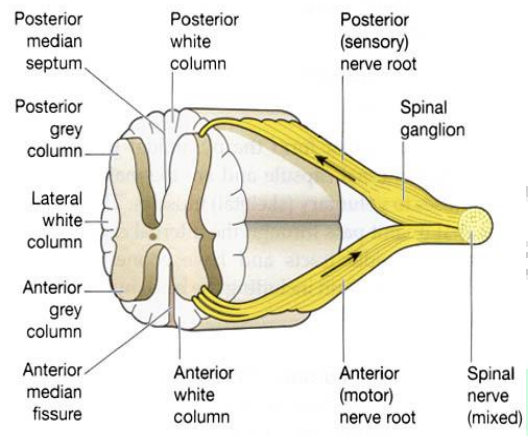
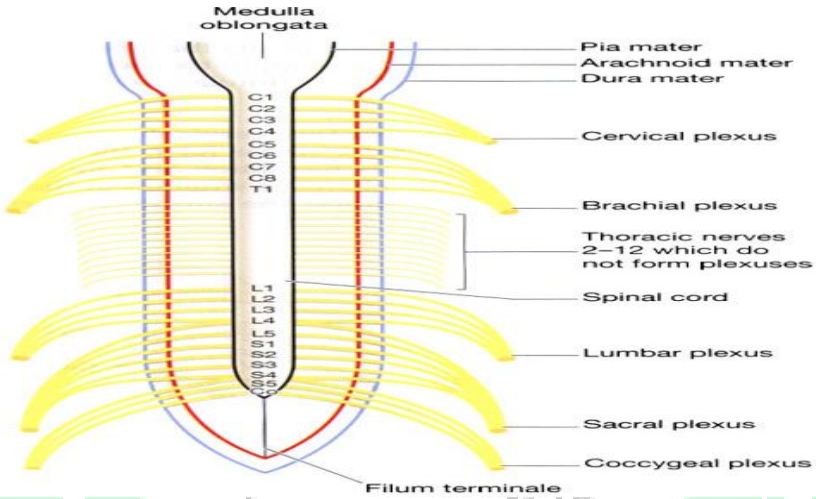
UNIT-1 SPINAL CORD

- The spinal cord is the elongated, almost cylindrical part of the central nervous system, which is suspended in the vertebral canal surrounded by the meninges and cerebrospinal Fluid
- Except for the cranial nerves, the spinal cord is the nervous tissue link between the brain and the rest of the body
- The spinal cord is incompletely divided into two equal parts, anteriorly by a short, shallow *median fissure* and posteriorly by a deep narrow septum, the *posterior median septum.*
- A cross-section of the spinal cord shows that it is composed of grey matter in the centre surrounded by white Matter
- The nature of spinal nerves is mixed(sensor and motor function).





SPINAL NERVES

There are *31 pairs of spinal nerves* that leave the vertebral canal by passing through the intervertebral foramina formed by adjacent vertebrae.

Cervical nerve=C1-C8 (innervates neck region)

Thoracic nerve=T1-T12(innervates the thoracic region)

Lumbar nerve=L1-L5(Innervates upper part of abdomen)

Saccral nerve=S1-S5 (innervates lower part of abdomen)

Coccygeal nerve= 1 represent tail nerve

Plexuses:

In the cervical,lumbar and sacral regions the anterior rami unite near their origins to form large masses of nerves or plexuses

SPINAL NERVES

PLEXUSES	ORIGIN	IMPORTANT NERVES	BODY AND SERVED
cervical	C1-C5	Phrenic nerve	Diaphragm and muscles of shoulder and neck
Brachial	C5-C8 T1	axillary nerve(C5,C6)	Deltoid muscles,shoulder joint and overlying skin
		Radial nerves(C6,C7,C8,T1)	Muscles of wrist and finger joints
		Musculocutaneous nerve (C5,C6,C7)	Muscles of upper arm and the skin of the forearm
		median nerve: C5, 6, 7, 8, T1	small muscles and the skin of the front of the thumb, the first two fingers and the lateral half of the third finger.
		ulnar nerve: C7, 8, T1	arm of the hand and the skin of the whole of the little finger and the medial half of the third finger

Click to add text **Lumbar plexus**	L1,L2	Genitoformal	lower abdomen, upper and medial aspects of the thigh and the inguinal region.
	L2,L3	lateral cutaneous nerve	lateral aspect of the thigh
	L2,L3,L4	Femoral nerve	supply the skin and the muscles of the front of the thigh
	L2,L3,L4	obturator nerve	adductor muscles of the thigh and skin of the medial aspect of the thigh
	L4,L5	lumbosacral trunk	pelvis

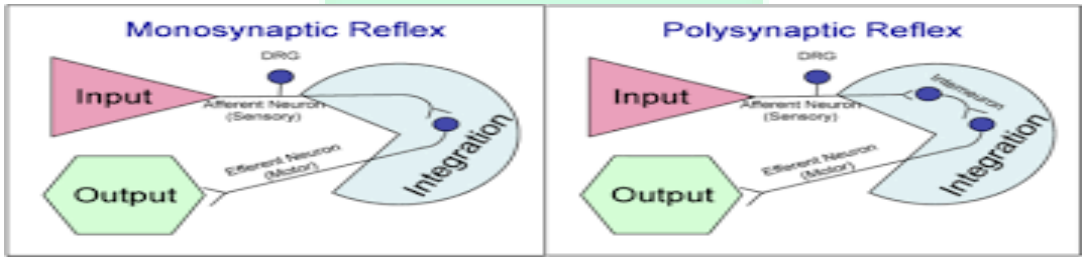
Gross Anatomy of the Spinal Cord:

Features of the Spinal Nerves Consist of:

- **Sensory nerves** (afferent nerves): transmit impulses toward the spinal cord
- **Motor nerves** (efferent nerves): transmit impulses away from the spinal cord

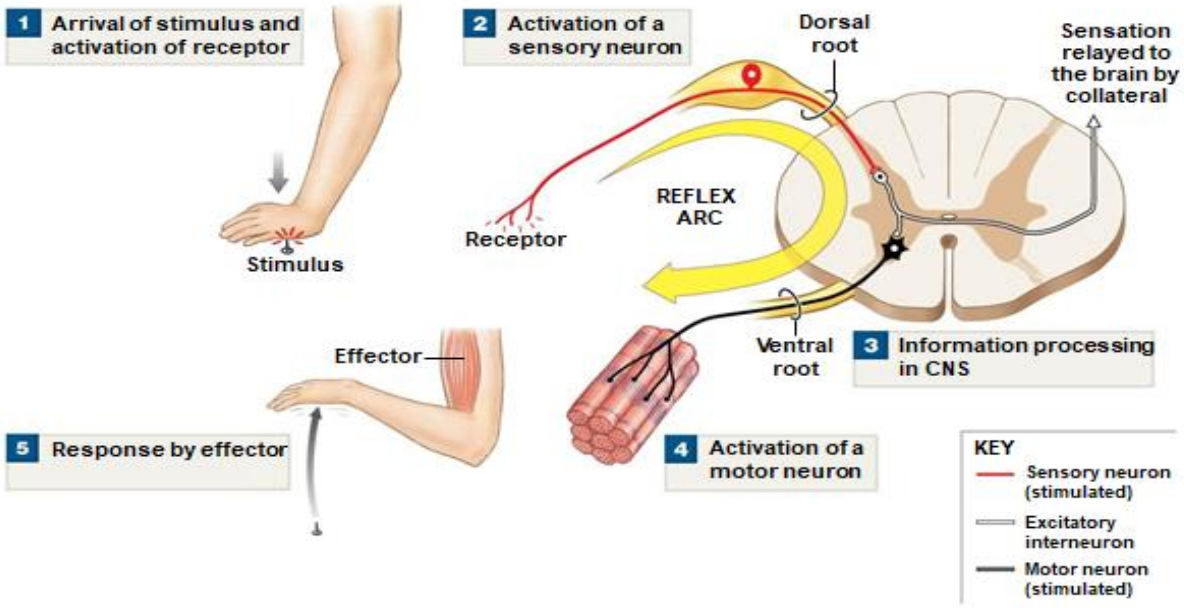
REFLEX AND REFLEX ARC:

- A reflex is any response that occurs automatically without conscious effort and the response is mediated by the nervous system.
- The neural pathway involved in accomplishing reflex activity is known as a reflex arc.
- The reflex arc forms the functional unit of the nervous system and consists of sensory receptor, afferent or sensory neuron ,efferent or motor neurons and effector organ
- The sensory receptor responds to stimulus.
- In response to stimulus the receptor produces an action potential that is relayed by the afferent or sensory neuron to the integrating centre (CNS) for processing.
- The gray matter within the spinal cord act as the integrating centre.
- If the integration takes place in the gray matter of spinal cord it is called spinal reflex
- If the integration occurs in the brain stem rather than spinal cord it is called cranial reflex
- Based on number of synapse the reflex may be monosyanptic or polysynaptIc
- A reflex pathway having one synapse in the CNS is called monosynaptic.
- Reflex pathway in which one or more interneuron is present between sensory and motor neuron and more than one synapse in CNS is called polysynaptic



- The integrating centre process all the information available to it from the receptor and then makes the decision about the appropriate response

Figure 14.14 A Reflex Arc



REFLEX

Pathway of a reflex arc

1. Activation of a sensory receptor
2. Relay of information to the CNS
3. Information processing
4. Activation of a motor neuron
5. Response by the effector