

# Anatomie II



*Rembrandt van Rijn 1632*  
*The Anatomy Lesson of Dr. Nicolaes Tulp*

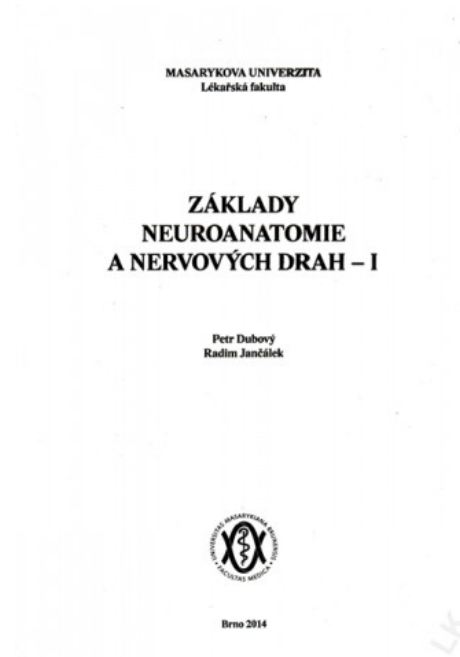
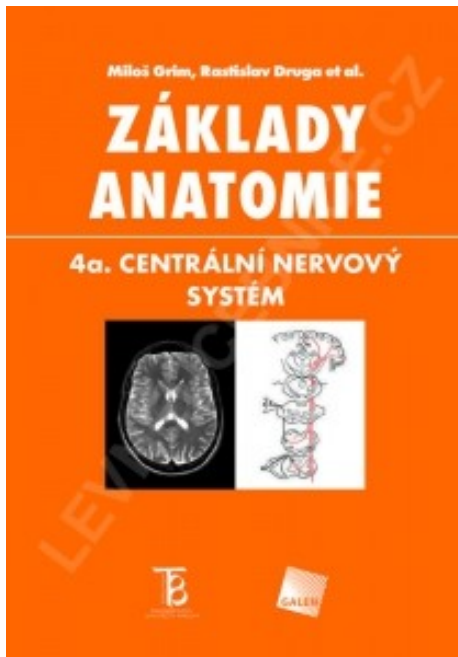


*Rembrandt van Rijn 1656*  
*The Anatomy Lesson of Dr. Deijman*

## Doporučena literatura

**Petr Dubový: Základy neuroanatomie a nervových drah**  
<https://telemedicina.med.muni.cz>

**DUBOVÝ, Petr and Radim JANČÁLEK.**  
**Základy neuroanatomie a nervových drah - I.**



# ROZDĚLENÍ CNS

**Mozek**

**Spinální mícha**

**mozkový kmen**

**medulla oblongata (prodl. mícha)**

**pons (most)**

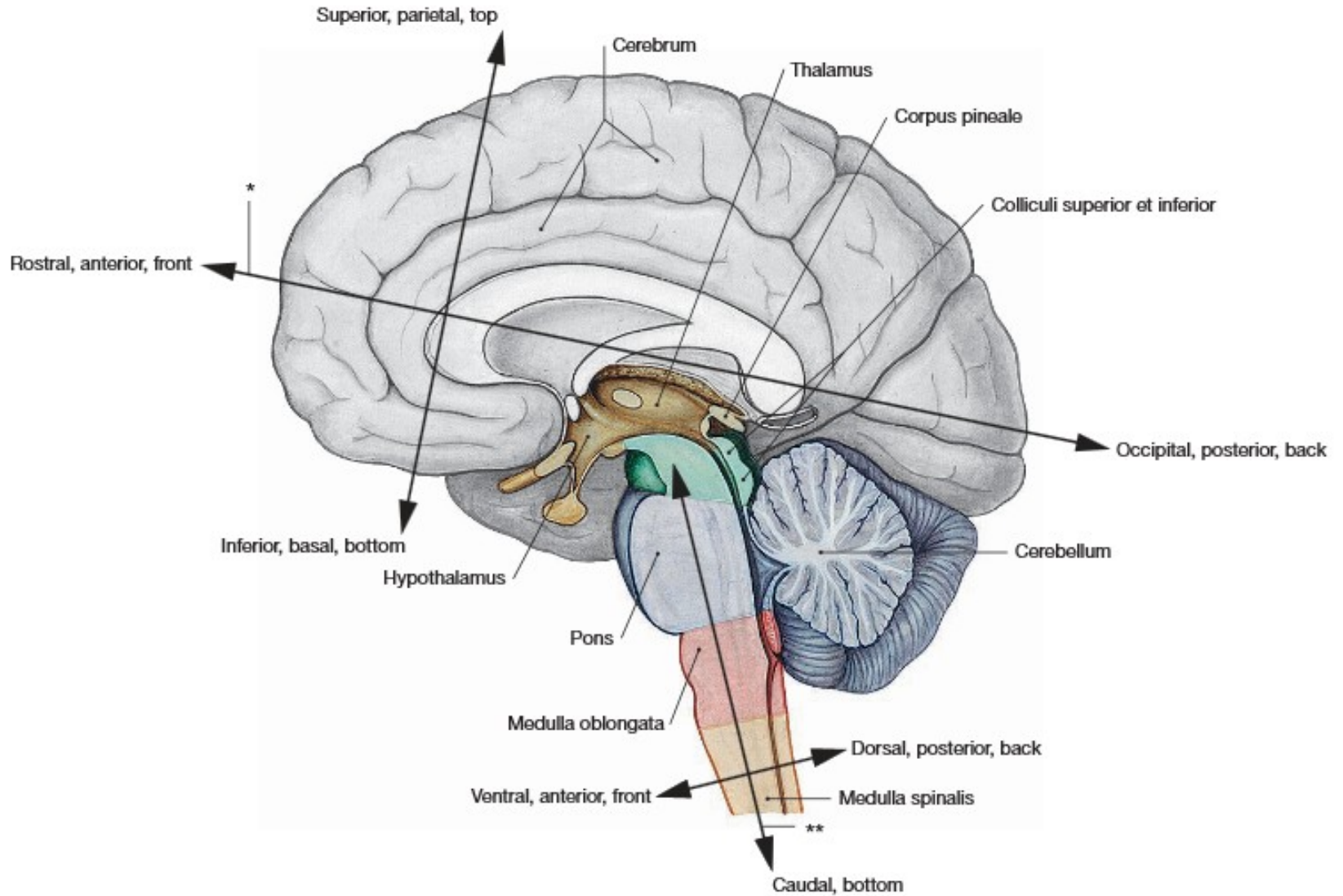
**mesencephalon (střední mozek)**

**cerebellum (mozeček)**

**diencephalon (mezimozek)**

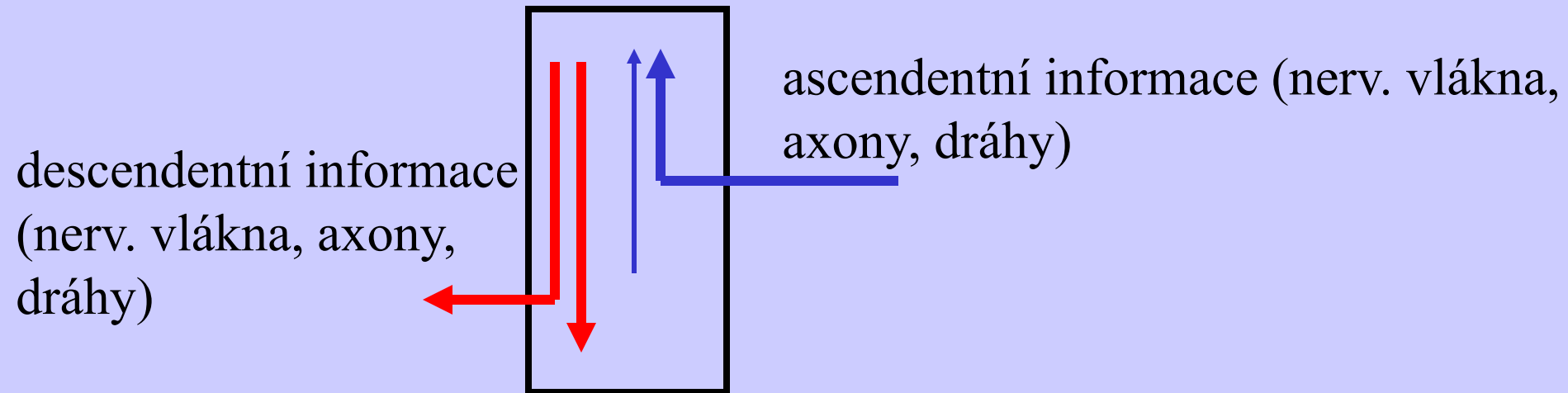
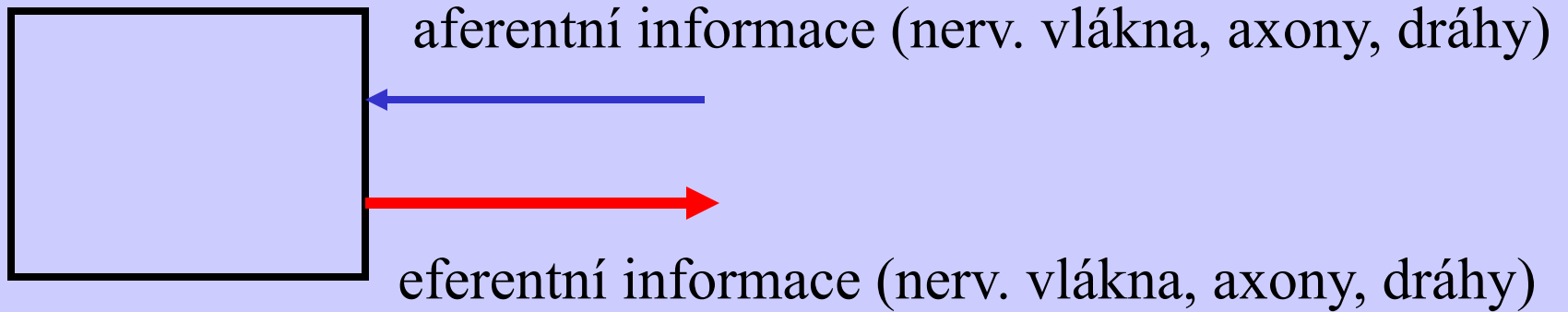
**telencephalon (koncový mozek)**

# Orientace na CNS



<span style="display: inline-block; width: 15px; height: 10px; background-color: #cccccc; border: 1px solid black;"></span> Telencephalon	<span style="display: inline-block; width: 15px; height: 10px; background-color: #90ee90; border: 1px solid black;"></span> Mesencephalon	<span style="display: inline-block; width: 15px; height: 10px; background-color: #f08080; border: 1px solid black;"></span> Medulla oblongata
<span style="display: inline-block; width: 15px; height: 10px; background-color: #a0522d; border: 1px solid black;"></span> Diencephalon	<span style="display: inline-block; width: 15px; height: 10px; background-color: #6495ed; border: 1px solid black;"></span> Metencephalon and Pons	<span style="display: inline-block; width: 15px; height: 10px; background-color: #d2b48c; border: 1px solid black;"></span> Medulla spinalis

## Základní pojmy



# ROZDĚLENÍ NERVOVÉ SOUSTAVY

**CNS**

**PNS**

oligodendrocyty  
astrocyty

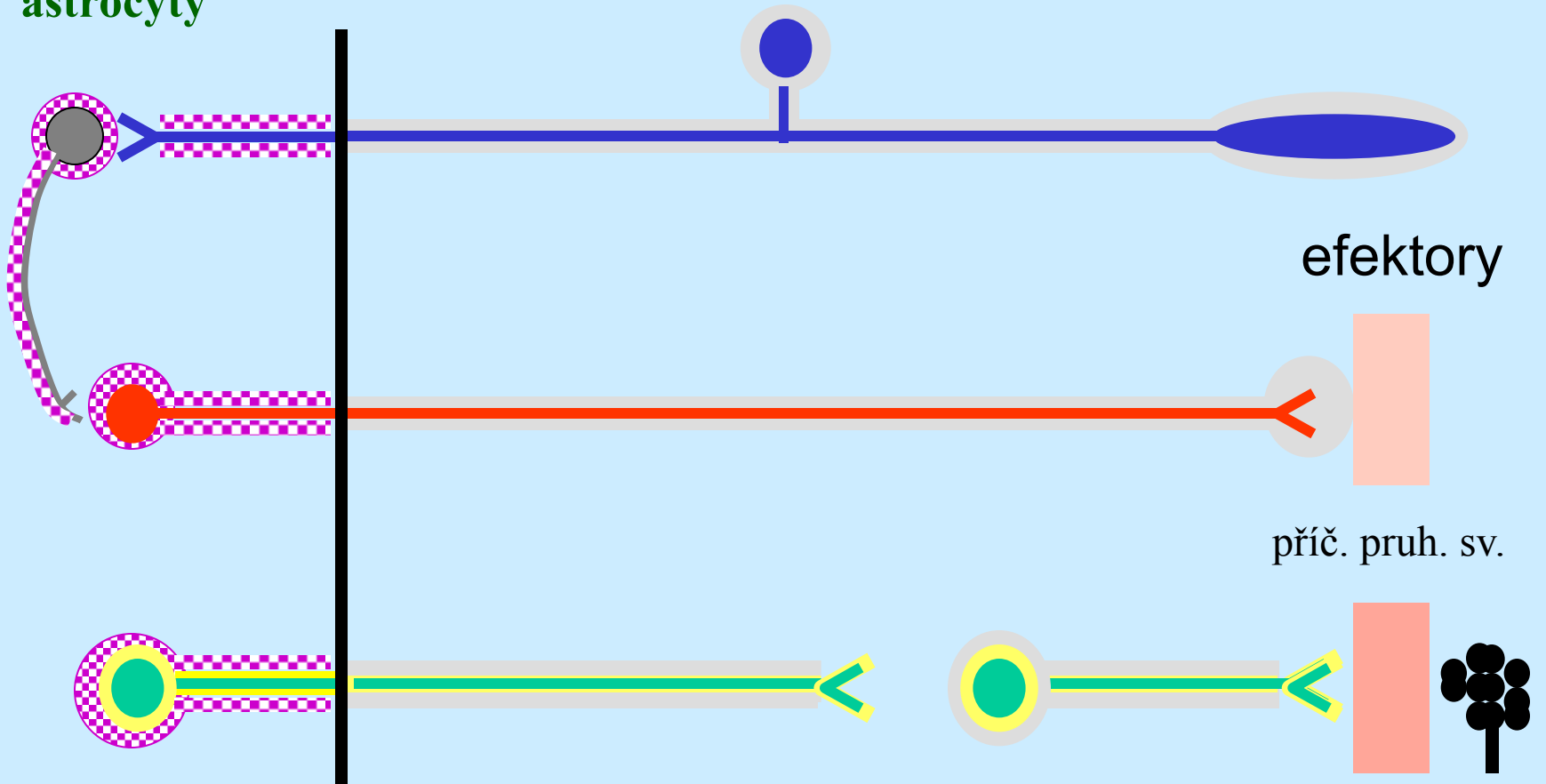
Schwannovy bb. a její deriváty

senzory

efektory

příč. pruh. sv.

hl. sv., myokard, žl.



# ROZDĚLENÍ PNS

hlavové, kraniální nervy III.-XII. (I.- XII.)

- **prostupují přes bázi lebni**

spinální nervy - 31 párů

- **prostupují přes foramina intervertebralia**

# FUNKČNÍ TYPY AXONŮ V PNS

Aferentní

somatosenzorické



kožní čítí, propiocepce, bolest

viscerosenzorické



mechanocepce, bolest

senzorické ←● aferentace chuti, sluchu, vestib. informací

Eferentní

somatomotorické



příčně pr. svalovina

branchiomotorické



příčně pr. svalovina

visceromotorické



hladká svalovina

sympatické



myokard

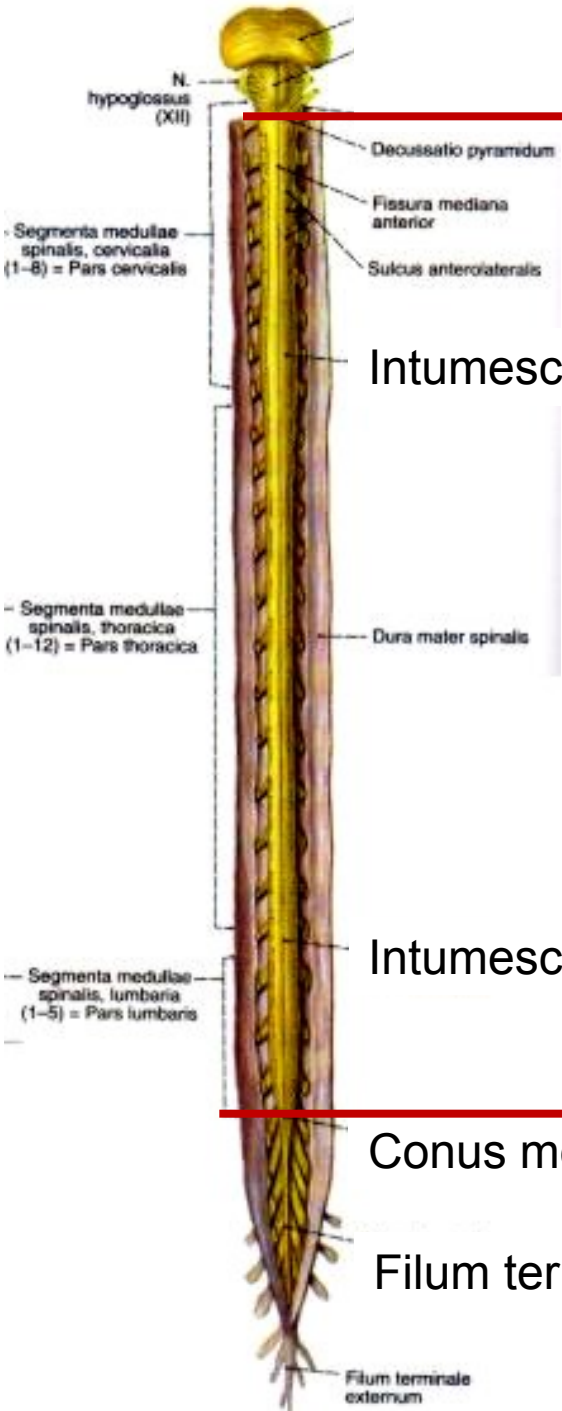
parasympatické



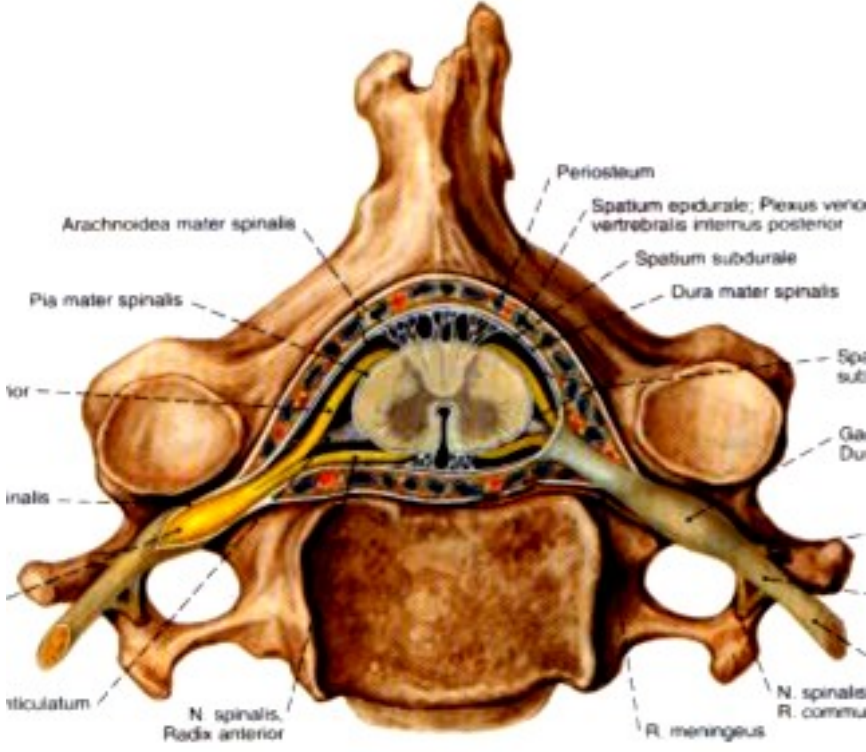
žlázy



# MEDULLA SPINALIS



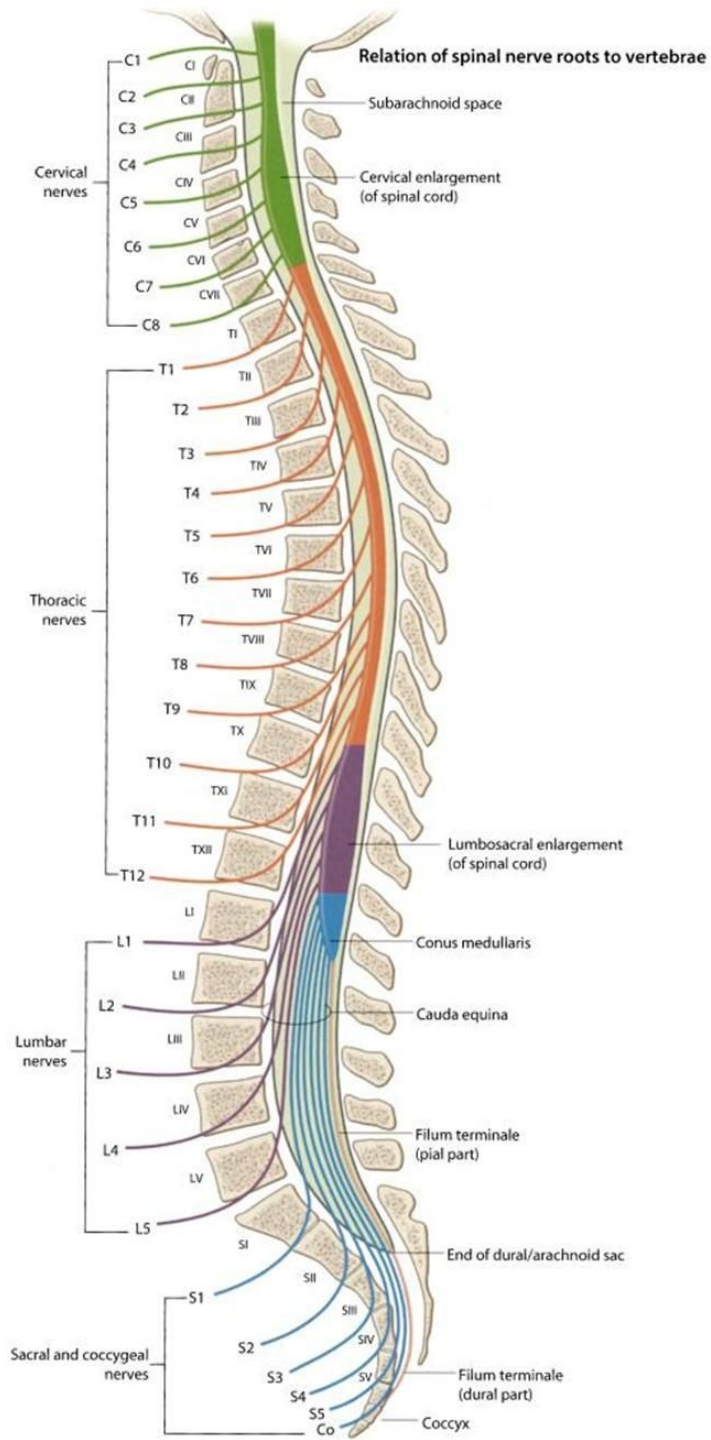
Kraniální hranice



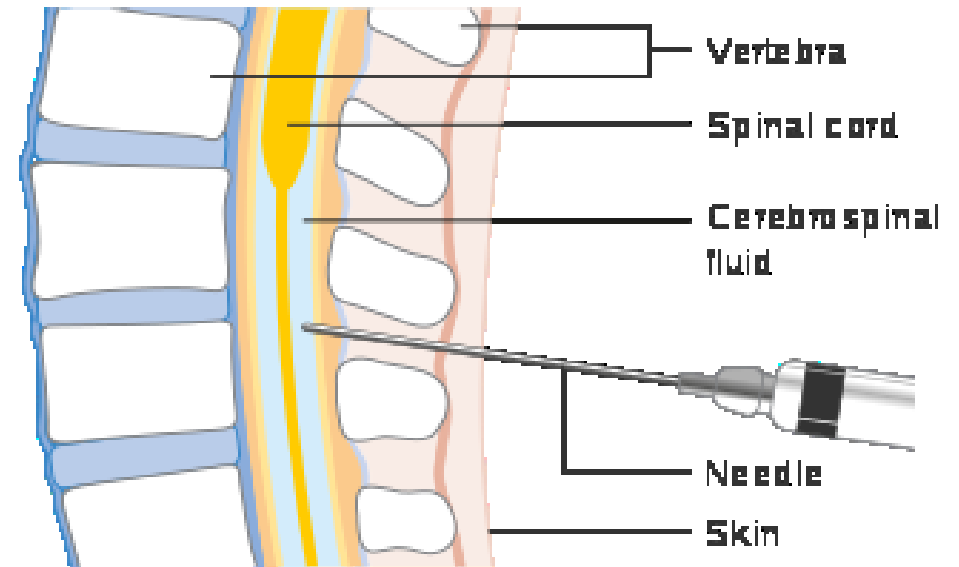
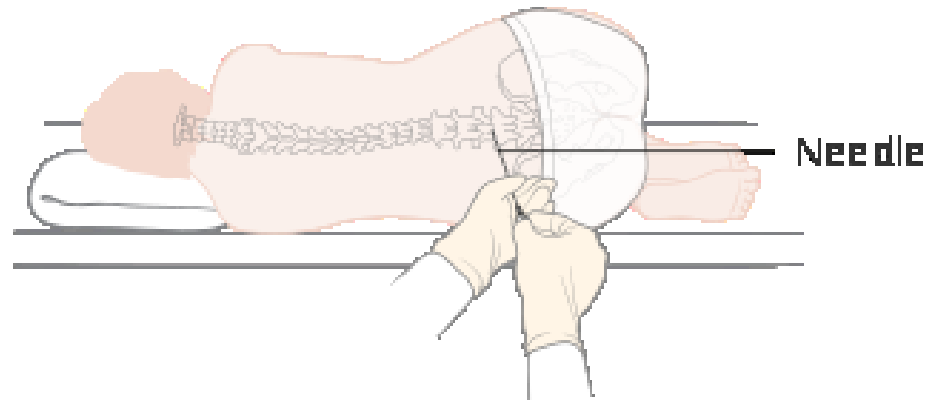
L2 – Kaudální hranice

Conus medullaris

Filum terminale

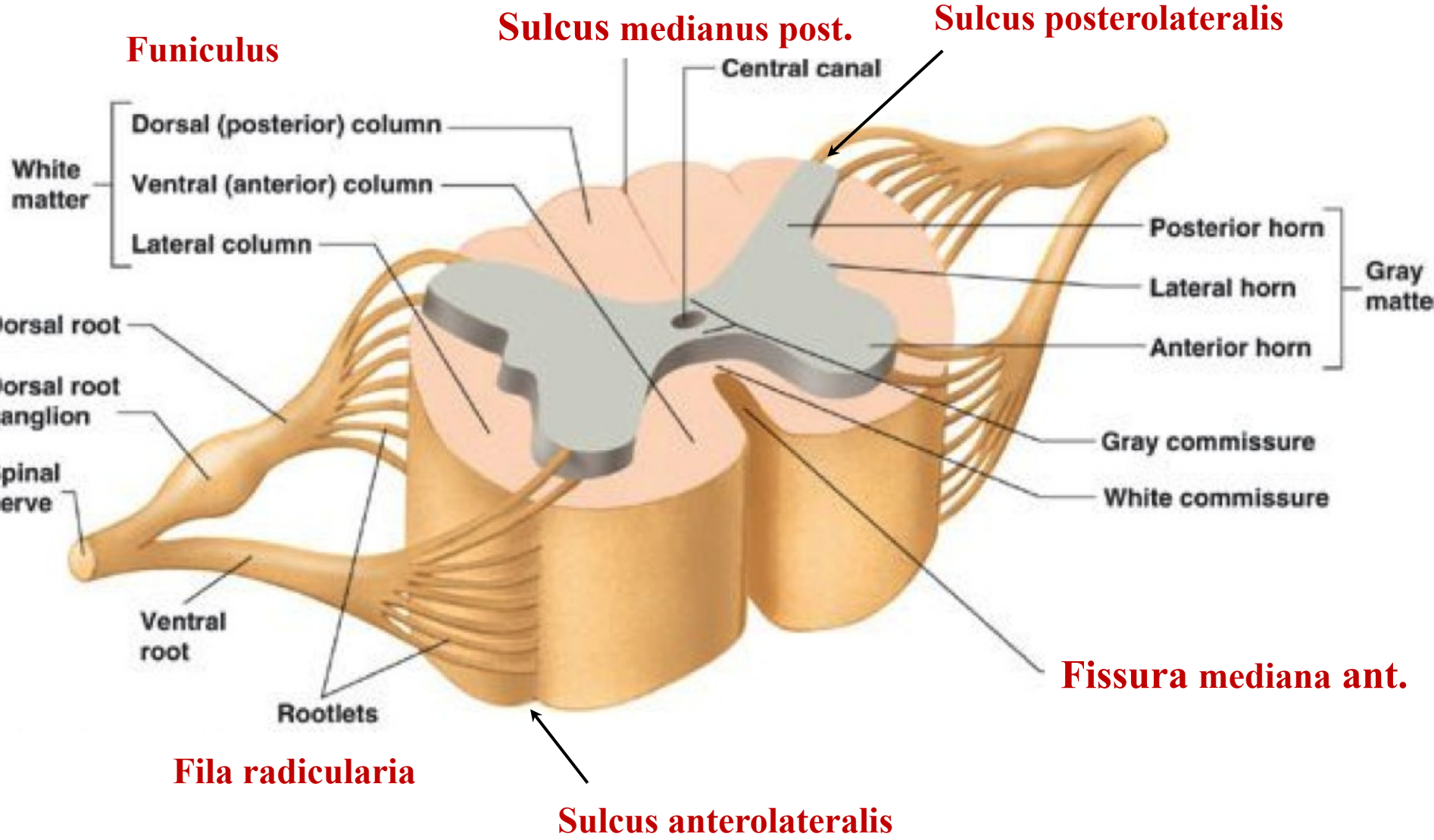


## Lumbální punkce

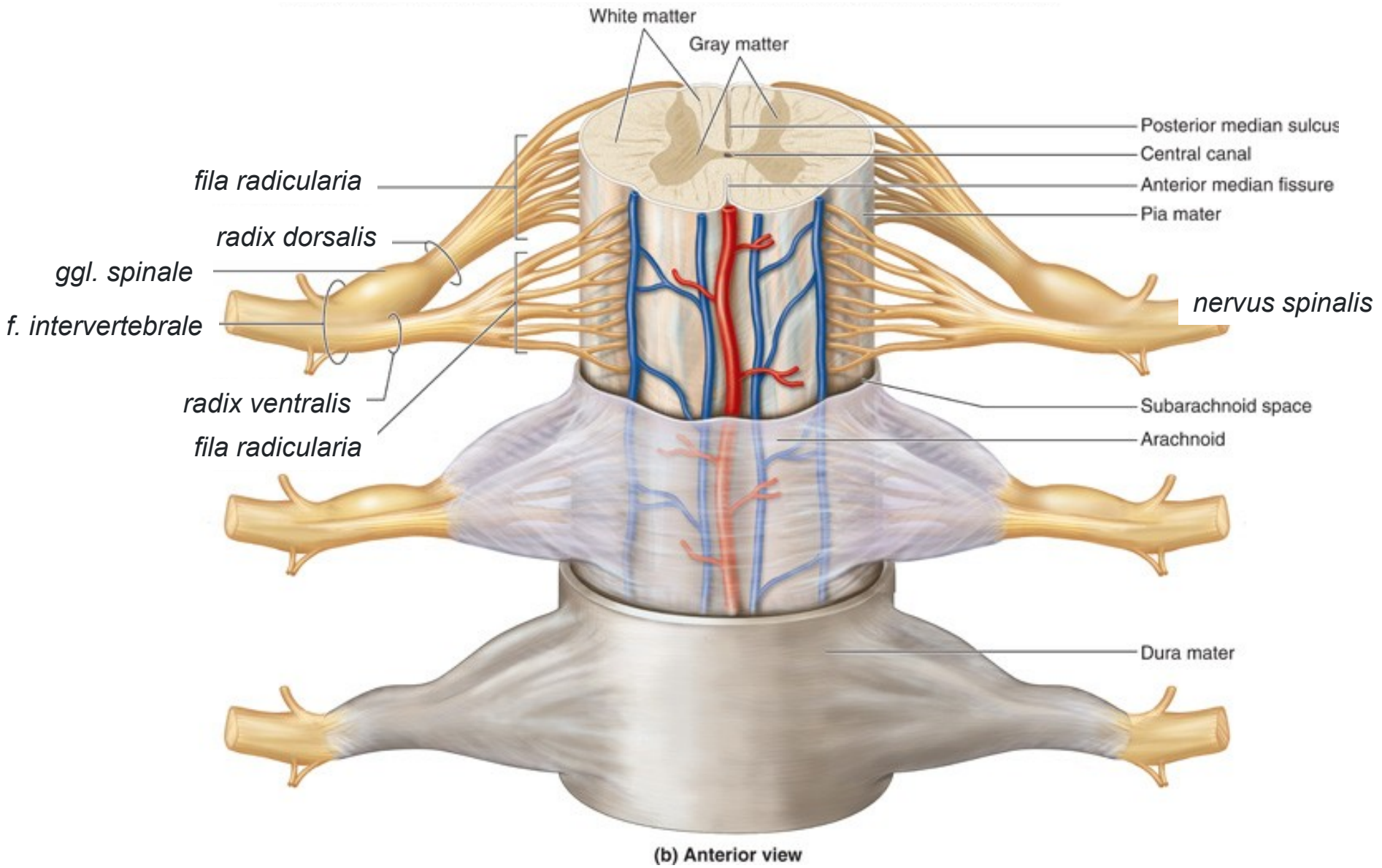


mezi L3-L4 nebo L4 a L5

# MEDULLA SPINALIS

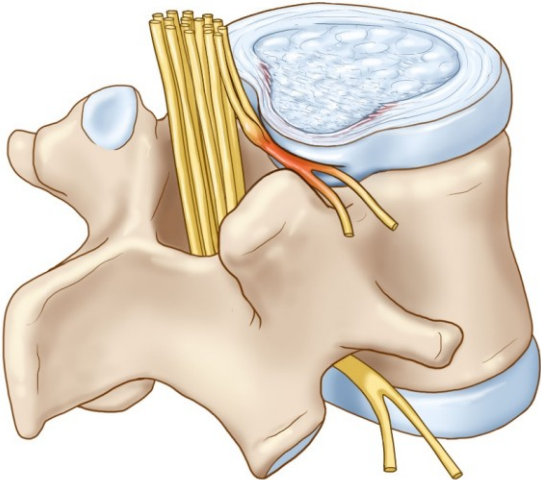
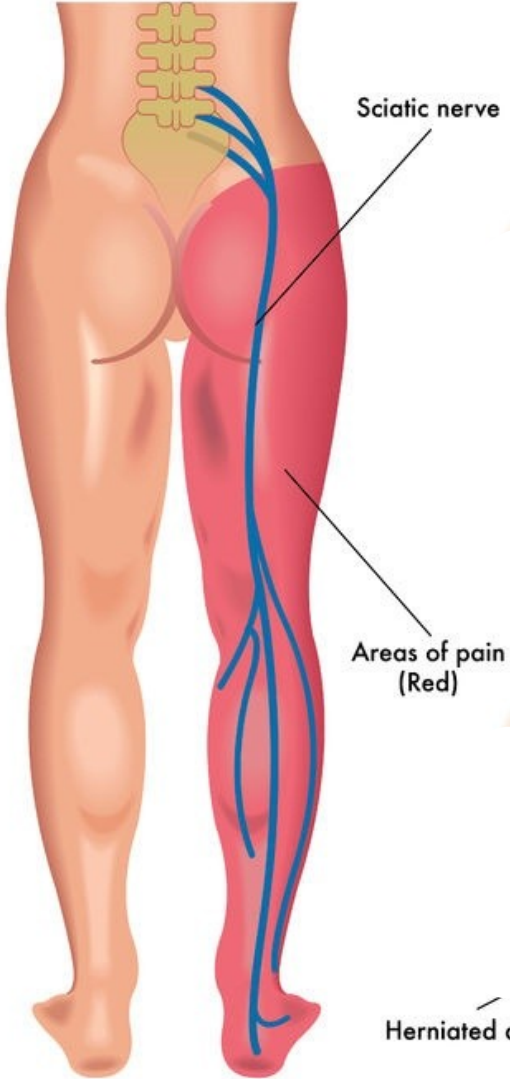
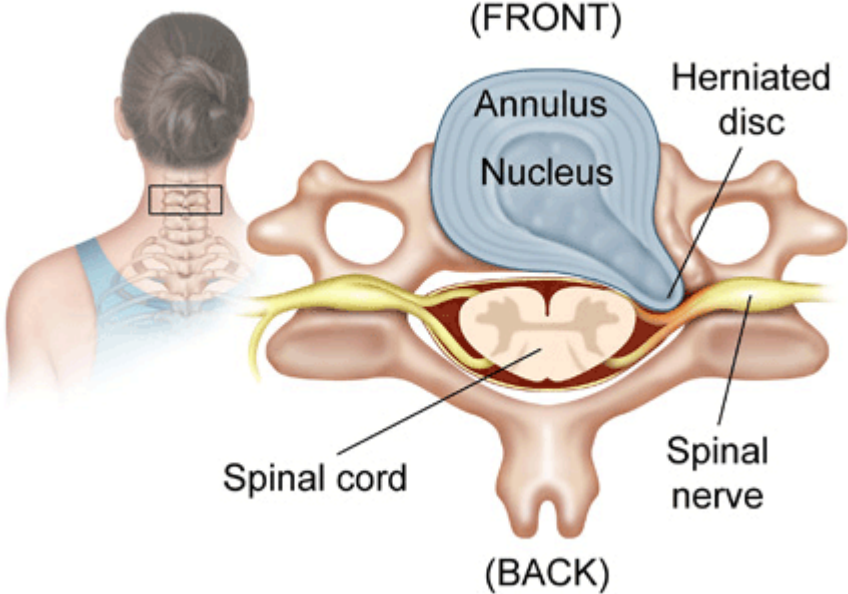


# Mícha se míchá do všeho !!!



# MEDULLA SPINALIS – klinická poznámka

lumbago (ischias)



# MEDULLA SPINALIS

Cornu posterius

Substantia intermedia

Cornu anterius

Posterior horn (sensory)

Lateral horn (visceromotor)

Anterior horn (motor)

Sulcus medianus post.

Fasciculus gracilis

Fasc. cuneatus

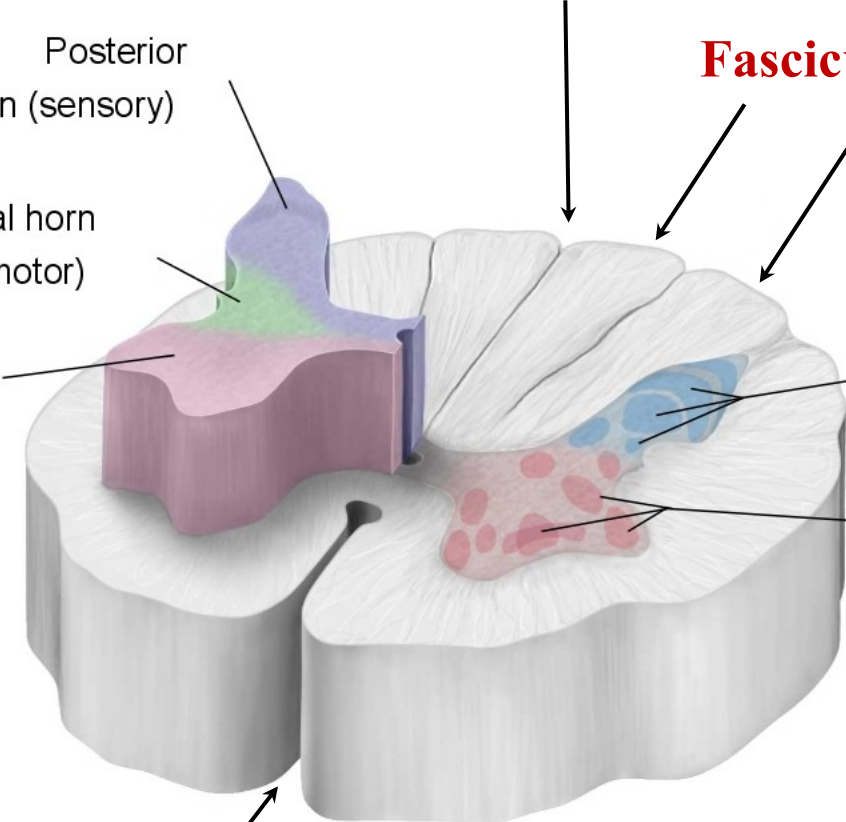
Afferent nuclei

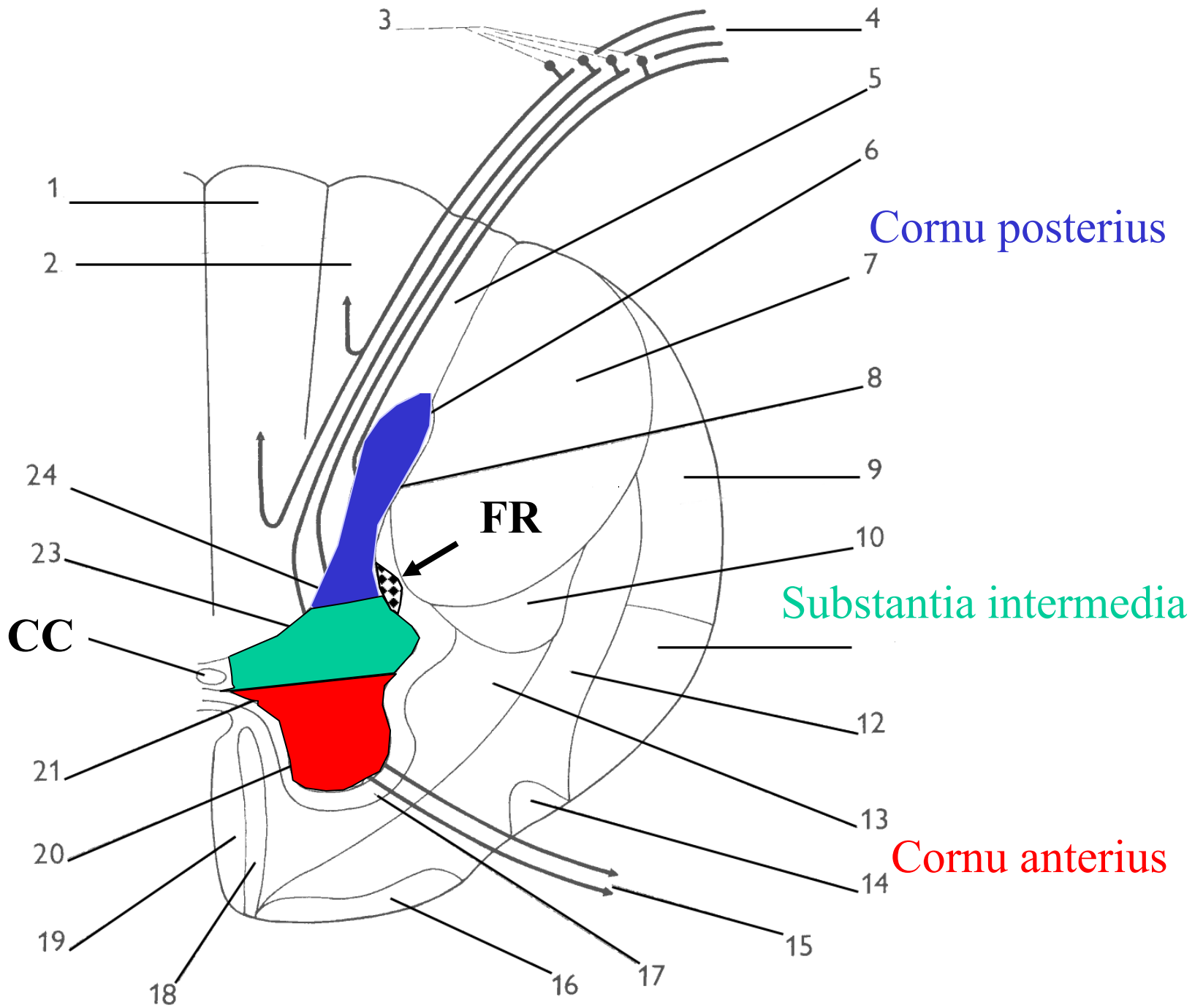
Efferent nuclei

Columns

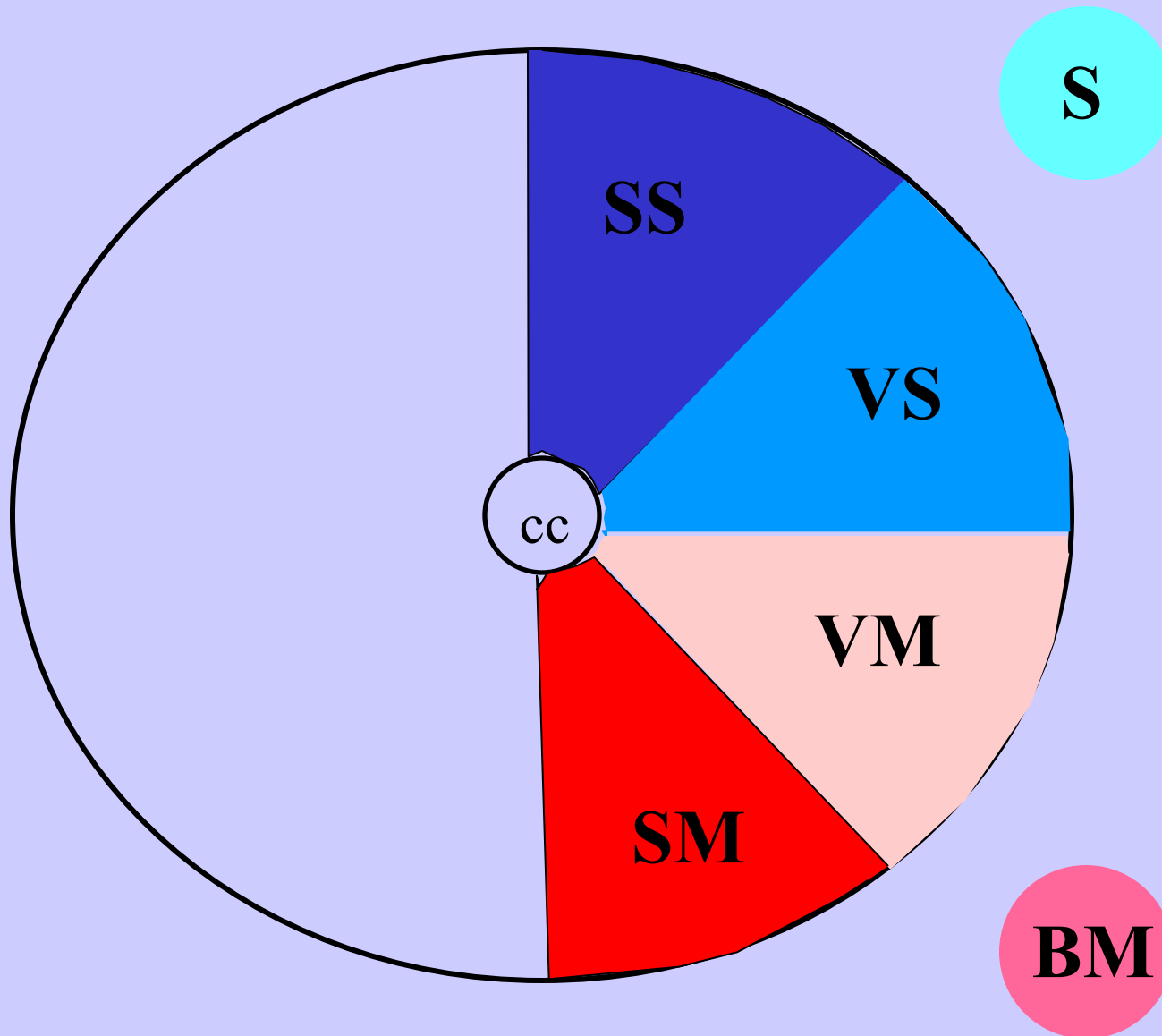
Nuclei

Fissura mediana ant.





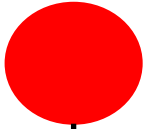
# FUNKČNÍ ZÓNY NEURONŮ V CNS





# Anatomická nomenklatura bílé hmoty

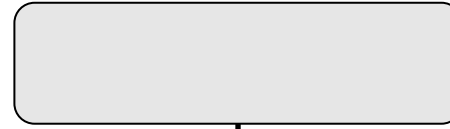
Ncl. ruber



Tr. rubro-spinalis

Míšní motoneurony

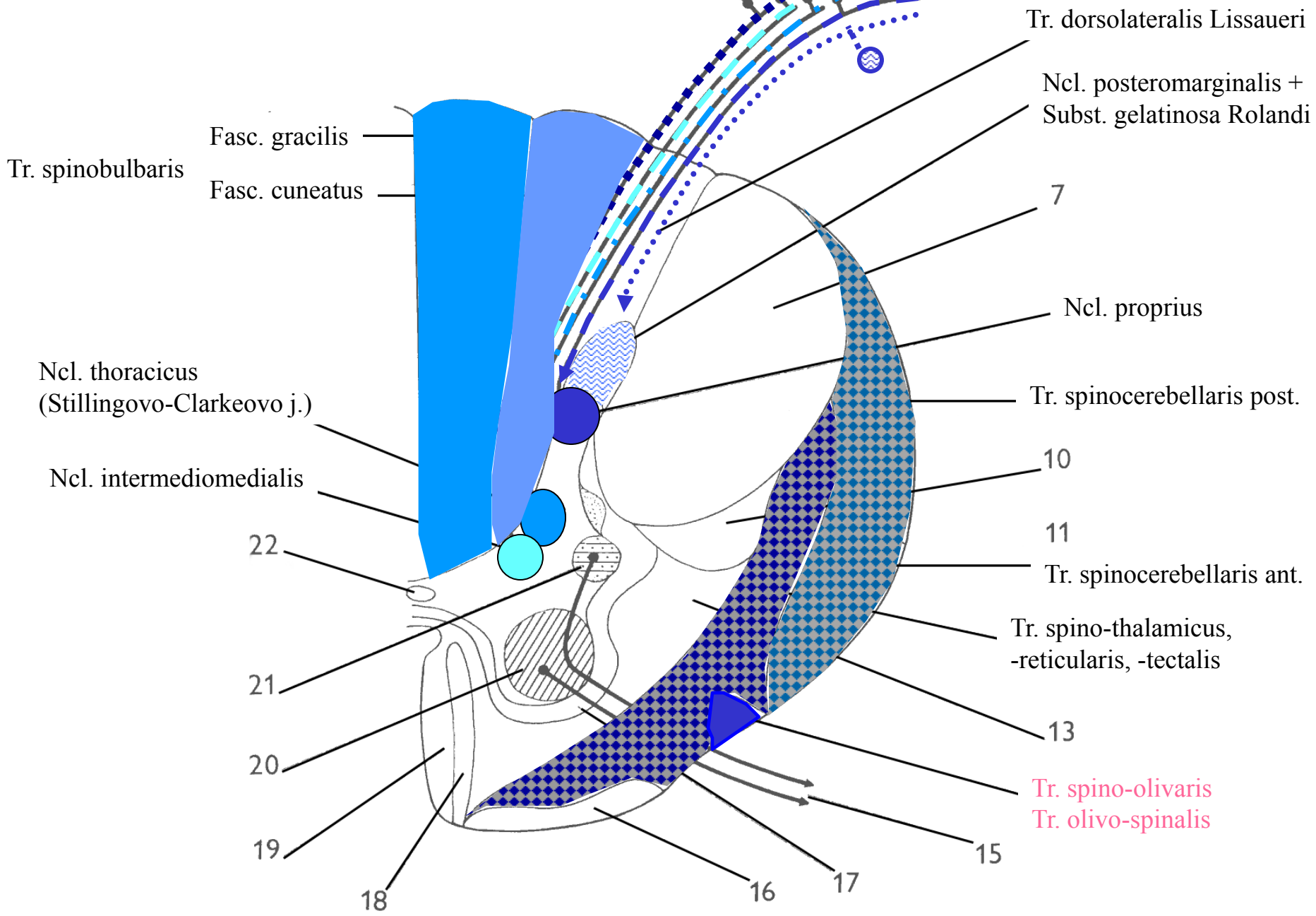
Cortex



Tr. cortico-spinalis

Pseudounipol. neurony ve SG

Radix dorsalis



Tr. spinobulbaris

Fasc. gracilis

Fasc. cuneatus

Ncl. thoracicus  
(Stillingovo-Clarkeovo j.)

Ncl. intermediomedialis

Tr. dorsolateralis Lissaueri

Ncl. posteromarginalis +  
Subst. gelatinosa Rolandi

7

Ncl. proprius

Tr. spinocerebellaris post.

10

11

Tr. spinocerebellaris ant.

Tr. spino-thalamicus,  
-reticularis, -tectalis

13

Tr. spino-olivaris  
Tr. olivo-spinalis

22

21

20

19

18

16

17

15

# ANTEROLATERÁLNÍ SYSTÉM

# LEMNISKÁLNÍ SYSTÉM

Jádra thalamu

Jádra thalamu

lemniscus medialis

Nucleus gracilis et cuneatus

tr. bulbo-thalamicus  
(lemniscus medialis)

Spinální ganglion

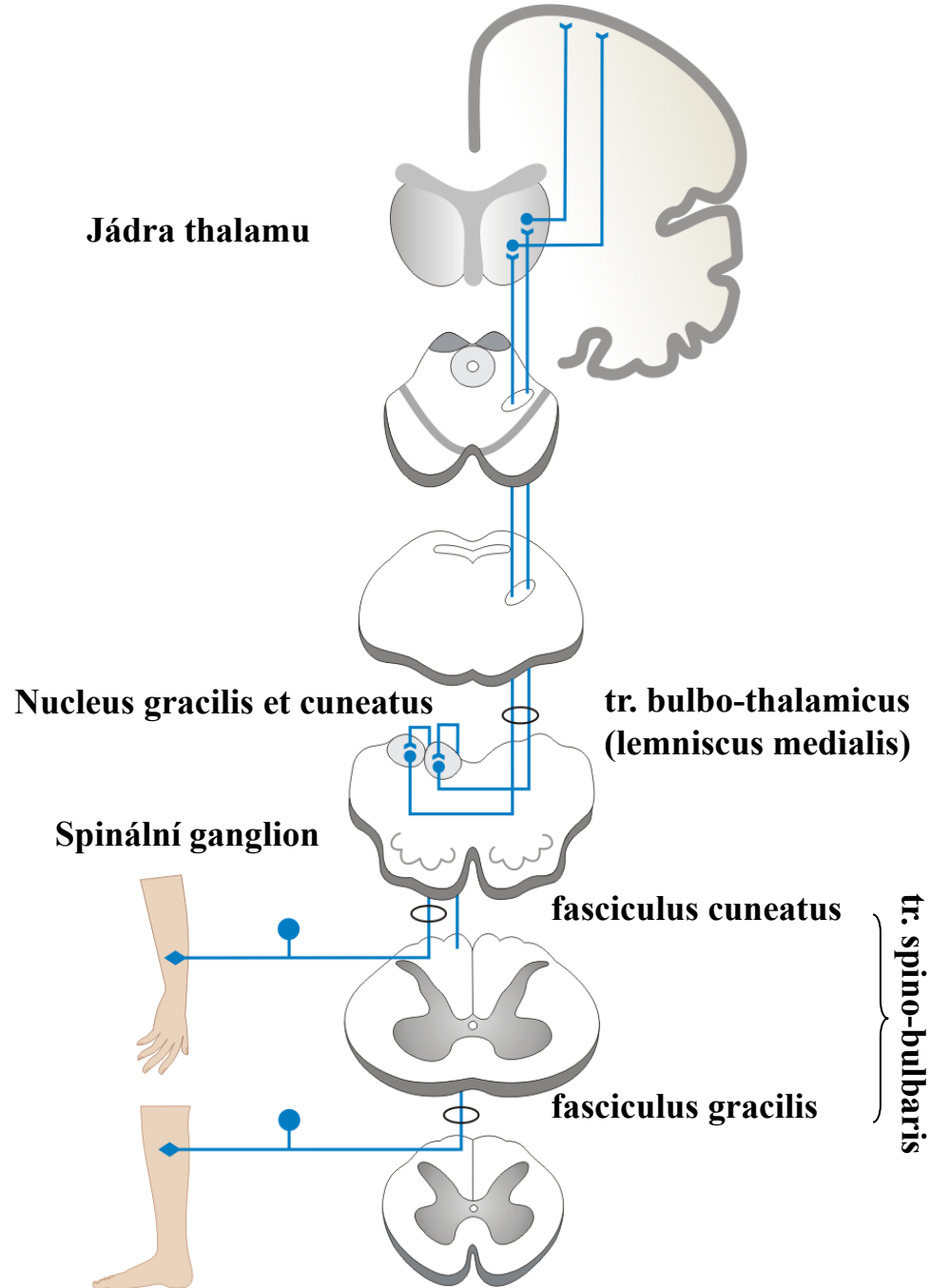
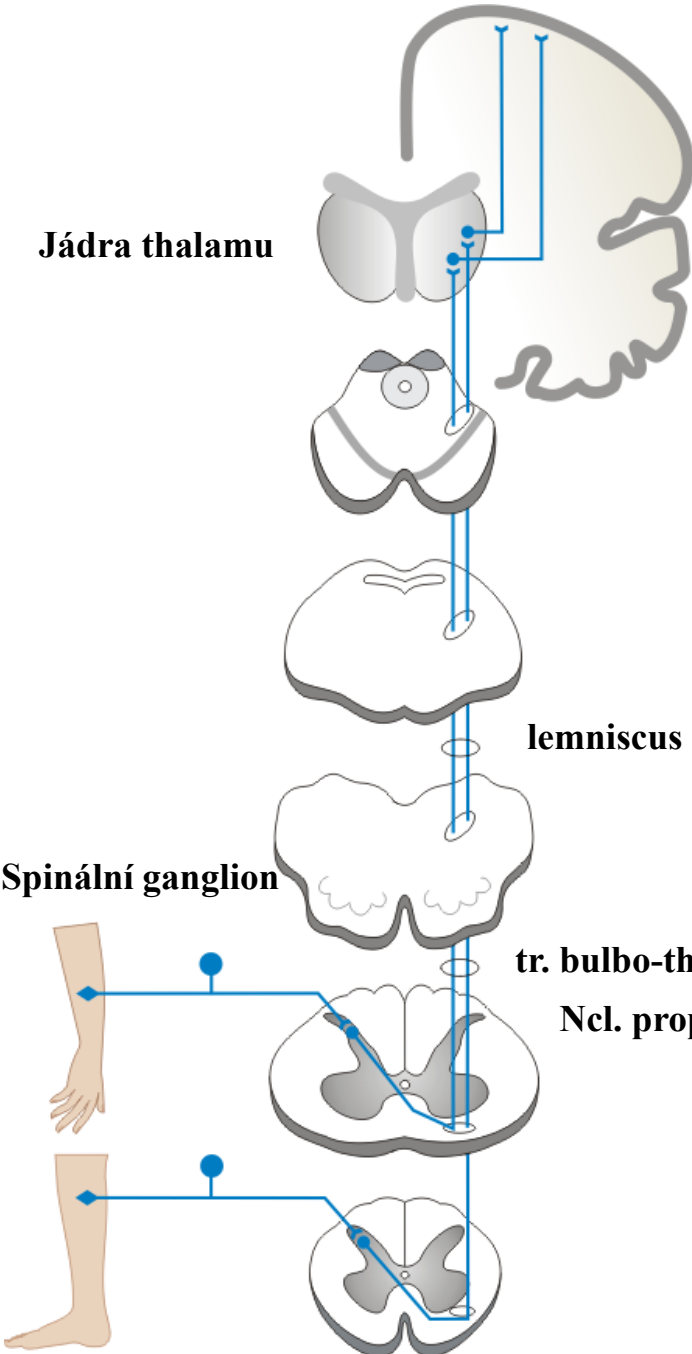
Spinální ganglion

tr. bulbo-thalamicus  
Ncl. proprius

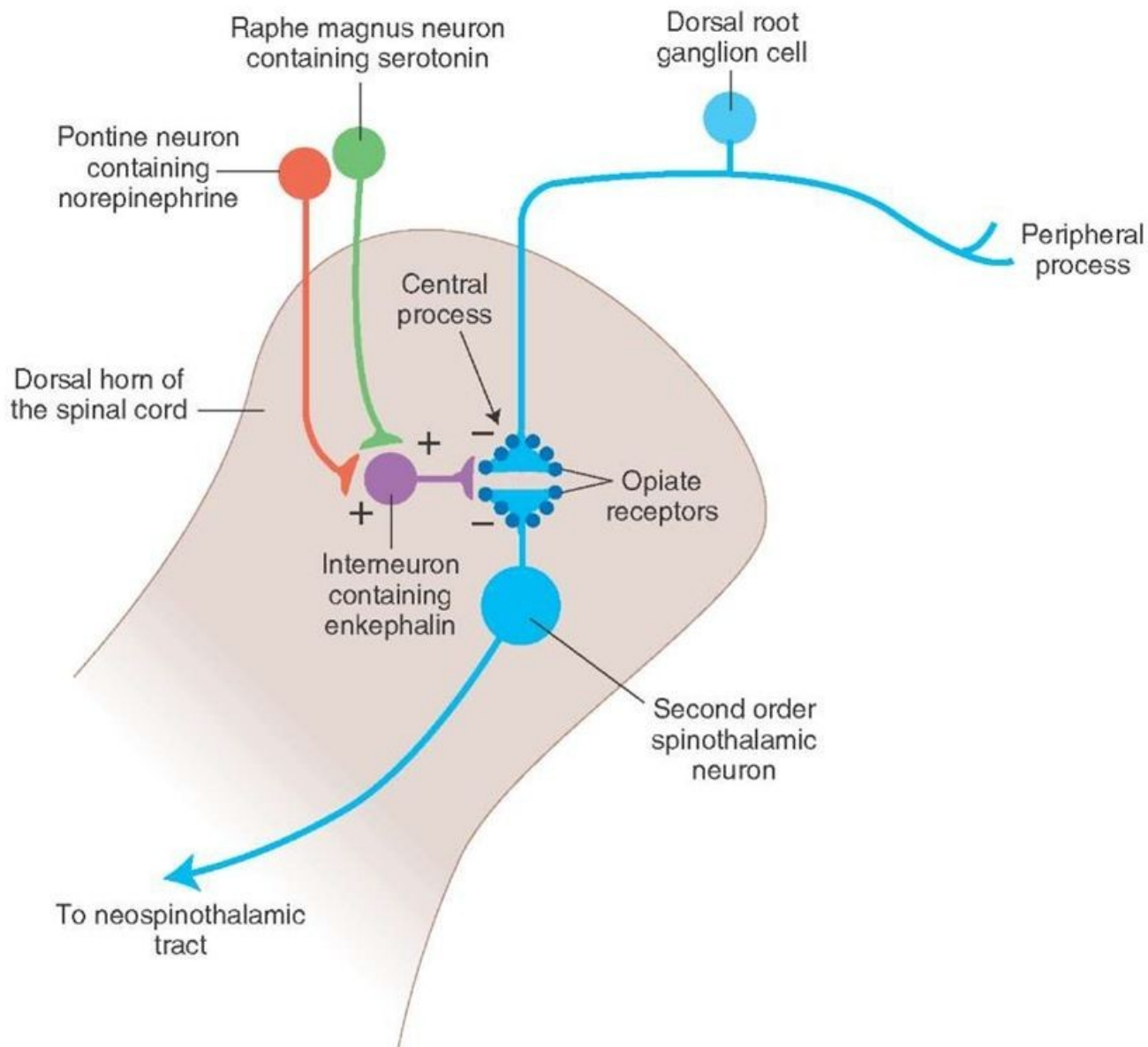
fasciculus cuneatus

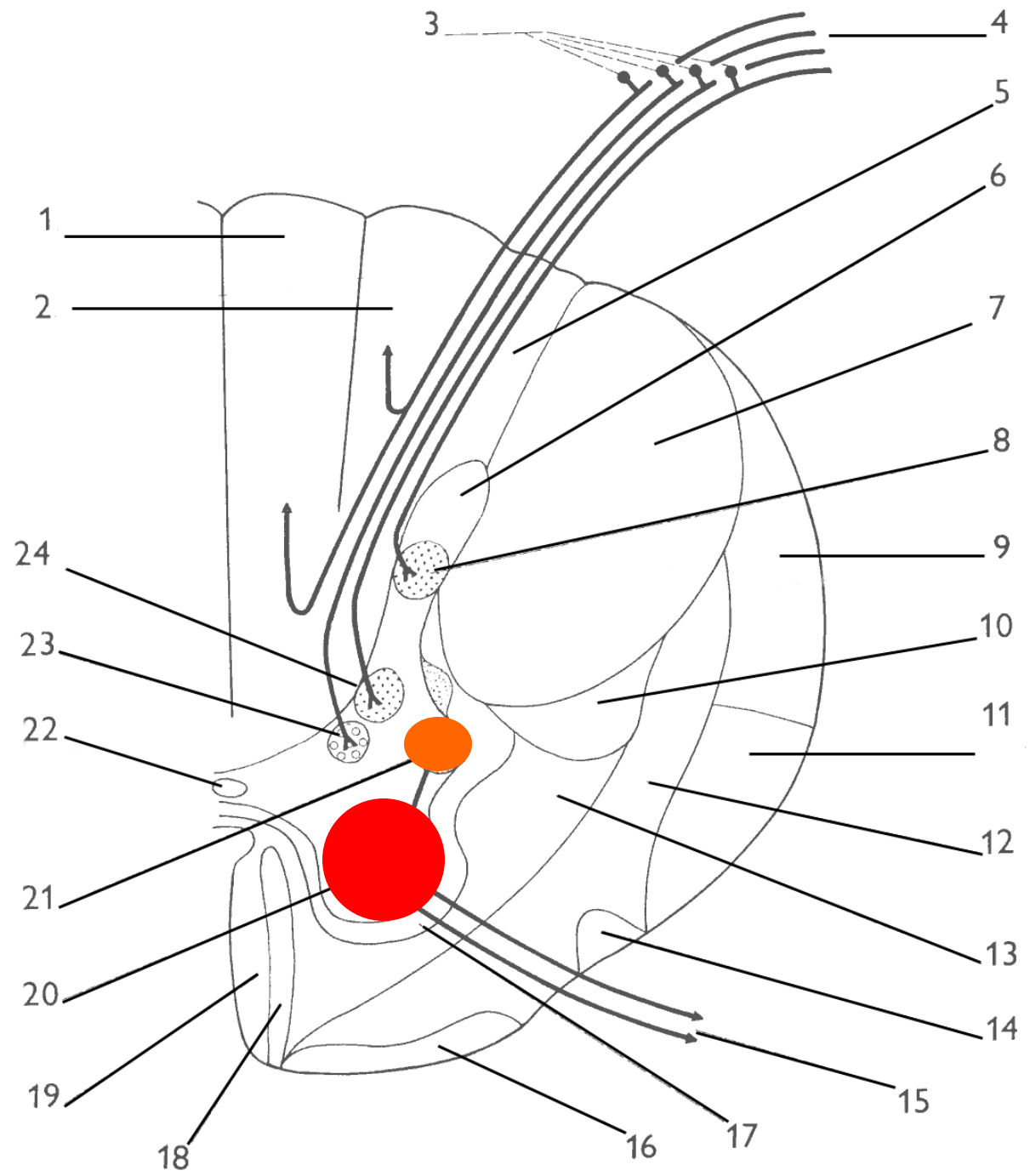
fasciculus gracilis

tr. spino-bulbaris



# Modulace aferentace bolesti v dorálním rohu míchy





Kortikální neurony



Tractus cortico-spinalis



**Ncl ruber**

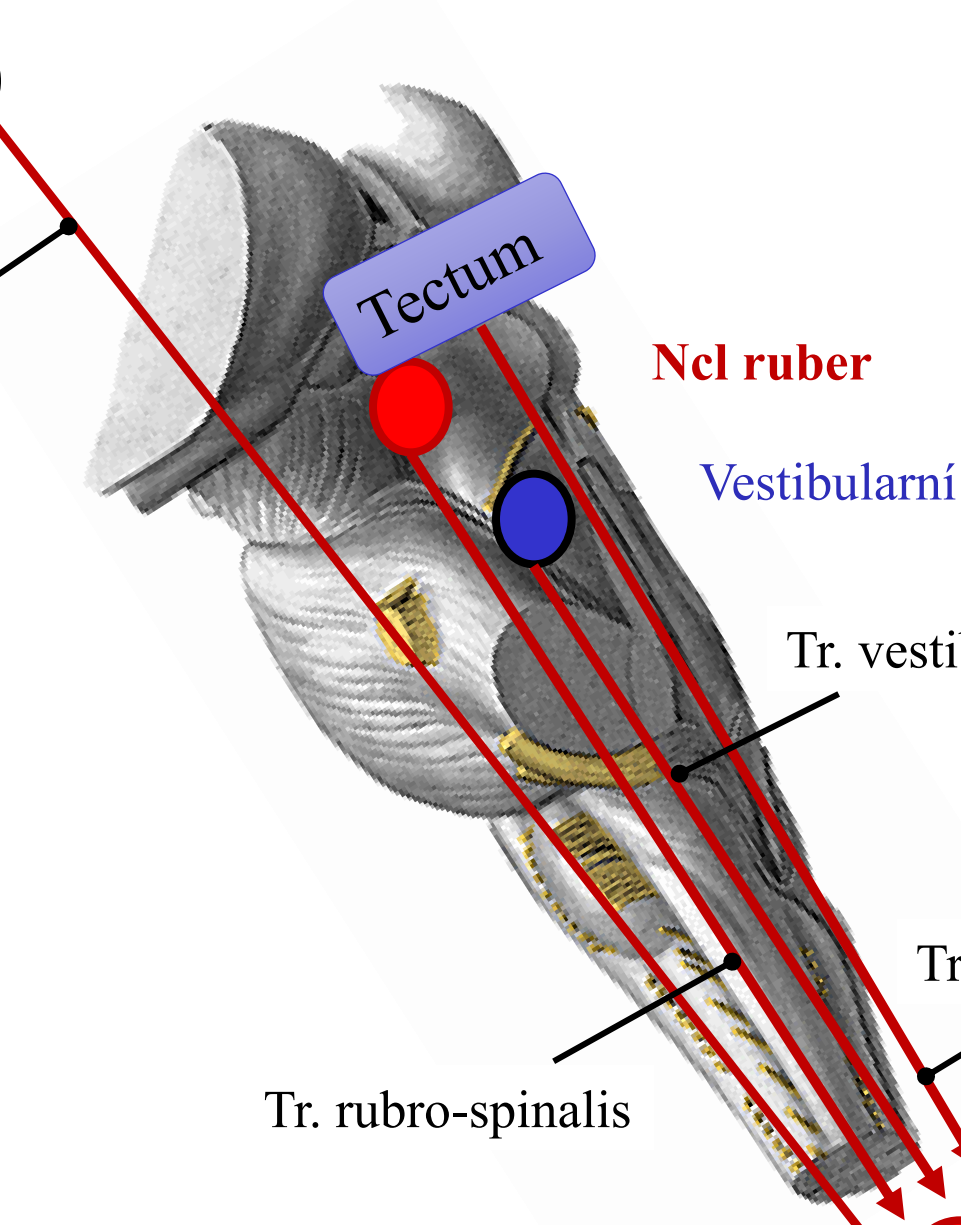
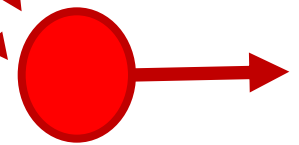
Vestibulární jádra

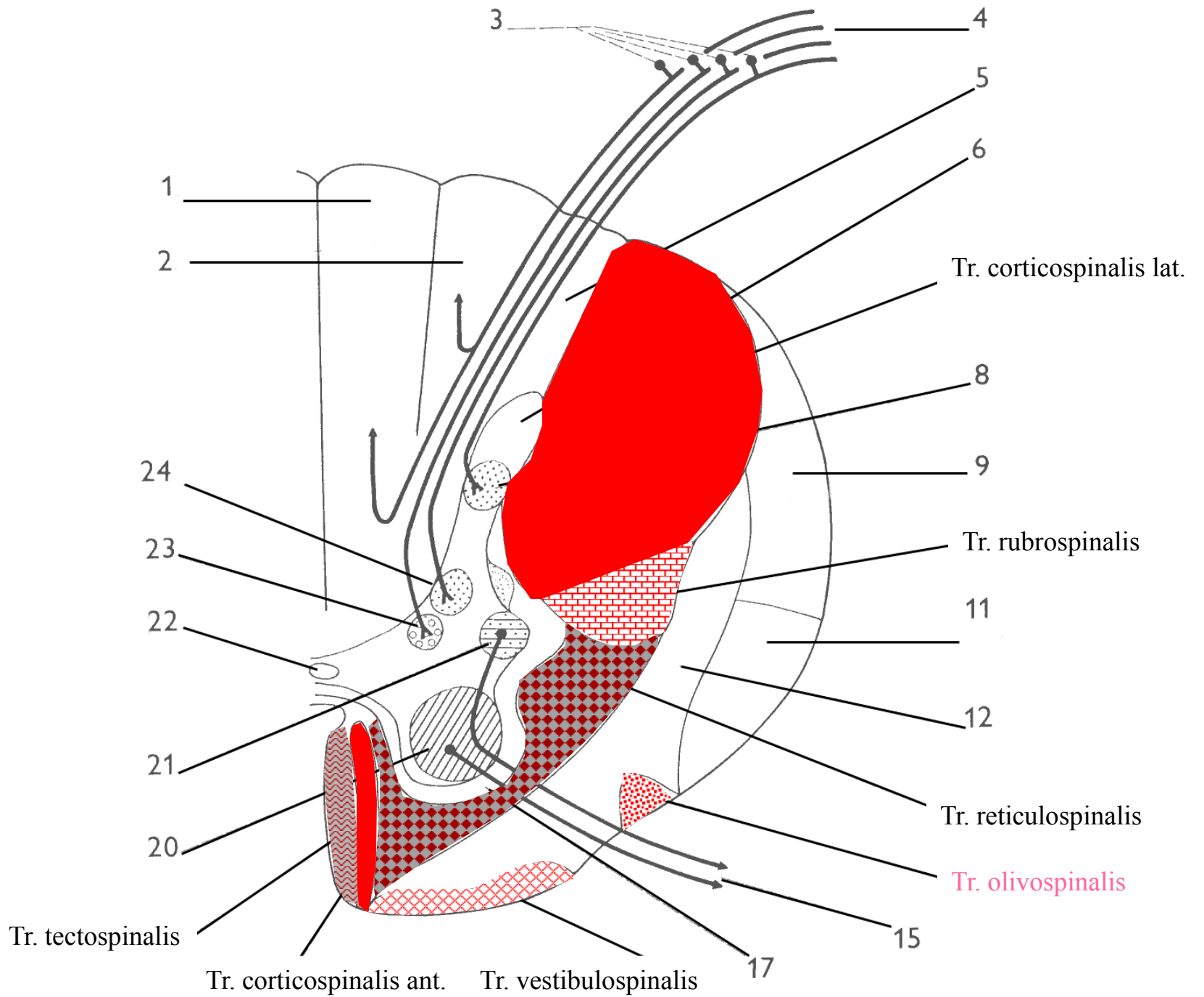
Tr. vestibulo-spinalis

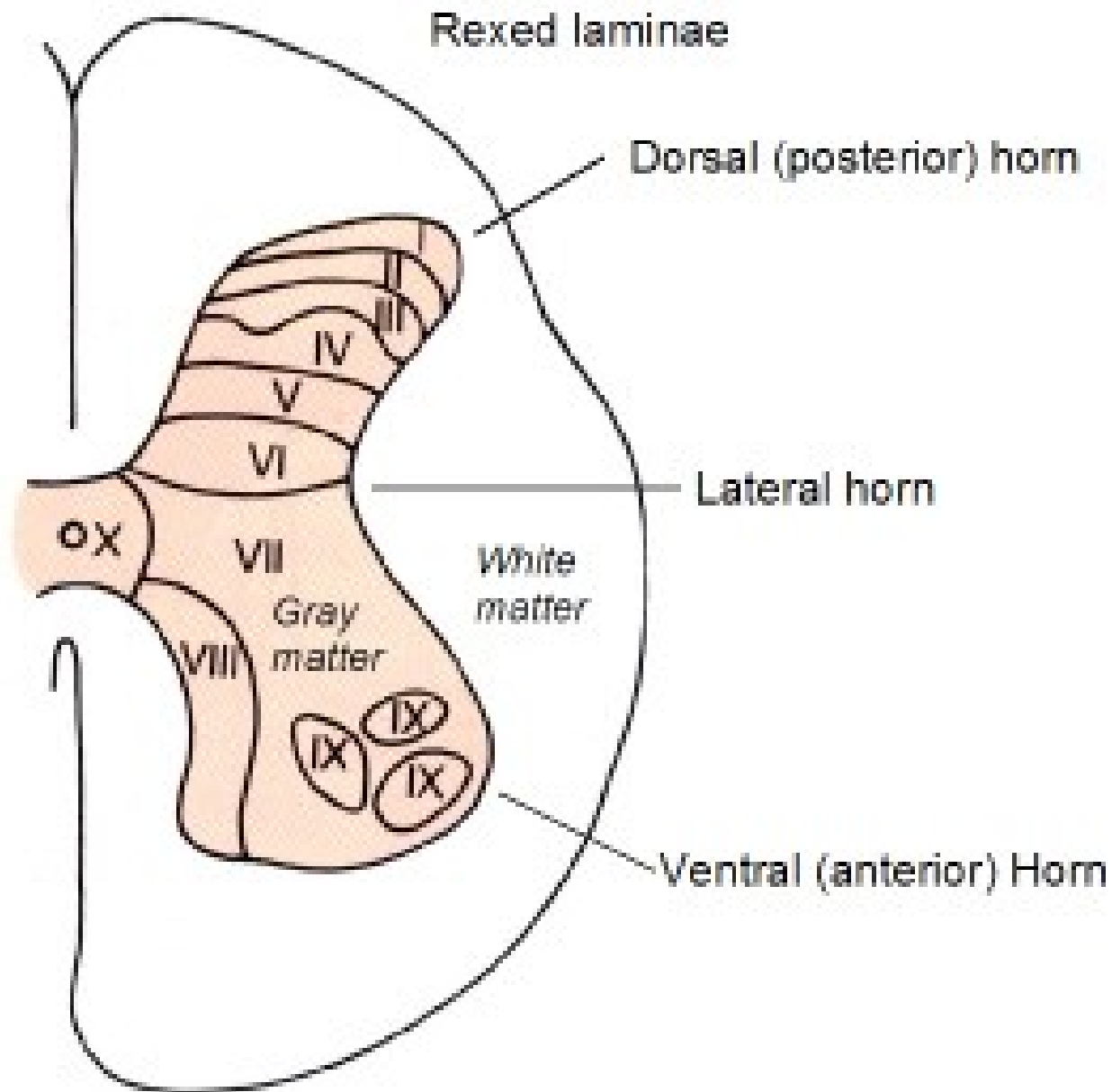
Tr. tecto-spinalis

Tr. rubro-spinalis

Spinální motoneurony









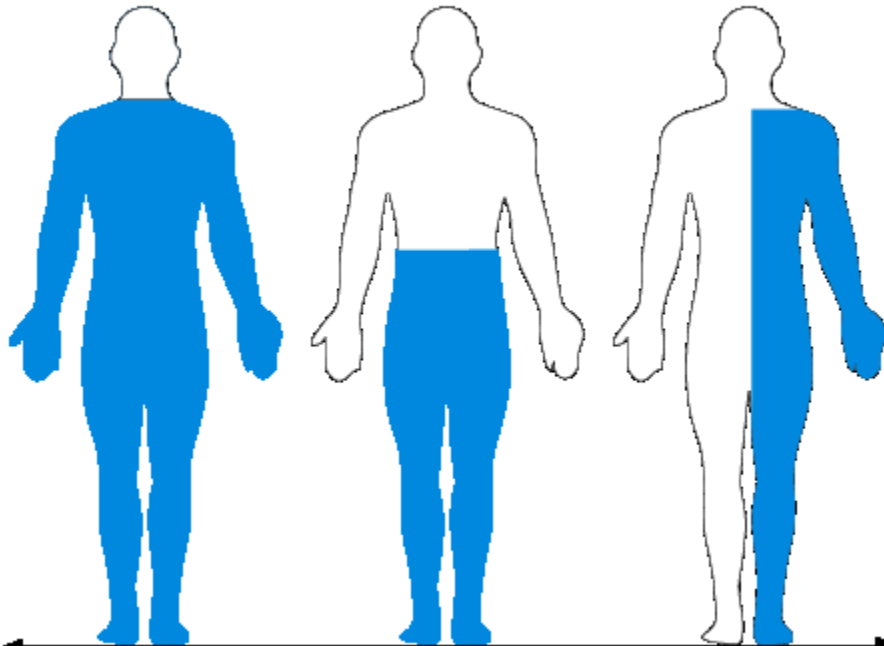
<b>lamina (Rexed 1952)</b>	<b>jádra</b>
I	ncl. apicalis (ncl. posteromarginalis)
II + III	substantia gelatinosa Rollandi
IV + V	ncl. proprius
VI	ncl. thoracicus (Stilling - Clarkeovo jádro) C8-L3
VII	skupina interneuronů v cornu anterius
VIII	mediální skupina motoneuronů
IX	lateralní skupina motoneuronů
X	zona centralis, šedá hmota kolem canalis centralis

# MEDULLA SPINALIS – traumatické poškození míchy

Quadriplegia

Paraplegia

Hemiplegia



tetraplegia



C4 injury (tetraplegia)



C6 injury  
(tetraplegia)



T6 injury  
(paraplegia)



L1 injury  
(paraplegia)