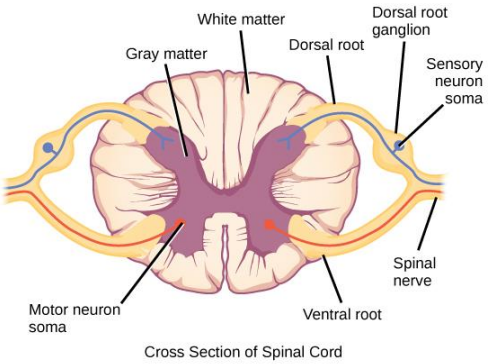


Cross Section of Spinal Cord

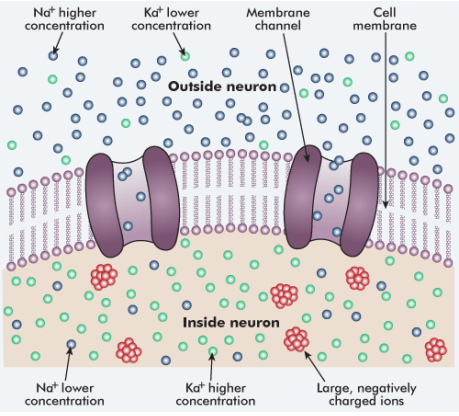
Gray matter is denser with neurone cell bodies, synapses and unmyelinated neurons.
Myelinated neurons are given a lighter colour because of the myelin, it is made from lipids.
The dorsal root contains sensory neurons and the cell bodies are contained in the dorsal root ganglion (cell body of sensory neuron).
Ventral root contains motor neurons; there are no cell bodies as they're in the gray matter so there's no ganglion.

A spinal reflex

This is an involuntary response that follows a sensory stimulus called a reflex. The pathway of neurons involved in a reflex is a reflex arc. The simplest forms of reflex arc (e.g. knee jerk reflex) involve only a sensory and motor neuron. More complex ones (withdrawal reflex) also involve a relay neuron. If the reflex involves the spinal cord but not the brain it is known as a spinal reflex. The main stages of a spinal reflex are:

- Stimulus- heat from hot object
- Receptor- temperature receptors in the skin. If the threshold value is reached a generator potential is established.
- Sensory neuron- the generator potential leads to an action potential passing along the sensory neuron to the spinal cord.
- Relay neuron- links the sensory neuron via synapses to the motor neuron within the gray matter of the spinal cord.
- Motor neuron- carries an action potential away from the spinal cord to the biceps muscle in the forearm.
- Effector- the biceps muscle of the forearm is stimulated to contract
- Response- the hand is raised away from the hot object

The nerve impulse



At resting potential, there are intrinsic proteins in the membrane with channels that can open and close. The Na+K- pump is active at resting potential, pumping out Na+.

There is a potential difference of -65mV.

The potassium channels are open and the sodium channel is closed. The pump pumps out 3Na+ for every 2K- pumped in, which creates a potential difference with the outside being more positive.