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Teaching Children with Epilepsy and Seizures:

A Literature Review

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Imagine that you are in the middle of teaching your class when suddenly one of your students drops to the floor and begins shaking violently and emitting gasping sounds. Would you know what to do to help keep your student safe? How about keeping the other students in the classroom calm? Would you know what is happening to the student? Imagine instead that it is the first day of class and a parent comes up to you to get to know you before you start of the new school year. They tell you that their child has epilepsy. What does this mean to you and how will you react to this information?

As a teacher, it is important to be aware of epilepsy and seizures. The results of a study done by Nabors, Little, Akin-Little, and Iobst (2008) show that only 15.2% of teachers felt that they were well informed about the medical condition of epilepsy. Approximately 4 or 5 elementary school age children out of 1,000 are affected by epilepsy, making it the most common neurological condition seen during childhood (Wodrich, Kaplan, Deering 2008). In addition, Fastenau, Shen, Dunn, and Austin (2008) also found in one of their studies that children with epilepsy have an increased risk of also having a learning disability. Knowing this, we need to be ready to address the needs of our students with epilepsy where special education is concerned.

This research paper has been done in order to inform teachers of what they should know about epilepsy. The areas of importance to an educator will follow in this paper. The causes of seizures and the differing types will be discussed. Different methods of treatments and how they affect the individual are covered. Teachers are likely to encounter an individual who has epilepsy during their career and it is important to know what to do in the case of a seizure, which will be covered later. Lastly, the previous points will be put into the educational setting and the importance for teachers will be tackled.

### What are Seizures?

According to Heward (2009), epilepsy is the condition in which seizures occur repeatedly in a person's life. Dahl and Lundgren (2005) describe a seizure as "the unconditioned response to a group of 'out of control' neurons that now and again for some reason get rowdy and recruit any willing neighbor neurons in sight and cause bedlam." (p 192)

### Causes

Historically, seizures were thought to be caused by magic, curses, or insanity (Svoboda, 2004). According to the Neurology Channel (2009), a seizure is caused by brain cells sending abnormal electrical discharges. This often occurs in the cerebral cortex. Typically a relatively even electrical charge occurs in the brain. A change in the chemistry (levels of potassium and sodium) surrounding and inside of the nerve stem causes a charge to pass through the membrane. During a seizure, the electrical charges become less coordinated and systematic, causing essentially an overload of signals to the body. Certain situations are listed on this website that seem to cause these electrical disturbances, such as decreased oxygen levels, metabolic changed, and infections. Heward (2009) adds to this list the excessive use of alcohol and head injuries. Those epilepsies that have a known cause are called symptomatic, while those without a known cause are called idiopathic (Wodrich et al., 2006)

### Types

According to Heward (2009), a seizure is "a disturbance of movement, sensation, behavior, and/or consciousness cause by abnormal electrical discharges in the brain" (p. 415). The Epilepsy Foundation(EF) (2006) states that seizures are classified under four different categories: generalized, partial, nonepileptic, and status epileptus. The EF website says that partial seizures are the most

common to those people with epilepsy. Wodrich et al.(2006) say that in school children they make up 60% of epilepsies.

*Generalized seizures* differ from others in that both sides of the brain are affected throughout the life of the seizure (Svoboda 2005). During this type of seizure consciousness is lost for a period of time. Generalized seizures are broken down into tonic-clonic, myoclonic, absence, and atonic by the EF (2009). Searson (2008) also added tonic and clonic seizures separately. *Tonic-clonic* seizures are those which are generally the most recognizable and are the most common type of seizure, also called grand mal seizures (EF 2009). These generally last for a period of 1 to 2 minutes. There are two phases to grand mal seizures which gives its name: tonic and clonic. During the tonic phase, the limbs stiffen and it is often accompanied by the person falling to the ground while very rigid. During the clonic phase the face and limbs jerk.

As stated by Searson (2008), if the tonic phase or the clonic phase of the grand mal seizure is all that is experienced, this is just a *tonic* or *clonic* seizure, respectively. *Myoclonic* seizures are like a “mini” grand mal seizure. Searson (2008) found that it is often the arm or the leg that is affected by this type of seizure. They usually affect both sides of the body but not always. The body muscles jerk rapidly but usually look like a twitch to others, rather than a seizure. According to the EF (2009), for those who are not epileptic the closest experience may be when during sleep, a body part jerks.

*Absence seizures*, or petit mal seizures, are usually not noticeable to outsiders. They start and stop suddenly, causing the affected person to “zone out” for several seconds. Searson (2008) described them as “a short cessation of physical movement and loss of attention” (p. 29). They usually last anywhere from 2 to 15 seconds and the person will resume whatever activity they were doing beforehand usually without realizing that the event just occurred (EF 2009). The person may stare, flutter their eyes, or do certain motions such as smacking the lips or fumbling repeatedly. *Atonic*

*seizures* are somewhat similar. Searson (2008) stated that they are often characterized by the affected person dropping to the floor, or dropping their head suddenly. The cause of this is a sudden lack of muscle tone in the body. These occur very suddenly and can cause head or face injuries because they happen so quickly and the person has no warning to protect themselves from the fall (Searson, 2008).

According to Searson (2008), *partial seizures* are those in which the activity in the brain affects only a portion of the brain, unlike generalized seizures, and may not spread to other areas. Svoboda (2004) indicated that this is important because the hemispheres control different aspects of learning. He noted that, “dominant-hemisphere discharges can impede language processing, while non-dominant hemispheric discharges may impede non-verbal functions”(p. 3), like movement. There are two subcategories of this type of seizure separated by whether consciousness is preserved or not. If the person is conscious throughout it is a *simple partial seizure*. These usually last up to around a minute and a half. *Complex partial seizures* last around the same amount of time and can have the same outwards signs as an absence seizure (Searson, 2008).

The last two categories of epilepsy are nonepileptic and status epilepticus. *Nonepileptic seizures* can look like epileptic seizures outward but there are not electrical disruptions to the brain occurring in this instance (EF 2009). *Status epilepticus* is what needs to be watched for during a seizure. This is when a seizure lasts more than thirty minutes in length (Kleppen & Zaagman, 2009). When the seizure continues indefinitely, it can be very dangerous to the brain, as the entire body is deprived of oxygen during this time period. When the brain is deprived of oxygen, it may cause permanent damage (Kleppen & Zaagman, 2009).

### Prevalence

According to Heward (2009), while only 1% of the population has epilepsy, 3% experience seizures, or are prone to them. The occurrence of epilepsy is slightly higher in the population of those

with learning disabilities (Searson, 2008; Klepping & Zaagman, 2009). According to the EF (2009), 300,000 people have a first seizure each year, 120,000 of whom are under the age of 18. They also estimate that many (75,000 to 100,000) are caused by fevers (febrile) in children under the age of 5. They estimate the diagnoses of first-time epilepsy cases to be 200,000 annually, with males showing a slightly higher prevalence than females. Minority racial groups also tend to see higher rates of epilepsy than Caucasians. Ten percent of the American population will experience a seizure in their lifetime. As disclosed by the Merck Manual (2009), 2% of adults have a seizure during their life, with 2/3 of those never having a second.

### How are Seizures Treated and Prevented?

#### First Aid

While Abraham (1956) suggested in his classic article that it is important for there to be printed information and vocal information given to school and the community that interacts with those with epilepsy in order to be better prepared, the belief is still shared today (EF, 2009). According to the EF (2009), first aid is very simple for epilepsy. It is important to never try to stop a seizure, because it has to run its course first. Keeping calm, like in most first aid situations, is key. The person should be kept as safe as possible, especially when the seizure is tonic-clonic or one where he is thrashing. This includes removing objects which may hurt the person including hard or sharp objects, and anything around the neck like a tie.

If the person is in water, keep his head above the water without restricting the movement and remove him from the water once possible (Burt & Cole, 2008). If the person is on a hard area, put a soft and flat object like a folded article of clothing under his head. If breathing does not begin normally after

the episode, CPR is in order, but most times it occurs naturally (EF, 2009). When the person regains consciousness, everyone should remain calm and let him know what happened while being friendly (Burt & Cole, 2008). If a seizure is non-convulsive, it may not be necessary to do anything (EF, 2009). The individual may be lead away from danger gently. It may be important to reassure those around that the person is okay. Everyone should continue to stay calm and wait for the seizure to run its course. If necessary, offer to help get the person home.

Timing the seizure and recording the time of day at which it occurred is important. According to Klepping and Zaagman (2009), when someone has more than two seizures in an hour, or has one seizure lasts longer than 5 minutes, emergency medical treatment is needed. The Nurse Practitioner (2006) gives other reasons for an emergency room visit as “if the person has the following conditions: diabetes, brain infections, heat exhaustion, pregnancy, poisoning, hypoglycemia, high fever, or a head injury” (p. 2). If the individual has an identification tag that says “epilepsy” there may not be a need to call an ambulance (Nurse Practitioner, 2006). As long as it does not appear as if the individual has been injured and they regain consciousness easily from a seizure lasting less than five minutes, the EF (2009) says that the situation is not life-threatening.

### Medical Treatments

As maintained by the Merck Manual (2009), if a cause is identified, no additional treatment is needed. However, unfortunately in most cases there is no known stimulus. There are some general guidelines put out for those people that have had seizures. Social and physical activities are recommended to have as full and healthy of a life as possible (Burt & Cole, 2008). To stay healthy, alcohol may need to be eliminated (Nurse Practitioner, 2007). Also, there are some activities that may be restricted to a degree. These are situations where it would be life threatening were a seizure to

occur. For example, it may be illegal to drive depending on the situation because if a person were to lose consciousness or awareness while driving there would be a serious accident (Nurse Practitioner, 2007). It may be necessary to avoid swimming, especially when there is no lifeguard or trained individual present (Burt & Cole, 2008; Nurse Practitioner, 2007).

Another method that the Merck Manual (2009) stated as being a treatment is the consuming of anticonvulsants. These are usually only prescribed if the person has had more than just the one seizure. Klepping and Zaagman (2009) listed Midazolam and Diazepam as two potential medications. Merck (2009) said that a third of all people who take these drugs never have another seizure, but also that they are completely ineffective for 10-20% of people. Dahl and Lundgren (2005) found that many individuals disliked taking anticonvulsant drugs because of the side effects that they have. They discuss the side effects as including reduction of memory ability, psychomotor speed, adverse effects on mood, and a dulling of the senses. In fact, they found that patients “report that quality of life is more adversely affected by the side effects of the (anticonvulsants) than of seizure frequency”(p. 192). Watkins et al. (2006) created a scale that people with Intellectual disabilities could show the effects that seizures have on them, including the way that the medications make them feel. Responses to the survey showed that there was more concern for the way that medication made them feel than fear of the seizures themselves.

### Other Therapies

Dahl and Lundgren (2005) observed that there has been much documentation of behavioral and stimulatory approaches that help with seizures. While these methods were used with only a small portion of the epileptic community (i.e., those having seizures in response to a specific environmental stimulus), they found a high success rate. These studies showed that in many cases where only one body part is affected by the seizure, stimulation of that area (e.g., massaging) was shown to decrease

the seizing of the affected limb or area. The other method used was a “general arousal.” (p. 191) Here, Dahl and Lundgren discussed how putting the body into a calm state can be learned, and the reaction of the seizure can be faded out. This uses a conditioning method, where first something that is calming to the subject is found out, such as the smell of jasmine and that smell is introduced to the individual when they start to feel the onset of a seizure. If this succeeds in calming them enough to quell the seizure, the smell itself is replaced with a thought or seeing an object and so on until the individual just has to *think* of one thing and they are able to calm away the oncoming seizure.

### What are the Implications for Teachers?

Epilepsy most often occurs or begins in childhood (Heward, 2009) which means that teachers may have a strong influence during this time. Nabors et al. (2008) found that most teachers do not feel comfortable with meeting the needs of students with epilepsy in school. While in their studies they found that special education teachers in general were more confident than the general education teachers, percentages were still very low. Nabors et al. (2008) suggested that teachers should make sure to be involved in training about the medical conditions of their students. Searson (2009) advised that teachers are an important part of the medical decision-making team. Nabors et al. (2008) also recommended that parents and school nurses are valuable resources for teachers to learn.

Heward (2009) stated that negative public attitudes and misconceptions may in fact be more damaging to someone with the condition than the actual epilepsy. Watkins et al (2006) shows that in response to their questions about concerns that people with intellectual disabilities have with their seizures, there was greater concern about what others thought and about it changes their daily lives than about their safety during a seizure. Because the public that children typically interact with at school is mostly other students, teachers can have a large influence on that population. Seeing a seizure for the first time, especially one as conspicuous as a tonic-clonic seizure, can be frightening. This fear

may be increased if what is happening to the child is mysterious. Teachers can help to educate the students in class or school about why this is happening. Abraham (1956) stressed that there should be an “understanding rather than anxiety and suspicion on the part of classmates, and, most important, a clear-cut knowledge on the part of the teacher of exactly what to do if there should be a seizure” (p. 148). Not only will children and teachers be better prepared if one of their classmates has an attack, they can also pass on the information and it can be used outside of the classroom, and later in life.

Having epilepsy has some correlation with having intellectual disabilities. Klepping and Zaagman (2009) found that just under one third of those with a learning disability also have epilepsy. Wodrich et al. (2006) said that lower spelling and reading scores are shown by students with idiopathic epilepsy that is well controlled, even when those with low IQ scores are excluded from the analysis. They also discussed how subjects like math that involve steps that are built up throughout the lessons can be affected by seizures. This is particularly seen with absence seizures when the child is not able to pay attention for a short period of time, because of the seizure. They may also have trouble paying attention in the aftermath of the seizure, which can cause the student to miss important steps in school. Svoboda (2004) stated that around half of children with epilepsy are going to have learning difficulties that may manifest in various ways. He said that they may appear as simply underachievement or as specific learning disabilities. The results of Wodrich et al’s (2006) study showed that special education services in some form were being received by more than half of students with epilepsy. Those with symptomatic epilepsy received services more often than those with idiopathic epilepsy according to their research. While they showed correlation, they do not show causation. Those epilepsies with known causes may have a cause that also affects their learning, rather than the seizures themselves causing the learning disabilities. Usually idiopathic seizures are more of a concern because the cause is unknown, and therefore they are harder to prevent, where symptomatic epilepsy can be controlled by avoiding the cause of the seizure.

Abraham (1956) suggested that because of not fully understanding seizures (at the time of his research), many students with epilepsy were experiencing failure in college. He made suggestions specifically for colleges on what they could do to help make college more welcoming to those with epilepsy. These can be transferred to any age schools or communities of other sorts. He said that to start off, it is important to actually know how the disorder manifests in the individual. The student shouldn't just be presumed to have a learning or intellectual disability because they have the label of having epilepsy, but rather the severity and specific conditions of the disorder should be looked at. He then said that we should look into the specific classroom needs and meet them for the child. Specific methods he listed such as providing opportunity for group activity to increase social skills and assigning activities that will relieve restlessness seem as though they are methods to be used with any age group of any children. These are key factors for any age classroom and are fine teaching skills to have. Abraham also suggested that it may be important for the teacher to be aware that stress can sometimes trigger a seizure and the workload that a student is facing and their ability to handle it without getting too anxious should be considered.

Heward (2009) suggested that a teacher can be useful in the actual detecting of epilepsy in children. Children who experience absence seizures may just look like they "zone out" in class a lot, and the teacher can help by documenting how often this happens and suggesting a visit to the doctors. Searson (2008) suggested watching for behaviors that are unusual or repetitive to differentiate from those associated with another disability. They can also help by documenting any changes in the child's behavior when the child is trying different treatments. Wodrich et al. (2006) found that in documentation for the students in their studies, one half showed that the student was using anti-epileptic drugs, but that none of them had the potential effects that the drugs would have on the student. Teachers should be aware of the potential side effects of medication that the students are taking, and contact the parents if there isn't anything listed in the student's documentation. Kleppen

and Zaagman (2009) listed some potential side effects of medication as “drowsiness, hypotension and headaches” (p. 33 ). If the teacher is unaware that some behaviors may be caused by medication, they may think the cause is something non-health related (Wodrich et al., 2006). It is especially important to know if the child is taking multiple medications, as according to Svoboda (2005) this tends to amplify cognitive and behavioral problems. The teachers do need to be aware, however of having lower expectations just because of the epilepsy disorder. Teachers should also take the time to discuss with the student, what the student would like to do when they sense they are going to have a seizure.

The aura is a stage which varies from person to person. As said by Heward (2009), a person may hear, see, feel or smell something that warns them they are about to have a seizure. The Nurse Practitioner (2006) lists some of the warning signs as “a tingling sensation, brief starting, the perception of an unusual taste or smell, a twitching muscle, convulsive movements, confusion, fear, anxiety, changes in awareness, and loss of consciousness” (p. 1). This can be very helpful so that everyone involved is prepared for what is coming. A student and teacher may create a signal that they can use so that the child can leave the classroom and get down to the nurse’s office or into another room (with the assistance of another child for safety in transition), if the child will be safer someplace else. The student may also feel more comfortable if the other students in the class do not witness the seizure. This may also make the rest of the students calmer if they are not aware of what is going on.

### Discussion

One of the most important parts of helping a child dealing with epilepsy falls to the teachers and others in the school. Here we see many cases, as a large percentage of those with epilepsy are of school-age. Seizures occur in many forms from the obvious tonic-clonic to the subtle absence seizure. In our role, we can make sure that we are ready to deal with whatever type of seizure we may come in contact with and we can be sure to follow good first-aid procedures and make sure the individual

comes-to in a supportive and calm environment. It is also important to know the type of treatment being used in order to know whether or not their performance in the classroom will be affected. From the research done we can see that it is important to be aware of the implications that epilepsy has on a school age child, and that they vary by each individual child.

We can take the initiative as educators, to better inform ourselves, our coworkers, our family and our students. We can learn as much as we can about not only epilepsy, but as many of the disabilities faced by our students as possible. One good resource outside of parents and the school nurse is the EF website which has extensive information about epilepsy. The site is geared toward not only those who are just curious, but families of those with epilepsy and those who are living with the condition themselves. Included in the site is a helpful questionnaire for parents to help answer some questions that may help you better teach their child. (<http://www.epilepsyfoundation.org>)

Svoboda (2004) stated that “children do not experience seizures; they experience the reactions to the seizures” (p. 7). Reactions come from everywhere: from the students in the classroom feeling fear at the unknown, or feeling sympathy and compassion for someone in possible pain; from parents putting the blame on themselves, or knowing that the focus is a cure; from teachers expecting little from the child, to expecting as much as the child can do. As teachers we can influence at least two of these forms of reaction: that which comes from us, and that which comes from our student.

### References

- Epilepsy Foundation (2009). *About epilepsy*. Retrieved February 2009, from <http://www.epilepsyfoundation.org/about>
- Abraham, W. (1956). Educational problems of college age persons with seizures. *Exceptional Children*, 22, 147-151, 174.
- Burnham, W.M. (2007). Epilepsy. In I. Brown & M. Percy (Eds.), *A comprehensive guide to intellectual and developmental disabilities* (pp. 287-294). Baltimore, MD: Paul H. Brookes.
- Burt, J., & Cole, C. (2008). Swimming guidelines for adults with epilepsy. *Learning Disability Practice*, 11, 12-16.
- Dahl, J., & Lundgren, T. (2005). Behavior analysis of epilepsy: Conditioning mechanisms, behavior technology and the contribution of act. *The Behavior Analyst Today*, 6, 191-202.
- Fastenau, P.S., Shen, J., Dunn D.W., & Austin, J.K. (2008). Academic underachievement among children with epilepsy: Proportion exceeding psychometric criteria for learning disability and associated risk factors. *Journal of Learning Disabilities*, 41, 195-207.
- Heward, W. L. (2009). *Exceptional children: An introduction to special education (9<sup>th</sup> edition)*. Upper Saddle River, NJ: Pearson Education.
- Klepping, L., & Zaagman, P. (2009). Midazolam and epilepsy in people with learning disabilities. *Learning Disability Practice*, 12, 30-35.
- Merck Manual (2009). Seizure disorders. *Brain, Spinal Cord, and Nerve Disorders*. Retrieved February 2009, from Website: <http://www.merck.com/mmhe/sec06/ch085/ch085a.html>
- Neurology Channel (2009). *Seizures/ Seizure disorders*. Retrieved February 2009, from <http://www.neurologychannel.com/seizures/index.shtml>
- Nurse Practitioner (2007). *Managing seizures*. Retrieved April 23, 2009, from Academic Search Complete database.
- Nabors, L.A, Little, S. G., Akin-Little, A. & Iobst, E A. (2008). Teacher knowledge of and confidence in meeting the needs of children with chronic medical conditions: Pediatric psychology's contribution to education. *Psychology in the Schools*, 45, 217-226.
- Searson, B. (2008). Meeting the challenges of epilepsy. *Learning Disability Practice* 11, 29-34.
- Svoboda, W.B. (2004). *Childhood epilepsy: Language, learning, and behavioral complications*. Cambridge: Cambridge University Press.

Watkins, J., Espie, C.A., Curtice, L., Mantala, K., Corp, A. & Foley, J. (2006). Development of a measure to assess the impact of epilepsy on people with an intellectual disability: The Glasgow epilepsy outcome scale- client version (GEOS-C). *Journal of Intellectual Disability Research*, 50, 161-171.

Wodrich D.L., Kaplan, A.M. & Deering, W.M. (2006). Children with epilepsy in school: Special service usage and assessment practices. *Psychology in the Schools* 43, 169-181.