

# **KIDS WITH SEIZURES AND BRAIN WAVE VARIANCE – THE IMPACT UPON DEVELOPMENT AND LEARNING**

## **A NEUROPSYCHOLOGICAL PERSPECTIVE**

When some people think of epilepsy/seizure they think of convulsions, a type of seizure characterized by jerking or twitching. The fact is that this is only one type of seizure. There are also other types of seizures which have hidden symptoms and can affect learning and development.

Some people also think that epilepsy/seizure is rare. This is not true. The Epilepsy Foundation has commented that seizures are the most common neurological disorder of childhood. Epilepsy is reported to affect 1 in 150-200 people. It is more common among males and people under 20 years of age and senior citizens. Over half of the people who get epilepsy, have their first seizure before age 15. Epilepsy, what happens when brain cells “misfire”, and seizure, what happens when a group of brain cells “misfire”, has actually been common throughout history. Famous writers such as Byron and Dostoevsky and statesmen like Napoleon Bonaparte, Alexander the Great and Julius Caesar and philosophers such as Socrates and Pythagoras and painters such as van Gogh and patriots such as Joan of Arc and composers such as Tchaikovsky and the Apostle St. Paul and Alfred Nobel, for whom the Nobel prize is named, are just a few of the individuals throughout history who had epilepsy.

The brain is like a computer – it runs on electric current. The electric signals allow neurons (brain cells) to switch on other neurons. When these cells ‘misfire’, especially if they repeatedly ‘misfire’, a temporary ‘short circuit’ of the brain develops. These ‘short circuits’ can affect functions of development including: Attention, Perception, Memory, Speech/Language, Sensory/Motor and Mood functions, organization and planning.

Epilepsy/seizure has many different causes. It can be genetic or acquired from injury or illness for example. One of the most commonly used tools to measure electrical activity in the brain is the electroencephalograph (EEG). This device directly measures electrical activity through small sensors called electrodes. These electrodes are sensitive enough to assess electric currents through the skin. This test is painless and harmless. The EEG is most sensitive when the person’s brain is in a sensitive state. For this reason, persons undergoing an EEG are often asked to deprive themselves of sleep. The use of flashing lights or quick breathing techniques are often used. Sometimes, the brain functions perfectly normally during the test. Sometimes the electric patterns that the device is looking for happened too deep in the brain to be picked up by a sleep-deprived EEG. For these reasons, a 24 hour EEG, done at home or at the hospital, is often recommended. In this way, the machine has a better chance of picking up some variant signal.

The EEG is not a perfect test. EEG findings must be correlated with clinical symptoms. Clinical correlation with neuropsychological tests which assess variance and functions of attention, perception, memory, speech/language, sensory/motor and mood functions can be very helpful in understanding the effect of abnormal brain wave patterns.

Recognition of the “hidden”, difficult to recognize, symptoms of epilepsy/seizure can aid in early diagnosis and treatment in order to avoid developmental difficulties, including learning disabilities and emotional or social problems.

The following symptoms can suggest the possibility of epilepsy/seizure and should be brought to the attention of the child’s doctor and neuropsychologist.

- Excessive daydreaming – excessive staring
- Continuous nighttime awakening
- Consistent nighttime bedwetting
- Excessive sleepwalking, sleeptalking, night terror
- Body jerking/movements during sleep
- Decreased responses for brief periods
- Sudden falls
- Unusual irritability when awakened from sleep
- Rapid eye blinking
- Irregular movements
- The child frequently reports that things, “look, sound, taste, smell or feel funny”.
- Stomach pains followed by confusion/sleepiness
- Frequent clumsiness
- Heightened state of fears/panic responses
- Significantly delayed speech/language
- Frequent complaints from the child of forgetting/“I can’t remember”

Epilepsy/seizure can be treated. Antiepileptic/antiseizure medications are used to control the seizures. Medical, psychological and educational treatments can be directed toward treatment of the specific symptoms. This is why it is so very important for the symptom complex to be as specifically documented as possible, through neurological and neuropsychological evaluation. Holistic intervention can certainly aid in easing the symptom complex and developing quality of life. Open and consistent communication with health care providers is important.