MEDICAL EDUCATION RESOURCE

Spinal Nerves

Spinal Nerve

General Features

- A spinal nerve is a **mixed nerve** formed by the union of:
  - **Ventral (anterior) root** ? motor fibers from anterior horn cells.
  - **Dorsal (posterior) root** ? sensory fibers from dorsal root ganglion.
- Total: **31 pairs of spinal nerves**.
  - 8 cervical
  - 12 thoracic
  - 5 lumbar
  - 5 sacral
  - 1 coccygeal

Formation and Branches

1. **Roots**
   - **Dorsal root** ? sensory, has dorsal root ganglion.

- **Ventral root** ? motor.
- Both unite in intervertebral foramen to form spinal nerve.

2. **Primary Rami**
   - **Dorsal ramus** ? supplies muscles and skin of back.
   - **Ventral ramus** ? supplies muscles and skin of front and limbs, forms major plexuses (cervical, brachial, lumbar, sacral).
3. **Other Branches**
   - **Ramus communicans** ? connects to sympathetic trunk.
   - **Meningeal branch** ? supplies dura mater, ligaments, periosteum around vertebra.

Functional Components of Spinal Nerves

- **Somatic efferent fibers** ? motor to skeletal muscle.
- **Somatic afferent fibers** ? sensory from skin, joints, muscles.
- **Visceral efferent fibers** ? autonomic to smooth muscle and glands.
- **Visceral afferent fibers** ? sensory from viscera.

Distribution

- **Cervical nerves** ? form cervical and brachial plexus.
- **Thoracic nerves** ? continue as intercostal nerves.

- **Lumbar, sacral, coccygeal nerves** ? form lumbar, sacral, and coccygeal plexuses.

Clinical Anatomy of Spinal Nerves

- **Nerve root compression** ? from disc herniation causes radiculopathy (pain, numbness, weakness).
- **Shingles (Herpes zoster)** ? infection of dorsal root ganglion ? painful vesicular eruption along dermatome.
- **Spinal nerve injury** ? results in sensory loss (dermatome) and motor deficit (myotome).
- **Referred pain** ? visceral afferents converge on same spinal segments as somatic afferents.
- **Cauda equina syndrome** ? compression of lower lumbar and sacral nerve roots ? paralysis, saddle anesthesia, incontinence.