

Bedside differential diagnosis of disturbances of consciousness

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Structure of the lecture

1. The types of disturbance of consciousness?
2. The severity of dist. of consciousness
3. Bedside investigation
4. Bedside differential diagnosis
5. Case presentations

Disturbances of consciousness

1. non-hypnoid (open eyes)

- e.g. vegetative state „vigil coma”, apallic syndrome

2. Hypnoid (closed eyes!!!! (similar to a healthy sleeping person with closed eyes!!!!))

- Somnolent
- stupor
- coma

Disturbances of consciousness

1. non-hypnoid (~~open eyes~~)

- e.g. vegetative state „vigil coma”, apallic syndrome

Today not!

2. Hypnoid (similar to a healthy sleeping person with closed eyes!!!!)

Today's topic!

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Hypnoid types

- **Somnolent**:ready to sleep
- **stupor**:deep-sleep, but some verbal or motor reaction
- **coma**:no reaction to pain except muscle tone, breath (spontaneous breath, circulation is OK)

The most frequently used scales in the assessment of consciousness disturbances

- *CRS-R Coma Recovery Scale-Revised*
- CLOCS Comprehensive Levels of Consciousness Scale
- CNC Coma/Near-Coma Scale
- FOUR Full Outline of UnResponsiveness Score
- *GCS Glasgow Coma Scale*
- GLS Glasgow-Liege Coma Scale
- INNS Innsbruck Coma Scale
- LOEW Loewenstein Communication Scale
- RLS85 Swedish Reaction Level Scale-1985
- SMART Sensory Modality Assessment Technique
- SSAM Sensory Stimulation Assessment Measure
- WHIM Wessex Head Injury Matrix
- WNSSP Western Neuro Sensory Stimulation Profile

The Coma Recovery Scale-Revised

1. Auditory function scale

- 4 Consistent movement to command
- 3 Reproducible movement to command
- 2 Localization to sound
- 1 Auditory startle
- 0 None

2. Visual function scale

- 5 Object recognition
- 4 Object localization: reaching
- 3 Visual pursuit
- 2 Fixation
- 1 Visual startle
- 0 None

3. Motor function scale

- 6 Functional object use
- 5 Automatic motor response
- 4 Object manipulation
- 3 Localization to noxious stimulation
- 2 Flexion withdrawal
- 1 Abnormal posturing
- 0 None/Flaccid

4. Oromotor/Verbal function scale

- 3 Intelligible verbalization
- 2 Vocalization/Oral movement
- 1 Oral reflexive movement
- 0 None

5. Communication scale

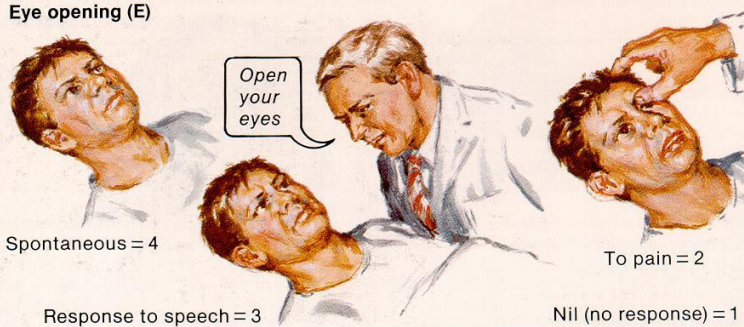
- 2 Functional: accurate
- 1 Non-functional: intentional
- 0 None

6. Arousal scale

- 3 Attention
- 2 Eye opening without stimulation
- 1 Eye opening with stimulation
- 0 Unarousable

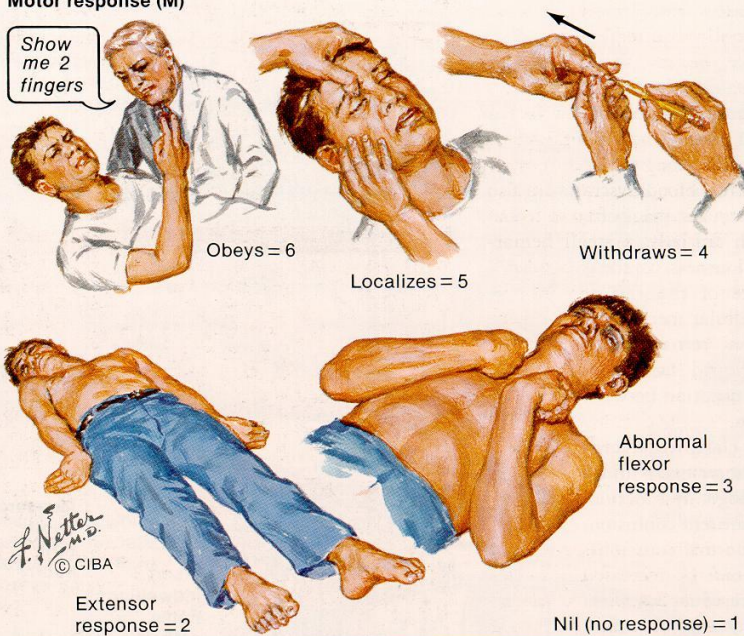
Glasgow Coma Scale

Eye opening (E)



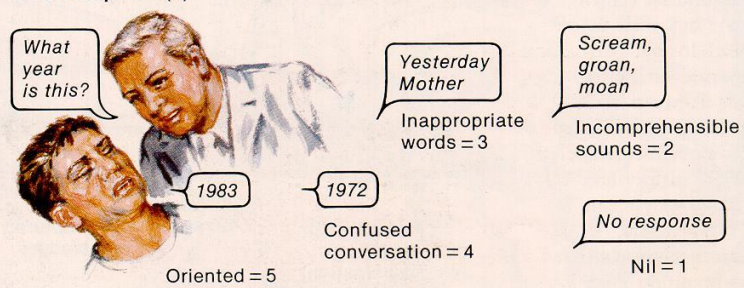
E	
Spontaneous	4
To speech	3
To pain	2
Nil	1

Motor response (M)



M	
Obeys	6
Localizes	5
Withdraws	4
Abnormal flexion	3
Extensor response	2
Nil	1

Verbal response (V)



V	
Oriented	5
Confused conversation	4
Inappropriate words	3
Incomprehensible sounds	2
Nil	1

Coma score (E + M + V) = 3 to 15

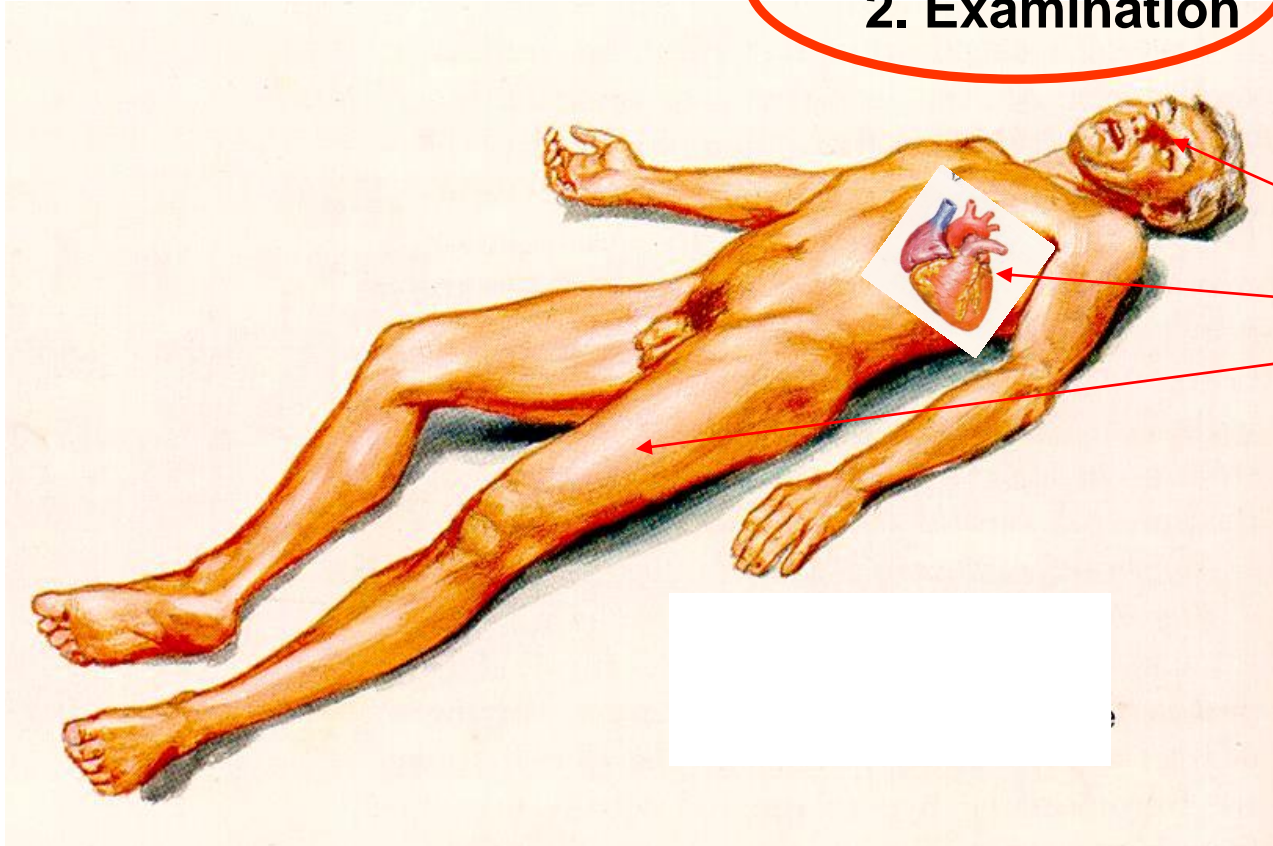
Structure of the lecture

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1. Case history

2. Examination

- consciousness
- cranial nerves
- brain stem reflexes
- cardioresp.
- paresis

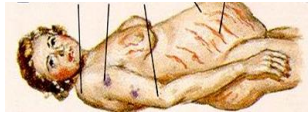


3. Instruments

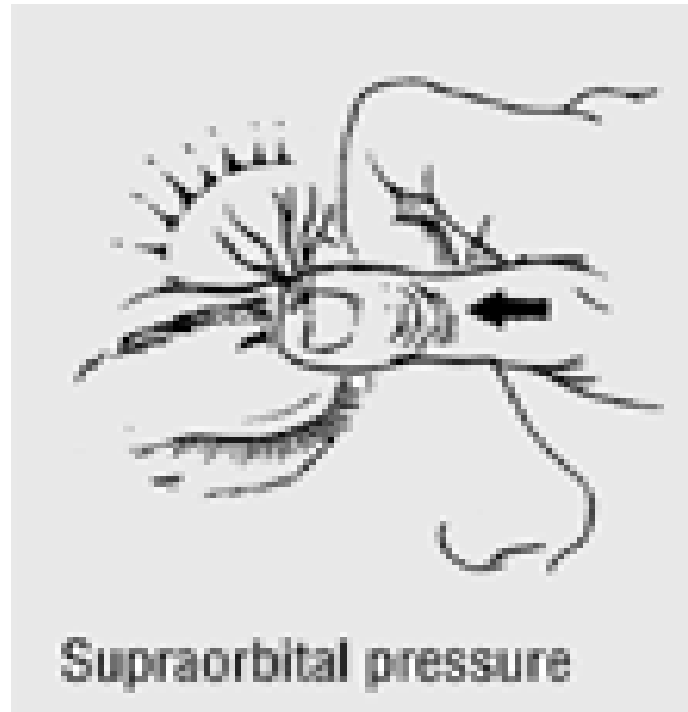


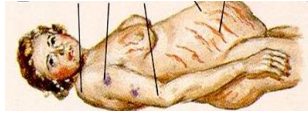


Case history observation

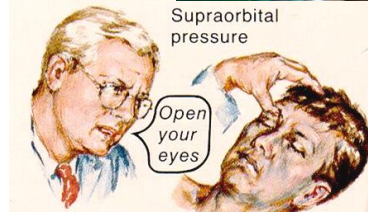


Case history observation





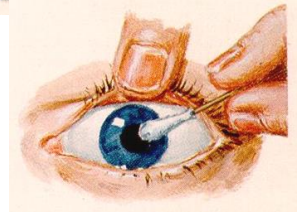
Case history
observation



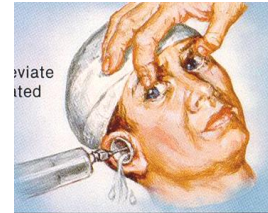
Reaction to pain stimuli



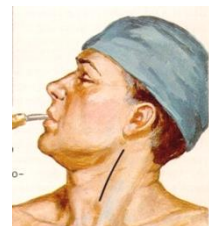
Pupil/light reflex (2nd-3rd): mesencephalon



corneal (5th-7th): pons



caloric stimulation
(8th-MLF-6th-3rd)



coughing reflex: (9th-10th)

Localisation

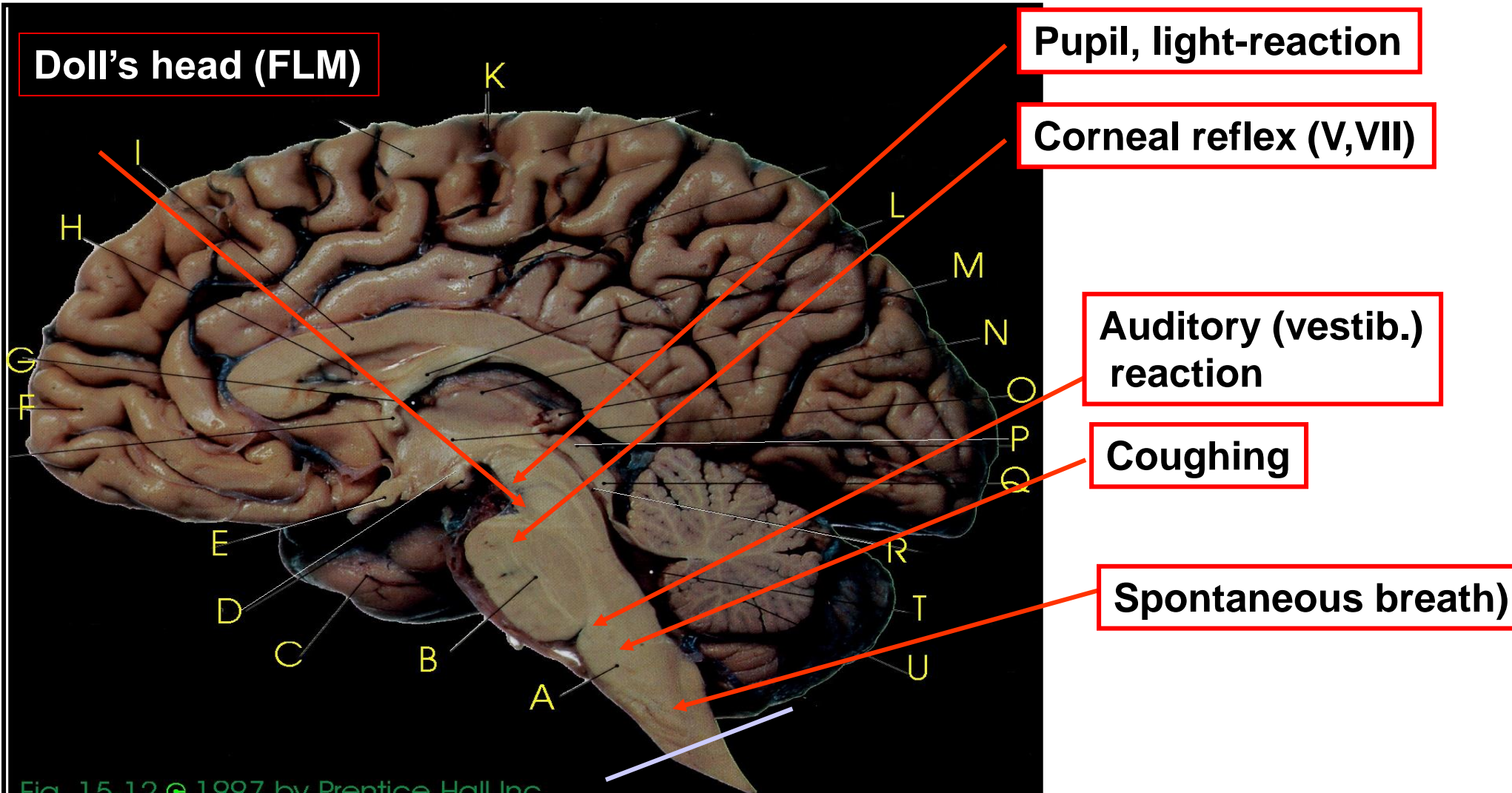
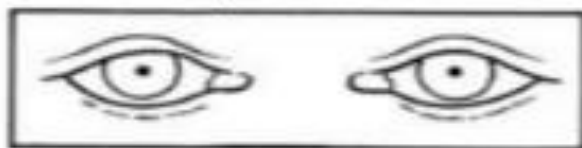


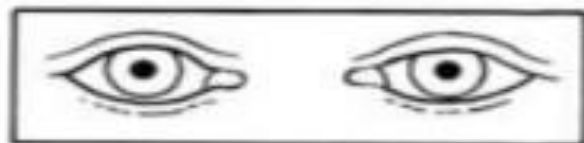
Fig. 15-12 © 1997 by Prentice Hall Inc.

Diencephalons



Small, reactive

Midbrain



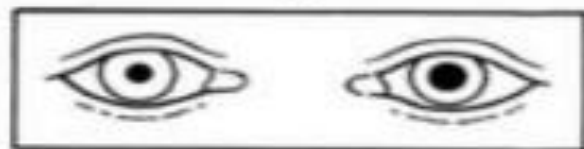
Medium-sized, fixed

TECTUM



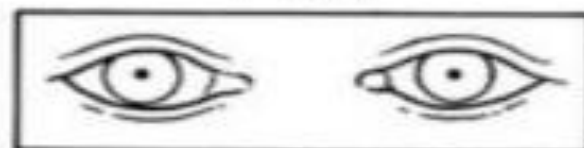
Dilated, Fixed

III

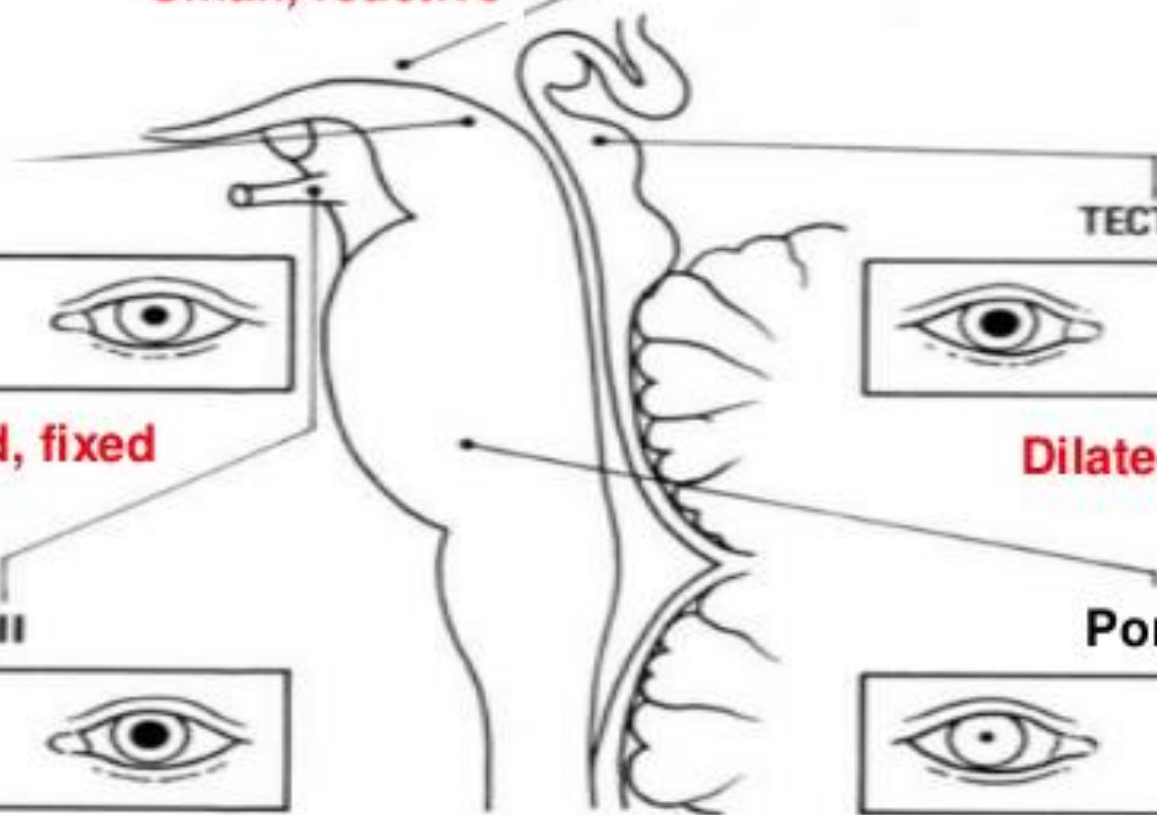


Ipsilateral dilated, Fixed

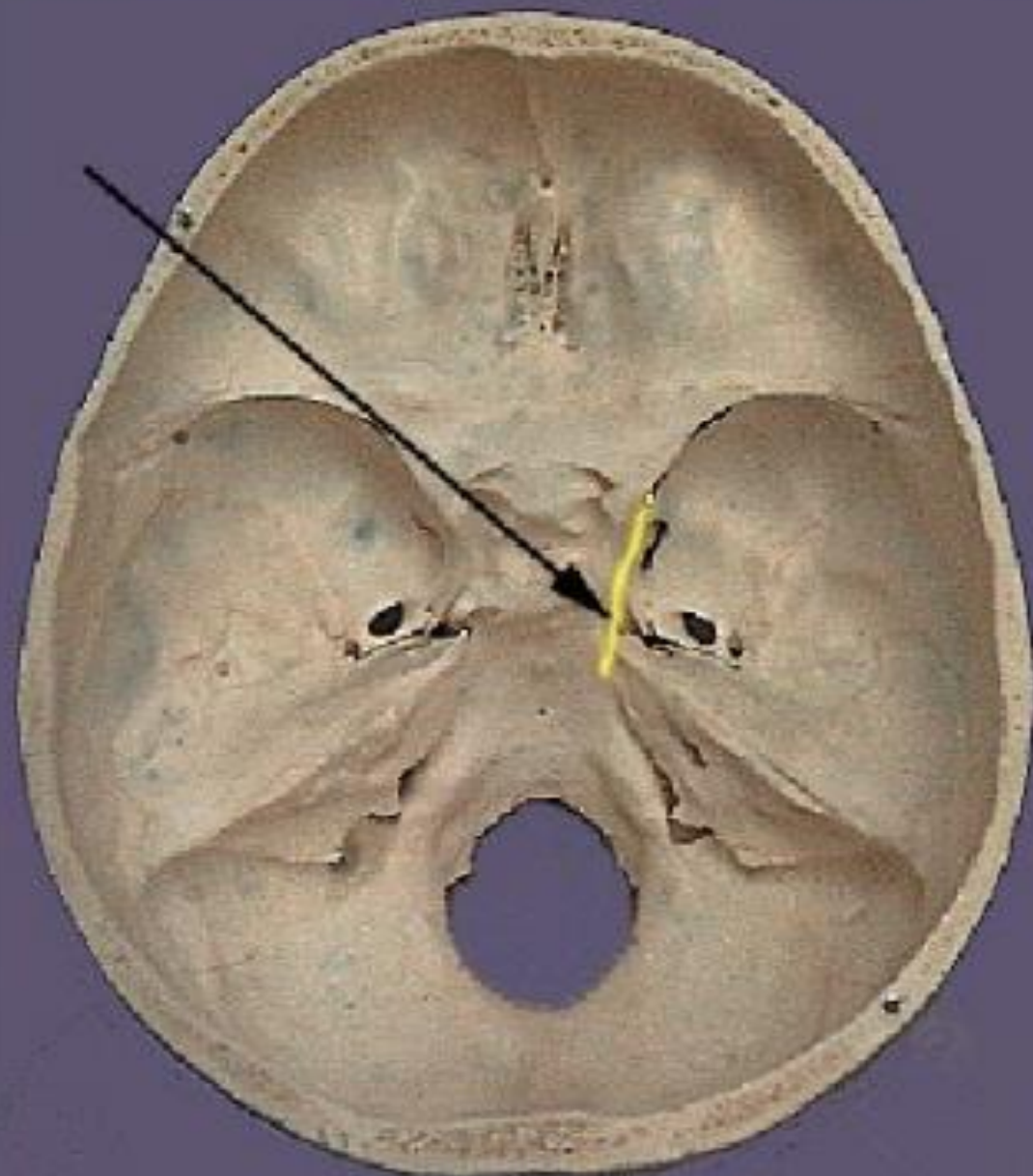
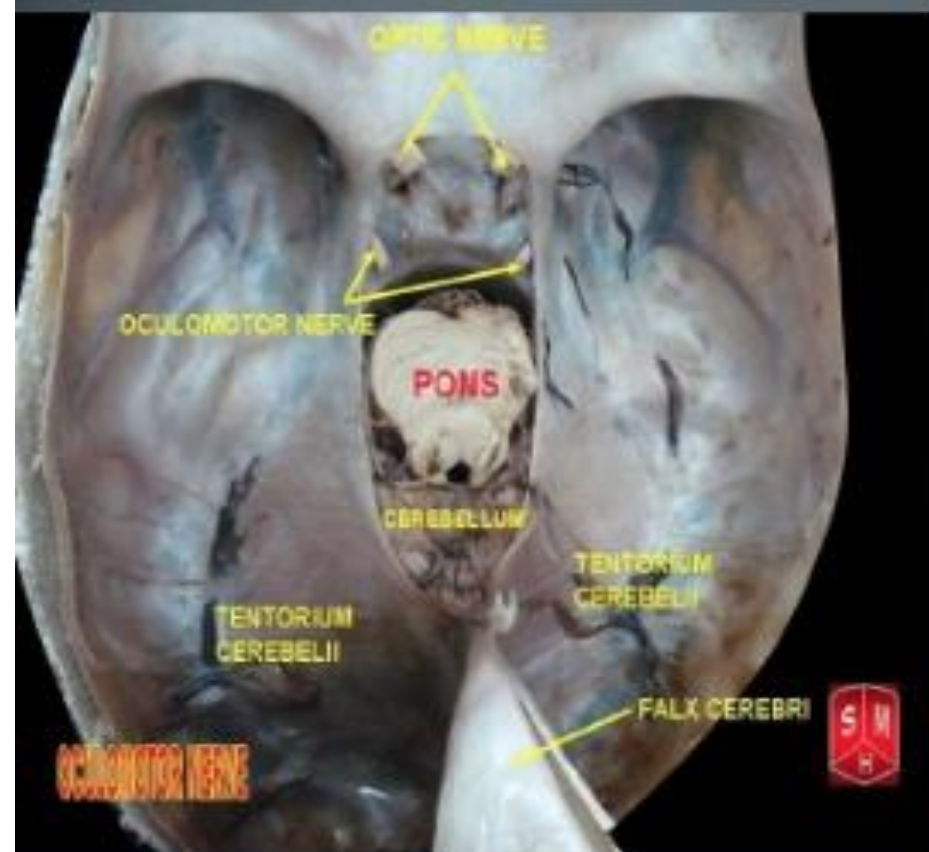
Pons



small, pinpoint
In hge reactive



Assessment of coma



Normal

If only **ipsilateral** narrowing
→ **contralat.** oculomot. palsy

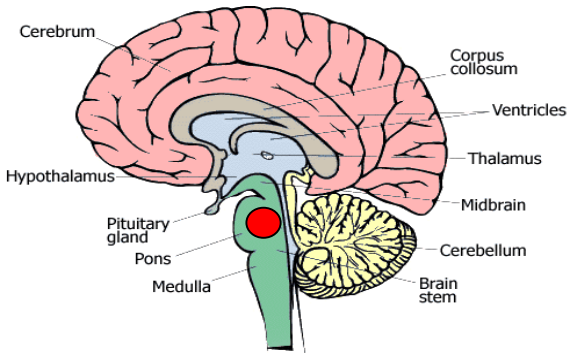
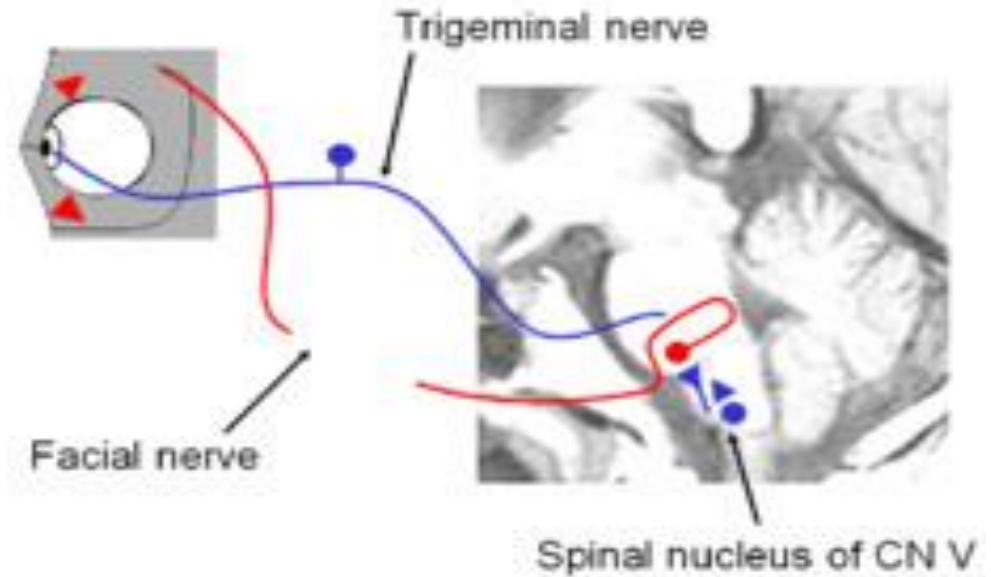
If only **contralat** narrowing:
→ **ipsilat.** oculomot. palsy



Corneal reflex

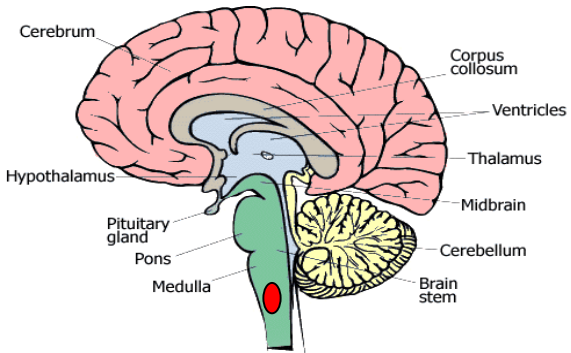
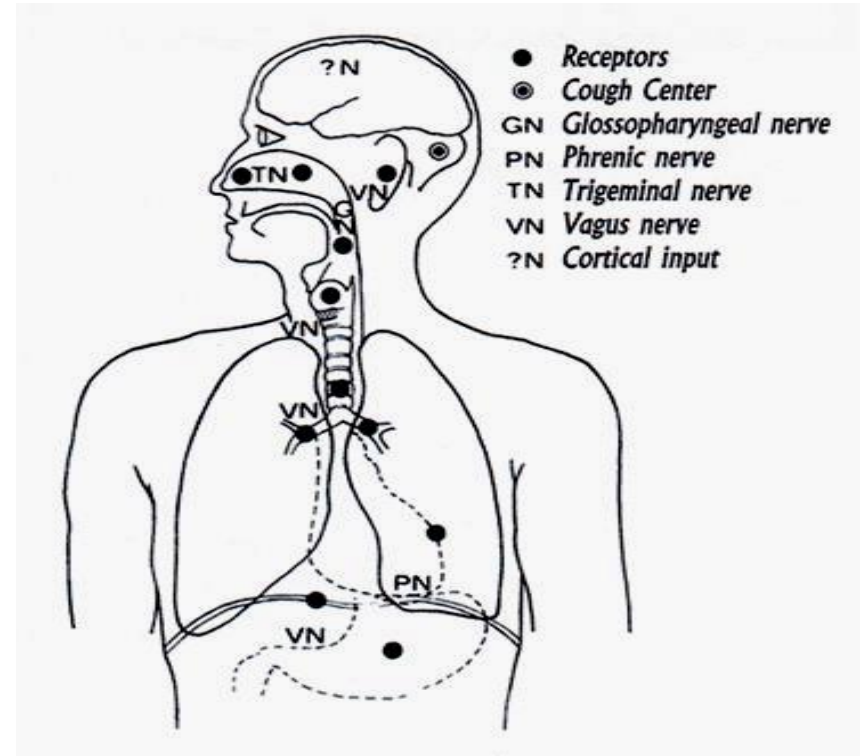


5. The Corneal Reflex



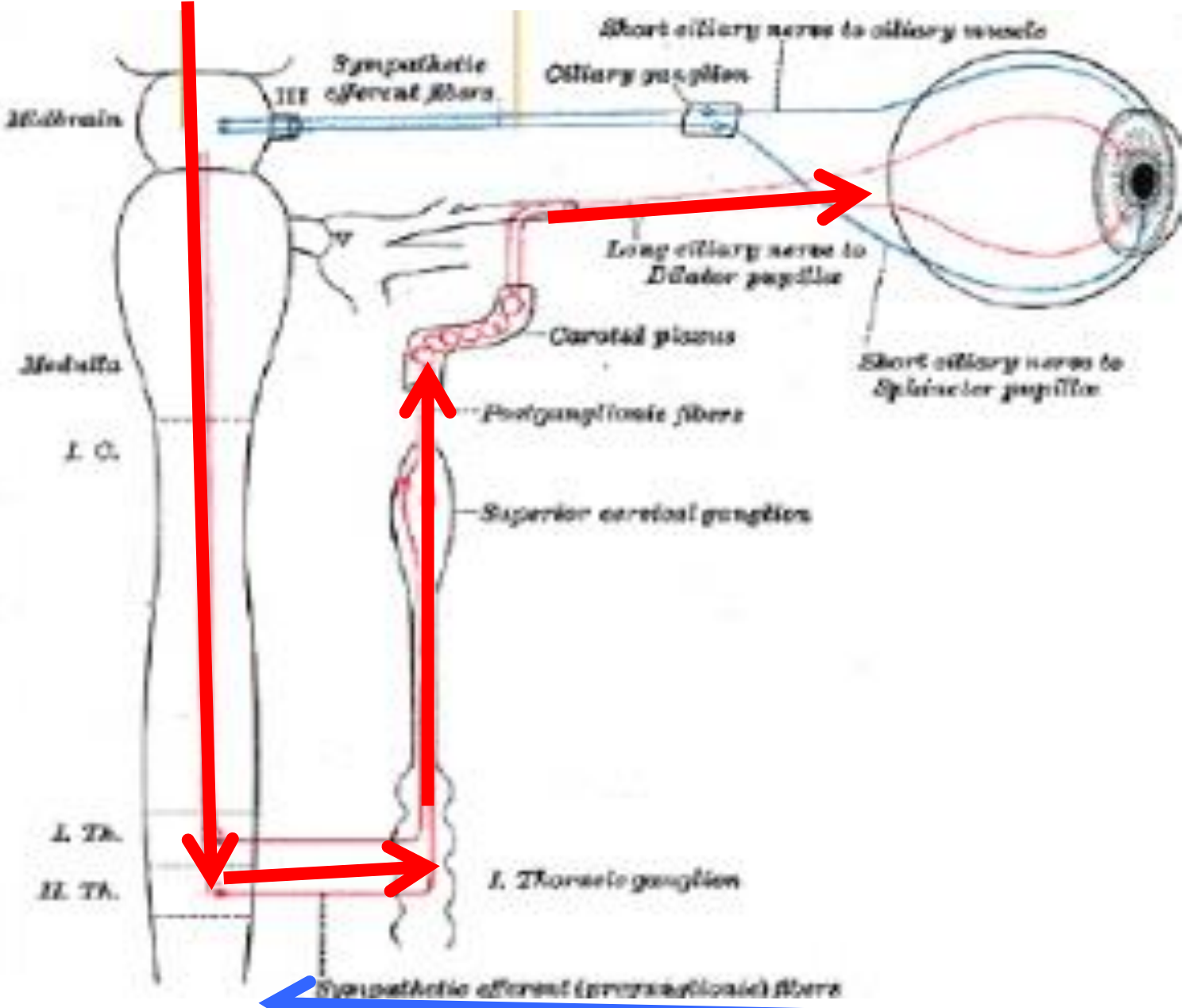
Coughing reflex

- Moving the tube
- Sucction
 - coughing
 - Change of pulse or BP



Hypothalamus

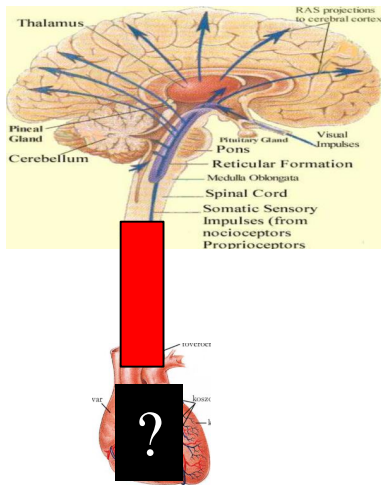
Cilio-spinal reflex



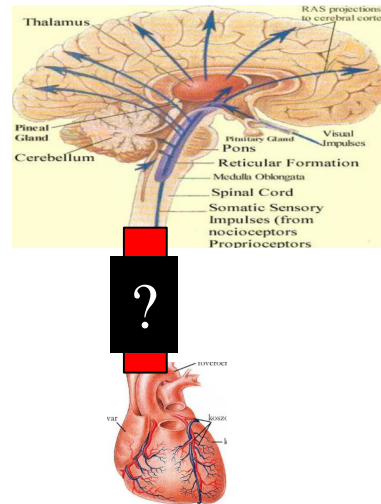
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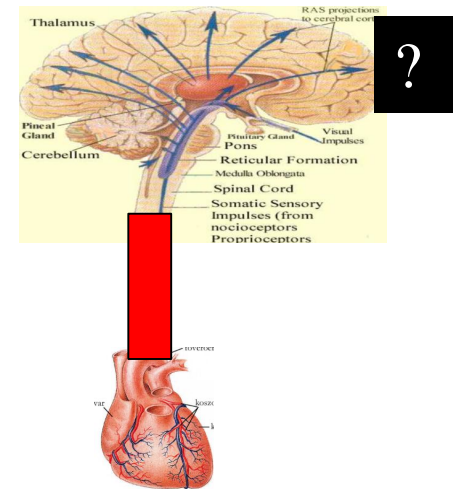
3 localisations



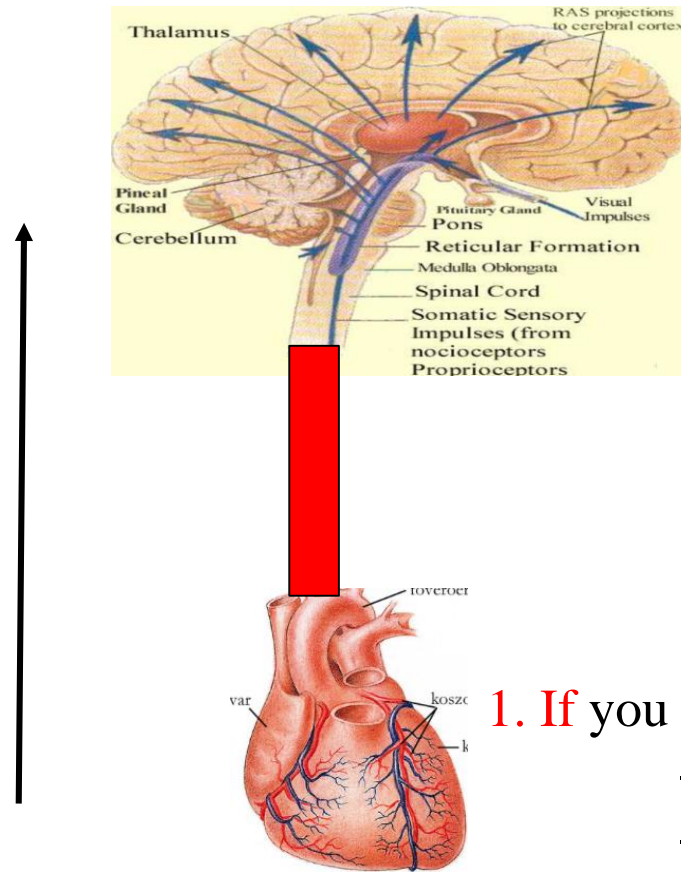
or



or

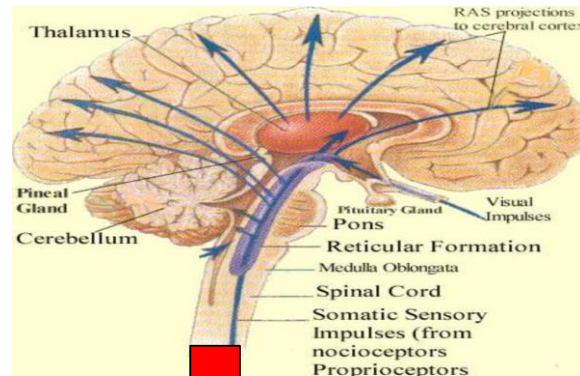


You are alert



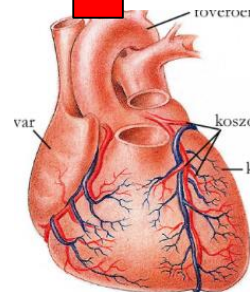
1. If you have a good pump
 - BP
 - EF
 - normorhythmia

You are alert



2. If the blood is OK

- physiol. parameters and
- no toxins/infection



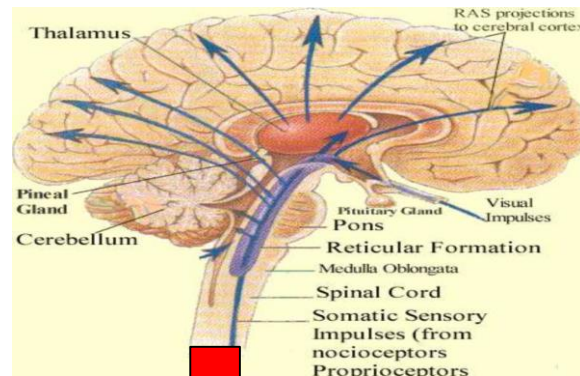
1. If you have a good pump

-BP

-EF

-normorhythmia

You are alert



3. If the brainstem is intact

2. If the blood is OK

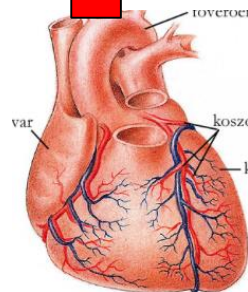
- physiol. parameters and
- no toxins/infection

1. If you have a good pump

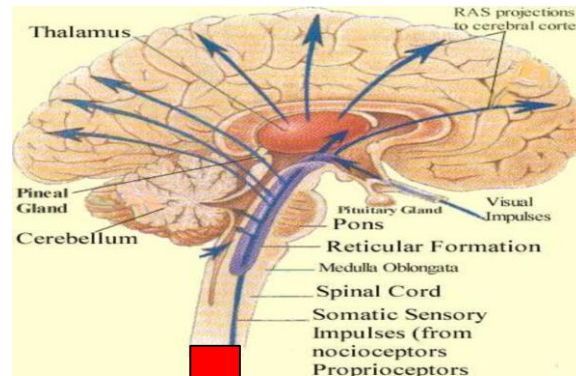
-BP

-EF

-normorhythmia



You are alert



4. If no **diffuse** lesion in the supratentorial region?

3. If the **brainstem** is intact

2. If the blood is OK

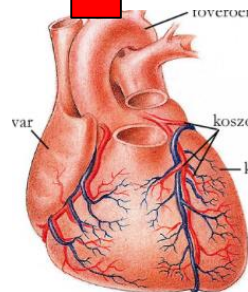
- physiol. parameters and
- **no toxins/infection**

1. If you have a good pump

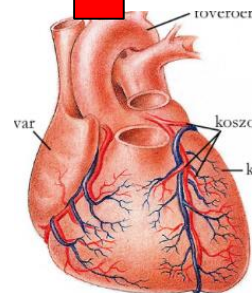
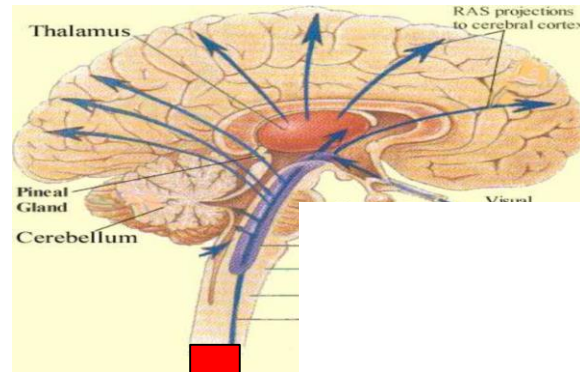
-BP

-EF

-normorhythmia

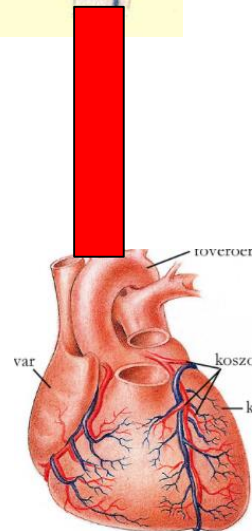
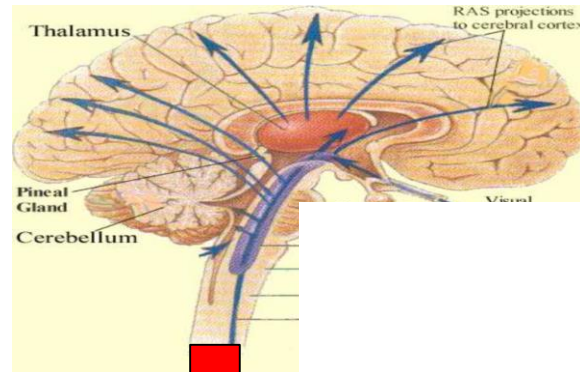


Diagnosis?



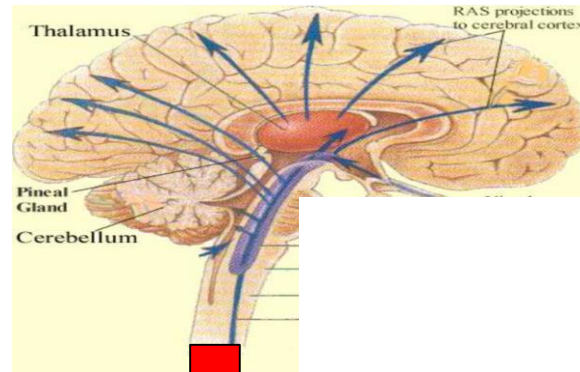
1. Pump? **BP/EF/ECG/necroenzymes**

Most common diseases

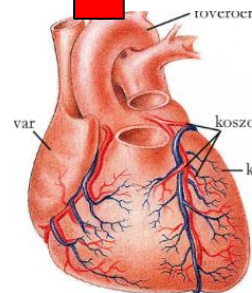


1. Pump? **asystolia, ventric. fibrillation, long lasting BP ↓**

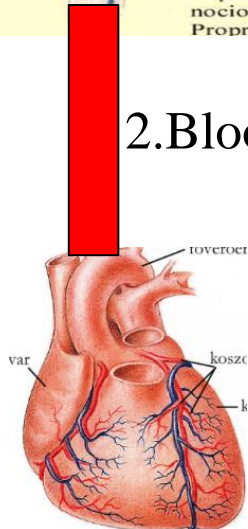
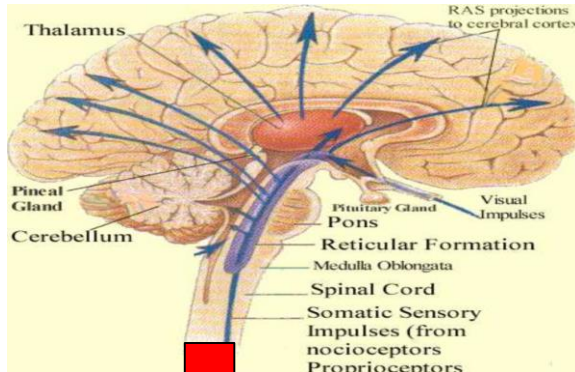
Diagnosis?



2. Blood: **labs?**



Most common diseases



2. Blood:

Abnormal blood constituents

↑

Hyperglyc
hypercapnia
uremia
hyperammon
hyperosmol.
hypertension
Hypernatr.
Hypercalc.
Hyperthermia
Non-convulsive
Epileptic status **OR external**

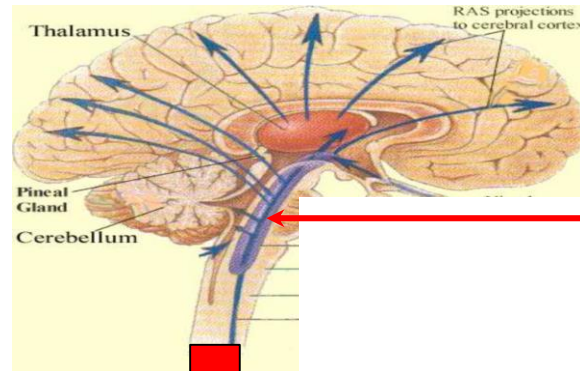
toxins

- chemicals
- bacterial

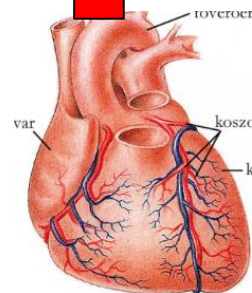
↓

Hypoxia
hypoglyc.
Hyponatr.
Hypocalc.
Hypothermia
Hypotension
Lack of thiamin

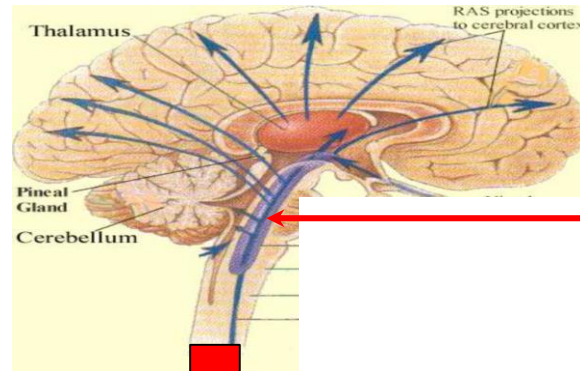
Diagnosis?



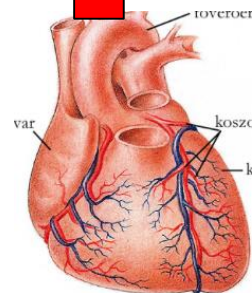
3. Brainstem
(retic.formation)? **MRI, CT/MR-AG,**
brainstem reflexes, BAEP



Most common diseases



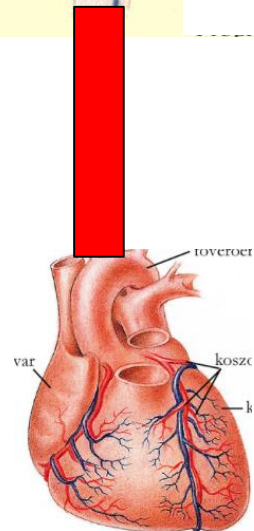
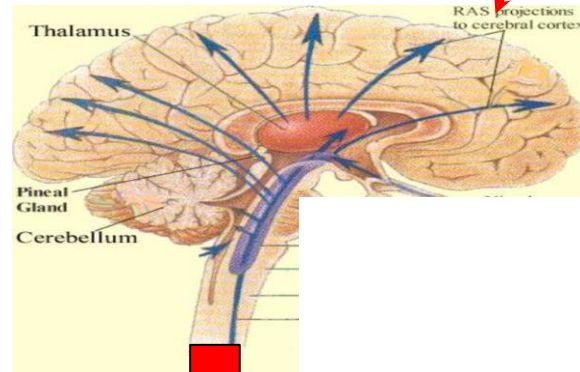
3. Brainstem: basilar artery occlusion, brainstem hemorrhage, tumor, brainstem enceph.



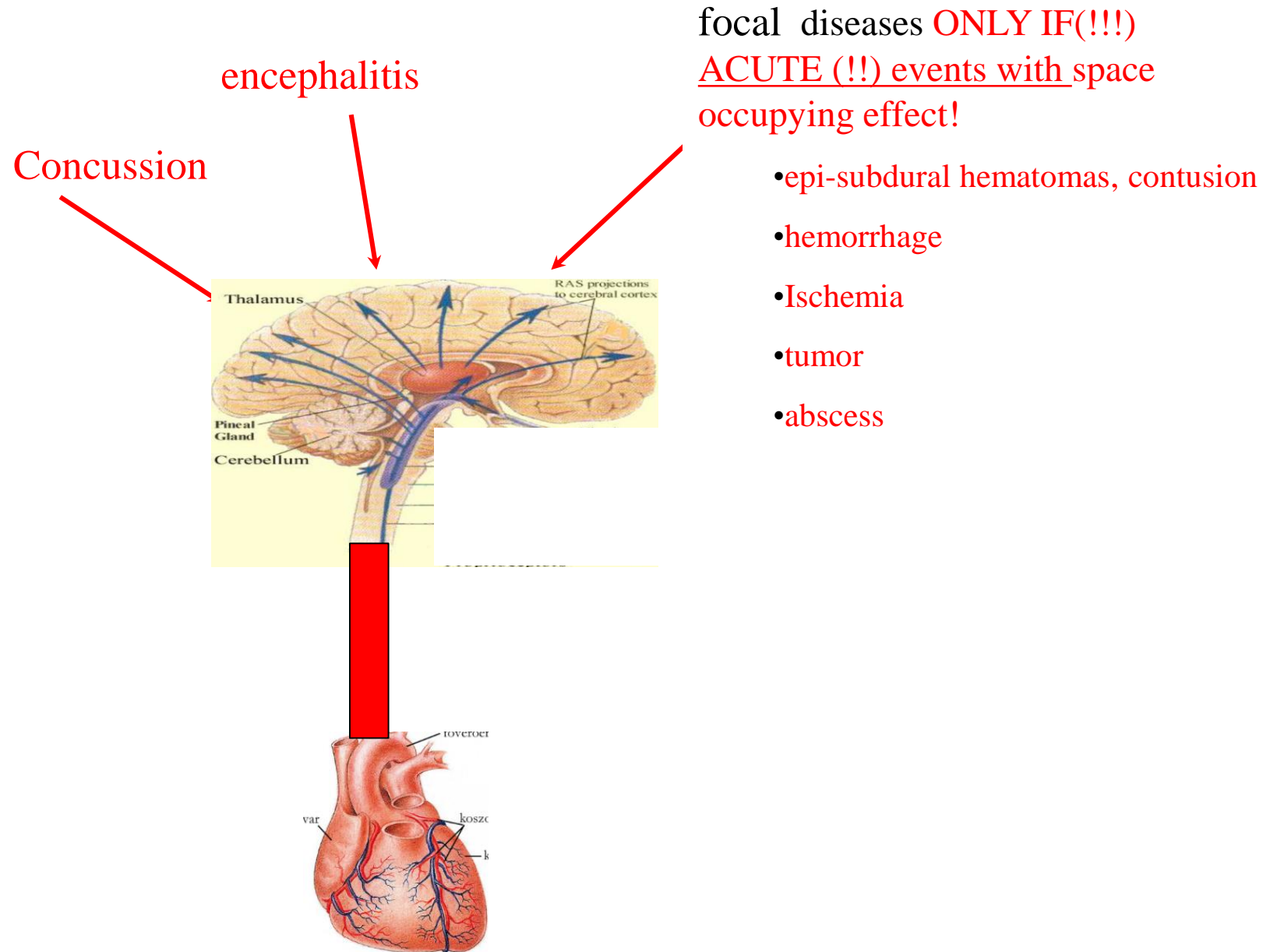
Diagnosis?

4. Supratent?

CT/MRI, EEG, EP



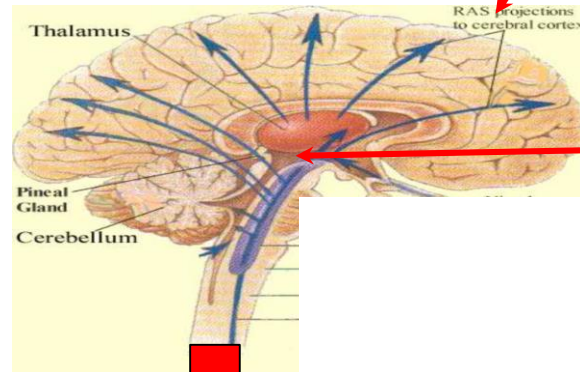
Most common diseases



All diagnostic steps

4. Supratent?

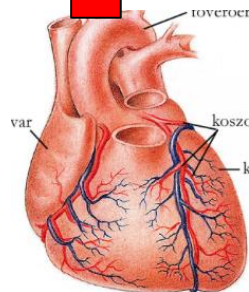
CT/MRI, EEG, EP



3. Brainstem

(retic.formation)? MRI, CT/MR-AG, brainstem reflexes, BAEP

2. Blood: labs?



1. Pump? BP/EF/ECG/necroenzymes



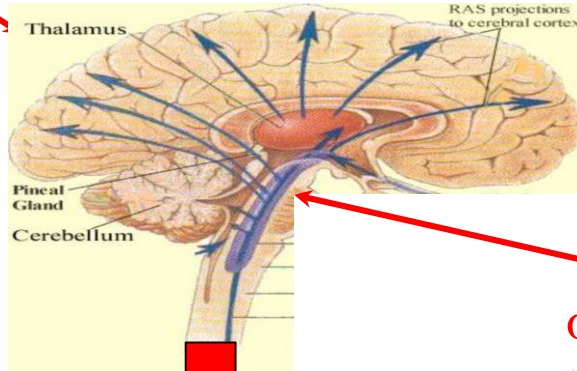
Most common diseases: ALL

4. Supratent?

focal diseases **ONLY IF(!!!)**
ACUTE (!) events with space
 occupying effect!

encephalitis

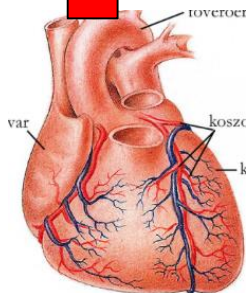
concussion



- epi-subdural hematomas, contusion
- hemorrhage
- Ischemia
- tumor
- abscess

3. Brainstem: basilar artery
 occlusion, brainstem hemorrhage,
 tumor, brainstem enceph.

2. Blood:



1. Pump? asystolia, ventric. fibrillation, long
 lasting BP decrease

Abnormal blood constituents

- ↑ Hyperglyc
- ↑ hypercapnia
- ↑ uremia
- ↑ hyperammon
- ↑ hyperosmol.
- ↑ hypertension
- ↑ Hyponatr.
- ↑ Hypercalc.
- ↑ Hyperthermia
- ↑ Non-convulsive
- ↑ Epileptic status **OR external**
- ↑ toxins
- chemicals
- bacterial
- ↓ Hypoxia
- ↓ hypoglyc.
- ↓ Hyponatr.
- ↓ Hypocalc.
- ↓ Hypothermia
- ↓ Hypotension
- ↓ Lack of thiamin