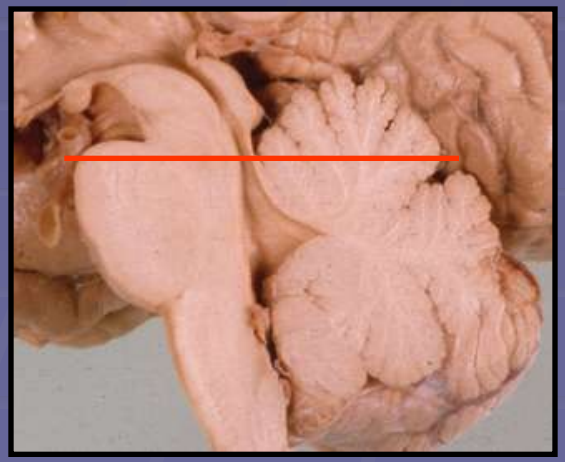
Atlas Fig. 2-37

Atlas Fig. 2-37

The Cerebellum – Superior View



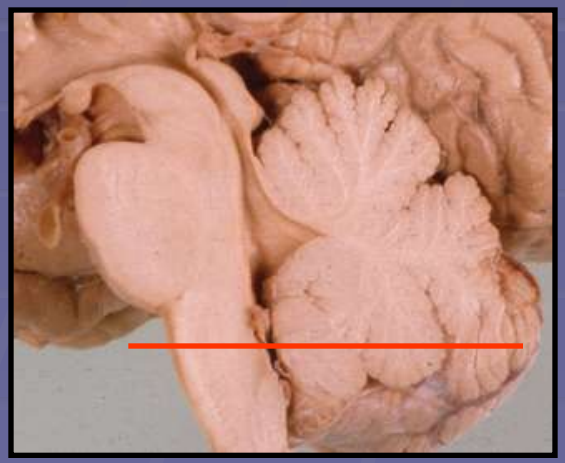
Atlas Fig. 2-36

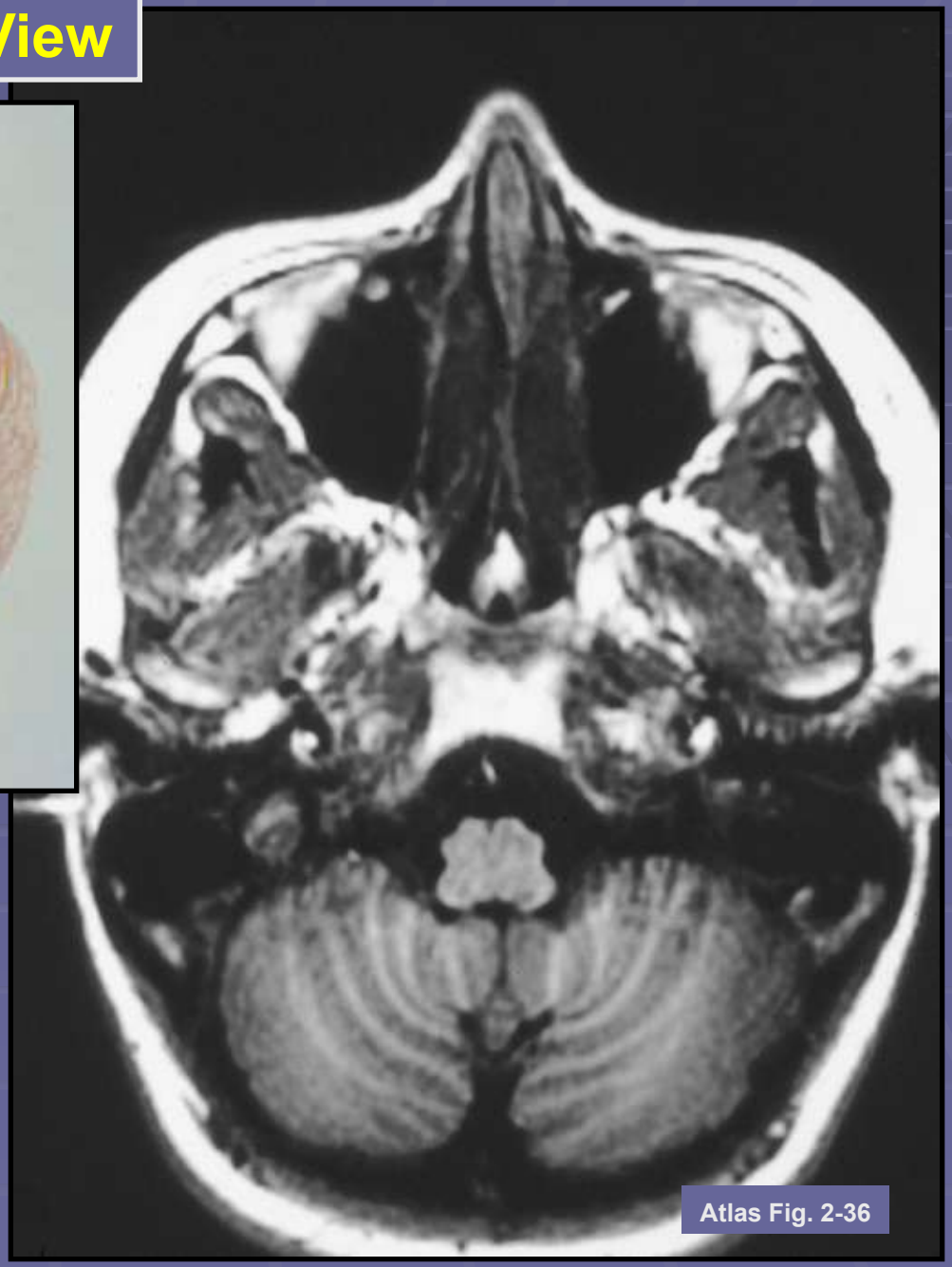


Atlas Fig. 2-36

The Cerebellum – Inferior View

Atlas Fig. 2-36





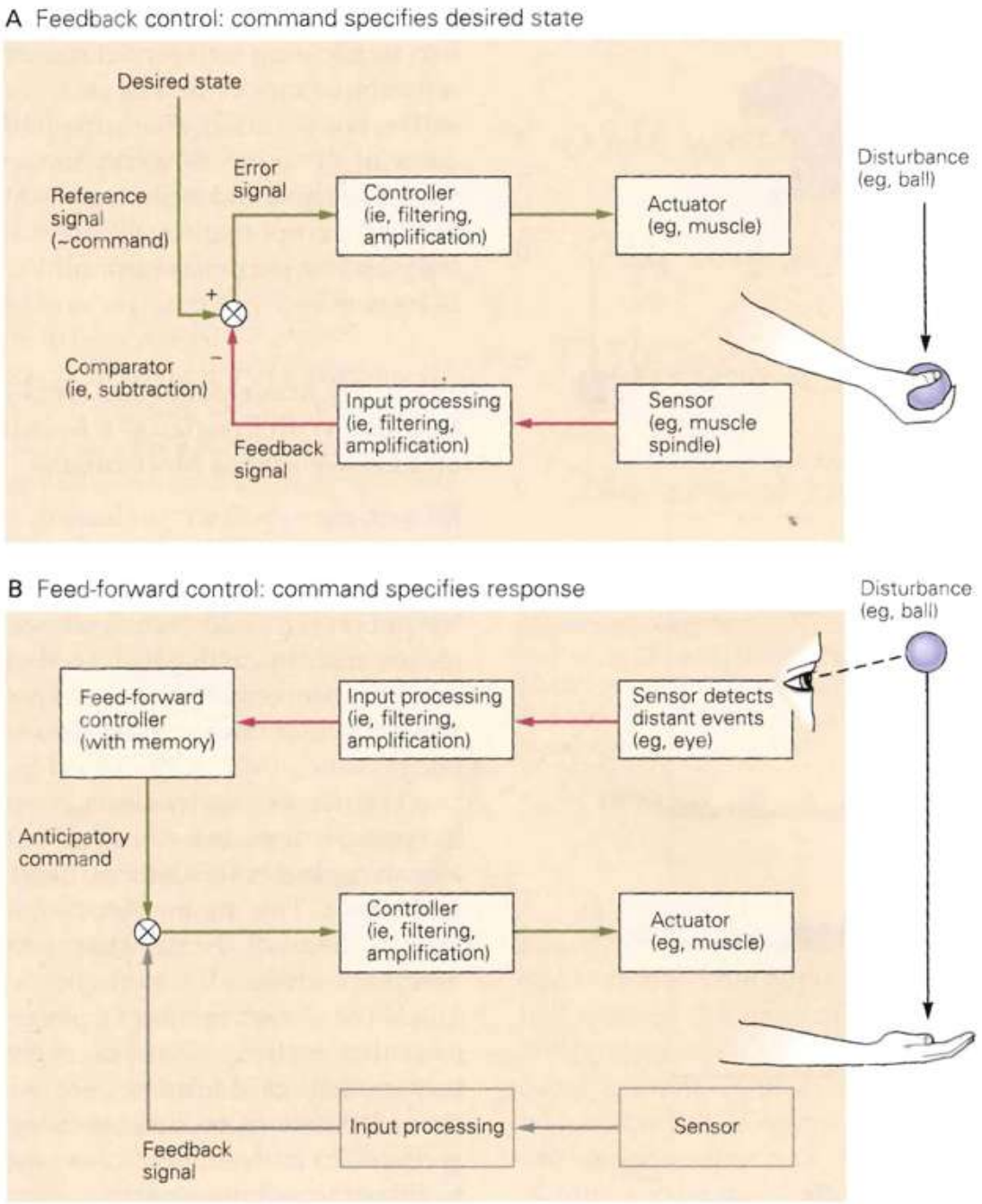
Atlas Fig. 2-36

Feed-back and feed-forward control circuits

By acting as a comparator

By acting as a timing device

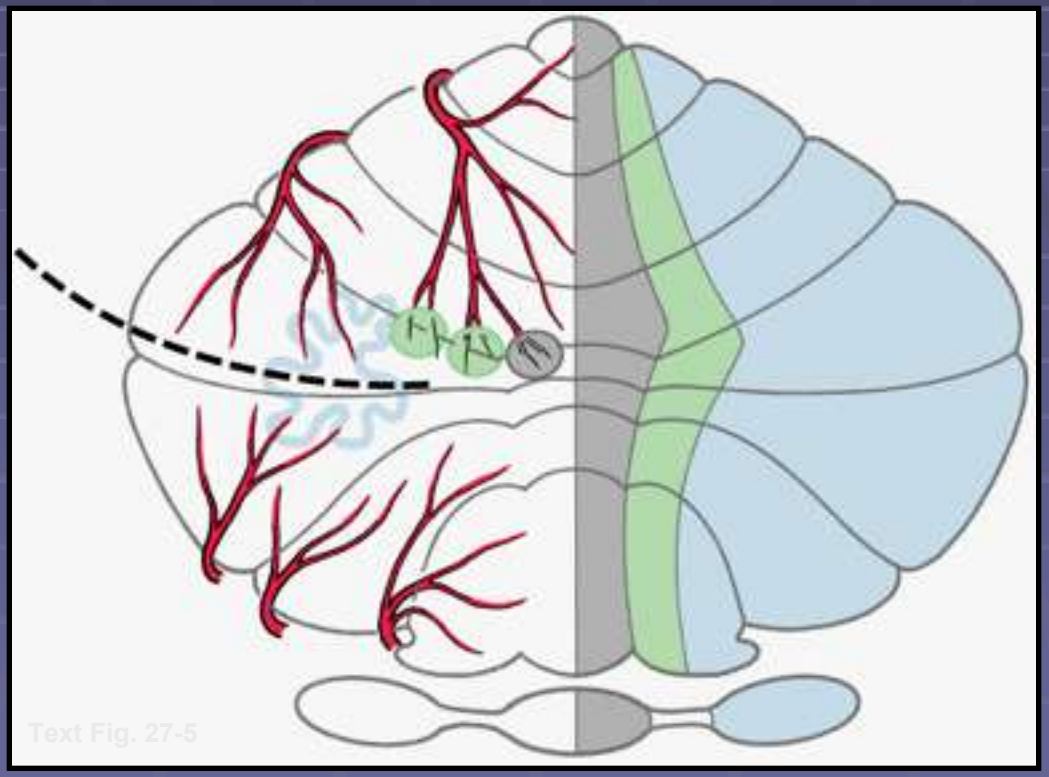
By storing information

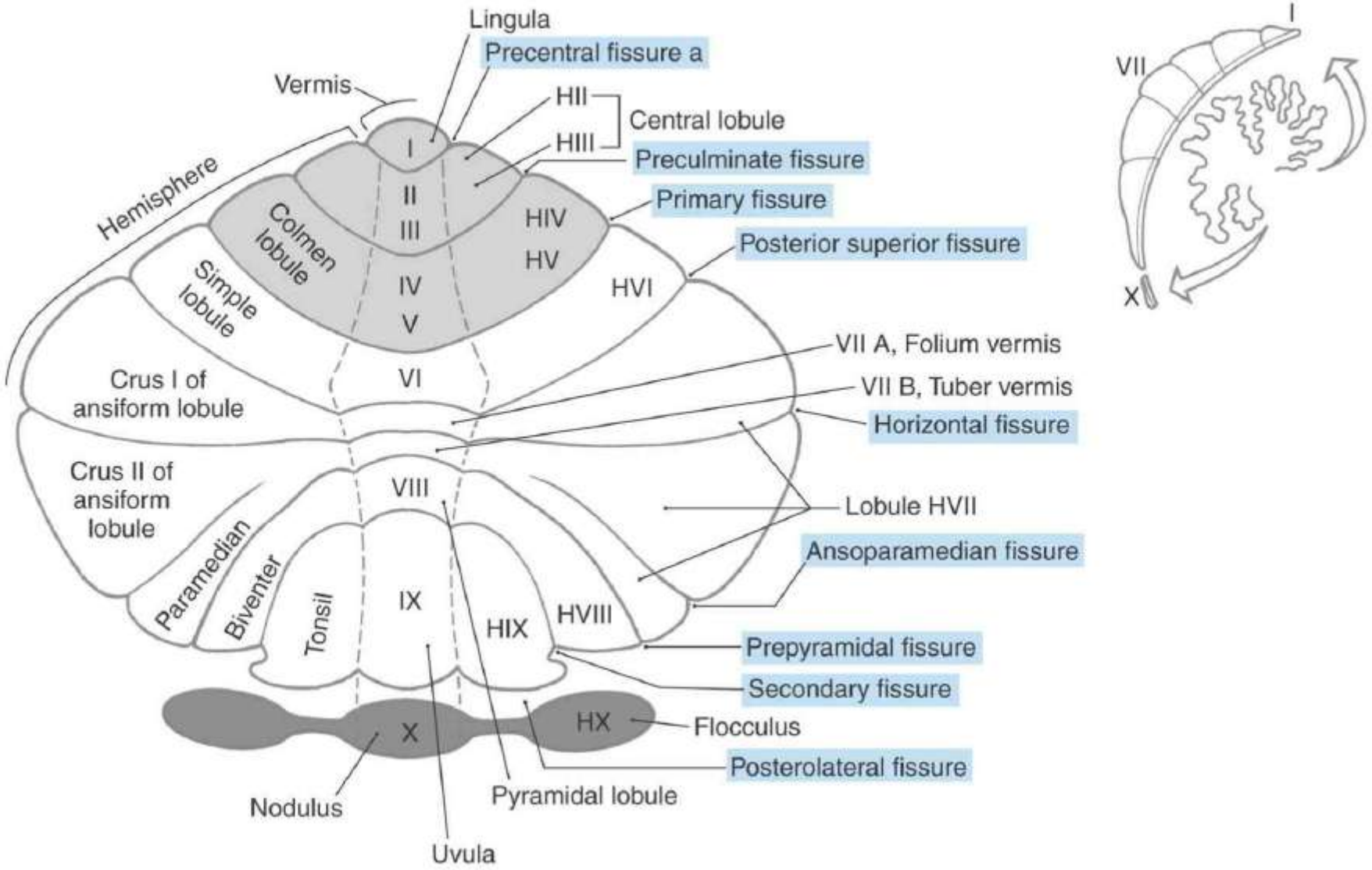


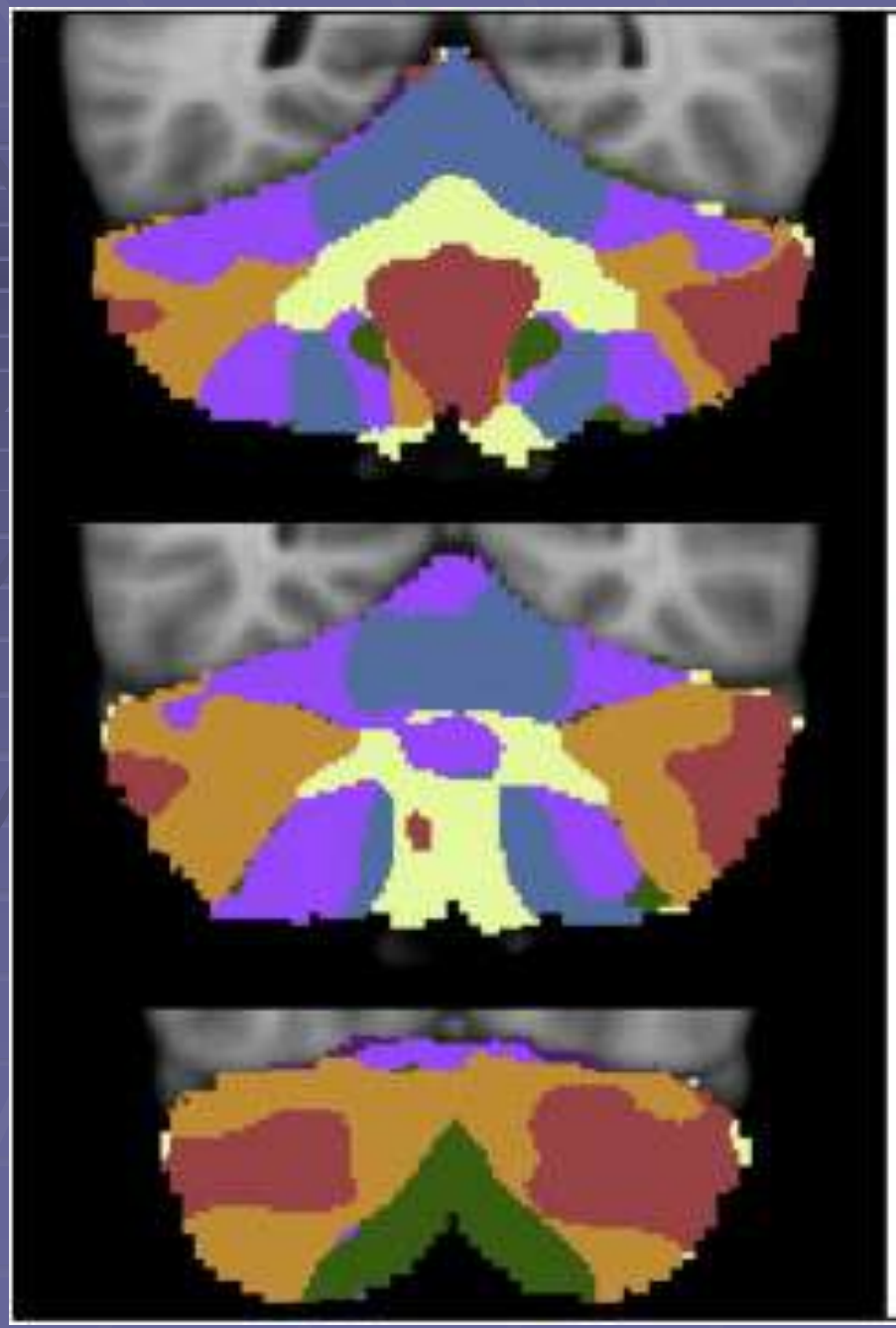
Cerebellar connections

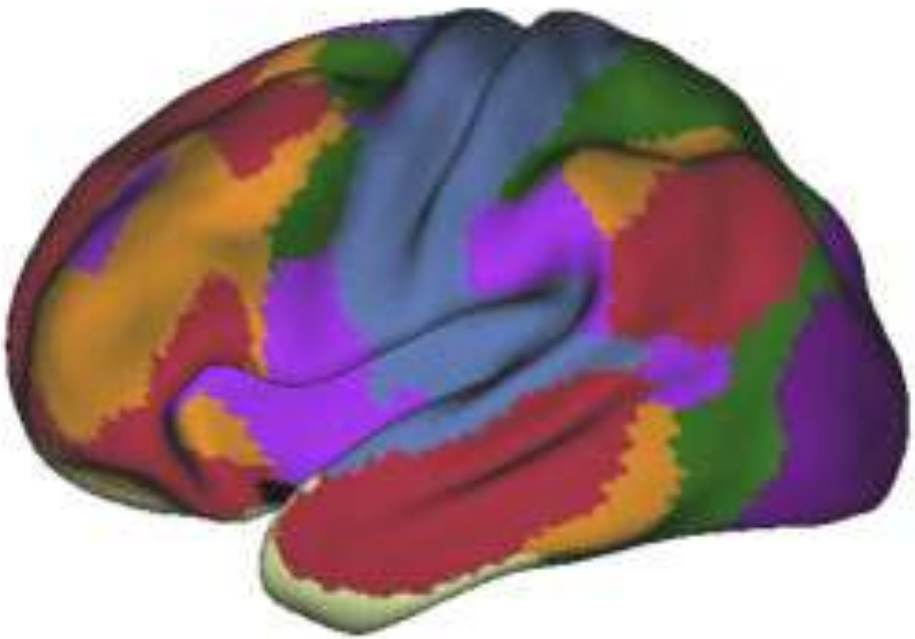
- Input:
  - Sensory cortex (somato, visual)
  - Association cortex
  - Vestibular system
  - Spinocerebellar tracts
- Output:
  - Motor cortex
  - Thalamus motor nuclei
  - Extra-pyramidal tracts
  - Association cortex

The Cerebellar Cortex and Nuclei: Blood Supply, Zones, and the Concept of Compartments




Lingula
Precentral fissure a
Vermis
HII
HIII
Central lobule
Preculminate fissure
Primary fissure
Posterior superior fissure
Hemisphere
Colmen lobule
Simple lobule
I
II
III
IV
V
VI
HIV
HV
HVI
VII A, Folium vermis
VII B, Tuber vermis
Horizontal fissure
Crus I of ansiform lobule
Crus II of ansiform lobule
VIII
Lobule HVII
Ansoparamedian fissure
Paramedian
Biventer
Tonsil
IX
HIX
HVIII
Prepyramidal fissure
Secondary fissure
X
HX
Flocculus
Posterolateral fissure
Nodulus
Pyramidal lobule
Uvula
I
VII
X





The motor cerebellum functions

The main functions of cerebellum:

- body equilibrium
- regulation of muscle tone
- coordination of movements

A t a x i a

- means disturbances of equilibrium of the body and coordination of movements.
- Cerebellum lesion produces **cerebellar ataxia**

Cerebellar ataxia

- **Attactic gait – patient can't to walk**
- **Disorders of equlibrium – patient can't to stand**
- **Intention tremor – is dynamic tremor (it is more expressed while moving and disappears while rest)**
- ***Dysarthria***
- **Nystagmus**
- **Dysmetria (disturbed ability to gauge distances)**
- **Dysdiadochokinesia** (Awkward performance of rapid alternating movements)

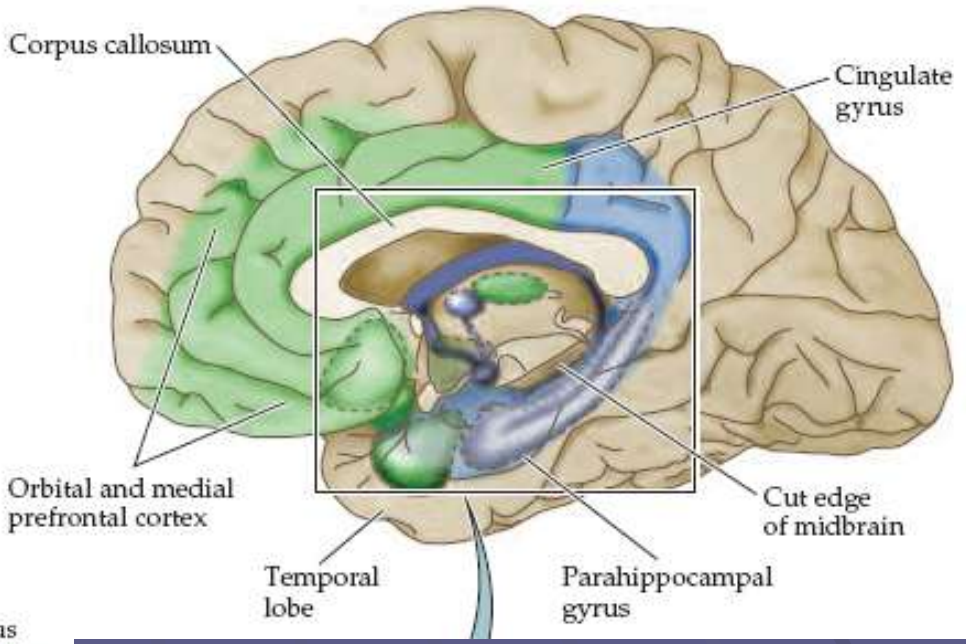
The Non-motor cerebellum functions

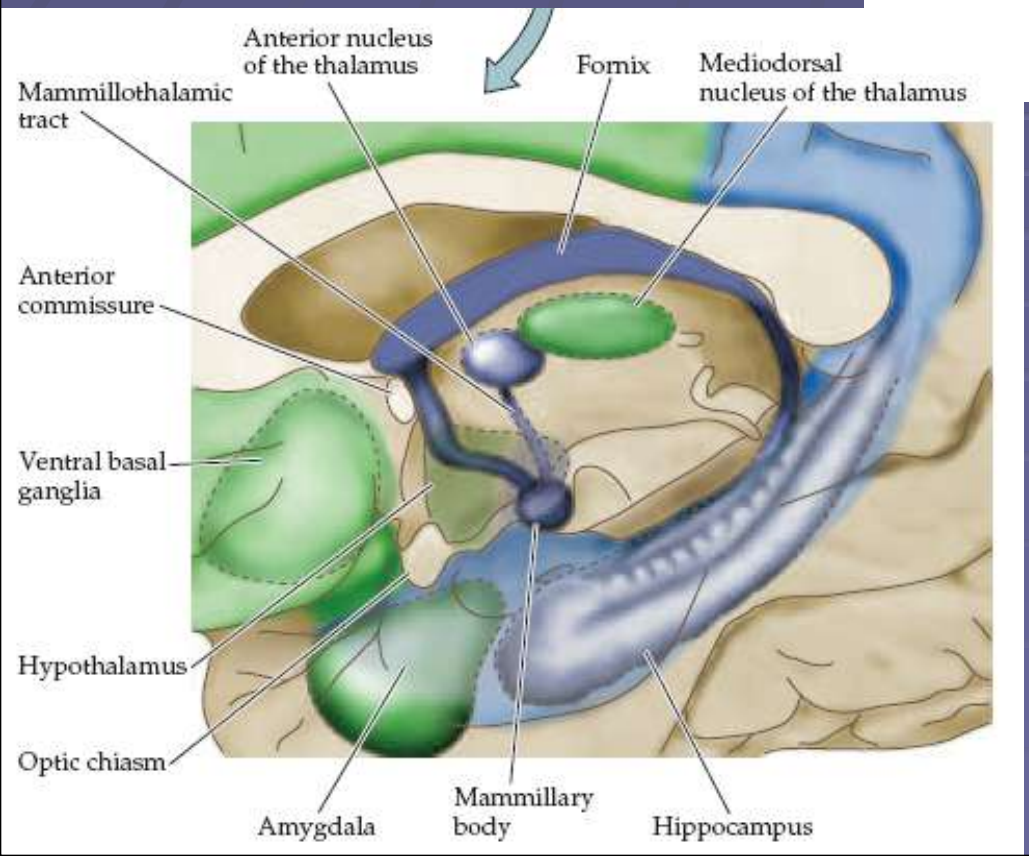
VISCEROMOTOR FUNCTIONS

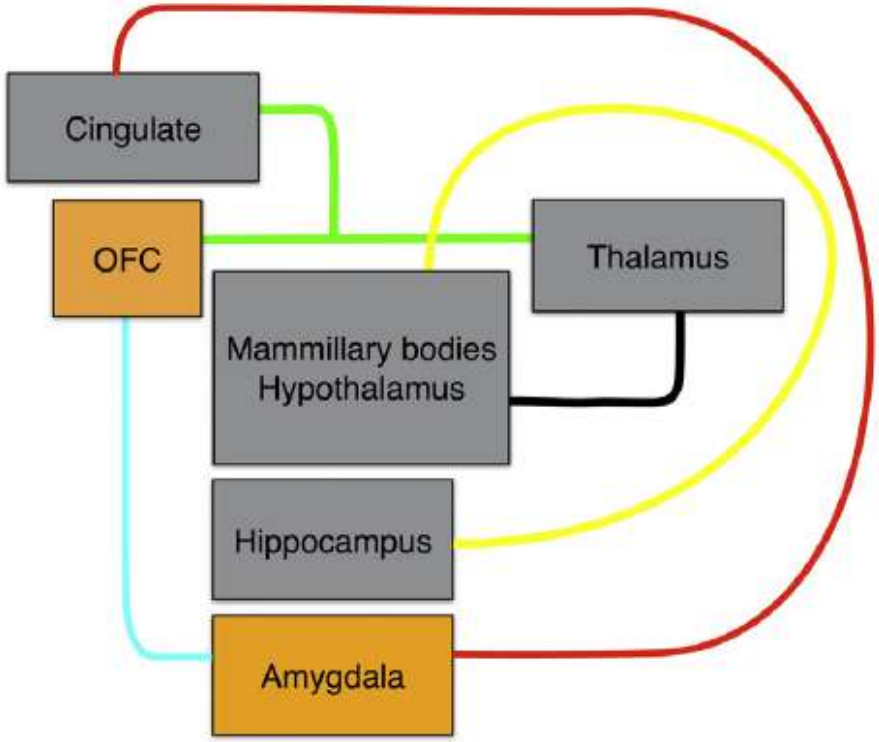
- dilated pupils
- flushed face
- decreases in heart rate and blood pressure.

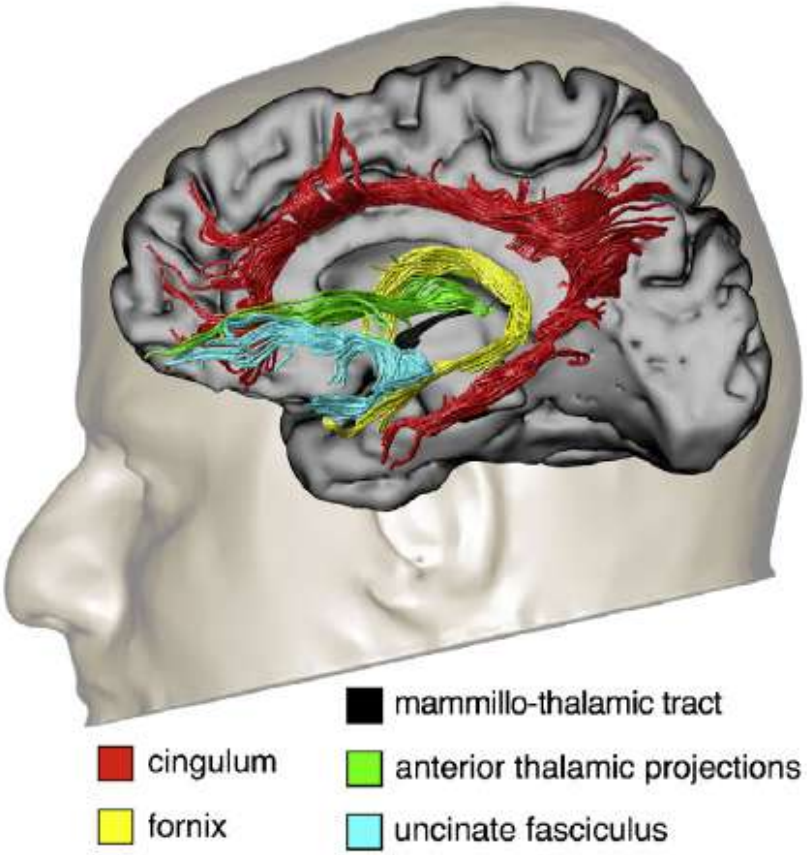
- executive, visual-spatial, linguistic and affective deficits
- Mutism and impaired verbal fluency
- affective symptoms and personality changes
- Attentional and emotional problems

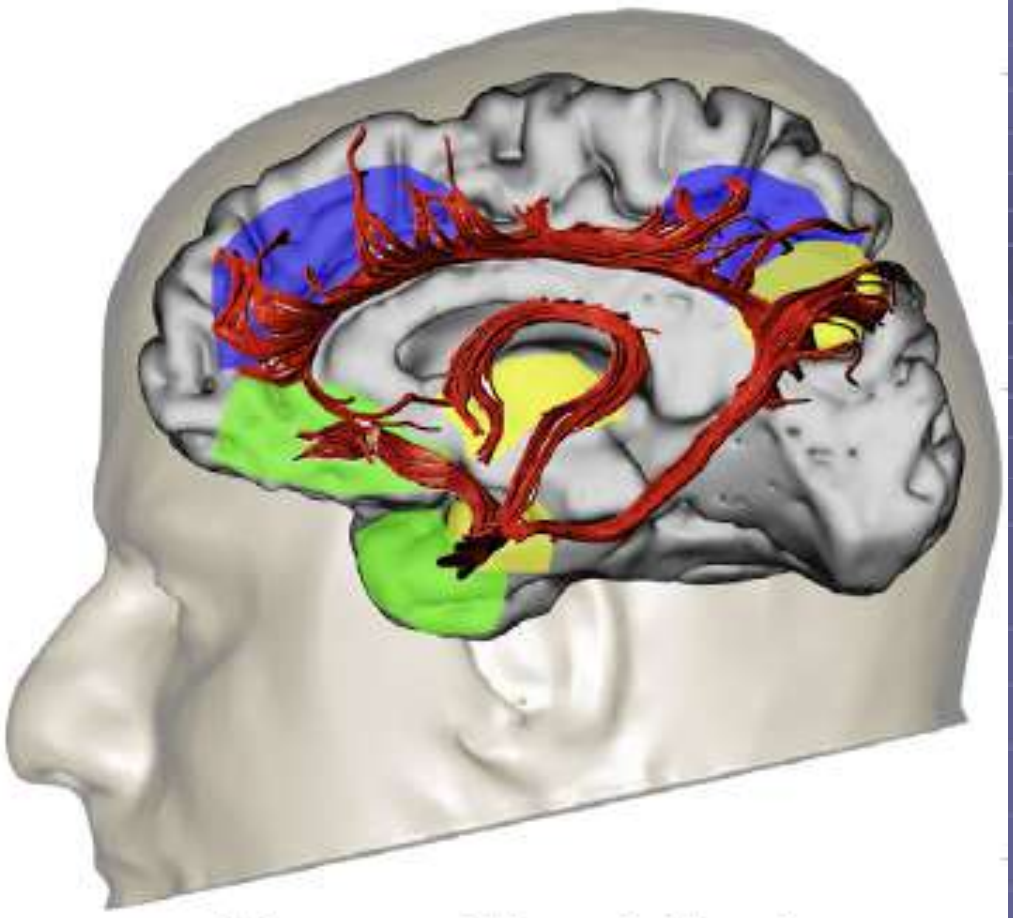
Limbic system


Corpus callosum
Cingulate gyrus
Orbital and medial prefrontal cortex
Cut edge of midbrain
Temporal lobe
Parahippocampal gyrus


Anterior nucleus of the thalamus
Fornix
Mediodorsal nucleus of the thalamus
Mammillothalamic tract
Anterior commissure
Ventral basal ganglia
Hypothalamus
Optic chiasm
Amygdala
Mammillary body
Hippocampus


Cingulate
OFC
Thalamus
Mammillary bodies
Hypothalamus
Hippocampus
Amygdala


mammillo-thalamic tract
cingulum
anterior thalamic projections
fornix
uncinate fasciculus



hippocampal-diencephalic and parahippocampal-retrosplenial network

temporal-amygdala-orbitofrontal network

medial 'default network'

Limbic system functions

- Memory
- Spatial orientation
- Multimodal sensory integration
- Emotion processing
- Motivation and behavioral selection
- Self knowledge
- Default network

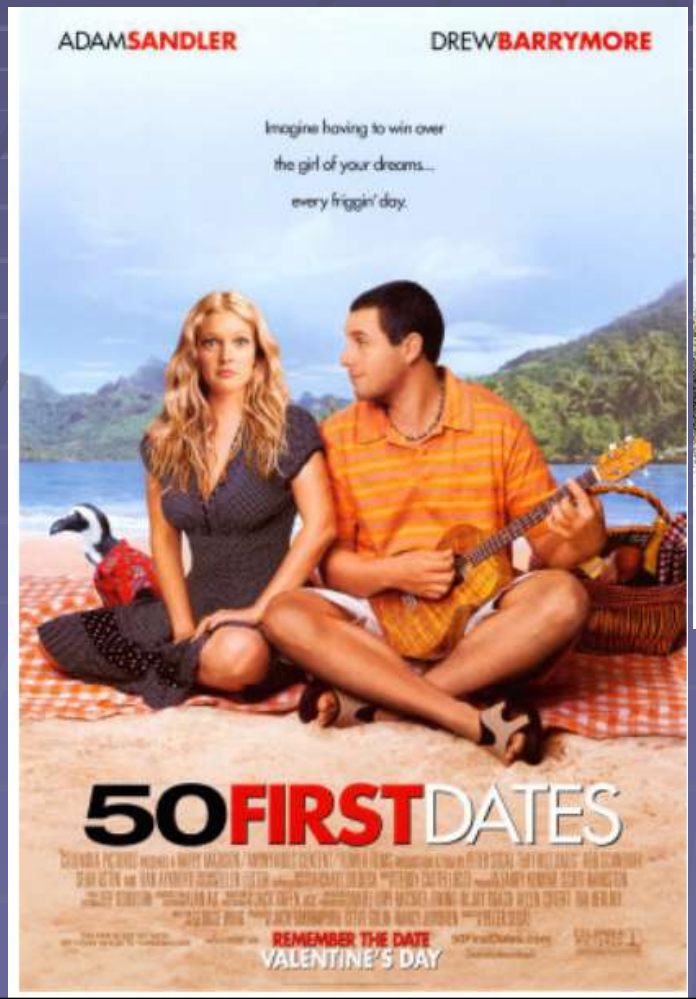
Limbic system functions

- Memory
- Spatial orientation

  Hippocampal-dienchphalic-parahippocampal- retrospinal network
- Multimodal sensory integration
- Emotion processing
- Motivation and behavioral selection
- Self knowledge
- Default network

Hippocampal-dienchphalic-parahippocampal-retrospinal network

- Alzheimer's disease
- Amnesias
- Korsakoff syndrome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DREWBARRYMORE
Imagine having to win over
the girl of your dreams...
every friggin' day.
50FIRSTDATES
REMEMBER THE DATE
VALENTINE'S DAY


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السبكى فيلم
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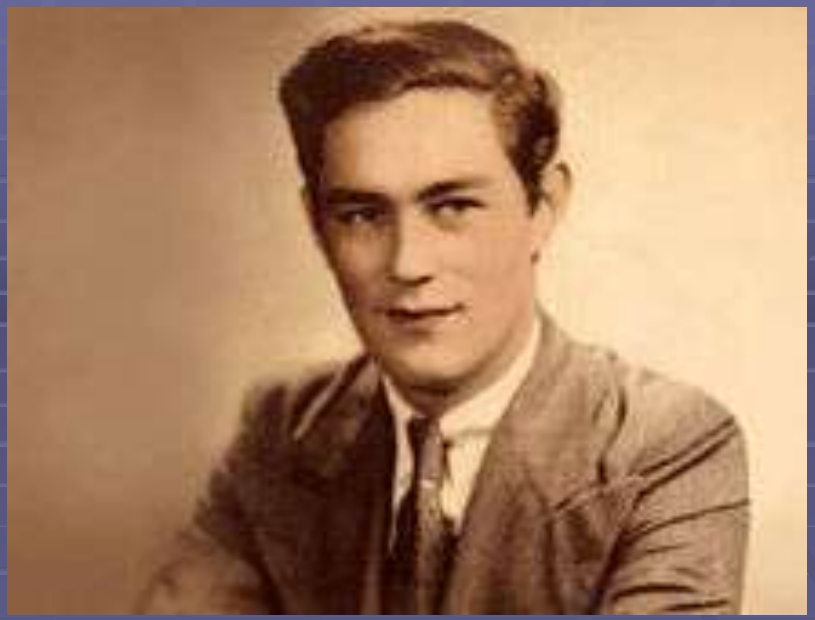
FaselwaNa3oud
إخراج
أحمد جلال
DVD
www.egyfilm.com


MEMENTO

Henry Gustav Molaison (H.M.)



- Surgical removal of left and right medial temporal lobes (hippocampus, parahippocampal gyrus)
- Anterograde amnesia

Korsakoff Syndrome

- Neuronal degeneration in the mammillary body, dorsomedial thalamic n. & hippocampus.
- Often seen in chronic alcoholics: due to thiamine deficiency.
- Both short- and long-term memory loss.
- Confabulation.
- Acute thiamine deficiency : Wernicke encephalopathy

Table 31-2 Neurologic Consequences of Thiamine Deficiency and a Comparison of Wernicke Encephalopathy with Korsakoff Psychosis

WERNICKE ENCEPHALOPATHY	KORSAKOFF PSYCHOSIS
Acute	Chronic
Ophthalmoparesis, ataxia, confusion	Confabulation, anterograde and retrograde amnesia
Reversible	Irreversible

- Wernicke-Korsakoff syndrome: profound memory loss & learning difficulties.

Limbic system functions

- Multimodal sensory integration
- Emotion processing
- Motivation and behavioral selection

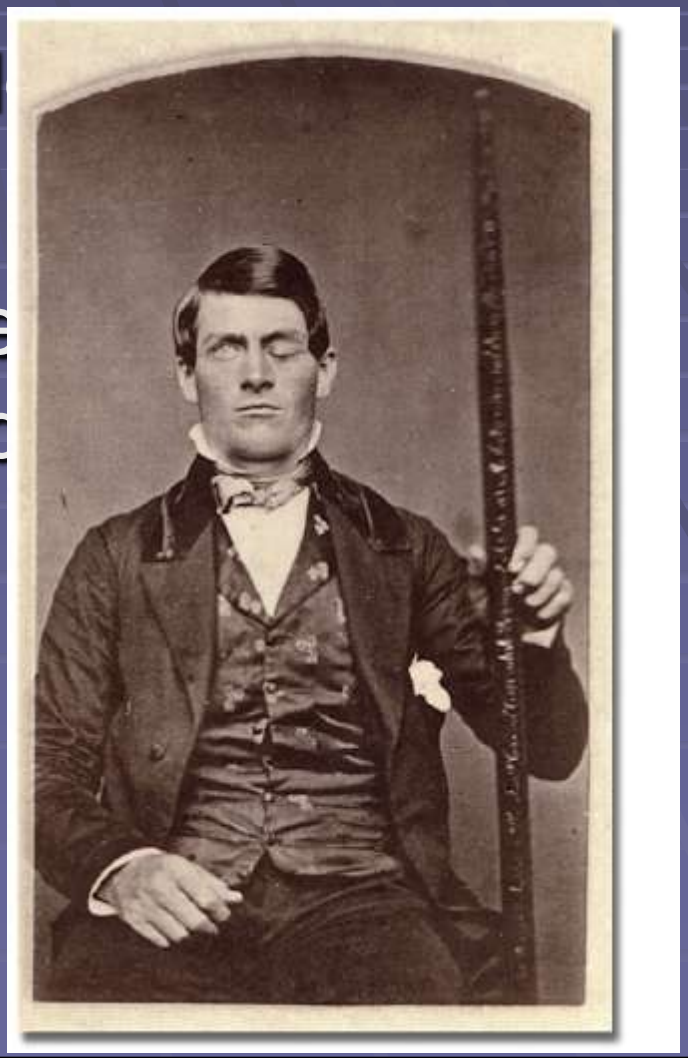
  Temporal-amygdala-orbitofrontal
- Self knowledge
- Default network

Temporal-amygdala-orbitofrontal

- semantic deficits (semantic dementia)
- language difficulties
- personality changes and other behavioral symptoms (e.g. aggression, disinhibition)
  - Kluver-bucy syndrome
  - Psychopathy
  - Bipolar affective disorders

Temporal-amygdala-orbitofrontal

- semantic deficits (semantic d
- language difficulties
- personality changes and othe
  symptoms (e.g. aggression, c
  - Kluver-bucy syndrome
  - Psychopathy
  - Bipolar affective disorders



Ablation of the amygdala bilaterally

- *Klüver-Bucy Syndrome*
  - Hyperphagia
  - Hyperorality
  - Hypersexuality
  - Hypermetamorphosis
  - Agnosia: visual, tactile & auditory
  - Dementia

Limbic system functions

- Self knowledge & Autobiographical information
- Moral reasoning & action monitoring
- Emotions of other & social evaluations

Dorsomedial Default network

- Posterior cingulate cortex & precuneus
- Medial prefrontal cortex
- Angular gyrus