

Behavior Changes after Stroke

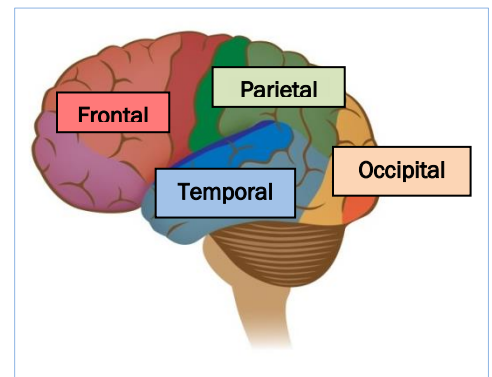
When someone has a stroke, there are often lasting effects to the brain that may change the way a person behaves. Your brain is composed of over 100 billion cells working together to understand your environment and respond to it appropriately. When a stroke happens to a particular part of the brain, this activity is disrupted, leading to changes in memory, language, emotions, personality and behaviors. Understanding how stroke can change behavior can help you prepare for and adapt to the difficulties after a stroke.

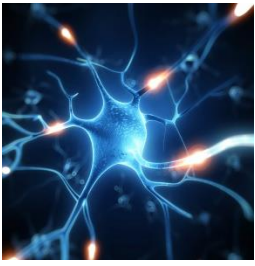
The Brain

Your brain is made up of gray matter and white matter. Gray matter is brain cells that make up the structures that have assigned responsibilities, while white matter is considered the highway between gray matter structures that help the different parts of the brain talk to each other.

The **cerebral cortex**, known as the thinking part of the brain, is made up of **gray matter** and is divided into four specialized areas, or lobes.

- **The frontal lobe** is the boss of the rest of the brain. It decides what incoming information to act upon, what action to take, and how to carry out the behavior. A stroke in this part of the brain can cause loss of movement on the opposite side of the body. It can also change someone's personality so that they react to people and situations in ways that are not expected of them. These behavior changes can be upsetting to family who don't know why their loved one is acting strangely. Other side effects include making impulsive or unwise decisions or appearing unmotivated.
- **The parietal lobe** is responsible for information about the body, including the sense of touch. It also has important connections that help you navigate through space. A stroke in this part of the brain can cause a loss of sensation in parts of the body, and difficulty with reading and writing. Some stroke patients with parietal lobe damage may even seem to be ignoring half of the world because of a problem called *neglect*, which happens when the brain turns off the ability to recognize the existence of things on one side of the body, even its own parts.
- **The temporal lobe** is involved in processing what you hear. It is also the part of the brain that stores new experiences and regulates your feelings and mood. A stroke in this part of the brain may make it hard to make sense of sounds, or lead to forgetfulness and trouble controlling anger.
- **The occipital lobe** is responsible for processing what you see. Color, shape and motion are first processed here. A stroke in this area of the brain may cause blind spots, color blindness, an inability to see movement and difficulty identifying objects by sight.

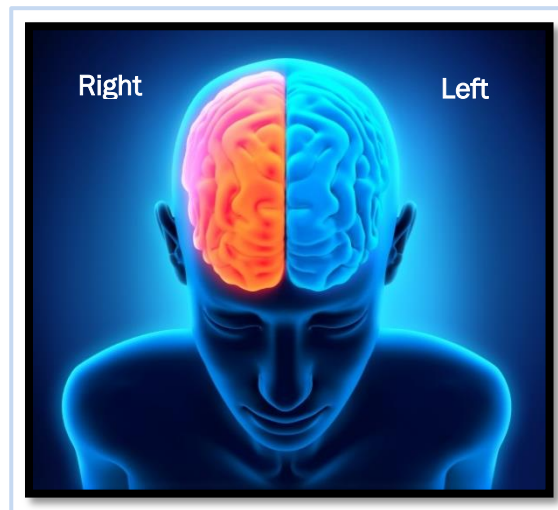




White Matter brain cells are the ones that allow the different parts of the brain to talk to each other, including sharing information between lobes and from one side of the brain to the other side. For example, visual images we see and recognize in the occipital lobe are shared with the temporal lobe where we process sounds and with the frontal lobe where we make decisions. So if you hear a siren and see flashing lights, you recognize a fire truck is near and act by pulling to the side of the road. The connection of this thought process is made by the white matter pathways.

Right Brain vs Left Brain

Our brains are divided into right and left sides called hemispheres. Both hemispheres have all of the four lobes of the cerebral cortex. The lobes on the right side of the brain control function on the left side of the body and the left brain controls the right side of the body, including movement, strength and coordination. In addition to specialized lobes, the right side and the left side of the brain have other differences.



The left side, called the dominant hemisphere, controls language for about 95 percent of people. There are two specific language centers: Broca's area controls the ability to form speech and to talk. Wernicke's area controls our understanding of what others say. Abilities processed on the left side include speaking, reading, writing, spelling and memories for what is said.

The right side is more specialized for non-verbal operations and includes being aware of your place in your surroundings, remembering where you parked your car, being able to recognize a friend in a room filled with people, or being aware that you have a medical disease.

In the end, it is important to remember that while the left and right sides of the brain have different job responsibilities, by working together they produce the behavior that makes us who we are.

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