H&H Care SA Pty Ltd

UNDERSTANDING EPILEPSY AND SEIZURE FIRST AID: A COMPREHENSIVE GUIDE

Neurological conditions affecting electrical activity in the brain remain widely misunderstood by the public. Understanding the fundamental differences between a seizure and epilepsy, recognizing various seizure presentations, knowing accurate diagnostic pathways, and mastering first aid responses are essential skills that foster safe, supportive environments for individuals living with epilepsy.

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1. What is the Difference Between a Seizure and Epilepsy?

Though frequently used interchangeably, a **seizure** and **epilepsy** refer to distinct clinical concepts:

- **A Seizure** is a single event - a temporary, involuntary surge of electrical disruption in brain neurons that alters movement, behaviour, sensation, or awareness. A seizure is a symptom rather than a chronic disease in itself. Anyone can experience a single seizure under specific physiological triggers (e.g., high fever, low blood sugar, severe head trauma, or drug toxicity).
- **Epilepsy** is a chronic neurological disorder characterized by a persistent predisposition to generate recurrent, unprovoked seizures. A person is generally diagnosed with epilepsy when they have had two or more unprovoked seizures occurring more than 24 hours apart, or one unprovoked seizure with a high risk of recurrence over the next 10 years.

Feature	Seizure	Epilepsy
Definition	A single transient episode of abnormal electrical brain discharge.	A chronic neurological condition defined by unprovoked, recurring seizures.

Feature	Seizure	Epilepsy
Cause	Can be provoked (fever, metabolic imbalance) or unprovoked.	Underlying structural, genetic, metabolic, or unknown brain factors.
Frequency	Single or isolated occurrence.	Recurrent episodes over time.
Treatment Focus	Identify and resolve acute underlying triggers.	Long-term anti-seizure medication (ASM) and lifestyle management.

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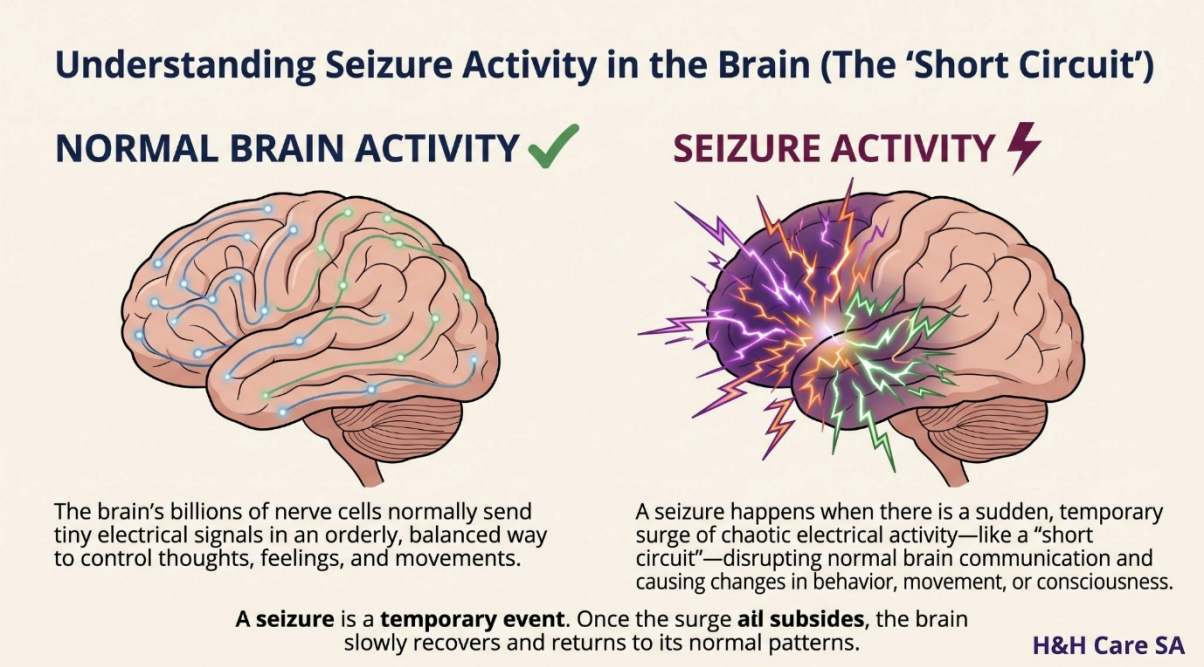
2. What is a Seizure? Understanding Brain Electrical Activity

The human brain contains billions of nerve cells (neurons) that communicate using controlled electrical and chemical impulses. During normal activity, these signals flow in an organized, balanced manner to control thoughts, movement, sensation, and autonomic functions.

A seizure occurs when a group of neurons suddenly fires at abnormally high, synchronized speeds. This temporary "electrical short circuit" disrupts normal brain communication, leading to physical convulsions, lapses in consciousness, sensory distortions, or involuntary movements.

Brain Activity Illustration (The "Short Circuit")

In a healthy state, electrical signaling follows smooth, regulated pathways. During a seizure, a sudden burst of hyper-synchronous electrical activity spreads across a localized region or the entire cortex, causing temporary functional disruption until normal inhibitory signals restore balance.



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3. Categorizing Seizures: Generalized vs. Focal

Medical professionals classify seizures into two primary categories based on where the electrical disturbance begins in the brain:

A. Generalized Seizures

Generalized seizures involve abnormal electrical discharges affecting both hemispheres (sides) of the brain simultaneously from the onset. Consciousness is almost always impaired or lost immediately.

- **Tonic-Clonic Seizures (formerly Grand Mal):** The most recognizable type. Begins with a stiffening phase (tonic) where the person may cry out and fall, followed by rhythmic jerking of limbs (clonic). Respiration may temporarily slow or become labored.
- **Absence Seizures (formerly Petit Mal):** Brief (5–10 second) lapses in awareness, often mistaken for daydreaming. The person suddenly stares blankly into space, sometimes with subtle eye blinking or lip smacking, then immediately resumes activity without confusion.
- **Atonic Seizures (Drop Attacks):** Sudden loss of muscle tone causing the individual to collapse abruptly to the floor, posing a risk of facial or head injuries.
- **Myoclonic Seizures:** Brief, shock-like muscle jerks or twitches, usually affecting the upper arms, shoulders, or legs, lasting only a fraction of a second.

B. Focal Seizures (Partial Seizures)

Focal seizures originate in a specific, localized area or network within one hemisphere of the brain. The symptoms experienced depend directly on the region of the brain involved.

- **Focal Aware Seizures (Simple Partial):** The person remains conscious and fully aware of their surroundings while experiencing involuntary symptoms, such as muscle twitching, sudden emotional rushes (unexplained fear or joy), tingling sensations, or distorted tastes/smells.
- **Focal Impaired Awareness Seizures (Complex Partial):** Awareness is altered or lost. The person may appear conscious but is unresponsive or confused, often engaging in repetitive, automatic behaviors (automatisms) like chewing, rubbing hands, pulling at clothes, or aimless wandering.
- **Focal to Bilateral Tonic-Clonic:** A seizure that begins in a localized focal zone and subsequently spreads across both hemispheres, evolving into a generalized tonic-clonic convulsion.

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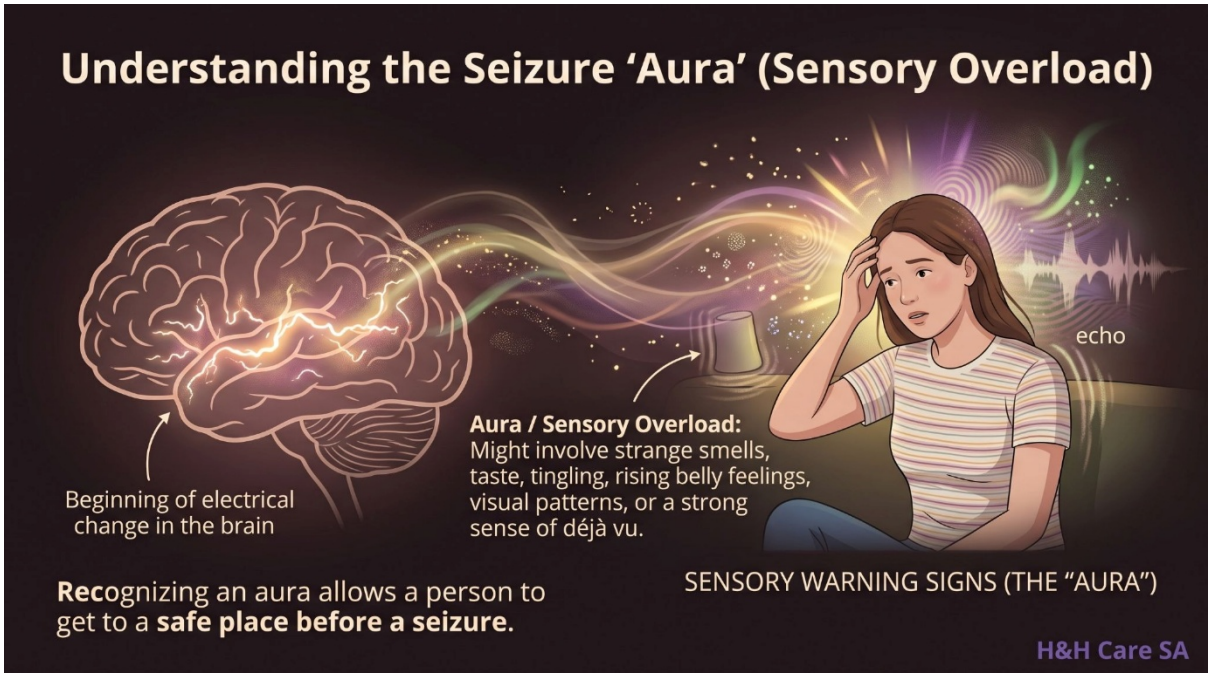
4. Seizure Descriptions and Sensory Experiences: The "Aura"

Before an overt focal or generalized seizure occurs, some individuals experience early warning sensations known clinically as an **aura**. An aura is technically a focal aware seizure that serves as an early indicator of electrical change in the brain.

Understanding the "Aura" / Sensory Overload Illusion

During an aura, the individual may experience visual distortions (flashing lights, swirling patterns), auditory echoes, intense deja vu, sudden nausea, or rising epigastric sensations. Recognizing an aura allows an individual to move to a safe position - such as sitting or lying down on a soft surface - before consciousness is altered or physical

convulsions begin.



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5. What is Epilepsy & How is it Diagnosed?

Epilepsy is a spectrum condition with diverse causes, ranging from genetic predispositions and developmental conditions to brain injuries, stroke, or tumors. Diagnostic evaluation requires a thorough clinical approach by a neurologist.

Diagnostic Steps:

1. **Detailed Clinical History:** Gathering eyewitness descriptions and precise timelines of the seizure event, including pre-seizure feelings, physical movements, duration, and post-seizure recovery state (postictal phase).
2. **Electroencephalogram (EEG):** A non-invasive test recording electrical activity in the brain via scalp electrodes. It identifies abnormal wave patterns or epileptiform discharges that help classify seizure types.
3. **Neuroimaging (MRI / CT Scans):** Magnetic Resonance Imaging (MRI) produces detailed structural images of the brain to detect anatomical causes, such as scar tissue, vascular malformations, tumors, or developmental abnormalities.
4. **Blood & Laboratory Testing:** Screening to rule out metabolic imbalances, electrolytes disruptions, infections, or toxins as acute triggers.

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6. Core Action First Aid Steps: Stay, Safe, Side

Providing correct, calm first aid during a seizure prevents secondary injuries and ensures clear airways. Follow the core three-step response:



Step 1: STAY (Calm & Time the Seizure)

Remain calm and stay with the person. Check your watch or phone immediately to track the duration of the seizure. Reassure observers and maintain a quiet, supportive environment.

Step 2: SAFE (Protect Head & Clear Hazards)

Protect the individual from physical injury. Gently place a soft folded jacket, pillow, or small cushion under their head. Move hard, sharp, or hot objects (chairs, tables, coffee cups) away from their immediate vicinity.

Step 3: SIDE (Gently Roll onto Side Once Shaking Stops)

Once active convulsive shaking subsides, gently roll the person onto their side into the recovery position. Ensure their mouth is pointing downward to allow saliva or fluid to drain freely, keeping their airway clear and unobstructed.

The Recovery Position Protocol

1. **Prepare:** Kneel beside the person. Place the arm closest to you at a right angle (90 degrees) with the palm facing upward.
2. **Position:** Bring their far arm across their chest, placing the back of their hand against their cheek. Bend their far knee upwards.

3. **Roll:** Gently roll them toward you onto their side by pulling on their bent knee and shoulder.
4. **Secure:** Adjust the top leg so the hip and knee are at right angles to support their body safely. Tilt the head back slightly to ensure an open airway.



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7. WHAT NOT TO DO During a Seizure (Critical Safety Warnings)

Outdated myths surrounding seizure first aid can cause serious injury. Always adhere to these negative constraints:

- **NEVER force anything into their mouth:** Contrary to popular myth, a person cannot swallow their tongue during a seizure. Forcing objects (spoons, wallets, fingers, or water) into their mouth can shatter teeth, cause severe jaw lacerations, or block their airway.
- **NEVER restrain their movements:** Do not try to hold the person down, pin their limbs, or stop their shaking. Restraint can lead to torn muscles, joint dislocations, or bone fractures.
- **NEVER give food, drink, or oral medication:** Do not offer food or liquid until the person is fully awake, conscious, and alert to prevent choking and aspiration.



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8. Medical & Practical Context: When to Call Emergency Services

While many seizures resolve naturally within 1 to 3 minutes without medical intervention, emergency medical help (calling 000) is required under specific conditions:

- The seizure lasts longer than **5 minutes**.
- A second seizure occurs immediately after the first without the person regaining consciousness in between.
- The person remains unresponsive or has difficulty breathing for an extended period after the shaking stops.
- The seizure occurs in water (such as a swimming pool or bathtub).
- The person is pregnant, injured, or has diabetes.
- It is the person's first known seizure.

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9. Inclusive Care and Daily Life Scenes

Living with epilepsy or supporting someone who does involves structured safety planning alongside empathy and social inclusion. Person-centered care providers focus on maintaining personal autonomy, dignity, and active community participation while implementing individualized Seizure Action Plans (SAPs).



Through community education, proper first-aid training, and accessible support systems, individuals with epilepsy can lead fulfilling, independent, and secure lives.