12.6C: Plexuses

A nerve plexus is a network of intersecting nerves that serve the same part of the body.

Learning Objectives

• Describe nerve plexuses in the peripheral nervous system

Key Points

• Nerve plexuses throughout the body tend to be named after the area in which the plexus occurs and the organs, limbs, and tissues it serves. Examples include the cervical, brachial, lumbar, sacral, celiac, and coccygeal plexuses.

• Auerbach’s plexus, which serves the gastrointestinal tract, is named after the first person to describe this plexus, Leopold Auerbach, rather than the area of the body it serves.

• The brachial plexus serves the chest, shoulders, arms and hands and is formed by the ventral rami of C5, C8, and T1 spinal nerves, and the lower and upper halves of the C4 and T2 spinal nerves.

Key Terms

• **nerve plexus**: A network of intersecting nerves.

• **brachial plexus**: A network of nerve fibers, running from the spine, formed by the ventral rami of the lower four cervical and first thoracic nerve roots (C5–C8, T1). It proceeds through the neck, the axilla (armpit region), and into the arm. It also supplies the brachium, the antebrachium, and the hand.

• **coccygeal plexus**: A plexus of nerves near the coccyx bone.

• **Autonomic**: A division of the peripheral nervous system that influences the function of internal organs.
A nerve plexus is a network of intersecting nerves; multiple nerve plexuses exist in the body. Nerve plexuses are composed of afferent and efferent fibers that arise from the merging of the anterior rami of spinal nerves and blood vessels.

There are five spinal nerve plexuses—except in the thoracic region—as well as other forms of autonomic plexuses, many of which are a part of the enteric nervous system.

**Spinal Plexuses**

**Cervical Plexus—Serves the Head, Neck and Shoulders**
The cervical plexus is formed by the ventral rami of the upper four cervical nerves and the upper part of fifth cervical ventral ramus. The network of rami is located deep within the neck.

**Brachial Plexus—Serves the Chest, Shoulders, Arms and Hands**
The brachial plexus is formed by the ventral rami of C5–C8 and the T1 spinal nerves, and lower and upper halves of the C4 and T2 spinal nerves. The plexus extends toward the armpit (axilla).

**Lumbar Plexus—Serves the Back, Abdomen, Groin, Thighs, Knees, and Calves**
The lumbar plexus is formed by the ventral rami of L1–L5 spinal nerves with a contribution of T12 form the lumbar plexus. This plexus lies within the psoas major muscle.

**Sacral Plexus—Serves the Pelvis, Buttocks, Genitals, Thighs, Calves, and Feet**
The sacral plexus is formed by the ventral rami of L4-S3, with parts of the L4 and S4 spinal nerves. It is located on the posterior wall of the pelvic cavity.

**Coccygeal Plexus—Serves a Small Region over the Coccyx**
The coccygeal plexus serves a small region over the coccyx and originates from S4, S5, and Co1 spinal nerves. It is interconnected with the lower part of sacral plexus.

In addition, the celiac plexus serves the internal organs, and Auerbach’s plexus serves the gastrointestinal tract.

**Autonomic Plexuses**

- Celiac plexus (solar plexus)—Serves internal organs.
- Auerbach’s plexus—Serves the gastrointestinal tract.
- Meissner’s plexus (submucosal plexus)—Serves the gastrointestinal tract.
**Brachial plexus:** Cervical (C5–C8) and thoracic (T1) nerves comprise the brachial plexus, which is a nerve plexus that provides sensory and motor function to the shoulders and upper limbs.

**Lumbar plexus:** The lumbar plexus is comprised of the ventral rami of the lumbar spinal nerves (L1–L5) and a contribution from thoracic nerve (T12). The posterior (green) and anterior (yellow) divisions of the lumbar plexus are shown in the diagram.