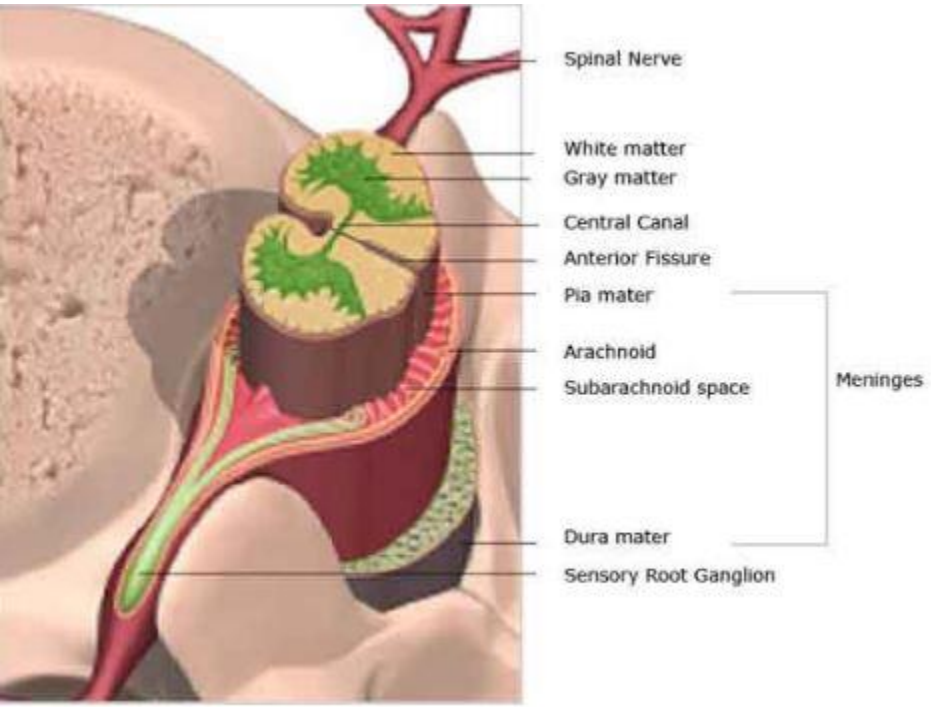
MADUVA SPINARII

- medulla spinalis -

-maduva-

Maduva spinarii reprezinta partea SNC

situata in canalul medular al coloanei vertebrale

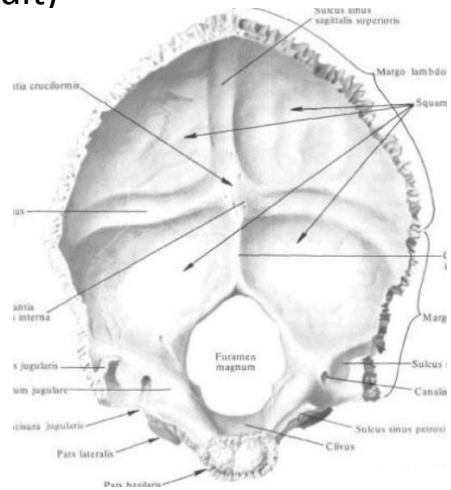


Configuratie externa

- Limite: Foramen magnum L1/L2 (adult)
- L3 (nou-nascut)
- Regiuni: - cervicala
  - Toracica
  - Lombara
  - Sacrala
  - Coccigeana
- Ocupa ⅔ superioare ale canalului vertebral
- Diametru neuniform:

  - intumescenta cervicala

  - intumescenta lombara



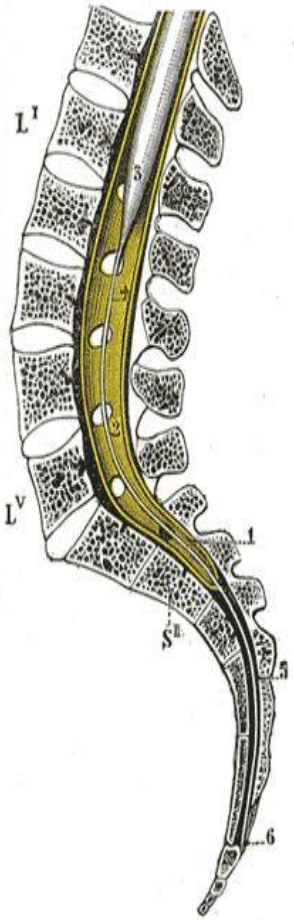
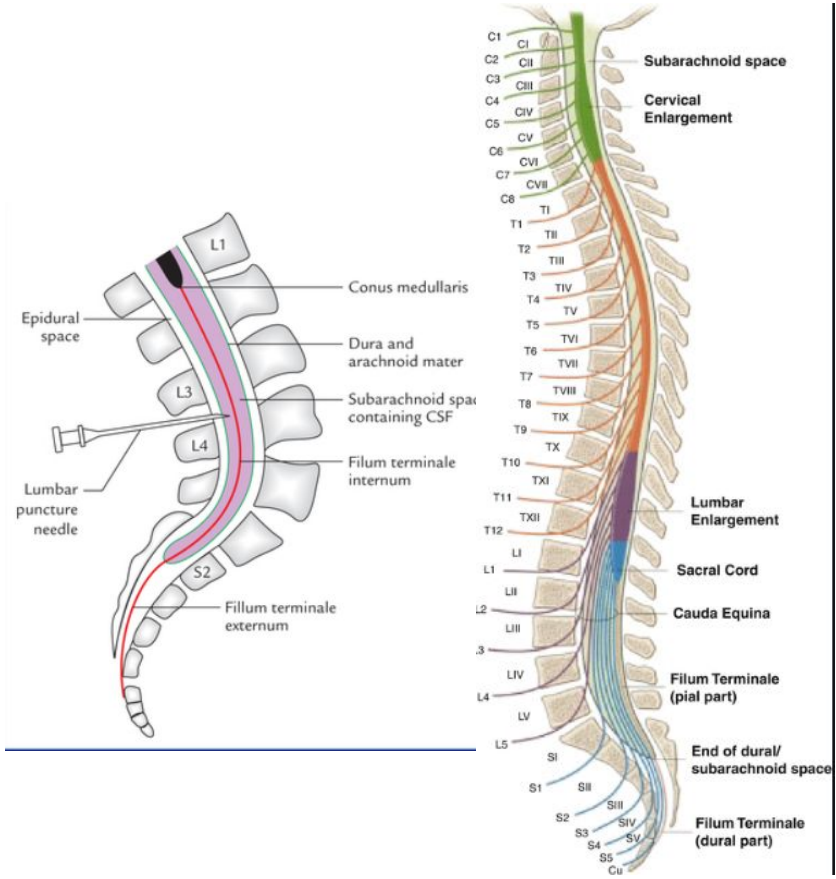


FIG. 661– Sagittal section of vertebral canal to show the lower end of the medulla spinalis and the filum terminale. *Li, Lv.* First and fifth lumbar vertebræ. *Sii.* Second sacral vertebra. 1. Dura mater. 2. Lower part of tube of dura mater. 3. Lower extremity of medulla spinalis. 4. Intradural, and 5, Extradural portions of filum terminale. 6. Attachment of filum terminale to first segment of coccyx. (Testut.)

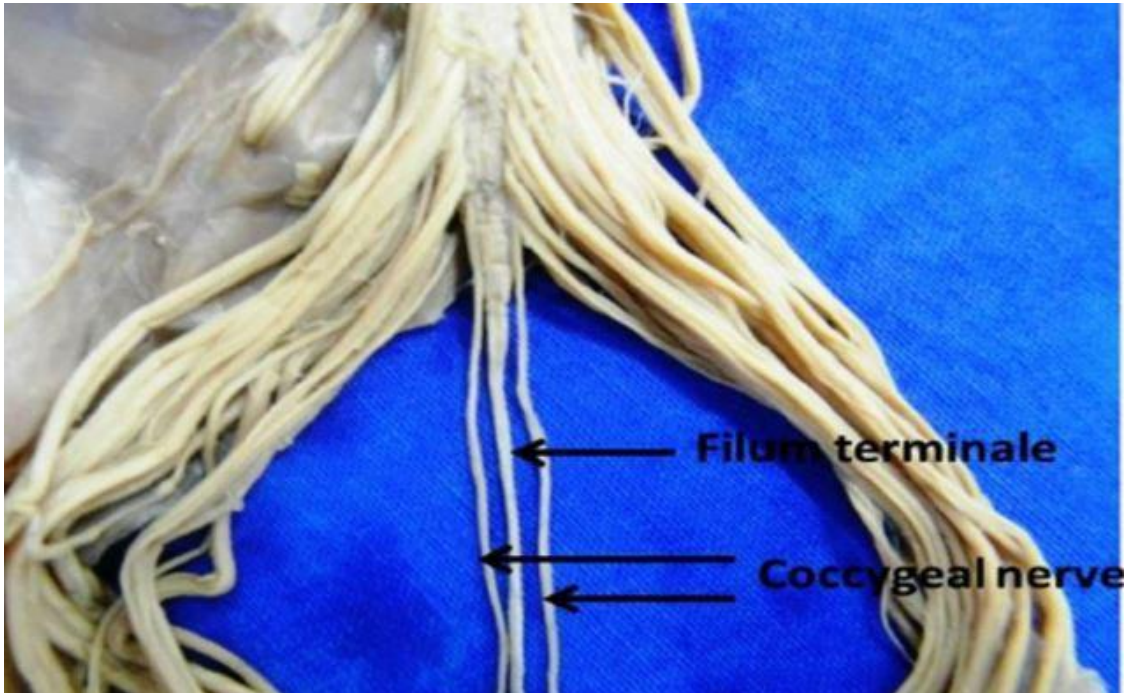
- Inferior se termina printr-o extremitate conica numita conus medullaris, de la apexul caruia porneste un filament delicat numit filum terminale

- Filum terminale se intinde de la conusul medular pana la nivelul fetei post. a coccigelui

- Cauda equina = filum terminale+radacinile ventrale si posterioare ale nervilor spinali care descind sub nivelul conusului medular

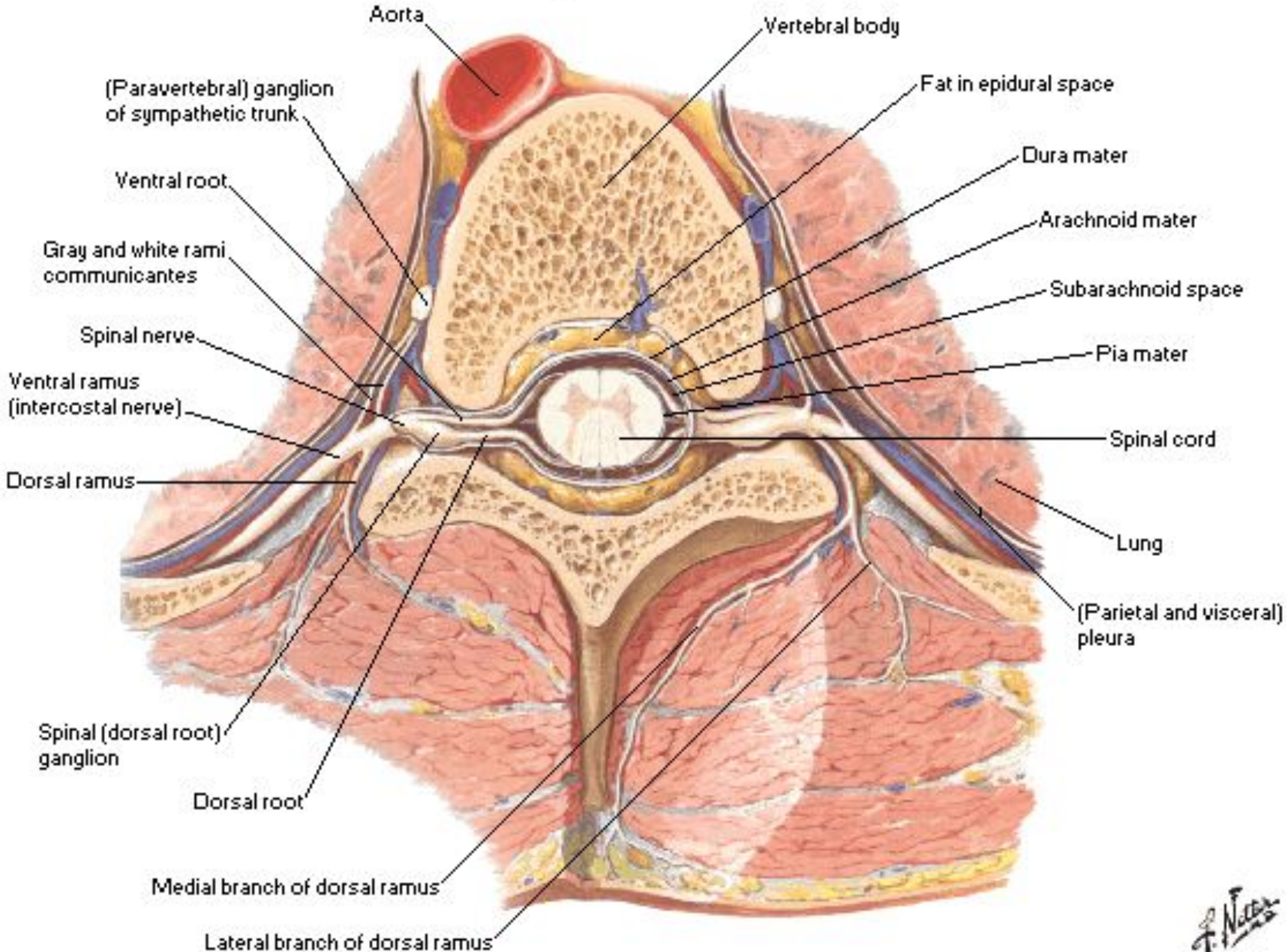


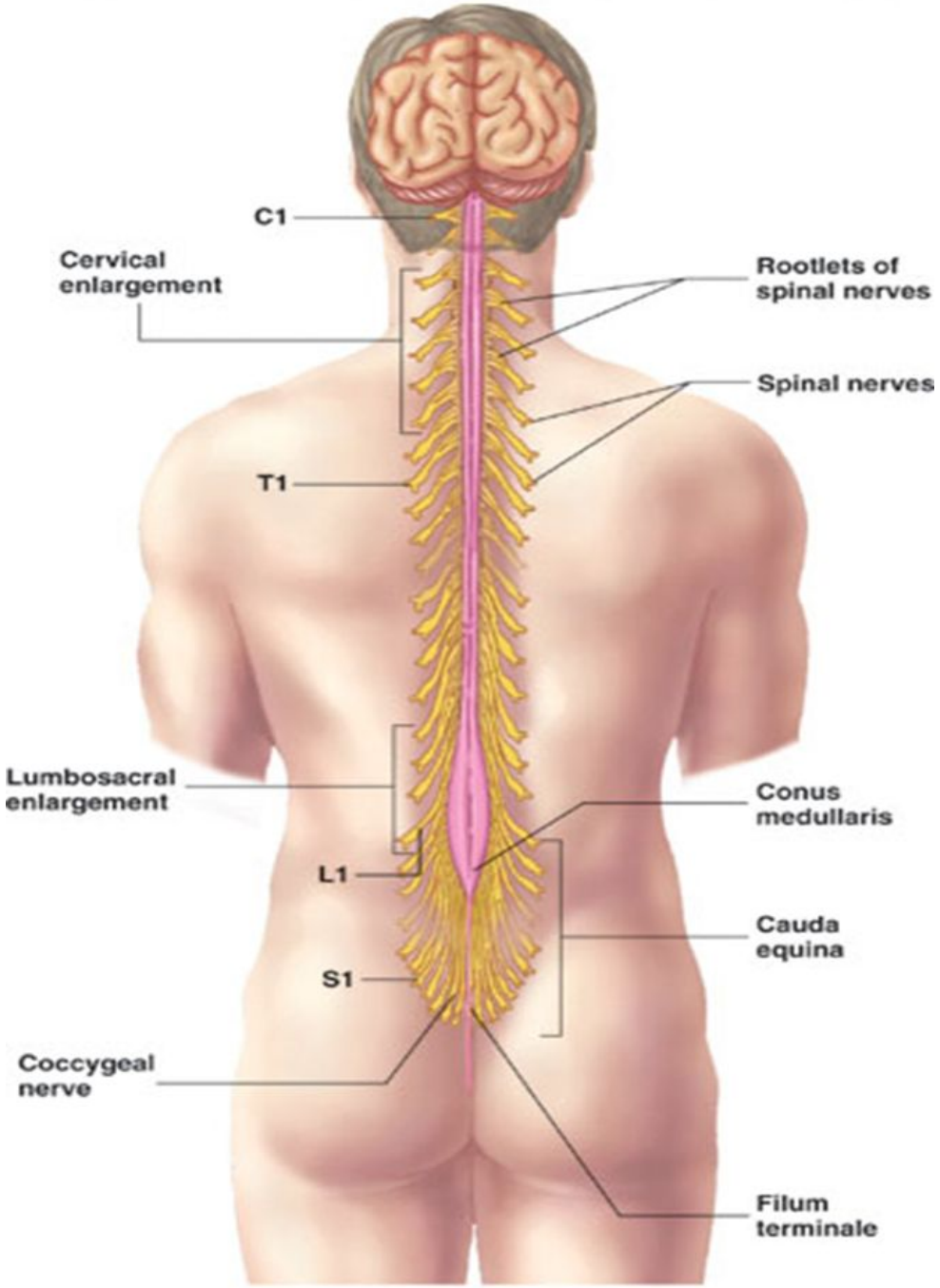
- Conus medullaris reprezinta capatul maduvei spinale adevarate
- Filum terminale se gaseste in interiorul formatiunii numita cauda equina
    - fasii subtiri de pia mater care ancoreaza conus medullaris de coccige



Spinal Nerve Origin

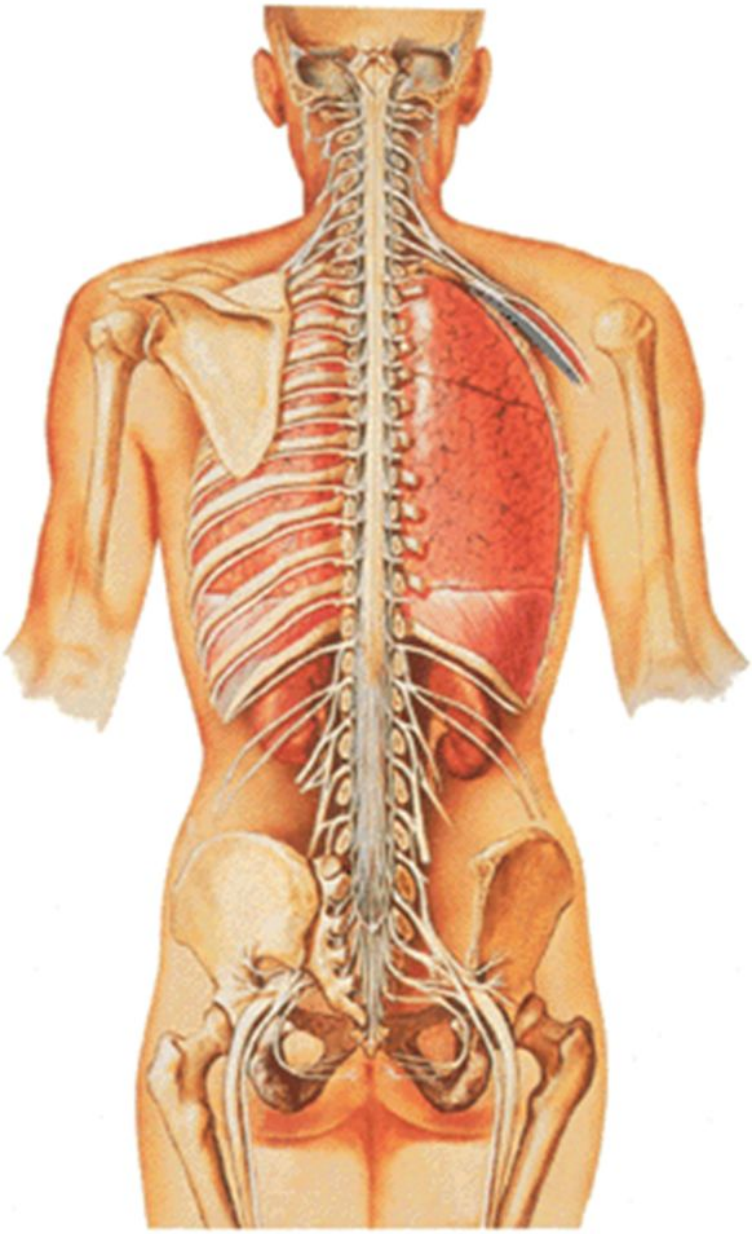
Section through Thoracic Vertebra





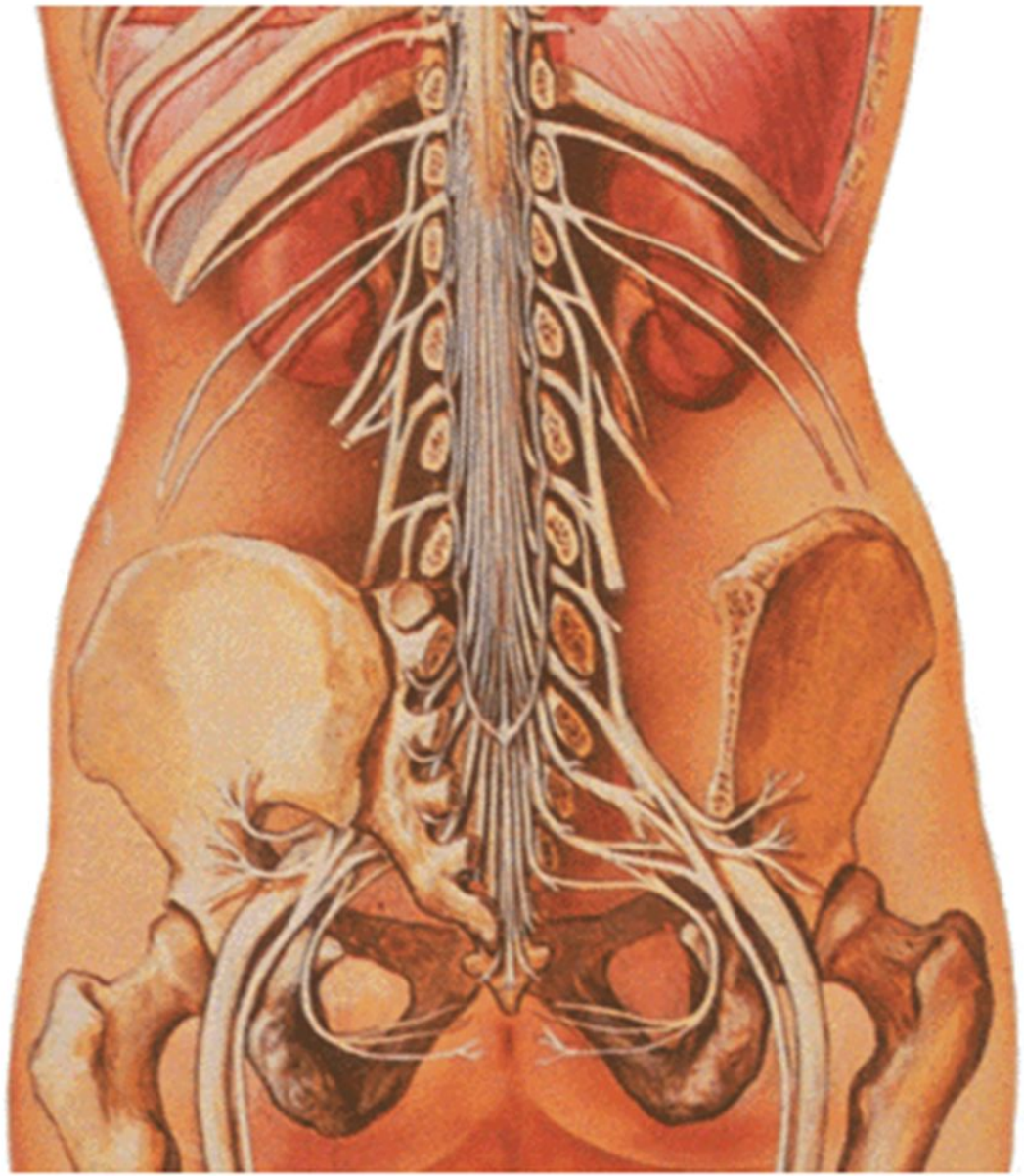
Posterior view

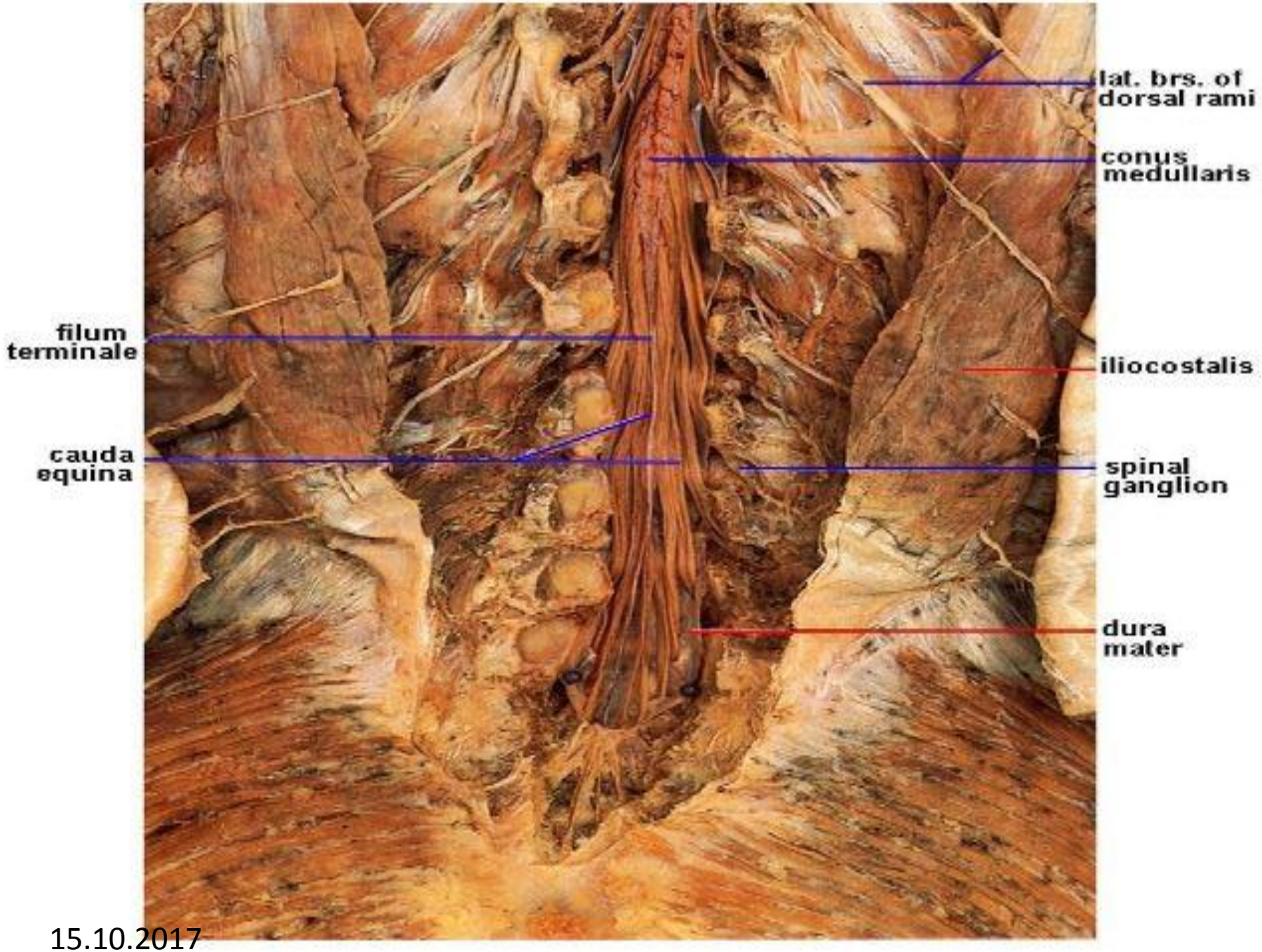
Spinal Cord in Situ

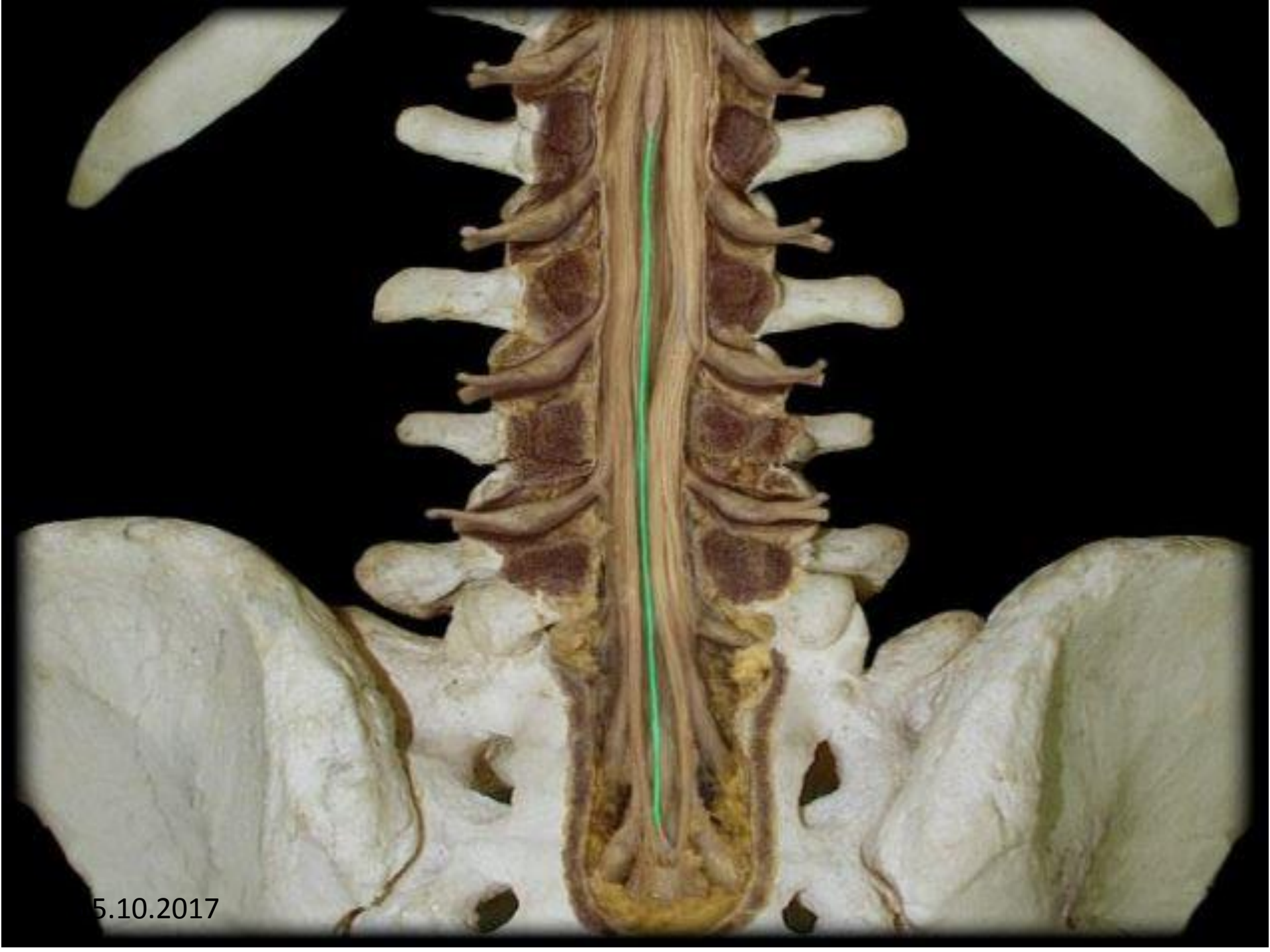


Spinal Cord in Situ

Enlargement of Cauda Equina

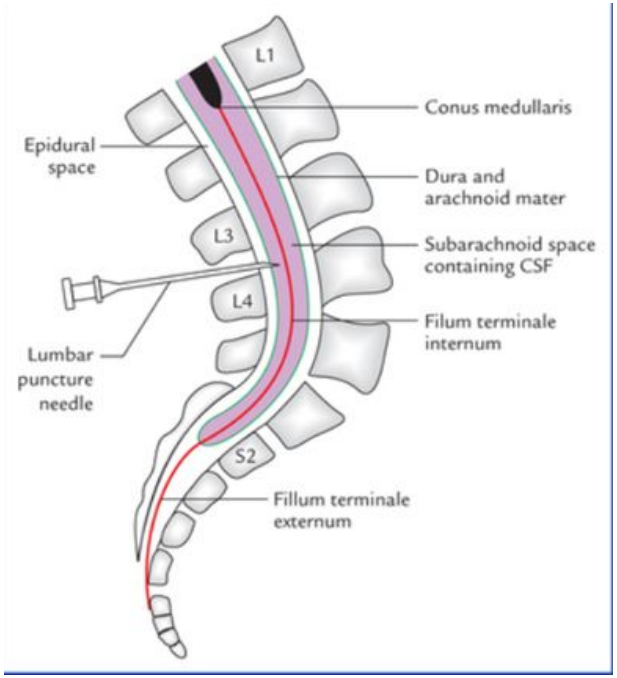



lat. brs. of dorsal rami
conus medullaris
filum terminale
iliocostalis
cauda equina
spinal ganglion
dura mater



Punctia lombara

- Se realizeaza la nivel L3/L4, L4/L5
- Coada de cal
- Pentru a nu leza maduva spinarii



Spinal cord

LATIN

Medulla spinalis

Men: 45 cm

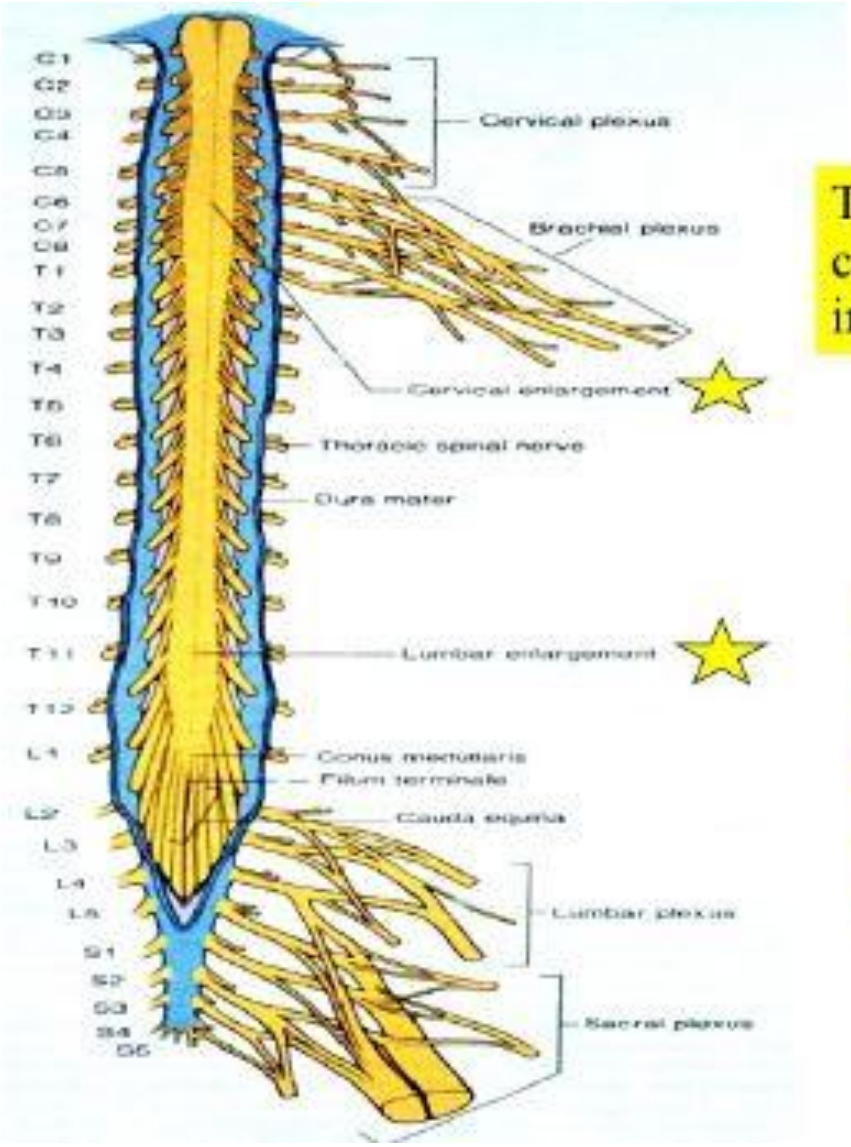
Women: 43 cm

Cervical and lumbar regions: 13 mm thick

Thoracic area: 6.4 mm thick

15.10.2017

-31 perechi nervi spinali (radacini anterioare si posterioare)



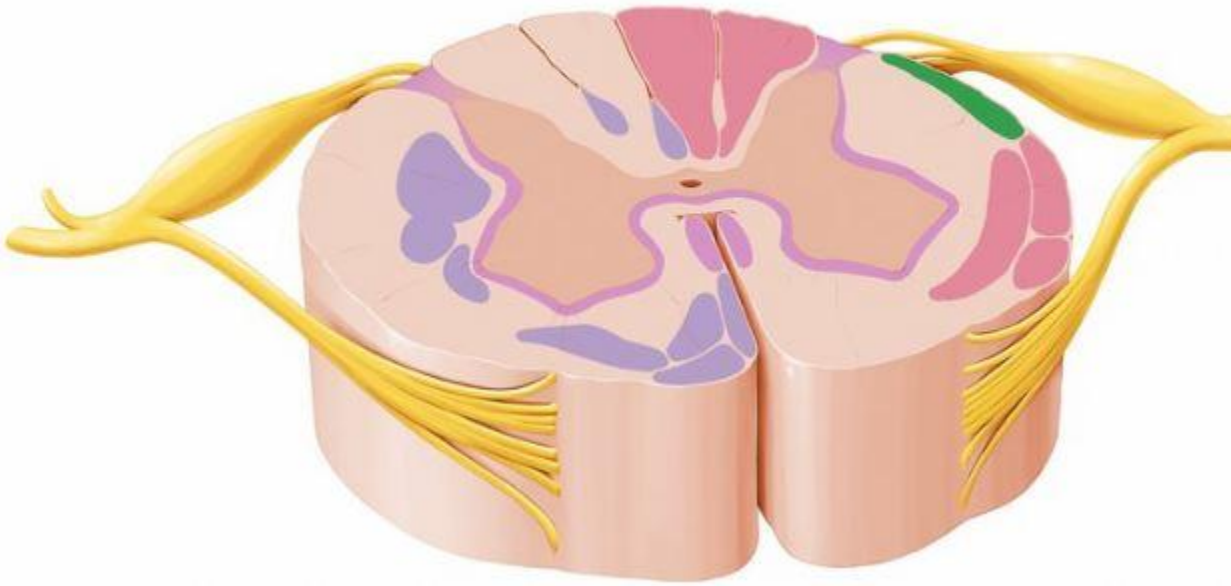
The **cervical enlargement** contains the neurons that innervate the upper limbs

The **lumbar enlargement** contains the neurons that innervate the lower limbs.

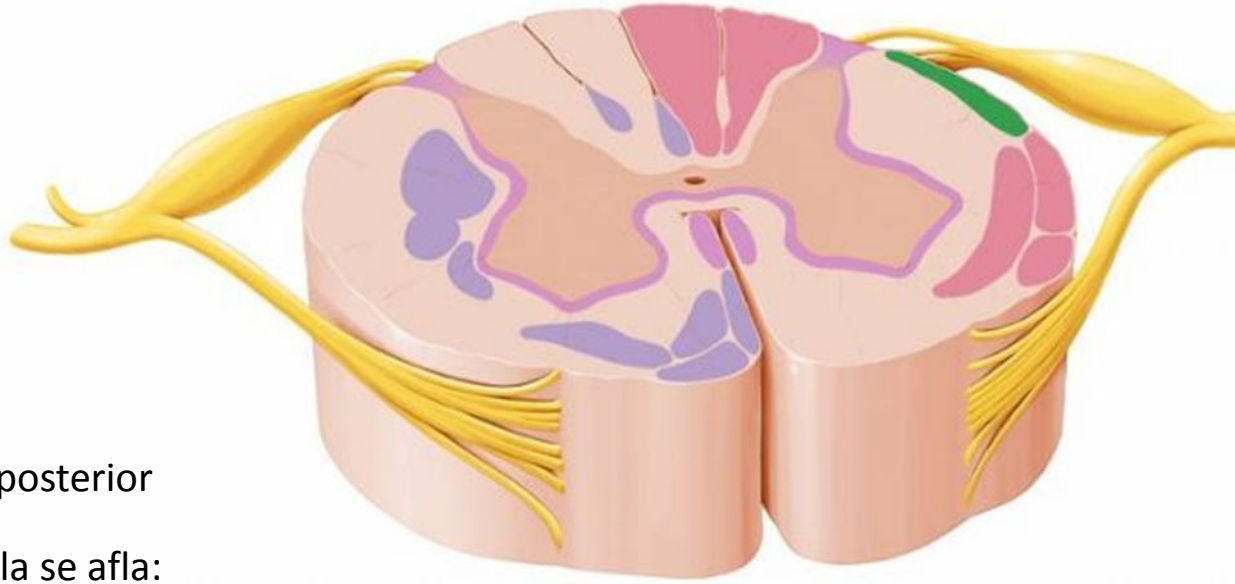
Configuratie externa

Fețe:

- Anterioara
- Posterioara
- 2 fete laterale



- Fata anterioara:
    - fisura mediana anterioara



- Fata posterioara:
  - santul median posterior

Pe fiecare jumatate antero-laterala se afla:

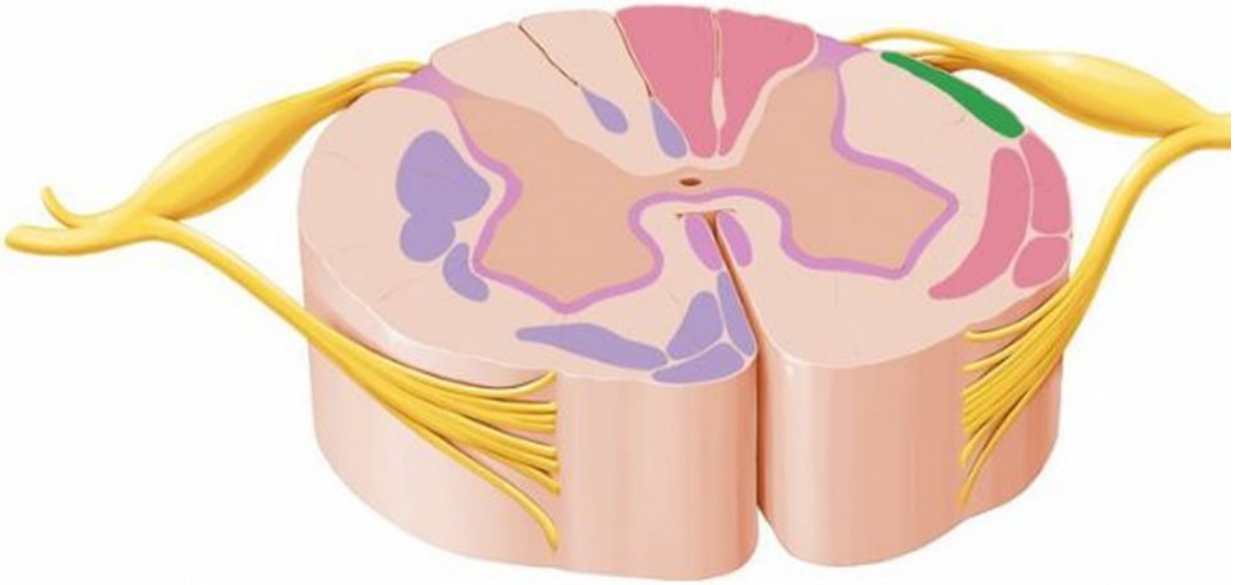
- santul colateral ant. pe unde iese rad. ant. a N. spinal
- santul colateral post. pe unde intra rad. post. a N. spinal

- Intre santul median post. si cel posterolat. se afla santul intermediar
  - - se gaseste numai in reg. cervicala si toracala sup. si delim. Fasc. Goll si Burdach

Nervul spinal-radacini(2)

-trunchi

-ramuri

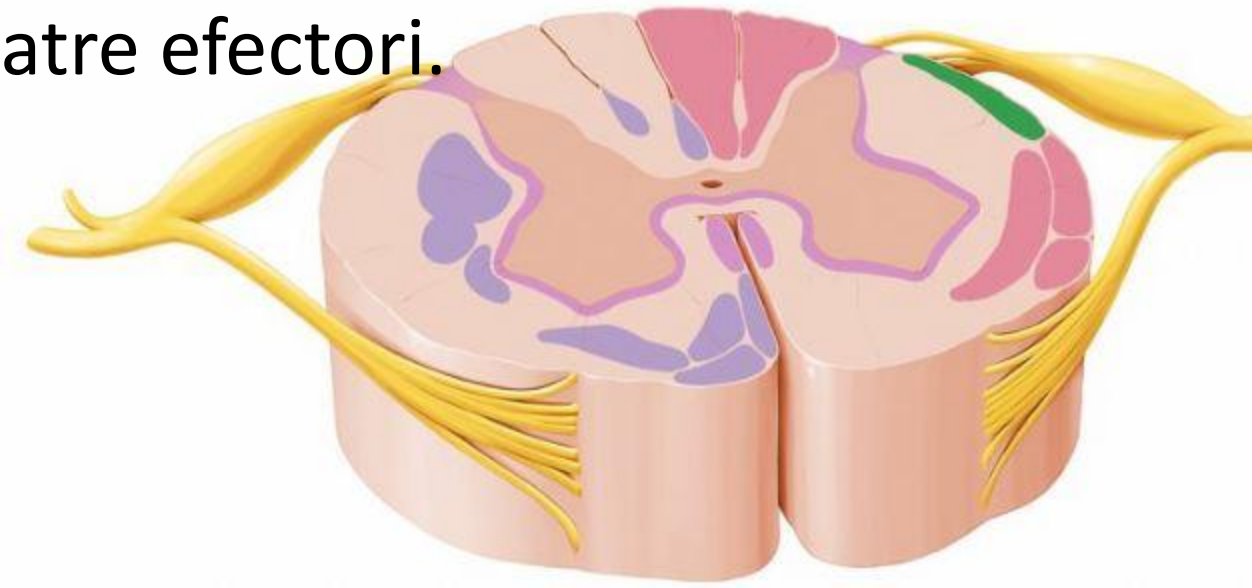


- Radacinile situate in canalul vertebral.

1. Anterioara(motorie) iese din maduva prin santul colateral anterior.

-alcatuita din axonii neuronilor somatomotori din coarnele anterioare si din axonii neuronilor visceromotori din coarnele laterale.

-duc impulsuri catre efectori.



- 2. Posterioara (senzitiva) intra in maduva prin santul colateral posterior.

- transmite impulsuri de la receptori-> maduva spinarii

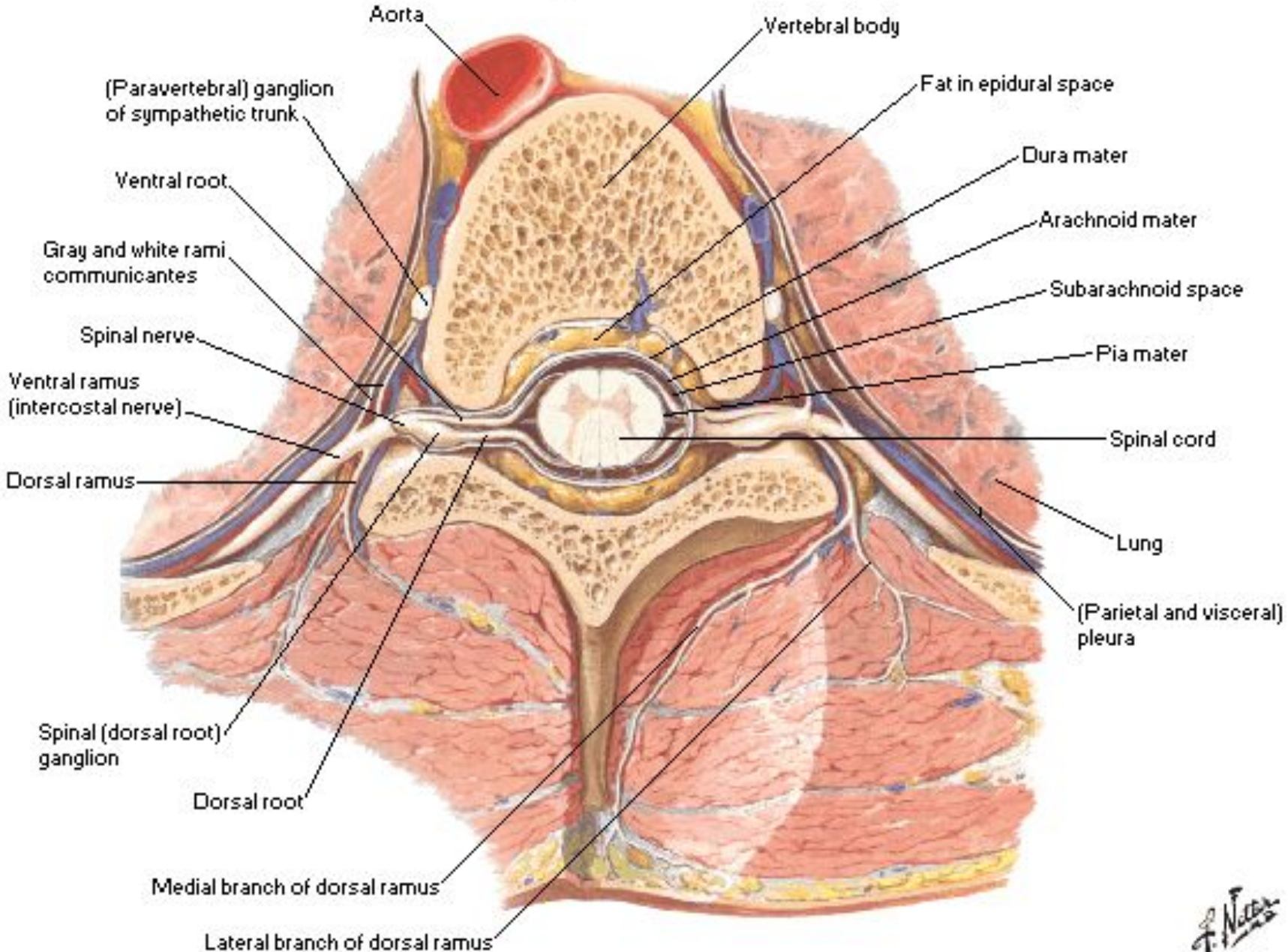
-are anexat ganglionul spinal (GS) alcatuit din neuroni somatosenzitivi care reprezinta protoneuronul pt. sensib. tactila, termica, dureroasa si proprioceptiva (const.si inconst.)

-este formata din axonii somatosenzitivi ai neuronilor din GS si din cei viscerosenzitivi de la visceroreceptori.

-aduc impulsuri de la receptori.

Spinal Nerve Origin

Section through Thoracic Vertebra



- Trunchiul

- scurt

-se formeaza prin unirea celor 2 radacini

Strabate gaura de conjugare dintre 2 vertebre, iesind in exteriorul coloanei vertebrale

- Fibrele visceromotorii Sy din constituenta trunchiului prezinta o colaterala care pleaca spre Ggl. Sy paravertebral prin ramura comunicanta alba; de la acest Ggl. se intorc fibre catre N. spinal prin intermediul ramurii comunicante cenusii

- Ramuri

-se formeaza la iesirea din coloana vertebrala prin divizarea trunchiului.

-anterioare (ventrale) care se anastomozeaza si formeaza plexuri.

-posterioare (dorsale) care se distribuie muschilor spatelui si cefei.

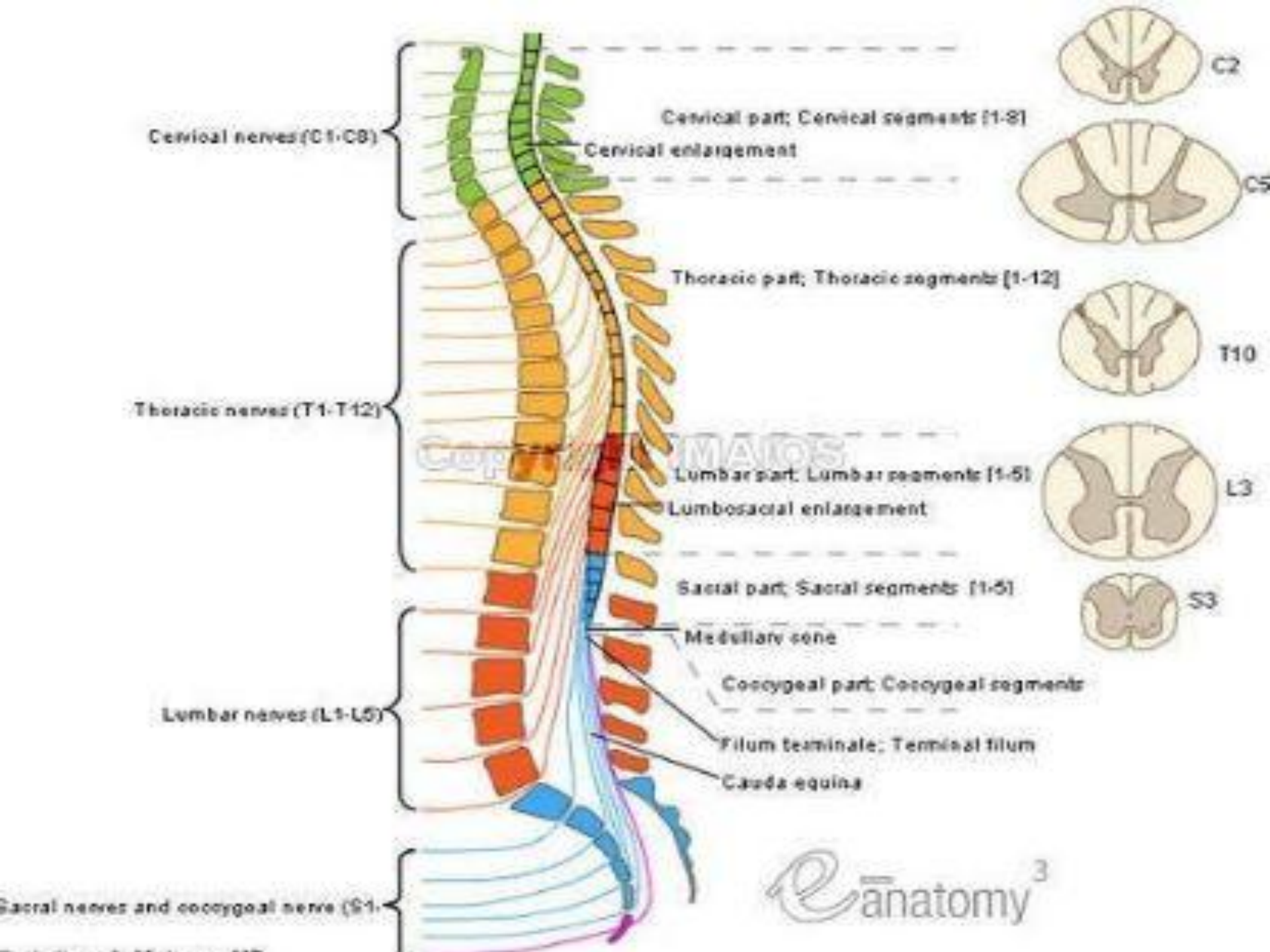
- Nervii spinali- 8 cervicali

  12 toracali(intercostali)

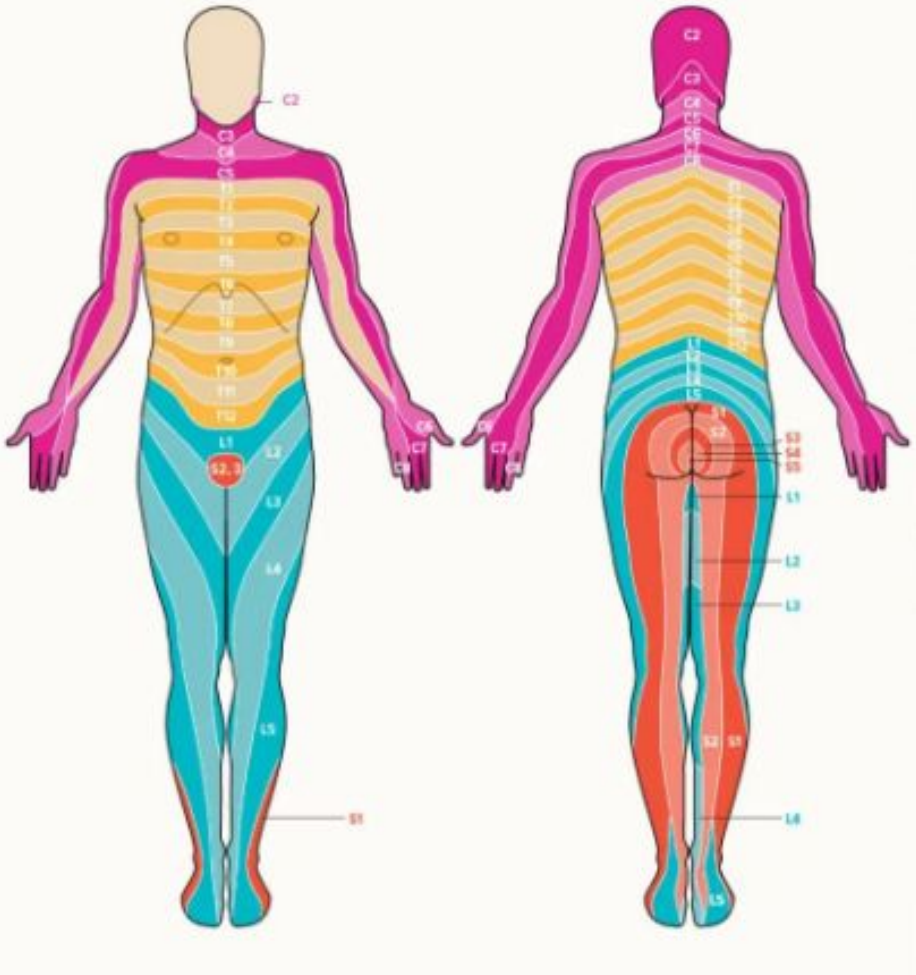
  5 lombari

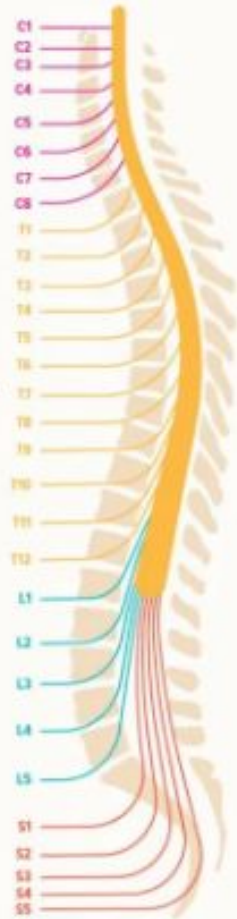
  5 sacrati

  1 coccigian


Cervical nerves (C1-C8)
Thoracic nerves (T1-T12)
Lumbar nerves (L1-L5)
Sacral nerves and coccygeal nerve (S1-
Cervical part; Cervical segments [1-8]
Cervical enlargement
Thoracic part; Thoracic segments [1-12]
Lumbar part; Lumbar segments [1-5]
Lumbosacral enlargement
Sacral part; Sacral segments [1-5]
Medullary cone
Coccygeal part; Coccygeal segments
Filum terminale; Terminal filum
Cauda equina
C2
C5
T10
L3
S3
anatomy

Dermatomes





Levels of principal dermatomes

T4	Nipples
T7	Xiphoid process
T10	Umbilicus
S2, S3, S4	Perineum

healthline

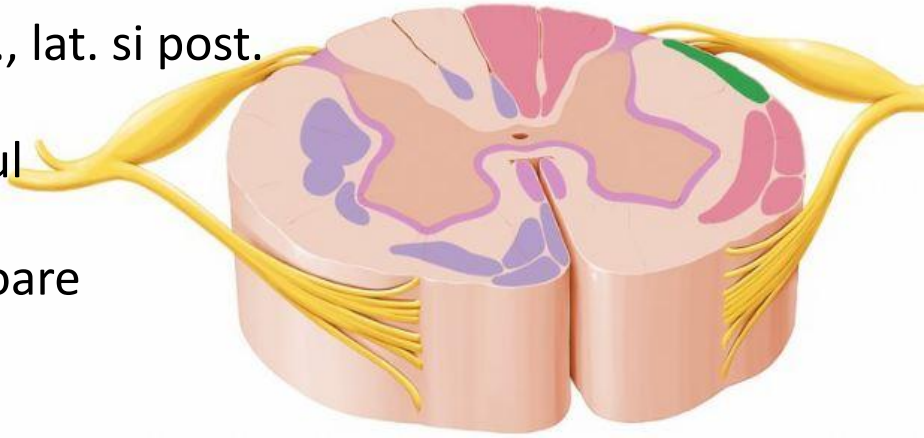
Myotomes

- C5 – Shoulder abduction (deltoid)
- C6 – Elbow flexion (biceps;brachiorad)
- C7 – Elbow extension (triceps)
- C8 – Wrist flexion (FDS)
- T1 – Finger abduction (DABs)
- L2 – Hip flexion (iliopsoas)
- L4 – Knee extension (quad fem)
- L5 – Dorsiflexion (tibialis anterior)
- S1 – Plantar flexion (gastrocnemius)

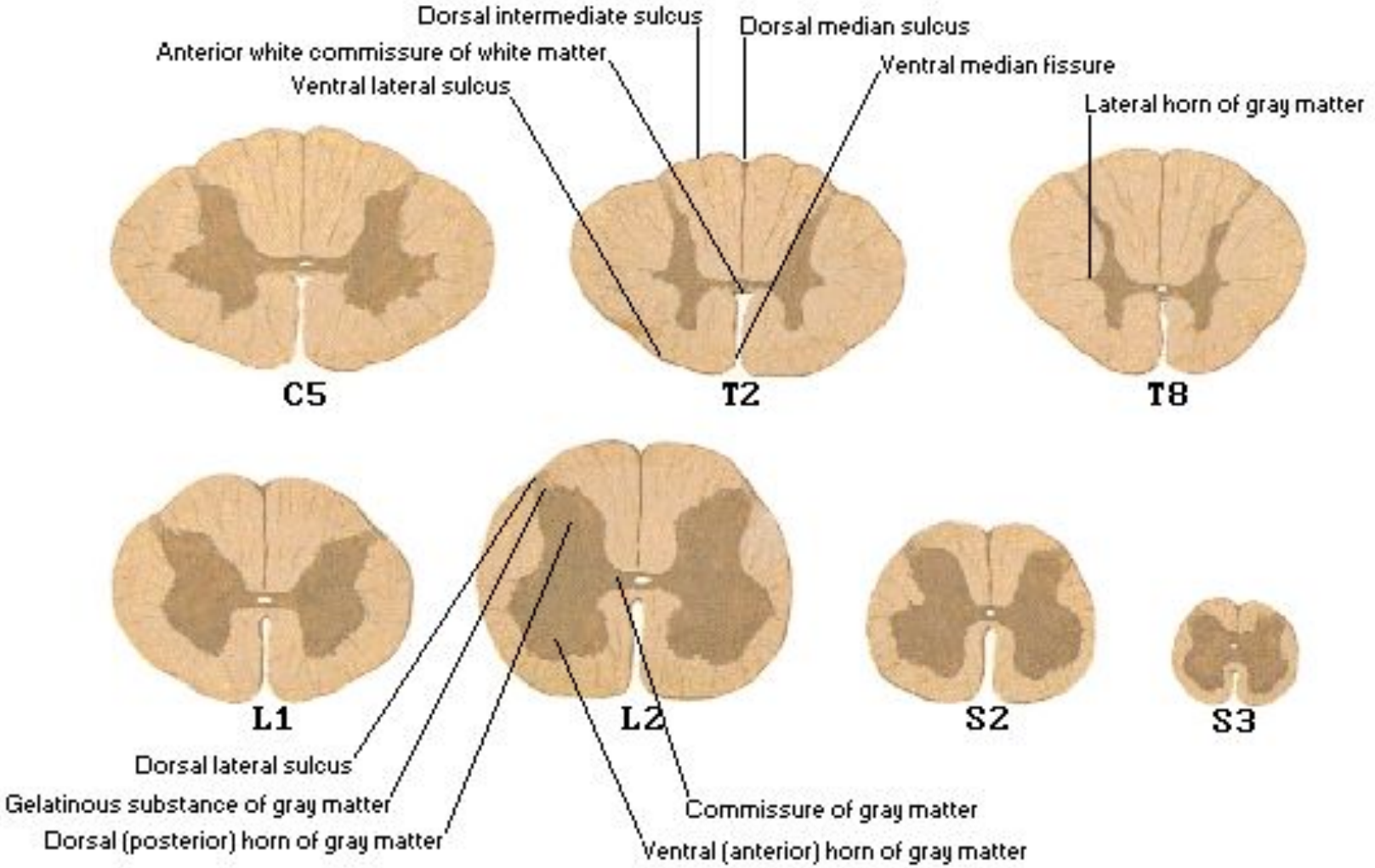
Structura microscopica
Substanta cenusie

- Litera H, sau fluture, la interior, inconjurata de substanta alba
- Cele doua jumatati sunt unite prin comisuri de substanta cenusie care prezinta canalul central sau ependimar
- Abundenta la nivelul intumescentelor
- Alc. din neuroni si fibre nervoase
- Corpii neuronali sunt dispusi sub forma de nuclei
- fiecare jumatate prezinta 3 coarne: ant., lat. si post.
- Coarnele laterale sunt prezente la nivelul

  segmentelor toracice si lombare superioare



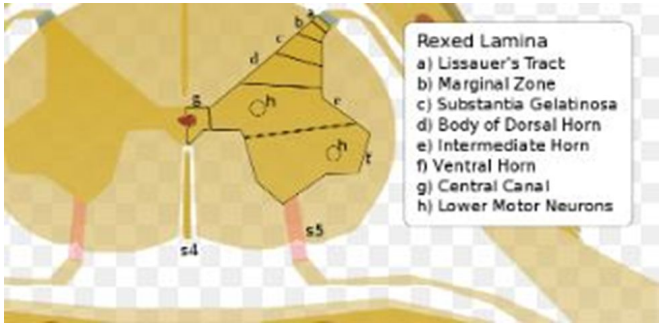
Spinal Cord Cross Sections



Sections through spinal cord at various levels

Cornul anterior: contine neuroni somatomotori

- Voluminos
  - Prezinta un cap si o baza
  - Neuronii sunt mari, multipolari

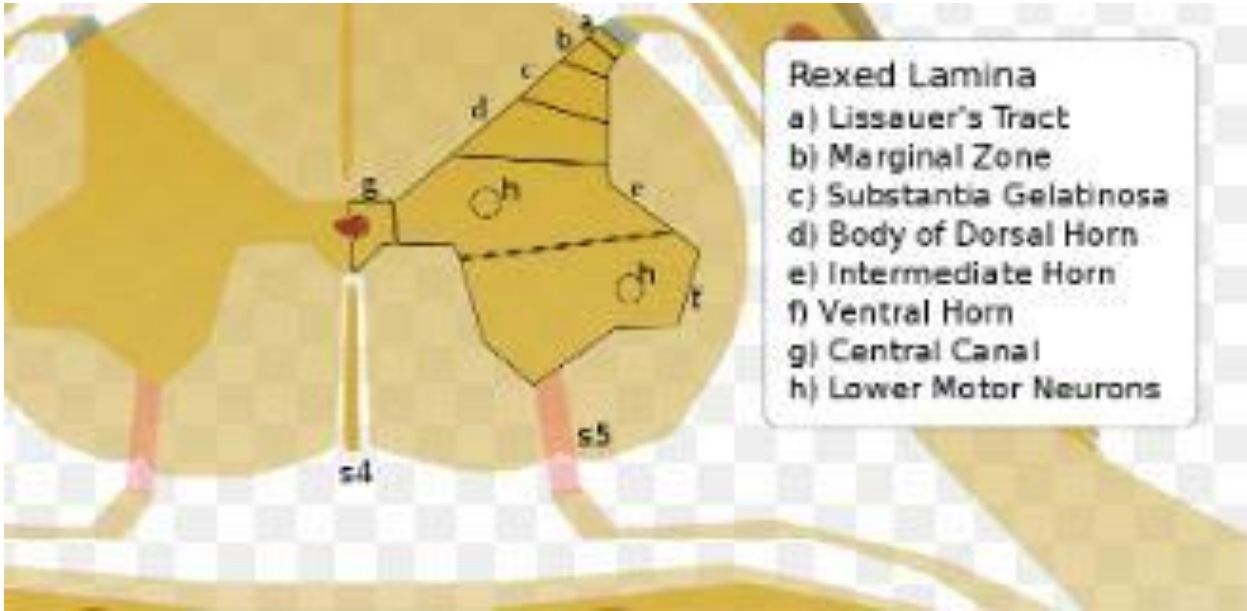


Cantitatea de substanta cenusie e d.p. cu musculatura inervata

Substanta cenusie este formata din neuroni, nevroglii, vase sanguine

Cornul posterior

- Mai subtire si mai alungit
- Senzitiv
- Prezinta cap, col, baza
- Capul e invelit de subt. gelatinoasa a lui Rolando, pe urma se gaseste substanta spongioasa si zona terminala a lui Lissauer

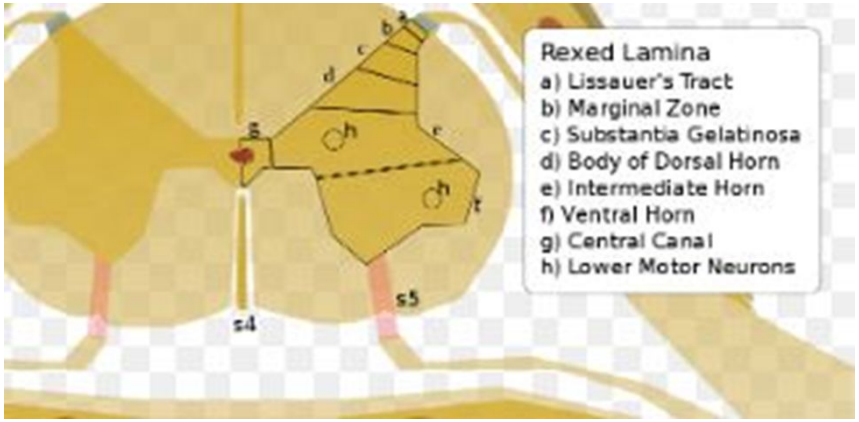


Substanta gelatinoasa

- Se gaseste de-a lungul maduvei
- Primeste fibre aferente care conduc impulsuri cu privire la sensibilitatea dureroasa, termica si tactila grosiera dinspre radacinile posterioare

Comisura gri si canalul central

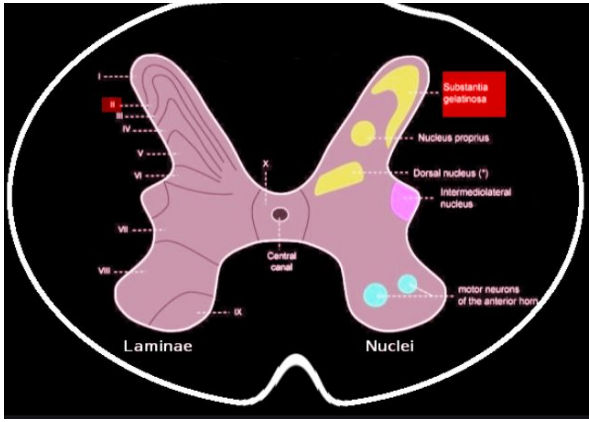
- Conecteaza cele 2 brate de substanta cenusie
- Prezinta canalul central sau ependimar
- Comisura anterioara
- Comisura posterioara



Canalul ependimar

- Se continua superior cu Ventriculul IV

Neuronii din coarnele posterioare - SOMATOSENZITIVI

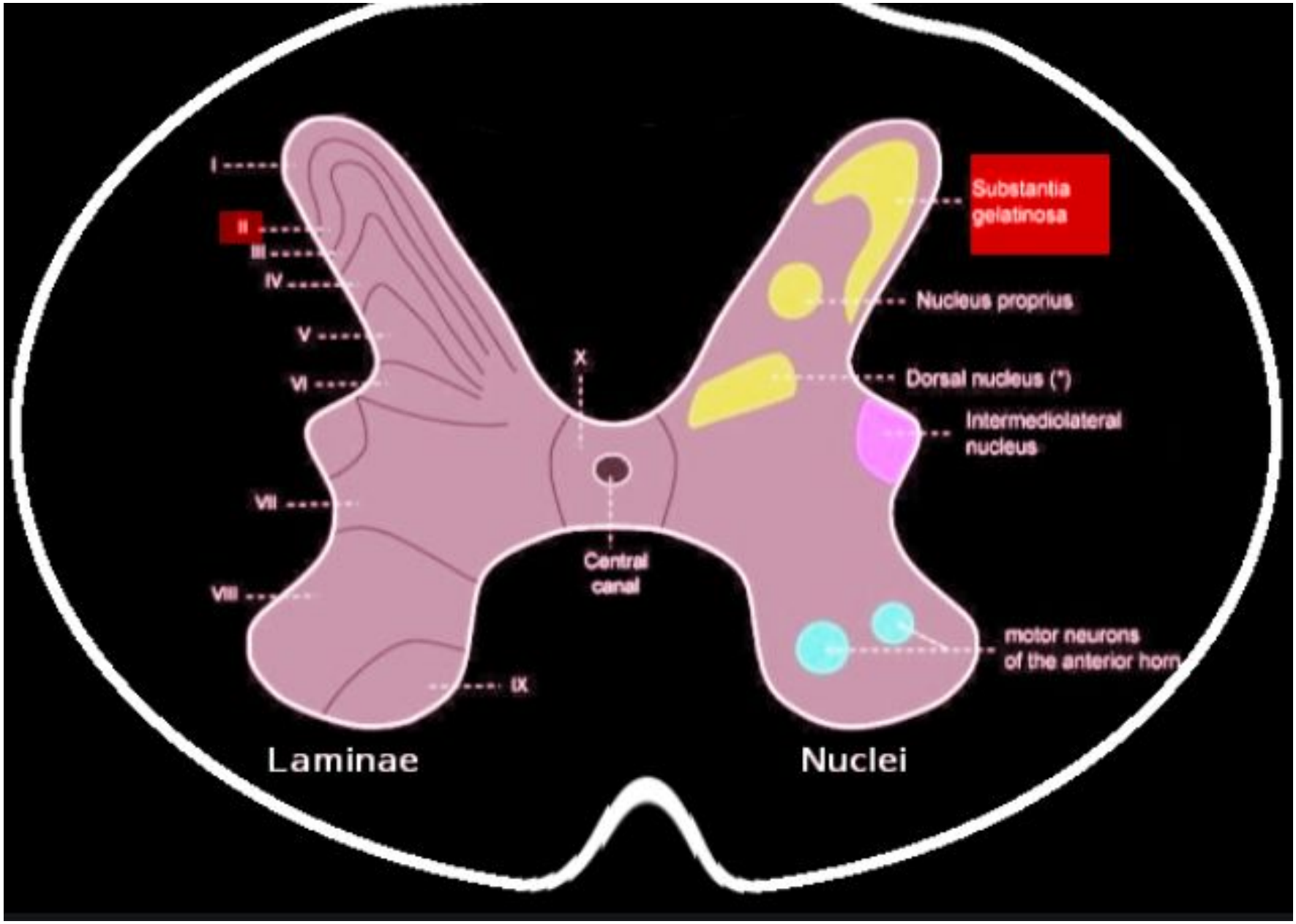


- Nucleul propriu Rolando
  - Situat la nivelul capului cornului post.
  - Contine neuron II (deutoneuronul)
  - aferente sosesc de la receptori pt. sensib:

    - tactila grosiera

    - termica

    - dureroasa de la niv. tegum. si mucoaselor, prin N. spinal, Ggl spinal (care contine protoneuronul), pe urma prin radacina posterioara patrund in cornul post.


I
II
III
IV
V
VI
VII
VIII
IX
X
Substantia gelatinosa
Nucleus proprius
Dorsal nucleus (*)
Intermediolateral nucleus
Central canal
motor neurons of the anterior horn
Laminae
Nuclei

- Eferentele se transmit prin axonii deutoneuronilor care se grupeaza pe 2 directii ce trec in

  cordoanele - ant . si

  - lat. de partea opusa

- Trec prin bulb, punte si mezencefal pana la

  talamus unde fac sinapsa cu N. III

. Fasciculul spinotalamic anterior

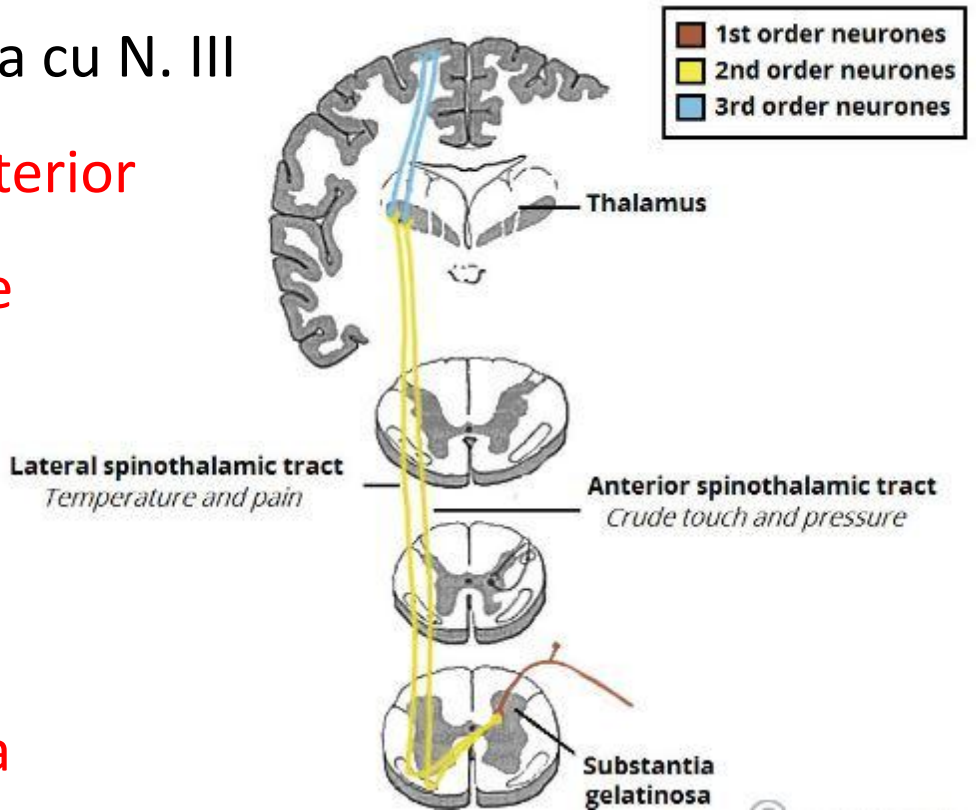
care conduce impulsuri. ale

sensib. tactile grosiere

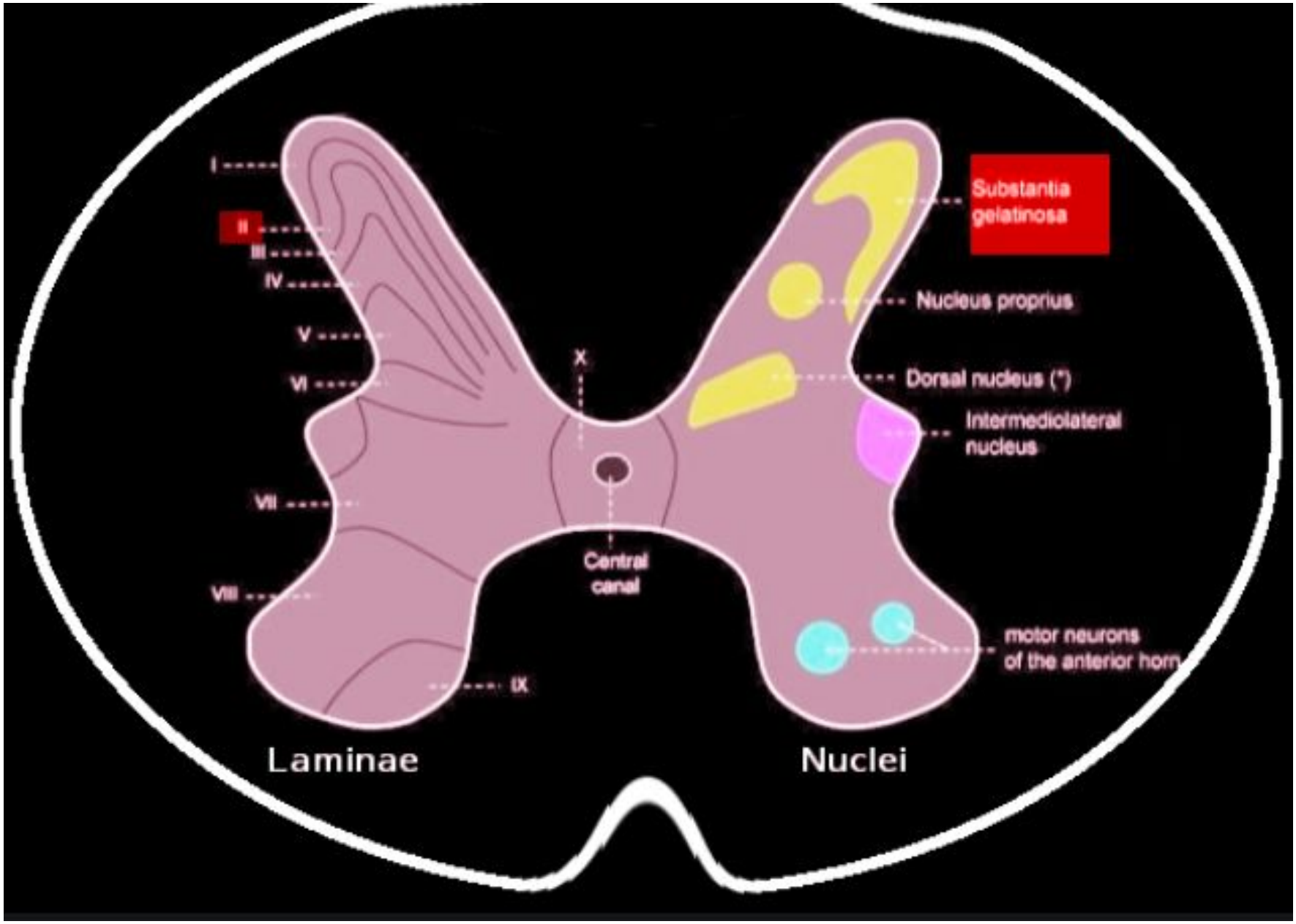
. Fasciculul

spinotalamic lateral pt

sensib. termica si dureroasa



- Nucleus dorsalis (Clarke Stilling)
- - somatosenzitiv
  - Partea mediana a bazei cornului posterior
  - C8-L3
  - Contine neuron II.
  - aferente de la r. proprii din muschi , tendoane si articulatii pt.sensibilitatea proprioceptiva inconstienta (membre inf.si ½ inf.a corpului)
  - Impulsurile vin prin N. spinal, Ggl. Spinal care contine protoneuronul acestei cai si prin rad. post. intra in cornul post.

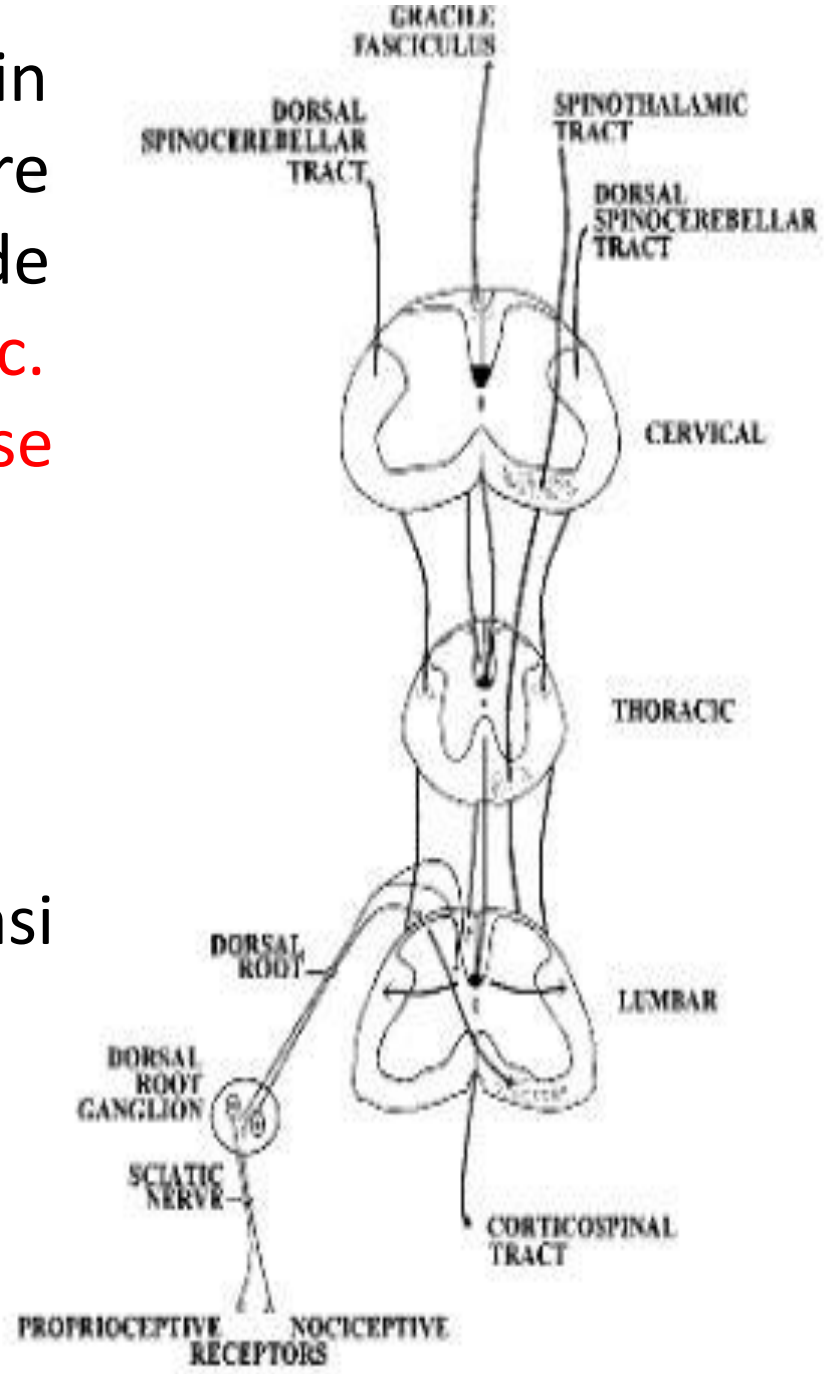

I
II
III
IV
V
VI
VII
VIII
IX
X
Substantia gelatinosa
Nucleus proprius
Dorsal nucleus (*)
Intermediolateral nucleus
Central canal
motor neurons of the anterior horn
Laminae
Nuclei

- Eferente se transmit prin axonii deutoneuronilor care trec in cordoanele laterale de aceeasi parte, formand fasc. ascendente spinocerebeloase post. sau directe.

- Urca prin bulb, iar prin

pedunculul cerebelos inferior

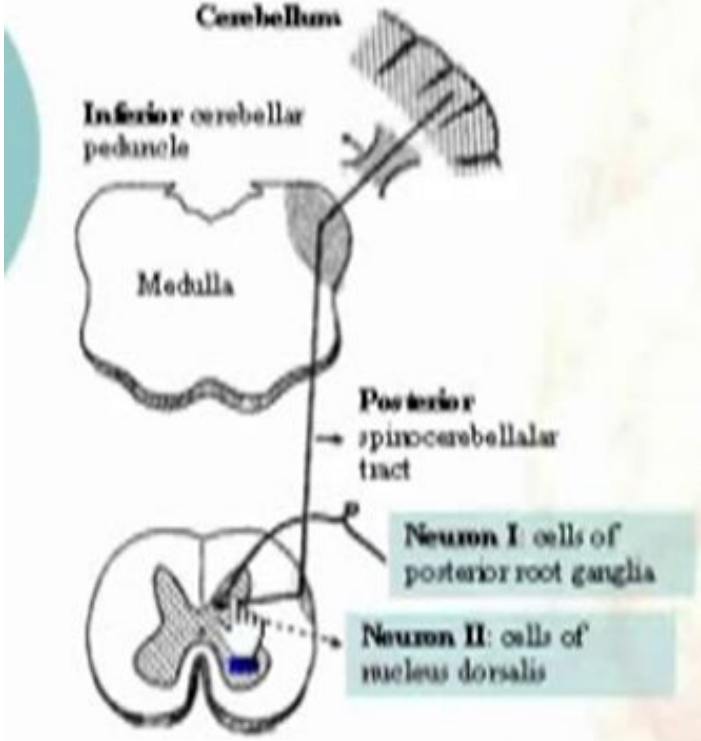
se termina in cerebel de aceeasi parte cu nucleul



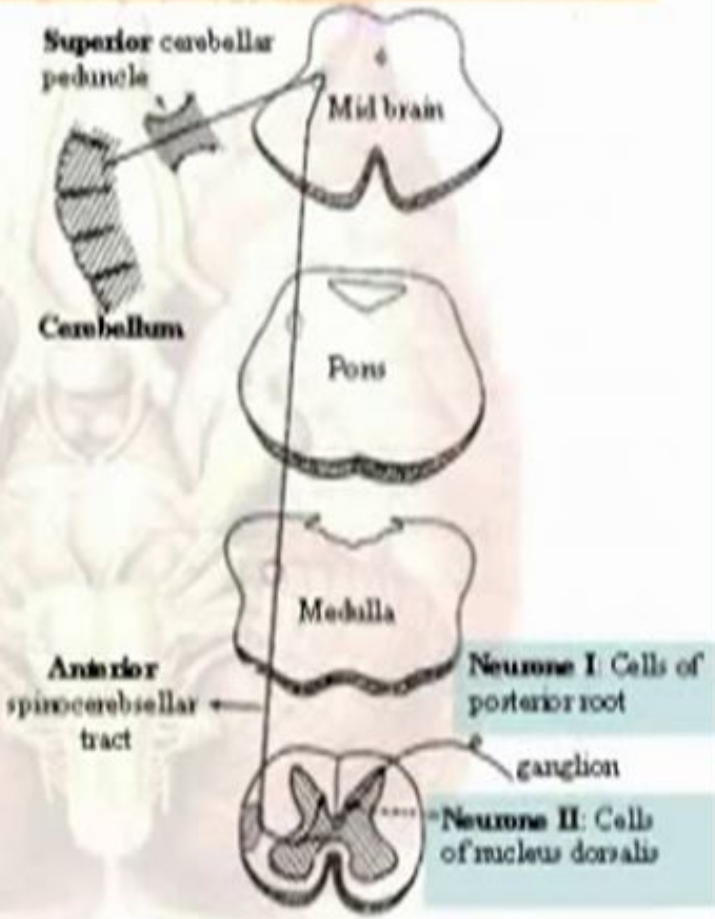
SPINOCEREBELLAR TRACTS

Function:

These tracts carry muscle tone and coordination of muscular activity to the cerebellum



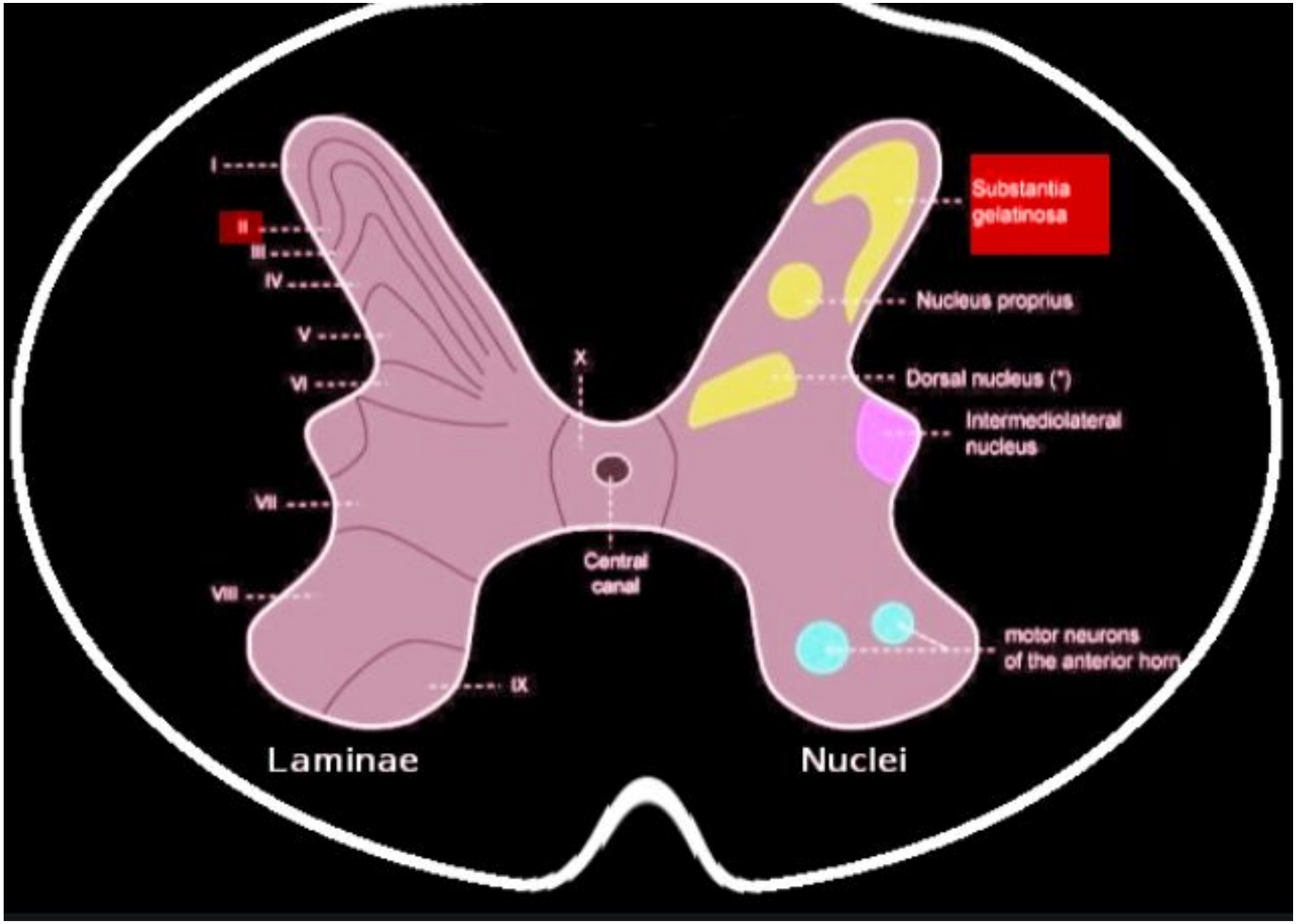
Posterior or direct Spinocerebellar tract



Anterior or indirect spinocerebellar tract

.Dr. Ahmed M.Kamal

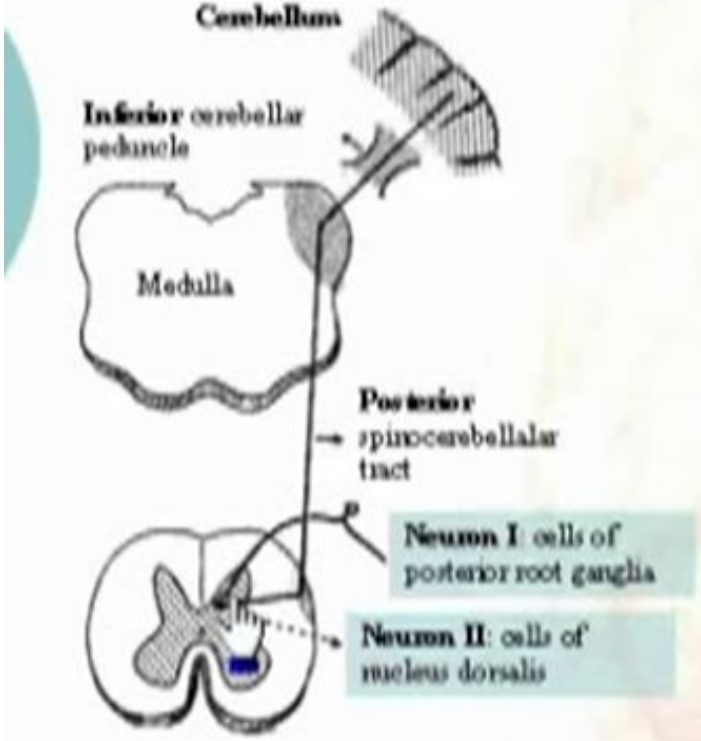
- Nucleus INTERMEDIO-MEDIAL
- - somatosenzitiv
  - La baza cornului posterior, lateral de nucleul Clarke-Stilling.
  - Contine neuronul II
  - aferente pt. sensib. proprioceptiva inconstienta (membre sup.si ½ sup.a corpului) de la Ggl. spinal.
  - Eferente prin fascicule ascendente care trec in cordonul lateral de partea opusa formand fascicule spinocerebeloase anterioare sau incrucisate.


I
II
III
IV
V
VI
VII
VIII
IX
X
Substantia gelatinosa
Nucleus proprius
Dorsal nucleus (*)
Intermediolateral nucleus
Central canal
motor neurons of the anterior horn
Laminae
Nuclei

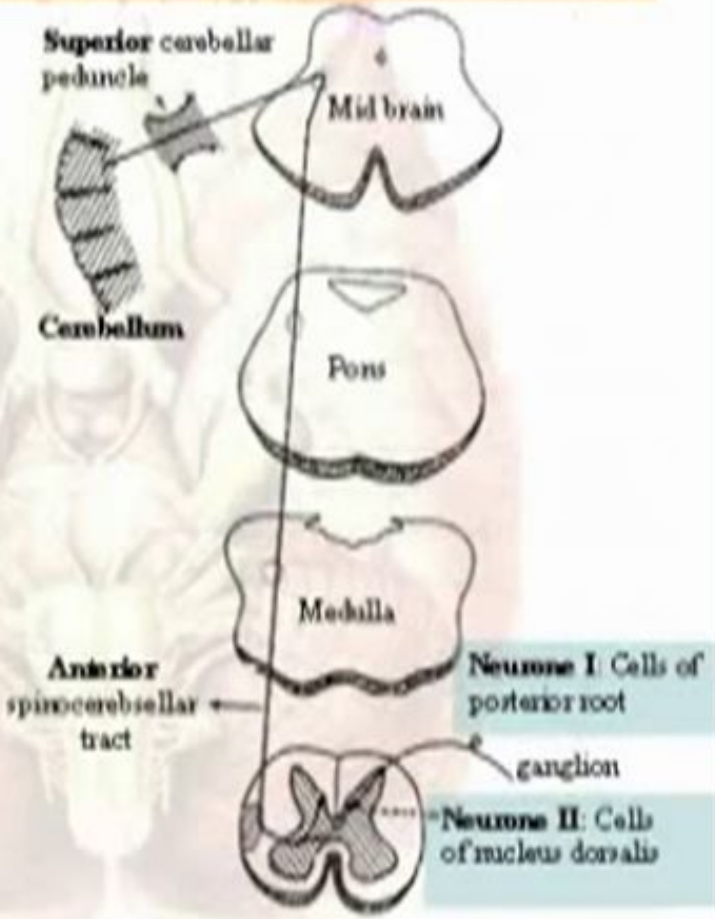
SPINOCEREBELLAR TRACTS

Function:

These tracts carry muscle tone and coordination of muscular activity to the cerebellum



Posterior or direct Spinocerebellar tract



Anterior or indirect spinocerebellar tract

.Dr. Ahmed M.Kamal

Va multumesc pentru

atentie si rabdare!