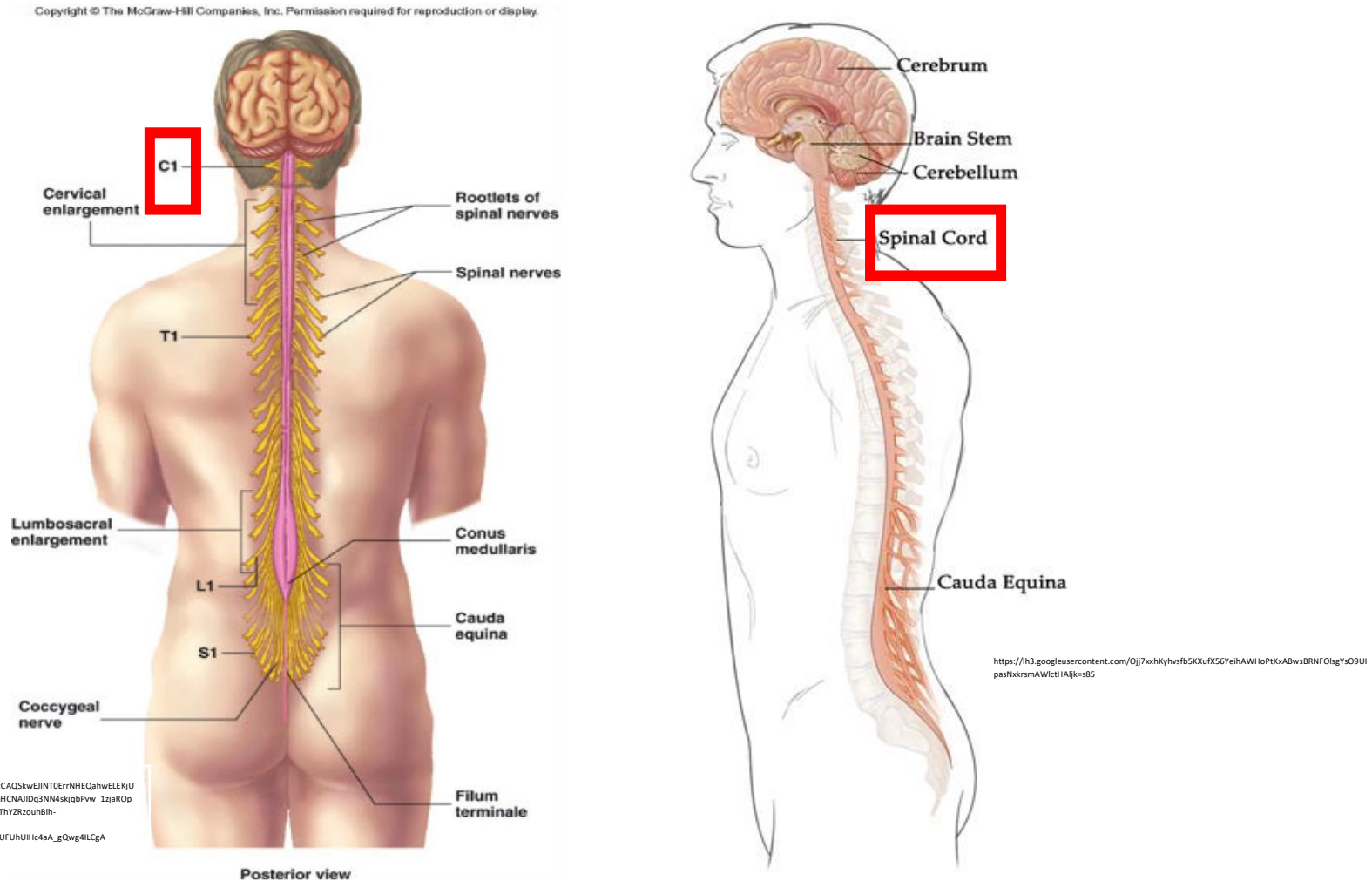


# Spinal Cord

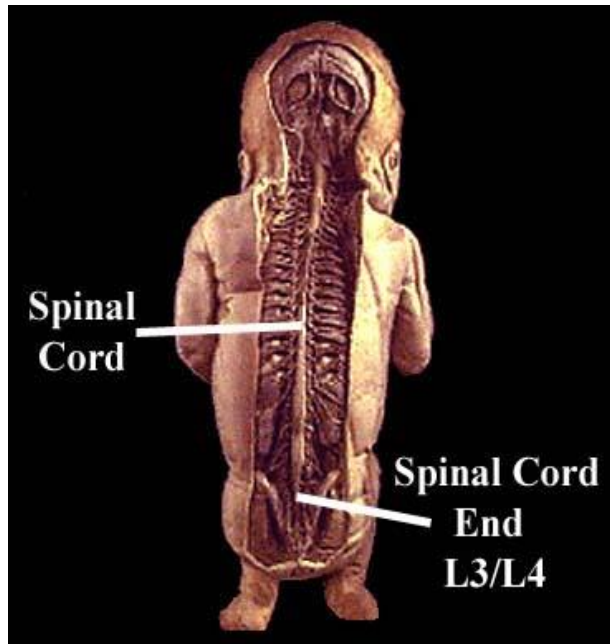
## Practical section 1

# The Spinal Cord

It starts at the upper border of 1<sup>st</sup> cervical vertebra as a continuation of the medulla oblongata.



- The spinal cord ends at the disc between 1<sup>st</sup> and 2<sup>nd</sup> lumbar vertebrae (in adults).
- While it ends opposite 3<sup>rd</sup> lumbar vertebra (at birth).



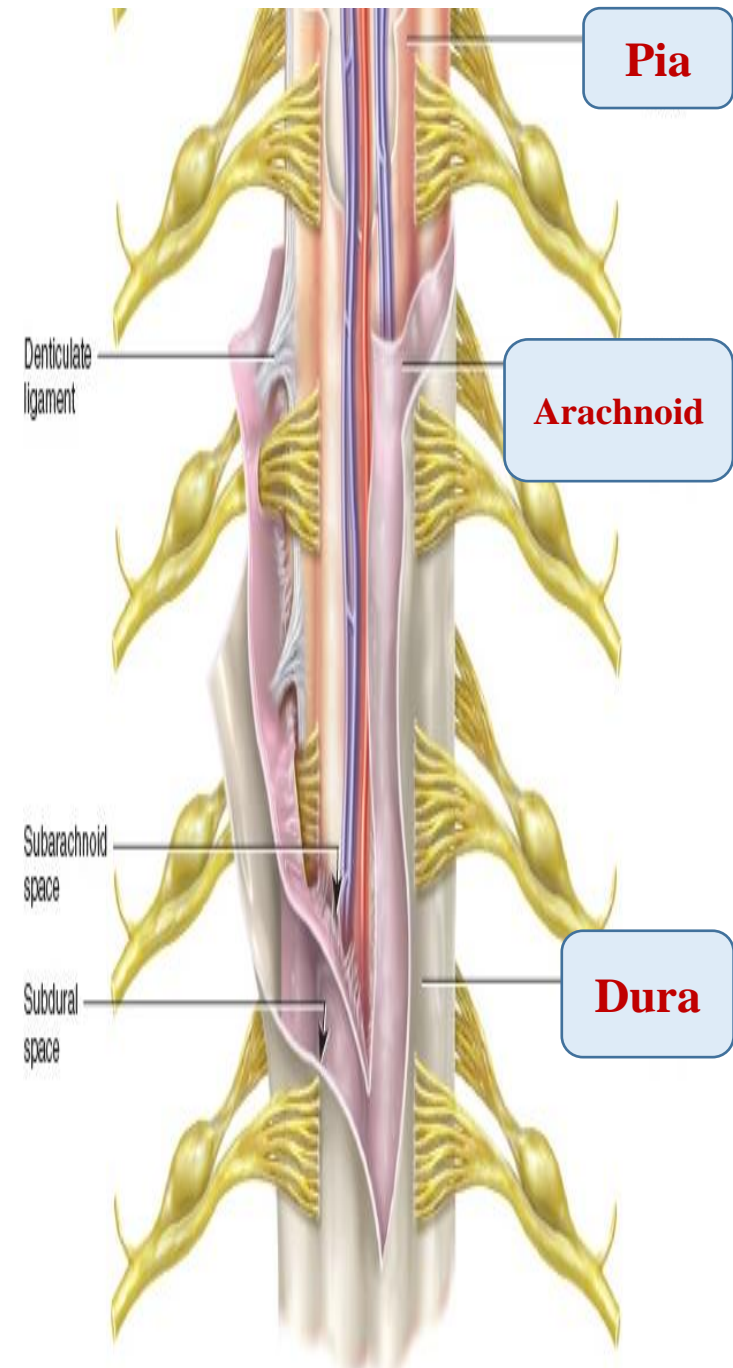
[https://www.google.com.eg/search?hl=en-EG&q=cervical+and+lumbar+enlargement+of+the+spinal+cord&tbm=isch&bs=simg:CAQSkwEJNi0eiA8ESaahwELEKJUZ2AQaAAwLELCMpwgaYgpgCAMSKJ0ZnhmUGZMzrBmqGakO8halGFAWIdqCLZM6IC7eLM420CSrJNsg50aMC4h0XzPz15\\_15ZJIK11brNTW-rgwXggu8uQolz70rFY05Xz0h5FHveMIFhCC6kGIAEDAsQiq7-CBoKcggIARIEsNK7rgw&sa=X&ved=0ahUKEwjCkKXp-\\_JAHuWRBUiHTM2BbkOwg4ILCgA](https://www.google.com.eg/search?hl=en-EG&q=cervical+and+lumbar+enlargement+of+the+spinal+cord&tbm=isch&bs=simg:CAQSkwEJNi0eiA8ESaahwELEKJUZ2AQaAAwLELCMpwgaYgpgCAMSKJ0ZnhmUGZMzrBmqGakO8halGFAWIdqCLZM6IC7eLM420CSrJNsg50aMC4h0XzPz15_15ZJIK11brNTW-rgwXggu8uQolz70rFY05Xz0h5FHveMIFhCC6kGIAEDAsQiq7-CBoKcggIARIEsNK7rgw&sa=X&ved=0ahUKEwjCkKXp-_JAHuWRBUiHTM2BbkOwg4ILCgA)



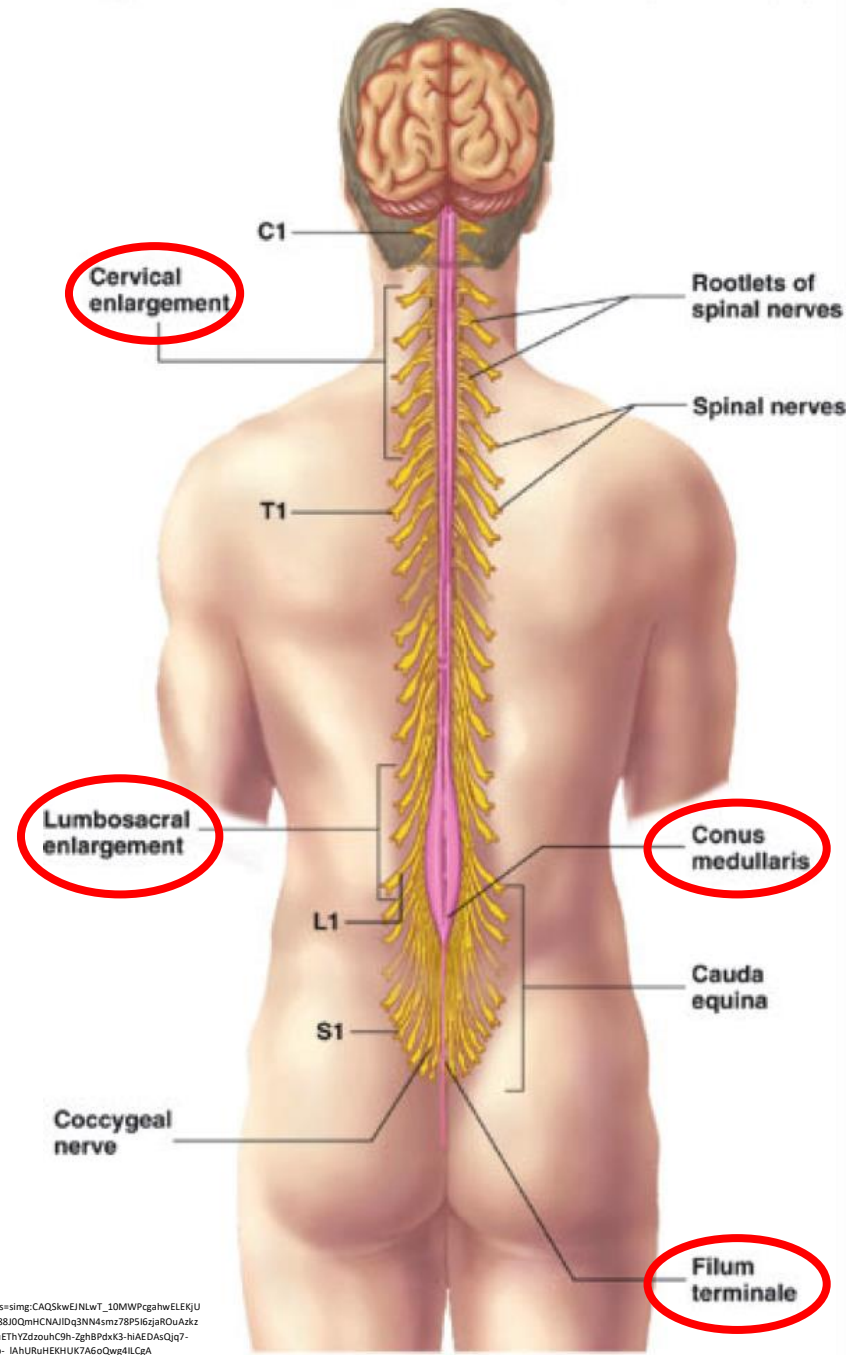
<https://lh3.googleusercontent.com/nx-Nlic5dP7PreqD06HghZzjNK5K0Emni5A0fNblmBjqMJR2ka0SrV4AIz7yp1-s85>

The spinal cord is covered by 3 meninges:

- 1- **Dura matter** (the outer layer).
- 2- **Arachnoid** (middle layer).
- 3- **Pia** (inner layer).



- It is cylindrical in shape with 2 enlargements : Cervical, and Lumbar.
- Its end is called “Conus medullaris” from which a pial ligament called “Filum terminale” extends to be attached to the back of coccyx.

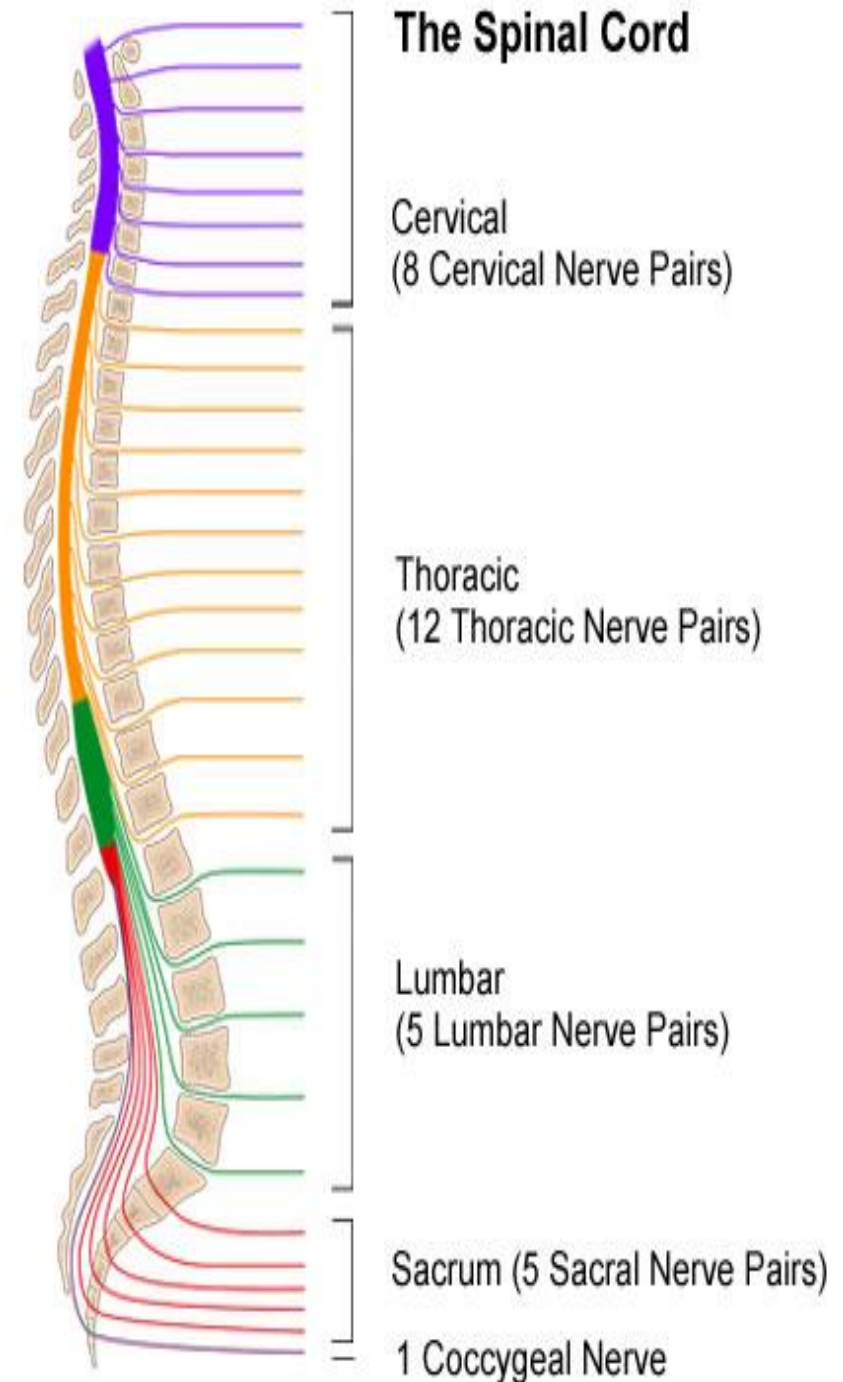


[https://www.google.com.eg/search?hl=en-EG&q=foramen+magnum+spinal+cord&btnisch&tbs=simg:CAQskwEiNLwT\\_10MWPqahwELEKJU2AQAAAwLELCMpwgaYppgCAMSkiQhQJCdsC4hUA88J0QmHCNAIDq3NN4smz78P5I6jaROUAkz oaMjDfI\\_1VjP5m3QRqPZLIC2FNS3D8jq6RagOyPbWuETHYZdzouhC9h-zgh8PdxK3-hiAEDAsQq7-CBoKcGgiARIEbxW2jww&sa=X&ved=0ahUKewj\\_64ivp\\_-JAHURuHEKHUK7A6oQwg4ILCgA](https://www.google.com.eg/search?hl=en-EG&q=foramen+magnum+spinal+cord&btnisch&tbs=simg:CAQskwEiNLwT_10MWPqahwELEKJU2AQAAAwLELCMpwgaYppgCAMSkiQhQJCdsC4hUA88J0QmHCNAIDq3NN4smz78P5I6jaROUAkz oaMjDfI_1VjP5m3QRqPZLIC2FNS3D8jq6RagOyPbWuETHYZdzouhC9h-zgh8PdxK3-hiAEDAsQq7-CBoKcGgiARIEbxW2jww&sa=X&ved=0ahUKewj_64ivp_-JAHURuHEKHUK7A6oQwg4ILCgA)

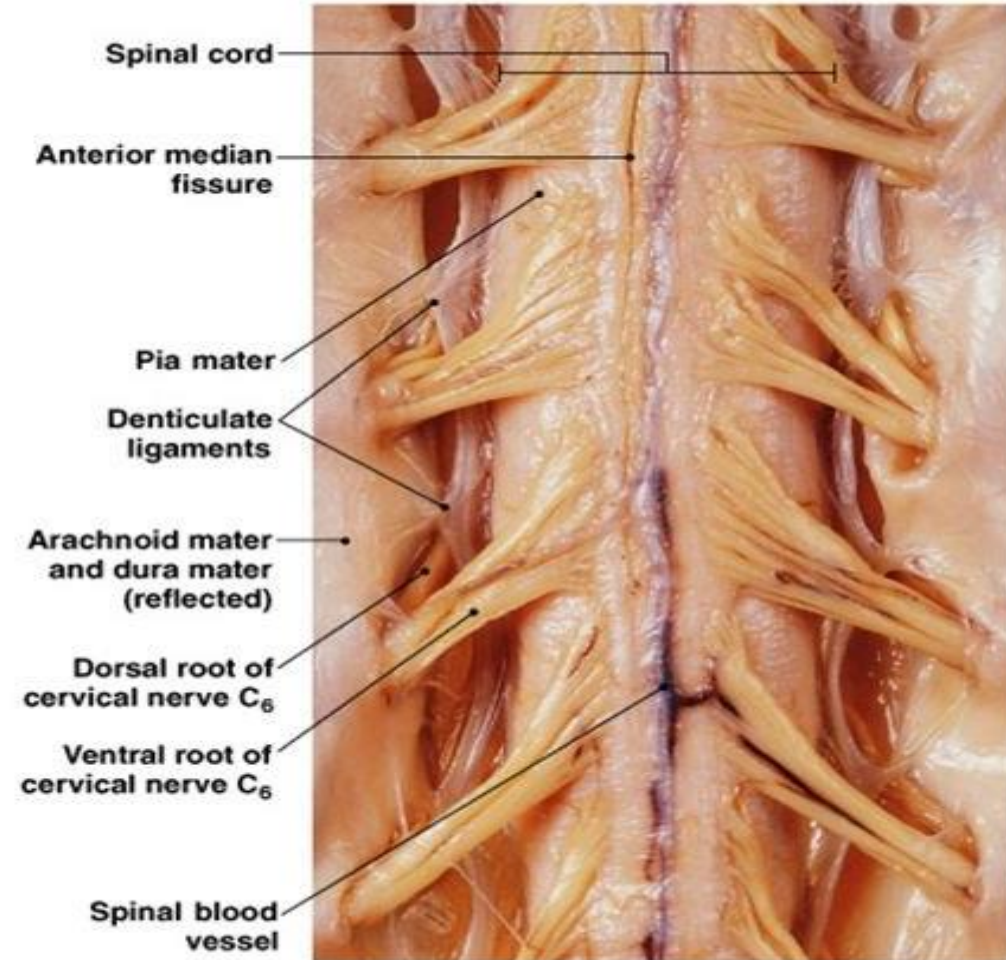
# The Spinal Cord

The cord is divided into segments **(31 segments)** giving rise to 31 pairs of spinal nerves:

- A- Cervical segments : **8**
- B- Thoracic segments: **12.**
- C- Lumbar segments: **5.**
- D- Sacral segments: **5.**
- E- **Single** coccygeal segment.

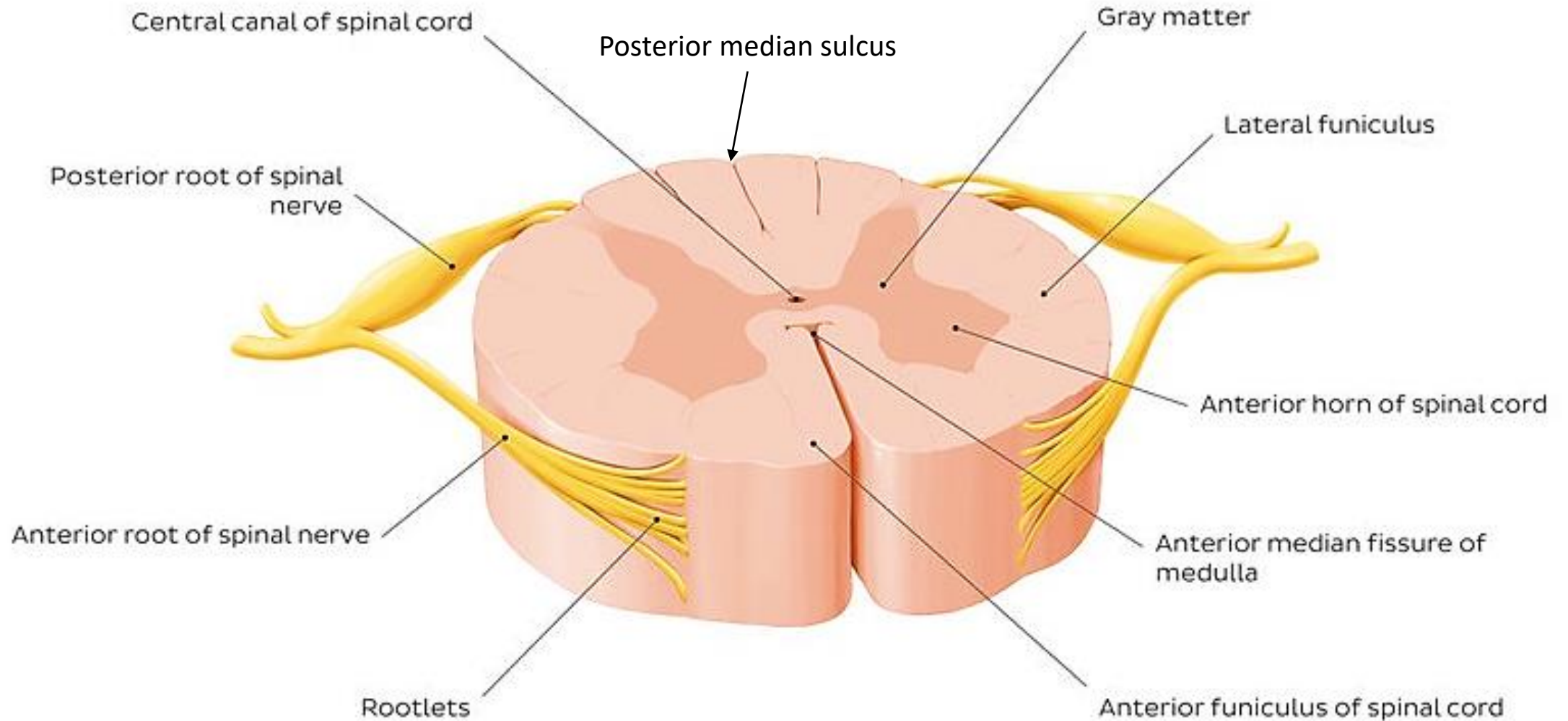


- Paired ***denticulate ligaments***:
  - extend from pia mater to dura mater
  - stabilize side-to-side movement



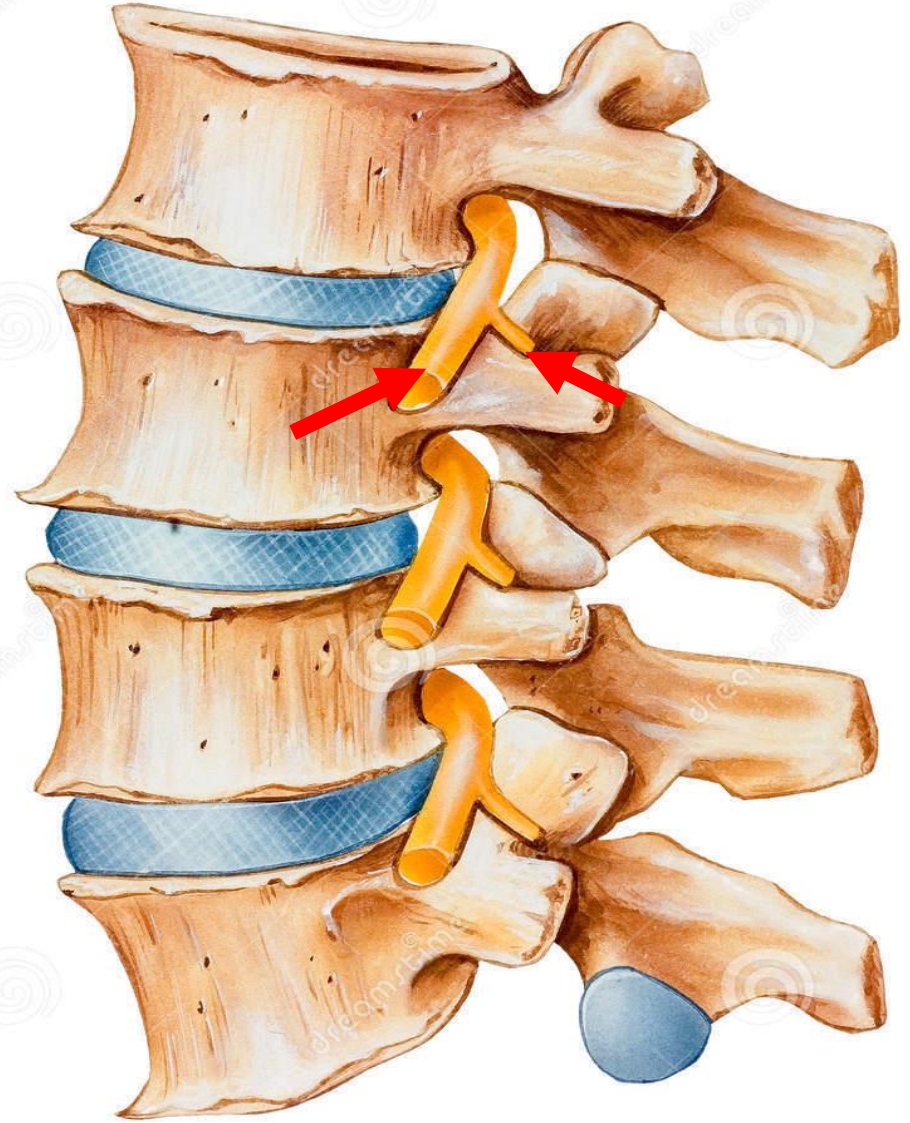
**Anterior view**

# Cross Section of the Spinal Cord

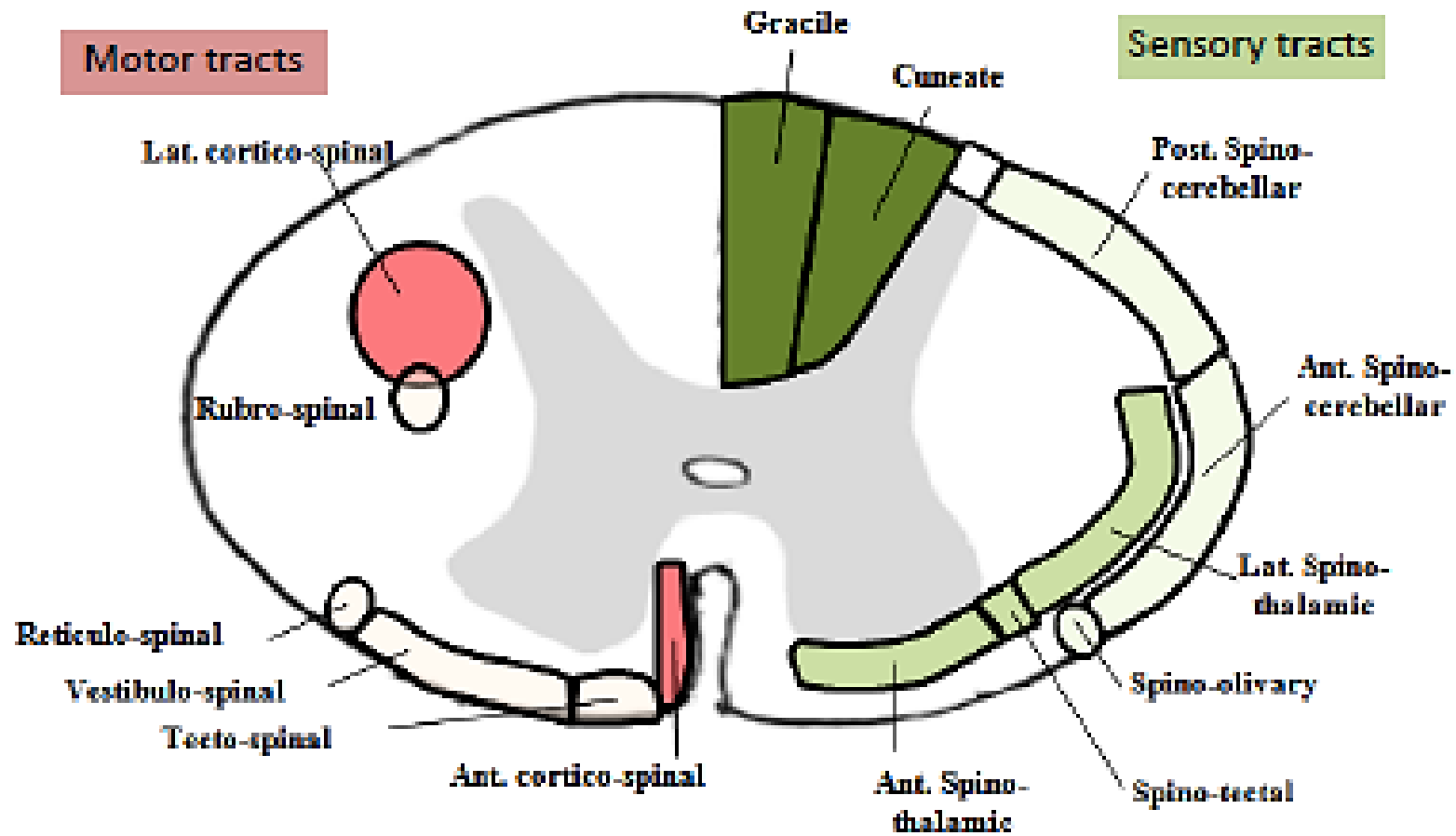




Once the spinal nerve emerges from the intervertebral foramen, it divides into a large “Anterior ramus” and a small “Posterior ramus”

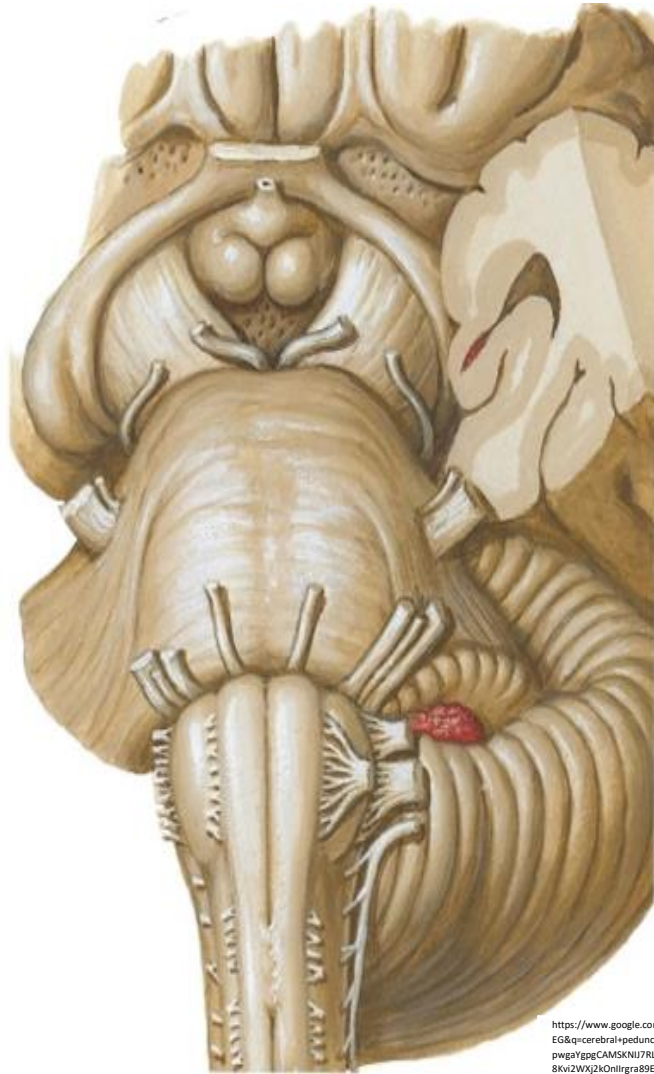


## Ascending and Descending Tracts

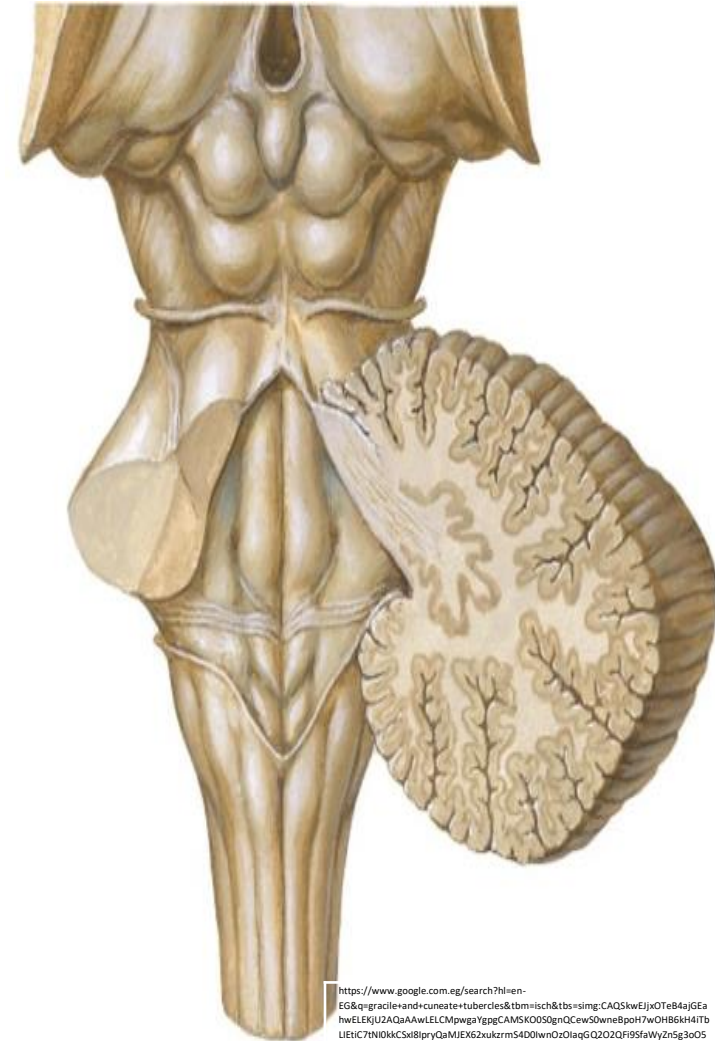


# The Brain Stem

Ventral surface



Dorsal surface



Mid Brain

Pons

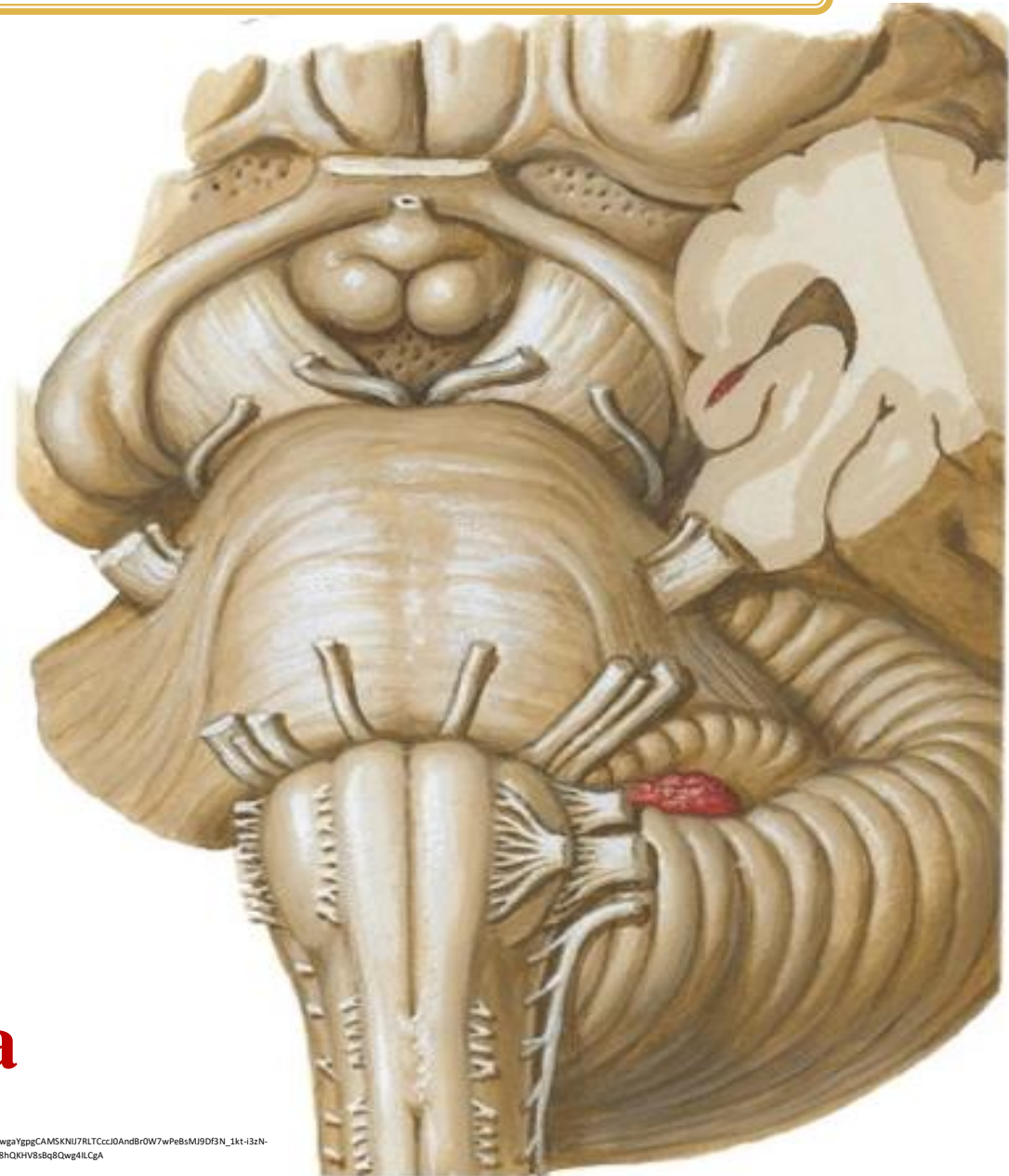
Medulla Oblongata

# Ventral Surface of the Brain Stem

**Mid Brain**

**Pons**

**Medulla Oblongata**



# Ventral Surface of the Brain Stem

## Identify:

### ➤ Mid Brain:

Cerebral peduncles ( ★ )

Inter-peduncular fossa ( ○ )

### ➤ Pons:

1- Basilar sulcus

2- Middle cerebellar peduncle (MCP)

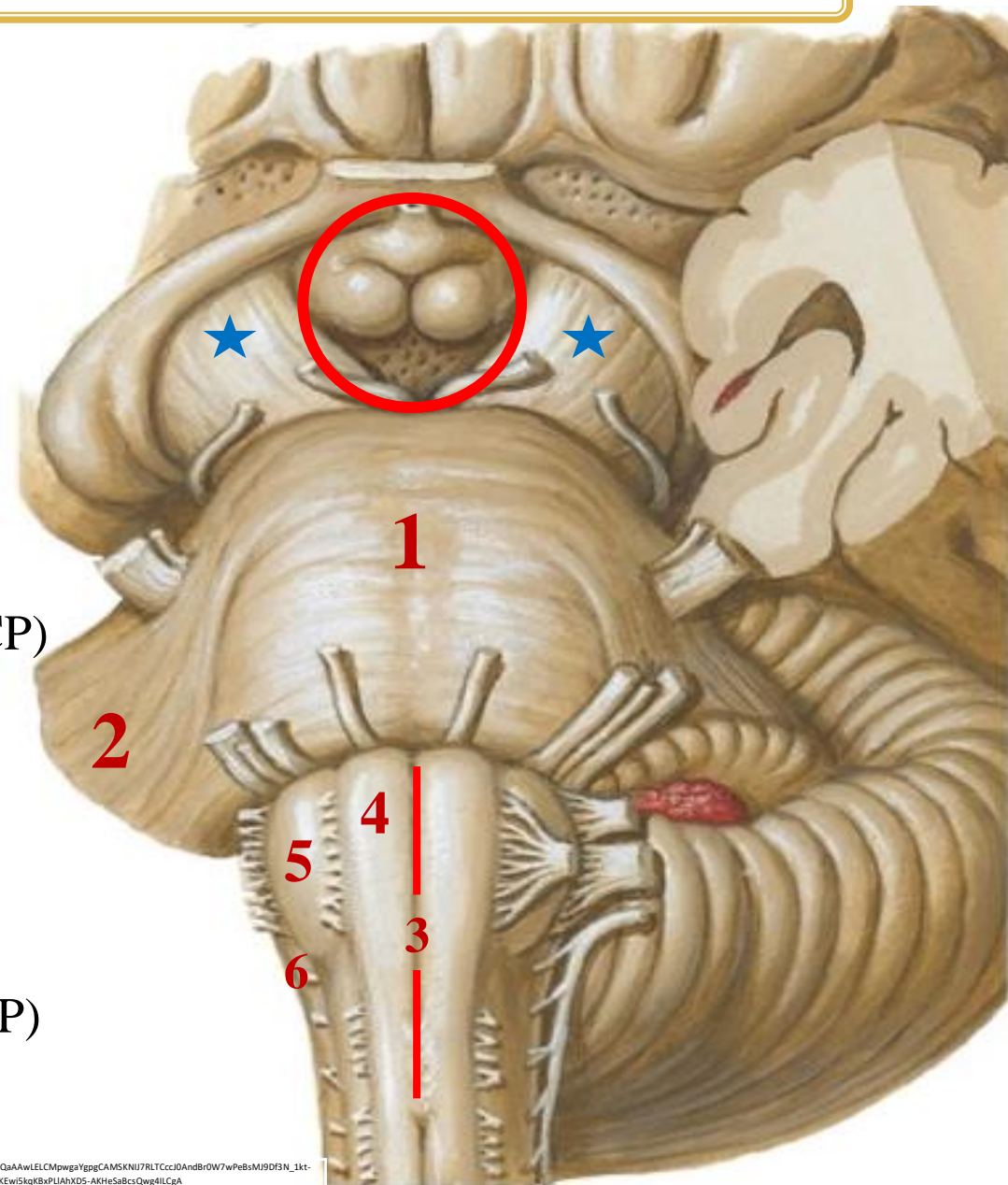
### ➤ Medulla oblongata:

3- Anterior median fissure

4- Pyramid

5- Olive

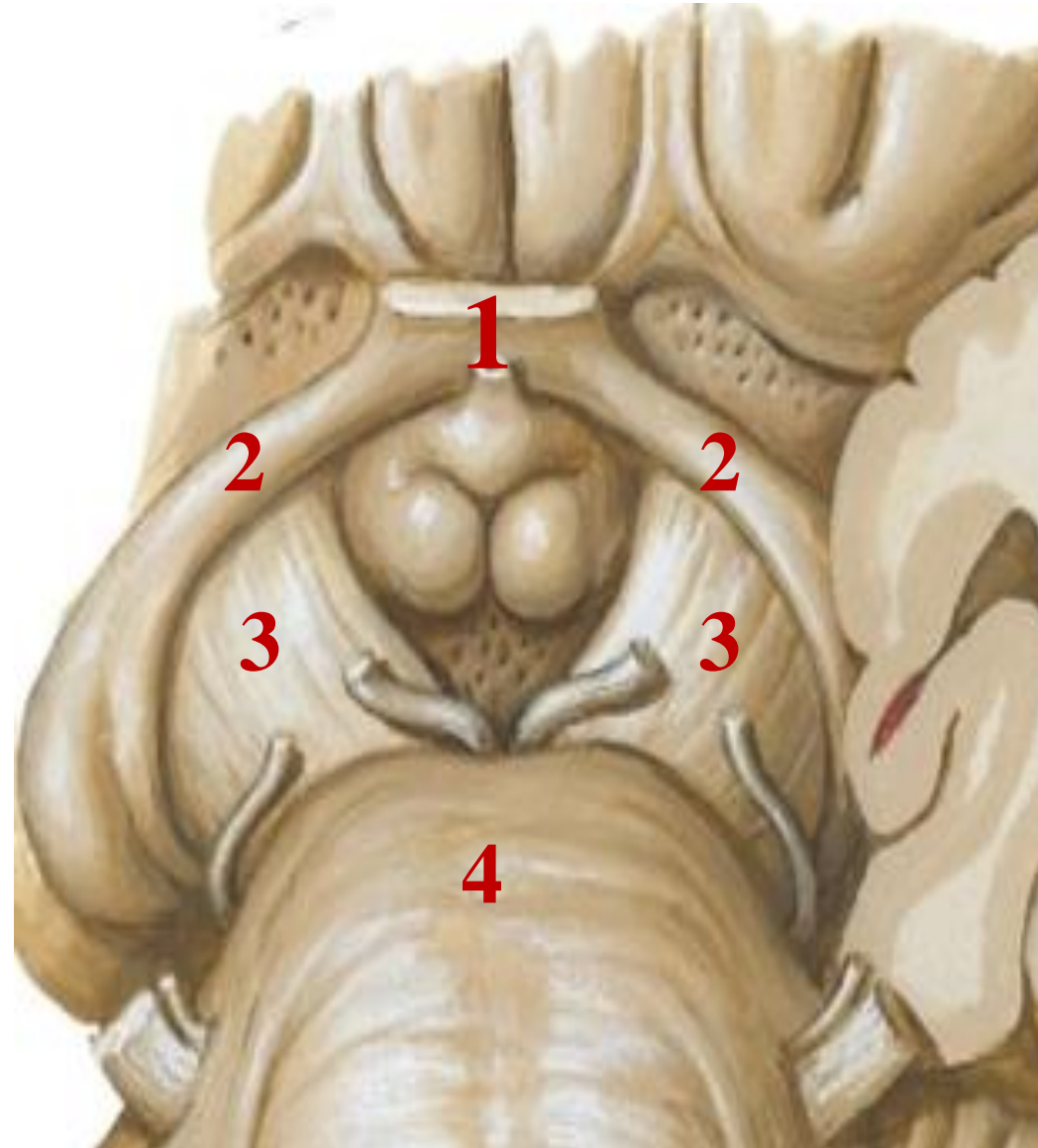
6- Inferior cerebellar peduncle (ICP)



# Mid Brain (Inter-peduncular Fossa)

## ➤ Boundries:

1. Anteriorly: optic chiasma.
2. Anterolaterally: optic tract.
3. Posterolaterally:  
cerebral peduncles.
4. Posteriorly: pons.

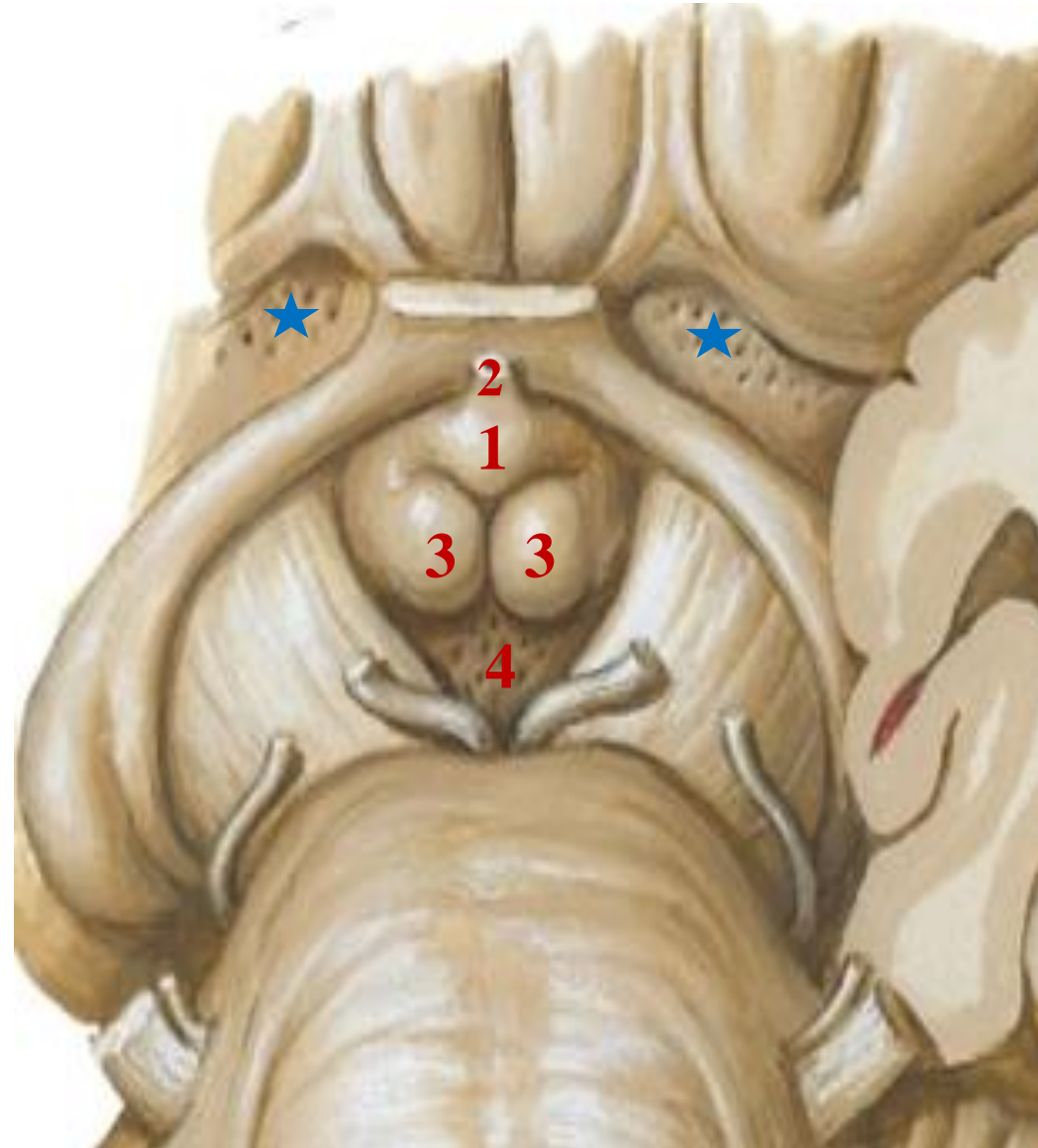


# Mid Brain (Inter-peduncular Fossa)

## ➤ Contents:

1. Tuber cinereum
2. Infundibulum
2. Mammillary bodies
4. Posterior perforated substance

Notice: anterior perforated  
substance (★ )

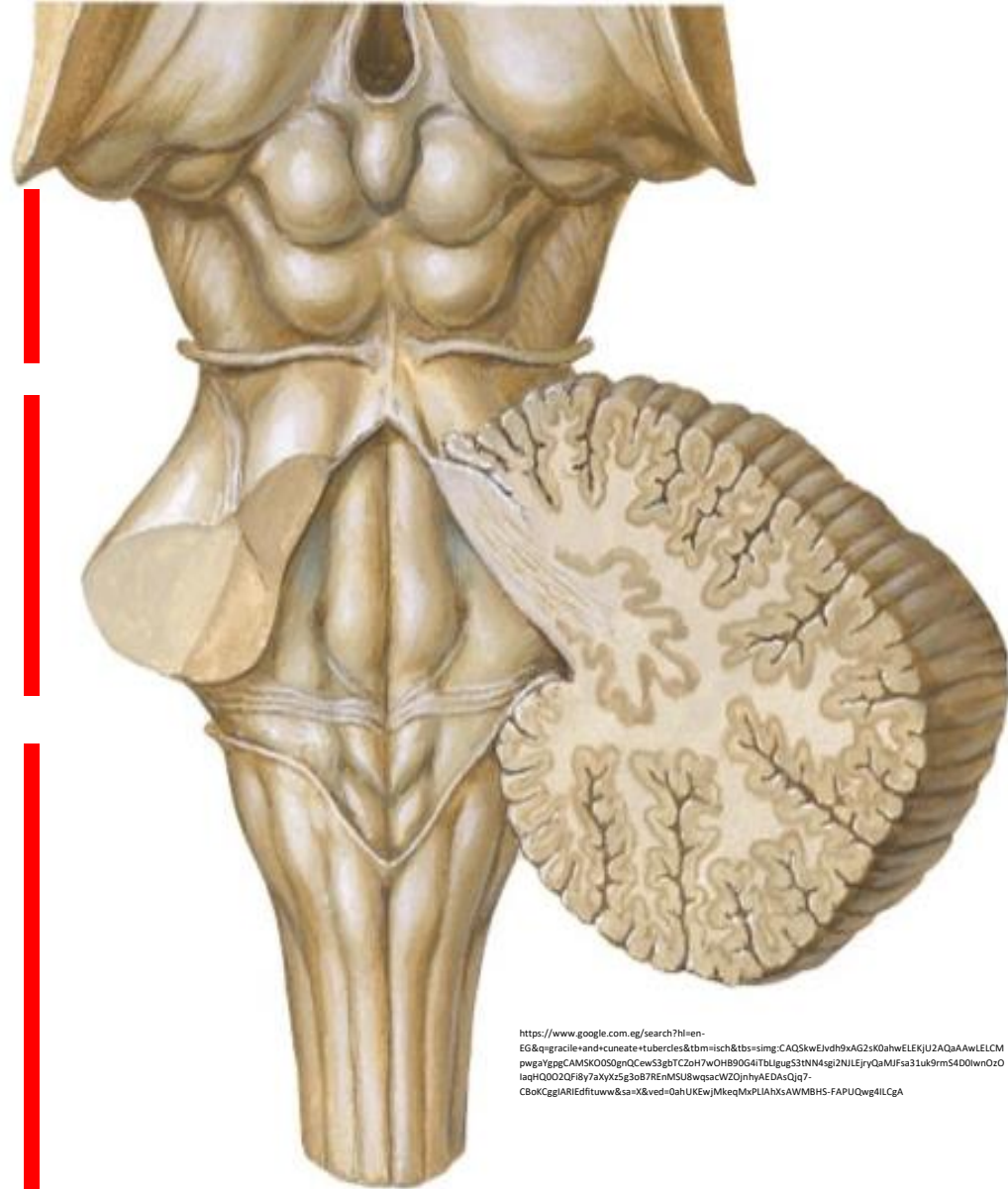


# Dorsal Surface of the Brain Stem

**Mid Brain**

**Pons**

**Medulla Oblongata**



<https://www.google.com/eg/search?hl=en-EG&q=gracile+and+cuneate+tubercles&tbm=isch&itbs=simg:CAGSkwEjvdh9xAG2xK0ahwELEKJU2AQaAwLELCMpwpaYpgcCAMSxO050gnDCew53gbTCzoH7wOH89OG4ITblugugS3tN4sg2NUEjryQaMfSa31uk9rmS4D0wnOzOluqH0Q0J2F8y7akYx5g3g8j7REmSU8wqpaWZ0jhyhAEDAsQjg7-CBoKCggARIEdfitww&sa=X&ved=0ahUKewjMkeqMxPLUAHxAWMBHS-FAPUQwg4ILCgA>



# Dorsal Surface of the Mid Brain

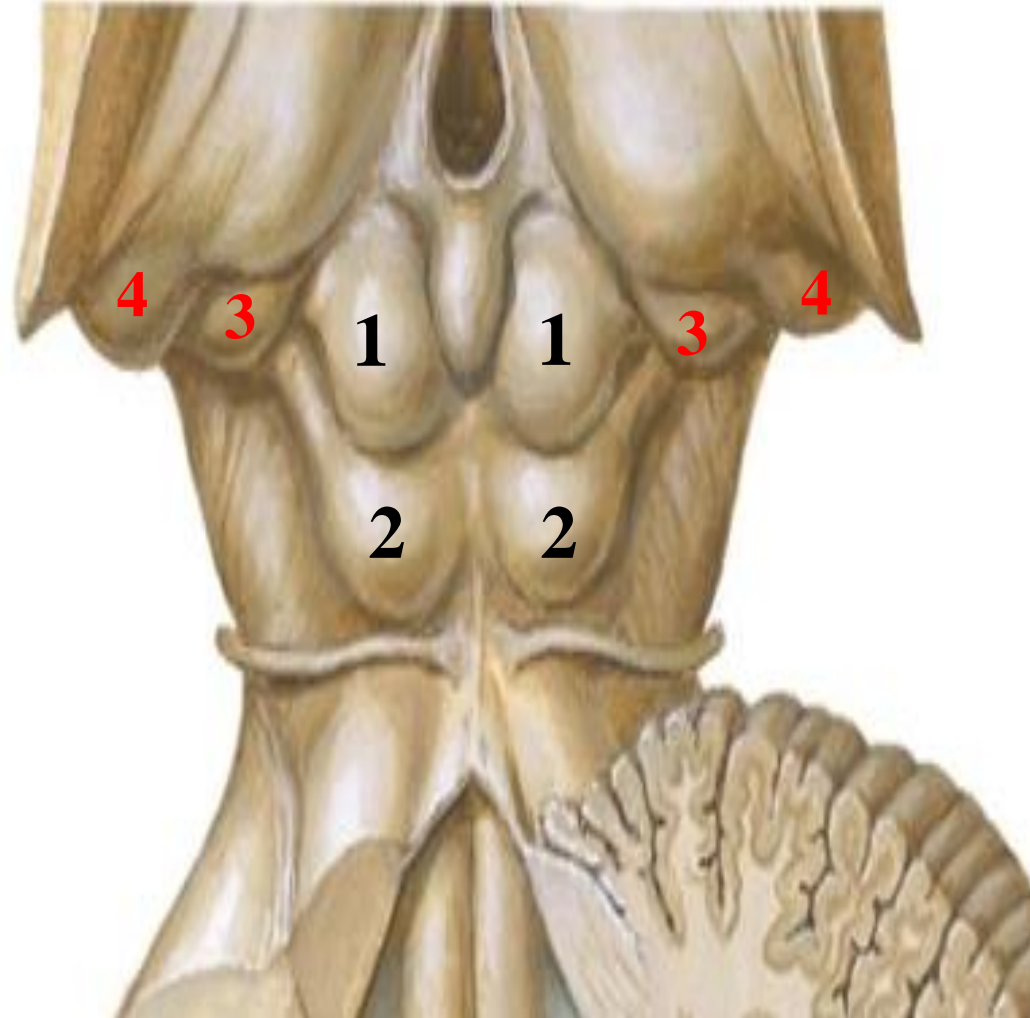
➤ Identify:

1- Superior colliculus

2- Inferior colliculus

3- Medial geniculate body (MGB)

4- Lateral geniculate body (LGB)

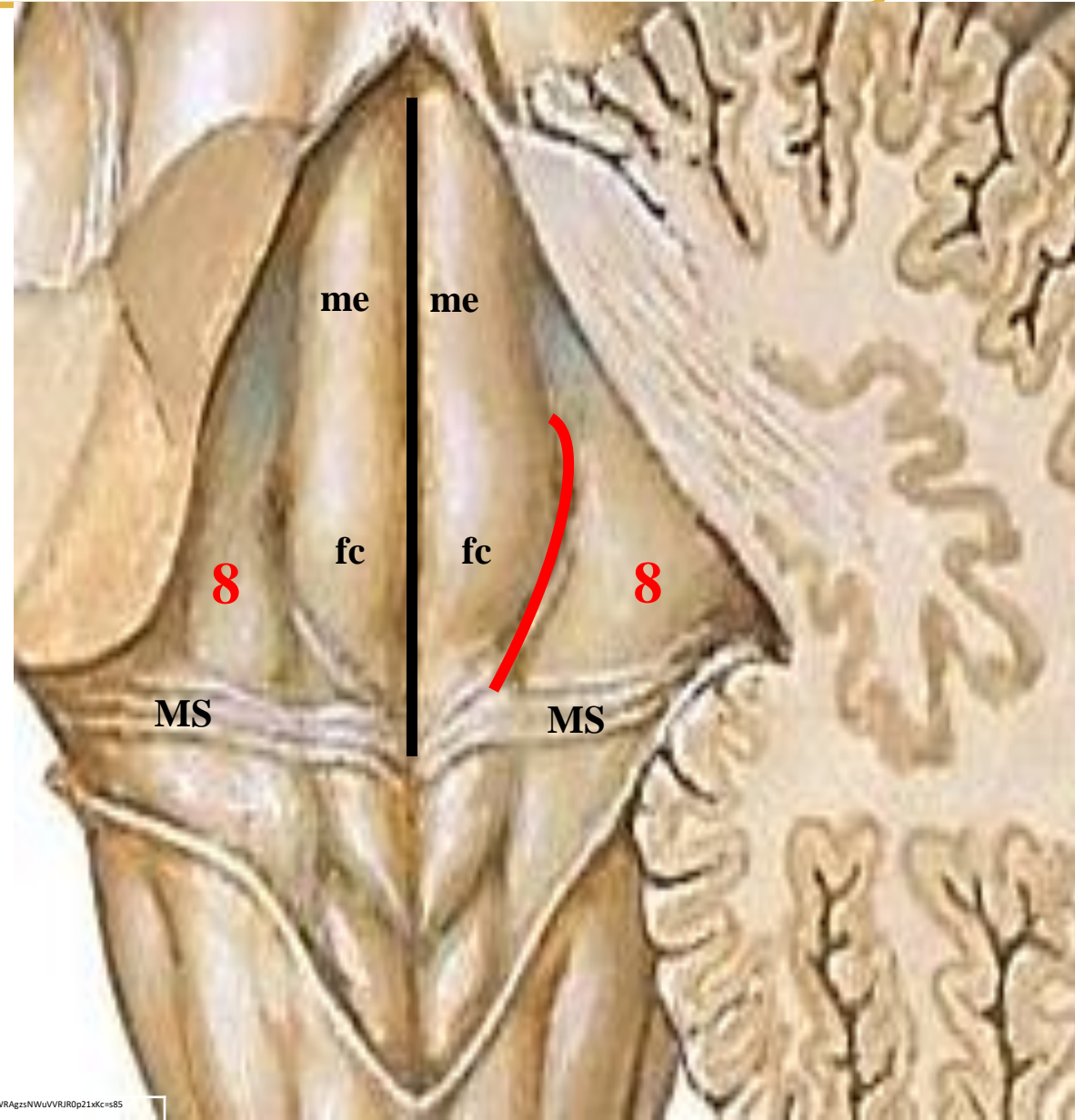


# Dorsal Surface of the Pons

(Upper part of 4<sup>th</sup> ventricle)

➤ **Identify:**

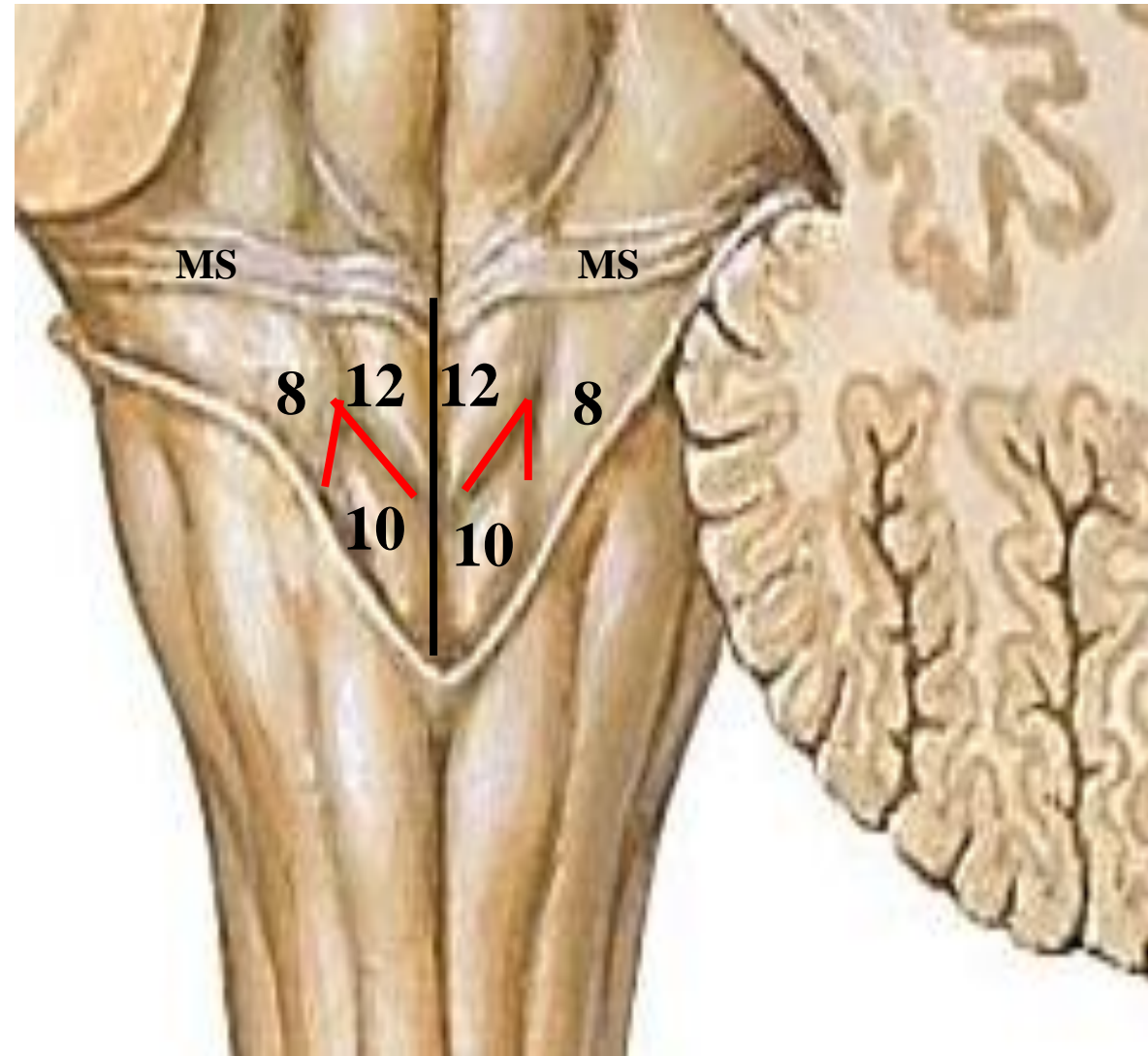
- **Medullary stria (MS)**
- **Median sulcus**
- **Medial eminence (me)**
- **Facial colliculus (fc)**
- **Sulcus limitans**
- **Locus ceruleus**
- **Superior fovea**
- **The vestibular area (8)**



# Dorsal Surface of the Opened Medulla Oblongata (Lower part of 4<sup>th</sup> ventricle)

➤ **Identify:**

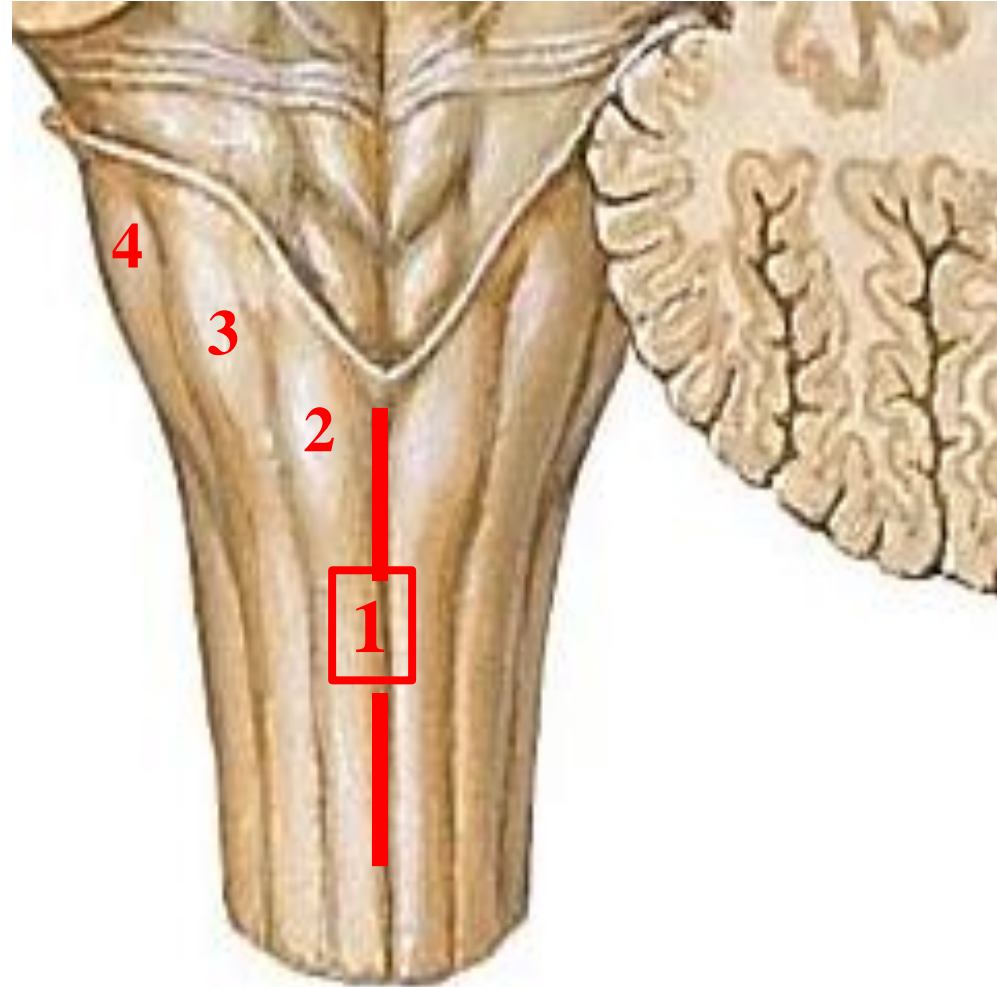
- **Medullary stria (MS)**
- **Median sulcus**
- **Inferior fovea (inverted V-shaped depression)**
- **Hypoglossal trigone (12)**
- **Vagal trigone (10)**
- **Vestibular trigone (8)**



# Dorsal Surface of the Closed Medulla Oblongata

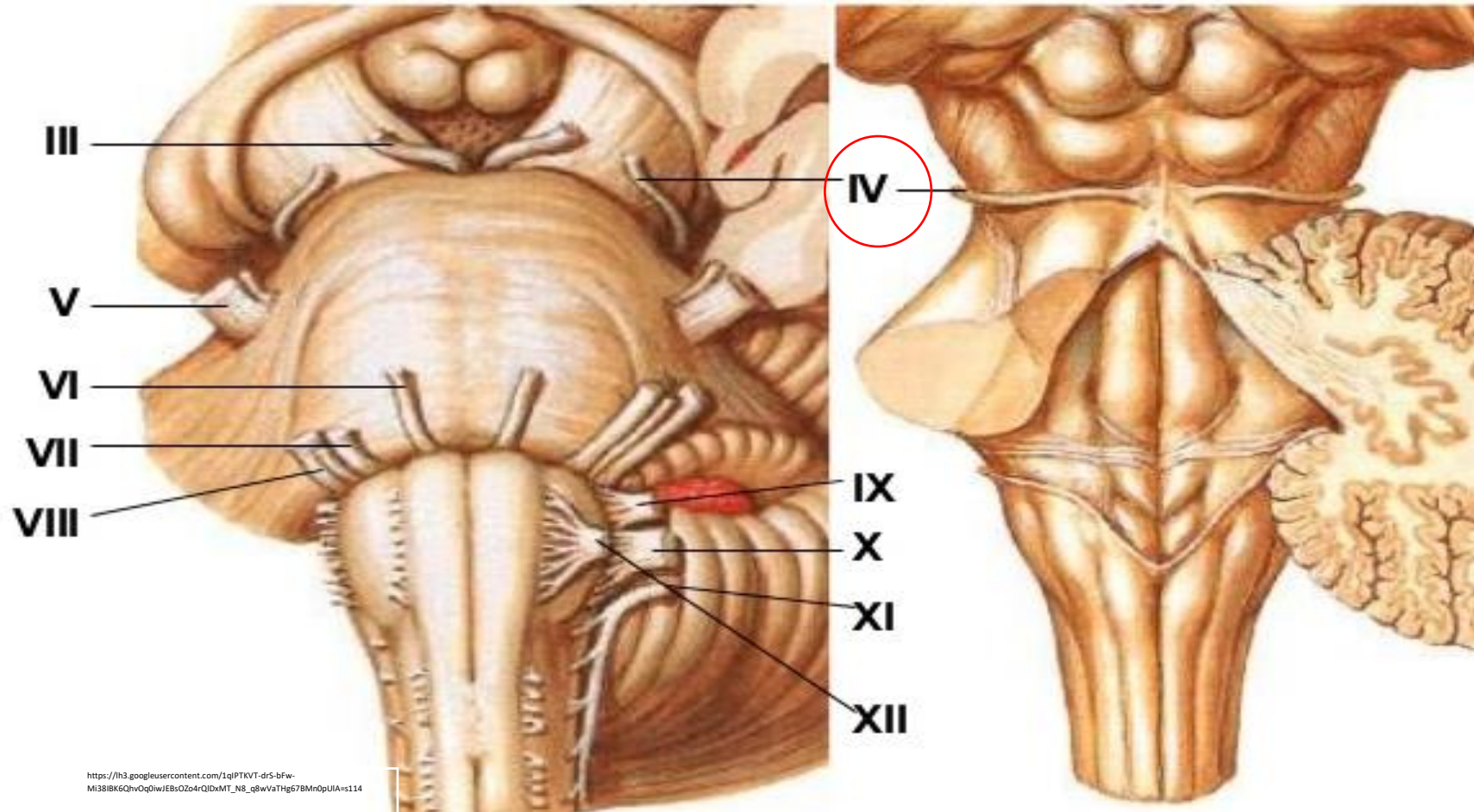
➤ Identify:

- 1- Posterior median sulcus
- 2- Gracile fasciculus
- 3- Cuneate fasciculus
- 4- Inferior cerebellar peduncle (ICP)



# Cranial Nerves Exit

- All cranial nerves have nuclei of origin in brain stem **Except I & II**
- All cranial nerves emerge from ventral surface of brain stem **Except trochlear nerve IV**
- All cranial nerves do not cross to the opposite side **Except trochlear nerve IV**

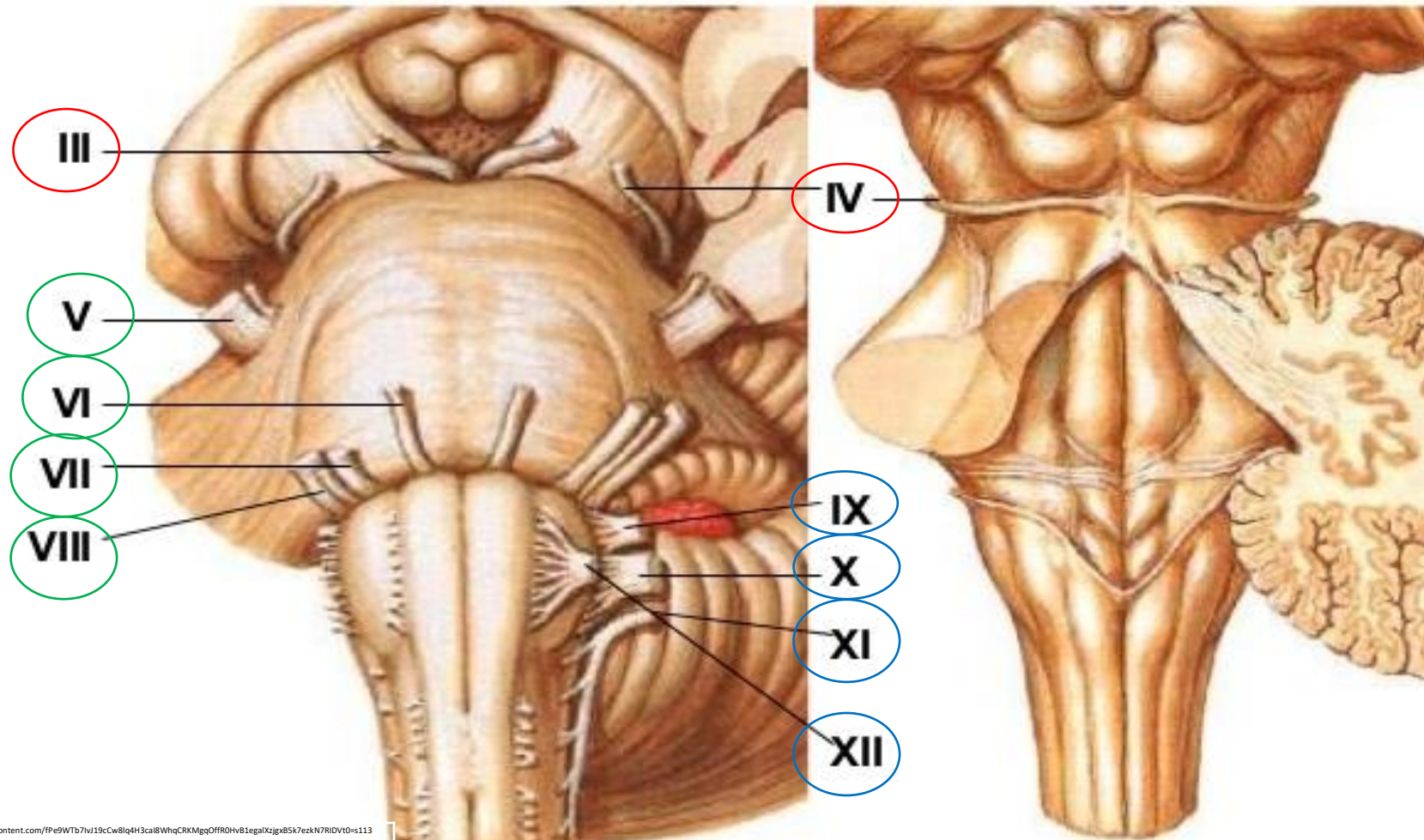


# Cranial Nerves Exit

**III & IV** cranial nerves emerge from **the midbrain**

**V, VI, VII & VIII** emerge from **the pons**

**IX, X, XI, XII** emerge from **the medulla oblongata**



**THANK YOU**