

The Royal College of Emergency Medicine

Clinical Audits

**Initial management of the fitting child
Clinical Audit 2014-15**

National Report

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Foreword



Seizures are the most common reason for a child to need care in the resuscitation room, so this is a great topic to choose for audit.

This study shows that, with nearly 6,500 patients audited, we can be confident that Emergency Departments across the UK are offering a good standard of clinical care to these patients.

This does not mean that we should be complacent – there is always scope for improvement and this audit has identified specific areas that we can target to achieve this.

College audits are widely respected as a benchmark of quality care. The inspectorate bodies of each of the UK nations pay particular regard to both participation and performance in these audits. I am keen that they continue to focus on patient experience. There is a clear link between audit performance and patient outcomes – a welcome change from many of the process measures we are obliged to undertake.

Dr Clifford Mann, President

Dr Adrian Boyle, Chair of Quality in Emergency Care Committee

Dr Jay Banerjee, Chair of Standards & Audit Subcommittee



Executive summary

A total of 6491 children presenting with fits to 171 Emergency Departments were included in this audit.

A small percentage (6% average) of these children were actively fitting on arrival in the Emergency Department, which correlates with shopfloor experience.

Of those who were fitting, over half had a blood glucose recorded and were managed in accordance with APLS/EPLS guidelines.

The treatment of most children appears to be good, but the primary intervention indicated by this audit should be better compliance with standards of documentation of treatment and follow-up.

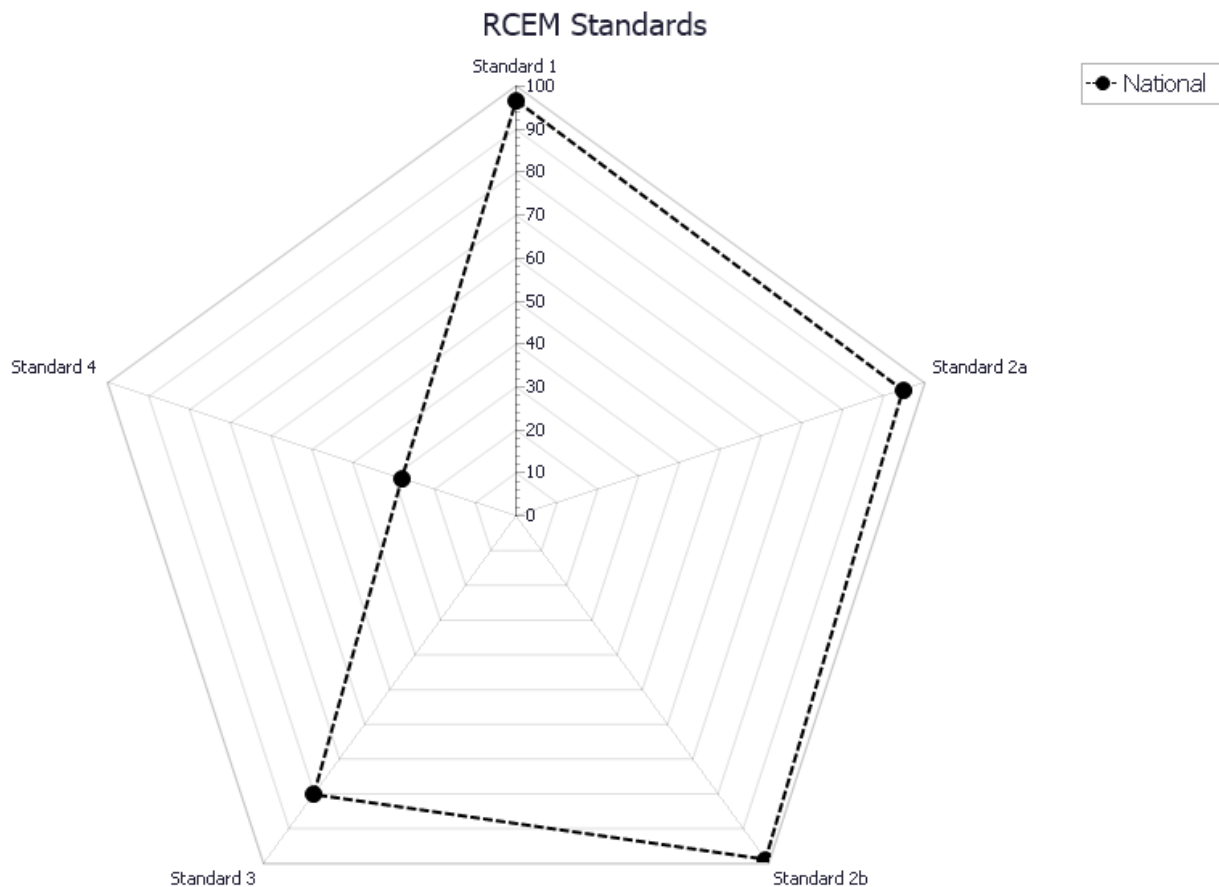
We have identified that there needs to be consistent recording of hypoglycaemia and its treatment to ensure we are not overlooking treating a potentially severe condition.

We have identified that there is no consistent provision of information for parents of patients presenting to the Emergency Department with fits, and have presented a plan to improve this.



Fitting Child Clinical Audit 2014-15

This graph shows the national performance on all standards for this audit.



Standard 1 - Manage all children who are fitting on arrival as per APLS or EPLS algorithm

Standard 2 - (a) Take a careful eyewitness history to (b) ascertain possible cause and document in the patient's clinical record

Standard 3 - Check blood glucose of actively fitting children and document in the patient's clinical record

Standard 4 - Parent information leaflets should be given to parents/carers providing clear safety net advice for all children discharged from the ED.

↑ **Higher scores (e.g. 100%)** indicate higher compliance with the standards and better performance.

↓ **Lower scores (e.g. 0%)** indicate that your ED is not meeting the standards and may wish to investigate the reasons.



Introduction





This report shows the results from an audit of the initial management of fitting children under the age of 16 years who presented at participating Emergency Departments (EDs) around the UK with a febrile or afebrile seizure (actively fitting or following a fit). The report compares the national returns and the clinical standards published by the Royal College of Emergency Medicine (RCEM) Quality in Emergency Care Committee (QECC). The standards were developed in consultation with the Royal College of Paediatrics and Child Health.

Nationally, **6491** cases from **171** EDs were included in the audit.

Country	Number of relevant EDs	Number of cases
National total	171/233 (73%)	6491
England	152/182 (84%)	5794
Scotland	7/26 (27%)	267
Wales	8/13 (62%)	297
Northern Ireland	3/9 (33%)	109
Isle of Man /Channel Islands	1/3 (33%)	24

RCEM Standards

The audit asked questions against standards published by the College in February 2013:

Standard	Standard type
1. Manage all children who are fitting on arrival as per APLS or EPLS algorithm ⁱ (exceptions: children with known history of seizures and a written management plan)	 Developmental
2. (a) Take a careful eyewitness history to (b) ascertain possible cause and document in the patient's clinical record	 Developmental (parts a and b)
3. Check blood glucose of actively fitting children and document in the patient's clinical record	 Fundamental
4. Parent information leaflets should be given to parents/carers providing clear safety net advice for all children discharged from the ED.	 Developmental



Understanding the different types of standards



Fundamental: need to be applied by all those who work and serve in the healthcare system. Behaviour at all levels and service provision need to be in accordance with at least these fundamental standards. No provider should provide any service that does not comply with these fundamental standards, in relation to which there should be zero tolerance of breaches.



Developmental: set requirements over and above the fundamental standards.



Aspirational: setting longer term goals.

For definitions on the standards, refer to appendix.

Audit history

All EDs in the UK were invited to participate in June 2014. Data were collected using an online data collection tool. This is the first time this audit has been conducted. The audit is included in the NHS England Quality Accounts for 2014/2015.

Participants were asked to collect data from ED/hospital records on 50 consecutive cases of children (under 16 years old) who presented to the ED with a febrile or afebrile seizure between 1st August 2014 and 31st January 2015. EDs that did not see 50 eligible patients within the timescale were able to include cases from before 1st August 2014.

Format of this report

The table overleaf shows the overall results of all participating trusts in the UK. The table indicates the variations in performance between departments as displayed through the lower and upper quartiles of performance as well as the median values. More detailed information about the distribution of audit results can be obtained from the charts on subsequent pages of the report. Please bear in mind the comparatively small sample sizes when interpreting the charts and results.






Feedback

We would like to know your views about this report, and participating in this audit. Please let us know what you think, by completing our feedback survey: <http://ow.ly/LX5gz>.

We will use your comments to help us improve our future audits and reports.



Summary of national findings

Question	RCEM Standard	National Results (6491 cases)		
		Lower quartile	Median*	Upper quartile
Management of active seizures				
Child actively fitting on arrival		2%	5%	10%
 STANDARD 1: of which were managed according to APLS or EPLS algorithm	100%	100%	100%	100%
 STANDARD 3: of which blood glucose was checked and documented	100%	67%	100%	100%
Child presented in status epilepticus		0%	3%	7%
Recorded clinical information				
 STANDARD 2(a): Eye witness history (includes partial)	100%	93%	96%	100%
Seizure type established (aggregate)		44%	67%	85%
Experience of previous episodes (aggregate)		41%	50%	59%
Duration of seizure (over 5 mins)		21%	28%	35%
Temperature documented		94%	98%	100%
GCS/AVPU assessment documented		81%	90%	96%
 STANDARD 2(b): Presumed aetiology	100%	100%	100%	100%
Treatment				
Febrile convulsion identified		32%	44%	54%
of which antipyretics administered		64%	78%	90%
Discharged patients				
Child discharged		20%	32%	56%
 STANDARD 4: of which written safety information provided (including previously)	100%	4%	25%	43%

Notes about the results

*The median value of each indicator is that where equal numbers of participating EDs had results above and below that value.

These median figures may differ from other results quoted in the body of this report which are mean (average) values calculated over all audited cases.

The lower quartile is the median of the lower half of the data values.

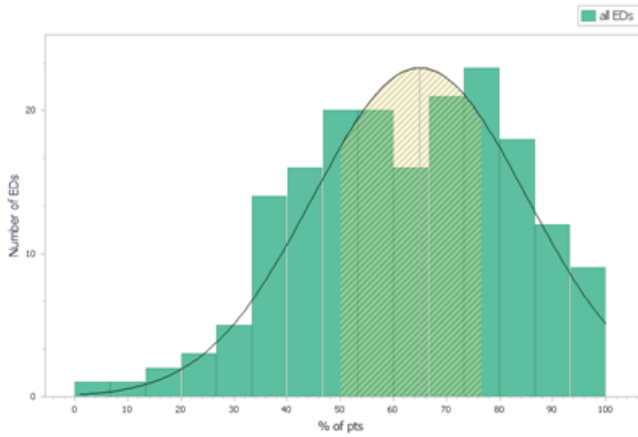
The upper quartile is the median of the upper half of the data values.



Fitting Child Clinical Audit 2014-15

Histogram charts

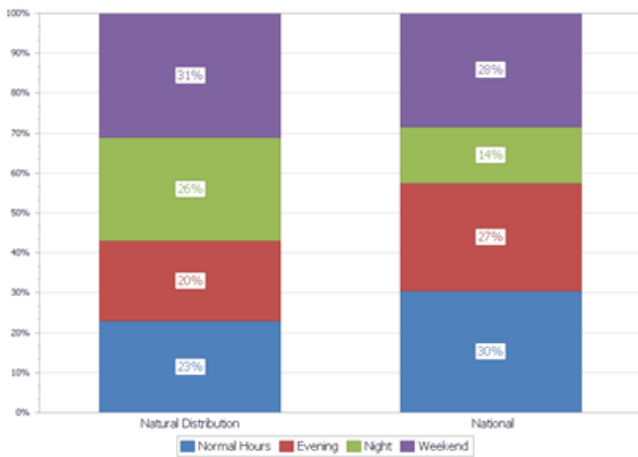
Histogram charts are used to show the distribution and frequency of results. Each histogram shows the number of EDs per % of patients as the height of each block.



The hatched area shows the interquartile range (the spread of the middle 50% of the data values). The grey line in this area shows the median.

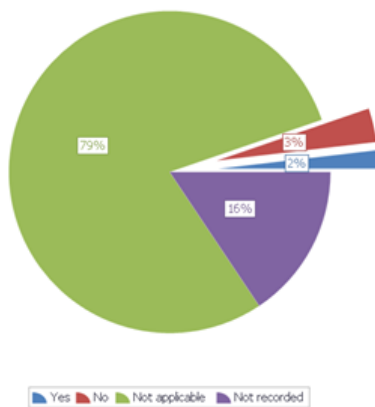
The curved line shows the normal distribution of data.

Stacked Bar Chart



Stacked bar charts show the breakdown of a group nationally.

Pie Chart



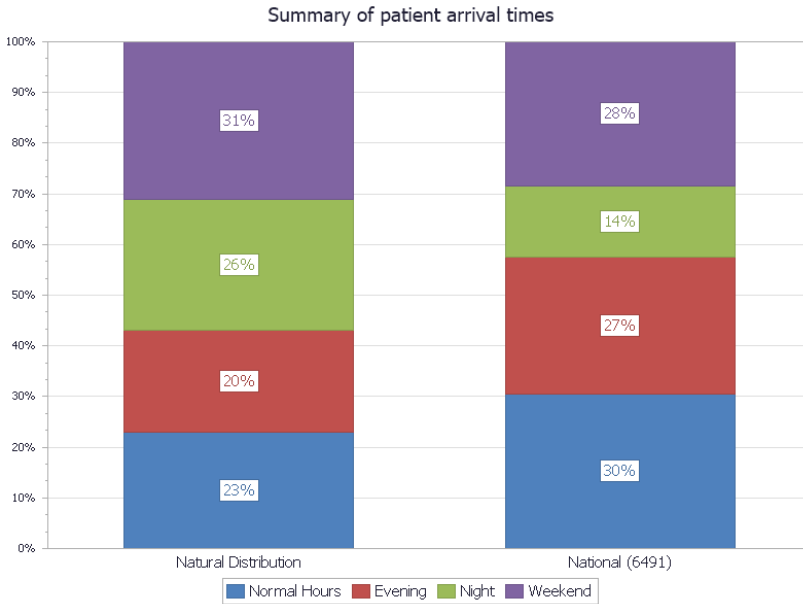
Pie charts show the breakdown of a group nationally.



SECTION 1: Casemix

National case mix and demographics of patients.

Q2. Date and time of arrival



In hours: 09:00-17:00

Evening: 17:01-00:00

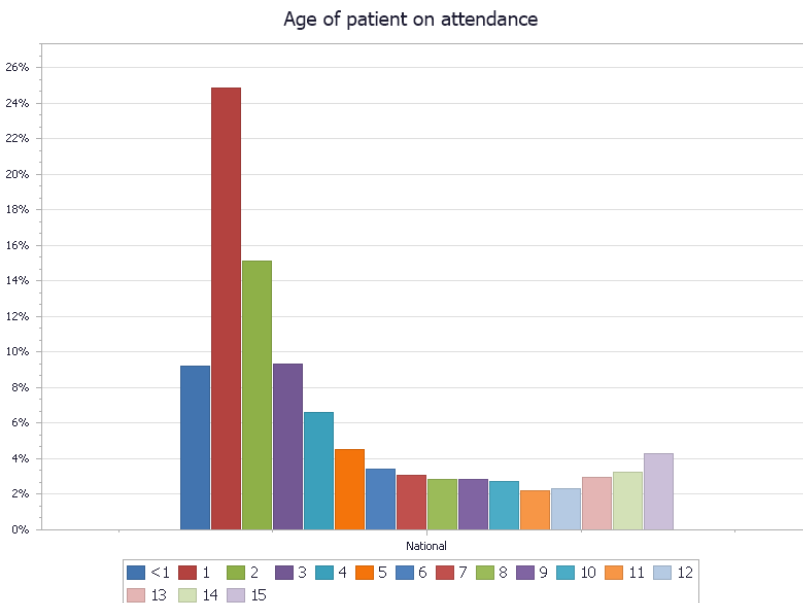
Night: 00:01-08:59

Weekend: Sat, Sun or bank holiday

The natural distribution shows how the attendances would look if this event occurred equally throughout the week.

The distribution of fits largely matches the natural distribution of hours over the week, indicating the random nature of this condition.

Q3 Patient age

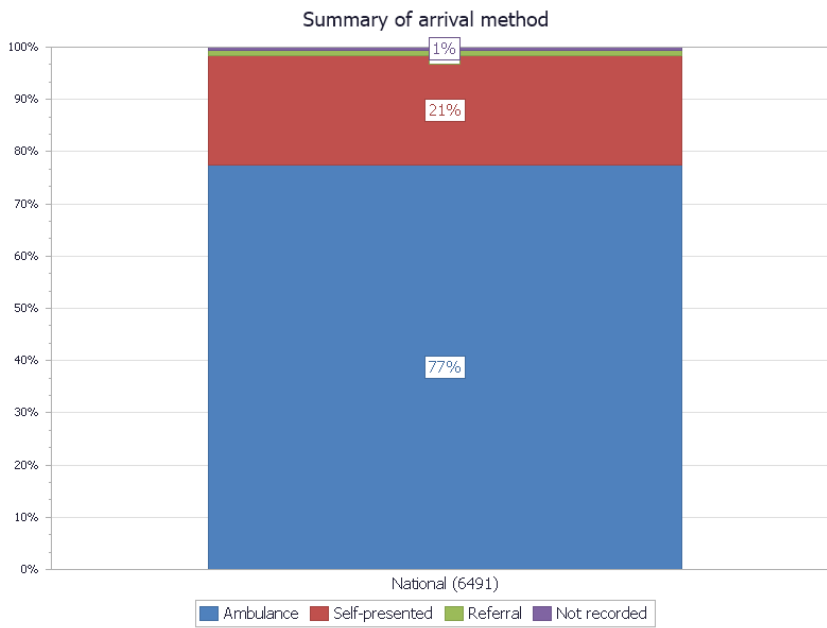


This graph correlates with clinical experience that it is the children aged 1-3 that are most likely to experience febrile convulsions.

Beyond 5 years febrile convulsions are rare and the rate of fits drops rapidly.

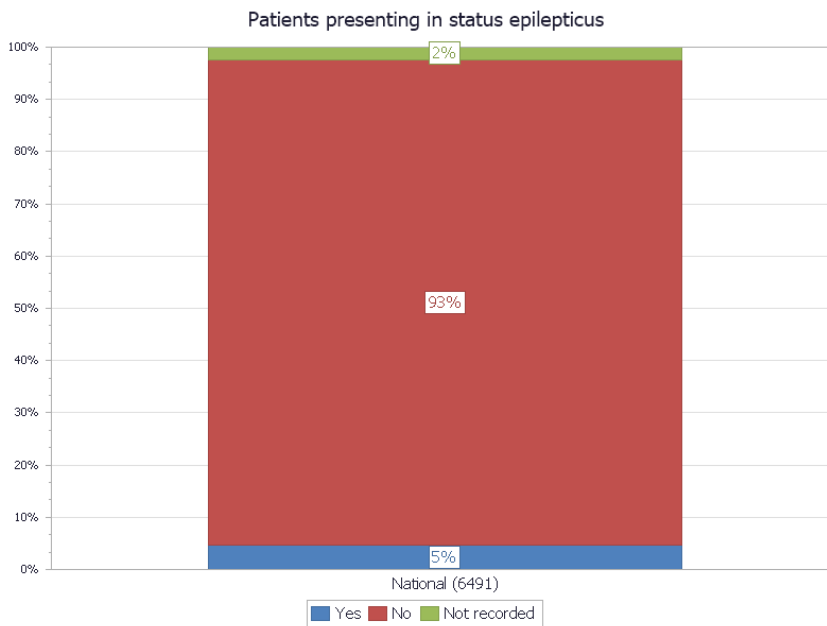


Q5 Method of arrival



The vast majority of children arrive by ambulance. This is expected, as a fitting child is a frightening experience for parents.

Q11 Did the patient present in status epilepticus?



As detailed above, seizure activity had ceased in the vast majority of children.

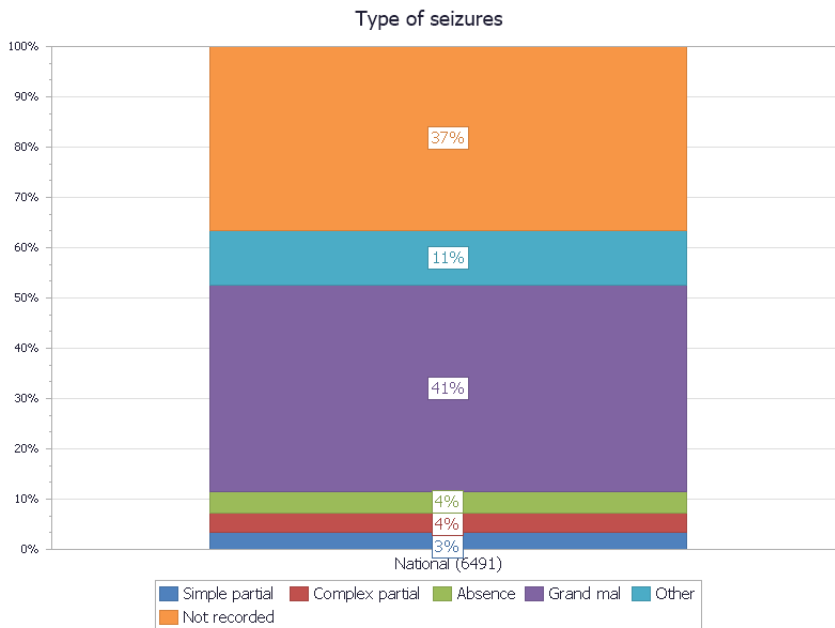
This audit did not capture how many of these children may have received pre-hospital treatment.

In the event that a child has prolonged seizures, it would often raise the possibility that there was an underlying cause.



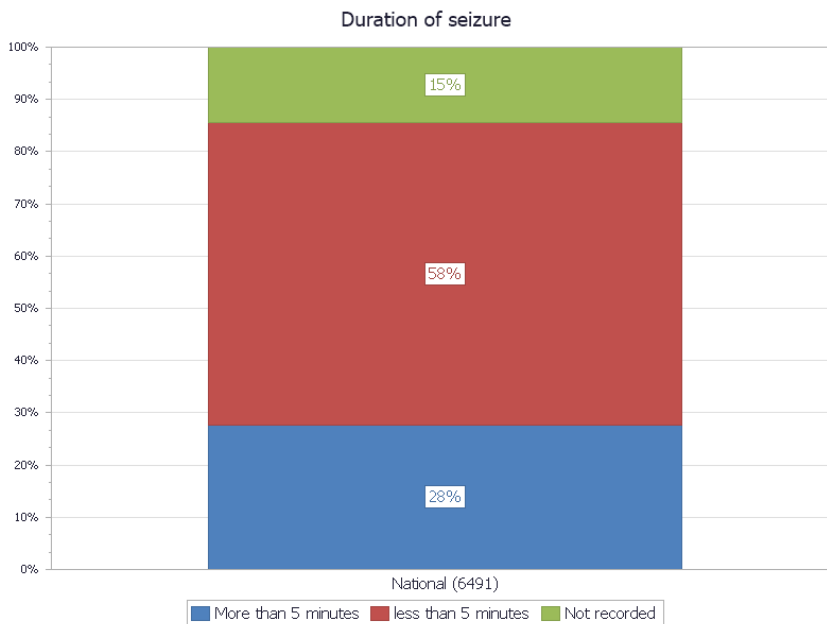
SECTION 2: Audit results

Q8 Was the type of seizure established and recorded?



While tonic-clonic (formerly known as 'Grand Mal') seizures were clearly the most common, nationally a lot of seizures were not classified.

Q10 Was the duration of the seizure established and recorded?



As most of the seizures were fever related, one would expect duration to be short.



Management of seizures

Q6a. If the patient was actively fitting on arrival, was the seizure managed according to APLS or EPLS algorithm?



Patient fitting on arrival who were managed according to APLS or EPLS algorithm



Standard 1 - developmental:

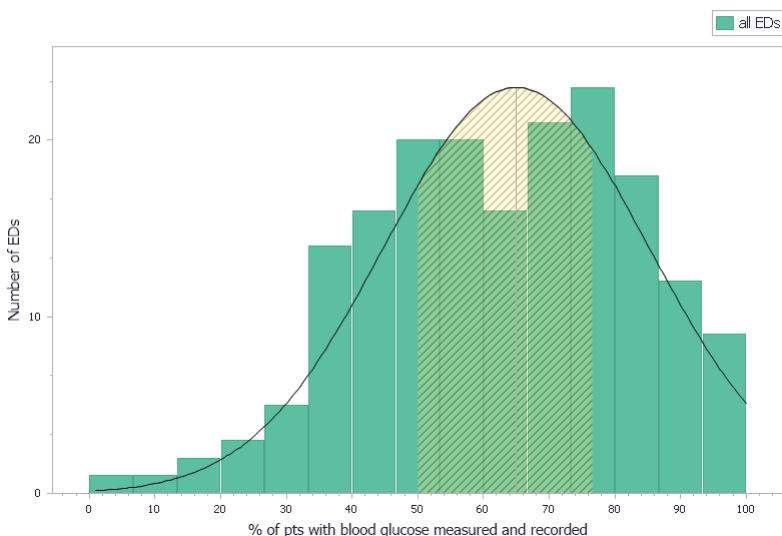
Manage all children who are fitting on arrival as per APLS or EPLS algorithm (exceptions: children with known history of seizures and a written management plan).

As explained above, this sub-group analysis only applies to children actively fitting on arrival; on average 6% of the sample.

The index population in individual hospitals will be very small, and therefore caution should be exercised in interpreting these results.

Q14. Was blood glucose taken as part of an initial assessment and recorded in the patient's clinical record?

Histogram of patients who had blood glucose measured and recorded for all EDs, showing quartiles



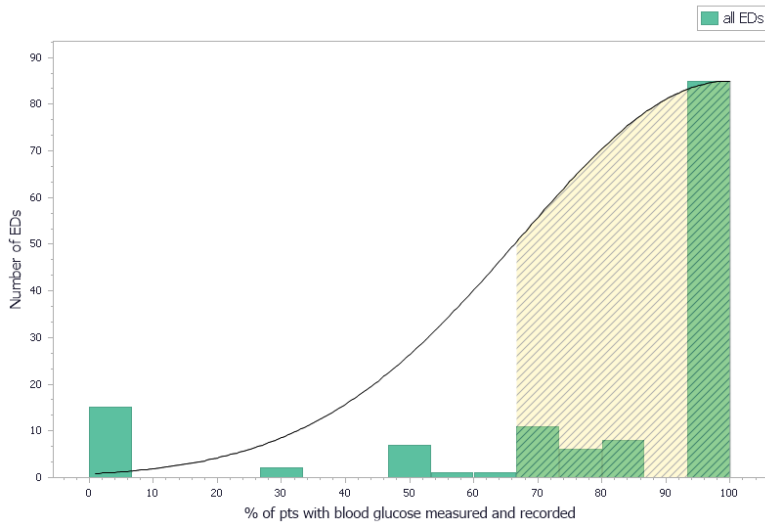
This graph includes all patients, not just those actively fitting.

A median of only 65% of children who presented had a glucose recorded. This includes cases which had measurements taken prior to arriving in the ED. Blood glucose measurement should be a routine part of any initial ED assessment of sick children.



Q6 and Q14. For patients actively fitting on arrival in the ED, was blood glucose taken as part of an initial assessment and recorded in the patient's clinical record?

Histogram of patients fitting on arrival who had blood glucose measured and recorded for all EDs, showing quartiles



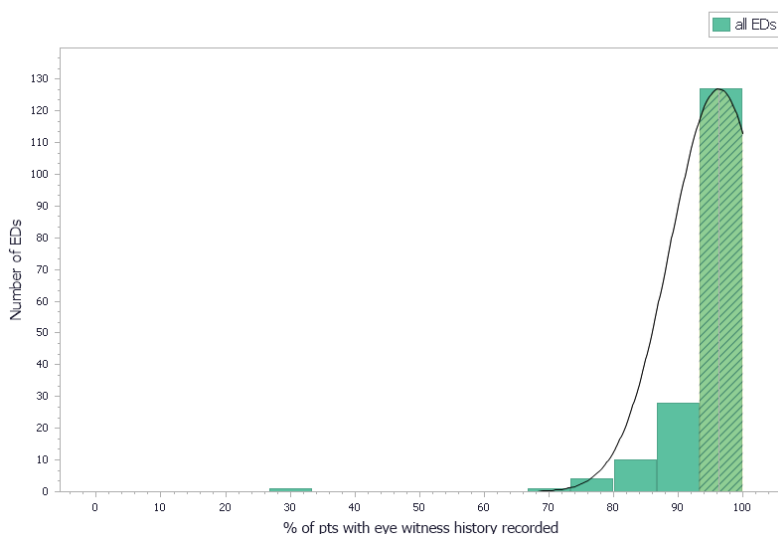
Standard 3 - fundamental: Check blood glucose of actively fitting children and document in the patient's clinical record.

This is a fundamental standard as prolonged hypoglycaemia is a dangerous yet easily treatable cause of fitting. While most children had their glucose checked, several did not **OR** did not have this documented. As mentioned previously, these figures may include cases which were checked in a pre-hospital setting. However it is good practice to repeat this if the fit persists on arrival.

Recorded clinical information

Q7 – Was an eyewitness history taken and recorded in the patient's clinical record?

Histogram of cases where eye witness history was taken and recorded for all EDs, showing quartiles



Standard 2 (a) - developmental: Take a careful eyewitness history.

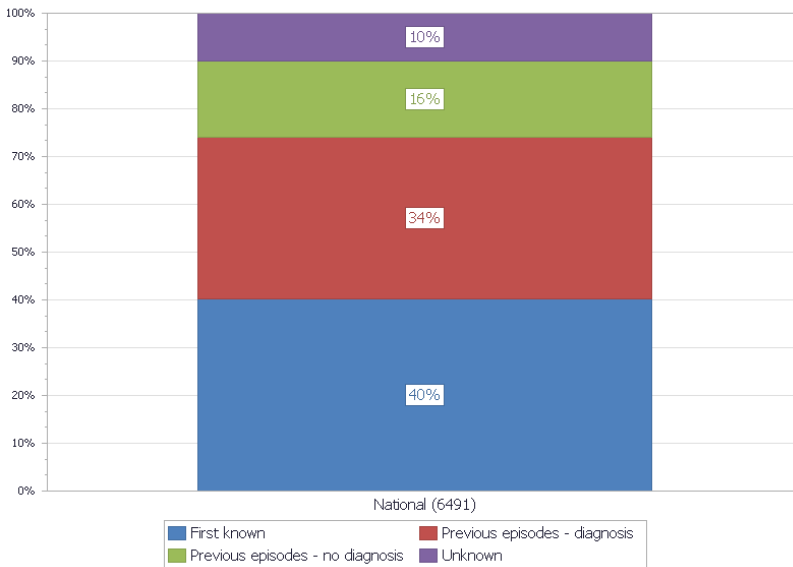
This is an important aspect that should be recorded at the time of patient attendance, as good detailed record can make later diagnostic and treatment decisions more robust.

The graph demonstrates good compliance with this standard with low variation, demonstrating widespread good practice.



Q9 Had the patient experienced any previous seizures?

Experience of previous episodes involving seizures

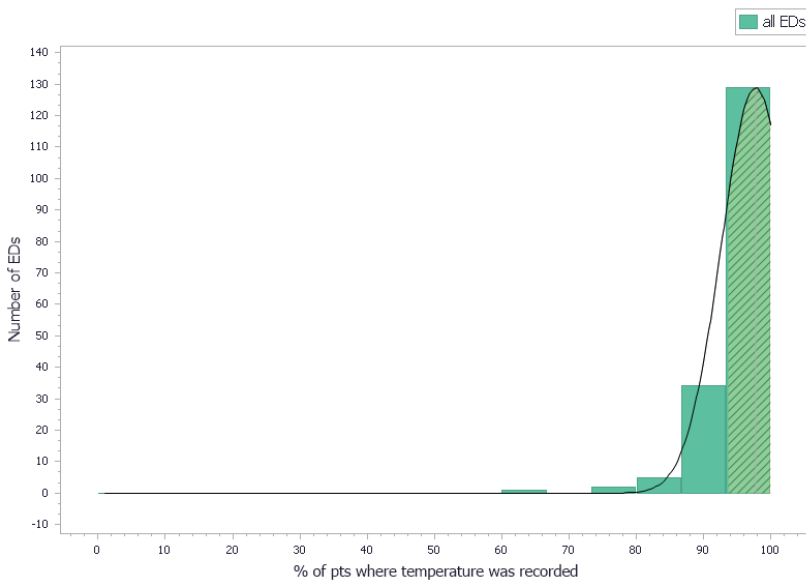


This data is difficult to interpret as the 'no diagnosis' group is larger than one would expect.

Therefore a substantial proportion of patients had no information regarding previous seizures. This information is critical to decisions regarding investigations and follow up.

Q12 Was the patient's temperature measured as part of an initial assessment and recorded in the patient's clinical record?

Histogram of patients whose temperature was recorded for all EDs, showing quartiles



As would be expected in a population that includes a high number of fever-related seizures, temperature measurement is generally undertaken.

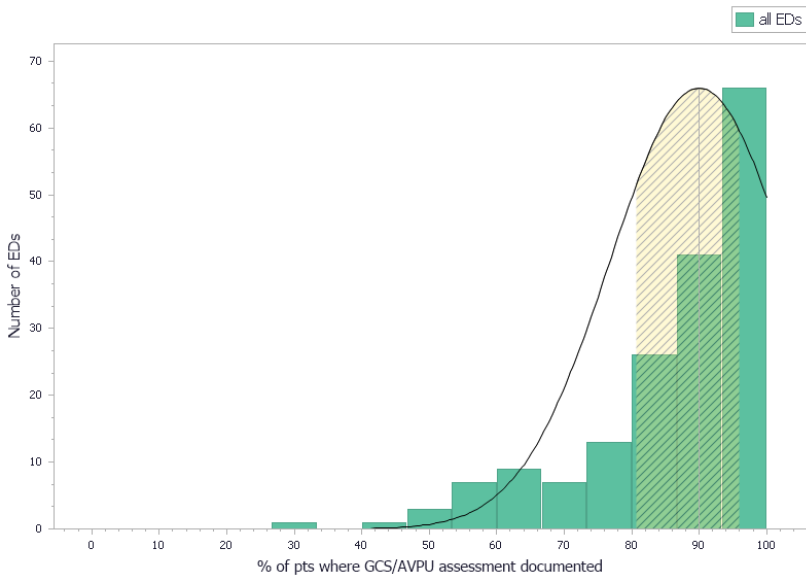
The band showing the interquartile range (variance) is quite tight, showing that most EDs are at or close to achieving this.



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Q13 Was GCS/AVPU assessment done as part of an initial assessment and recorded in the patient's clinical record?

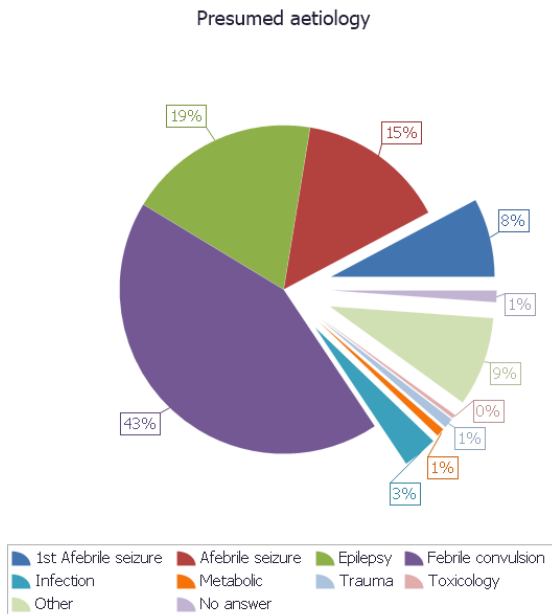
Histogram of patients whose GCS/AVPU assessment documented for all EDs, showing quartiles



Assessing conscious state immediately after fitting is sometimes difficult but represents a useful baseline, particularly for those who are slow to improve.

While the median is 90% and the interquartile range is quite tight, there are still many EDs that are not routinely achieving this.

Q16 Was the presumed aetiology recorded in the patient's clinical record?



Standard 2 (b) - developmental:

Arriving at a diagnosis wherever there is sufficient information is important for both patients and other healthcare workers.

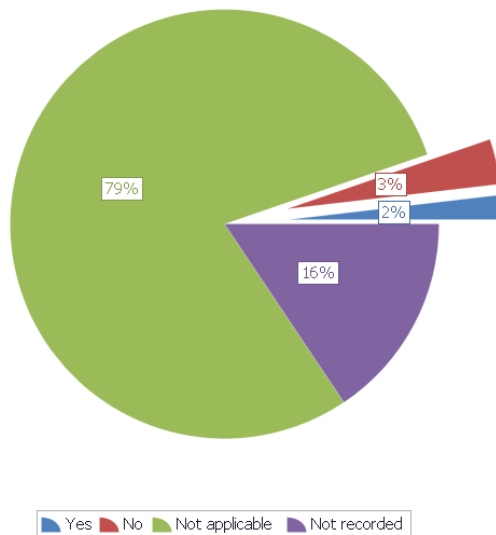
The performance against this standard was good with only 10% being coded as 'other' or 'no answer'.



Treatment

Q15. If there was evidence of hypoglycaemia, was this treated appropriately?

Evidence of hypoglycaemia treated appropriately



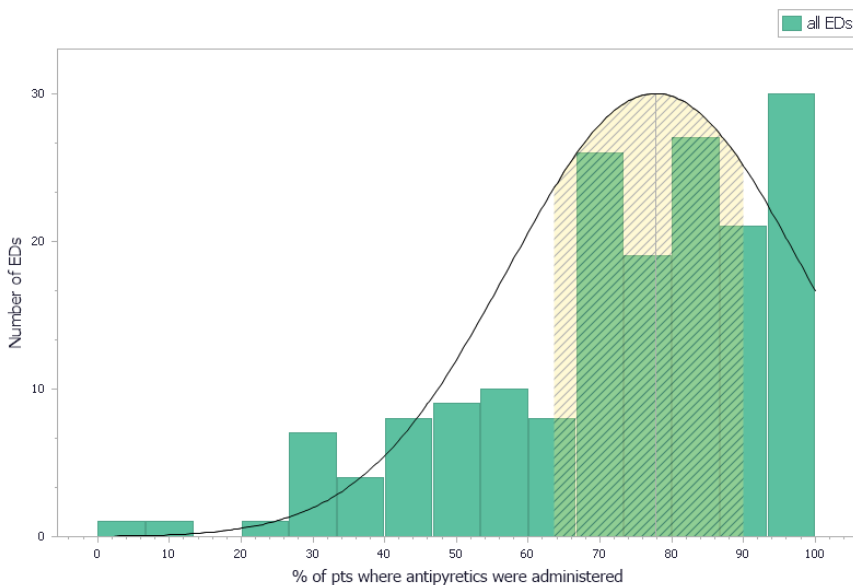
The vast majority of patients did not have evidence of hypoglycaemia.

For patients with hypoglycaemia, less than 10% of these nationally had a record of treatment.

A substantial proportion had no record of appropriate treatment; however this may be due to problems in the way this is recorded.

Q16a. If presumed aetiology in patient's clinical record is 'febrile convulsion' were antipyretics administered?

Histogram of patients antipyretics administered if aetiology was presumed to be 'febrile convulsion' for all EDs, showing quartiles



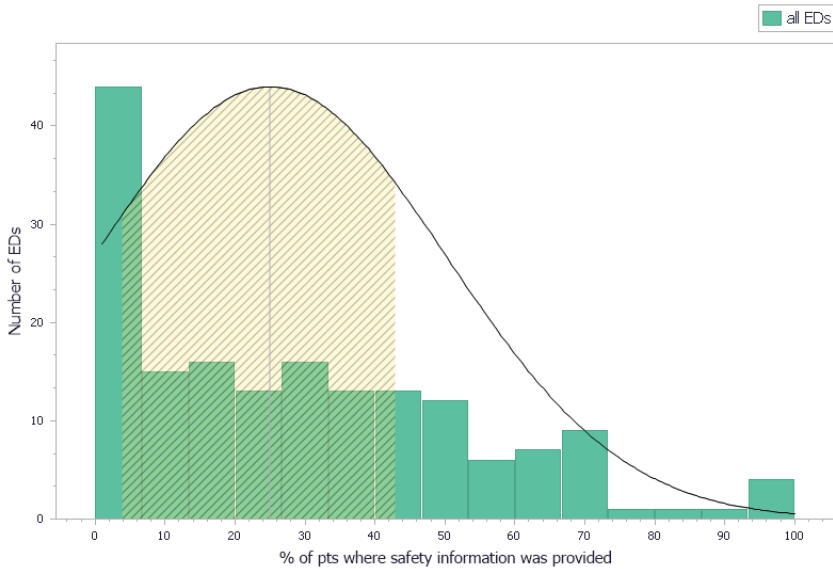
Wide variation is expected in this result. Many of these children may not have been febrile at the time of presentation or may have already received a dose of antipyretics in the previous 4 hours including from the paramedics. In some cases the genuine need for antipyretics may have been missed or not documented.



Discharged patients

Q17a. If the patient was discharged, were the patient's parents/carers provided with written safety information?

Histogram of patients discharged whose parents/carers were provided written safety information for all EDs, showing quartiles



Standard 4 - developmental:

Parent information leaflets should be given to parents/carers providing clear safety net advice for all children discharged from the ED.

We know that information given in the ED is poorly retained by patients, and that written guidance is appreciated by patients.

Febrile seizures and 'first fit' are common enough diagnoses that Emergency Departments can reasonably be expected to provide printed information on these conditions.



Analysis

Serious illness and potentially life-threatening events in children are thankfully rare. It is therefore difficult for any single ED to obtain an objective view on its standard of treatment, and therefore a very good topic for a national audit. It is important that the data are collected from a large population, and learning shared as widely as possible.

To have collected data on nearly 6,500 children with an uncommon condition is therefore a great achievement and we are very grateful to all the people who have made this possible.

The samples sizes for each standard were:

Standard 1:	367
Standard 2a:	6491
Standard 2b:	6491
Standard 3:	367
Standard 4:	2457

The case numbers for standards 2a, 2b and 4 were considered large enough for the findings to be deemed as a valid national representation. The case numbers for standards 1 and 3 fall slightly short of recommended representative sample size.

The overall standards of clinical care appear to be generally high, with a couple of cautions:

Only about one in 20 children was still fitting on arrival at the Emergency Department. As most EDs submitted 50 cases, this would be two or three cases in most centres, and therefore this subgroup analysis will inevitably be of small numbers. That said, it is still concerning that:

- a) blood sugar is not being routinely recorded in fitting children.
- b) once hypoglycaemia was recognised, correct treatment is not being instituted and/or being recorded as instituted.

Provision of safety net information to parents and carers was inconsistent. We know that patients are given a lot of information in the ED and find it difficult to retain this information: this is something we can remedy quite easily.

Limitations

This audit, like all the others, depends on the quality of the data entered by the treating clinicians. We have long been aware that there are very heterogeneous standards of data collection. This makes audit difficult, particularly in conditions such as seizures that may be ultimately coded in many different ways – including cardiac/ vasovagal, and we need to ensure that a retrospective audit does not incur bias and ignore cases because of this.



Summary of recommendations

1. EDs to develop a simple proforma for recording information about a fit.
2. EDs to produce patient information leaflets for febrile seizures and 'first fit' and ensure that parents or carers of all children who present with seizures receive written advice (examples available in 'Resources' section).
3. If the audit suggests that hypoglycaemia has not been appropriately managed and treated, this needs to be addressed through education and a further audit.
4. Sites that have performed poorly on compliance with APLS / EPLS standard treatment should review their training and protocols to ensure they are up to date with most recent practice.

Using the results of this audit to improve care

If your Emergency Department has performed badly in this audit, you should consider taking action to improve your care.

The results of this audit should be shared with staff who have responsibility for looking after children with seizures. Sharing the results of these audits with staff is a good way of demonstrating both commitment to improve, and their ability to make changes that matter. The results are tracked using a simple run chart and the short run-in times allow more confidence in the change processes creating the needed improvement.

Clinical audit is a quality improvement tool. However, traditional clinical audit with an annual or biannual cycle takes too long and may fail to demonstrate a "cause and effect" which allows us to draw conclusions from implementation of changes and their actual effect on performance. Rapid cycle audit is a better quality improvement tool that involves consulting front-line staff, and asking them to suggest changes to improve the patient care, and then conducting short cycles of audit of specific standards e.g. 10 patients at a time, and reviewing these to ensure that the performance is improving.

You should also review whether clinical staff are able to easily measure blood glucose and treat hypoglycaemia correctly.

For further information regarding methodology please see HQIP guide on using quality improvement tools (Dixon and Pearce, 2011).



Further Information

Thank you for taking part in this audit. We hope that you find the results helpful.

If you have any queries about the report please e-mail audit@rcem.ac.uk or phone 020 7400 6108.

Feedback is welcome at: <http://ow.ly/LX5gz> or https://www.surveymonkey.com/s/audit_14-15.

Details of the RCEM Clinical Audit Programme can be found under the Clinical Audit section of the College Website at www.rcem.ac.uk.

Useful Resources

- National report
- Site-specific PowerPoint presentation – developed to help you disseminate your site specific audit results easily and efficiently.
- Site-specific CSV data file – allows you to conduct additional local analysis using your site-specific data for this audit.
- Epilepsy 12 National Audit: www.rcpch.ac.uk/epilepsy12
- National Audit of Seizure Management in Hospitals (NASH): www.nashstudy.org.uk
- Epilepsy Society: <http://www.epilepsysociety.org.uk/>
- Epilepsy Action: <https://www.epilepsy.org.uk>
- Examples of local guidance and proformas: www.rcem.ac.uk/Shop-Floor/Clinical%20Guidelines/Local%20Guidelines
- Examples of patient information leaflets:
 - Eastern Paediatric Network (2014): <https://www.networks.nhs.uk/nhs-networks/eastern-paediatric-epilepsy-network/information-leaflets/advice-sheet-for-first-seizure-child-or-young-person>.
 - Nottingham University Hospitals (2012): <https://www.nuh.nhs.uk/handlers/downloads.ashx?id=13498>.

Report authors and contributors

This report is produced by the Standards and Audit Committee subgroup of the Quality in Emergency Care Committee, for the Royal College of Emergency Medicine.

Pilot sites

We are grateful to contacts from the following trusts for helping with the development of the audit:

- Derby Hospitals NHS Foundation Trust
- East Kent University Hospitals NHS Foundation Trust
- Homerton University Hospital NHS Foundation Trust
- University Hospitals Bristol NHS Foundation Trust



References

Advanced paediatric life support (ALSG, 5th edition)

Baumer JH *Arch Dis Child* 2004; 89: 278-280 Evidence based guideline for post seizure management in children presenting acutely to secondary care

The epilepsies: the diagnosis and management of the epilepsies in adults and children in primary and secondary care, NICE CG137, Jan 2012

Transient loss of consciousness ('blackouts') management in adults and young people (NICE CG109, Aug 2010)

NICE Clinical Knowledge Summary (updated October 2013)

The epilepsies: the diagnosis and management of the epilepsies in adults and children in primary and secondary care, NICE CG137, Jan 2012

Wahl H, Banerjee J, Manikam L, Lakhanpaul M. Health information needs of families attending the paediatric emergency department. *Arch Dis Child*. 2011 Apr;96(4):335-9. doi: 10.1136/adc.2009.177527. Epub 2011 Jan 10.

Dixon N & Pearce M. HQIP Guide to using quality improvement tools to drive clinical audits (2011)

Sample size calculator (Raosoft Inc, 2004). www.raosoft.com/samplesize.html (Accessed April 2015)



Appendix 1: Audit questions

QUESTION		ANSWER OPTIONS (select one only)
Q1	Date of arrival	(dd/mm/yyyy)
Q2	Time of arrival	HH:MM
Q3	Patient age	___years
Q4	Patient sex	Male/Female
Q5	Method of arrival	Ambulance/Self-presented/GP or other HCP referral
Q6	Was the patient actively fitting on arrival in the ED?	Yes/No
Q6a	If answer to Q6 is YES, was the seizure managed according to APLS or EPLS algorithm?	Yes/Partially – some deviation/No – serious omissions
Q7	Was an eyewitness history taken and recorded in the patient's clinical record?	Yes/Partially /No
Q8	Was the type of seizure established and recorded in the patient's clinical record?	Simple partial/Complex partial/Absence/Grand mal/Other/Not recorded
Q9	Had the patient experienced any previous seizures?	First known seizure / Previous episodes – no diagnosis / Previous episodes – diagnosis reached /Unknown or not recorded
Q10	Was the duration of the seizure established and recorded in the patient's clinical record?	Yes - <5 minutes duration/ Yes - ≥5 minutes duration/ Not recorded
Q11	Did the patient present in status epilepticus?	Yes / No / Not recorded
Q12	Was the patient's temperature measured as part of an initial assessment and recorded in the patient's clinical record?	Yes / Not recorded
	If the answer to Q12 is 'Yes', what was the patient's temperature?	≥37.8°C / <37.8°C
	Enter the time temperature first measured in the ED	HH: MM
Q13	Was GCS/AVPU assessment done as part of an initial assessment and recorded in the patient's clinical record?	Yes / Not recorded
	Enter the time GCS/AVPU first assessed in the ED	Enter time/ Time not recorded
Q14	Was a blood glucose measurement taken as part of an initial assessment and recorded in the patient's clinical record?	Yes / Not recorded
	If the answer to Q14 is 'Yes' was the blood glucose measurement taken in the ED or pre-hospital?	ED / Taken pre-hospital
	Enter the time blood glucose first measured in the ED	HH:MM / Time not recorded
Q15	If there was evidence of hypoglycaemia, was this treated appropriately?	Yes / No / Not applicable / Not recorded
Q16	Was the presumed aetiology recorded in the patient's clinical record?	Febrile convulsion / 1 st Afebrile seizure / Afebrile seizure (aetiology unknown) / Trauma / Epilepsy / Infection / Toxicology / Metabolic /Other
Q16 a	If answer to Q16 is 'febrile convulsion', were antipyretics administered?	Yes / No / Unknown or not recorded
Q17	What was the outcome?	Admitted to PICU or HDU / Admitted to in-hospital paediatric service / CDU or ED observation ward / Discharged /Patient died
Q17 a	If the patient was discharged, were the patient's parents/carers provided with written safety information?	Yes / No / Previously provided / Not recorded



Appendix 2: Participating Emergency Departments

ENGLAND:

Addenbrooke's Hospital
Airedale General Hospital
Alder Hey Hospital
Alexandra Hospital
Arrowe Park Hospital
Barnet Hospital
Barnsley Hospital
Basildon University Hospital
Bedford Hospital
Birmingham Children's Hospital
Blackpool Victoria Hospital
Bradford Royal Infirmary
Bristol Royal Hospital for Children
Broomfield Hospital
Calderdale Royal Hospital
Chelsea & Westminster Hospital
Chesterfield Royal Hospital
City Hospital
Colchester General Hospital
Conquest Hospital
Countess Of Chester Hospital
Croydon University Hospital
Cumberland Infirmary (The)
Darent Valley Hospital
Darlington Memorial Hospital
Derriford Hospital
Diana, Princess Of Wales Hospital
Dorset County Hospital
Ealing Hospital
East Surrey Hospital
Epsom General Hospital
Fairfield General Hospital
Friarage Hospital
Frimley Park Hospital
Furness General Hospital
Gloucestershire Royal Hospital
Good Hope Hospital
Great Western Hospital
Harrogate District Hospital
Heartlands Hospital
Hereford County Hospital
Hillingdon Hospital
Homerton University Hospital
Horton Hospital
Huddersfield Royal Infirmary
Hull Royal Infirmary
Ipswich Hospital
James Cook University Hospital
James Paget Hospital
John Radcliffe Hospital
Kettering General Hospital
Kings College Hospital
King's Mill Hospital
Kingston Hospital
Leeds General Infirmary
Leicester Royal Infirmary
Leighton Hospital
Lewisham Hospital
Lincoln County Hospital
Lister Hospital
Macclesfield District General Hospital
Manor Hospital
Medway Maritime Hospital
Milton Keynes Hospital
Musgrove Park Hospital
New Cross Hospital
Newham General Hospital
Norfolk & Norwich University Hospital
North Manchester General Hospital
North Middlesex University Hospital
North Tyneside General Hospital
Northampton General Hospital
Northwick Park Hospital
Ormskirk & District General Hospital
Peterborough City Hospital
Pilgrim Hospital
Pinderfields Hospital
Poole General Hospital
Princess Alexandra Hospital
Princess Royal Hospital (The)
Princess Royal University Hospital
Queen Alexandra Hospital
Queen Elizabeth Hospital (Gateshead)
Queen Elizabeth Hospital (King's Lynn)
Queen Elizabeth Hospital (Woolwich)
Queen Elizabeth The Queen Mother Hospital
Queen's Hospital (Burton)
Queen's Hospital (Romford)
Queen's Medical Centre
Rotherham District General Hospital
Royal Albert Edward Infirmary
Royal Berkshire Hospital
Royal Blackburn Hospital
Royal Bolton Hospital
Royal Cornwall Hospital
Royal Derby Hospital
Royal Devon & Exeter Hospital
Royal London Hospital (The)
Royal Manchester Children's Hospital
Royal Oldham Hospital
Royal Preston Hospital
Royal Shrewsbury Hospital
Royal Surrey County Hospital



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Royal United Hospital
Royal Victoria Infirmary
Russells Hall Hospital
Salford Royal Hospital
Salisbury District Hospital
Sandwell General Hospital
Scarborough General Hospital
Scunthorpe General Hospital
Sheffield Children's Hospital
Solihull Hospital
South Tyneside District General Hospital
Southampton General Hospital
Southend Hospital
St George's Hospital
St Helier Hospital
St Mary's Hospital
St Peter's Hospital
St Richard's Hospital
St Thomas' Hospital
Staffordshire General Hospital
Stepping Hill Hospital
Stoke Mandeville Hospital
Sunderland Royal Hospital
Tameside General Hospital
Torbay District General Hospital
Tunbridge Wells Hospital
University College Hospital
University Hospital Coventry
University Hospital Of North Durham
University Hospital of North Staffordshire
University Hospital Of North Tees
Wansbeck Hospital
Warrington Hospital
Warwick Hospital
Watford General Hospital
West Cumberland Hospital
West Middlesex University Hospital
West Suffolk Hospital
Weston General Hospital
Wexham Park Hospital
Whipps Cross University Hospital
Whiston Hospital
Whittington Hospital
William Harvey Hospital
Worcestershire Royal Hospital
Worthing Hospital
Wythenshawe Hospital
Yeovil District Hospital
York Hospital

SCOTLAND:

Forth Valley Royal Hospital
Hairmyres Hospital
Monklands Hospital
Royal Alexandra Hospital
Royal Hospital for Sick Children
St John's Hospital at Howden
Wishaw General Hospital

WALES:

Bronglais General Hospital
Glangwili General Hospital
Morrison Hospital
Nevill Hall Hospital
Princess of Wales Hospital
Royal Gwent Hospital
Withybush General Hospital
Ysbyty Gwynedd

NORTHERN IRELAND:

Antrim Area Hospital
Causeway Hospital
Ulster Hospital

ISLE OF MAN/CHANNEL ISLANDS:

Noble's Hospital



Appendix 3: Standards definitions

Standard 1 – for the purposes of the audit 'fitting child' means any child under the age of 16 presenting with or following a fit, convulsion or seizure. All presentations below were included:

- *Seizure* - paroxysmal disturbance of brain function (motor, sensory, autonomic or cognitive) that may be epileptic, or non epileptic
- *Epileptic seizure* - occurrence of signs and/or symptoms of abnormal excessive hypersynchronous activity in the brain
- *Non-epileptic seizure* - seizure occurring due to non epileptic causes e.g. syncope, reflex anoxic seizures, breath holding attacks, cardiac arrhythmias, raised ICP
- *Acute symptomatic seizure* - seizure secondary to metabolic or electrolyte disturbances, intracranial infections, intracranial haemorrhage, tumour, ingestions
- *Febrile seizure* - seizure in presence of fever ≥ 37.8 C or features in history or examination indicative of febrile seizure
- *Epilepsy* - recurrence of epileptic seizures.

Exceptions: If the child had a known history and has a written management plan then that patient should not be included in the audit. If it is unclear whether the patient had a personal written management plan when they presented, they were included in the audit.

Standard 2 – An eyewitness to the seizure should be contacted to ascertain:

- the conscious level prior to the seizure
- the duration of the seizure
- whether the seizure was focal or generalised
- the time taken to recover
- the state of the child afterwards.¹

Standard 3 – Measuring blood glucose must be done in all cases. If it was measured pre-hospital by an ambulance crew the result should be recorded in the ED notes.

Standard 4 – Parents or carers of children discharged from the ED should be provided with written information that includes:

- information about the type of seizure experienced
- the likelihood of recurrence
- what steps to be taken by carers in the event of a recurrence
- contact details for where carers can seek help in the event of a recurrence.

Exceptions: if the patient has a history of seizures with a diagnosed condition and has already received written advice on the type of seizure experienced.



Appendix 4: Calculations

Value: Seizure managed according to APLS

Sample Group Condition: Only those entries where the answer to “Q6 Was the patient fitting on arrival?” (Q6answer) was answered ‘Yes’.

Value: Patient's temperature over 37.8 or under 37.8

Sample Group Condition: Only those entries where the answer to “Q12 Was the patient's temperature measured?” (Q12answer) was answered ‘Yes’. Blank answers reinterpreted as ‘not recorded’.

Value: Blood glucose measurement taken in ED or pre-hospital

Sample Group Condition: Only those entries where the answer to “Q14 Was a blood glucose measurement taken?” (Q14answer) was answered ‘Yes’. Blank answers reinterpreted as ‘not recorded’.

Value: Febrile Convulsion, were antipyretics administered

Sample Group Condition: Only those entries where the answer to “Q16 Was the presumed aetiology recorded?” (Q16answer) was answered ‘Febrile convulsion’.

Value: Standard 3

Sample Group Condition: Only those entries where the answer to “Q6 Was the patient fitting on arrival?” (Q6answer) was answered ‘Yes’.