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Happy Learning!

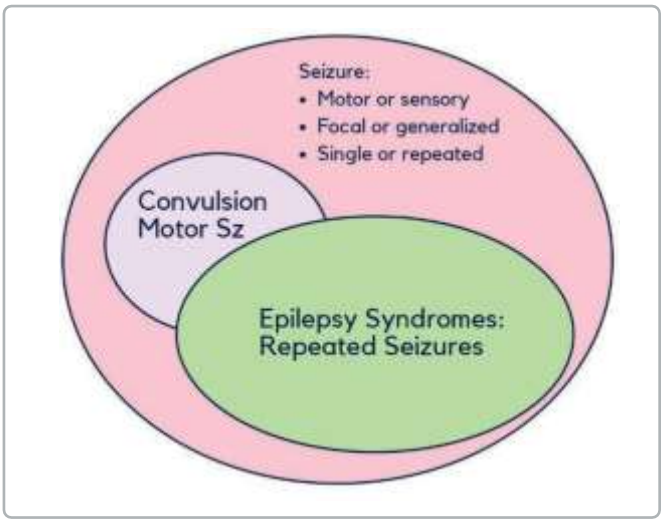
EPILEPSY PART - 1 CLASSIFICATION & DIAGNOSIS

DefINITIONs

00:01:20

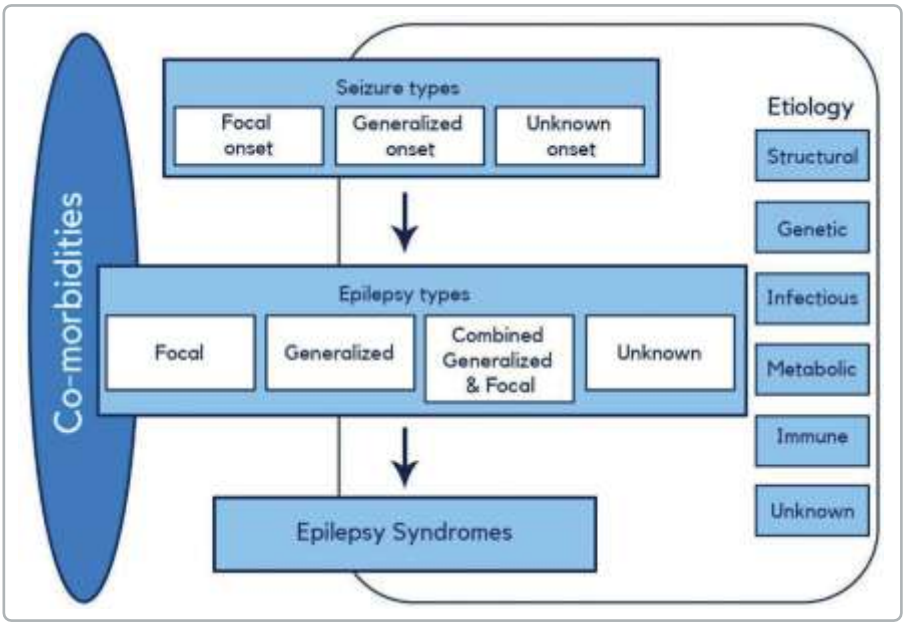
Seizure

- The word seizure is derived from the Latin term "sarkar", meaning "to take possession of".
- Defined as a transient occurrence of signs and/or symptoms due to abnormal, excessive, and synchronous neuronal activity in the brain.
- It can be motor, sensory, focal, generalised, or secondary generalised, and may occur as single or repeated episodes.



Convulsion

- Refers specifically to the motor external manifestations of a seizure.
- All motor manifestations are described under the term convulsion.



Epilepsy (ILAE - International League Against Epilepsy Definition)

- Diagnosis is made when any one of the following criteria is met:
  - Two unprovoked seizures occurring ≥ 24 hours apart.
  - One unprovoked seizure with abnormal imaging, clinical, or electrographic findings that indicate a high risk of recurrence (≥ 60% risk of another episode within the next 10 years).
  - First seizure with features suggestive of a specific epilepsy syndrome.

Status Epilepticus (SE)

- Seizures that are prolonged without regaining consciousness in between episodes.
- Includes:
  - Generalised tonic-clonic seizure lasting > 5 minutes.
  - Focal seizure lasting > 30 minutes.

Classification of Seizures and Epilepsy

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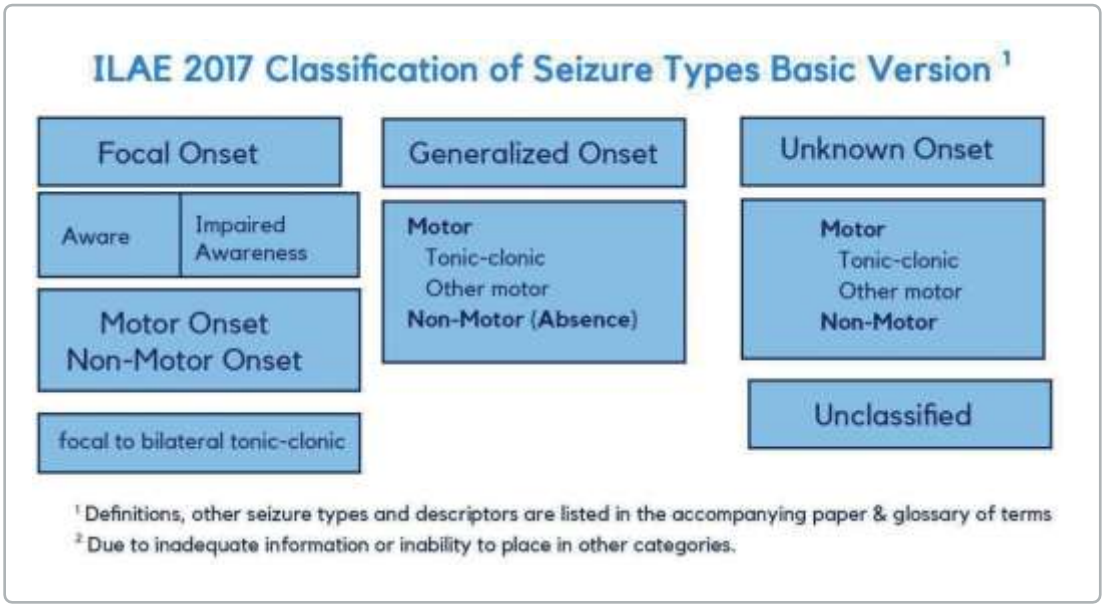
Latest ILAE (2017) Classification

- Seizures are categorised based on their onset.



Semiology (Description of Seizure Pattern)

00:07:30

Prodromal / Aura Phase

- Definition: Symptoms or signs felt just prior to or at the onset of a seizure.
- Often a sensory phenomenon:
  - Paresthesia (somatic)
  - Déjà vu / Jamais vu (psychic)
  - Special senses involvement - visual, gustatory, auditory

Ictal Phase (Actual Seizure Event)

Type	Description
Tonic seizure	Sustained muscle contraction
Clonic seizure	Sustained contraction interrupted by periodic relaxation
Tonic-clonic seizures	A combination of tonic and clonic phases
Myoclonic	Brief jerks
Atonic	Brief loss of composure, sudden fall
Automatisms	Stereotypic movements such as grabbing, lip smacking, staring (often in hypo-motor seizures)

Post-Ictal Phase (After the Seizure)

Feature	Description / Cause
Amnesia	Transgrade or retrograde; inability to recall the event
Todd's Paresis	Post-seizure inhibition of the motor cortex → weakness in a body part
Aphasia / Dysarthria	Due to the language cortex inhibition
Post-ictal sensory symptoms	Blindness, auditory, or gustatory deficits due to inhibition of respective cortices
Autonomic phenomena	Vomiting, urinary incontinence
Post-ictal psychosis	Aggressive behaviour, unresponsiveness, and confusion

Focal Vs Generalised Seizures

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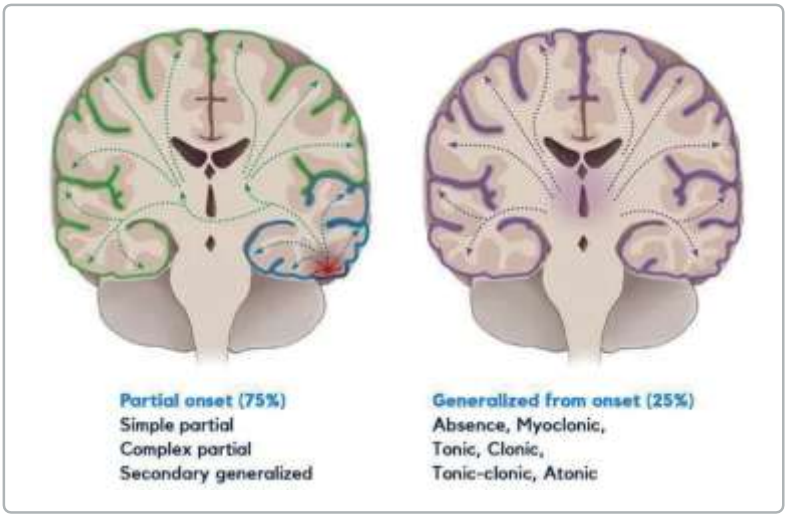

Epileptogenesis

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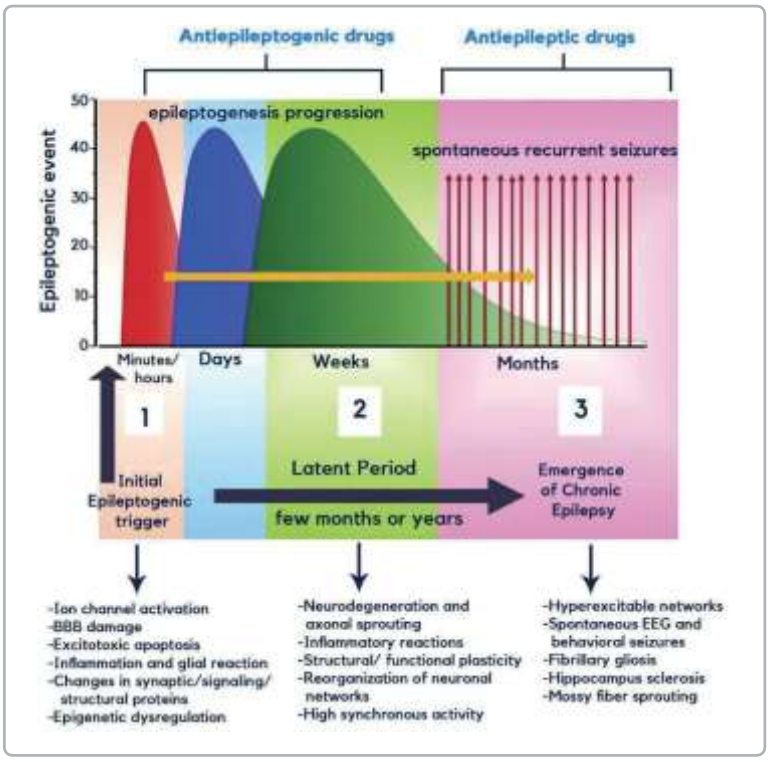
- Initial Trigger: Examples include trauma and febrile seizures.
- Early Changes: Subcellular alterations and changes in neuronal architecture lead to the occurrence of initial symptomatic seizures.



- Latent Phase: No outward seizures occur during this period; however, internal neuronal plasticity changes occur, leading to the formation of new network connections that heighten the risk of future seizure recurrence.
- Chronic Phase: Development of habitual seizures due to the persistence of newly formed epileptic networks, resulting in repeated seizure episodes.

Epilepsy Syndromes

00:13:35

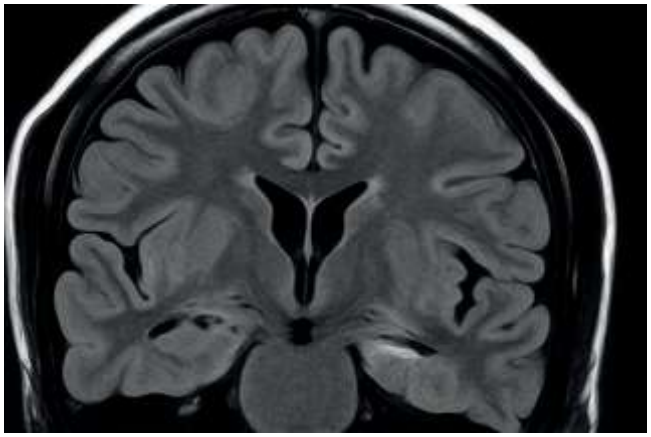
Focal Aware Seizure (formerly Simple Partial)

- Awareness: Patient remains aware during the event.
- Symptoms: Often sensory (e.g., tingling) or motor (e.g., jerking).
- Jacksonian March: Seizure activity may propagate across the motor cortex.

- Post-Ictal Feature: ToddCs paresis (weakness after seizure) may occur.
- Investigations:
  - EEG: May show focal spikes.
  - MRI/CT: Can detect structural causes such as calcification or sclerosis.

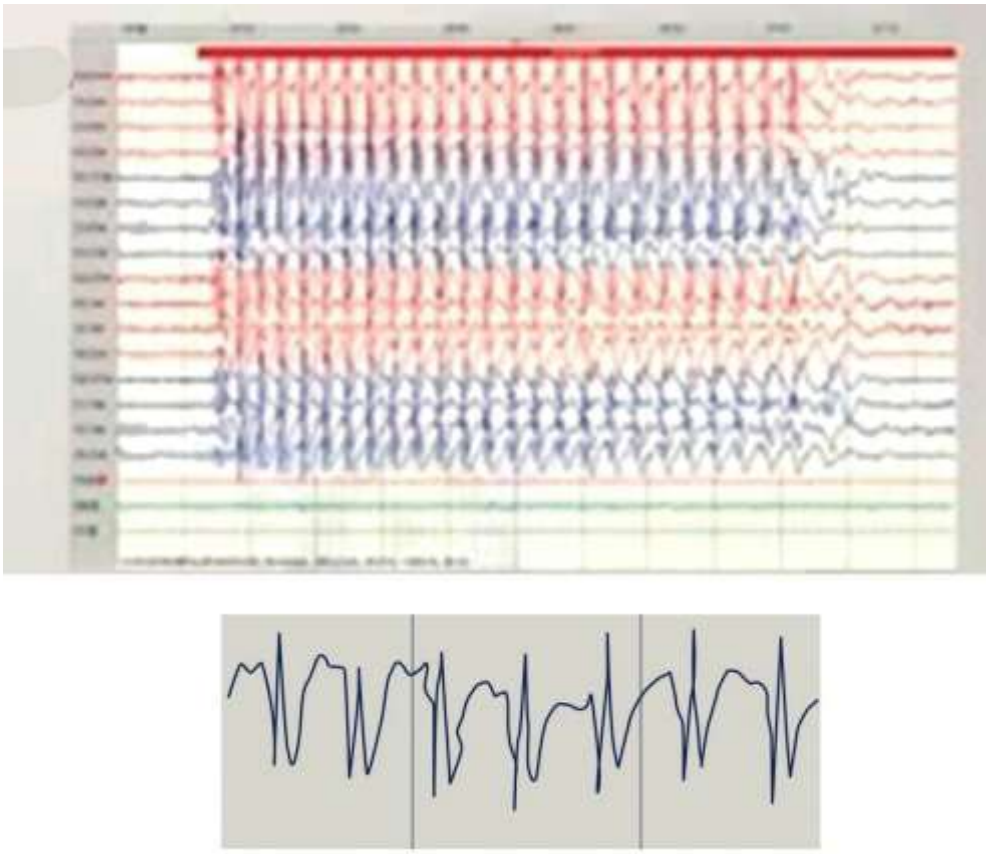
Focal Unaware Seizure (formerly Complex Partial)

- Awareness: Impaired awareness, often with unresponsiveness and automatisms.
- Common Association: Medial Temporal Lobe Epilepsy (MTLE), often linked to a history of febrile seizures in childhood and hippocampal sclerosis.
- Memory: Patients are usually amnesic about the event.
- MRI Finding: Atrophic hippocampus.



Absence Epilepsy (Generalised Onset Non-Motor)

- Presentation: Brief, abrupt lapses of consciousness, often in children, characterised by gazing or daydreaming.
- Motor Tone: No loss of tone unless standing unsupported.
- Trigger: Can be precipitated by hyperventilation.
- EEG: Classically shows 3 Hz spike-and-wave discharges.
- Childhood Absence Epilepsy: Normal cognition and an EEG background.



- Atypical Absence Seizures: Slower EEG (2–2.5 Hz), may be associated with cognitive slowing.

Generalised Tonic-Clonic Seizure (GTCS)

- Phases:
  - Tonic: Stiffening of the entire body, often with falling.
  - Clonic: Brief, repeated jerking movements.
- Post-Ictal Phase: Often includes amnesia, tongue bite, and urinary incontinence.
- Triggers: May be provoked by alcohol intoxication.

Juvenile Myoclonic Epilepsy (JME)

- Age Group: Common in adolescents (12-18 years).
- Seizure Types:
  - Myoclonic jerks (especially in the morning).
  - Generalised tonic-clonic seizures.
  - Sometimes, there are absence seizures.
- Triggers: Sleep deprivation, physical strain.
- Clinical & Imaging: Normal examination, cognition, and imaging.
- Treatment: Responds well to valproate, levetiracetam, and clonazepam.
- Caution: May worsen with sodium channel blockers (e.g., carbamazepine).

Atonic Seizures

- Presentation: Sudden loss of posture, leading to abrupt falls and potential injuries.
- Types:
  - Focal: e.g., head drop.
  - Generalised: Entire body affected.

Epileptic Spasms

- Description: More sustained flexion or extension of the trunk or proximal limbs; often involves the head, neck, and proximal muscles.
- EEG: Classically shows hypsarrhythmia (generalised high-amplitude spiking and slow waves).
- Common Syndrome: Seen in West Syndrome.

Etiological Reasons By Age Group

00:30:05

Age Group	Common Causes
Infancy / Early Childhood	– Perinatal complications – Genetic causes
Late Adolescence / Early Adulthood	– Acquired causes such as post-traumatic, metabolic, or immune-mediated conditions (e.g., encephalitis)
Elders (beyond 60-75 years)	– Cerebrovascular accidents (strokes, especially ischemic) – Neoplastic causes (cancer) – Paraneoplastic causes – Neurodegenerative disorders (e.g., Alzheimer's disease)

Etiologies

- Structural conditions: Tumours, lesions
- Genetic variants
- Infections: Tuberculosis, neurocysticercosis
- Metabolic disorders: Hypercalcemia, hypoglycemia
- Immune-mediated seizures: Autoimmune encephalitis
- Unknown causes: Idiopathic/cryptogenic

Approach To A patient With Seizure

00:31:00

1. Initial Stabilisation

- Stabilise the patient - follow ABC (Airway, Breathing, Circulation) first.

2. Detailed History Taking

- Demographics: Age, gender, handedness (important for language/memory impact).
- Onset & Pattern: Time of onset (nocturnal/daytime), frequency, past similar events, temporal correlation.
- Event Description: Detailed description of prodromal, ictal, and post-ictal phases.
- Triggers/Precipitating Factors: Sleep deprivation, intoxication, etc.
- Associated Medical History: Comorbidities, addictions, perinatal/childhood history, and family history.
- Medication History: Anti-seizure medication compliance, missed doses, and drug interactions.

3. Clinical Evaluation

- General Examination: Look for injuries (tongue bite, dislocations, falls).
- Neurological Examination: Post-ictal paresis, focal deficits, residual changes from trauma/stroke.

4. Investigations

- Immediate biochemical tests: Glucose, alcohol level, toxicology screen.
- Routine labs: Hemogram, LFT, RFT, electrolytes, CBG.
- EEG: Within 24-48 hours for maximum yield.
- Neuroimaging: CT or MRI (availability & patient status) to rule out structural lesions.
- CSF Evaluation: Optional; indicated in suspected infective or autoimmune causes.
- Drug Levels: For anti-seizure drugs, if withdrawal is suspected.

Management plan

00:33:57

1. Distinguish Epileptic vs. Non-Epileptic Events

- Non-epileptic paroxysmal events:
  - Transient ischemic attacks.
  - Sleep-related behaviours.
  - Metabolic disorders (e.g., hypoglycemia).
  - Movement disorders.
- Psychogenic Non-Epileptic Seizures (PNES): Mimic epilepsy due to psychological causes; rule out medical causes, then manage with psychotherapy.

2. Treatment of Epilepsy

- If multiple seizures or a history of similar episodes → classify as epileptic → assign epilepsy syndrome → start anti-seizure medication (ASM).
- For the first seizure episode:
  - Evaluate for symptomatic/precipitating causes (metabolic, intoxication, structural lesions).
  - If the cause is treatable & recurrence risk is low → may not treat.
  - If recurrence risk is high → classify as epileptic → initiate ASM with proper selection & dosage.

3. Goal of Treatment

- Better seizure control.
- Improve the quality of life in people with epilepsy.