Clinical Practice Guidelines: Neurological/Seizures

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<th>Date</th>
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<td>Purpose</td>
<td>To ensure consistent management of patients with Seizures.</td>
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<td>Scope</td>
<td>Applies to all QAS clinical staff.</td>
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A seizure is defined as a transient disturbance of cerebral function caused by abnormal neuronal activity in the brain. Patient presentation may range from obvious convulsions to abnormal behaviours or subjective experiences.

Epilepsy is a disorder of brain function that takes the form of recurring seizures and is due to many diverse aetiologies.

Seizures can broadly be characterised as focal or generalised.

Focal seizures – where the abnormal neuronal activity originates and is limited to one hemisphere of the cerebral cortex. Seizure symptoms are representative of the area of the cerebral cortex where the abnormal neuronal discharge exists. Focal seizures can evolve to become bilateral convulsive seizures.

- **Focal** – seizure activity that does not impair awareness or responsiveness.
- **Focal dyscognitive** – seizure activity where the level of awareness or responsiveness is reduced but full consciousness is not lost.

Generalised seizures – where the abnormal neuronal activity rapidly engages both hemispheres of the cerebral cortex. Several types of generalised seizures exist:

- **Absence** – brief loss of awareness and responsiveness (usually < 10 seconds) with no post-ictal phase.
- **Atonic** – sudden loss of muscle tone that (usually lasts < 2 seconds) and results in a sudden fall.
- **Tonic** – sudden increased muscle tone that most often occurs in clusters during sleep (usually lasts seconds to minutes).
- **Myoclonic** – a brief, sudden jerking action of a muscle or muscle group (lasting milliseconds only) that may occur in a series leading into a tonic clonic seizure.
- **Tonic clonic** – an abrupt loss of consciousness that is concurrent with involuntary muscular contractions (tonic phase) followed by symmetrical jerking movements (clonic phase). Typically lasts for 1–3 minutes after which the patient experiences a post-ictal period.

Status epilepticus – is a medical emergency defined as seizure activity > 5 minutes in duration or recurrent seizure activity where the patient does not recover to a GCS of 15 prior to another seizure.

Seizure triggers in epilepsy include:

- Lack of sleep, stress
- Sudden stopping or changing medications
- Fever, infection
- Diarrhoea and vomiting, dehydration
- Alcohol/Illicit drug use
- Menstruation
- Photosensitivity
- Extreme temperatures, particularly heat
- Electrolyte disturbances.
Psychogenic non-epileptic seizures (PNES) – previously known as pseudoseizures, are episodic behavioural events that mimic seizure activity but are not epileptic seizures.[6] PNES arise due to different factors in different individuals. If doubt exists to seizure causation, the administration of midazolam is appropriate.[7]

Provoked seizures – result from a recognisable cause. Examples include:

- Hypoxia and hypercarbia
- Hypotension
- Metabolic (hypoglycaemia, hyponatraemia, hypocalcaemia, hyperthyroidism, uraemia)
- Pregnancy – eclampsia
- Meningitis/encephalitis
- Hyperthermia/febrile convulsions
- Drugs/toxins (intoxication/withdrawal)
- Cerebral pathology (e.g., tumour, stroke, trauma).

Clinical features

Typical presentations in seizures[2]

- Visual hallucinations
- Localised twitching of muscles without impaired consciousness
- Localised tingling and numbness
- Nonsensical speech
- Disorientated movements
- Sudden pause in activity or fixed gaze
- Nystagmus
- Automatism
- Increase or loss of tone
- Alternating tonic/clonic posturing
- Incontinence
- Post-ictal: confusion, fatigue, headache, nausea

Prolonged seizures or status epilepticus are associated with:

- Hypoxia, hypercarbia
- Progressive lactic and respiratory acidosis
- Hyperthermia, hypertension, tachycardia
- Hypo/hyperglycaemia
- Hyperkalaemia.
- Patient history should include any causes, past history, duration of seizure, and whether or not it had a focal onset and if so the features of the focal onset.
- Provoked seizures require concurrent treatment of both the seizure and the underlying cause.
- Focal seizure activity in a patient who is unconscious or has an ALOC with GCS \( \leq 12 \) should be managed as a generalised seizure. For patients with a GCS > 12, officers should discuss treatment options with the QAS Clinical Consultation and Advice Line.
- Seizure activity may manifest differently in children,\(^8\) including:
  - Vacant stare
  - Lack of gross muscle tonicity
  - Nystagmus, lateral fixed gaze and/or facial muscle twitching.

Consider:
- Reversible causes
- Oxygen
- Posturing
- PNES

Note: Officers are only to perform procedures for which they have received specific training and authorisation by the QAS.