



Etiology

Seizures occur due to sudden, abnormal electrical activity in the brain and result in temporarily altered behaviour. The causes of seizures can include hypoxia or low blood sugar, brain diseases such as epilepsy, tumours, head trauma, alcohol, drugs, and eclampsia. Alternatively, the cause may be idiopathic (unknown).

Types of Seizures

1. Generalized seizures which are a result of abnormal activity on both sides of the brain include:
 - a. Tonic-clonic or grand mal seizure – generalized motor seizure producing a loss of consciousness, and includes a postictal phase after the seizure has finished during which the patient may be confused and fatigued.
 - b. Absence or petit mal seizure – brief loss of consciousness with occasional loss of muscle tone.
 - c. Pseudoseizures – a physical manifestation of an emotional or psychological disturbance; not caused by electrical disruptions in the brain.
2. Partial seizures present with localized malfunction and may be either:
 - a. Simple or focal – dysfunction of one area of the body (e.g. lip smacking, eye twitching).
 - b. Complex – characterized by distinctive auras including unusual smells, tastes, sounds, or visual disturbances.

Status epilepticus is a condition where two or more generalized motor seizures occur without regaining a normal level of consciousness in-between. It may involve a prolonged period of apnea which may result in severe hypoxia.

Most patients experiencing a seizure will lose consciousness and some will vomit and/or experience incontinence. The focus of the Medical First Responder is to ensure patient safety, prevent injury, and ensure airway patency.

MFR Management

- Do not attempt to restrain the patient.
- Move furniture and other objects away from the patient.
- Consider c-spine precautions because the patient may have fallen when the seizure began.
- Provide high-flow oxygen (if trained and equipped) as soon as possible.
- Patients may become combative as they recover from the seizure.
- Document the duration of the seizures and the areas of the body involved.
- Acquire a blood glucose level.

Interventions**Airway Management**

1. Ensure patient positioning, oxygen administration and suctioning as needed are the priorities in a seizing patient.
2. Do not attempt to place anything in the patient's mouth to protect or guard the airway beyond suction as needed, if safe to do so.

3. Consider airway management post-seizure if patient is unable to maintain airway or if aspiration suspected during seizure. NPA (if not contraindicated) may be better tolerated by a postictal patient with airway compromise. Consider other airway management tools as needed, within scope of practice.

Identifiable Causes

1. Hypoglycemia
 - a. A sudden drop in blood sugar may result in seizure activity. If qualified, obtain a blood glucose level earlier rather than later.
 - b. Treat hypoglycemia according to the Adult Hypoglycemia Protocol.
2. Eclampsia
 - a. The most serious presentation of pregnancy-induced hypertension.
 - b. Characterized by generalized motor seizure activity often preceded by visual disturbances.
 - c. Risk of fetal mortality increases by 10% with each seizure.

Important History Questions

It may help to gather some pertinent history about the patient. For example:

- Does the patient have a known neurological disorder such as epilepsy, traumatic brain injury or tumour?
- Has the patient ever experienced a seizure before? How long did it last?
- Have they ever had more than one seizure in a row?

Finding out any other pertinent medical history is important.

- Is the patient diabetic? Is there a history of cancer? If so, what kind? Has the patient used any drugs or alcohol recently? Is there a history of substance abuse?
- If another seizure begins or if the patient is still seizing after MFR arrival, consider asking dispatch to convey this information to the EMS dispatchers.

Special Circumstances – Pediatric seizures

While this MCP may not differ for pediatric patients, it is worthwhile to note that the most common cause of seizure in pediatric patients is a fever. These seizures are referred to as febrile (fever) seizures and between two and five per cent of children will experience one before the age of five.

Pediatric seizures can be an especially frightening experience for parents or caregivers, especially if the patient continues to seize while awaiting EMS arrival and after a seizure resolves. Like older patients after a seizure, pediatric patients typically experience a postictal phase and may be very sleepy, unconscious or confused and uncoordinated.

Many parents may be under the assumption that a fever must be very high in temperature before causing a seizure, but research has revealed this is not the case. Febrile seizures can occur even with mild fevers. It may be important to reassure the parent they have done nothing wrong. If a febrile seizure is suspected as the cause, medical first responders may also want to ensure the patient's clothing or blankets are removed to passively cool them while awaiting the arrival of EMS.

What to expect when the EMS crew arrives

While it is always a good idea to ensure there is room to maneuver and work around a patient, this is especially important for seizure patients as their movements can be erratic. If the patient is still seizing, the crew may administer an intramuscular injection immediately or they may initiate an IV (or use the IV access initiated by the MFR crew) to administer the anti-seizure medication through. Some patients may experience multiple seizures while others may have only one. Patients with a history of seizure disorders may know what to expect and may choose not to be transported to hospital by the incoming EMS crew.

Patient Experience Considerations

- Most patients with seizure disorders are well-managed and only require supportive care during and post seizure.
- A seizure can be a frightening episode to witness. The unusual behaviour resulting from the seizure can be misinterpreted as an aggressive act. This may invoke a hostile response or police involvement, where there was no intention to cause harm or trouble.