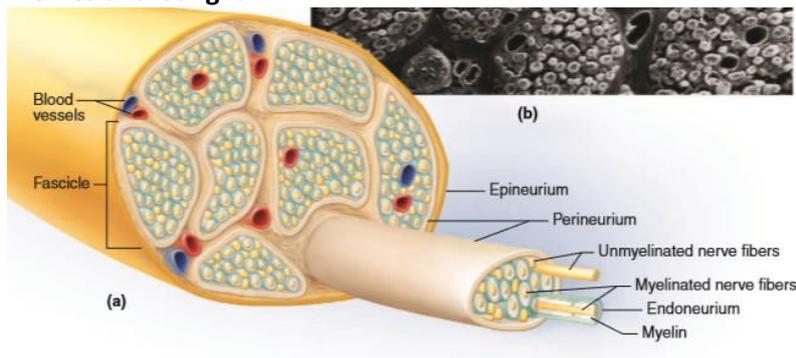


**DESCENDING TRACTS - conduct motor impulses down**

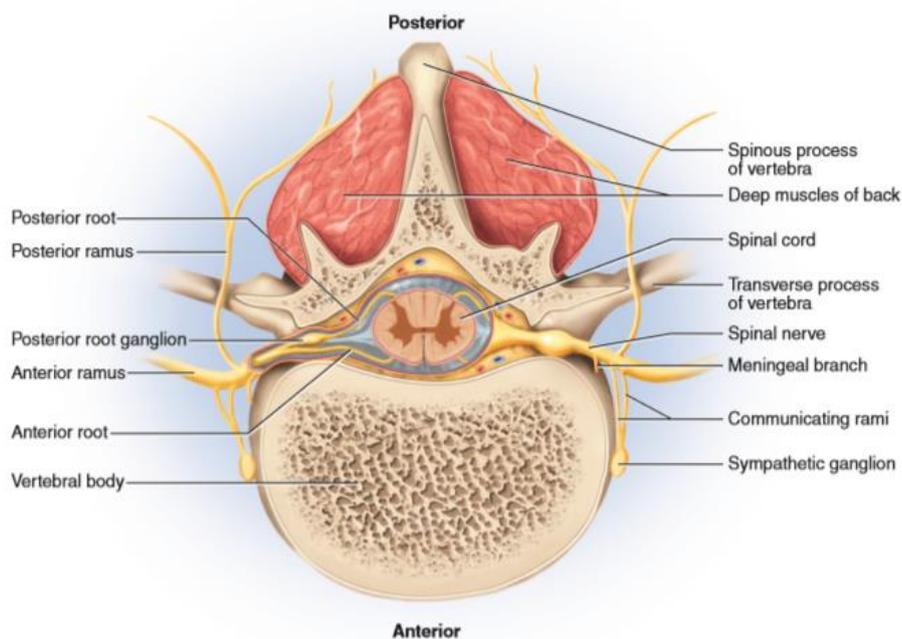
- Pathway typically involves two neurons called the upper and lower motor neurons
  - Upper motor neuron: begins with a soma in the cerebral cortex/brainstem and as an axon that terminates on a ->
  - Lower motor neuron: in the brainstem or spinal cord. Axon of this neuron leads the rest of the way to the muscle/other target organ
- **CORTICOSPINAL TRACTS:** carry motor signals from the cerebral cortex for precise, finely coordinated limb movements

**General Anatomy of Nerves and Ganglia**



- Nerve fibres of the PNS are sheathed in Schwann cells - forms a NEURILEMMA + myelin sheath around axon
- External to the neurilemma, each fibre is surrounded by a basal lamina, and then a thin sleeve of CT called ENDONEURIUM
- Most nerves, fibres are gathered in bundles called FASCICLES, each wrapped in sheath called PERINEURIUM
- Fascicles are bundled and wrapped in outer EPINEURIUM to form nerve
- GANGLION is a cluster of neurosomas outside the CNS - enveloped in an epineurium continuous with that of the nerve
- Purely sensory nerves (only afferent fibres) are rare - olfactory, optic nerves
- Motor nerves carry only efferent fibres
- Most nerves are mixed nerves - both efferent and afferent == therefore conduct signals in 2 directions
- NOTE: any one fibre in the nerve conducts signals in one direction only

### Spinal Nerves



- 31 pairs of spinal nerves: 8 cervical, 12 thoracic, 5 lumbar, 5 sacral, 1 coccygeal

### REFLEXES

#### Somatic reflexes

- Reflexes are quick, involuntary, stereotyped reactions of glands/muscles to stimulation (require stimulation)
- Reflex employs a reflex arc: somatic receptors, afferent nerve fibres, integrating centre, efferent nerve fibres, effectors

#### The Muscle Spindle

- Stretch receptors embedded in muscles - are among the body's proprioceptors, sense organs specialised to monitor the position and movement of body parts
- Function: to inform the brain of muscle length and body movements - enables brain to send motor commands back to the muscles that control muscle tone, posture, coordinated movement, and corrective reflexes

#### The Stretch Reflex

- Sudden stretch = muscle contracts, increases tone, feels stiffer than an relaxed muscle
- Reflex: helps maintain equilibrium and posture, often feedback more than a single muscle (a set of synergists and antagonists)