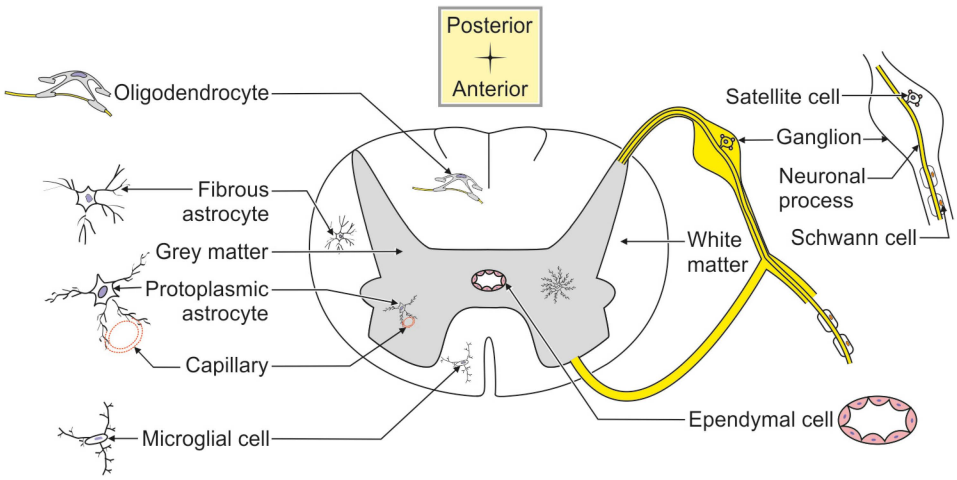

Fig. 1.1: TS of spinal cord showing spinal nerve and all neuroglia

OLA-1 Enumerate different types of neuroglial cells. What are their functions?

Please refer Fig. 1.1. Protoplasmic and fibrous astrocyte (SN-1)

Neuroglial cells *neuron* (Gk)—nerve; *gloia* (Gk)—glue

1. **Astrocytes**
   - A. **Structure:** They are star ★ shaped cells. These are of two types,
     - a. Protoplasmic, and
     - b. Fibrous.
   - B. **Functions**
     - a. They are concerned with nutrition of the nervous tissue.
     - b. They form blood–brain barrier.
   - C. **Absent in**
     - a. Pineal gland, and 
     - b. Posterior pituitary.
2. **Oligodendrocytes** (Gr. *oligos*—little, few; *dendron*—tree) are counterparts of the Schwann cells. Schwann cells myelinate the peripheral nerves. Oligodendrocytes myelinate the tracts.
3. **M**icroglia (Gr. *microglia*—small glue) behave like macrophages of the central nervous system. They develop from **mesoderm**.
4. Ependymal cells are columnar cells lining the cavities of the central nervous system. Since the glial cells are capable of dividing, they can form the central nervous system tumour.

SN-2 Oligodendrocytes

(*Oligo*—few)

1. **Definition:** These are neuroglial cells present in the central nervous system (Fig. 1.2).

CHAPTER

2

Meninges of the Brain and Cerebrospinal Fluid

SN-5 Cerebrospinal fluid

1. **The CSF** is modified tissue fluid (Fig. 2.1). It is present in
   A. Ventricles of brain,
   B. Subarachnoid space around brain, and
   C. Spinal cord.
2. **Formation**
   A. The bulk of the CSF is formed by choroid plexus lining lateral ventricle.[NEET]
   B. Small amount is formed by choroid plexus of 3rd and 4th ventricles.
   C. The total quantity: About 150 ml.
   D. Rate of formation: 200 ml/hour and 5000 ml/day.
   E. Normal pressure: 60 to 100 mm H_2O.
3. **Circulation**

   Lateral ventricle $\xrightarrow{\text{Foramen of Monro}}$ 3rd ventricle $\xrightarrow{\text{Cerebral aqueduct}}$

   4th ventricle $\xrightarrow{\text{Median and lateral apertures}}$ Subarachnoid space.
4. **Absorption**
   A. Chiefly absorbed through
      a. Arachnoid villi, and
      b. Arachnoid granulation.
   B. Partly by
      a. Perineural lymphatics around the 1st, 2nd, 7th and 8th cranial nerves, and
      b. Veins related to spinal nerves.
5. **Functions**
   A. Protection of brain,
   B. Nutrition of brain and coverings, and
   C. Removal of waste products from brain.

➢ Calcification of choroid plexus can be visualized by radiography, which is important in differentiating tumour of pineal gland.

SN-7 Interpeduncular fossa

Introduction: It is a lozenge shaped space present between the cerebral peduncles of the midbrain.

1. **Gross anatomy**
   - A. **Shape:** Rhomboid
   - B. **Boundaries**
     - a. **Anteromedially:** Optic chiasma shaped
     - b. **Anterolaterally:** Optic tract.
     - c. **Posteriorly:** Upper border of pons.
     - d. **Posterolaterally:** Crus cerebri.
   - C. **Forms:** Floor of IIIrd ventricle.
   - D. **Contents:** They are described from anterior to posterior.
     - a. **Tuber cinerium:** Slightly raised area of grey matter between mammillary body and optic chiasma.

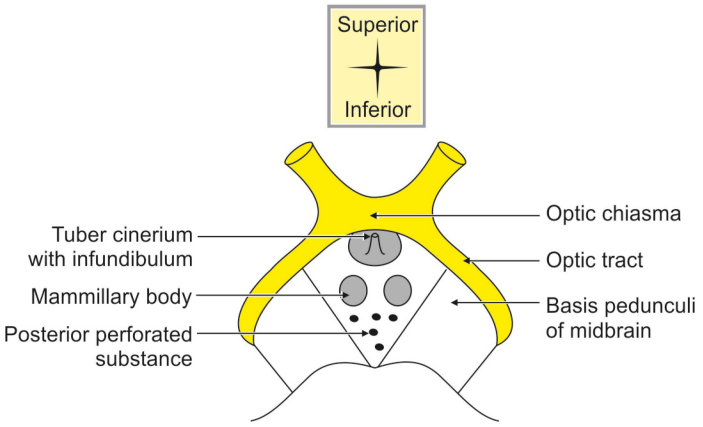

Fig. 2.4: Interpeduncular fossa

     - b. **Infundibulum:** It suspends hypophysis cerebri.
     - c. **Posterior perforated substance:** It is grey matter perforated by
       - I. Posterior cerebral arteries, and
       - II. Inferior cerebellar arteries.

2. **Relations**
   - A. **Anterolateral:** Anterior cerebral artery.
   - B. **Posterior:** Posterior cerebral artery.
   - C. **Posterolateral:** Posterior communicating artery.

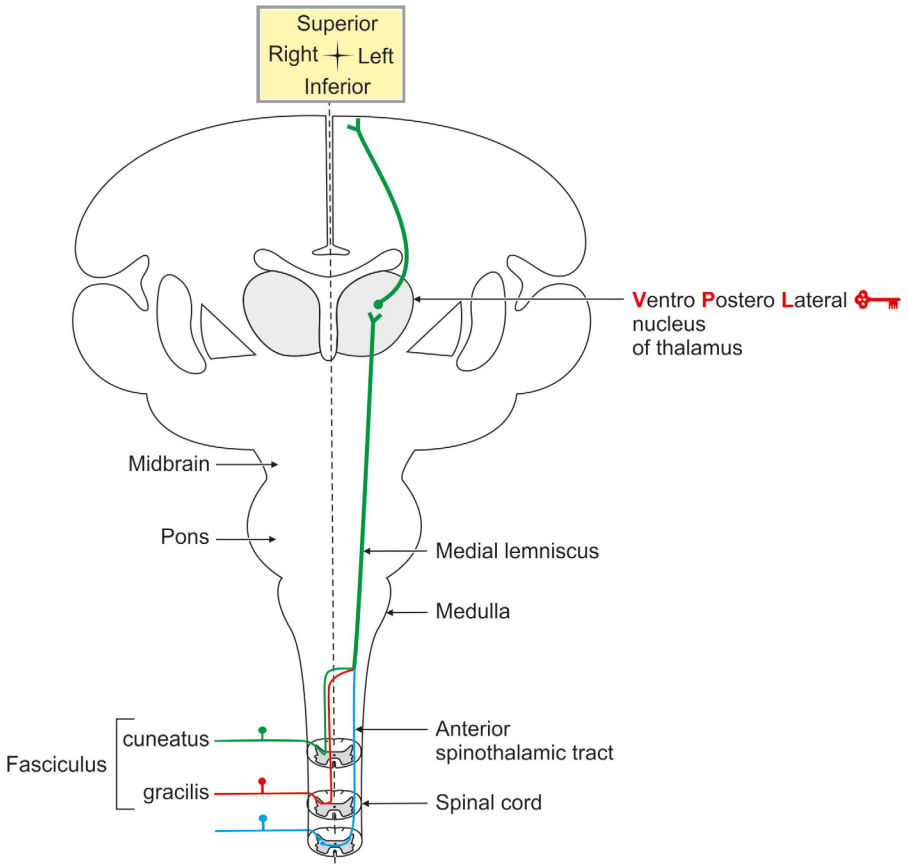

Fig. 3.3: Formation of medial lemniscus

OLA-7 What is a peduncle?

Peduncle: The biggest bundle of fibres connecting various grey matters is called peduncle. Many lemnisci combine together to form peduncle.

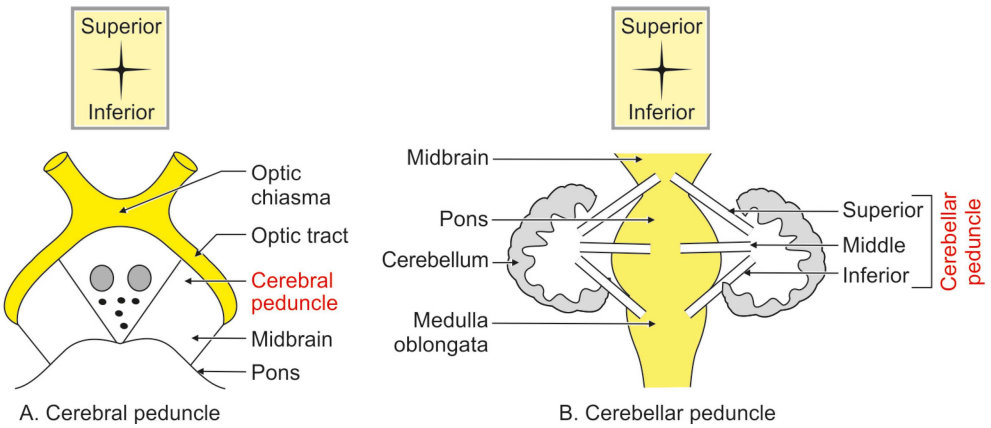

Fig. 3.4: Peduncles