



The College of Emergency Medicine

CEM Clinical Audits 2011-12

Pain in Children

Introduction

This report shows results from an audit of the treatment of children between the ages of 5 and 15 arriving at emergency departments (EDs) in moderate or severe pain with a fractured elbow, forearm, wrist, ankle, tibia, fibula or femur against the clinical standards of the College of Emergency Medicine (CEM) Clinical Effectiveness Committee. Departments were asked to exclude patients who were only in mild pain. It compares EDs that made audit returns.

Nationally, 7963 cases from 166 EDs (including 81% of those EDs in England and Wales that treat children) were included in the audit.

The CEM standards - pain in children

- 1 Patients in severe pain (pain score 7 to 10) should receive appropriate analgesia, according to local guidelines,
 - 50% within 20 minutes of arrival or triage whichever is the earliest.
 - 75% within 30 minutes of arrival or triage whichever is the earliest.
 - 98% within 60 minutes of arrival or triage whichever is the earliest.
- 2 Patients with moderate pain (pain score 4 to 6) should be offered or receive analgesia, according to local guidelines,
 - 75% within 30 minutes of arrival or triage whichever is the earliest.
 - 90% within 60 minutes of arrival or triage whichever is the earliest.
- 3 90% of patients with severe pain should have documented evidence of re-evaluation and action within 60 minutes of receiving the first dose of analgesic.
- 4 75% of patients with moderate pain should have documented evidence of re-evaluation and action within 60 minutes of receiving the first dose of analgesic.
- 5 If analgesia is not prescribed and the patient has moderate or severe pain the reason should be documented in the notes.

Please note standards are reviewed annually. Standard 3 was modified in August 2010.

History of the audits

Pain in children is one of three CEM clinical audit topics for 2011-12, the others being severe sepsis / septic shock and consultant sign-off. These audits follow on from the successful earlier audits of ED treatment of children in pain in 2003, repeated in 2004, 2005, 2007, 2008 and 2009. Since 2003, there have also been similar audits of the treatment of vital signs in majors, feverish children, renal colic, paracetamol overdose, fractured neck of femur, urinary retention and moderate/severe asthma in adults.

In August 2011 letters were sent to nominated consultants and audit departments in each trust asking them to participate in the 2011-12 audits. Audit tools were made available on the CEM website.

Participants were asked to collect data retrospectively from ED notes on 50 consecutive children, between the ages of 5 and 15 inclusive, presenting at their ED in any part of the period 1 August 2011 to 31 January 2012, who were in moderate or severe pain, with fractures of elbow, forearm, wrist, ankle, tibia, fibula or femur.

The audit tool summarised the data entered automatically. The summaries were then e-mailed to CEM for analysis.

The format of this report

Table 1 overleaf shows the national results.

Table 2 shows trends in national results over successive rounds of the audit since 2003. Fewer EDs participated in the 2004 and 2005 re-audits than in the other rounds of the audit (as only a six week period was allowed for data collection). Only three EDs re-audited in both of these years. Results for 2004, 2005 (and a few late returns received in 2006) have therefore been combined in this report.

By showing the lower and upper quartiles of performance as well as the median values, the tables indicate the variations in performance between departments.

More detailed information about the distributions 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. Values are not shown in the tables and charts if less than 5 relevant values were audited.

Results for this department since 2003

The CEM Pain in Children Audit is now in its sixth round. The table below shows national results for 2011 (in the cells shaded blue). The table on the next page summarises the national results for each round of the audit.

TABLE 1: Comparison of 2009 Pain in Children Audit results against previous years

Chart No.	CEM Standard	National Results 2011								
		Lower Quartile	Median	Upper Quartile						
How many patients received analgesia before arrival at the ED? (%)										
	All patients	18%	24%	32%						
How promptly after arrival was analgesia provided? (%)										
1 (-4)	Within 20 minutes	29%	40%	56%						
	Within 30 minutes	42%	56%	72%						
	Within 60 minutes	59%	76%	86%						
	Not in ED due to pre-hospital admin	0%	2%	6%						
How promptly after arrival was analgesia provided for patients in severe pain? (% relevant pts)										
	Within 20 minutes	50%	38%	50%	67%					
	Within 30 minutes	75%	57%	71%	83%					
	Within 60 minutes	98%	78%	92%	100%					
	Not in ED due to pre-hospital admin	0%	0%	4%						
How promptly after arrival was analgesia provided for patients in moderate pain? (% relevant pts)										
	Within 20 minutes	33%	48%	60%						
	Within 30 minutes	75%	47%	64%	80%					
	Within 60 minutes	90%	67%	80%	90%					
	Not in ED due to pre-hospital admin	0%	3%	8%						
Was analgesia provided in accordance with need? (% of pts)										
5	Pain score recorded	32%	63%	96%						
6	Accepted analgesia	62%	76%	86%						
7	In accordance - wholly	34%	58%	74%						
	with guidelines - wholly or partly	50%	70%	87%						
8	Not offered, no reason recorded	2%	8%	18%						
Was analgesia re-evaluated? (%)										
12	Evidence of re-evaluation	8%	18%	30%						
	Within 30 minutes	0%	2%	5%						
	Within 1 hour	2%	6%	13%						
	Within 2 hours	4%	12%	22%						
How soon was analgesia re-evaluated for patients in severe pain? (% relevant pts)										
	Within 30 minutes	90%	0%	0%	11%					
	Within 1 hour	0%	17%	29%						
	Within 2 hours	10%	24%	44%						
How soon was analgesia re-evaluated for patients in moderate pain? (% relevant pts)										
	Within 30 minutes	0%	0%	6%						
	Within 1 hour	75%	0%	5%	14%					
	Within 2 hours	0%	9%	21%						
How quickly did the patient go to X-ray? (% of pts)										
13	Within 30 minutes	20%	31%	41%						
	Within 1 hour	57%	68%	78%						
	Within 2 hours	88%	94%	96%						
Time to leave ED (% of pts)										
14	Within 1 hr	2%	4%	8%						
	Within 2 hrs	24%	32%	46%						
	Within 4 hrs	87%	96%	98%						
Supplementary figures										
15	% in severe pain	24%	37%	52%						
	% cases where NAI considered	4%	34%	88%						
	No. cases audited	50	50	50						

* Values are not shown if less than 5 relevant cases were audited.

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 the "national" results quoted in the body of this report which are the mean values for all audited patients.

Summarised National Results since 2003

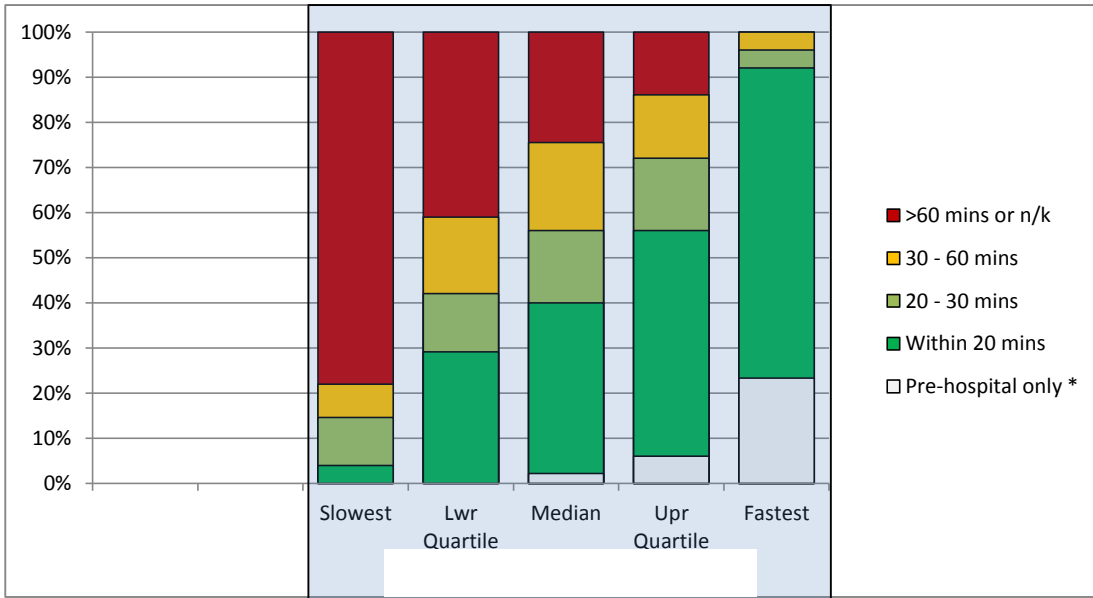
The table below summarises the national results for the 2011-12 audit alongside those for previous rounds to show how performance has changed. It suggests that some of the improvements made between 2003 and 2007 have not been sustained. By showing the lower and upper quartiles of performance as well as the median values, the table indicates the wide variations in performance that still exist between less well and better performing departments.

TABLE 2: National results: 2003 to 2009

	CEM Standard	Lower Quartile						Median						Upper Quartile					
		2011	2009	2008	2007	2004-6	2003	2011	2009	2008	2007	2004-6	2003	2011	2009	2008	2007	2004-6	2003
How many patients received analgesia before arrival at the ED? (%)																			
All patients		18%	14%	0%	0%			24%	22%	6%	3%			32%	30%	10%	10%		
How promptly after arrival was analgesia provided? (%)																			
Within 20 minutes		29%	32%	27%	27%	17%	17%	40%	40%	42%	42%	30%	29%	56%	54%	58%	58%	47%	47%
Within 30 minutes		42%	40%	38%	40%	28%	25%	56%	54%	58%	60%	47%	42%	72%	70%	70%	73%	63%	60%
Within 60 minutes		59%	56%	54%	57%	44%	36%	76%	72%	74%	77%	67%	56%	86%	87%	86%	90%	81%	78%
Not in ED due to pre-hospital admin		0%	0%					2%	2%					6%	6%				
How promptly after arrival was analgesia provided for patients in severe pain? (% relevant pts)																			
Within 20 minutes	50%	38%	40%	42%	39%	23%	40%	50%	53%	50%	50%	27%	53%	67%	70%	67%	70%	36%	71%
Within 30 minutes	75%	57%	59%	64%	55%	40%	70%	71%	71%	75%	65%	50%	75%	83%	84%	85%	82%	71%	87%
Within 60 minutes	98%	78%	81%	86%	83%	67%	81%	92%	90%	92%	91%	80%	92%	100%	100%	100%	95%	86%	99%
Not in ED due to pre-hospital admin		0%	0%					0%	0%					4%	0%				
How promptly after arrival was analgesia provided for patients in moderate pain? (% relevant pts)																			
Within 20 minutes		33%	30%	32%	39%			48%	42%	49%	55%			60%	54%	62%	67%		
Within 30 minutes	75%	47%	43%	50%	56%			64%	55%	63%	67%			80%	71%	77%	82%		
Within 60 minutes	90%	67%	60%	68%	71%			80%	78%	83%	83%			90%	89%	92%	94%		
Not in ED due to pre-hospital admin		0%	0%					3%	0%					8%	7%				
Was analgesia provided in accordance with need? (% of pts)																			
Pain score recorded		32%	25%	26%	20%	11%	0%	63%	56%	55%	46%	34%	12%	96%	90%	94%	81%	66%	48%
Accepted analgesia		62%	60%	59%	58%	49%	43%	76%	75%	71%	77%	67%	61%	86%	86%	82%	86%	83%	83%
In accordance - wholly		34%	32%	38%	34%	27%	22%	58%	60%	58%	63%	52%	46%	74%	74%	72%	87%	76%	77%
with guidelines - wholly or partly		50%	54%					70%	70%					87%	84%				
Not offered, no reason recorded		2%	0%	0%	0%			8%	7%	5%	0%			18%	20%	18%	5%		
Was analgesia re-evaluated? (%)																			
Evidence of re-evaluation		8%	8%	10%	6%	1%	0%	18%	18%	18%	17%	7%	7%	30%	30%	30%	36%	21%	18%
Within 30 minutes		0%	0%					2%	2%					5%	6%				
Within 1 hour		2%	2%					6%	8%					13%	14%				
Within 2 hours		4%	4%					12%	12%					22%	21%				
How soon was analgesia re-evaluated for patients in severe pain? (% relevant pts)																			
Within 30 minutes	90%	0%	0%					0%	8%					11%	16%				
Within 1 hour		0%	6%					17%	16%					29%	30%				
Within 2 hours		10%	11%					24%	23%					44%	43%				
How soon was analgesia re-evaluated for patients in moderate pain? (% relevant pts)																			
Within 30 minutes		0%	0%					0%	3%					6%	7%				
Within 1 hour	75%	0%	0%					5%	7%					14%	17%				
Within 2 hours		0%	3%					9%	12%					21%	27%				
How quickly did the patient go to X-ray? (% of pts)																			
Within 30 minutes		20%	16%					31%	26%					41%	38%				
Within 1 hour		57%	54%					68%	65%					78%	78%				
Within 2 hours		88%	88%					94%	92%					96%	96%				
Time to leave ED (% of pts)																			
Within 1 hr		2%	2%	3%				4%	5%	7%				8%	10%	12%			
Within 2 hrs		24%	28%	28%				32%	37%	40%				46%	46%	50%			
Within 4 hrs		87%	90%	86%				96%	96%	95%				98%	98%	98%			
Supplementary figures																			
% in severe pain		24%	19%	15%	17%	23%	15%	37%	31%	29%	29%	37%	27%	52%	48%	42%	44%	50%	40%
% cases where NAI considered		4%	2%					34%	12%					88%	61%				
No. cases audited in each ED		50	50	49	30	30	30	50	50	50	32	30	35	50	50	50	40	38	45
No. EDs participating								166	142	117	140	71	173						

How promptly was analgesia provided?

Chart 1: Analgesia provided or offered within 20, 30 and 60 minutes of arrival in the ED



* The "pre-hospital only" category comprises cases where it was documented in the notes that adequate analgesia had been given prior to arrival in the ED.

Chart 1 shows percentages of audited cases in which it was documented in the notes that analgesia was first offered or administered within 20, 30 and 60 minutes of the patient's arrival in the ED. Each of these percentages also include the percentage of cases where it was recorded that adequate analgesia had been provided prior to arrival in the ED. The denominators of these percentages include all audited cases, whether or not the time when analgesia was provided was documented in the notes. This may have a significant effect on your results.

Nationally, only 5% of all audited children received adequate pain relief before arrival in the ED, 43% within 20 minutes of arrival, 57% within 30 minutes and 72% within 60 minutes of arrival.

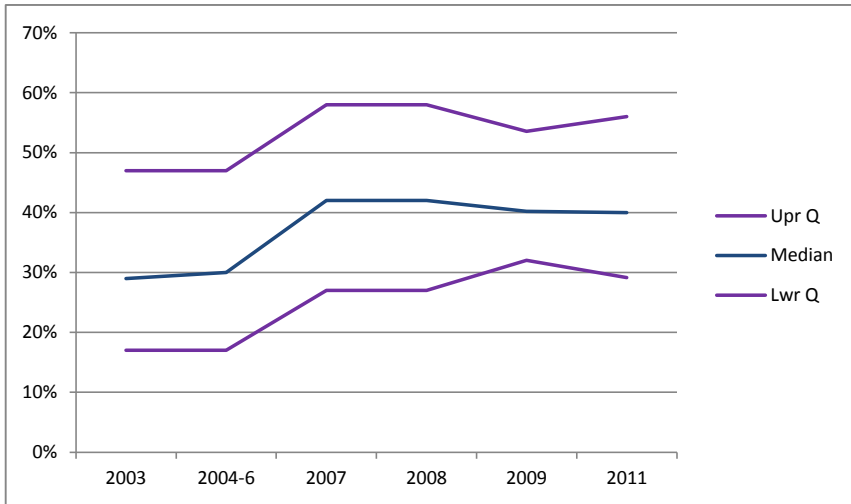
Analgesia was provided somewhat more quickly for those judged to be in severe pain: 53% within 20 minutes of arrival, 71% within 30 minutes and 87% within 60 minutes.

However, as shown in chart 1, there were large variations in promptness of analgesia between EDs. Some provided very quick pain relief – in 5% of EDs at least 3 in every 4 children received analgesia within 20 minutes of arrival; and in 64% of EDs at least 1 in 2 children received analgesia within 30 minutes.

In some other departments, analgesia was less prompt – in 14% of EDs less than one half of the children included in the audit received analgesia within 60 minutes.

Has the promptness of analgesia improved since earlier audits?

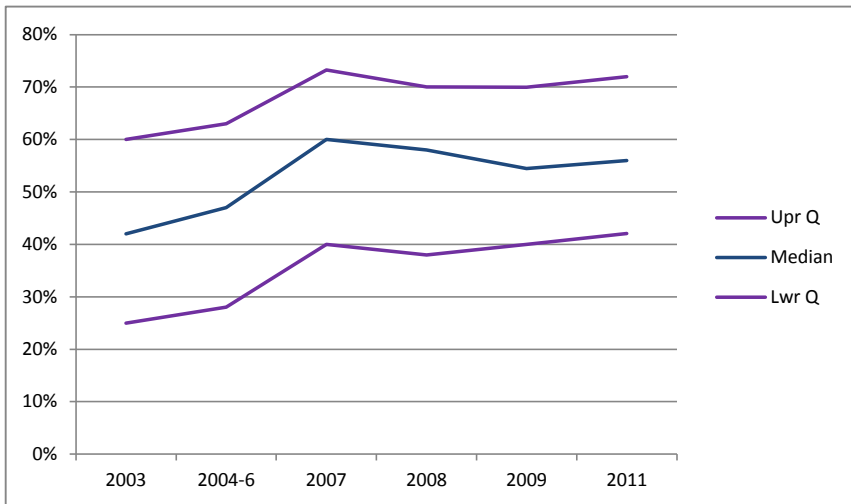
Chart 2: Analgesia within 20 minutes - trend over successive audits



These trend charts show changes over successive rounds of the audit in the promptness with which analgesia was provided in EDs.

The comparative set may vary from year to year as not all EDs participated in each round of the audit.

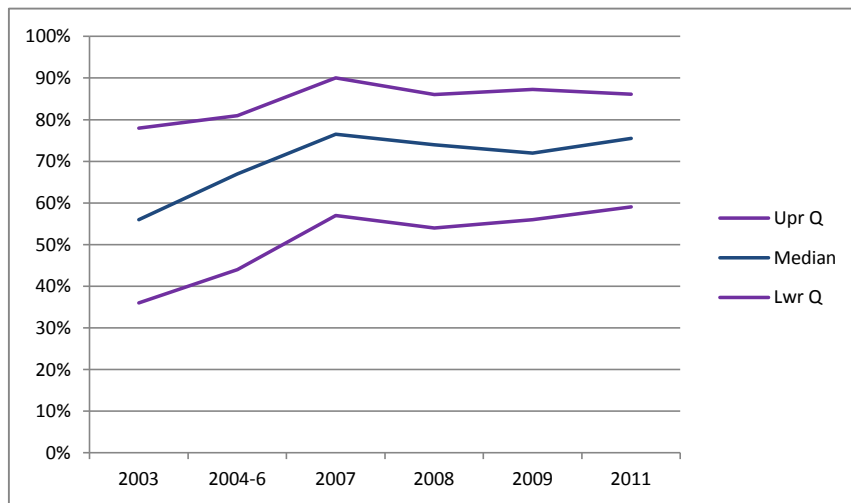
Chart 3: Analgesia within 30 minutes - trend over successive audits



Charts 2 - 4 and table 2 (on page 4) show that nationally the promptness of analgesia in EDs improved markedly between 2003 and 2007; for example, median performance for the percentage of patients receiving analgesia within 30 minutes of arrival improved from 42% to 60%. Between 2007 and 2009 performance deteriorated in many EDs; the median percentage receiving analgesia within 30 minutes dropped back to 54%, although these average figures masked slight improvements in promptness of analgesia at the lowest performing EDs.

Between 2009 and the current audit, national totals show some slight improvement in promptness of analgesia, the median percentage for analgesia within 30 minutes of arrival rising to 56%. However, the performance of the majority of EDs has not yet recovered to 2007 levels.

Chart 4: Analgesia within 60 minutes - trend over successive audits



Was analgesia provided in accordance with need?

Chart 5: Pain score recorded?

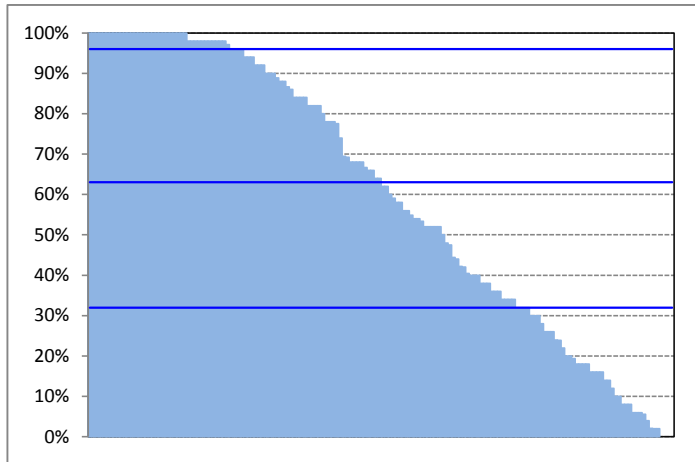
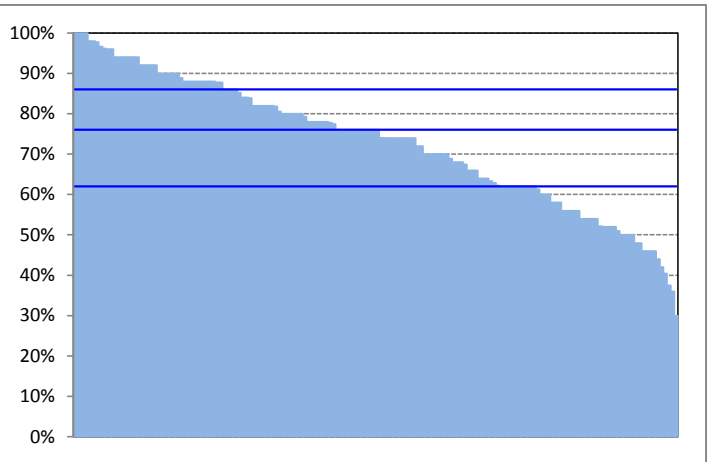


Chart 6: Analgesia accepted?



Charts 5 and 6 show whether a pain score was recorded or analgesia accepted. Across the whole audit, a pain score was recorded for 60% of children and 73% received analgesia.

Practice varied greatly between departments. In 17% of EDs all children had their pain score recorded. However in 39% of EDs a pain score was recorded for less than 1 in every 2 children included in the audit and in 7% of EDs less than 1 in 2 children received analgesia.

The audit included only those children presenting in severe or moderate pain. However, there was great variation (from 0 to 88% - mean 37%) in the percentage of audited patients who were assessed to be in severe pain. This may suggest inconsistency in the way the degree of pain was assessed or variations in ED casemix.

Chart 7: Analgesia within guidelines?

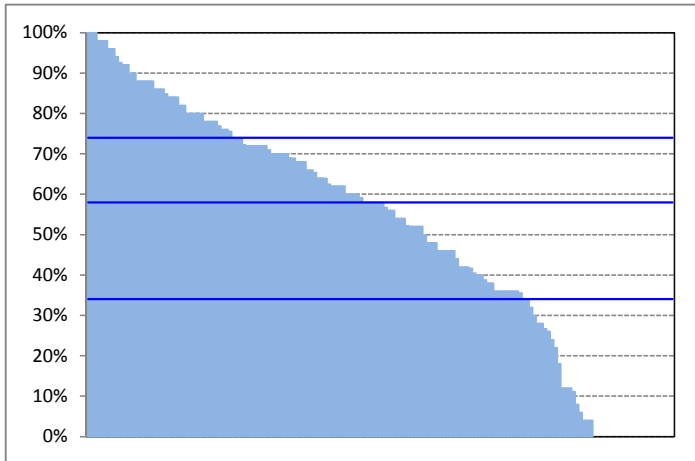
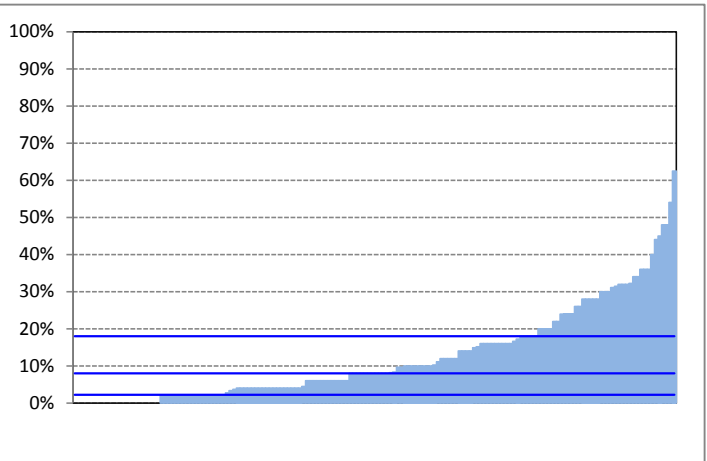


Chart 8: No analgesia administered but reason not recorded



Across the 2011 audit, 51% of children received analgesia wholly in accord with CEM guidelines (or local ones if present); 62% received analgesia wholly or partly in accord with these guidelines. However, in 24% of EDs, less than 1 in every 2 children received analgesia either wholly or partly in line with guidelines.

This chart shows the proportion of ALL audited cases for which a) no analgesia was administered and b) the reason for this was not recorded in the notes – unlike the other charts, a **HIGH VALUE SUGGESTS POOR PRACTICE**. Nationally, this occurred for 12% of all audited patients, but there was wide variation.

Trends in provision of analgesia

The trend charts on this page show how practice has changed over successive audits.

The comparative set may vary from year to year as not all EDs participated in each round of the audit.

Chart 9: Pain score recorded - trend over successive audits

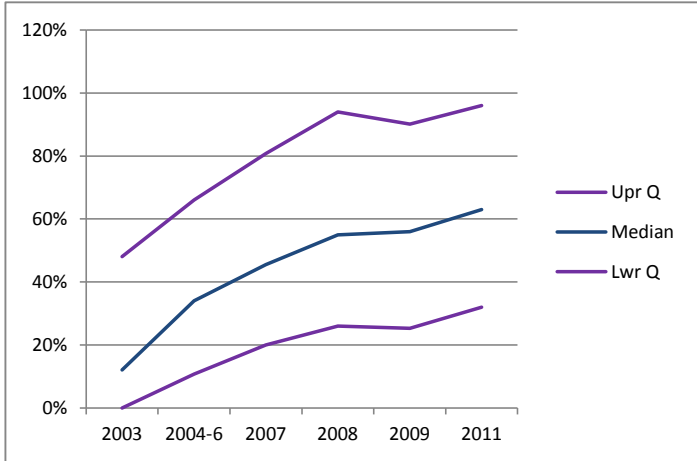


Chart 9 shows that nationally there has been continued improvement in the percentage of cases for which a pain score was recorded. The median rose from 12% in 2003 to 55% in 2008 and 63% in the latest audits.

Chart 10: Analgesia accepted - trend over successive audits

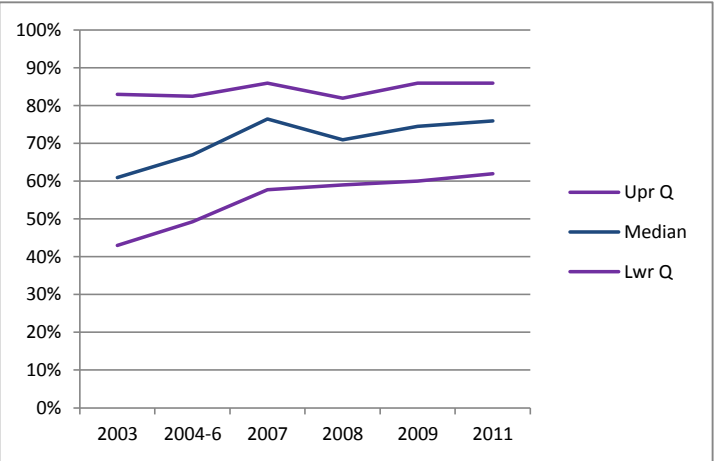


Chart 10 shows little change nationally since 2007 in the percentage of cases in which analgesia was accepted.

Chart 11: Analgesia wholly within guidelines

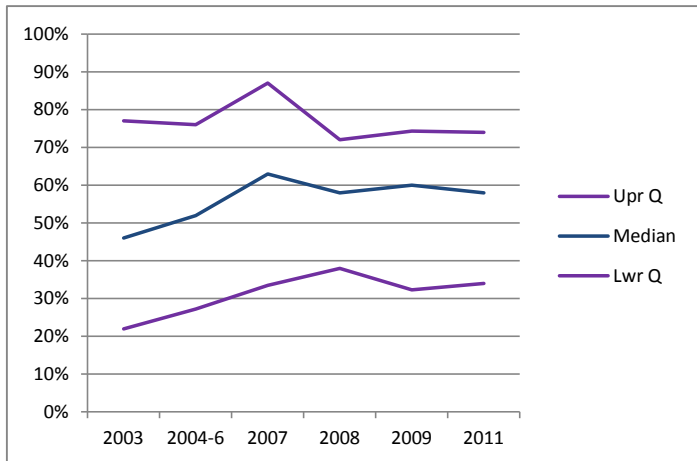
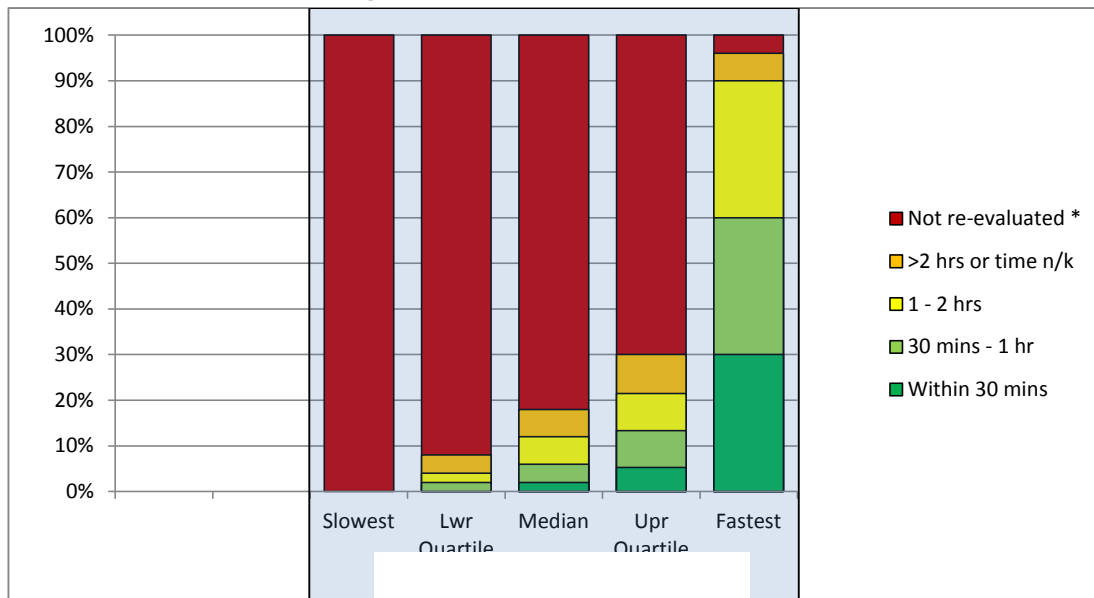


Chart 11 shows very mixed trends, despite only minor deterioration since 2004-6 in the average proportion of audited cases where analgesia was judged to be within CEM guidelines. It is, of course, possible that standards of assessment have become more rigorous in some departments over the intervening years.

Was analgesia re-evaluated?

Chart 12: Re-evaluation of analgesia



CEM recommends that analgesia is re-evaluated within 30 minutes of administration for those in severe pain (90% of relevant patients), or within 60 minutes for those in moderate pain (75% of relevant patients).

Chart 12 shows that in most EDs performance was well below the required standard – in 54% of EDs re-evaluation was evidenced in less than 1 in 5 children. In 10% of EDs, the notes show that analgesia was re-evaluated for 50% or more of children. Nationally, re-evaluation was noted in 22% of audited cases. Despite poor overall performance there was improvement between 2003 and 2008, but there has been little further change nationally over the past two years.

None of the EDs participating in the audit met the CEM re-evaluation standards. Nationally, only 7% of children in severe pain had their analgesia re-evaluated within 30 minutes - and 10% of those in moderate pain within 1 hour.

Contextual measures

Chart 13: Time to X-Ray

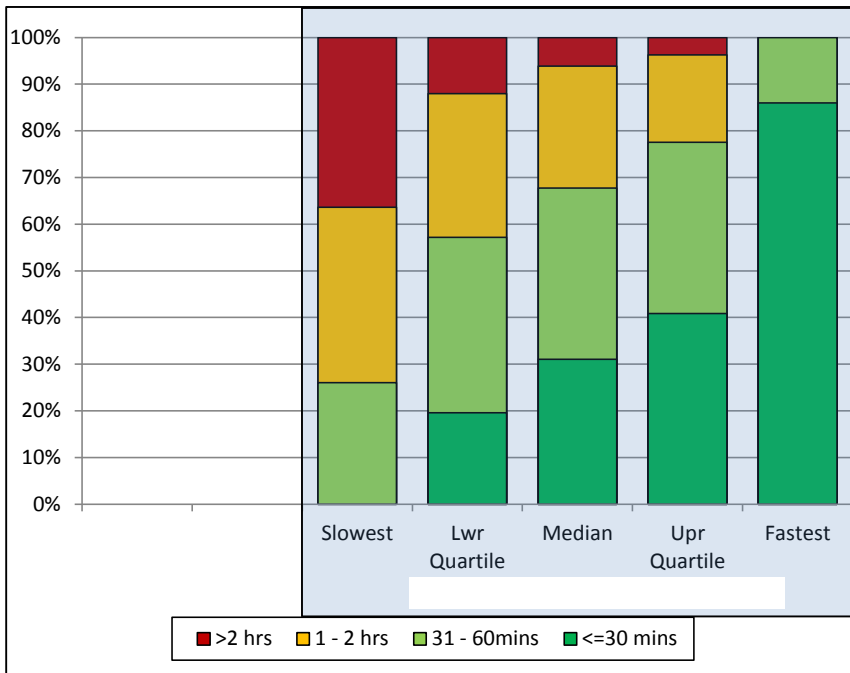


Chart 13 shows the proportions of those audited reaching X-ray within 30 minutes, 1 hour and 2 hours of arrival in the ED. Departments that recorded these times for less than 5 audited cases are excluded.

Nationally, 31% of children for whom this time was recorded reached X-ray within 30 minutes, 67% within 1 hour and 92% within 2 hours.

Chart 14: Left the ED within 4 hours

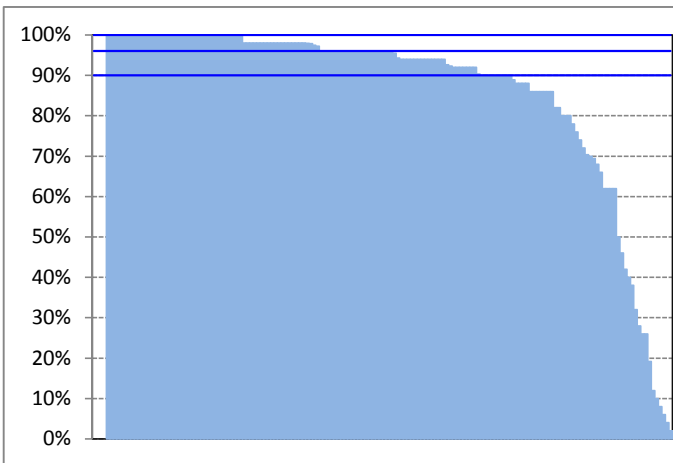
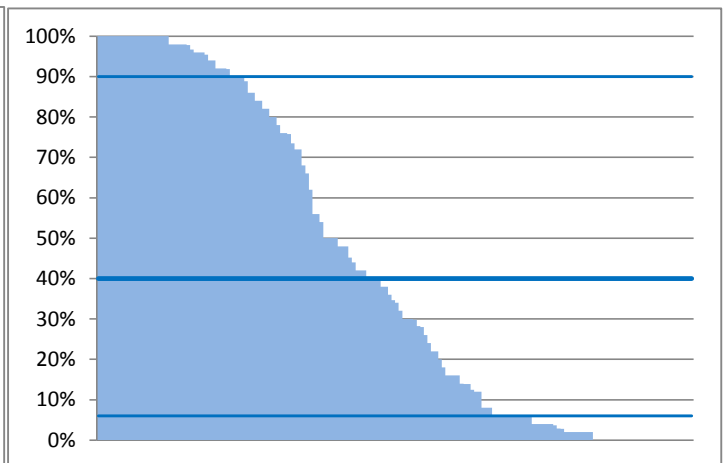


Chart 14 shows variations between EDs in the proportion of audited cases in which the child left the ED within 4 hours of arrival. Overall, 86% of the audited patients left within 4 hours.

Chart 15: Non-accidental injury considered?



As demonstrated by chart 15, answers to the question about whether non-accidental injury (NAI) was considered varied widely. This could reflect differences in policy, in the population served or in interpretation of the question. Nationally, NAI was considered in 31% of cases in 2009 increasing to 43% of cases audited in 2011.

Changes to protocols or policies since earlier audits

9% of EDs said that they had made significant changes, 39% minor changes and 14% no changes. The remaining 38% of EDs either did not know or did not respond to this question.

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

However, should you feel that any of the figures or charts in this report misrepresent the results of your audit, please contact the CEM by e-mailing philip.mcmillan@collemergencymed.ac.uk or telephoning 020 7067 1269.

Details of the CEM national audit programmes can be found at: <http://www.collemergencymed.ac.uk/Shop-Floor/Clinical Audit/Current Audits>