

## PART 2:

# RELEVANT ISSUES FOR SCHOOL AND GENERAL STRATEGIES FOR CHILDREN WITH EPILEPSY



## Introduction

Epilepsy is defined as a “disease of the brain characterized by a predisposition to generate epileptic seizures, and by the cognitive, psychological, and social consequences of this condition” (Fisher et al., 2005).

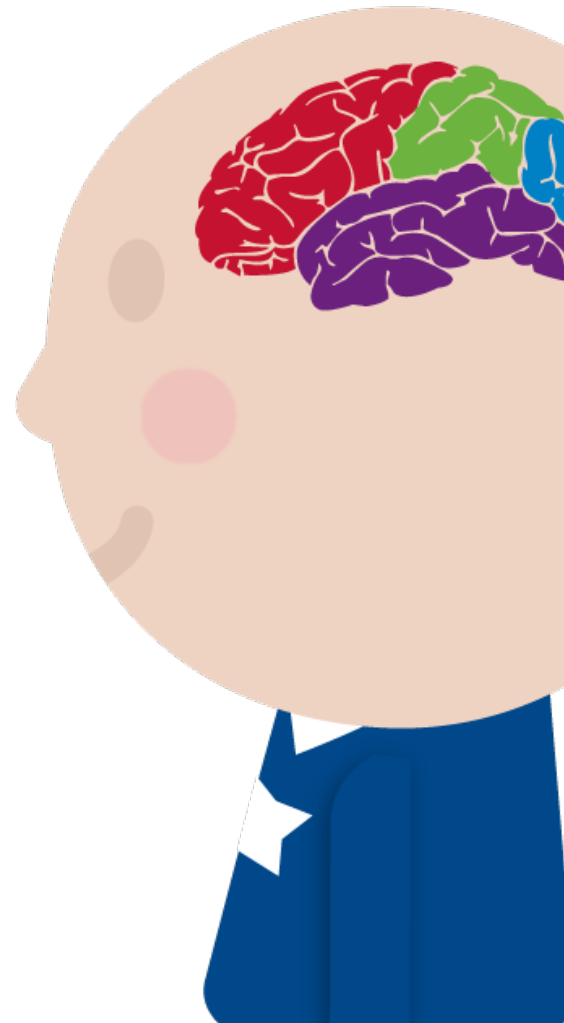
Understanding epilepsy and the cognitive, psychological, and social consequences of the condition is the first step in supporting students living with epilepsy.



## Understanding the brain, seizures, and the impact of seizures on brain function

The human brain contains billions of specialized cells, called neurons. The electrical and chemical signals these cells transmit and receive are at the heart of how the brain functions. Everything we do, think, say, and feel is the result of the signals that are generated by the neurons in the brain.

The brain is often compared to a computer - a processing unit that receives inputs and generates outputs. However, the brain is so much more than a simple input-output device. The brain is a living organ that modifies itself based on the experiences and the interactions we have with our environment. It is the control centre of our thinking, problem solving, consciousness, emotions, physical movement, and social behaviour. Brain cells form new connections when we have new experiences.



# The lobes of the brain

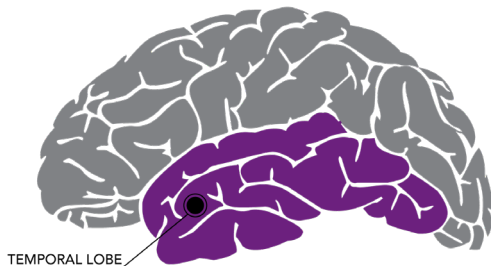
## Frontal Lobe

The frontal lobe provides executive control over the brain's higher functions. Executive functioning is related to self-directed skills, including concentrating on things, planning, organizing, problem solving, as well as cueing ourselves to regulate our emotions and attention, and to use previously learned information.



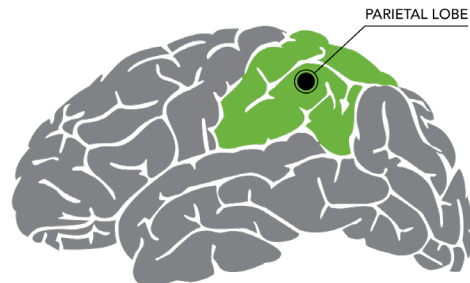
## Temporal Lobe

The temporal lobe helps form longer-term memories. Behaviours, emotions and language comprehension are also associated with structures in the temporal lobe.



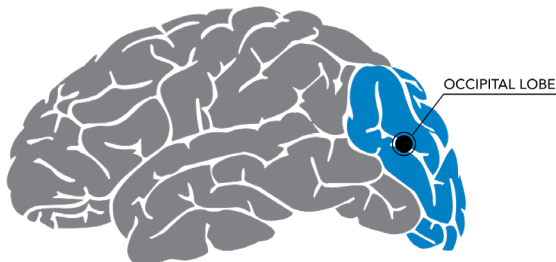
## Parietal Lobe

The parietal lobe helps process sensory information (e.g. touch), left and right orientation, as well as aspects of spatial relationships and language functioning.



## Occipital Lobe

The occipital lobe is involved in visual processing and perception.



## The Brain as a Network

Many parts of the brain work together to support complex functions. There is communication between different parts of the brain to enable us to carry out complex tasks that are important for school success, such as language, attention, reading, and mathematics.

## What is a seizure?

Sometimes the neurons in the brain don't signal properly and cause a sudden burst of electrical energy in the brain or what is known as a seizure.

Seizure symptoms depend on where in the brain the abnormal bursts of electrical activity occurs. Seizures may be observed as a transient change in sensation, movement, behaviour, or consciousness. Because the brain is responsible for a wide range of functions, there are many different types of seizures.

Between seizures, some students continue to have heightened electrical discharges in their brain (called interictal discharges) which are not strong enough to cause a seizure but cause transient issues with attention, thinking, memory, and behaviour.



## Epilepsy is more than recurrent seizures

Epilepsy is a spectrum disorder with varying presentations of:

- (1) Seizure frequency
- (2) Seizure types
- (3) Seizure severity
- (4) Seizure control: some students have good seizure control while others have seizures which are persistent and severe
- (5) Chronicity: some students outgrow their seizures and others do not
- (6) Types of cognitive, psychological, and social problems
- (7) Severity of cognitive, psychological, and social problems

For each student living with epilepsy, the effect a seizure has on their brain function and consequently the related cognitive, psychological (behavioural, emotional), and social abilities will be different. While some students with seizures affecting only one area or lobe of the brain may have very specific problems associated with that lobe, many students with epilepsy experience problems across multiple domains. Students living with epilepsy may be similar to students with other types of neurological damage (e.g., Traumatic Brain Injury).

Some students living with epilepsy will have very few barriers to achievement while others are at risk of poor school performance and poor occupational/academic outcomes as adults.

## Epilepsy is an invisible condition

If a student walked into a classroom with a cast on their arm we would immediately recognize that they had an injury. We would not expect the student to throw a baseball or use a badminton racquet with the injured arm. It would be easy to modify most activities because we could see and understand the impairment.

Students living with epilepsy have an invisible condition. You cannot tell that they have epilepsy unless they are actively having a seizure. It is not possible to see “the cast” on the part of the brain where the seizures originate.

The cognitive, psychological, and social consequences associated with epilepsy are frequently unrecognized (Reilly et al., 2014).

The seizure is the tip of the iceberg. Below the surface of the iceberg lie the invisible or unrecognized consequences: the cognitive, psychological, and social impacts associated with this brain disease.



## Epileptic Seizure

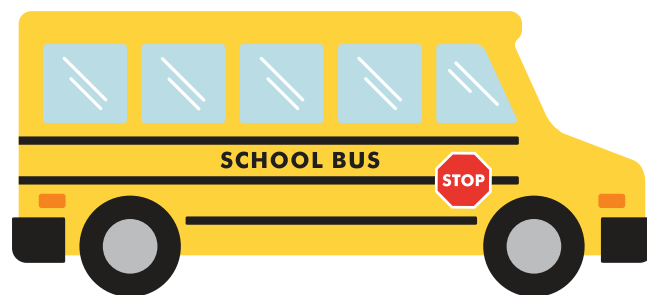
**Cognitive:** Learning Disabilities, Language, Memory, Processing Speed, Fatigue

**Psychological:** Behavioural Challenges, Attention, Hyperactivity, Impulsivity, Depression, Anxiety, ADHD

**Social:** Peer Acceptance, Teasing and Bullying, Social Isolation, Stigma, Adult Overprotection, Restrictions at School

## School attendance

- Students with epilepsy may miss lessons or miss content even when they are present in class.
- They have higher rates of school absenteeism to recover from seizures, attend medical appointments, and to establish new treatments.
- Social factors including embarrassment, teasing, and bullying also impact school attendance.
- Some schools unnecessarily send students home when they have a seizure at school or exclude them from activities due to concerns that they may have a seizure.
- A student who is absent 15 days per school year will have missed the equivalent of one full year of instruction by the end of Grade 12.



## Reducing restrictions at school

While it may seem like limiting a student's physical activity is in their best interest, doing so may actually encourage social isolation and interfere with many opportunities for the student to learn and practice important physical literacy and social skills.

Every effort should be made to include students in physical activities such as gym, recess, lunch, extracurricular sports, and field trips. There is evidence that seizures are less likely to occur if the student is engaged in satisfying and motivating activities, whether they are mental or physical.

Excess adult monitoring and limit setting may actually increase seizure activity.

## Medication side effects

Not all students with epilepsy experience medication side effects.



Side effects are most likely to occur when: a new medication is introduced, the dosage of an existing medication is increased, or when the student is on more than one medication.

Potential side effects of anti-seizure medications may include:

- Fatigue
- Drowsiness
- Slower information processing speed
- Difficulties with attention and memory
- Problems with dizziness and coordination
- Double vision
- Changes in mood, behaviour, and appetite

Developing a communication plan with families is helpful to document seizure activity and observations following medication changes.

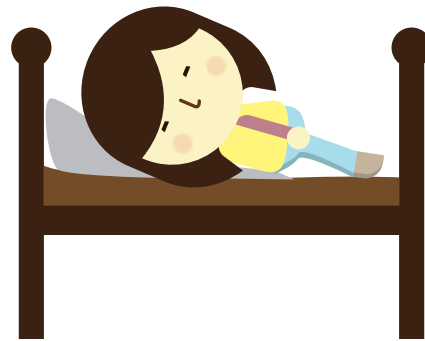
## Fatigue is a consistent complaint of students living with epilepsy

The underlying brain abnormality causing the seizures, the recovery after a seizure, and the medications to treat the seizures can make a student feel exhausted.

Some students have frequent seizures at night causing them to be tired, irritable, or to function poorly the next day.

Students with epilepsy need plenty of sleep and may go to bed earlier than their peers. They may fall asleep in class or nap when they arrive home from school.

Fatigue can make it difficult for students with epilepsy to fully participate in academic endeavours and to concentrate for long periods of time. Fatigue may make it difficult to finish homework or to participate in after-school programs.



## Strategies to help students with fatigue

- ☐ Offer less intensive classes later in the day.
- ☐ Reduce the amount of work you expect the student to complete within a specific amount of time.
- ☐ Offer frequent breaks.
- ☐ Do assessments over a series of several days.
- ☐ Reduce the amount of homework you assign.
- ☐ Reduce the course load for older students.
- ☐ Develop a communication plan with the parent and student to document seizure activity, medication changes and side effects.



## Variability in functioning from day to day is typical

A student's presentation can be variable from day to day and within days.

**Good Days:** You will observe times when a student living with epilepsy is available to learn, engages in discussions, appears to make connections, and displays an even temperament.

**Bad Days:** You may observe other times when the student appears to be readily distracted, has forgotten previously learned information, or may be irritable.

## Without support, what does the future hold?

The potential trajectory for children with epilepsy is demonstrated through adult outcome data:

Studies around the world indicate that in adulthood, people living with epilepsy have:

- Lower education
- Higher unemployment
- Higher rates of poverty
- Higher rates of unplanned pregnancy
- Higher rates of mental health problems

In Canada, the projected indirect economic costs due to premature death and disability in epilepsy are approximately \$3 billion in a year, second only to brain injury among all neurological conditions (PHAC, 2014).

*For students living with epilepsy, school education and learning represent the primary interactive biopsychosocial components associated with their health outcomes.*

Providing school-based support to students with epilepsy has the potential to reduce the challenges of epilepsy on the student, their family, and the school community. Developing skills and confidence in the early years may alter the negative trajectory for the student with childhood-onset epilepsy.

### References:

Fisher RS, Van Emde Boas W, Blume W, Elger C, Genton P, Lee P, Engel Jr J. Epileptic Seizures and Epilepsy: Definitions Proposed by the International League Against Epilepsy and the International Bureau for Epilepsy. *Epilepsia*, 46(4):470–472, 2005.

PHAC (2014). Public Health Agency of Canada, & National Population Health Study of Neurological Conditions (Canada), (2014). Mapping connections: An understanding of neurological conditions in Canada

Reilly, C., Atkinson, P., Das, K. B., Chin, R. F., Aylett, S. E., Burch, V. & Neville, B. G. (2014). Academic achievement in school-aged children with active epilepsy: A population-based study. *Epilepsia*, 55(12), 1910-1917.



## General strategies for teachers to improve school success

### Checklist:

- ☐ Meet with the parents to understand the child's epilepsy and to develop a plan of care.
- ☐ Empower the student who had the seizure by engaging them in the discussion on what to do and how it feels to have epilepsy.
- ☐ Invite a community-based epilepsy educator to provide you and your colleagues with an epilepsy professional development session.
- ☐ Invite a community-based epilepsy educator to provide age-appropriate videos or presentations explaining epilepsy and seizure first aid to the entire class.
- ☐ Ensure that the entire class understands what to expect when a classmate has a seizure and how they can help.
- ☐ Minimize known seizure triggers: heat, dehydration, flashing/flickering lights, stress, changes in temperature, overexertion fatigue in the classroom.
- ☐ Provide a rest area.
- ☐ Prevent social and emotional challenges by providing proper information to the class following the occurrence of a seizure.
- ☐ Promote social interaction.
- ☐ Keep the child in class following a seizure so they can develop social and emotional coping skills.
- ☐ Participate in epilepsy awareness programs, Purple Day for epilepsy, international days and fundraisers.