Seizures

Definition / Supporting Information

The terms seizure disorder and epilepsy are synonymous and are applied to the condition in which a tendency for recurrent, unprovoked seizures exist. A seizure should be considered a symptom of systemic or central nervous system (CNS) dysfunction.

When initially considering the child with a potential seizure disorder, an open mind should be kept as to whether the events in question are epileptic are not.

When taking the history of the paroxysmal events, the exact number of different events recognised by the parents or carers should be determined, along with what the parents or carers call each different event. A paroxysm is defined as a sudden attack or outburst.

It should be recognised that children may present with a combination of epileptic and non-epileptic paroxysmal events.

Keywords / also known as: convulsion, electrical disturbance, epilepsy, fit

Essential History

Ask about:

- Age and sex
- Detailed description of the paroxysmal event, including any observer history. This should be tailored to the age of the baby, child or young person
  - Presence of prodrome, if possible to elicit with particular reference to visual disturbance, palpitations or chest pain
  - Was the child asleep, waking or awake when the event began?
  - What did the movements during the episode look like, and, if more than one body part was involved, were the movements in different body parts synchronous or asynchronous?
  - Were the movements during the episode tonic, clonic, or both?
  - Were there any myoclonic jerks?
  - Any loss of consciousness or altered consciousness?
  - Extent of body involvement (face, limbs) and presence of bowel or bladder incontinence
  - Did the movement occur in just one body region, or start in one part of the body then spread to other regions or start in different body regions at the same time (ie, focal or focal progressing to generalised
  - Duration of episode
  - Post-dromal (postictal) phase

  - Presence of headache, drowsiness, confusion, weakness or abnormal sensation in any part of the body
  - Time to complete recovery
- Is there any video footage of the event?
- Presence of headache (may be acute or chronic)
- Presence of fever and any other systemic symptoms
  - Rash, childhood exanthema, encephalopathy
- Perinatal history including:
  - Details of pregnancy gestation
  - Complications at delivery
  - Risk factors for infection
  - Feeding history
  - Any neonatal complications (eg, kernicterus)
- Past medical history including any previous seizures, or ‘funny turns’, or conditions associated with epilepsy such as autism
- History of head trauma and / or minor painful injury
- Drug history including:
  - Any current anti-epileptic drugs (AED)
  - Compliance with medication
  - Dose change
  - Recent growth spurt
  - Any factors affecting drug absorption (eg, diarrhoeal illness)
- Developmental history
- Social history including any previous safeguarding concerns
- Social issues
  - Sleep deprivation
  - Stress
  - Alcohol
  - Recreational drug use
  - Hormonal changes
- Family history including:
  - History of seizures
  - Cardiac history (prolonged QT)
  - Cardiomyopathy
  - Sudden unexplained death
- Pre-existing genetic disorders
  - Angelman syndrome, Rett syndrome

‘Red Flag’ Symptoms and Signs

Status epilepticus is defined as a prolonged seizure lasting more than 30 minutes or recurrent seizures without return to baseline between seizures.

All seizures lasting more than 5 minutes are at risk of progressing to status epilepticus so treatment must not be delayed.

Status epilepticus should be managed according to Advanced Paediatric Life Support (APLS) guidelines (see Advanced Paediatric Life Support Manual [Advanced Life Support Group])

Ask about:

- Symptoms relating to possible intracranial pathology (see Increased Intracranial Pressure)
- If the child has an epilepsy plan, the plan should be followed when seizures occur

Look for:

- Signs relating to raised intracranial pressure
- Signs relating to intracranial infection (see Meningitis)

Differential Diagnosis / Conditions

For more detailed information about epilepsy including definitions and aetiology, see Epilepsies: diagnosis and management [NICE clinical guideline CG137] and ILAE Definition and Classification [The International League against Epilepsy]

Each paroxysmal event should be considered and a decision made as to whether it is a seizure or if there is an alternative diagnosis. If a seizure is considered likely then there needs to be a decision as to what type of seizure it is.

Differential diagnosis

A careful history must be taken as outlined above. The following is not an exhaustive list.

- Seizures must be differentiated from other paroxysmal disorders in childhood, such as:
  - Syncope
  - Breath-holding spells
  - Reflex anoxic seizures
  - Staring related to inattention
  - Paroxysmal vertigo
  - Cardiac arrhythmias
  - Stereotypic behaviors
  - Sandifer syndrome

  - Tics and other paroxysmal movement disorders
  - Self-gratification movements
- Neonatal seizures
  - Clonic seizures
    - Differentiate from benign neonatal sleep myoclonus, which consists of small-amplitude clonic activity that may wax and wane in various parts of the body
  - Myoclonic seizures
    - Differentiate from benign myoclonic jerks that occur during sleep in neonates

Paroxysmal nonepileptic events / dissociative events

- Can occur in early childhood but are more frequent in adolescence, especially in girls
- May occur in children who also have epileptic seizures
- Movements are usually not synchronised clonic jerks but may be quivering or random thrashing
- Episodes may be dramatic, with screaming, shouting, and thrashing of the extremities
- Incontinence, injury, or tongue biting may still occur and cannot be used to differentiate from epileptic activity
- Episodes may vary greatly in the same child
- Usually, no postictal period

Classification of seizures

- For all children who have seizures an epilepsy syndrome diagnosis should be classified using a multi-axial scheme
  - See the ILAE Definition and Classification webpage for more details if required [ILAE classification of epilepsies]
- The axes that should be considered are:
  - Description of seizure (ictal phenomenology)
  - Seizure type (generalized, focal or unknown)
  - Epilepsy Type
  - Epilepsy Syndrome
  - Aetiology
- Failure to classify the epilepsy syndrome correctly can lead to inappropriate treatment and persistence of seizures (see Epilepsies: diagnosis and management [NICE clinical guideline CG137] and [ILAE classification of epilepsies])
- Video footage of any possible seizure activity can be very helpful to the clinician
- **An epilepsy syndrome must only be diagnosed by a specialist in paediatric epilepsy**

Epileptic seizures may be classified on the basis of the spatial distribution of the neuronal network they involve. Generalized seizures are seizures which very rapidly spread across both hemispheres of the brain, and may involve the whole cerebral cortex. Focal seizures originate within one cerebral hemisphere. Focal seizures may spread to involve the originally uninvolved cortex, which is termed secondary generalisation.

Epileptic seizures may also be classified according to their semiology (eg, motor or non-motor).

Epilepsy types

Generalised seizures

Generalized tonic-clonic seizures

- Tonic phase
  - Sustained contraction of muscles that causes the child to fall to the ground
    - Fall usually features opisthotonus (abnormal posturing with hyperextension and spasticity)
  - Extensor posturing usually occurs with tonic contraction of the diaphragm and intercostal muscles
    - Halts respiration and, in turn, produces cyanosis
  - Lasts < 1 minute and is followed by the clonic phase
- Clonic phase
  - Bilateral synchronous rhythmic jerking
  - Jerks may be accompanied by expiratory grunts produced by diaphragmatic contractions against a closed glottis
  - Frequency of jerks decreases as the seizure progresses, although intensity may increase
  - The tongue may be bitten, and bowel and bladder incontinence may occur
  - Usually stops within several minutes
  - May be followed by vomiting, confusion, and lethargy, with gradual recovery of consciousness within minutes to hours

Absence seizures

- Generalized, non-convulsive seizures characterised by interruption of activity, staring, and unresponsiveness
- May be typical, atypical or absence with special features
- Typical absences usually last 5–15 seconds
- Starts abruptly without warning and ends abruptly with resumption of the child’s preictal activity
- The child may be unaware that the episode occurred

- Unresponsiveness is sometimes accompanied by
  - Eyelid fluttering
  - Upward rotation of the eyes
- Seizures may occur > 100 times per day and may interfere with the child's learning ability
- Atypical absences
  - Last longer
  - Have a less abrupt onset and recovery
  - May be associated with mild motor manifestations, automatisms (eg, lip smacking, grimacing or swallowing), or loss of postural tone

Clonic seizures

- The body parts involved contracts and then relaxes, resulting in a rhythmic jerking
- The position during contraction is determined by the strongest muscles that move the body or body part
  - Usually the antigravity muscles – arm flexors and leg and trunk extensors

Tonic seizures

- Characterised by a sudden sustained contraction of musculature, like the beginning of a tonic-clonic seizure
- When the contractions are short, tonic seizures are hard to distinguish from myoclonic events

Atonic seizures

- Sudden decrease in muscle tone that may result in head nodding or mild leg flexing
  - More significant decreases in muscle tone may cause the child to slump to the floor
- Usually no alteration in consciousness is detectable

Myoclonic seizures

- Brief, sudden muscle contractions or jerks that may involve only part of the body or may be generalized / multifocal
- May occur in clusters, especially when the child is falling asleep or shortly after awakening
- Usually no alteration in consciousness is associated with these seizures
- May be "positive" (caused by contraction in the motor unit) or negative (caused by a brief relaxation of the motor unit)
- May be myoclonic, myoclonic-atonic, or myoclonic-tonic

Focal seizure types

- Characterised according to:
  - One or more features of aura, motor or autonomic disturbance
  - Whether awareness and / or responsiveness are altered or retained
- May evolve to bilateral convulsive status
- Depending on the location of the neuronal discharge, symptoms may be:
  - Motor
  - Sensory
  - Cognitive
- Motor seizures
- Location / extent may be:
  - Restricted to a part of the body (eg, the face or a limb)
  - Involving the entire side
  - Spreading to the opposite hemisphere, resulting in generalized tonic-clonic seizure activity
- Focal tonic-clonic seizure activity may be followed by Todd paralysis, a weakness of the limbs most involved in the seizure
  - This usually resolves within 48 hours
- Focal sensory seizures
  - Most often manifest as paraesthesias lasting < 1–2 minutes
- May result in impaired consciousness. Preceding impairment of consciousness, the patient may have symptoms that are referred to as the ‘aura’
  - Seizure discharges from one occipital lobe may cause visual symptoms (eg, scintillating coloured spots or scotoma)
    - These are perceived in the visual field contralateral to the discharge
  - Seizures with more complex visual hallucinations often progress to altered consciousness
- Auditory seizures
  - Manifest as hearing noises
  - Less commonly, involve elaborate, but usually non-verbal, auditory hallucinations, such as hearing music
- Seizure activity in the olfactory region
  - Sensation of an odour, usually described as unpleasant
- Affective symptoms such as fear or other unpleasant feelings can occur
- Anger and rage:
  - Extremely rare
  - May occur during postictal confusion if the patient is restrained
- Other common symptoms include:
  - Déjà vu, the feeling that an experience has occurred before

  - Jamais vu, the feeling that a previously experienced sensation is unfamiliar and strange
  - A rising epigastric sensation. Young children have difficulty describing these symptoms and may say that a “funny feeling” occurred in the head or stomach
  - Staring and automatisms:
    - Involuntary co-ordinated motor activities
    - Occur when clouding of consciousness occurs
    - Include:
      - Simple phenomena (eg, chewing, lip smacking, swallowing, and hissing)
      - More complicated activities (eg, picking at clothes, searching, or ambulating)
      - Automatisms are usually followed by postictal amnesia
      - The child may become tired and go to sleep
- Focal seizures with impaired consciousness
  - Differentiate from absence seizures, which are also characterised by staring and unresponsiveness
    - Absence seizures have abrupt onset and termination; focal seizures have a more gradual onset and termination
    - Absence seizures last < 30 seconds and are not associated with postictal confusion
    - Automatisms can occur if absence episodes are prolonged, but are often just a continuation of motor activity present before onset of seizure
- Focal seizures may evolve into a bilateral or generalised convulsive seizure
  - Sometimes focal seizures generalise so quickly that they look like generalised tonic-clonic seizures from the start

Difficult-to-classify (unknown) seizure types

Epileptic spasms

- Sudden contraction of neck, trunk, and extremity muscles
- Spasms may be flexor, extensor, or mixed flexor-extensor
- Spasms last only a few seconds each but often occur in clusters of ≤ 100 individual spasms
- A typical episode involves dropping of the head along with abduction of the shoulders and flexion of the lower extremities
- The infant may cry during or after the spasm
- Pallor, flushing, grimacing, laughter, and nystagmus sometimes occur
- Episodes are common on awakening from sleep, during drowsiness, and with feeds but are rare during sleep

Epilepsy syndromes

There are a number of epilepsy syndromes, only some of the commoner ones are covered here.

Generalised epilepsy syndromes

Childhood absence epilepsy (CAE)

- Consists only of typical absence seizures with onset < 8 years
- Females:Males ratio is 2:1
- Very frequent classical typical absences
- Typical EEG findings of regular , bilateral, synchronous 3Hz spike and wave, provoked by hyperventilation
- Usually resolves before puberty

Juvenile myoclonic epilepsy

- Age of onset: 12–18 years
- Primary generalised epilepsy characterised by myoclonic jerks that affect mainly the upper extremities and less commonly the lower extremities
  - Jerks usually occur shortly after awakening
  - Patients may report clumsiness or difficulty holding objects early in the morning
- Myoclonic jerks almost always precede the onset of generalised tonic-clonic seizures by months to years
- In addition to myoclonic seizures
  - Approximately 80% of patients have generalized tonic-clonic seizures
  - 25% of patients have absence seizures

Lennox-Gastaut syndrome

- Age of onset: 3–5 years
- Severe epileptic encephalopathy:
  - Characterised by:
    - Focal seizures
    - A variety of generalized seizures, including:
      - Tonic
      - Tonic-clonic
      - Atypical absence seizures
    - Often occurring at a greater frequency than other seizure disorders
  - Tonic seizures cause sudden, sustained contraction of the muscle groups, sometimes causing the child to fall
  - Atypical absence seizures consist of a brief period of staring and immobility

        - Onset and recovery of atypical absence seizures are less abrupt than those of typical absence seizures
    - Episodes may be associated with mild tonic motor manifestations, automatisms, or loss of postural tone
    - Atonic seizures occur and may be preceded by myoclonic jerks
- The seizures are often very difficult to control
- Aetiology is similar to West syndrome
    - Many cases of West syndrome evolve into Lennox-Gastaut syndrome
- Boys are affected slightly more frequently than girls
    - Many patients have neurological deficits before onset (eg, intellectual disability and cerebral palsy)
    - May be related to hypoxic or other insults to the brain or abnormal brain development

Focal epilepsy syndromes

Benign childhood **e**pilepsy with **c**entro**t**emporal **s**pikes (BECTS)

- Age of onset: 5–8 years
- Seizures typically occur during sleep
- The child awakens with one side of the face twitching
- Oropharyngeal muscles are also often involved, causing the child to make unintelligible gurgling sounds
- The ipsilateral upper extremity may be involved, but the lower extremity is involved only rarely
- In rare cases, a seizure episode will become generalised
- Consciousness is often retained during seizure, although the child may not be able to speak
- Most seizure episodes last < 2 minutes
- The frequency of seizures is low, with 25% of patients having a single-seizure episode and 50% having < 5 episodes
- Boys are more often affected than girls
- Genetic factors play a role

Other seizure disorders

Neonatal seizures

A careful history is required to elicit the possible cause. Not all are considered part of a syndrome, but rather as seizure types with a specific aetiology.

- Subtle seizures
    - Consist of abnormal ocular movements:
        - Random and roving eye movements
        - Sustained conjugate tonic deviation

        - Eyelid blinking or fluttering
        - Eyes rolling up
    - Oral-buccal-lingual movements:
        - Sucking
        - Smacking
        - Chewing
        - Tongue protrusions
    - Other abnormal movements:
        - Swimming movements of the arms
        - Pedalling movements of the legs
    - Apnoea
    - It may be difficult to distinguish between normal actions and abnormal movements
    - Further assessment should be considered if:
        - The movements are frequent and repetitive
        - The movements appear abnormal to the parents
    - Subtle seizures usually occur in infants with severe CNS insults
- Clonic seizures
    - May be focal or multifocal
        - Focal clonic seizures
            - Characterised by rhythmic jerking that remains localised
        - Multifocal clonic seizures
            - Characterised by clonic activity in one extremity that migrates randomly, often rapidly, from side-to-side and place to place within the body
- Tonic seizures
    - May be focal or generalised
    - Focal tonic seizures
        - Characterised by sustained posturing of a limb
        - Or asymmetrical posturing of the neck and trunk
        - Possibly accompanying subtle seizure activity (eg, eye deviation)
    - In premature infants, tonic seizures may occur at the onset of severe intraventricular bleeding
- Myoclonic seizures
    - Flexion jerks of the upper or lower extremities
    - Singly or in a series of repetitive jerks
    - Sometimes associated with tonic spasms and multifocal seizures
    - Infants with myoclonic seizures tend to have severely abnormal dysgenetic brains or metabolic defects

Infantile spasms

- Peak age of onset: 3–7 months
- Boys are more likely to be affected than girls
- Usually divided into symptomatic and idiopathic groups based on the presence (symptomatic) or absence of a predisposing aetiological factor (idiopathic)
- Causes of symptomatic spasms include:
  - Structural abnormalities of the brain
  - Hypoxic-ischaemic insults
  - CNS infections or haemorrhages
  - Inborn errors of metabolism
  - Children with tuberous sclerosis account for up to 25% of patients
  - Infants in whom no aetiological factor (West syndrome- infantile spasms, hypsarrythmia, and developmental regression / delay) is found tend to be older at onset than symptomatic infants

Febrile seizures

- Age of onset: 6 months to 5-6 years
- Median age of occurrence: 18–22 months
- Approximately 2–5% of children will experience a febrile convulsion
- Boys are more susceptible than girls
- Triggered by any illness that causes fever, most frequently by otitis media and upper respiratory tract infections
- The rate of febrile seizures with shigellosis, salmonellosis, and roseola is high, possibly because of a direct effect of the causative organism on the CNS or to a neurotoxin they produce.

Aetiology of seizures

- In older children and adolescents, a cause is identifiable in < 20%
- Potential aetiology is often closely linked to epilepsy syndrome, and so the syndromic diagnosis should be used to help guide and prioritise investigations
- The more abnormal the child’s neurodevelopmental status, the more likely a structural cause or epilepsy syndrome will be identified, or may already have been determined before seizure onset. These include:
  - Brain malformations
  - Genetic disorders
  - Disorders of metabolism
  - Traumatic or previous infectious injury of the brain
  - Neoplasm
- Children with infantile spasms and Lennox-Gastaut syndrome are more likely to have an identifiable underlying cause
- In children with focal seizures an underlying brain abnormality must be looked for

- Focal seizures are caused by focal epileptiform discharges, but a focal structural lesion may not be found in most children
- Identifiable causes, all of which may be associated with scarring of the temporal lobe, include:
  - Perinatal insults
  - Head trauma
  - CNS malformations
  - Encephalitis
  - Possibly, status epilepticus
- Indolent tumours (eg, hamartomas and low-grade gliomas) are found in approximately 20% of children who have intractable focal seizures

Neonatal seizures

- Hypoxic-ischaemic encephalopathy
  - Most common cause of seizures in both premature and full-term infants
  - These seizures usually begin within the first 24 hours of life and may be difficult to control for several days
  - Infants with hypoxia-ischaemia who are treated with head or body cooling may have seizures after 3 days during rewarming
- Intracranial haemorrhage
  - Seen in premature and full-term infants
  - Intraventricular haemorrhage is seen mainly in premature infants within the first 3 days of life
  - Generalised tonic seizures may be associated with severe haemorrhage involving the brain parenchyma
  - Subdural haemorrhage is associated with trauma and may be associated with focal seizure activity
  - Important to consider non-accidental injury and take an appropriate history and examination
    - See Head Injury: assessment and early management [NICE clinical guideline CG176] and Child maltreatment: when to suspect maltreatment in under 18s [NICE clinical guideline CG89]
- Arterial Ischaemic stroke
  - Focal seizures
- Metabolic disturbances
  - Hypoglycaemia
    - Infants small for gestational age
    - Post-term infants
    - Infants of mothers with diabetes
  - Hypocalcaemia
    - Low-birth-weight infants

        - Infants of mothers with diabetes
        - History of hypoxia
    - Hyponatraemia
    - Hypernatraemia
    - Pyridoxine deficiency or dependence
    - Various inborn errors of metabolism
- Bacterial and viral intracranial infections
    - Most common bacterial causes are group B streptococci and *Escherichia coli*.
    - Prenatal non-bacterial causes include toxoplasmosis, rubella, herpes simplex virus, coxsackievirus type B, and cytomegalovirus
- Malformations of the brain
    - Cortical dysgenesis (eg, lissencephaly, pachygyria, and polymicrogyria)

Investigations

To be undertaken by non-specialist practitioners (eg, General Practitioner (GP) Team):

All children and young people who have had a first afebrile seizure should be seen as soon as possible by a specialist in the management of childhood epilepsy.

This is essential to ensure:

- Precise and early diagnosis
- Initiation of therapy as appropriate to their needs

See Epilepsies: diagnosis and management [NICE clinical guideline CG137]

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric and / or Paediatric Neurology Team(s)):

Children and young people presenting to an emergency department following a suspected seizure should be screened initially. This should be done by a paediatrician with onward referral to a specialist when an epileptic seizure is suspected or there is diagnostic doubt.

- See Epilepsies: diagnosis and management [NICE clinical guideline CG137]
    - Laboratory tests that should be considered at the time of the initial seizure include measurement of:
        - Serum electrolytes
        - Calcium
        - Magnesium
        - Blood glucose
        - Full blood count and inflammatory markers (C-reactive protein)
        - Consider a septic screen especially in babies

        - Drug levels (to monitor compliance) if appropriate
- 12-lead electrocardiogram (ECG) should be performed in all children and young people presenting with paroxysmal events
- In some cases, history or examination may indicate that a more extensive laboratory evaluation is required
    - Neurometabolic screen

Imaging

- Neuroimaging studies are not warranted in every child who has epilepsy
- Computed tomography (CT) and magnetic resonance imaging (MRI)
    - Detect structural abnormalities, such as:
        - Low-grade tumours
        - Cortical malformations or disorders of neuronal migration
    - MRI is more sensitive than CT and, therefore, the better study when available
    - A CT scan can be used to identify underlying gross pathology:
        - If MRI is not available or is contraindicated
        - For children or young people in whom a general anaesthetic or sedation would be required for MRI but not CT
    - In an acute situation, CT may be used to determine whether a seizure has been caused by an acute neurological lesion or illness (see Head Injury: assessment and early management [NICE clinical guideline CG176])
- MRI is particularly important in those:
    - Who develop epilepsy before the age of 2 years or in adulthood
    - Who have any suggestion of a focal onset on history, examination or EEG (unless there is clear evidence of benign focal epilepsy)
    - Whom seizures continue in spite of first-line medication (see Epilepsies: diagnosis and management [NICE clinical guideline CG137])

Other investigations

- EEG
    - Measures physiological function of the brain
    - EEG helps define the seizure type
        - Epileptiform EEG may support diagnosis of epilepsy, but a normal tracing does not exclude the diagnosis
    - Other abnormalities (eg, slowing and background disorganisation) are much less specific
    - Repeat tracings increase the likelihood of detecting epileptiform discharges in patients who have recurrent epileptic seizures
    - Procedures such as hyperventilation, photic stimulation, and sleep should be used when obtaining EEG recordings

  - EEG abnormalities must be interpreted in view of the clinical symptoms as they may often be seen in children who are not experiencing epilepsy
- Positron emission tomography and single-photon emission CT
  - Useful in localising metabolic alterations with seizure activity and seizure foci
  - Clinically relevant only in individuals with intractable epilepsy being evaluated for epilepsy surgery
- Genetic studies
  - In some children certain presentations of epileptic seizures and those with unexplained epilepsy, particularly those with other neurodevelopmental or dysmorphic features, it may be important to test for specific genetic disorders

Treatment Approach

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric and / or Paediatric Neurology Team(s)):

Acute convulsive status epilepticus management should follow APLS principles

- See Advanced Paediatric Life Support Manual [Advanced Life Support Group]

Children with known seizures should have an epilepsy plan.

Anti-epileptic drug (AED) therapy in children and young people should be initiated by a specialist or on the advice of a specialist.

- Treatable causes (eg, hypoglycaemia, electrolyte imbalance, infection) must be pursued rapidly

Treatment, by type of seizure

Further information is available in the NICE guideline CG137 and is not covered here, as the decision to start anticonvulsants is made by a paediatrician with interest in epilepsy.

- See Epilepsies: diagnosis and management [NICE clinical guideline CG137]

When to Refer

Refer urgently to specialist practitioners (eg, Emergency Department / Paediatric Team(s) if:

- First Acute seizure both first febrile and afebrile refer to ED for assessment by the paediatric team
- Any child with an afebrile seizure should be referred to a general paediatrician with interest in epilepsy for further assessment

Escalate care to specialist practitioners (eg, Paediatric Neurology Team(s)) if:

- Type of seizure is unclear
- The need to treat, the choice of medication, or the dose of medication is unclear
- Seizures are refractory to medication
- Infantile spasms are suspected – this warrants urgent consultation

When to Admit:

- Seizures are acutely uncontrolled or prolonged
- Seizures vary from normal in a child with known seizures
- Video EEG monitoring is needed (specialist advice)
- Rapid changes of anticonvulsant doses are needed resulting in a risk for marked increase in seizures

'Safety Netting' Advice

Essential information (verbal and written) should be provided to a child or young person who has experienced a possible first seizure, and their family, carer or parent as appropriate.

This information should include:

- How to recognize a seizure
- First aid
- The importance of reporting further attacks

This information should be provided while the child or young person is awaiting a diagnosis.

This information should also be provided to their family or carer.

- See Epilepsies: diagnosis and management [NICE clinical guideline CG137]
- Addressing psychosocial issues
  - Parents and children may have many fears and need reassurance
    - Explain the terms epilepsy and seizure disorder
    - Help parents understand that diagnosis of epilepsy does not mean that their child has intellectual disability or a psychiatric disorder
    - Give guidelines on what to do when their child has a seizure, including positioning on the side and putting nothing in the mouth
    - Emphasise to parents that death from a seizure is rare
- Discuss activities of children with seizures
  - Activities should be restricted as little as possible
  - A child with a seizure disorder should not swim alone or go bike riding without a helmet (as for all children)
  - Contact sports are permissible when epilepsy is controlled
  - The decision about climbing up to certain heights should be based on how well seizures are controlled

  - Children with epilepsy should take showers rather than baths as soon as they are old enough and should not be allowed to bathe unattended

Patient / Carer Information

Please note: whilst these resources have been developed to a high standard they may not be specific to children.

- Following a first seizure without fever in children and young people: Information for parents and carers (Web page), Royal College of Paediatrics and Child Health
- Self-management UK (Web page)
- Epilepsy Society (Web page)

All children and young people with epilepsy should have a comprehensive care plan that is agreed between the person, family and / or carers where appropriate, and primary care and secondary care providers. This should include lifestyle issues as well as medical issues.

Information on sudden unexpected death in epilepsy (SUDEP) should be included in literature on epilepsy to show why preventing seizures is important. Tailored information on the person's relative risk of SUDEP should be part of the counselling checklist for children, young people and adults with epilepsy and their families and / or carers.

- See Epilepsies: diagnosis and management [NICE clinical guideline CG137]

Prognosis

- The best prognosis is in children with a generalised seizure, normal neurological examination, and a non-epileptiform EEG.
- Certain epilepsy syndromes like childhood absence epilepsy and BECTs have excellent prognosis for seizure remission
- Febrile seizure (written information should be given)
  - One-third of children who have a febrile seizure will have another one with another febrile illness
  - The younger the child is at the time of the first episode, the greater the risk of recurrence
  - Approximately 50% of recurrences occur within 6 months of the initial seizure; 75% occur within 1 year
  - The risk of subsequent epilepsy in children with febrile seizures is < 5%

Resources

National Clinical Guidance

Epilepsies: diagnosis and management (Web page), NICE clinical guideline CG137, National Institute for Health and Care Excellence

Medical Decision Support

Advanced Life Support Group. Advanced Paediatric Life Support: The Practical Approach (APLS), 6th edn. John Wiley & Sons (Wiley-Blackwell), 2016. (Chapter 9)

Suggested Resources

Please note: these resources include links to external websites. These resources may not have national accreditation and therefore PCO UK cannot guarantee the accuracy of the content.

Following a first seizure without fever in children and young people: Information for parents and carers (Web page), Royal College of Paediatrics and Child Health

Carbamazepine (oral) for preventing seizures (Web page), Medicines for Children

Clobazam for preventing seizures (Web page), Medicines for Children

Clonazepam for preventing seizures (Web page), Medicines for Children

International League against Epilepsy (Web page)

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