

The College of  
Emergency Medicine



---

## **CEM Clinical Audits: Paracetamol Overdose 2008**

### **All Trusts Report 2008**

INT. GROUP: All trusts  
COMP. SET: All trusts  
YEAR(S): 2008, 2004  
DATABASE: cemp\_2008\_paracetamol.xls

## Introduction

This report shows results from an audit of the treatment of patients presenting in Emergency Departments (EDs) with a paracetamol overdose against the clinical standards of the College of Emergency Medicine (CEM) Clinical Effectiveness Committee. It compares your department with 126 other departments that made audit returns.

6,021 cases from 127 Emergency Departments were included in the 2008 audit.

This report has been prepared by the Care Quality Commission in partnership with the College.

## History of the audits

This audit follows on from the successful earlier audits of ED treatment of paracetamol overdose in 2004 and 2005. There have been similar audits of the treatment of fractured neck of femur, pain in children, urinary retention and moderate/severe asthma in adults. These audits were developed in association with the CEM, initially by the Audit Commission's Acute Hospital Portfolio and then by the Healthcare Commission as part of its programme of service reviews. The Care Quality Commission is continuing this work as part of its work on clinical quality.

In September 2008, letters were sent to nominated contact Consultants and audit departments in each trust asking them to participate in the latest round of audits. Audit tools were made available on the Healthcare Commission and CEM websites.

Participants were asked to collect data from ED notes on 50 or more patients presenting with a paracetamol overdose. The audit tool summarised the data entered automatically. These summaries were then e-mailed to the College, who passed them to the Commission for the preparation of this report.

## Next Steps

Should you think that any of the figures or charts in this report misrepresent the results of your audit, please inform CEM by e-mailing [philip.mcmillan@collemergencymed.ac.uk](mailto:philip.mcmillan@collemergencymed.ac.uk) or telephoning 020 7067 1269.

Details of CEM audits for 2009 will be circulated shortly with a view to starting them in August 2009. The Care Quality Commission's support for the CEM audits will now be provided through its work on clinical quality with the view to publishing the results as comparative data. Some more information can be found at

<http://www.collemergencymed.ac.uk/CEM/Clinical Effectiveness Committee/CEC Standards and Audit>

## Results for this department since 2004

The paracetamol overdose audit is now in its third cycle, and the table below shows your results for each round. It allows you to see quickly whether performance in your department is improving.

The table also includes the national results for 2008 (in blue type) so that you can quickly compare your department's results against the performance of the other departments that took part in the audit. The median shows the results of the "average" department, while the lower and upper quartiles indicate departments that were noticeably below or above average.

The charts from page 5 to the end of the report allow more considered comparisons to be made.

**Table 1: ED's results since 2004 compared with national results for 2008**

	Results for this department			Results for 2008		
	2008	2005	2006	lower quartile	median	upper quartile
<b>Case mix</b>						
Number of patients audited				48	50	50
Who presented within 1 hour of ingestion (%)				10	14	18
Who took a staggered dose (%)				4	8	12
<b>Assessment and Treatment (%)</b>						
Received plasma paracetamol level test				72	79	88
<i>of which</i> plasma level tested earlier than 4 hours after ingestion				3	8	13
Where tested within 8 hours of ingestion <i>and</i> plasma concentration above treatment level				11	17	22
<i>of which</i> received N-acetylcysteine (NAC) within of 8 hours ingestion				50	73	86
Where dose >12g <i>and</i> over 8 hours since ingestion <i>or</i> staggered ingestion				2	8	14
<i>of which</i> % received NAC within 1 hour of arrival				0	2	4
<b>Compliance of treatment with guidelines (%)</b>						
Yes - recommended treatment received				73	83	90
No - recommended treatment <i>partially</i> received				6	10	20
No - serious omissions in treatment				0	0	3

Note: the median and quartiles are descriptive statistics. When results are sorted into numerical order, the median is the value where half (50%) the values are less than it and half are greater. Similarly, the lower quartile represents the quarter-way value (25%), and the upper quartile the three-quarters value (75%).

## National results since 2004

The table below summarises national performance since 2004. It uses three measures to summarise the variation between departments in performance. The median indicates performance in an average department. The lower quartile indicates departments that performed less well. The upper quartile shows the results achieved by the better performing departments. The table below presents an overview of national and local performance.

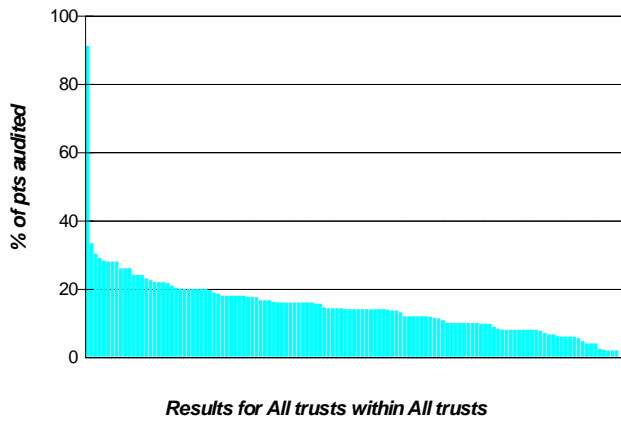
**Table 2: National results since 2004**

	Results for 2008			Results for 2005			Results for 2004		
	lower quartile	median	upper quartile	lower quartile	median	upper quartile	lower quartile	median	upper quartile
<b>Case mix</b>									
Number of patients audited	48	50	50	30	30	33	30	32	40
Who presented within 1 hour of ingestion (%)	10	14	18	10	13	23	10	14	19
Who took a staggered dose (%)	4	8	12	2	6	10	0	6	10
<b>Assessment and Treatment (%)</b>									
Received plasma paracetamol level test	72	79	87	70	77	87	69	79	87
<i>of which</i> plasma level tested earlier than 4 hours after ingestion	3	8	13	4	5	11	4	7	13
Where tested within 8 hours of ingestion <i>and</i> plasma concentration above treatment level	11	17	22	7	10	15	6	10	17
<i>of which</i> received N-acetylcysteine (NAC) within 8 hours of ingestion	50	73	86	53	67	100	50	68	100
Where dose >12g <i>and</i> over 8 hours since ingestion <i>or</i> staggered ingestion	2	8	14	7	13	17	7	13	19
<i>of which</i> % received NAC within 1 hour of arrival	0	2	4	0	0	30	0	0	29
<b>Compliance of treatment with guidelines (%)</b>									
Yes - recommended treatment received	73	83	90	76	83	88	63	75	84
No - recommended treatment <i>partially</i> received	6	10	20						
No - serious omissions in treatment	0	0	3						
<b>Other</b>									
No. of departments participating in audit	128			33			171		

The charts in the following pages allow more considered comparisons to be made.

**Case mix 1**

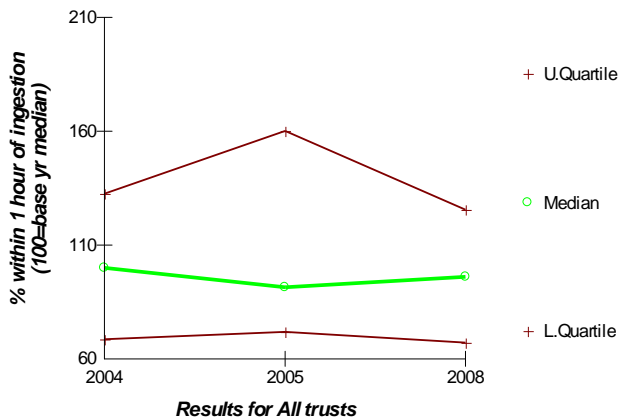
Chart 03: Patients presenting within 60 minutes of ingestion



Usually few patients arrive at an ED within one hour of ingestion. If they do they may be treated with charcoal.

The median value was 14%, but in a 10% of departments it was 24% or more.

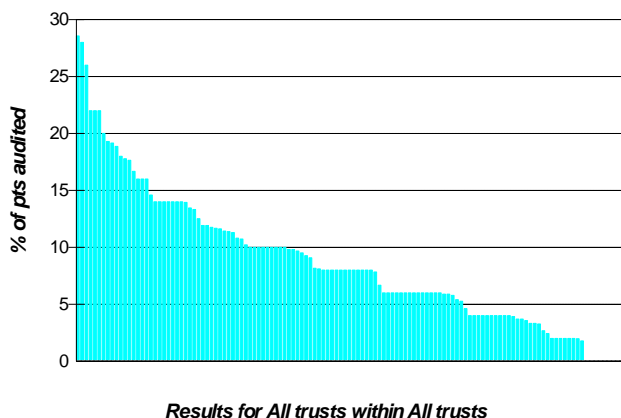
Chart 03T: Trend in patients presenting within 60 minutes of ingestion



This trend chart shows how those presenting with an overdose at your ED has changed over successive audits compared to patients presenting at other EDs. All values shown on a trend chart are in relation to the national median score in the first audit (i.e. a current score greater than 100 represents a rise on the national result of the first audit).

The thick red line (your results) shows how your patients are changing compared to other departments. Where the line is moving away from the median line, those presenting at your ED's case mix is diverging from the "average".

Chart 04: Patients who took a staggered dose

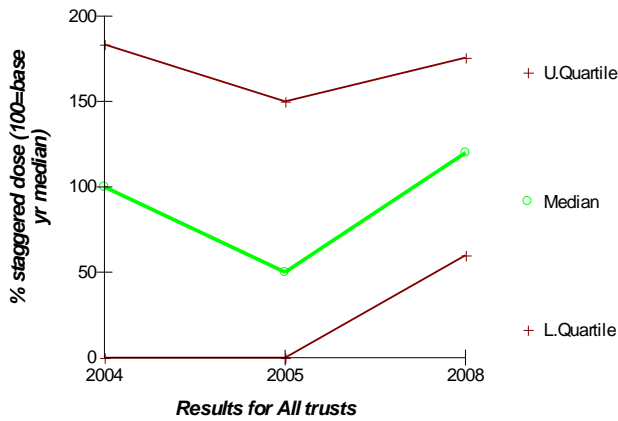


Like chart 03 this is a contextual measure as if a staggered dose was taken affects how a patient is assessed and treated.

The median value was 8%, but in a tenth of departments it was 17% or more.

**Case mix 2**

Chart 04T: Trend in patients who took a staggered dose

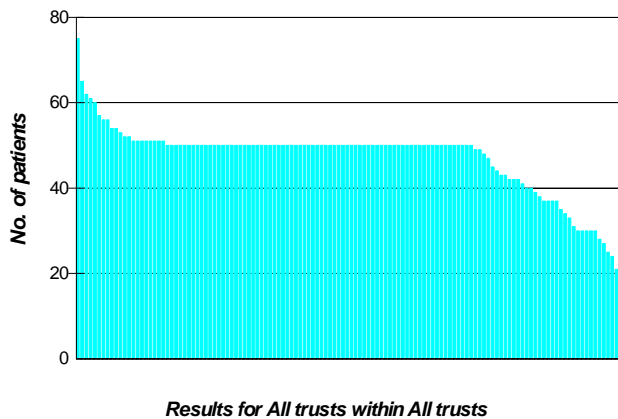


This chart shows how this aspect of case mix is changing compared to case mix at other departments.

The red line compares patients who took a staggered OD in your ED with the national median score in the first audit, which is shown as 100.

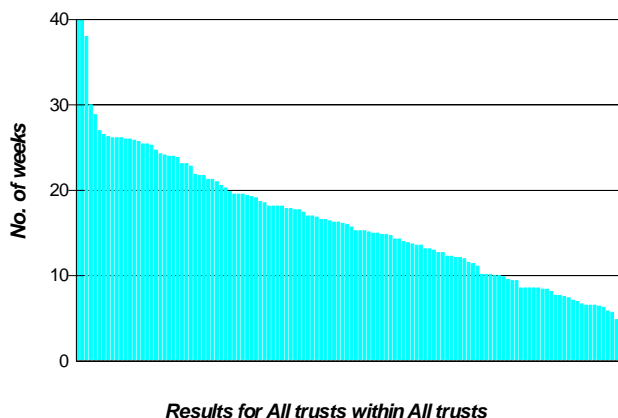
Compared to 2004 there has been a slight rise in patients who took a staggered dose. (The 2005 results, which are based on 32 EDs, should be treated with caution.)

Chart 01: No. of patients audited



For the 2008 round of audits departments were asked to sample 50 patients, however a quarter of EDs did not audit this number. Some only covered 30 patients, which was the sample number for the 2004 and 2005 audits.

Chart 02: Time taken to complete the audit



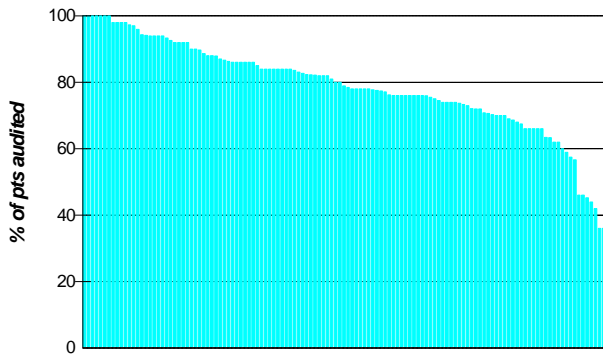
This measure uses the dates of the first and last presentations included in the audit and reflects how frequently patients present with an overdose of paracetamol.

The median was 16 weeks, and some larger EDs completed the audit within a month. However others took over 6 months as they extended the data collection period in order to find 50 cases for the audit.

N.B. Some very high values may reflect inaccurate start dates being supplied. Values above 40 have been capped.

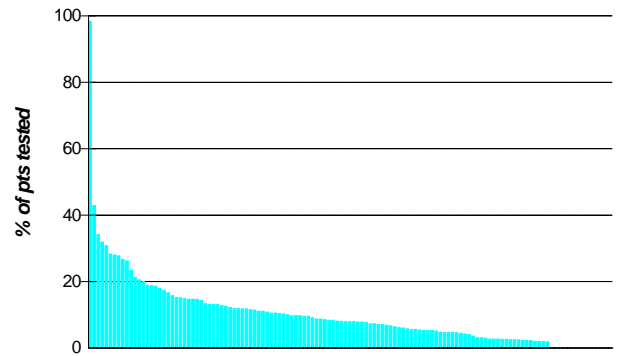
**Assessment & Treatment - plasma concentration test**

Chart 05: Plasma paracetamol level tested



Results for All trusts within All trusts

Chart 06: Where plasma tested earlier than 4 hours after ingestion



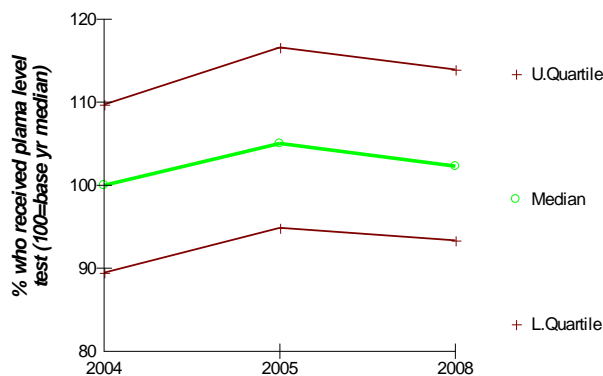
Results for All trusts within All trusts

This plasma test was taken for 79% of patients (chart 05, where a high value is good), and in 10% of these patients it occurred less than four hours before ingestion (chart 06, low value is good).

As charts 05 and 06 show practice in some departments was very good: all patients were tested and no test occurred less than 4 hours after ingestion. The charts also show that in a sizeable minority of departments practice needs to improve as in 25% of departments over a quarter of patients did not receive a plasma level.

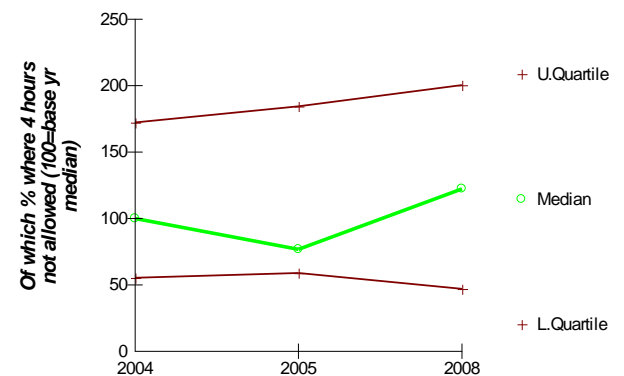
*Chart 06 only denominator is no. of patients where plasma level tested*

Chart 05T: Trend in testing of plasma concentration



Results for All trusts

Chart 06T: Trend in plasma tested earlier than 4 hours after ingestion



Results for All trusts

These trend charts measures performance by comparing your department, shown by the thick red line, to the median in the first audit (2004) which has a value of 100.

For chart 05T, where high values are good, there has been a modest improvement since 2004.

For chart 06T, where low values are good, the performance of the better trusts is has improved a little, however performance in other EDs has slipped back slightly, and the difference between the performance of the better and poorer EDs is widening.

**Assessment & Treatment - Less than 8 hours from ingestion**

Chart 07: Plasma tested within 8 hours AND concentration above treatment level

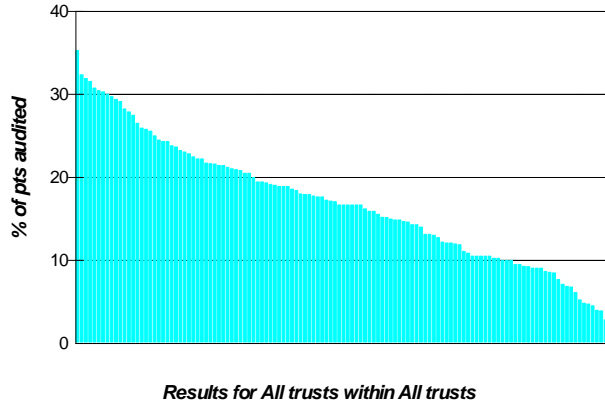


Chart 08: Patients receiving NAC within 8 hours of ingestion

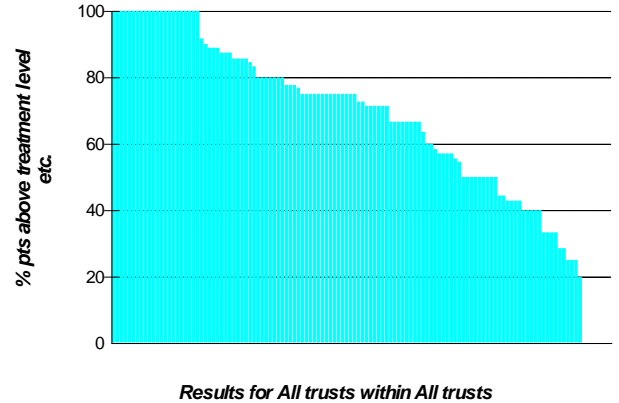


Chart 07T: Trend in test within 8 hours of ingestion AND above treatment level

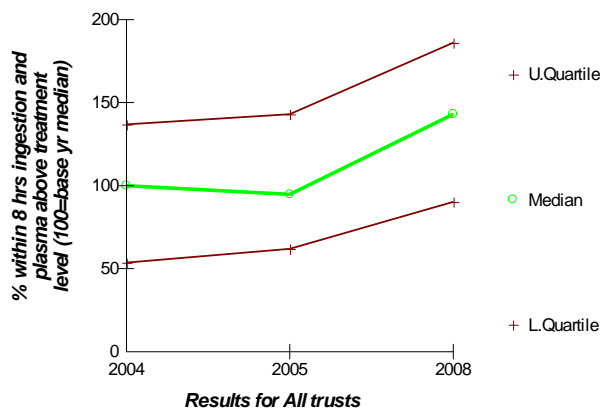
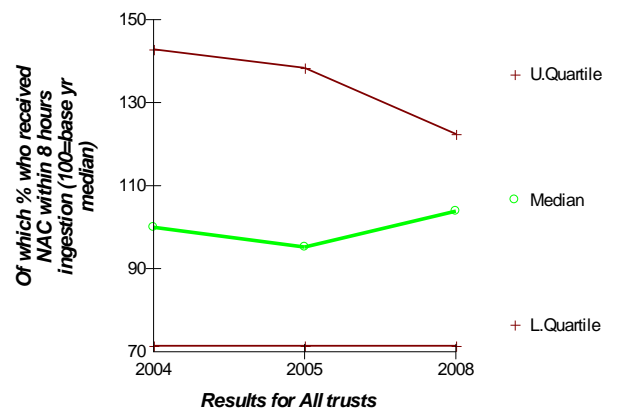


Chart 08T: Trend in patients receiving NAC within 8 hours of ingestion



Treatment with NAC, N-acetylcysteine, is most effective when undertaken within 8 hours of ingestion and EDs should aim to treat 90% of relevant patients within this time.

Across the audit 17% of patients received a plasma test within 8 hours where the concentration was above the treatment level (chart 07). 69% of these patients received NAC within 8 hours of ingestion (Chart 08).

The trend for those tested and over the treatment line (chart 07T) shows a small rise since 2004.

The trend for NAC treatment (chart 08T) shows that the median, representing a typical ED, has improved slightly from 2004, however the lower quartile, representing more poorly performing EDs has not changed, and the upper quartile, representing better performing EDs has fallen noticeably. (Detailed comparisons with 2004 data show fewer EDs achieved either 0% or 100%).

(For these charts your ED is shown by the thick red line.)

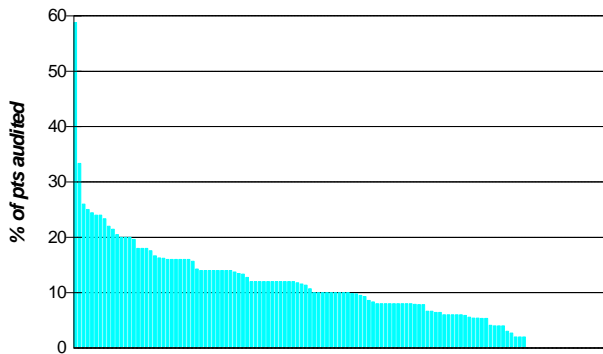
In both charts 7 and 8 there is significant variation between departments. EDs where fewer than 80% of patients receive NAC within 8 hours of ingestion **should investigate the reasons for this.**

*For Chart 08 the denominator is no. patients tested within 8 hours of ingestion and where the level was above the treatment line.*



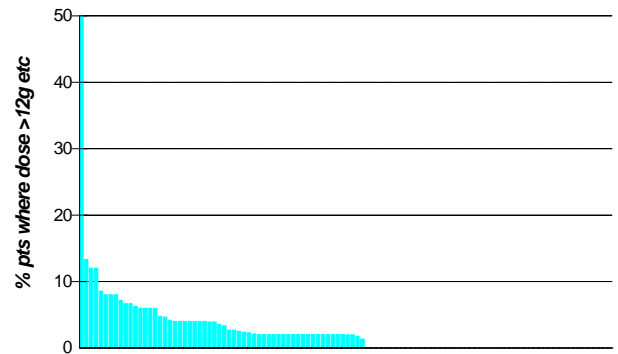
**Assessment & Treatment - More than 8 hours from ingestion**

Chart 09: Patients where dose >12g, >8hours since ingestion or staggered dose



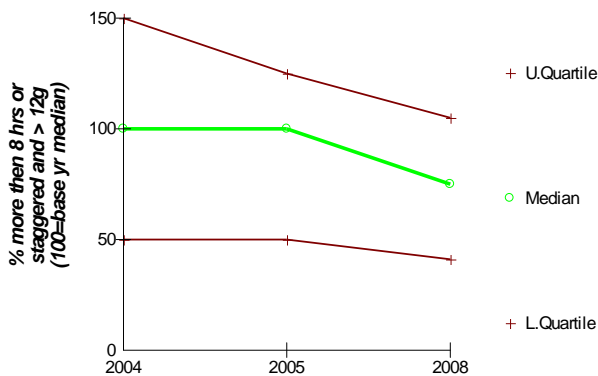
Results for All trusts within All trusts

Chart 10: Patients where dose >12g etc & receiving NAC within 60 minutes of arrival



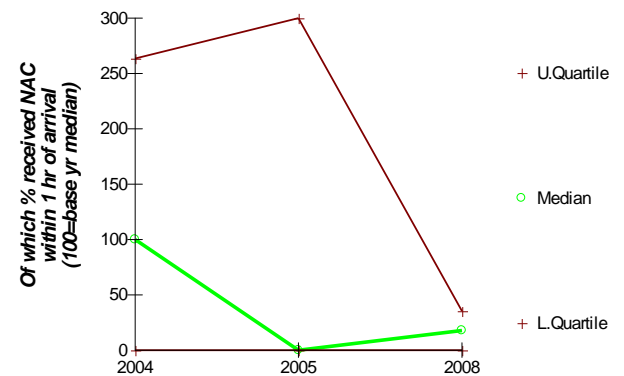
Results for All trusts within All trusts

Chart 09T: Trend in dose >12g, > 8hours since ingestion or staggered dose



Results for All trusts

Chart 10T: Trend in NAC treatment within 60 minutes



Results for All trusts

For patients present 8 or more hours after ingestion treatment should start within one hour to limit liver damage.

Charts 09 and 09T provide context for performance in starting treatment within 60 minutes. Chart 9 shows that a small proportion of patients present 8 or more hours after ingestion. It was 10% for the whole audit, but for some EDs it was over 20%.

Charts 10 and 10T measure performance. In at least half the EDs participating in the audit, only a few patients were involved ( in your ED). This meant delays in treating one or two patients, had a big impact on performance.

In Chart 10T good performance is indicated if the thick red line (your results) is now either above the line denoting the upper quartile performance of all participating EDs, or is converging towards it. The lower quartile for all years was zero (0) and runs along the x-axis.

*Denominator for chart 10 is no. patients where dose >12g, more than 8 hrs since ingestion or staggered dose*

### Compliance of treatment with guidelines

Chart 11: Patients receiving recommended treatment

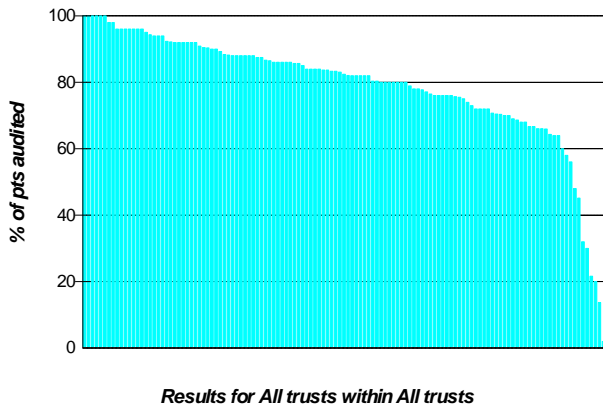


Chart 11T: Trend in patients receiving the recommended treatment

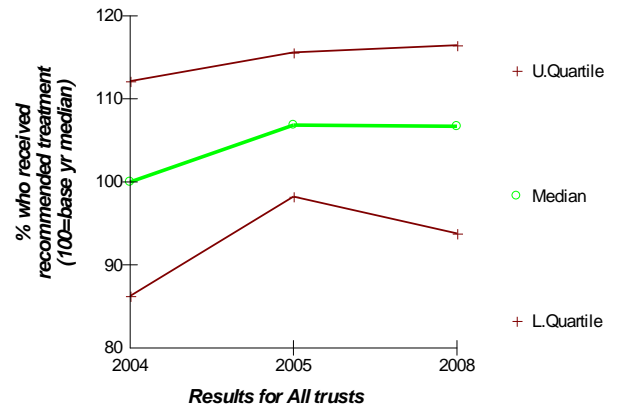


Chart 12: Patients partially receiving recommended treatment

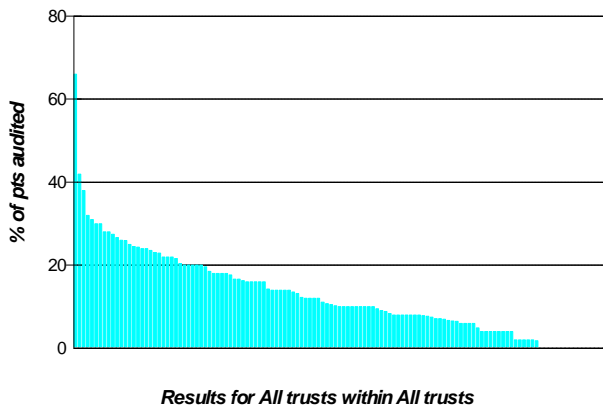
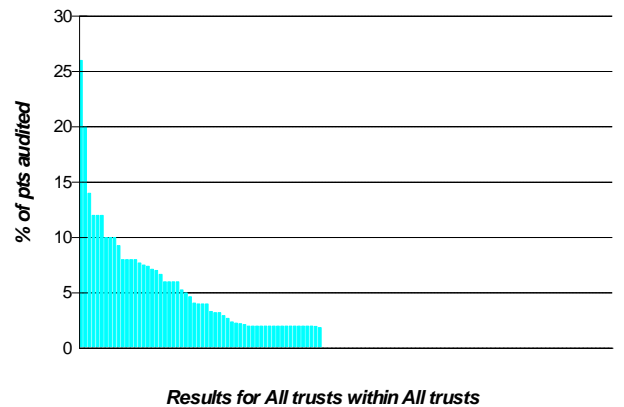


Chart 13: Patients where serious omissions in treatment



Ideally all patients should receive the recommended treatment. Overall only 80% received the recommended treatment. Chart 11 shows that in 75% of EDs this occurred for less than 90% of patients. In 6% of EDs less than 50% of patients received the recommended treatment.

Chart 11T shows the trend of very modest improvement. Good performance is indicated if the thick red line (your results) is now either above the line denoting the upper quartile performance of all participating EDs, or is converging towards it.

Charts 12 and 13 are counterparts to chart 11. Chart 12 considers patients who have not received the recommended treatment, which should be under 10%. Chart 13 covers where there were serious omissions, which should be 0%.

Across the whole audit 12% of patients partially received the recommended treatment, and there were serious omissions in 3% of cases. There was though significant variation between EDs.

Departments should look at their results shown Table 1 on page 3 and **should investigate where the proportion receiving the recommended treatment is less than 80%, or those partially receiving the recommend treatment is more than 10%, or there were serious omissions in treatment.**