11.2.5

Cerebellum

The cerebellum ("little brain") sits under the occipital lobes of the cerebral hemispheres and attaches to the brain stem. Its structure is similar to the cerebrum in that it has a cortex composed of gray matter with white matter in the center. Likewise, the surface of the cerebellum is composed of folds called folia. It functions in motor learning, motor coordination and equilibrium. Smooth, coordinated skeletal muscle movement requires a functioning cerebellum. As we practice and learn complex movements the cerebellum is crucial in fine tuning the movements. When the motor cortex of the frontal lobes sends orders to the muscles to perform a particular task a copy of those orders is sent to the cerebellum. It, in turn, receives feedback from the proprioceptors in the muscles and joints as well as information from the inner ear relating to balance and equilibrium and compares what is actually happening with what the motor cortex ordered. Based on these comparisons, information is relayed back to the motor cortex in the cerebrum to fine tune the motor activity. The end result is the development of smooth, coordinated movements and agility for tasks like typing, driving, piano playing, dancing etc. In addition, procedural memories for tasks like how to walk or ride a bike are stored here. Other studies using brain imaging and observations of patients with cerebellar injuries suggest that the cerebellum also plays roles in language, thought processing, and emotions.