INTRODUCTION

A convulsion is a period of involuntary muscular contraction, often followed by a period of profound lethargy and confusion and sometimes profound sleep.

Most convulsions in children under the age of 5 years will be due to febrile convulsions. The first convulsion can be very frightening for the parents.

Children with learning disabilities or congenital syndromes may have epilepsy as part of the condition.

Convulsions can occur for various reasons (***see Table 1***).

Table 1 – Reasons for convulsions

Epilepsy	In pre-hospital care, the majority of episodes attended are convulsions occurring in patients known to have epilepsy. These patients are usually on anti-epileptic medication, (e.g. phenytoin sodium valproate (Epilim), carbamazepine (Tegretol), and Lamotrigine (Lamictal). Urinary incontinence and tongue biting often accompany a full epileptic convulsion (tonic/clonic).
Febrile convulsions	The other most common ambulance emergency involving convulsions are febrile convulsions. These tend to occur in children (between 6 months and 5 years) with an infection accompanied by a rapid rise in temperature, and may recur in subsequent pyrexial illnesses. Most children who have febrile convulsions **DO NOT** go on to develop epilepsy later in life.
Hypoglycaemia	Convulsions may be a presenting sign of **HYPOGLYCAEMIA** and should be considered in **ALL** patients, especially known diabetics and children. An early blood glucose level reading is essential in all actively convulsing patients (including known epileptics).
Hypoxia	Any patient suffering from hypoxia, regardless of cause, may convulse. The cause may be very simple which is why good A and B maintenance is important prior to drug therapy.
Hypotension	Severe hypotension can trigger a convulsion. This may be seen with syncope or a vasovagal attack where the patient remains propped up. In these instances there will usually be a clear precipitating event and no prior history of epilepsy. Once the patient is laid flat and the blood pressure is restored the convulsion will generally stop.

There are a significant number of other causes of convulsions and these include:

1. cerebral tumour
2. electrolyte imbalance
3. drug overdose
4. cardiac arrhythmias.

It is important not to label a patient as epileptic unless there is a confirmed diagnosis.

HISTORY

Is the child known to have a confirmed diagnosis of epilepsy?

If so, are they on medication, and are they taking it appropriately?

Have they had convulsions recently?

Have they had a high temperature in the last 24 hours?

Is the child **DIABETIC** (could this be secondary to hypoglycaemia)?

Is there any history of head injury?

Is there any evidence of alcohol ingestion or drug/ toxic substance usage (including inhaled volatile agents)?

ASSESSMENT

Assess **ABCDE**'s.

Evaluate whether there are any TIME CRITICAL features present: These may include:

- any major ABCD problems
- serious head injury
- status epilepticus
- underlying infection, e.g. meningitis

If any of these features are present, **CORRECT A AND B PROBLEMS ON SCENE THEN COMMENCE TRANSPORT** to **Nearest Suitable Receiving Hospital –** in these cases the ease and safety with which the patient can be moved whilst still convulsing should be considered and treatment may need to begin in situ. With small children it may be best to carry the child to the ambulance and continue assessment and treatment en-route.

Provide a **Hospital Alert Message / Information call.**

En-route – continue patient **MANAGEMENT** (***see below***).

If no **TIME CRITICAL** problems are present, perform a more thorough assessment and a brief Secondary Survey.

Assess type of convulsion if still convulsing – is this a generalised convulsion, tonic-clonic, focal or one-sided?

Tonic-clonic

- assess for focal neurological loss before, during or after the convulsion
- assess for raised temperature (child may feel hot after a convulsion) and any sign of a rash, (possible meningitis)
- assess for mouth/tongue injury, incontinence.

MANAGEMENT

Follow ***management of the seriously ill child guideline***, remembering to:

- administer high concentration oxygen (O_2) (***refer to oxygen protocol for administration and information***) via a non-re-breathing mask, using the stoma in laryngectomee and other neck breathing patients, to ensure an oxygen saturation (SpO_2) of >95%.
- all patients who are convulsing, post ictal or have a convulsion secondary to a head injury (even if they appear fully recovered) should receive high concentration oxygen
- establish if any treatment e.g. rectal diazepam has already been administered
- consider IV/IO access if convulsions persist or recur.

Specifically consider:

- position for airway security, comfort and protection from dangers, especially the head
- do not attempt to force an oropharyngeal airway into a convulsing child. A nasopharyngeal airway is a useful adjunct in such patients
- apply pulse oximetry and monitor
- check blood glucose level to exclude hypoglycaemia. If blood glucose <4.0mmol or hypoglycaemia is clinically suspected, give oral glucose, **glucose 10%** IV or **glucagon** IM (***refer to relevant glucose drug protocols) (refer to glycaemic emergencies in children guideline***)
- if the child convulses repeatedly in close succession or has one convulsion lasting >5 minutes then administer **diazepam** (***refer to diazepam protocol for dosages and information***)
- if the child can be moved, despite the convulsion, it is important to reach hospital for definitive care as rapidly as possible
- in the pyrexial child (temp > 37.5ºC) who has ceased convulsing and regained consciousness, remove excess clothing and administer **paracetamol** (***refer to paracetamol protocol for dosages and information***) to reduce pyrexia and make the child more comfortable. Tepid sponging is associated with increased patient distress and generally unnecessary if the above advice is followed
- **correct A and B problems on scene then commence transport immediately to Nearest Suitable Hospital**
- provide a **Hospital Alert Message / Information Call**
- at the hospital, provide a comprehensive verbal handover, and a completed patient report form to the receiving hospital staff
- if child is left at home then leave a copy of the patient record form at home and give advice to carers regarding actions if further convulsions occur or carers become concerned

- some children may have a specific protocol developed by the Doctor and patient/carer to be enacted when a convulsion occurs, ask if one exists.

ADDITIONAL INFORMATION

Post ictal

Is the term given to patients who have had a convulsion but are now in the recovery phase. Convulsions are extremely disorientating, even for epileptics who may suffer them regularly. It is not uncommon for patients to act out of character when post ictal. This may include verbal or physical aggression. Oxygen therapy and a calm approach are important; remember, when the patient recovers they may be a completely different person.

Febrile convulsions

A febrile convulsion typically presents as a grand mal convulsion, although, as with all such episodes, the exact nature may vary from patient to patient.

Transport all children with a first febrile convulsion or under 1 year of age to an Emergency Department, even if the convulsion has ceased on your arrival at the scene, because of the risk of serious underlying illness and because the parent (or carer) will be very frightened.

In patients who have a history of febrile convulsions (which have previously been investigated and management advice given) it is reasonable to consider contacting the General Practitioner (GP) to agree management rather than transporting the child to hospital but **ONLY** if child appears well, the parents are confident with this **AND** the patient has **not** had:

- 2 or more convulsions in rapid succession
- a convulsion lasting in excess of ten minutes.

A thorough examination should be performed on any patient who is to be left at home. Any signs of potentially serious underlying illness require assessment in hospital.

If the patient is not removed to hospital the G.P. **MUST** be informed.

Status Epilepticus

Patients with persistent and continual convulsions are in **STATUS EPILEPTICUS,** and need aggressive ABC care and rapid transport to hospital. Administer diazepam IV or PR where IV access cannot be rapidly achieved (***refer to diazepam protocol for dosages and information***). **NOTE:** this is a medical emergency and the child must be removed to hospital as rapidly as possible.

Epilepsy

A number of patients with diagnosed epilepsy, who have repeated convulsions and a well documented history of this, may present regularly to the Ambulance Service.

If they are **fully recovered and not at risk**, and **in the care of a responsible adult**, consideration may be given to not transferring them routinely to hospital unless they wish to travel. These cases must have vital signs recorded on a disclaimer form, along with the explanation given to the parents/guardian. Patients and the responsible adult should be advised to contact either the GP if the child feels generally unwell or 999 if there are repeated convulsions.

The reasons for the decision not to transport must be documented on a disclaimer form, which must be signed by the parent/guardian. Ensure contact is made with the patient's GP particularly in cases where the patient has made repeated calls.

It is important wherever possible to obtain contact details of any witnesses to a convulsion in the above circumstances and pass this to the receiving Hospital.

Key points – Convulsions in children

- Febrile convulsions most common type of convulsion in under fives.
- Most convulsions settle spontaneously without drug therapy.
- Hypoxia causes convulsions – check A and B.
- Always check blood glucose level.
- Provide a hospital alert message for status epilepticus.

METHODOLOGY

Refer to methodology section.