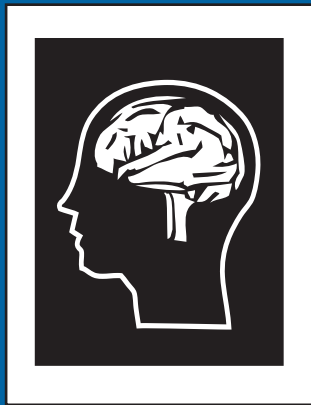


A N O V E R V I E W

Epilepsy



EPILEPSY EDUCATION SERIES

This publication was produced by the


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This booklet is designed to provide general information about Epilepsy to the public. It does not include specific medical advice, and people with Epilepsy should not make changes based on this information to previously prescribed treatment or activities without first consulting their physician.

Special thanks to our Consulting Team, which was comprised of Epilepsy Specialist Neurologists & Neuroscience Nurses, Hospital Epilepsy Clinic Staff, Educators, Individuals with Epilepsy, and Family Members of Individuals with Epilepsy.



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Index

Epilepsy Facts	1
Epilepsy and Seizures	6
Epilepsy and Lifestyle	11
Epilepsy Support and First Aid	16
First Aid	17 - 18
Glossary of Terms	19



Epilepsy Facts

Q *How does someone get epilepsy?*

A A person cannot catch **epilepsy** from someone else. Epilepsy is **not** a disease. Epilepsy is a condition of the brain that results in recurring **seizures**. In many cases, the cause of the condition is unknown.

In some cases, however, a cause of the seizures can be identified. The causes vary depending on the age of the person when epilepsy begins.

Q *Do many people have epilepsy?*

A Epilepsy is more common than most people realize. It is one of the most common chronic neurological disorders and an estimated one percent of the general population has epilepsy. In Canada, that means that approximately 330,000 people have epilepsy. In North America, almost four million people have epilepsy.

**Find definitions of highlighted words
in the glossary at the back
of this booklet.**

Q At what age does epilepsy usually begin?

A People of all ages and nationalities have epilepsy. The condition can begin at any age although its *onset* is most often in childhood or in the later years of life.

The frequency of seizures in childhood may be partly due to the low *seizure threshold* of some children. A seizure threshold is the level at which the brain will have a seizure and the seizure threshold generally rises as the brain matures. This may partly explain why children with epilepsy often outgrow the condition.

In the elderly, there is an increased incidence due to strokes and aging of the brain.

Q Can a person inherit epilepsy?

A Certain types of epilepsy are known to have a genetic basis. In some types, one or more inherited genes result in the condition. In others, an inherited neurological disorder that involves structural or chemical abnormalities in the brain increases the risk of seizures and leads to epilepsy.

Seizure thresholds also influence the risk of developing epilepsy. Each individual has a seizure threshold that determines the level at which the brain will have a seizure. Some individuals inherit a lower threshold or lower resistance to seizures resulting in a greater risk of having seizures.

The overall risk of a child having unprovoked seizures is one to two percent in the general population and approximately six percent if a parent has epilepsy.

Q How is epilepsy diagnosed?

A Conditions other than epilepsy such as a very high fever or a glucose imbalance in the body can result in seizures. A doctor will first consider other possible causes of the seizures before diagnosing epilepsy. Sometimes blood tests are used to determine other causes.

In establishing a diagnosis of epilepsy, a thorough physical examination, a medical history, and diagnostic tests are generally used.

The doctor will require a family health history and a detailed description of the characteristics, onset, and frequency of the seizures. Often the doctor must rely on the description of others who were with the person during the seizure. In many cases, a person who has had a seizure does not remember the seizure.

An *electroencephalogram (EEG)* records the brain's electrical activity and is an important diagnostic test in the diagnosis of epilepsy. Neuroimaging tests such as *computed tomography (CT)*, *magnetic resonance imaging (MRI)*, *magnetic resonance spectroscopy (MRS)*, and *positron emission tomography (PET)* are also sometimes used.

In establishing a diagnosis of epilepsy, a thorough physical examination, a medical history, and diagnostic tests are generally used.

In approximately 60 to 75 percent of epilepsy cases, no specific cause of the seizures can be identified. In the remaining 25 to 40 percent, some of the causes include:

- Genetic
- Birth injury (e.g. lack of oxygen to the baby's brain at birth)
- Developmental disorder (e.g. brain damage to the fetus during pregnancy)
- Brain trauma (e.g. from car accidents, sports injuries)
- Infection (e.g. meningitis, encephalitis, AIDS)
- Brain tumor
- Stroke
- Cerebral degenerative disorder (e.g. those associated with Alzheimer's Disease)
- Alcohol and drug abuse (Both heavy alcohol consumption and withdrawal from excessive use of alcohol can provoke seizures in some individuals. Use of certain street drugs is also associated with provoking seizures. If a person has repeated uncontrolled seizures, it can result in a changes in the activity of the networking nerve cells that can eventually result in epilepsy).



Q Can epilepsy be prevented?

A As one of the known causes of epilepsy is head injury, use of appropriate safety devices (i.e. bike helmets, vehicle seatbelts) can reduce the risk of injury that can result in seizures. Good prenatal care reduces the risk of complications to the fetus during pregnancy that can also result in injury to the brain.

Avoiding alcohol and drug abuse also helps in the prevention of epilepsy.

Q *Is there a cure for epilepsy?*

A There is no known cure for epilepsy but in well over half of those with epilepsy, seizures are controlled with seizure medication. In some cases, epilepsy surgery offers the possibility of a reduction or elimination of seizures. Depending on the type of epilepsy, some people will outgrow their epilepsy.

Q *What is the treatment for epilepsy?*

A In the majority of cases, seizures are controlled with seizure medication. Surgery is considered in up to 15 percent of individuals with epilepsy when treatment with various seizure medications does not result in an individual being seizure free.

Surgery may involve the removal of the part of the brain where the seizures originate such as in a *temporal lobectomy* or it may involve a surgical cut to prevent seizures from spreading from one part of the brain to another by interrupting the nerve pathways such as in a *corpus callosotomy* or in *multiple subpial transections*.

Vagus Nerve Stimulation (VNS) is a surgical therapy that involves the implantation of a battery-powered device called a vagus nerve stimulator under the skin in the chest.

The device is similar to a pacemaker. The VNS device stimulates the left vagus nerve which then sends an electrical signal to the brain. The signals help to prevent or interrupt the electrical disturbances in the brain that result in seizures.

A special diet known as *ketogenic diet* is also a method used to treat epilepsy. The diet is used primarily in the treatment of children.

Some people have found that *complementary therapies* used in conjunction with prescribed treatment have helped to control seizures.

E *Epilepsy and seizures*

Q *Why do seizures happen?*

A The brain is made up of billions of nerve cells or neurons that communicate through electrical and chemical signals. When there is a sudden excessive electrical discharge that disrupts the normal activity of the nerve cells, this may result in a change in the person's behaviour or function. This abnormal activity in the brain that results in a change in the person's behaviour or function is a seizure.

A number of causes can result in a disruption of the normal activity of the nerve cells and result in seizures. Sometimes the disruption results in a single seizure. In other cases, abnormal activity recurs causing a person to have recurring seizures. A single seizure is not epilepsy. Recurring or multiple seizures are diagnosed as epilepsy.

Q *How can you tell if a person is having a seizure?*

A Seizures generally involve a change in function or behaviour. A seizure may take many different forms including a blank stare, muscle spasms, uncontrolled movements, altered awareness, odd sensations, or a **convulsion**. The location in the brain of the abnormally discharging nerve cells determines the form the seizure will take.

Sometimes the forms seizures take can be mistaken to be deliberate acts. Sometimes people misunderstand seizures and think that those with epilepsy are mentally disabled or are more likely to be violent. Seizures are **not** deliberate acts and people with epilepsy are **neither** prone to violence **nor** are they mentally disabled.

An excessive electrical discharge in the brain temporarily causes a change in the person's function or behaviour. When the seizure is over, the person typically returns to normal.

Q How does a person tell the difference between one type of seizure and another?

A There are many types of seizures. The different types begin in different areas of the brain and they are grouped into two categories: *partial seizures* and *generalized seizures*.

A **partial seizure** occurs when the excessive electrical discharge is limited to one part of the brain. Partial seizures are the most common type of seizure in adults. Some partial seizures are described as simple, others as complex, depending on whether or not the person is aware of what is going on during the seizure.

During a *simple partial seizure*, a person remains aware but cannot completely control function or behaviour. For instance, a person might experience a strange smell or something that isn't there. Or he or she may feel suddenly afraid or very happy for no apparent reason. A simple partial seizure can also result in an autonomic symptom such as a feeling of nausea or dizziness. These unusual sensations, feelings, or movements are called *auras*.

During a *complex partial seizure*, a person experiences altered awareness and may do random movements such as chewing motions, pulling at clothing, or purposeless walking known as *automatisms*. Occasionally there are dramatic behavioural changes such as screaming, undressing, or laughing at inappropriate times.

A **generalized seizure** is characterized by the involvement of the whole brain. The excessive electrical charge is widespread and involves both sides of the brain. The seizure may or may not be convulsive. If it is not a convulsive seizure then the person might stare blankly for a few seconds and appear as if he or she is daydreaming. This is known as an *absence seizure*. In a convulsive seizure, or a *tonic clonic seizure*, the person will fall to the ground and the body will shake all over.

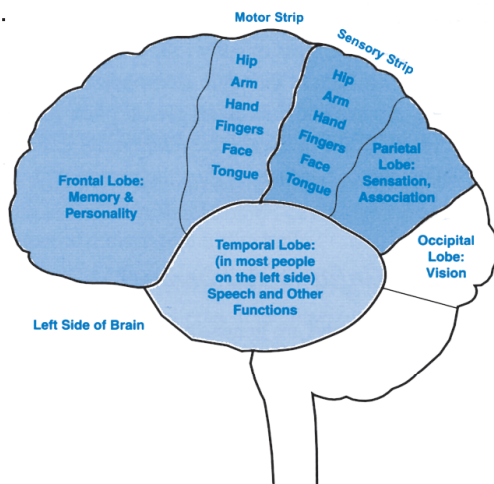
How Different Areas of the Brain Control Different Functions

The brain is made up of lobes, each with a different function. Movements on the right side of the body are controlled by the left side of the brain and vice versa. The location in the brain of the abnormally discharging nerve cells determines the form the seizure will take.

When the excessive electrical activity occurs in one area of the brain as in a partial seizure, the area will determine what form the seizure will take. For example, the motor strip in the frontal lobe controls movement in the body. If the excessive electrical activity takes place in the hand area of the motor strip, the person having a seizure will jerk his or her hand. If the excessive electrical activity takes place in the hand area of the sensory strip of the brain, then the person might experience tingling in the hand.

Abnormal electrical activity in the temporal lobe could result in a seizure that involves experiences such as an inability to speak clearly, an unusual smell, a feeling of fear, or of déjà vu.

In some seizures, the abnormal activity starts in one area of the brain and spreads to another area or to the whole brain. For example, a simple partial seizure or aura may spread and become a complex partial seizure or a partial seizure may spread and become a tonic clonic seizure.



Sometimes seizures begin as partial and then spread and become generalized. These are referred to as *partial seizures secondarily generalized*. For instance a complex partial seizure may progress to a tonic clonic seizure.

Atonic seizures are generalized seizures that can result in a person dropping objects or falling down. *Myoclonic seizures* cause a sudden jerk in part of the body such as the arm or leg.

Sometimes seizures begin as partial and then spread and become generalized. These are referred to as partial seizures secondarily generalized.

Q *Do seizures last very long?*

A Most seizures last for seconds to minutes. With some seizures such as absence seizures, the seizure generally lasts for less than 10 seconds and the person regains alertness quickly following the seizure. With other types of seizures such as the tonic clonic seizure, the seizure lasts one to three minutes and a *postictal period* often follows the seizure. This period results in the person temporarily experiencing fatigue, confusion and/or headache. Often the person will want to sleep.

Q *Are seizures painful or dangerous?*

A Seizures are not painful and are generally not harmful but prolonged or recurrent seizures can cause damage to the brain.

A continuous seizure state known as *status epilepticus* is a life-threatening condition. Seizures are prolonged and occur one after

another without full recovery between seizures. **Immediate medical care is necessary.** The seizures may be convulsive or non-convulsive.

There is also an increased risk of injury in people with epilepsy. If seizures are uncontrolled, then a person is at greater risk.

Open flames, stoves, irons, and smoking all pose risks to those with seizures.

Use of a microwave oven rather than a stove, padding the edges of tables and other furniture, taking showers rather than baths, and standing back from roads of the edge of platforms while traveling by bus or subway are just a few of the precautions that can reduce some of the risks.

Q What is Sudden Unexplained Death in Epilepsy (SUDEP)?

A SUDEP, where death occurs suddenly for no discernable reason, is rare. Sudden unexplained death also occurs in the general population but the risk is higher for people with epilepsy. SUDEP occurs most often in young and middle-aged adults.

Q Could behaviour seem like a seizure but be something else?

A Yes, there are other disorders that result in falling and sometimes shaking that could be interpreted as a seizure but are not. The two most common of these conditions are syncope and pseudoseizures.

Syncope or fainting is sometimes misdiagnosed as being a seizure but is generally caused by insufficient blood getting to the brain and not by an excessive electrical discharge in the brain.

Pseudoseizures (now called non-epileptic events) are psychological in origin and can resemble epilepsy-related seizures. They are not, however, the result of excessive electrical activity in the brain but are often subconscious reactions to very stressful situations.

E *Epilepsy and Lifestyle*

Q How does epilepsy affect a person's lifestyle?

A Epilepsy affects each person differently. How epilepsy affects a person's lifestyle often depends on the type and frequency of the seizures a person is experiencing and on the outcome of the treatment prescribed. In well over half of those with epilepsy, seizures are well controlled with seizure medication and there may be little change in lifestyle required. In those with uncontrolled seizures, significant change may be necessary to assure safety.

Q Does taking seizure medication affect a person?

A Some seizure medication may produce side effects.

The most common side effects are those related to the level of the drug in the blood and can include drowsiness, loss of coordination, fatigue, headache, decreased appetite, nausea, drooling, tremor, weight gain or loss, double or blurred vision, dizziness, and even impaired attention and memory. Sometimes dose-related side effects are cosmetic and include overgrowth of the gums, hair loss, or excessive hair growth.



Q Can a person with epilepsy participate in sports and recreational activities?

A Most sports and recreational activities are safe for people with epilepsy. Some activities such as scuba diving, rock climbing, and parachuting, however, are considered too dangerous and others such as hockey, soccer, football, and karate pose some risk due to the possibility of head injury. Swimming with a companion, preferably an experienced swimmer, is recommended for anyone who has seizures. If a person has uncontrolled seizures, then swimming is not advisable without constant supervision.

Q *Can a person with epilepsy work?*

A Yes, most people with epilepsy can work and have rewarding careers. There may be some restrictions in certain careers (e.g. bus drivers, pilots) for safety reasons, but there are many options in employment choices for those with epilepsy.

If a person has uncontrolled seizures, then personal safety, the side effects of medication, or the inability to drive, may alter employment decisions.

Although people with epilepsy sometimes face discrimination and/or an under-utilization of skills in the workplace due to a lack of knowledge about the condition on the part of the employer, attitudes towards the conditions are slowly changing through public awareness and education.

Physical disabilities are protected grounds under human rights legislation and the Canadian Human Rights Act does not allow discrimination by an employer due to a disability such as epilepsy. It is the responsibility of the employer to demonstrate that the individual's disability would threaten his or her safety or the safety of others.

Q *Can a person with epilepsy drive?*

A If a person's seizures are controlled, then driving is restricted.

If epilepsy has been diagnosed, driving is generally not allowed until a person has been seizure free for at least 6 to 12 months and the person is under a doctor's care. There are provincial and territorial differences in regulation. Drivers are also required by law to report any health problems such as epilepsy that would interfere with driving to the appropriate regulatory agency.



Q Does epilepsy affect a persons emotional well-being?

A A person who has been diagnosed with epilepsy may experience a range of emotions such as anger, frustration, and depression. Concern for the future and negative responses from friends and family can leave a person feeling vulnerable and alone. Depression is more common in individuals with epilepsy than it is in the general population. This could be due to psychological factors, the seizures themselves, and/or to seizure medication. Living with epilepsy can result in personal challenges, but it does not have to result in an inability to a rewarding and full life. Learning about epilepsy and sharing information with others, finding effective medical treatment, developing a support network of family and friends, and pursuing what matters in life, are all important in living positively with epilepsy.

Q Does epilepsy affect cognitive function and development?

A As a group, people with epilepsy have the same range of intelligence as the general public. As in any cross section of the population, people with epilepsy have varying intellectual abilities.

Although many people with epilepsy do not experience significant impairment in cognitive function, some do experience changes. Factors that can have a negative impact on cognition and development include:

- Pre-existing cognitive impairment as a result of birth trauma or previous illnesses (e.g. meningitis).
- Severity and frequency of seizures including a history of status epilepticus
- The use of high doses of one or more seizure medications.

Q Can a person with epilepsy have a sexual relationship?

A Yes, people with epilepsy can have a normal sexual relationship. Only in rare cases, does sexual activity trigger seizures. Seizure medication may, however, lessen a person's interest in sexual activity or affect sexual function. Changes in treatment can sometimes alleviate these concerns.

Q Can a woman with epilepsy have a baby?

A Most women with epilepsy have healthy babies but there is a slightly higher risk that having epilepsy or taking seizure medication will affect the fetus. If a woman with epilepsy is planning to take or is taking birth control pills, is planning to become pregnant, or is pregnant, it is essential that she discuss these issues with her doctor so that the best possible medical care can be established.



Q Can a woman with epilepsy drink alcohol?

A While excessive use of alcohol and subsequent withdrawal can trigger seizures, modest occasional alcohol consumption does not seem to increase seizure activity in individuals who are not alcoholics or who are not sensitive to alcohol. Alcohol use can, however, lower the metabolism which results in lower blood levels of the seizure medication that is also metabolized by the liver. Drinking alcohol can also lower the seizure threshold. A seizure threshold is the level at which the brain will have a seizure. Some doctors recommend that individuals with uncontrolled seizures abstain from alcohol consumption. If a person chooses to consume alcohol, it is essential that he or she continues to take seizure medication as prescribed.

Q *Does a person living with epilepsy have to avoid flashing lights?*

A If a person has a type of epilepsy known as photosensitive epilepsy, the lights flickering at a certain speed and brightness (e.g. from televisions, computer screens, strobe lights, video games, movies) can trigger a seizure. A person with photosensitive epilepsy should avoid flickering lights. Sometimes natural light patterns such as sunlight reflecting off water can also trigger the seizures. Photosensitive epilepsy is often outgrown in adulthood (late 20s or early 30s).

Common Seizure Triggers

While some people are not able to identify specific events or circumstances that affect seizures, others are able to recognize definite seizure triggers. Some common seizure triggers include:

- Forgetting to take prescribed seizure medication
- Lack of sleep
- Missing meals
- Stress, excitement, emotional upset
- Menstrual cycle/hormonal changes
- Illness or fever
- Low seizure medication levels
- Medications other than prescribed seizure medication
- Flickering lights of computers, television, video, etc.
- Excessive alcohol consumption and subsequent withdrawal
- Street drugs (e.g. cocaine, amphetamines, ecstasy LSD, withdrawal from marijuana)

E Epilepsy Support and First Aid

Q *Where can a person get more information on epilepsy?*

A There are epilepsy associations across Canada servicing those with epilepsy and their families and communities. Most associations can provide up-to-date medical and lifestyle information regarding the condition. Many offer resource libraries, programs, support groups, newsletters, educational forums, referrals, advocacy, and public awareness. For more information, contact your local epilepsy association or call 1-866-EPILEPSY (374-5377) toll-free to connect directly with the association in your area.

There are epilepsy associations across Canada servicing those with epilepsy and their families and communities. Most associations can provide up-to-date medical and lifestyle information regarding the condition.

Q *What should a person do to assist someone having a seizure?*

A People who have not experienced being with someone who is having a seizure sometimes find the experience frightening. Staying calm is important and, in most cases, a seizure will take its natural course. If you know that a person has epilepsy and the seizure is taking a typical course then medical assistance may not be required. In other cases, a seizure may be a medical emergency and help will be necessary.

F First Aid

What To Do If Someone Has A Non-Convulsive Seizure (staring blankly, confused, not responding, movements are purposeless)

- 1 Stay with the person.** Let the seizure take its course. Speak calmly and explain to others what is happening.
- 2 Move dangerous objects out of the way.**
- 3 DO NOT restrain the person.**
- 4 Gently guide the person away from danger or block access to hazards.**
- 5 After the seizure, talk reassuringly to the person.** Stay with the person until complete awareness returns.

What To Do If Someone Has A Convulsive Seizure (characterized by stiffening, falling, jerking)

- 1 Stay calm.** Let the seizure take its course.
- 2 Time the seizure.**
- 3 Protect from injury.** If necessary, ease the person to the floor. Move hard or sharp object out of the way. Place something soft under the head.
- 4 Loosen anything tight around the neck.** Check for medical identification.
- 5 DO NOT restrain the person.**
- 6 DO NOT put anything in the mouth.** The person will not swallow his or her tongue.
- 7 Gently roll the person onto his or her side as the convulsive seizure subsides** to allow saliva or other fluids to drain away and keep the airway clear.
- 8 After the seizure, talk to the person reassuringly.** Do not leave until the person is re-oriented. The person may need to rest or sleep.



Calling An Ambulance

In assessing the need to call an ambulance, a combination of factors has to be considered. For example, if cyanosis (blue or gray colour) or laboured breathing accompanies the seizure, then an ambulance may be called earlier. If a person is known to have epilepsy and the seizure pattern is uncomplicated and predictable, then ambulance help may not be necessary.



CALL AN AMBULANCE:

- If a convulsive seizure lasts longer than 5 minutes.
- If consciousness or regular breathing does not return after the seizure has ended.
- If seizure repeats without full recovery between seizures.
- If confusion after a seizure persists for more than one hour.
- If a seizure occurs in water and there is any chance that the person has inhaled water. Inhaling water can cause heart or lung damage.
- If it is a first-time seizure, or the person is injured, pregnant, or has diabetes. A person with diabetes may experience a seizure as a result of extremely high or low blood sugar levels.

Glossary of Epilepsy Terms

Absence seizure (formally called petit mal): A generalized seizure that results in a blank stare usually lasting less than 10 seconds. The seizure starts and ends abruptly and awareness is impaired during the seizure. These seizures are sometimes misinterpreted as daydreaming or inattentiveness. An individual may experience as many as several hundred absence seizures in a day. Absence seizures most often begin in childhood and in many children, the seizures stop during adolescence.

Atonic seizure: Sometimes called a “drop attack,” an atonic seizure involves a sudden loss of muscle tone that can result in the person falling down, dropping objects, or nodding the head involuntarily. Typically, these seizures last for a few seconds.

Aura: A simple partial seizure that may occur alone or may progress to a complex partial seizure or a generalized seizure. It can be used as a warning signal to allow a person to take the necessary precautions to avoid injury. An aura results in an individual experiencing an unusual sensation, feeling, or movement. For example, an aura might be a distortion in sight, sound, or smell where a person sees, hears, or smells things that aren't there, or it may be sudden jerky movements of one area of the body such as the arm, leg, or face that the person is unable to control. A person may experience a sudden overwhelming emotion such as joy, sadness, fear, or anger. Others may experience stomach upset, dizziness, a shiver, a tingling or burning sensation, pallor, or flushing. Occasionally there will be the experience of déjà vu during which the person has the sensation of having experienced something before.

Automatisms: Random purposeless movements over which a person has no control such as mumbling, lip smacking, head turning, or picking motions in the air. Automatisms often characterize a complex partial seizure.

Catamenial epilepsy: A type of epilepsy in which seizure occurrence is linked to the menstrual period.

Complementary therapies: Therapies that are used to supplement and not to replace accepted treatments that some individuals have found helpful in seizure control. It is important to remember that all therapies should be

discussed with a doctor. Some of the complementary therapies being used include medication, yoga, massage therapy, aromatherapy, herbal remedies, art, music, and pet therapy, reflexology, and biofeedback.

Complex partial seizure (formally called psychomotor or temporal lobe):

A type of seizure that occurs in one part of the brain and during which the person experiences altered awareness. The person may appear dazed and confused. The seizure often begins with an aura. An aura is a simple partial seizure that can occur alone or as the onset of a complex partial seizure. In a complex partial seizure, the aura often occurs just before awareness is altered. Automatisms often characterize the seizure. The seizure usually lasts for between one and two minutes and is often followed by a postictal period of disorientation and confusion.

Computed Tomography (CT or CAT scan): A scan used to detect physical conditions in the brain that may be causing seizures such as tumors or scar tissue. The CT machine takes a series of x-rays to show the brain's structure.

Convulsion: A seizure that involves stiffening and jerking.

Corpus callosotomy: A surgical technique that involves cutting the corpus callosum to disconnect the two hemispheres in the brain in order to prevent seizures from spreading from one hemisphere to another. The corpus callosum is the tissue band that connects the two sides of the brain.

Electroencephalogram (EEG): A painless, non-invasive test that is used to measure a person's brain wave pattern. The electrical impulses of the brain are recorded by small metal discs placed on the person's scalp, connected through wires, with the EEG machine.

Epilepsy: A condition of the brain that is characterized by recurrent seizures. Approximately one in ten Canadians will experience at least one seizure during a lifetime. A single seizure, however, is not epilepsy. Epilepsy is a condition that is defined by multiple seizures.

Epilepsy syndrome: As well as the different types of seizures, there are different types of epilepsy. Types of epilepsy are classified as epilepsy syndromes. This classification system is based on patterns of features common to a type of epilepsy such as similarities in terms of the age of onset, seizure type, EEG results, response to treatment, and future prognosis.

Epileptologist: A doctor who is a neurologist with specialized training in epilepsy

Febrile seizures: Seizures triggered by high fever. These are the most common seizures in children and are usually outgrown by the age of five. Over half of the children who have a single febrile seizure will not have a second one. These seizures are tonic clonic.

Gelastic seizure: Known as laughing seizure. A rare type of partial seizure that results in laughing at inappropriate times.

Generalized seizure: A generalized seizures characterized by the involvement of the whole brain. The excessive electrical discharge is widespread and involves both sides of the brain. The seizure may or may not be convulsive.

Intractible seizures: Seizures that are difficult to control with medical treatment.

Ketogenic diet: A strict diet high in fats and low in protein and carbohydrates that has been used in the treatment of difficult-to-control epilepsy in children. Occasionally it is used in the treatment of teenagers and adults. A chemical change is created in the body called ketosis resulting in the body breaking down fats instead of carbohydrates. This process inhibits seizures in some people. The diet requires medical supervision.

Magnetic Resonance Imaging (MRI): A diagnostic test used to provide structural information such as the presence in the brain of tumors, scar tissue, or abnormal blood vessels. Magnetic fields instead of x-rays are used to produce precise two-or three-dimensional images of the brain.

Magnetic Resonance Spectroscopy (MRS): Essentially an MRI with a different computer program, the MRS provides information about chemical activity in the brain.

Monotherapy: Treatment with one medication.

Multiple subpial transections: A type of surgery used in treating partial seizures and involving a series of cuts underneath the cerebral cortex to disconnect the neuronal pathways.

Myoclonic seizure: A generalized seizure that results in a sudden jerk of part of the body such as the arm or leg. The person may fall over. The seizure is very brief.

Neurologist: A doctor who specializes in the area of medicine relating to

the nervous system and its disorders.

Onset (of epilepsy): The beginning of seizures.

Partial seizure: A seizure in which the excessive electrical discharge occurs in one part of the brain.

Photosensitive epilepsy: A type of epilepsy in which lights flickering at a certain speed and brightness can trigger a seizure. Seizures are most often tonic clonic.

Polytherapy: Treatment with more than one drug.

Positron Emission Tomography (PET): PET scanning produces three-dimensional computer images of the brain processes at work. These images provide information on the chemistry, blood flow, and glucose consumption of the brain that is useful in locating the origin of the seizures.

Postictal period: A stage that takes place directly after the seizure. Some seizures are followed by a postictal period. Others are not. An individual may temporarily experience confusion (postictal confusion), weakness (postictal paralysis), or sleepiness (postictal state).

Prognosis: Probable outcome of the condition.

Seizure: A sudden excessive electrical discharge in the nerve cells of the brain that results in a change in function or behaviour. The brain is made up of billions of nerve cells or neurons that communicate through electrical and chemical signals. When there is a sudden excessive electrical discharge that disrupts the normal activity of the nerve cells and results in a change in function or behaviour, this is a seizure.

Seizure focus: The area of the brain where the seizure originates.

Seizure threshold: The level at which the brain will have a seizure. Each person has a seizure threshold. Some people have a lower threshold and are more susceptible to having seizures. Children generally have a lower seizure threshold than adults.

Seizure triggers: Circumstances or events that provoke seizures.

Simple partial seizure (formerly called focal): A seizure that occurs in one part of the brain and results in the person remaining aware during the

seizure. A simple partial seizure can involve sensory, motor, psychic, or autonomic symptoms which result in the person experiencing an unusual sensation, feeling, or movement known as an aura. A simple partial seizure usually begins suddenly and lasts seconds to minutes.

Status epilepticus: A continuous seizure state that is a life-threatening condition. Seizures are prolonged or occur one after another without full recovery between seizures. **Immediate medical care is necessary.** The seizures may be convulsive or non-convulsive.

Temporal lobectomy: A type of surgery that involves the removal of part of the temporal lobe. It is the most common type of epilepsy surgery and it offers the chance of a cure in many patients and a reduction in seizures in others.

Tonic clonic seizure (formally called grand mal): A generalized seizure that involves a tonic and clonic phase. The tonic phase typically involves a crying out or groan, a loss of awareness, and a fall as consciousness is lost and muscles stiffen. The clonic phase typically involves convulsion and there is jerking and twitching of the muscles in all four limbs. Usually the movements involve the whole body.

Urinary and bowel control may be lost and there may be shallow breathing, a bluish or gray skin colour, and drooling.

The seizure usually lasts one to three minutes. Awareness is regained slowly.

A postictal state often follows a tonic clonic seizure. This may involve fatigue and confusion and the person may experience a severe headache. Often the person will want to sleep.

Epilepsy Education Series

The Edmonton Epilepsy Association has produced a series of epilepsy educational booklets, including:

Epilepsy: An Overview

Living with Epilepsy

Epilepsy: A Guide for Parents

Let's Learn About Epilepsy:
An Activity Book for Children

Teens and Epilepsy

Epilepsy: A Guide for Teachers

Women and Epilepsy

Seniors and Epilepsy

Epilepsy: A Guide for Professionals and Caregivers

Epilepsy: Seizures and First Aid

Safety and Epilepsy

For more information, or to order copies of these booklets, contact your local Epilepsy Association at 1-866-EPILEPSY (374-5377).

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