

Diagnosing and classifying epilepsy

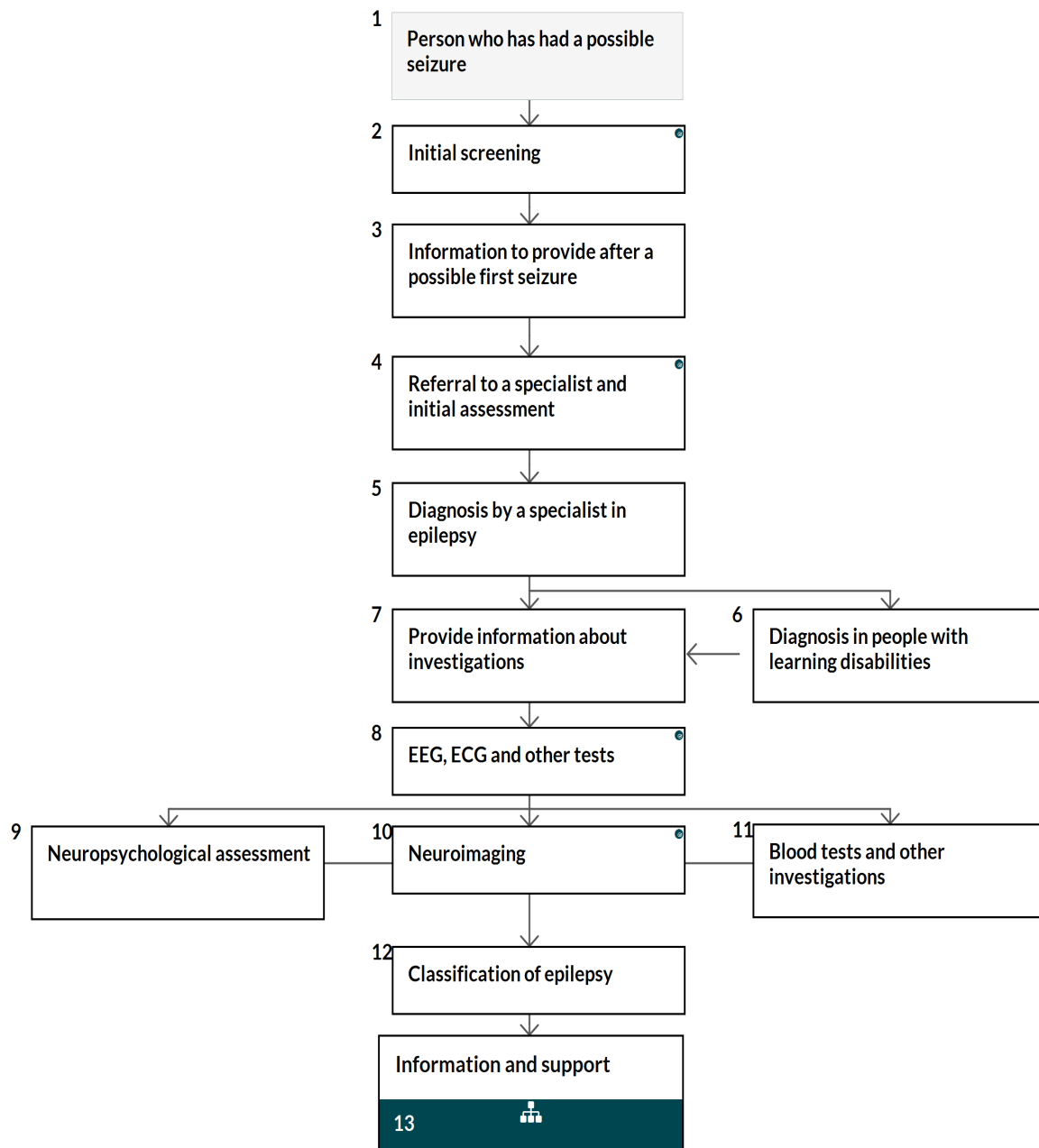
NICE Pathways bring together everything NICE says on a topic in an interactive flowchart. NICE Pathways are interactive and designed to be used online.

They are updated regularly as new NICE guidance is published. To view the latest version of this NICE Pathway see:

<http://pathways.nice.org.uk/pathways/epilepsy>

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This document contains a single flowchart and uses numbering to link the boxes to the associated recommendations.



1 Person who has had a possible seizure

No additional information

2 Initial screening

Children, young people and adults presenting to an Accident and Emergency department following a suspected seizure should be screened initially. This should be done by an adult or paediatric physician with onward referral to a specialist when an epileptic seizure is suspected or there is diagnostic doubt. See also [referral to a specialist and initial assessment \[See page 4\]](#).

Protocols should be in place that ensure proper assessment in the emergency setting for children, young people and adults presenting with an epileptic seizure (suspected or confirmed).

The information that should be obtained from the child, young person or adult and/or their family or carer after a suspected seizure is contained in [appendix of the NICE guideline](#).

Quality standards

The following quality statements are relevant to this part of the interactive flowchart.

1. Referral to a specialist (children and young people)
1. Referral to a specialist (adults)

3 Information to provide after a possible first seizure

Essential information on how to recognise a seizure, first aid, and the importance of reporting further attacks should be provided to a child, young person or adult who has experienced a possible first seizure, and their family/carer/parent as appropriate. This information should be provided while the child, young person or adult is awaiting a diagnosis and should also be provided to their family and/or carers.

4 Referral to a specialist and initial assessment

Referral

Adults

It is recommended that all adults having a first seizure should be seen as soon as possible by a specialist in the management of the epilepsies to ensure precise and early diagnosis and initiation of therapy as appropriate to their needs.

The Guideline Development Group considered that with a recent onset suspected seizure, referrals should be urgent, meaning that patients should be seen within 2 weeks.

Children and young people

It is recommended that all children and young people who have had a first non-febrile seizure should be seen as soon as possible by a specialist in the management of the epilepsies to ensure precise and early diagnosis and initiation of therapy as appropriate to their needs.

The Guideline Development Group considered that with a recent onset suspected seizure, referrals should be urgent, meaning that patients should be seen within 2 weeks.

At the initial assessment

At the initial assessment for a recent onset seizure, the specialist should have access to appropriate investigations.

In a child, young person or adult presenting with an attack, a physical examination should be carried out. This should address their cardiac, neurological and mental status, and should include a developmental assessment where appropriate.

Quality standards

The following quality statements are relevant to this part of the interactive flowchart.

1. Referral to a specialist (children and young people)
1. Referral to a specialist (adults)

5 Diagnosis by a specialist in epilepsy

The diagnosis of epilepsy in adults should be established by a specialist medical practitioner with training and expertise in epilepsy.

The diagnosis of epilepsy in children and young people should be established by a specialist paediatrician with training and expertise in epilepsy.

A detailed history should be taken from the child, young person or adult and an eyewitness to the attack, where possible, to determine whether or not an epileptic seizure is likely to have occurred.

The clinical decision as to whether an epileptic seizure has occurred should then be based on the combination of the description of the attack and different symptoms. Diagnosis should not be based on the presence or absence of single features.

Where non-epileptic attack disorder is suspected, suitable referral should be made to psychological or psychiatric services for further investigation and treatment.

Prospective recording of events, including video recording and written descriptions, can be very helpful in reaching a diagnosis.

Children, young people and adults and their families and/or carers should be given an opportunity to discuss the diagnosis with an appropriate healthcare professional.

It may not be possible to make a definite diagnosis of epilepsy. If the diagnosis cannot be clearly established, further investigations and/or referral to a tertiary epilepsy specialist (see [when to refer to a tertiary epilepsy service](#)) should be considered. Follow-up should always be arranged.

In cases of diagnostic uncertainty, a referral to a cardiologist should be considered.

6 Diagnosis in people with learning disabilities

It can be difficult to diagnose epilepsy in children, young people and adults with learning disabilities, and so care should be taken to obtain a full clinical history. Confusion may arise between stereotypic or other behaviours and seizure activity.

It is important to have an eye witness account supplemented by corroborative evidence (for

example, a video account), where possible.

Clear, unbiased reporting is essential. Witnesses may need education to describe their observations accurately.

Those with learning disabilities may require particular care and attention to tolerate investigations.

Facilities should be available for imaging under anaesthesia, if necessary.

Children and young people

In the child or young person presenting with epilepsy and learning disability, investigations directed at determining an underlying cause should be undertaken.

7 Provide information about investigations

Information should be provided to children, young people and adults and families and/or carers as appropriate on the reasons for tests, their results and meaning, the requirements of specific investigations, and the logistics of obtaining them.

8 EEG, ECG and other tests

EEG

When to use an EEG

Children, young people and adults requiring an EEG should have the test performed soon after it has been requested. (The Guideline Development Group considered that 'soon' meant being seen within 4 weeks.)

An EEG should be performed only to support a diagnosis of epilepsy in adults in whom the clinical history suggests that the seizure is likely to be epileptic in origin.

An EEG should be performed only to support a diagnosis of epilepsy in children and young people. If an EEG is considered necessary, it should be performed after the second epileptic seizure but may, in certain circumstances, as evaluated by the specialist, be considered after a first epileptic seizure.

An EEG may be used to help determine seizure type and epilepsy syndrome in children, young people and adults in whom epilepsy is suspected. This enables them to be given the correct prognosis.

In children, young people and adults presenting with a first unprovoked seizure, unequivocal epileptiform activity shown on EEG can be used to assess the risk of seizure recurrence.

Photic stimulation and hyperventilation should remain part of standard EEG assessment. The child, young person or adult and family and/or carer should be made aware that such activation procedures may induce a seizure and they have a right to refuse.

Children (aged 28 days to 11 years)

All investigations for children should be performed in a child-centred environment.

When an EEG should not be used

An EEG should not be performed in the case of probable syncope because of the possibility of a false-positive result. For further information, see [the NICE Pathway on transient loss of consciousness](#).

The EEG should not be used to exclude a diagnosis of epilepsy in a child, young person or adult in whom the clinical presentation supports a diagnosis of a non-epileptic event.

The EEG should not be used in isolation to make a diagnosis of epilepsy.

If diagnosis is still unclear after a standard EEG

For children, young people and adults in whom epilepsy is suspected, but who present diagnostic difficulties, specialist investigations should be available.

Repeated standard EEGs may be helpful when the diagnosis of the epilepsy or the syndrome is unclear. However, if the diagnosis has been established, repeat EEGs are not likely to be helpful.

Repeated standard EEGs should not be used in preference to sleep or sleep-deprived EEGs.

When a standard EEG has not contributed to diagnosis or classification, a sleep EEG should be performed.

In children and young people, a sleep EEG is best achieved through sleep deprivation or the use of melatonin.

Long-term video or ambulatory EEG may be used in the assessment of children, young people and adults who present diagnostic difficulties after clinical assessment and standard EEG.

ECG

A 12-lead ECG should be performed in adults with suspected epilepsy.

In children and young people, a 12-lead ECG should be considered in cases of diagnostic uncertainty.

Other tests

Measurement of serum prolactin is not recommended for the diagnosis of epilepsy.

Provocation by suggestion may be used in the evaluation of non-epileptic attack disorder. However, it has a limited role and may lead to false-positive results in some people.

Quality standards

The following quality statements are relevant to this part of the interactive flowchart.

2. Investigations (children and young people)
2. Investigations (adults)

9 Neuropsychological assessment

Neuropsychological assessment should be considered in children, young people and adults in whom it is important to evaluate learning disabilities and cognitive dysfunction, particularly in regard to language and memory.

Referral for a neuropsychological assessment is indicated:

- when a child, young person or adult with epilepsy is having educational or occupational difficulties
- when an MRI has identified abnormalities in cognitively important brain regions
- when a child, young person or adult complains of memory or other cognitive deficits and/or

- cognitive decline.

Children (aged 28 days to 11 years)

All investigations for children should be performed in a child-centred environment.

10 Neuroimaging

Neuroimaging should be used to identify structural abnormalities that cause certain epilepsies.

MRI should be the imaging investigation of choice in children, young people and adults with epilepsy.

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 clear evidence of benign focal epilepsy)
- in whom seizures continue in spite of first-line medication.

Children, young people and adults requiring MRI should have the test performed soon. (The Guideline Development Group considered that 'soon' meant being seen within 4 weeks.)

Neuroimaging should not be routinely requested when a diagnosis of IGE has been made.

In an acute situation, CT may be used to determine whether a seizure has been caused by an acute neurological lesion or illness.

Children and young people

CT should be used to identify underlying gross pathology if MRI is not available or is contraindicated, and for children or young people in whom a general anaesthetic or sedation would be required for MRI but not CT.

See [the NICE Pathway on sedation in children and young people](#).

Children (aged 28 days to 11 years)

All investigations for children should be performed in a child-centred environment.

Quality standards

The following quality statements are relevant to this part of the interactive flowchart.

2. Investigations (children and young people)
2. Investigations (adults)
3. Magnetic resonance imaging (children and young people)
3. Magnetic resonance imaging (adults)

11 Blood tests and other investigations

Adults

In adults, appropriate blood tests (for example, plasma electrolytes, glucose, calcium) to identify potential causes and/or to identify any significant co-morbidity should be considered.

Children and young people

In children and young people, other investigations, including blood and urine biochemistry, should be undertaken at the discretion of the specialist to exclude other diagnoses, and to determine an underlying cause of the epilepsy.

Children (aged 28 days to 11 years)

All investigations for children should be performed in a child-centred environment.

12 Classification of epilepsy

The seizure type(s) and epilepsy syndrome, aetiology, and comorbidity should be determined, because failure to classify the epilepsy syndrome correctly can lead to inappropriate treatment and persistence of seizures.

Epileptic seizures and epilepsy syndromes in children, young people and adults should be classified using a multi-axial diagnostic scheme. The axes that should be considered are: description of seizure (ictal phenomenology); seizure type; syndrome and aetiology.

Children, young people and adults with epilepsy should be given information about their seizure type(s) and epilepsy syndrome, and the likely prognosis.

13 Information and support

See Epilepsy / Information and support for people with epilepsy and their family or carers

Glossary

ECG

(electrocardiogram: a test that records the heart's electrical activity)

EEG

(electroencephalogram: an investigation that involves recording the electrical activity of the brain)

Epileptic seizure

(a transient occurrence of signs and/or symptoms, the result of a primary change to the electrical activity (abnormally excessive or synchronous) in the brain)

Epileptic seizures

(transient occurrences of signs and/or symptoms, the result of primary changes to the electrical activity (abnormally excessive or synchronous) in the brain)

Epilepsy syndrome

(a distinctive disorder identifiable on the basis of a typical age of onset, seizure types, specific EEG characteristics, and often other features; identification of epilepsy syndrome has implications for treatment, management and prognosis)

Ictal phenomenology

(description or history of ictal events (seizures))

IGE

(idiopathic generalised epilepsy (a well-defined group of disorders characterised by typical absences, myoclonic and generalised tonic–clonic seizures, alone or in varying combinations in otherwise normal individuals))

Non-epileptic attack disorder

(a disorder characterised by episodes of change in behaviour or movement, not caused by a

primary change in electrical activity of the brain; movements are varied, and the attacks can be difficult to differentiate from epileptic seizures)

Provocation

(methods used to provoke seizures, such as hyperventilation, photic stimulation, sleep deprivation and withdrawal of medication)

Specialist

(for children and young people: a paediatrician with training and expertise in epilepsy; for adults: a medical practitioner with training and expertise in epilepsy)

Syncope

(a brief lapse in consciousness caused by transient reduction in blood flow to the brain)

Tertiary epilepsy specialist

(an adult neurologist who devotes the majority of their working time to epilepsy, works in a multidisciplinary tertiary referral centre with appropriate diagnostic and therapeutic resources, and is subject to regular peer review)

Sources

[Epilepsies: diagnosis and management](#) (2012 updated 2021) NICE guideline CG137

Your responsibility**Guidelines**

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them

and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Technology appraisals

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, health professionals are expected to take these recommendations fully into account, alongside the individual needs, preferences and values of their patients. The application of the recommendations in this interactive flowchart is at the discretion of health professionals and their individual patients and do not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Commissioners and/or providers have a responsibility to provide the funding required to enable the recommendations to be applied when individual health professionals and their patients wish to use it, in accordance with the NHS Constitution. They should do so in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Medical technologies guidance, diagnostics guidance and interventional procedures guidance

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take these recommendations fully into account. However, the interactive flowchart does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Commissioners and/or providers have a responsibility to implement the recommendations, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this interactive flowchart should be interpreted in a way that would be inconsistent with compliance with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.