EPILEPSY NEW ZEALAND
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Brain Functions

Before discussing seizures, it is a good idea to gain a brief overview of the functions of the brain. This helps to understand why seizures can look so different depending on where in the brain the activity is occurring.

The human brain is the command centre for the human nervous system. It receives signals from the body's sensory organs and sends information to the muscles. The brain is made up of two hemispheres (sides) – a right hemisphere and left hemisphere. Researchers and clinicians used to think that different behaviours, thinking skills and emotions could be 'localised' to very specific parts of the brain. The more we learn about the brain, however, the more we realise there many different 'networks' involving and connecting different areas across the brain. However, generally speaking, the left hemisphere is more responsible for language functioning and verbal memory, and the right side of the brain is more responsible for visuospatial functioning and visual memory.

Each hemisphere has six different parts (lobes):

- Frontal Lobes: control thinking skills that are important for regulating emotional responses, impulse control, organisation and planning of behaviours. They also play a role in concentration, memory retrieval and voluntary movements.
- Temporal Lobes: organise sensory input, auditory perception, language and speech production, as well as memory formation and storage. Seizures from this part of the brain may affect a person's speech or ability to understand what other people are saying (*during* the seizure).
- Occipital Lobes: help to correctly understand what your eyes are seeing by making sense of visual information. Seizures in this area may affect a person's vision (e.g., they may see flashing lights).
- Parietal Lobes: process and integrate sensory information, such as taste, temperature and touch. People who have a seizure in this area may smell something that isn't there (e.g., burning) or taste something even though they don't have anything in their mouth.
- Cerebellum: receives information from the sensory systems, the spinal cord, and other parts of the brain to regulate motor skills and movements.
- Brain stem: controls the flow of messages between the brain and the rest of the body. It also controls basic bodily functions such as breathing, swallowing, heart rate, blood pressure,

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consciousness, and whether one is awake or sleepy.