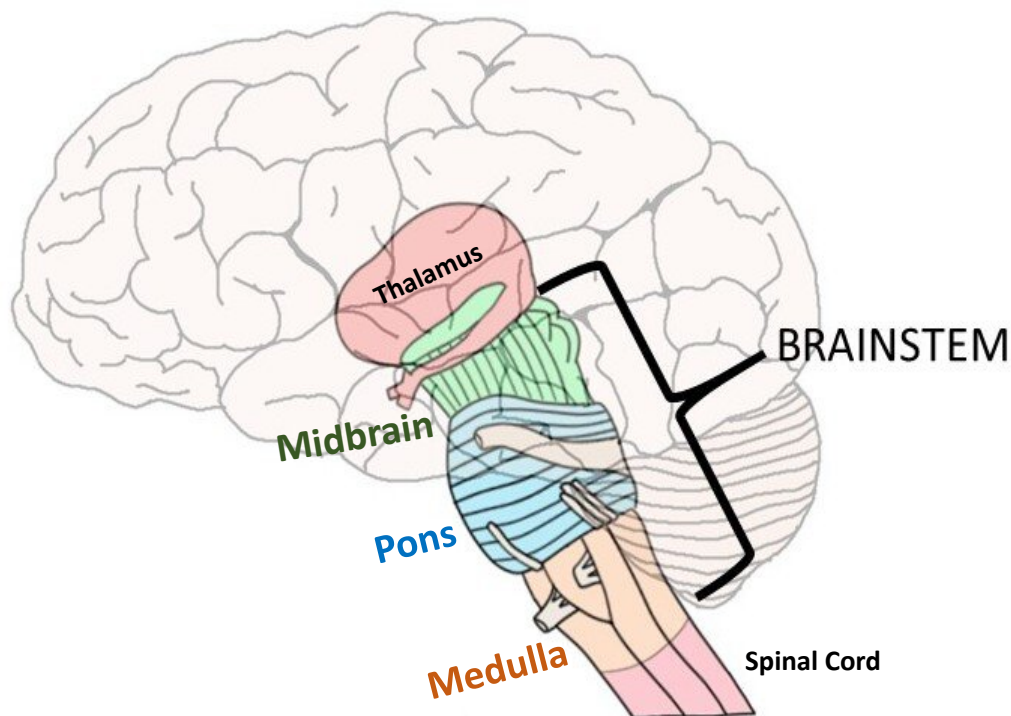


**FIGURE 13**



*The brainstem is subdivided into the midbrain, pons, and medulla.<sup>14</sup>*

In addition to these clusters of cell bodies or nuclei, all the pathways made of many axons that go between the brain and the body must pass through the brainstem to get to where they are going. Therefore, the brainstem contains regions of both grey matter and white matter.

### ***The Spinal Cord***

The **spinal cord** is the other main section of the central nervous system besides the brain. Whereas the brain is encased inside of a skull, the spinal cord is encased in **vertebrae** (or back bones) that make up the spine. The spinal cord is located below the brainstem and serves mainly to conduct information between the brain and the body. This includes information regarding touch, pain, temperature, and body position from the body and motor commands from the brain.

If you were to view a cross section of the spinal cord (Figure 14), you would see that the axons of the pathways that form the white matter run on the outside portion of the cord, while some cell bodies would be found on the inside, in a butterfly-shaped section of grey matter. These cell bodies help relay sensory information into and out of the many pathways that run up and down the spinal cord in the white matter. These cell bodies are also responsible for spinal **reflexes**, such as when a doctor taps your knee with a hammer, and your leg twitches. The soma of these cells in the spinal cord do all the work for these kinds of body reflexes, so much so that the brain isn't even needed at all!

The spinal cord is one long continuous structure, but medical professionals and scientists like to divide it up into sections when they discuss it, to make it easier to explain exactly which part of the spinal cord they are talking about. The top section of the spinal cord is called the **cervical spinal cord**, and it **innervates** (connects with, by sending axons to or from) the arms, neck, and shoulders. The next section is the **thoracic spinal cord**, which carries information to and from the chest and torso. The **lumbar spinal cord** section innervates the hips and fronts of the legs, whereas the **sacral spinal cord** innervates the buttocks and backs of the legs as well as the genitalia (Figure 14).