The Royal College of Emergency Medicine

PROCEDURAL SEDATION IN ADULTS

CLINICAL AUDIT 2017/18

National Report

Published: 10 October 2018

Contents

Foreword

Dr Taj Hassan, RCEM President

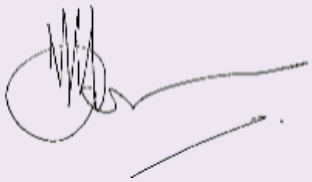
Providing safe sedation for procedural care in the Emergency Department (ED) is an essential skillset for the emergency physician. The key principles are to ensure that clinicians have the right competencies, that the procedure is performed in the right environment, with adequate numbers of staff, standards for monitoring are met and that the patient is given appropriate advice at discharge.

Since the last audit, there have been some improvements but important areas are highlighted that merit greater attention for clinicians, Safety Leads and Clinical Directors alike. In the increasingly busy and crowded ED, it can become increasingly challenging to deliver care - risks are heightened, which can lead to harm to patients. We know that applying sedation skills well to the right cohort will reduce admissions, reduce pressure on theatre space and ultimately reduce costs. Most importantly, it is good for patients.

Sedation is an area of practice that benefits particularly from standard operating procedures and helps to mitigate undesired human factors that can lead to a bad outcome. It was disappointing to see that only a small proportion of EDs use local or national checklists. The WHO surgical checklist concept has shown the benefits that this approach can bring at very low cost. Every ED should progress to mandating such an approach.

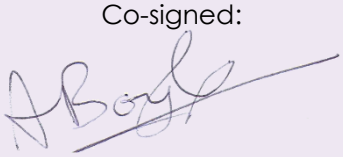
The audit described where teams need to focus efforts. A dedicated space with availability of resuscitation facilities is essential. Having adequate staff so that there is at least one person to provide sedation, one to be the procedurist and a nurse are all vital. The level of monitoring is another area for improvement. The complication rate for procedural sedation has risen since the last audit. This may be due to a number of reasons and will need to be explored further in future iterations.

There are many 'pearls of improvement' in the report. We strongly recommend you read it, digest it and, in an increasingly difficult working environment, follow best practice for the sake of your patients, your staff and yourself. We look forward to further work in the future in this important field of our clinical work.



Dr Taj Hassan, RCEM President

Co-signed:



Dr Adrian Boyle, Chair of Quality in Emergency Care Committee

Dr Jeff Keep, Chair of Quality Assurance and Improvement Sub Committee

Executive Summary

Overview

A total of 8815 patients presenting to 183 Emergency Departments (ED) were included in this audit. This was the second time this audit has been conducted. The performance summary chart on the next page is a summary of the national performance against standards.

The purpose of the audit is to monitor documented care against the standards published in July 2017. The audit is designed to drive clinical practice forward by helping clinicians examine the work they do day-to-day and benchmark against their peers, and to recognise excellence. There is much good practice occurring and RCEM believes that this audit is an important component in sharing this and ensuring patient safety.

Key findings

Organisational data

As with the previous audit, organisational data on this topic have been analysed. On this occasion, there was an additional question on the availability and use of LocSSIPs.

Very few sedations were for invasive procedures, but it is encouraging to see that 64% of departments have these in place for appropriate procedures.

Whilst this was an audit of adult sedation, it is also encouraging to see a dramatic increase in the number of departments providing paediatric. sedation: 72 departments compared to just 2 in the previous audit.

Patient data

Over 80% of sedations were to facilitate joint reduction. The audit demonstrates practice throughout the week but increased activity in the middle of the day on Saturdays and Sundays. This is consistent with weekend sports activities and associated injuries.

Other procedures undertaken included DC cardioversion and chest drain. Approximately 10% of procedures were not specified.
In many areas there is improved practice. Pre-procedural assessment has improved significantly with the median number of cases where all elements are recorded rising from 8% to 34%. Documentation of informed consent has risen from 52% to 68% and the increased use of capnography has seen the full set of observations undertaken rise from 26% to 45% of cases.

A key recommendation of the previous audit was to ensure that all procedures were undertaken in a resuscitation (or similarly equipped) room. There is however again evidence this is not always the case and it is disappointing to see little change form 2015/16. The analysis of the reported adverse events acts as an urgent reminder for improvement work.

The quality and completeness of documentation may have been a barrier to demonstrating some elements of performance. Discharge criteria are noted for many patients though very few are recorded as having received written advice.

Key recommendations

1. Procedural sedation should be undertaken in a resuscitation room or one with dedicated resuscitation facilities immediately available. Departments not achieving this should work to remedy the situation. Although there were few adverse incidents in this audit, they serve as a clear reminder of associated risks.

2. ED procedural sedation involves the allocation of three distinct roles. EDs should ensure the presence of a separate sedationist, procedurist and nurse on all occasions.

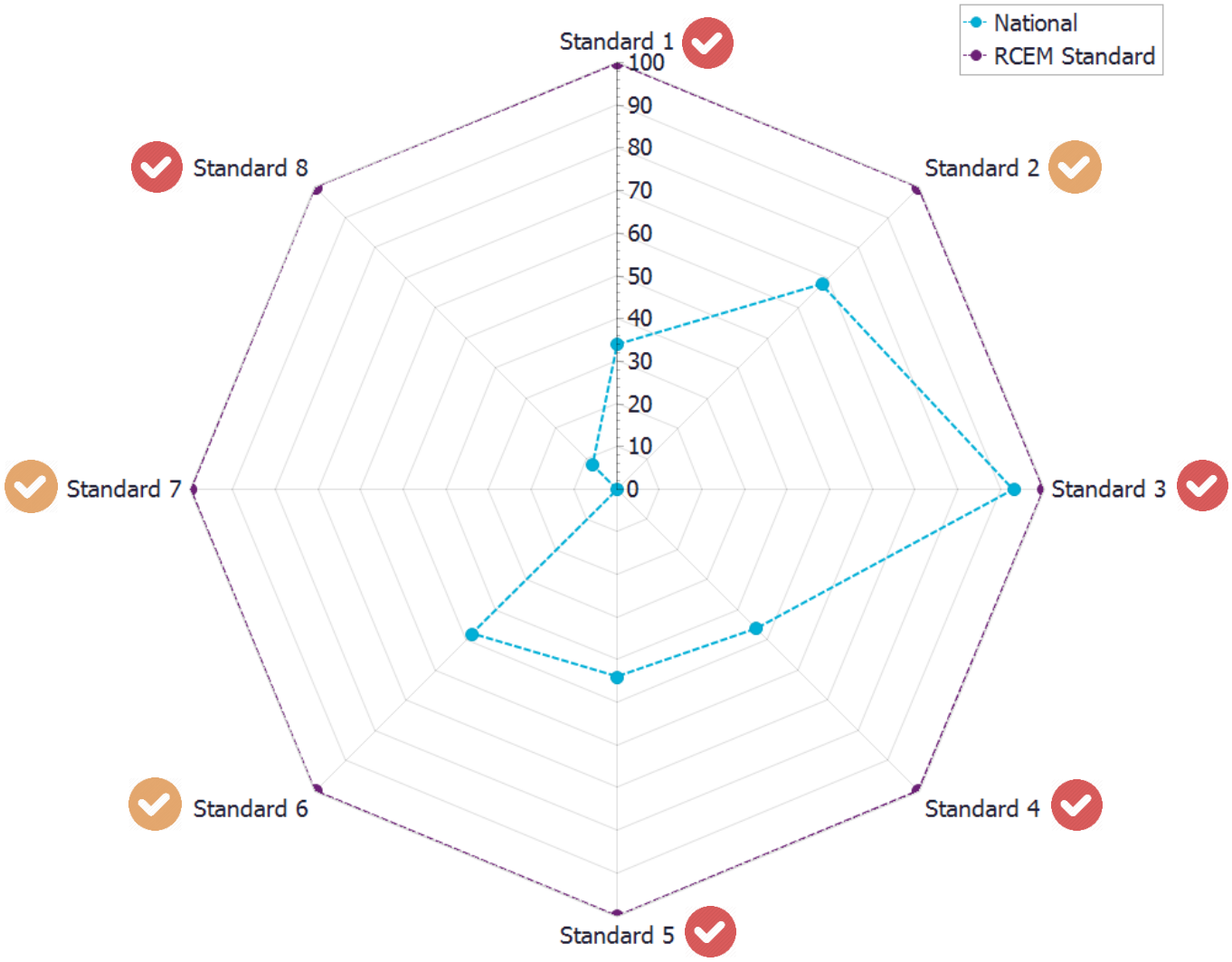
3. All elements of monitoring in Standard 5 should be used and recorded. Improvement activity for use of capnography needs to continue to meet this fundamental standard.

4. Oxygen was routinely administered from the start of procedures. Individual departments should identify whether their practice is consistent with current guidance about "appropriate" oxygen therapy and make improvements accordingly.

5. Departments need to identify ways of providing and recording the issuance of written discharge advice.

Performance Summary

This graph shows the median national performance against standards for this audit



Standards:

Fundamental Developmental Aspirational

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

↓ **Lower scores (e.g. 0%)** indicate lower compliance with the standards and EDs may wish to investigate the reasons.

Summary of national findings

	RCEM Standard	National Results			
		2017/18 (8815 cases)			2015/16 (8845 cases)
		Lower quartile	Median	Upper quartile	Median
STANDARD 1: Patients undergoing procedural sedation in the ED should have documented evidence of pre-procedural assessment, including: a. ASA grading, b. Prediction of difficulty in airway management, c. Pre-procedural fasting status	100%	12%	34%	50%	8%
STANDARD 2: There should be documented evidence of the patient's informed consent unless lack of mental capacity has been recorded.	100%	46%	68%	82%	52%
STANDARD 3: Procedural sedation should be undertaken in a resuscitation room or one with dedicated resuscitation facilities.	100%	75%	93%	98%	91%
STANDARD 4: Procedural sedation requires the presence of all of: a. a doctor as sedationist, b. a second doctor, ENP or ANP as procedurist, c. a nurse	100%	23%	46%	67%	42%
STANDARD 5: Monitoring during procedural sedation must be documented to have included all of: a. non-invasive blood pressure b. Pulse oximetry, c. Capnography, d. ECG	100%	20%	44%	69%	26%
STANDARD 6: Appropriate oxygen therapy should be given from the start of sedative administration until the patient's condition is returned to baseline.	100%	22%	48%	79%	No data – see note on p25
STANDARD 7: For invasive procedures, a Local Safety Standard for Invasive Procedures checklist (LocSSIP) or NatSSIP compliant checklist is used.	100%	0%	0%	0%	No data - new standard from 2017/18
STANDARD 8: Following procedural sedation, patients should only be discharged after documented formal assessment of suitability, including all of the below:	100%	0%	8%	24%	3%
Return to baseline level of consciousness	100%	34%	61%	86%	56%
Vital signs within normal limits for the patient	100%	41%	64%	85%	59%
Absence of respiratory compromise	100%	20%	45%	75%	39%
Absence of significant pain and discomfort	100%	17%	38%	61%	25%
Written advice on discharge for all patients	100%	7%	18%	39%	15%

NOTE: these national figures present the **median** and **quartiles**, which may differ from other results quoted in the body of this report which are **mean** (average) values calculated over all audited cases due to the distribution of data.

Introduction

This report shows the results of an audit of adult patients who presented to EDs and required procedural sedation.

The administration of sedative drugs to promote calm or sleep for a medical procedure is common practice in EDs. Sedation is an important topic as it can lead to adverse effects if incorrectly undertaken. Studies by NCEPOD[1] and NPSA[2] have reported avoidable overdose and deaths.

Background

As a result of occasional unpredictable pharmacokinetics and pharmacodynamics, drugs given for sedation can sometimes result in progression between levels of sedation irrespective of the practitioner's intention. Sedation is mostly not a life-saving procedure and safety in its practice is paramount. The provider must be equipped with the necessary skills, support, resources and monitoring to manage this continuum and any possible complications. This is reflected in our standards set out for this audit which is as much for addressing safety before, during and after the procedure as it is for monitoring the effects of medication.

Inappropriately delivered and monitored sedation can cause unintended loss of consciousness and dangerous hypoxia[3]. However, if administered safely, it can enhance the patient's experience and care by reducing pain and procedure time. It may also benefit the hospital by reducing admissions. It is an ideal audit topic as structure, process and outcomes can all be measured.

The AoMRC 'Safe sedation practice for healthcare procedures' guidance[4] states "There should be audit of the process and outcome of procedures performed under sedation, particularly the incidence of major complications (e.g. cardiopulmonary arrest, unexpected admission to intensive care and delayed hospital discharge)."

The joint guideline from the RCoA and RCEM (2012)[5], AoMRC guidance (2013)[4] and NICE CG112[3] are used as the basis for standards and audit measures.

Aims

The audit has been conducted for the second time to continue the work of the previous data collection. It identifies current performance in EDs against RCEM clinical standards, shows the results in comparison with other departments and across time, nationally and locally, if there was previous participation.

Results from the 2015/16 audit show that there is scope for improvement in the care provided to patients who underwent procedural sedation. Trends in the recognition and management of patients could be examined further, and improvement objectives could be set if needed. It would be useful to see if and how performance has changed.

The purpose of the audit is:

1. To benchmark current performance in EDs against RCEM/RCoA and AoMRC clinical guidance
2. To allow comparison nationally and between peers
3. To identify areas in need of improvement
4. To compare against previous performance

Methodology

Participation summary

Nationally, **8815** cases from **183** EDs were included in the audit.

Country	Number of relevant EDs	Number of cases
National total	183/233 (79%)	8815
England	160/179 (89%)	7660
Scotland	6/26 (23%)	430
Wales	9/13 (69%)	400
Northern Ireland	6/9 (67%)	261
Isle of Man /Channel Islands	2/3 (67%)	64

Pilot methodology

A pilot of the audit was carried out prospectively from 5 to 14 June 2017, with the help of 3 sites. The pilot period was used to test the standards, audit questions, quality of data collected and reporting template.

Pilot sites

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

- Northampton General Hospital NHS Trust
- Royal Cornwall Hospitals NHS Trust
- University Hospital of South Manchester NHS Foundation Trust

Audit history

All EDs in the UK were invited to participate in July 2017. Data were collected using an online data collection tool. The audit is included in the NHS England Quality Accounts for 2017/2018.

Participants were asked to collect data from ED patient records on consecutive cases who presented to the ED between 1st January 2017 and 31st December 2017.

Sample size

RCEM recommended auditing a different number of cases depending on the number of the patients seen within the data collection period. If this was an area of concern, EDs were able to submit data for more cases for a more in-depth look at their performance.

Basing the audit sample size on the number of cases in this way increased the reliability of EDs' audit results.

Audited cases were recommended to be collected consecutively during the data collection period (1 January 2017 to 31 December 2017).

Expected number of cases	Recommended audit sample
< 50	All eligible cases
50-250	50 consecutive cases
>250	100 consecutive cases

Standards

The audit asked questions against standards published by RCEM in 2017:

Standard	Standard type
1. Patients undergoing procedural sedation in the ED should have documented evidence of pre-procedural assessment, including: a. ASA grading[4] b. Prediction of difficulty in airway management[4] c. Pre-procedural fasting status[4]	**Fundamental**
2. There should be documented evidence of the patient's informed consent unless lack of mental capacity has been recorded[4].	Developmental
3. Procedural sedation should be undertaken in a resuscitation room or one with dedicated resuscitation facilities.	**Fundamental**
4. Procedural sedation requires the presence of all of the below: a. A doctor as sedationist[4] b. A second doctor, ENP or ANP as procedurist[4] c. A nurse	**Fundamental**
5. Monitoring during procedural sedation must be documented to have included all of the below: a. Non-invasive blood pressure[4] b. Pulse oximetry[4] c. Capnography[4] d. ECG	**Fundamental**
6. Appropriate oxygen therapy should be given from the start of sedative administration until the patient's condition is returned to baseline[4].	Developmental
7. For invasive procedures, a Local Safety Standard for Invasive Procedures checklist (LocSSIP) or NatSSIP compliant checklist is used[6, 7].	Developmental
8. Following procedural sedation, patients should only be discharged after documented formal assessment of suitability, including all of the below: a. Return to baseline level of consciousness[4] b. Vital signs within normal limits for the patient[4] c. Absence of respiratory compromise[4] d. Absence of significant pain and discomfort[4] e. Written advice on discharge for all patients	**(a) Fundamental** **(b) Fundamental** **(c) Fundamental** **(d) Fundamental** (e) Developmental

About this report

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. The median figures in the summary table 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.

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.

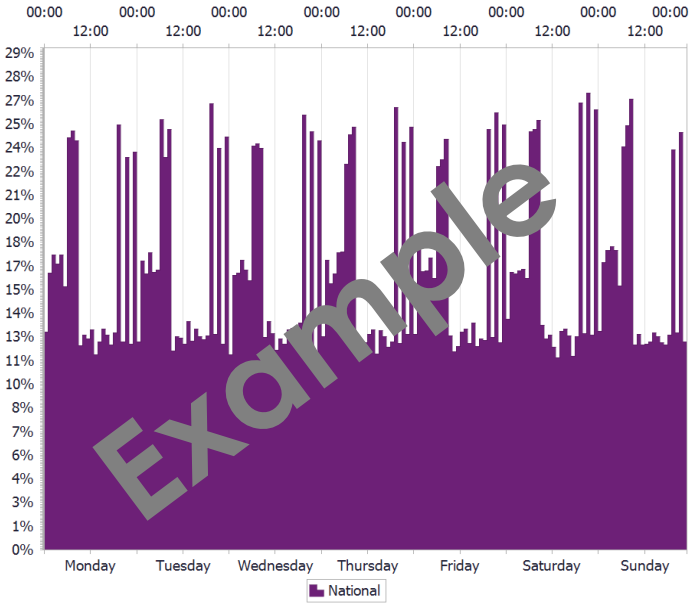
QIP Quality Improvement Project

This symbol identifies an area that would be a good topic nationally for a QIP. Local QIP priorities may vary depending on performance.

Understanding the charts

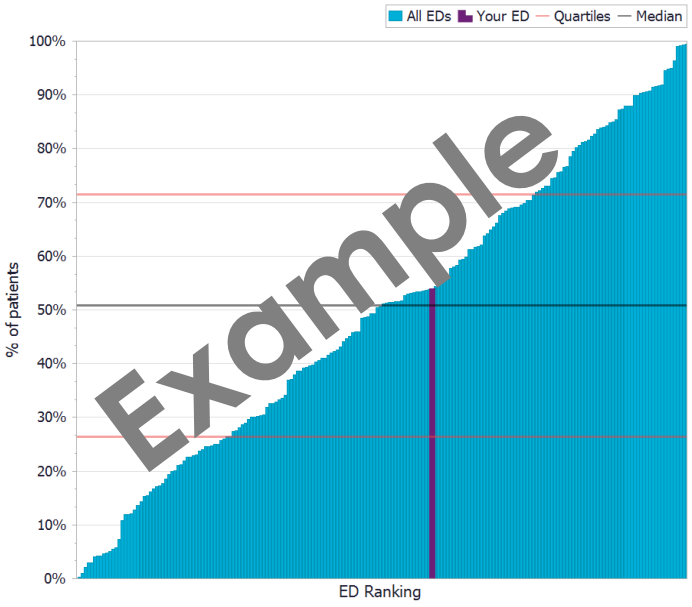
There are different types of charts within this report to present the data. The example graphs below show the type of charts you will encounter.

Time and date



This chart shows the day and time of patient arrivals. Higher bars show when a lot of patients are arriving in the ED, whereas lower bars show quieter arrival times.

Sorted Bar Chart



Sorted bar charts show the national performance, where each bar represents the performance of an individual ED. The horizontal lines represent the median and upper/lower quartiles.

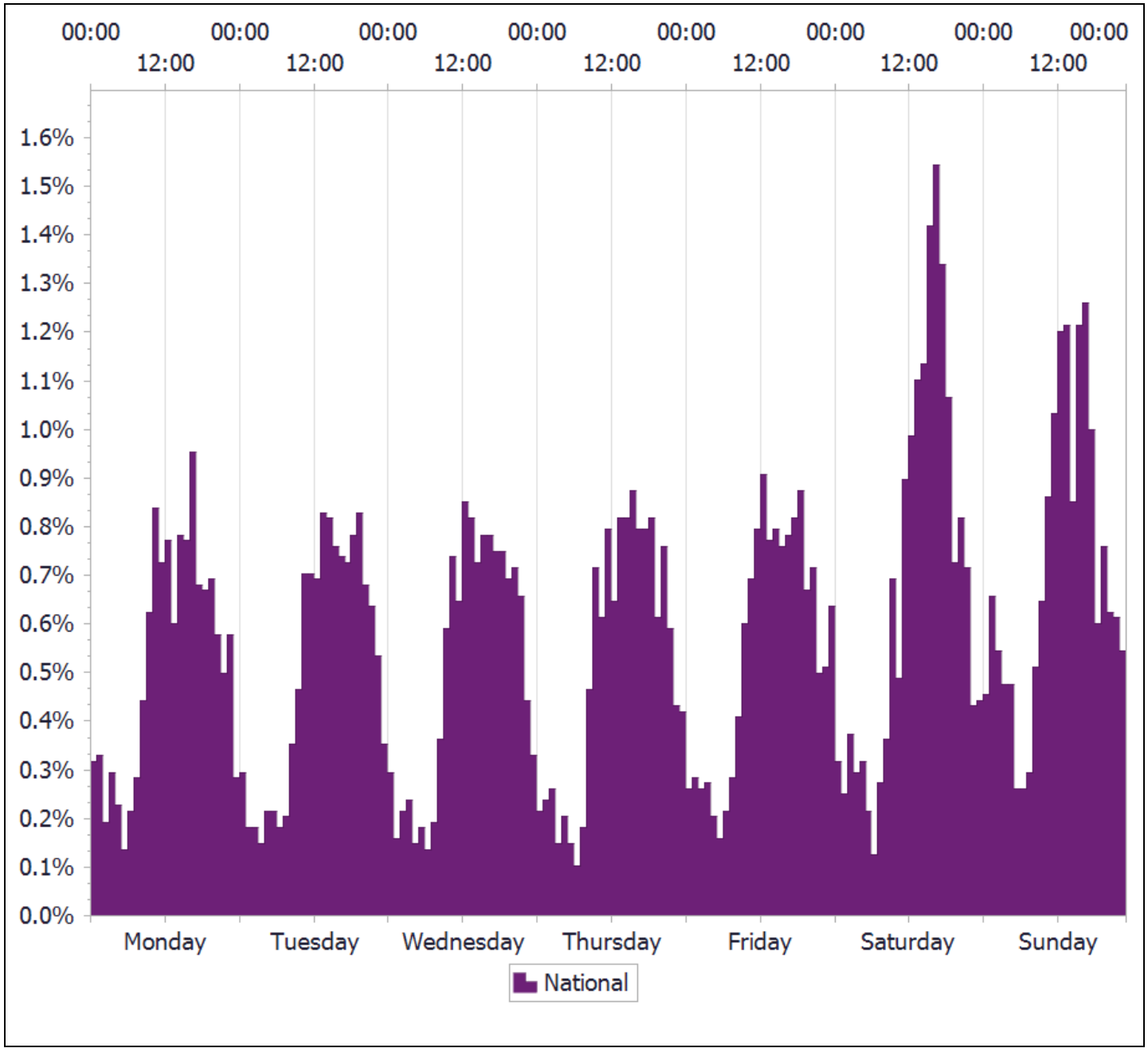
Stacked Bar Chart

Stacked bar charts show the breakdown of a group nationally. These are used when it will be helpful to compare two groups side by side, for example comparing local data with the national data.

Section 1: Casemix

National casemix and demographics of the patients

Q2: Date and time of arrival or triage

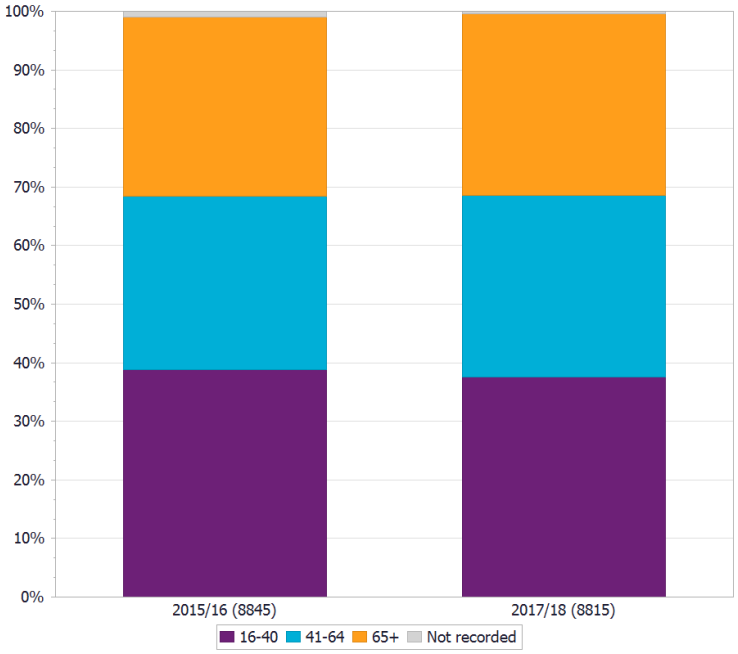


Sample: all patients (n=8815)

This chart shows the day and time of arrival and not the time of sedation, which mostly take place several hours after arrival.

There is a spike on Saturday afternoon, which may correspond with increased sporting activities.

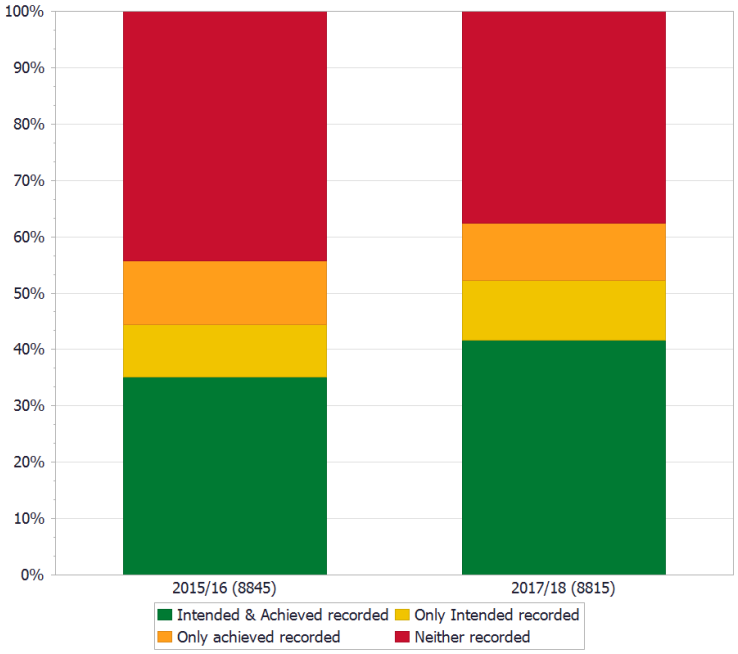
Q3. Patient age



Sample: all patients (n=8815)

Sedation procedures were undertaken across the age range of presentations to ED and have not changed since 2015/16.

Q4 and Q5 Level of sedation



Sample: all patients (n=8815)

There has been an improvement in the recording of levels of sedation. There are 7% fewer cases in the "neither recorded" and 7% greater in the "intended and achieved" groups.

Q4 and Q5 Level of sedation intended and achieved

		Achieved				
		Conscious	**Minimal**	**Dissociative**	**Deep**	**Not recorded**
Intended	**Conscious**	26.41%	0.92%	0.15%	1.46%	8.55%
	Minimal	0.36%	3.34%	0.00%	0.05%	0.64%
	Dissociative	0.08%	0.05%	2.55%	0.11%	0.60%
	Deep	0.37%	0.11%	0.06%	5.57%	0.90%
	Not recorded	4.64%	1.74%	3.61%	0.19%	37.54%

Sample: all patients (n=8815)

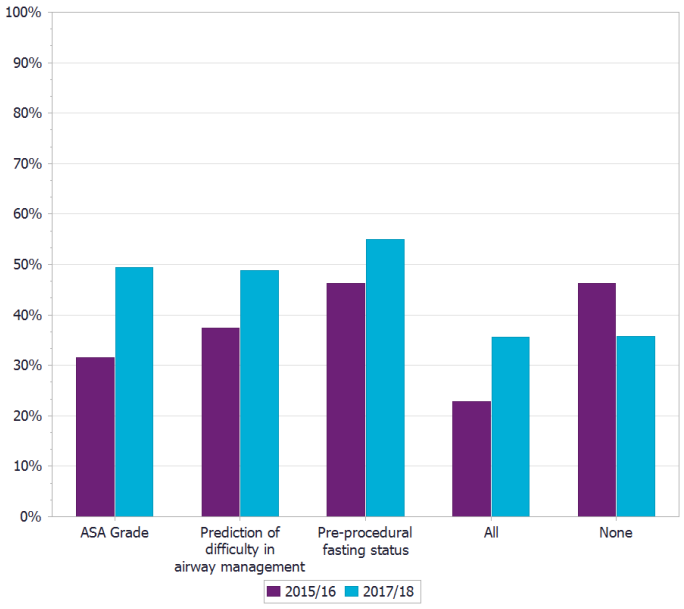
This table expands on the data presented on page 16. Good, safe practice is where the achieved level of sedation is the same as the intended level of sedation. There will always be a proportion of patients where the level achieved differs, but a high proportion of these cases suggests an improvement area for Trusts. Documentation is certainly an area for improvement with 37.54% of patient having neither element documented.

Section 2: Pre-procedure

This section gives information about care given pre-procedure i.e. assessment and patient consent.

Q6 Were the following elements of pre-procedural assessment recorded in the ED notes?

QIP

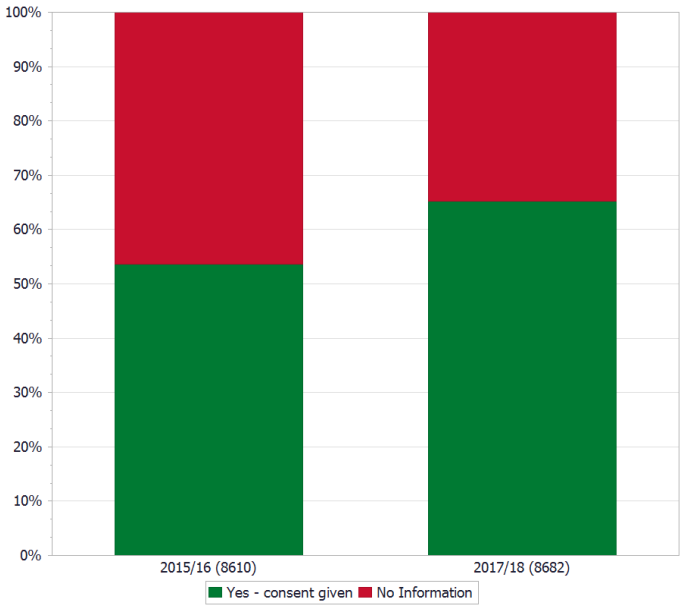


STANDARD 1: Patients undergoing procedural sedation in the ED should have documented evidence of pre-procedural assessment, including: a. ASA grading, b. Prediction of difficulty in airway management, c. Pre-procedural fasting status

Sample: all patients (n=8815)

There has been significant improvement in the recording of all elements of pre-procedure assessment. Departments not yet achieving this should consider this an area for improvement

Q7 Was there documented evidence of the patient's informed consent for the sedation?



STANDARD 2: There should be documented evidence of the patient's informed consent unless lack of mental capacity has been recorded.

Sample: all patients, excluding Q7 = No - lack of mental capacity noted (n=8682)

Practice has improved. An additional 11% of cases had this documented compared to 2 years ago.

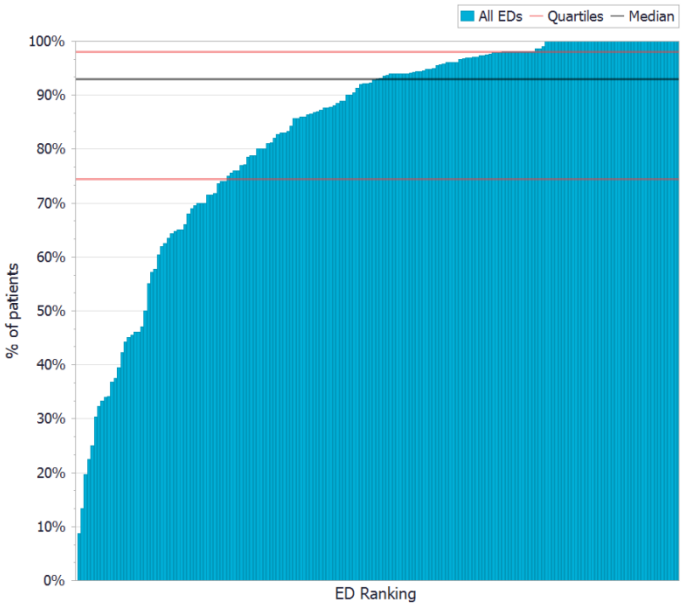
Section 3: Procedure

This section details care provided during the procedural sedation. It shows the national performance regarding appropriateness of location, staffing, and sedating agents.

QIP

STANDARD 3: Procedural sedation should be undertaken in a resuscitation room or one with dedicated resuscitation facilities.

Q8 Was the sedation carried out in a resuscitation room or one with dedicated resuscitation facilities?

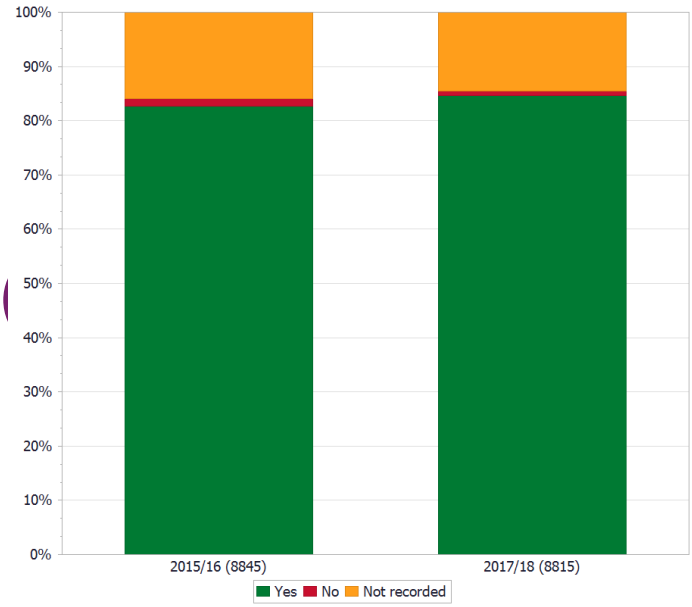


Sample: all patients (n=8815)

There are a number of departments able to achieve this for all cases.

The risks of undertaking procedural sedation without immediate resuscitation facilities are such that any department not achieving this standard should review their practice as a matter of urgency.

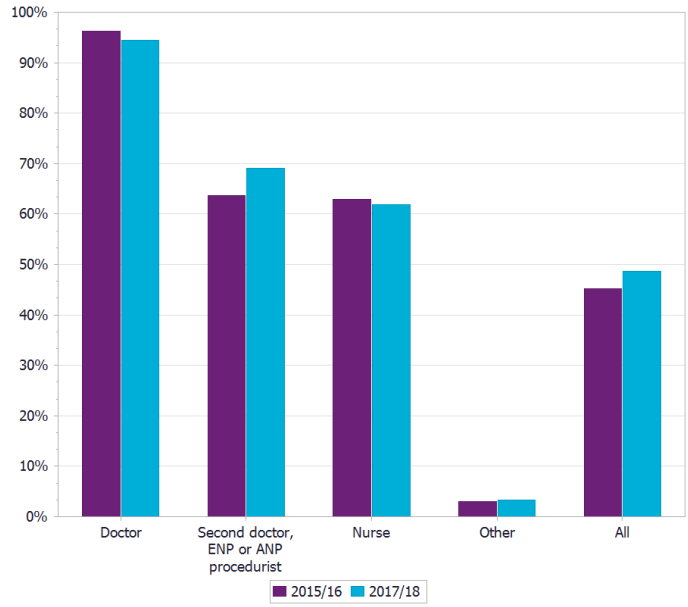
Q8 Was the sedation carried out in a resuscitation room or one with dedicated resuscitation facilities?



Sample: all patients (n=8815)

There is no significant change in performance against this standard. Pressures on EDs are recognised but this is regarded as a fundamental standard of care. As demonstrated by the graph on page 19, many departments are able to achieve this for all cases.

Q9 Which of the following staff were present during the procedure?

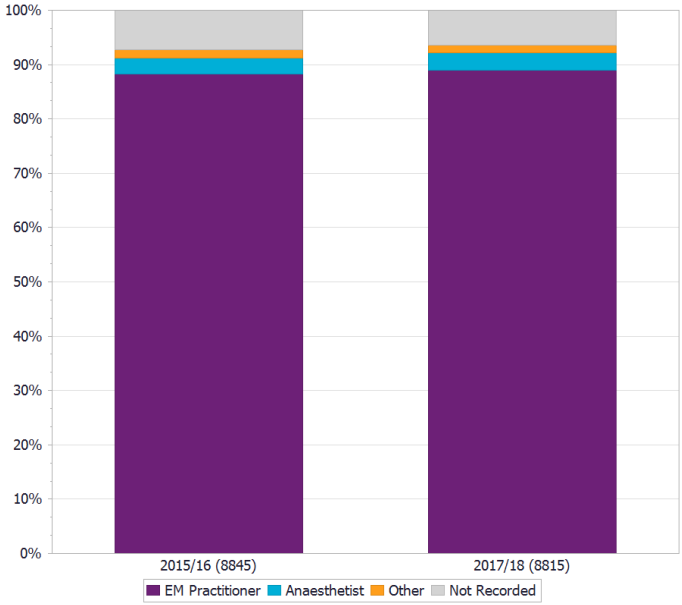


STANDARD 4: Procedural sedation requires the presence of all of: a. a doctor as sedationist, b. a second doctor, ENP or ANP as procedurist, c. a nurse

Sample: all patients (n=8815)

It is disappointing to see little improvement against this standard. This may reflect a lack of improvement in documentation. It may also reflect the grade of doctor performing the sedation or the procedures undertaken. Departments should consider what this means for the level of care provided and the safety of practice.

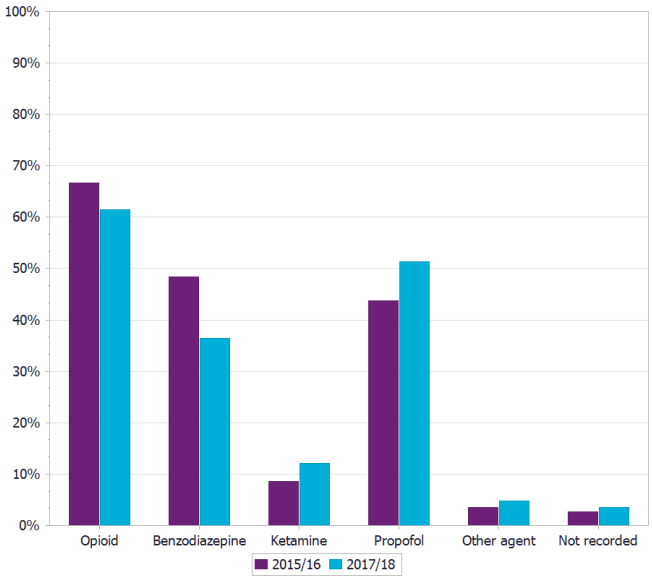
Q10 What was the specialty of the sedating practitioner?



Sample: all patients (n=8815)

Procedural sedation undertaken in ED is consistently provided by EM practitioners.

Q11 Which agents were used for sedation?

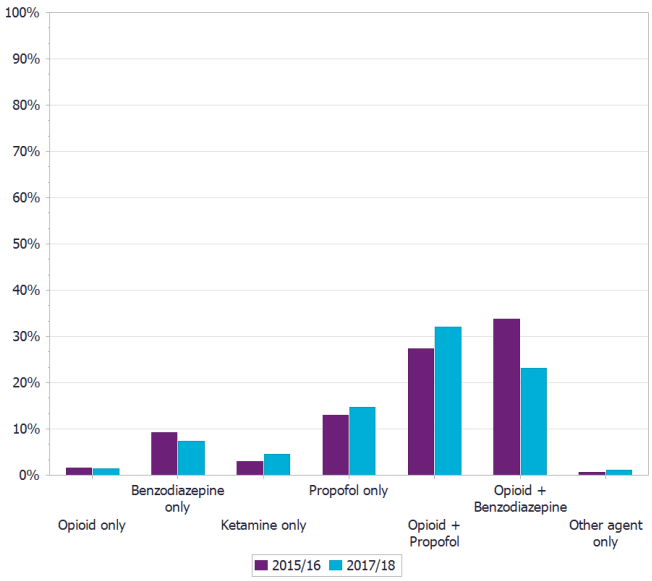


Sample: all patients (n=8815)

It is interesting to note that since last audited, there has been an increase in the use of Propofol and ketamine and a decrease in the use of benzodiazepines and opioids.

Q11 Which agents were used for sedation?

Combinations of agents



Sample: all patients, excluding Q11 = Not recorded (n=8508)

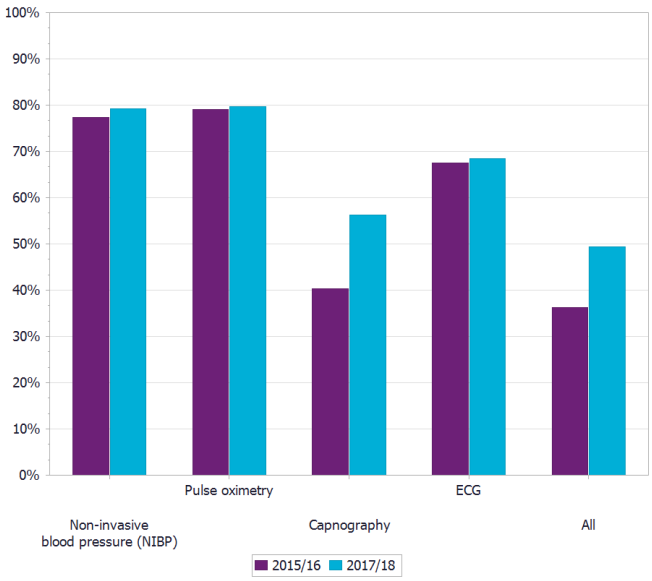
This chart shows the use of combinations of agents and further demonstrates the reduction in use of benzodiazepines. The increased use of propofol / ketamine and the decreased use of benzodiazepines could be evidence of more senior doctors undertaking a greater proportion of sedations.

Section 4: Monitoring

This section details the patient monitoring and oxygen administration during the procedural sedation.

Q12 Was there evidence of monitoring of the following during the procedure?

QIP

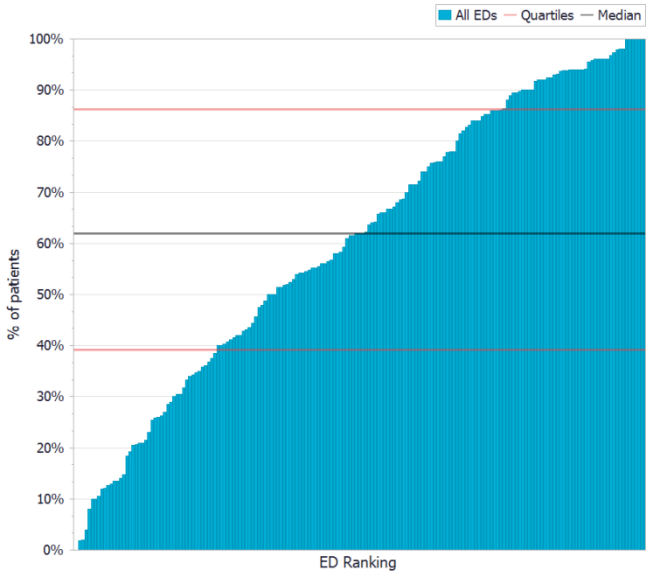


STANDARD 5: Monitoring during procedural sedation must be documented to have included all of: a. non-invasive blood pressure b. Pulse oximetry, c. Capnography, d. ECG

Sample: all patients (n=8815)

There is clear improvement in the use of capnography and in the use of all monitoring modalities. At 50% for "All", there remains room for further quality improvement work

Q13 Did the patient receive appropriate oxygen therapy during the sedation?



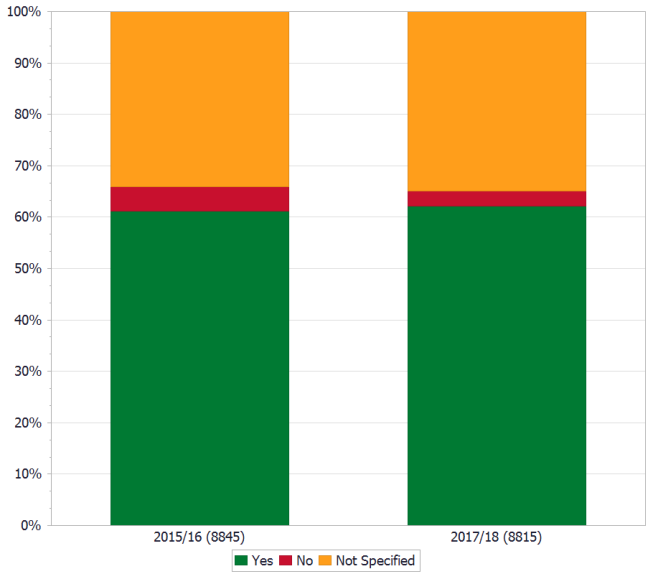
Sample: all patients (n=8815)

Note: the wording of the question in 2015/16 was *Did the patient receive oxygen during the sedation?*

Although the data shows a very small improvement in this area, the median remains lower than expected.

The "Not recorded" figure has increased slightly and departments should endeavour to improve note-taking.

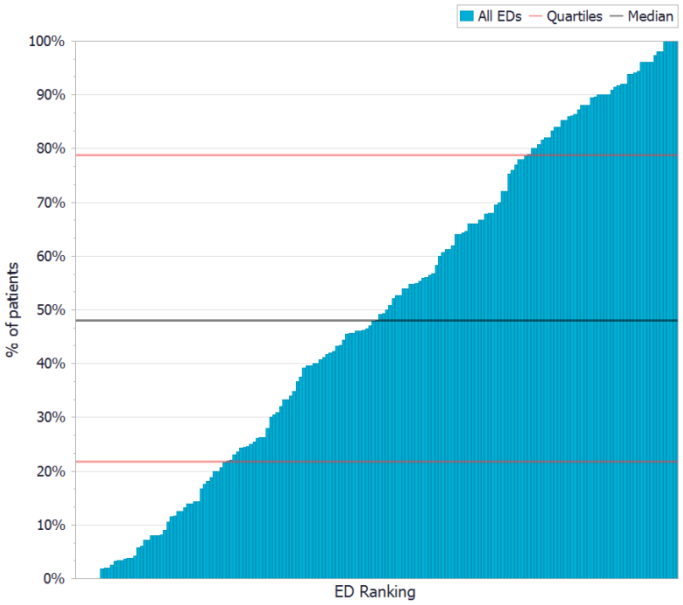
Q13 Did the patient receive appropriate oxygen therapy during the sedation?



Sample: all patients (n=8815)

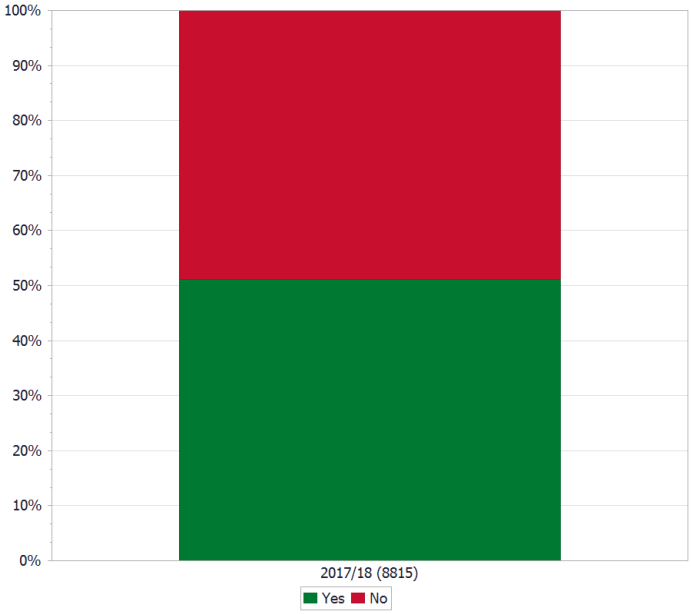
STANDARD 6: Appropriate oxygen therapy should be given from the start of sedative administration until the patient's condition is returned to baseline.

QIP



Sample: all patients (n=8815)

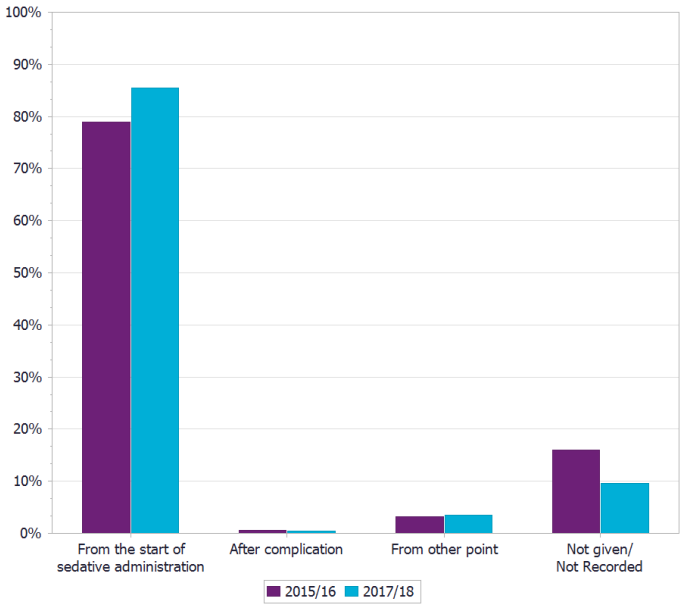
Note: As Standard 6 was amended in 2017/18, it is not possible to directly compare the current results against those from the 2015/16 audit. Standard 6 in 2015/16 was "Oxygen should be given from the start of sedative administration until the patient is ready for discharge from the recovery area".



Sample: all patients (n=8815)

The wording of this question has changed since last audited to reflect current guidance on the use of supplemental oxygen. The wide variation in performance makes it difficult to draw a conclusion for national performance. Departments should consider how they record this and whether their own practice is consistent with current guidance.

Q13a When was oxygen given?

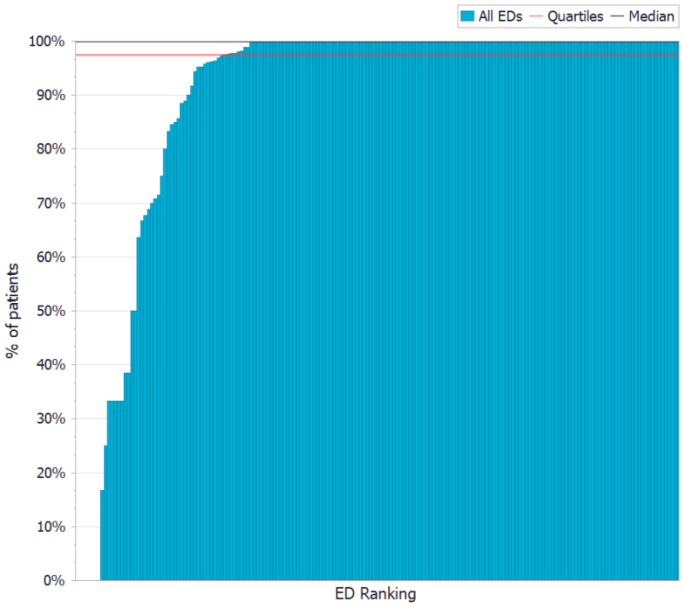


Sample: Q13=y, (n=5478)

Note: Standard 6 has been amended for the 2017/18 audit. The previous Standard was not properly tested in 2015/16 as no data about whether patients were given oxygen until they were ready for discharge were collected. Only data about when oxygen therapy started was collected and a comparison of this is shown in this chart.

More patients are being given oxygen from the start of sedative administrative and the levels of "Not given/not recorded" has improved since the last audit.

Q13b Was appropriate oxygen therapy given until the patient's condition returned to baseline?

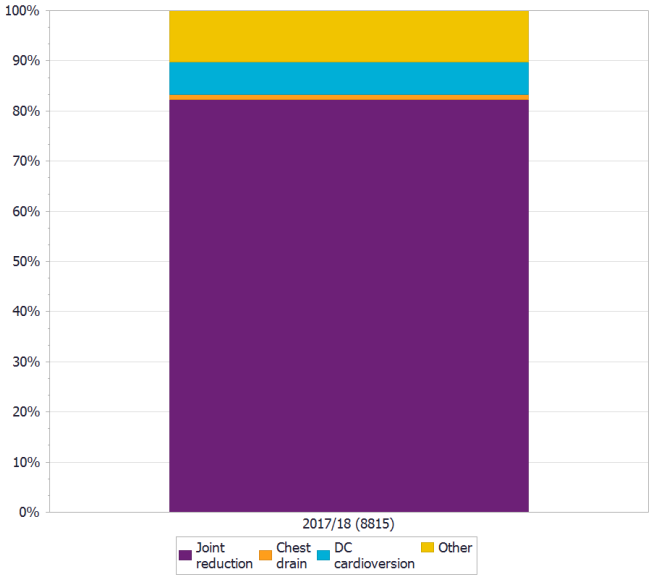


Sample: Q13=y and Q13a=y, (n=4682)

Note: Due to the Standard being amended in 2017/18, there is no data available from 2015/16 for the purposes of comparison.

This chart shows that when patients are given supplemental oxygen from the start of sedative administration, the vast majority of these continue to be given it until their condition has returned to baseline.

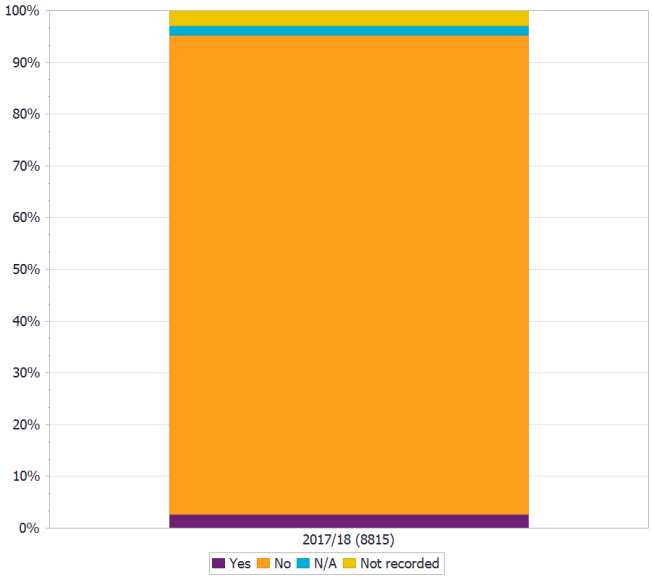
Q14 What was the procedure for which sedation was required?



Sample: all patients (n=8815)

It will be no surprise to ED practitioners that the majority of sedations take place for joint reduction. This provides further evidence to the theory that sporting activities account for an increase in sedation activity during weekends.

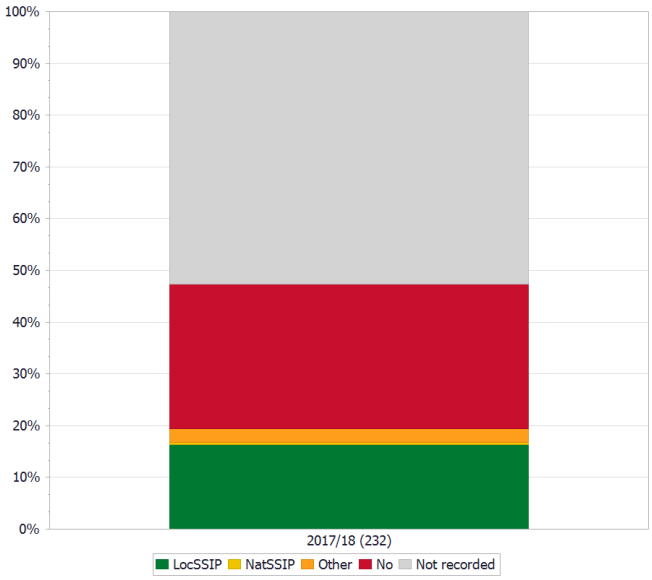
Q15 Was the sedation to facilitate an invasive procedure?



Sample: all patients (n=8815)

Very few procedures were considered "invasive".

Q15a Was a LocSSIP (or other NatSSIP compliant checklist) used?



STANDARD 7: For invasive procedures, a Local Safety Standard for Invasive Procedures checklist (LocSSIP) or NatSSIP compliant checklist is used.

Sample: Q15 = Yes (n=232)

Note: This is a new standard for 2017/18, hence no data available from previous audit for comparison purposes.

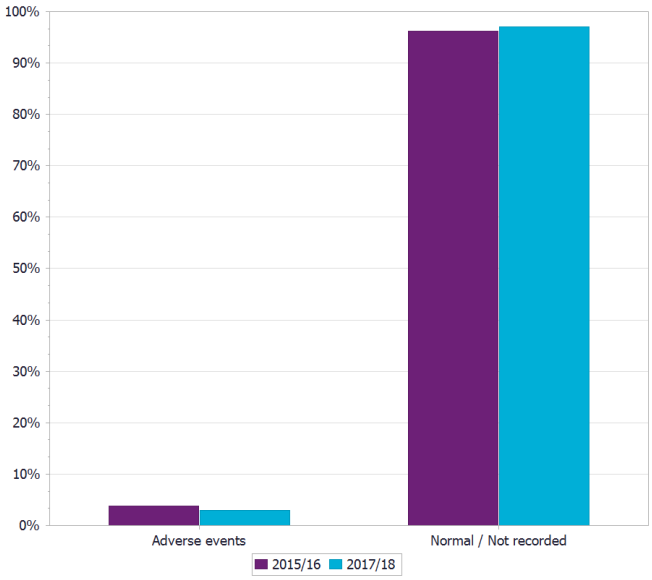
The relevant cases where invasive procedures were undertaken was submitted by only 7 EDs. Although the mean performance shown in this graph is low, the median result, as shown in the Summary of national findings table, is 100%.

Very few procedures were "invasive". 1% were for chest drains and the use of a checklist would be appropriate. It is however encouraging to see that in an audit including very few qualifying procedures, there is evidence of their adoption.

Section 5: Adverse events

This section tells you more about any adverse events that occurred, the outcome of any adverse event and how these events were reported.

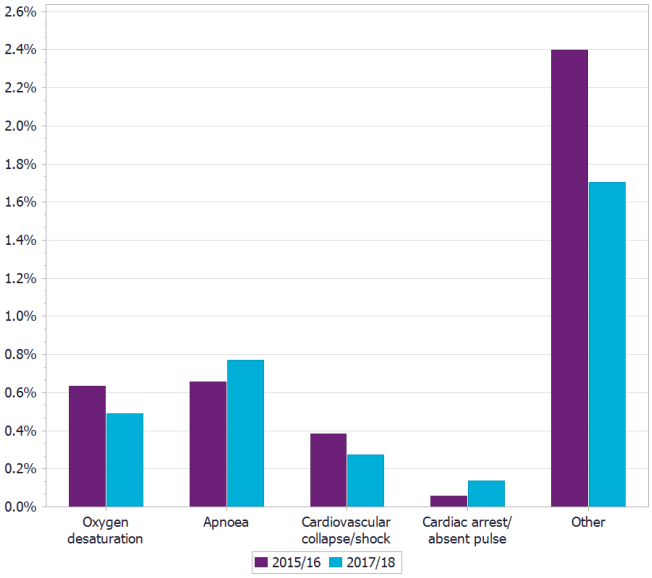
Q16 Did any adverse events arise?



Sample: all patients (n=8815)

Fewer adverse events were reported in comparison to the last audit. There does not seem to be a change in the type of procedures undertaken and suggests safer practice.

Q16a-e Did any of the following adverse events arise?

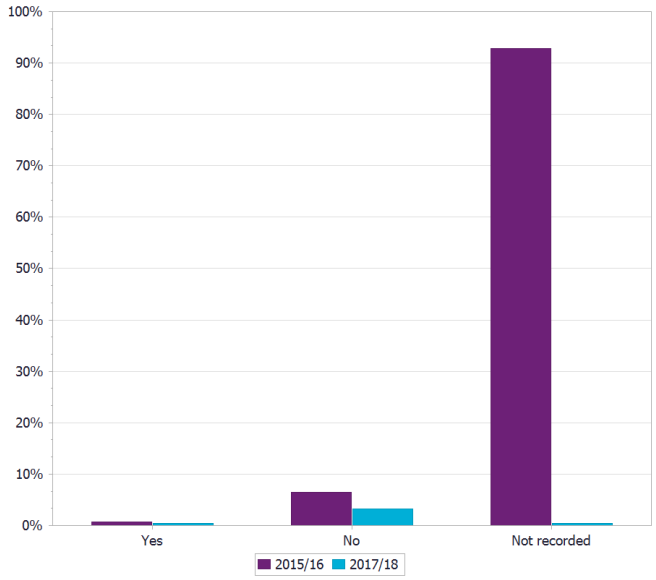


Sample: all patients (n=8815)

Overall there are fewer adverse events. There are only small numbers in the "cardiac arrest/absent pulse" group but there is an increase in this subgroup.

There are a group of high risk, critically ill patients for whom sedation in ED is entirely appropriate. There is the potential for adverse events and the reporting of these for analysis and any learning and improvement represents good clinical governance.

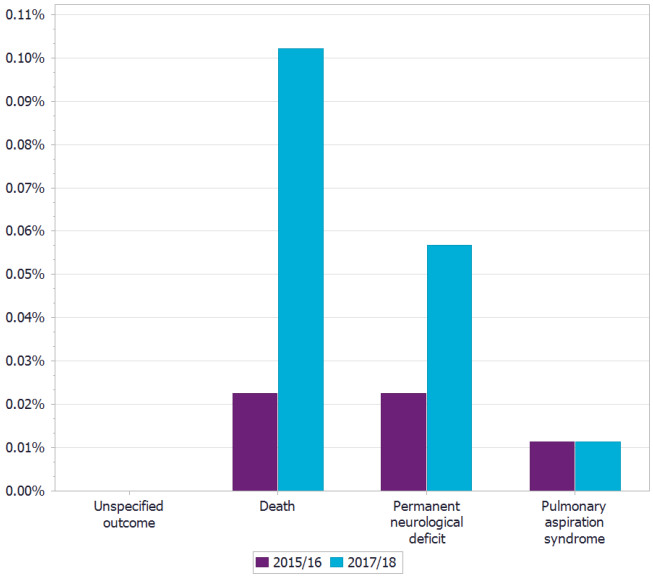
Q16g Did the adverse event lead to unplanned hospitalisation or escalation of care?



Sample: all patients (n=8815)

Occurrences of adverse events are rare and they seldom lead to hospitalisation. It is encouraging to see that the need to admit patients has reduced.

Q16h Did any of the following outcomes arise?



Sample: all patients (n=8815)

There is evidence of improvement with fewer cases "Not reported/not recorded". Many hospitals use recording and reporting systems that do not directly link to the clinical record from which we audit. It is likely that more events were reported through these systems and not recorded here. RCEM contacted the departments that reported these serious outcomes. The data in this graph includes the 9 reported deaths from a total of 8815 cases of sedation.

1 was incorrectly reported as a death. The patient was sedated for DC cardioversion of a complex arrhythmia. They were subsequently discharged home following ITU admission and pacemaker insertion.

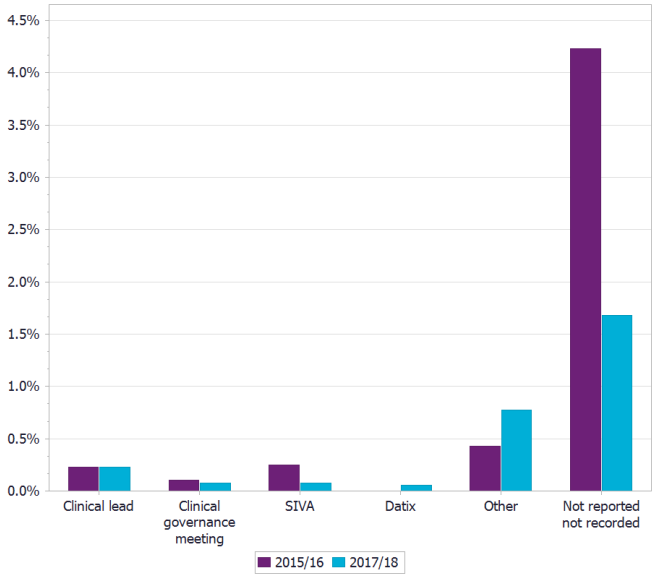
4 were associated with anaesthesia and intubation of critically ill patients.

2 others were reported as deaths not contributed to by sedation.

No further details were provided for a further death.

1 death appears to be directly associated with procedural sedation and local investigations continue.

Q16i If an adverse event occurred, was this reported as follows?



Sample: all patients (n=8815)

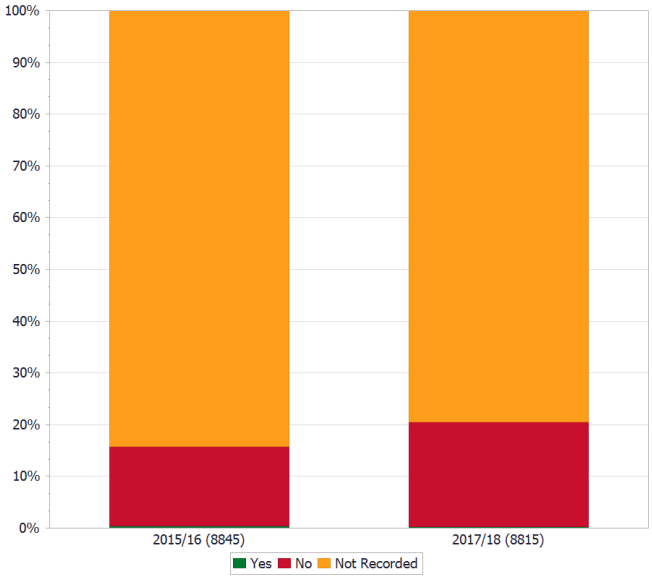
Note: In 2017/18, data was specifically collected for Datix but it was not in 2015/16. Any Datix responses in 2015/16 would have been included in the 'Other' category.

There is evidence of improvement with fewer cases "Not reported/not recorded". Many hospitals use recording and reporting systems that do not directly link to the clinical record from which we audit. It is likely that more events were reported through these systems and not recorded here

Section 6: Patient satisfaction

QIP

Q16f Patient Satisfaction with procedure?



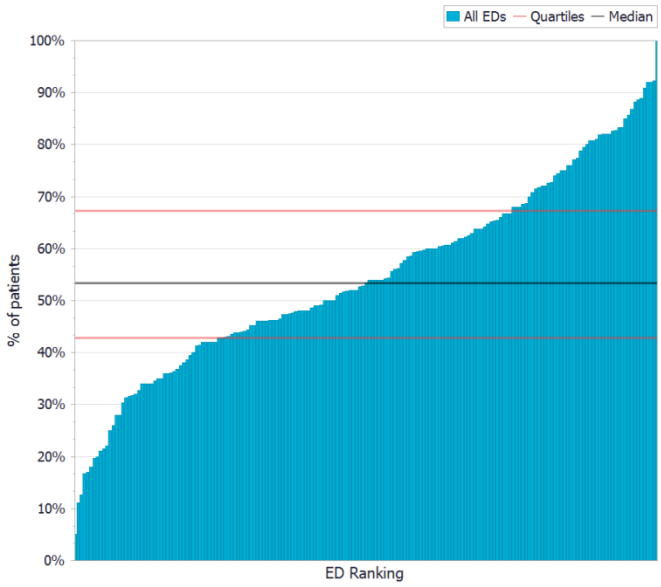
Sample: all patients (n=8815)

Drawing conclusions with so many unrecorded responses is difficult. Many departments use patient feedback methods that are separate from the clinical interaction and would be difficult for auditors to access and link.

Section 7: Patient discharge

This section tells you more about patient discharge and pre-discharge assessment.

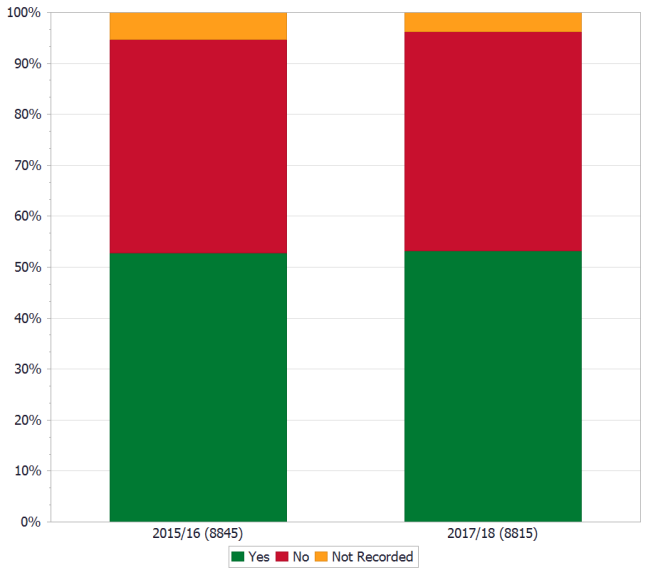
Q17 Was the patient discharged home?



Sample: all patients (n=8815)

Good practice lies somewhere in the middle of this chart. Departments admitting a high proportion of patients may consider whether they are risk averse. The use of Clinical Decision Units for periods of observation and the interpretation of "discharged home" may have altered the shape of these results.

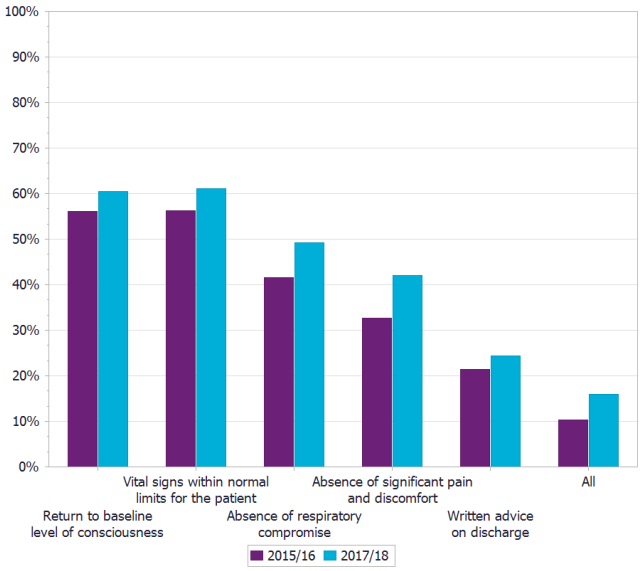
Q17 Was the patient discharged home?



Sample: all patients (n=8815)

Q17a Were the following elements of formal assessment of discharge suitability documented?

QIP



STANDARD 8: Following procedural sedation, patients should only be discharged after documented formal assessment of suitability, including all of: a. Return to baseline level of consciousness, b. Vital signs within normal limits for the patient, c. Absence of respiratory compromise, d. Absence of significant pain and discomfort, e. Written advice on discharge for all patients

Sample: Q17 = Yes (n=4689)

All elements of the discharge criteria have seen an improvement. Overall compliance remains low. It is likely that practitioners are failing to document this clearly.

Section 8: Organisational audit

EDs were asked to provide information about whether procedural sedation was undertaken in children and which clinicians were involved in the process. They were also asked about LocSSIP checklist usage.

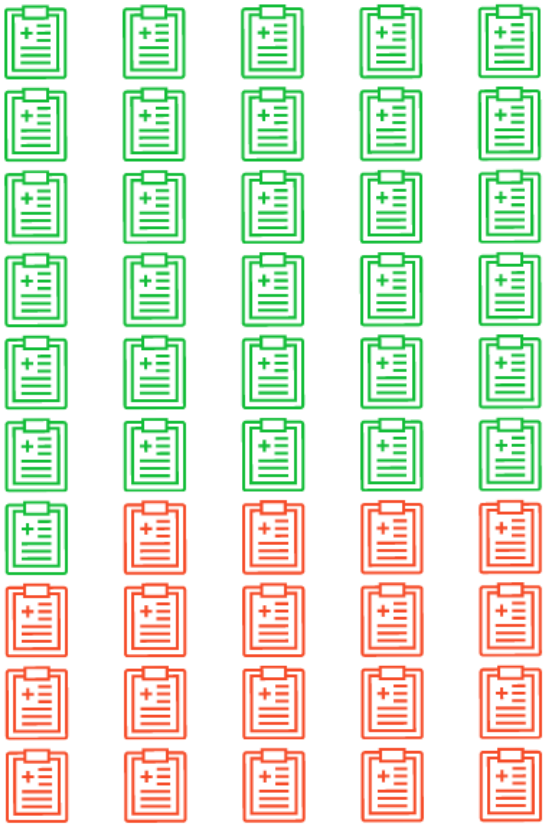
Procedural sedation in children

63% EDs undertake procedural sedation in children

Who undertakes procedural sedation in children?

87% ED clinician
6% Anaesthetic clinician
7% Not specified

LocSSIPs



62% EDs have LocSSIP checklists for relevant procedures

NOTE: The organisational data is taken from a sample of 115 out of 182 who gave responses to these questions.

There is an increase in the number of departments undertaking procedural sedation in children. Without this service, it is probable that children are waiting for procedures to be undertaken on an emergency theatre list, often associated with delays. This likely represents a significant improvement in the quality of care for children.

The question about LocSSIPs was new for this audit. It is encouraging to see that two thirds of departments have these in place. Departments without these checklists may have similar processes for ensuring safety. If not, they should consider this an area of practice to examine for improvement work.

Analysis

Organisational data

The audit includes data for 8815 cases from 183 EDs.

Over two thirds of departments in England, Wales, Norther Island, the Channel Islands and the Isle of Man contributed. Sedation practice in Scotland is less well represented by this audit with 23% taking part.

New questions for this audit sought to establish to what extent LocSSIPs have been implemented. Whilst there were few invasive procedures included, it is encouraging to see that 62% of departments that responded have these in place. It is also encouraging to see a dramatic increase in the number of departments providing paediatric sedation: 72 departments compared to just 2 in the previous audit.

Patient data

Reported data has been analysed and, where necessary, further information has been sought from individual departments. In the case of deaths related to procedural sedation, specific details were obtained.

This demonstrated that of 9 reported deaths, 1 was incorrectly reported and survived, 4 related to anaesthesia of critically ill patients rather than procedural sedation, and for a further 2, sedation was considered non-contributory to death. Details for 1 case were not provided, but the report provided for another case suggests procedural sedation could be directly linked.

Limitations

It is encouraging to see improvement in a number of areas of procedural sedation practice and that the number of adverse events was small. The majority of cases included in this audit were sedations for joint reduction. This is typically a low risk group. Any interpretation of the safety of Emergency Department sedation should bear this in mind. Though few, the reported adverse events serve as a reminder of the need for appropriate assessment of risk and high standards of care.

Summary of recommendations

1. Procedural sedation should be undertaken in a resuscitation room or one with dedicated resuscitation facilities immediately available. Departments not achieving this should work to remedy the situation. Although there were few adverse incidents in this audit, they serve as a clear reminder of associated risks.

2. ED procedural sedation involves the allocation of three distinct roles. EDs should ensure the presence of a separate sedationist, procedurist and nurse on all occasions.

3. All elements of monitoring in Standard 5 should be used and recorded. Improvement activity for use of capnography needs to continue to meet this fundamental standard.

4. Oxygen was routinely administered from the start of procedures. Individual departments should identify whether their practice is consistent with current guidance on "appropriate" oxygen therapy and make improvements accordingly.

5. Departments should identify and implement methods of providing and recording the issuance of written discharge advice.

Using the results of this audit to improve patient care

The results of this audit should be shared with all staff, including doctors and nurses, who have responsibility for looking after patients with hip fracture or suspected hip fracture.

Discussing the results of this audit with colleagues is a good way of demonstrating the ED's commitment to improving care. Engaging staff in the action planning process will lead to more effective implementation of the plan.

EDs may wish to consider using a rapid cycle audit methodology and/or a Quality Improvement Project, which can be used to track performance against standards, as a tool to implement the action plan. For further resources, please visit the RCEM Quality Improvement webpage.

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.

Details of the RCEM Clinical Audit Programme can be found under the Current Audits section of the RCEM website.

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: www.surveymonkey.co.uk/r/RCEMaudit17

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

Useful Resources

- Site-specific report – available to download from the clinical audit website for registered users
- Site-specific PowerPoint presentation developed to help you disseminate your site-specific audit results easily and efficiently – available to download from the clinical audit website for registered users
- Local data file – a spreadsheet that allows you to conduct additional local analysis using your site-specific data for this audit, available to download from the clinical audit website for registered users
- National data file - you can access data from other EDs to customise your peer analysis
- RCEM Learning modules on procedural sedation
- Appendices in this report.
- RCEM Quality Improvement webpage

Report authors and contributors

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Appendices

Appendix 1: Audit questions

Casemix

Q1	Reference (do not enter identifiable data)	
Q2	Date of arrival *(dd/mm/yyyy)* and time of arrival or triage, whichever is earlier *(use 24-hour clock e.g. 11.23pm = 23:23)*	dd/mm/yyyy HH:MM
Q3	Age of patient on attendance	• 16-40 • 41-64 • 65 and above
Q4	Level of sedation intended	• Minimal • Conscious – Moderate • Deep • Dissociative • Not recorded
Q5	Deepest level of sedation achieved	• Minimal • Conscious – Moderate • Deep • Dissociative • Not recorded

Pre-procedure

Q6	Were the following elements of pre-procedural assessment recorded in the ED notes? *(tick all that apply)*	• ASA grade • Prediction of difficulty in airway management • Pre-procedural fasting status
Q7	Was there documented evidence of the patient's informed consent for the sedation?	• Yes - consent given • No - lack of mental capacity noted • No - unable to assess mental capacity • No information

Procedure

Q8	Was the sedation carried out in a resuscitation room or one with dedicated resuscitation facilities?	• Yes • No • Not recorded
Q9	Which of the following staff were present during the procedure? (tick all that apply)	• Doctor • Second doctor, ENP or ANP procedurist • Nurse • Other

Q10	What was the speciality of the sedating practitioner?	• EM practitioner • Anaesthetist • Other • Not recorded
Q11	Which agents were used for sedation? (tick all that apply)	• Opioid • Benzodiazepine • Ketamine • Propofol • Other agent State name: _____ • Not recorded

Monitoring

Q12	Was there evidence of monitoring of the following during the procedure? *(tick all that apply)*	• Non-invasive blood pressure (NIBP) • Pulse oximetry • Capnography • ECG
Q13	Did the patient receive appropriate oxygen therapy during the sedation?	• Yes • No *(go to Q14)* • Not recorded *(go to Q14)*
Q13a	(Only answer if YES to Q13) please state when oxygen was given	• From the start of sedative administration • After complication • From other point • Not specified
Q13b	(Only answer if YES to Q13a) Was appropriate oxygen therapy given until the patient's condition returned to baseline?	• Yes • No
Q14	What was the procedure for which sedation was required? *(tick all that apply)*	• Joint reduction • Chest drain • DC cardioversion • Other – please state
Q15	Was the sedation to facilitate an invasive procedure?	• Yes • No *(go to Q16)* • N/A *(go to Q16)* • Not recorded *(go to Q16)*
Q15a	(Only answer if YES to Q15) If for an invasive procedure, was a LocSSIP checklist used (or other NatSSIP compliant checklist)?	• LocSSIP checklist • NatSSIP compliant checklist State name: _____ • Other State name: _____ • No • Not recorded

Adverse events

Q16	Did any of the following adverse events arise?	
Q16a	Oxygen desaturation, severe (<75% at any time) or prolonged (<90% for >60s)	• Yes • No • Not recorded

Q16b	Apnoea, prolonged (>60s)	• Yes • No • Not recorded
Q16c	Cardiovascular collapse/shock	• Yes • No • Not recorded
Q16d	Cardiac arrest/absent pulse	• Yes • No • Not recorded
Q16e	Other	• Yes State what: _____ • No
Q16f	Patient dissatisfaction with procedure (score of 5/10 or less) when assessed on leaving the resus/ procedure room	• Yes • No • Not recorded

Adverse events – further information

→ If answered *yes* to either Q16a-f please answer Q16g-j; if *not*, please skip to Q17

Q16g	Did the adverse event lead to unplanned hospitalisation or escalation of care?	• Yes • No • Not recorded
Q16h	Did any of the following outcomes arise? *(tick all that apply)*	• Death • Permanent neurological deficit • Pulmonary aspiration syndrome
Q16i	If an adverse event occurred, was this reported as follows? *(tick all that apply)*	• Reported to the department clinical lead • Discussed at the departmental clinical governance meeting • Via completion of World SIVA Adverse Sedation Event Reporting Tool • Datix • Other method • Not reported/Not recorded
Q16j	If an adverse event has occurred, please provide details of the event or contact details if willing to participate in a structured interview and to supply a copy of the World SIVA form.	

Patient discharge

Q17	Was the patient discharged home from the ED?	• Yes • No • Not recorded

Q17a	(Only answer if YES to Q17) Were the following elements of formal assessment of discharge suitability documented? (tick all that apply)	• Return to baseline level of consciousness • Vital signs within normal limits for the patient • Absence of respiratory compromise • Absence of significant pain and discomfort • Written advice on discharge

Organisational audit

PLEASE ANSWER THE FOLLOWING QUESTIONS ONCE PER EMERGENCY DEPARTMENT ONLY

Q1	Is procedural sedation in children undertaken in your ED?	• No • Yes – by ED clinicians • Yes – by anaesthetic clinicians • Yes – not specified by whom
Q2	Does your department have LocSSIP checklists for relevant procedures?	• Yes • No

Notes

Appendix 2: Participating Emergency Departments

Aberdeen Royal Infirmary
Addenbrooke's Hospital
Aintree University Hospital
Airedale General Hospital
Alexandra Hospital
Antrim Area Hospital
Arrowe Park Hospital
Barnet Hospital
Barnsley Hospital
Basildon University Hospital
Basingstoke and North Hampshire Hospital
Bassetlaw Hospital
Bedford Hospital
Blackpool Victoria Hospital
Bradford Royal Infirmary
Bristol Royal Infirmary (Adults)
Bronglais General Hospital
Broomfield Hospital
Calderdale Royal Hospital
Causeway Hospital
Charing Cross Hospital
Chelsea & Westminster Hospital
Cheltenham General Hospital
Chesterfield Royal Hospital
Chorley and South Ribble Hospital
City Hospital (Birmingham)
Colchester General Hospital
Conquest Hospital
Countess of Chester Hospital
Craigavon Area Hospital
Croydon University Hospital
Darent Valley Hospital
Darlington Memorial Hospital
Derriford Hospital
Diana, Princess of Wales Hospital
Doncaster Royal Infirmary
Dorset County Hospital
Dr Gray's Hospital
Ealing Hospital
East Surrey Hospital
Eastbourne District General Hospital
Epsom General Hospital
Fairfield General Hospital
Forth Valley Royal Hospital
Frimley Park Hospital
Furness General Hospital
Glangwili General Hospital
Gloucestershire Royal Hospital
Good Hope Hospital
Grantham & District Hospital
Hairmyres Hospital
Harrogate District Hospital
Heartlands Hospital
Hereford County Hospital
Hillingdon Hospital
Hinchingbrooke Hospital
Homerton University Hospital
Horton Hospital
Huddersfield Royal Infirmary
Hull Royal Infirmary
Ipswich Hospital
James Paget Hospital
John Radcliffe Hospital
Kettering General Hospital
King George Hospital
King's Mill Hospital
Kingston Hospital
Leeds General Infirmary
Leicester Royal Infirmary
Leighton Hospital
Lincoln County Hospital
Lister Hospital
Luton and Dunstable University Hospital
Maidstone District General Hospital
Manchester Royal Infirmary (Adults)
Medway Maritime Hospital
Milton Keynes Hospital
Monklands Hospital
Morriston Hospital
Musgrove Park Hospital
New Cross Hospital
Newham General Hospital
Noble's Hospital
Norfolk & Norwich University Hospital
North Devon District Hospital
North Manchester General Hospital
Northampton General Hospital
Northern General Hospital
Northumbria Specialist Emergency Care Hospital
Northwick Park Hospital
Peterborough City Hospital
Pilgrim Hospital
Pinderfields Hospital

Poole General Hospital
Princess Alexandra Hospital
Princess of Wales Hospital
Princess Royal University Hospital
Queen Alexandra Hospital, PO
Queen Elizabeth Hospital (Birmingham)
Queen Elizabeth Hospital (Gateshead)
Queen Elizabeth Hospital (Woolwich)
Queen Elizabeth The Queen Mother Hospital
Queen's Hospital (Burton)
Queen's Hospital, Romford
Queen's Medical Centre, Nottingham
Rotherham District General Hospital
Royal Albert Edward Infirmary
Royal Berkshire Hospital
Royal Blackburn Hospital
Royal Bolton Hospital
Royal Bournemouth General Hospital
Royal Cornwall Hospital
Royal Derby Hospital
Royal Devon and Exeter Hospital (Wonford)
Royal Free Hospital
Royal Gwent Hospital
Royal Lancaster Infirmary
Royal London Hospital (The)
Royal Oldham Hospital
Royal Preston Hospital
Royal Stoke University Hospital
Royal Surrey County Hospital
Royal Sussex County Hospital
Royal United Hospital
Royal Victoria Hospital - Belfast
Royal Victoria Infirmary
Russells Hall Hospital
Salford Royal Hospital
Salisbury District Hospital
Sandwell General Hospital
Scarborough General Hospital
Scunthorpe General Hospital
South Tyneside District General Hospital
South West Acute Hospital
Southampton General Hospital
Southend Hospital
Southmead Hospital
Southport & Formby District General Hospital
St George's
St Helier Hospital
St James's University Hospital
St Peter's Hospital
St Richard's Hospital (Chichester)
St Thomas' Hospital
Stepping Hill Hospital
Stoke Mandeville Hospital
Sunderland Royal Hospital
Tameside General Hospital
The Cumberland Infirmary
The Great Western Hospital
The James Cook University Hospital
The Princess Elizabeth Hospital
The Queen Elizabeth Hospital (King's Lynn)
The Royal Liverpool University Hospital
Torbay Hospital
Tunbridge Wells Hospital
Ulster Hospital
University College Hospital
University Hospital Lewisham (Adults)
University Hospital of North Durham
University Hospital of North Tees
University Hospital of Wales
University Hospital, Coventry
Victoria Hospital
Warrington Hospital
Warwick Hospital
Watford General Hospital
West Cumberland Hospital
West Suffolk Hospital
Weston General Hospital
Wexham Park Hospital
Whipps Cross University Hospital
Whiston Hospital
Whittington Hospital
William Harvey Hospital
Withybush General Hospital
Worcestershire Royal Hospital
Worthing Hospital
Wrexham Maelor Hospital
Wythenshawe Hospital
Yeovil District Hospital
York Hospital
Ysbyty Gwynedd

Appendix 3: Definitions

Standards definitions

Standard 1
ASA - American Society of Anaesthesiologists Physical Status Classification[6]. See Q6 answer definition for further detail.

Standard 2
Evidence of consent - a form with a ticked box for verbal consent is adequate, or documentation of verbal consent in the ED record. Written consent by the patient is not obligatory.

Standard 4
ENP – Emergency Nurse Practitioner
ANP – Advanced Nurse Practitioner

Standard 5
ECG - Electrocardiogram

Capnography - Sedation is a continuum. It is not always possible to predict the level of sedation in advance, therefore in this audit capnography is a standard for all sedation levels.

Question and answer definitions

Q6
ASA - American Society of Anaesthesiologists Physical Status Classification[8]

ASA PS Classification	***Definition***
ASA I	A normal healthy patient
ASA II	A patient with mild systemic disease
ASA III	A patient with severe systemic disease
ASA IV	A patient with severe systemic disease that is a constant threat to life
ASA V	A moribund patient who is not expected to survive without the operation
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes

Q15a
NatSSIPs - "are intended to provide a skeleton for the production of Local Safety Standards for Invasive Procedures (LocSSIPs) that are created by multiprofessional clinical teams and their patients and are implemented against a background of education in human factors and working as teams. The NatSSIPs do not replace the WHO Safer Surgery Checklist. Rather, they build on it and extend it to more patients undergoing care in our hospitals. They will standardise key elements of procedural care, ensure that care is harmonised – not just within organisations delivering NHS-funded care but also between organisations – and will reinforce the importance of education to patient safety.
LocSSIPs - "Organisations should develop Local Safety Standards for Invasive Procedures (LocSSIPs) that include the key steps outlined in the NatSSIPs and to harmonise practice across the organisation such that there is a consistent approach to the care of patients undergoing invasive procedures in any location."
https://www.england.nhs.uk/wp-content/uploads/2015/09/natssips-safety-standards.pdf

Q16c

Cardiovascular collapse/shock - clinical evidence of inadequate perfusion, cardiovascular compromise raising clinical concern, need for resus, fluid, or positioning of the patient.

Q16h

Pulmonary Aspiration Syndrome – known or suspected inhalation of foreign material such as gastric contents into the respiratory tract associated with new or worsening respiratory symptom

Q17

Patients discharged from the ED clinical decision unit (CDU) or observation ward should be treated as a discharge from the ED.

Appendix 4: Evidence base for standards

STANDARD	EVIDENCE
1. Patients undergoing procedural sedation in the ED should have documented evidence of pre-procedural assessment, including: a. ASA grading[4] b. Prediction of difficulty in airway management[4] c. Pre-procedural fasting status[4]	Safe sedation practice for healthcare procedures – standards and guidance The importance of pre-operative assessment and preparation of patients, focusing on medical, social and psychological assessment and evaluation of risk, taking into consideration the limitations of the setting, cannot be overestimated. Safe Sedation of Adults in the Emergency Department 2012 p3, p9, p10 Recommendations for safe sedation in the Emergency Department - Level 1 sedation training ('conscious' sedation): • ASA grading, • Pre-procedural assessment including prediction of difficulty in airway management, • Pre-procedural fasting and risk benefit assessment
2. There should be documented evidence of the patient's informed consent unless lack of mental capacity has been recorded[4].	Safe sedation practice for healthcare procedures – standards and guidance Valid consent is an essential preliminary to sedation. Safe Sedation of Adults in the Emergency Department 2012 p3, p9, p10 Recommendations for safe sedation in the Emergency Department - Level 1 sedation training ('conscious' sedation): Consent and documentation
3. Procedural sedation should be undertaken in a resuscitation room or one with dedicated resuscitation facilities.	Safe sedation practice for healthcare procedures – standards and guidance Staffing and equipment must meet the needs of both the technique (including monitoring) and its possible complications. Appropriate recovery facilities and discharge criteria relevant to the patient's destination are necessary. Safe Sedation of Adults in the Emergency Department 2012 p8, p9 Moderate sedation/ analgesia ('conscious' sedation) using intravenous agents, typically benzodiazepines - location and facilities: Resuscitation room facilities
4. Procedural sedation requires the presence of all of the below: a. a doctor as sedationist[4] b. a second doctor, ENP or ANP as procedurist[4] c. a nurse	Safe sedation practice for healthcare procedures – standards and guidance Staffing and equipment must meet the needs of both the technique (including monitoring) and its possible complications. Safe Sedation of Adults in the Emergency Department 2012 p3, p8, p10, p11 Moderate sedation/ analgesia ('conscious' sedation) using intravenous agents, typically

	benzodiazepines - Minimum staffing levels: One physician as sedationist *and* one Physician or ENP as operator and *one* Nurse
5. Monitoring during procedural sedation must be documented to have included all of the below: a. Non-invasive blood pressure[4] b. Pulse oximetry[4] c. Capnography[4] d. ECG	<u>Safe sedation practice for healthcare procedures – standards and guidance</u> • Existing guidance for patients undergoing anaesthesia identifies the need for pulse oximetry, ECG and automated non-invasive blood pressure monitoring. • The Association of Anaesthetists of Great Britain and Ireland recommend that continuous waveform capnography should be used to monitor adequacy of ventilation for all patients undergoing moderate or deep sedation, and should be available wherever any patients undergoing moderate or deep sedation are recovered and additionally where: ■ ventilation cannot be directly observed, e.g. MRI/CT ■ multiple drugs/anaesthetic drug techniques are used, and ■ pre-assessment highlights increased clinical risk. <u>Safe Sedation of Adults in the Emergency Department 2012</u> p3, p8, p9, p10, p11 Moderate sedation/ analgesia ('conscious' sedation) using intravenous agents, typically benzodiazepines - Monitoring: ECG, NIBP, pulse oximetry. The use of capnography is recommended.
6. Appropriate oxygen therapy should be given from the start of sedative administration until the patient's condition is returned to baseline[4].	<u>Safe sedation practice for healthcare procedures – standards and guidance</u> Oxygen, via nasal cannulae, should usually be administered from the commencement of sedation, through to readiness for discharge from recovery, particularly for patients with relevant medical conditions, where multiple drug techniques or anaesthetic drugs are used, or deeper levels of sedation administered. <u>Safe Sedation of Adults in the Emergency Department 2012</u> p7, p8, p9, p10 Oxygen should be given to sedated patients, who may experience a fall in oxygen saturation from the baseline level measured on room air. Oxygen should be given from the start of sedative administration until the patient is ready for discharge from the recovery area.
7. For invasive procedures, a Local Safety Standard for Invasive Procedures checklist (LocSSIP) or NatSSIP	<u>NHS England National Safety Standards for Invasive Procedures</u> Organisations should develop Local Safety

compliant checklist is used[6,7].	Standards for Invasive Procedures (LocSSIPs) that include the key steps outlined in the NatSSIPs and to harmonise practice across the organisation such that there is a consistent approach to the care of patients undergoing invasive procedures in any location.
8. Following procedural sedation, patients should only be discharged after documented formal assessment of suitability, including all of the below: a. Return to baseline level of consciousness[4] b. Vital signs within normal limits for the patient[4] c. Absence of respiratory compromise[4] d. Absence of significant pain and discomfort[4] e. Written advice on discharge for all patients	<u>Safe sedation practice for healthcare procedures – standards and guidance</u> Patients should be formally assessed for suitability for discharge from the clinical area where sedation has taken place. Discharge criteria are as follows: ■ The patient has returned to their baseline level of consciousness. ■ Vital signs are within normal limits for that patient. ■ Respiratory status is not compromised. ■ Pain and discomfort have been addressed. ■ If there is a requirement to discharge the patient prior to meeting these criteria they should be transferred to an appropriate clinical environment with continuation of peri-procedure monitoring standards. ■ Patients meeting discharge criteria following sedation who go on to be discharged home should be discharged into the care of a suitable third party. ■ Verbal and written instructions should be given. <u>Safe Sedation of Adults in the Emergency Department 2012</u> p3, p10, p11 Patients should be formally assessed for discharge suitability from the clinical area where sedation has taken place. Discharge criteria are as follows: • The patient has returned to their baseline level of consciousness. • Vital signs are within normal limits for that patient. • Respiratory status is not compromised. • Pain and discomfort have been addressed.

Appendix 5: Calculations

Standard	Patient sample	Calculations
1	All patients	Standard met: Q6 = yes to all 3 options Not met: all other cases
2	All patients, excluding Q7 = No - lack of mental capacity noted	Standard met: Q7 = Yes – consent given Not met: all other cases
3	All patients	Standard met: Q8 = Yes Not met: all other cases
4	All patients	Standard met: Q9 = yes to Doctor and Second doctor, ENP or ANP and Nurse Not met: all other cases
5	All patients	Standard met: Q12 = yes to all 4 options Not met: all other cases
6	All patients	Standard met: Q13 = Yes and Q13a = From the start of sedative administration and Q13b = Yes Not met: all other cases
7	Q15 = Yes	Standard met: Q15 = Yes and Q15a = LocSSIP checklist or NatSSIP compliant checklist Not met: all other cases
8	Q17 = Yes	Standard met: Q17a = yes to all options Not met: all other cases

Appendix 6: Inclusion and exclusion criteria

Inclusion criteria

- Adult patients past their 16th birthday
- Patients undergoing procedural sedation at all levels (minimal, conscious, moderate, dissociative and deep)

Exclusion criteria

- Patients aged 15 or under.
- Patients receiving:
  - Entonox (50% nitrous oxide/oxygen) only
  - Opiates only
  - Entonox and opiates in combination

Search Terms

The ICD 10 codes below can be used to help initially identify potential cases. This is not an exhaustive list; other search terms can be used but all potential patients should then be reviewed to check they meet the definitions & selection criteria before inclusion in the audit.

ECDS codes to support case identification

Related Audit Q	DATA GROUP	DATA ITEM NAME	ICD10	SNOMED	DM&D	UDDA v 3	ECDS	CDS_Code mapping used for HRG Grouping	PbR_ Category	NOTES
Q2	EMERGENCY CARE ATTENDANCE ACTIVITY CHARACTERISTICS	EMERGENCY CARE ARRIVAL DATE	-	-	As per CDS 6.2 Type 010	-	-	-	-	Exclude all BEFORE 01/01/2017
Q2	EMERGENCY CARE ATTENDANCE ACTIVITY CHARACTERISTICS	EMERGENCY CARE ARRIVAL DATE	-	-	As per CDS 6.2 Type 010	-	-	-	-	Exclude all AFTER 31/01/2017
Q3	PATIENT IDENTITY – UNVERIFIED IDENTITY STRUCTURE	PERSON BIRTH DATE	-	-	As per CDS 6.2 Type 010	-	-	-	-	Exclude all BIRTH dates AFTER 31/12/2001

Related Audit Q	DATA GROUP	DATA ITEM NAME	ICD10	SNOMED	DM&D	UDDA v 3	ECDS	CDS_Code mapping used for HRG Grouping	PbR_ Category	NOTES
-	TREATMENT	PROCEDURE DATE	-	-	As per CDS 6.2 Type 010	-	-	-	-	
-	TREATMENT	PROCEDURE TIME	-	-	As per CDS 6.2 Type 010	-	-	-	-	
-	TREATMENT	Anaesthesia : local anaesthetic	-	386761002	-	-	1135110000	232	1-2	
-	TREATMENT	Anaesthesia : entonox	-	427035008	-	-	1135210000	234	1-2	
-	TREATMENT	Anaesthesia : regional block	-	27372005	-	-	1135410000	233	1-2	
-	TREATMENT	Anaesthesia : sedation	-	50697003	-	-	1135610000	235	3-4	

Flow of data searches to identify audit cases

Using codes listed above, first identify all patients attending ED between dates, then by age at time of attendance, then through treatment criteria.

Date and time of attendance

Age (exclude < 18 years)

Procedure

Additional codes that may be of use

Related audit Q	DATA GROUP	DATA ITEM NAME	ICD10	SNOMED	D&MD	UDDA version 3	ECDS	CDS_Code mapping used for HRG Grouping	PbR_Category
Q13	TREATMENT	Supplemental oxygen	-	57485005	-	-	1111110000	40	3-4
	PROCEDURE	DATE	-	-	As per CDS 6.2 Type 010	-	-	-	-
	PROCEDURE	TIME	-	-	As per CDS 6.2 Type 010	-	-	-	-

Related audit Q	DATA GROUP	DATA ITEM NAME	ICD10	SNOMED	D&MD	UDDA version 3	ECDS	CDS_Code mapping used for HRG Grouping	PbR_Category
Q16b	DIAGNOSIS	Respiratory arrest	-	87317003	-	-	1414149000	-	-
Q16c	DIAGNOSIS	Cardiogenic shock	-	89138009	-	-	1411129000	-	-
Q16d	DIAGNOSIS	Cardiac arrest	-	410429000	-	-	1411399000	-	-
Q17	DISCHARGE DESTINATION	Discharge to home	-	306689006	-	-	2018111111	-	-
		Discharge to residential home (procedure)	-	306691003	-	-	2018112111	-	-
		Discharge to nursing home (procedure)	-	306694006	-	-	2018113111	-	-
		Discharge to police custody (procedure)	-	306705005	-	-	2018114111	-	-
		Patient discharge, to legal custody (procedure)	-	50861005	-	-	2018114511	-	-
		Emergency department discharge to emergency	-	1066331000000109	-	-	2018311111	-	-

Related audit Q	DATA GROUP	DATA ITEM NAME	ICD10	SNOMED	D&MD	UDDA version 3	ECDS	CDS_Code mapping used for HRG Grouping	PbR_Category
		department short stay ward (procedure)							
		Emergency department discharge to ambulatory emergency care service (procedure)	-	1066341000000100	-	-	2018312111	-	-
		Discharge to hospital at home service (procedure)	-	1066351000000102	-	-	2018313111	-	-

Appendix 7 Recommendations for safe sedation in the Emergency Department

The full document can be downloaded from: www.rcem.ac.uk/code/document.asp?ID=6691

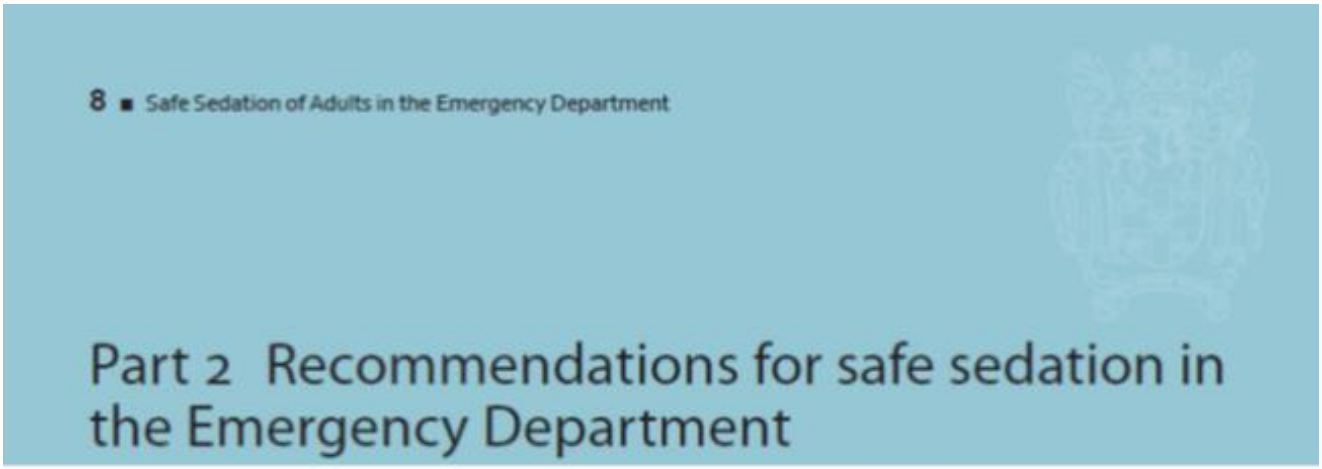


Table 1 Requirements for Emergency Department Sedation (see also notes below)

Depth of sedation	Minimum staffing levels	Competencies of sedating practitioner	Location and Facilities	Monitoring
Minimal sedation with Entonox	One Physician *or* Emergency Nurse Practitioner (ENP)	Current Immediate Life Support (ILS) or Advanced Life Support (ALS) certification or equivalent agreed locally	Anywhere within the Emergency Department (ED)	Pulse oximetry
Moderate sedation/ analgesia ('conscious' sedation) using intravenous agents, typically benzodiazepines	One physician as sedationist *and* one Physician or ENP as operator *and* one Nurse	Current ILS or ALS certification Local sign off for Level 1 sedation training*	Resuscitation room facilities****	ECG, NIBP, pulse oximetry The use of capnography is recommended
Deep sedation/ analgesia	As above	Royal College of Anaesthetists initial assessment of competence Local sign off for Level 2 sedation training**	Resuscitation room facilities****	Standards conforming to AABGI guidelines for general anaesthesia[1] The use of capnography is mandatory
Dissociative sedation using ketamine	As above	As above	As above	As above
Rapid sequence induction of anaesthesia (RSI) and tracheal intubation	As above	As above, plus additional supervised practice and local sign off for ED RSI training including: ■ experience in failed intubation drills/ rescue oxygenation techniques ■ the use of cricoid pressure ■ the adjustment of anaesthetic dosage in critical illness and circulatory support***	As above	As above

Part 2 Recommendations for safe sedation in the Emergency Department

* Level 1 sedation training ('conscious' sedation)
- ASA grading
- Pre-procedural assessment including prediction of difficulty in airway management
- Pre-procedural fasting and risk benefit assessment
- Consent and documentation
- Drug selection and preparation: benzodiazepine/opioid combinations, intervals between increments and reversal drugs
- Monitoring, complications (e.g. hypoxia and hypotension) and rescue strategies
- Governance and audit

** Level 2 sedation training (deep sedation/general anaesthesia)
- As per level 1
- Drug selection with emphasis on potential alternative strategies and/or lighter sedation
- Safe use of propofol
- Safe use of ketamine
- Monitoring, complications (e.g. hypoxia and hypotension) and rescue strategies
- Governance and audit

*** Additional training for ED RSI
- As per level 2
- Additional supervised practice and assessment in the operating theatre, intensive care unit and ED. Independent RSI is not included within the current emergency medicine core curriculum, and the additional competencies required to undertake this procedure, and maintain skills over time, have not yet been defined. Further work in this area would be welcomed

**** Resuscitation room facilities
- Full resuscitation equipment for the administration of basic and advanced life support. Equipment and drugs should be checked daily, and after each use. That such checks have occurred should be routinely recorded
- Difficult airway equipment
- Continuous high flow oxygen with appropriate devices for administration
- High pressure suction with appropriate suction catheters
- A trolley capable of being tipped head down
- Monitoring: Pulse oximeter, ECG, NIBP and continuous quantitative capnography
- Appropriate range of intravenous cannulae
- An appropriate range of intravenous fluids and infusion devices
- Manual handling devices

Part 2 Recommendations for safe sedation in the Emergency Department

Immediate Life Support comprises the essential knowledge and skills to enable recognition of the acutely ill patient and treatment of a patient in cardiac arrest while awaiting the arrival of a resuscitation team. Competencies within the domain of ILS include: delivery of high-quality chest compressions, basic airway management, safe defibrillation using either manual or automated external defibrillators (AEDs), and being a cardiac arrest team member.

Oxygen

Oxygen should be given to sedated patients, who may experience a fall in oxygen saturation from the baseline level measured on room air. Oxygen should be given from the start of sedative administration until the patient is ready for discharge from the recovery area.

Capnography

The use of continuous capnography is mandatory wherever deep sedation, dissociative sedation, general anaesthesia or RSI occurs (i.e. whenever it is anticipated that verbal contact with the patient will be lost), except in rare cases where it would substantially interfere with surgical access. Capnography is also recommended at lighter levels of sedation; this is an emerging area of practice, and the use of capnography is expected to become routine.[3]

Documentation

Standard forms should be routinely used for patient pre-assessment, patient information, consent, monitoring, discharge information and clinical audit. Past medical history, medications, allergies and physical examination of vital signs, airway and cardiopulmonary status should all be recorded prior to the procedure. Good practice guidelines, issued by the Department of Health, include standard consent forms for patients undergoing procedures including sedation and general anaesthesia,[4] but national agreement has not been established in the other documentation areas, and the development of appropriate forms would be welcomed. Whilst the urgency of the clinical situation or patient status may sometimes necessitate treatment in the absence of consent, and in the patient's best interests, every effort should be made to obtain prior written consent for both the proposed procedure and sedation technique.

Post-procedure monitoring

All patients who have received sedation should continue to be managed in a clinical area that provides the same level of facilities and monitoring as those required during the procedure, until the level of consciousness and other vital signs have returned to pre-procedure baseline levels. This includes the presence of a clinician who has been trained in the core skills required of recovery nurses, as described in guidelines issued by the Association of Anaesthetists of Great Britain and Ireland.[5] These skills include the monitoring and measurement of vital signs and overall patient status, including respiratory rate, blood pressure, heart rate, Glasgow Coma Score and basic life support training.

Part 2 Recommendations for safe sedation in the Emergency Department

Discharge status

Patients should be formally assessed for discharge suitability from the clinical area where sedation has taken place. Discharge criteria are as follows:

- The patient has returned to their baseline level of consciousness.
- Vital signs are within normal limits for that patient.
- Respiratory status is not compromised.
- Pain and discomfort have been addressed.

If there is a requirement to discharge the patient prior to meeting these criteria they should be transferred to an appropriate clinical environment, usually level 2 care with continuation of peri-procedure monitoring standards.

Patients meeting discharge criteria following sedation who go on to be discharged home from the Emergency Department should be discharged into the care of a responsible third party. Verbal and written instructions should be given.

The role of the skilled assistant

The RCoA recommends that anaesthesia should not proceed without a skilled, dedicated assistant.[6]

The role of the skilled assistant can be undertaken by a number of professionals in the emergency care setting such as an emergency nurse, other emergency practitioner or an operating department practitioner. They must be formally trained in the role that they will be required to undertake, be that assistance with sedation or assistance with RSI. NHS Education Scotland has devised a portfolio of core competencies for anaesthetic assistants.[7] It would be expected that those assisting with sedation and RSI would have achieved competencies equivalent to those listed in sections 3.5 and 3.6 and sections 4.1 to 4.12 of this document. If the patient is thought to have a potential neck injury a second competent assistant is needed to perform manual in-line cervical stabilisation (MILS).

The RSI assistant may also be involved in post intubation care, and should be familiar and practised in post intubation procedures. Local protocols, training packages and competency assessments should be developed to ensure that staff are able to perform the role of skilled assistant and regularly practise these skills (either through actual experience or high fidelity simulation).

Part 2 Recommendations for safe sedation in the Emergency Department

Fasting prior to Emergency Department sedation

Fasting is not needed for minimal sedation, sedation with nitrous oxide (in oxygen) alone, or moderate sedation where verbal contact is maintained.

For elective procedures using all other sedation techniques (deep sedation, dissociative sedation and moderate sedation where the patient might not maintain verbal contact with the healthcare professional), apply the fasting rule used for general anaesthesia: two hours for clear fluids and six hours for solids.[8]

For an emergency procedure in someone who is not fasted, base the decision to proceed with sedation on the urgency of the procedure and the target depth of sedation.

Careful judgement is required when assessing the risk of aspiration in relation to the urgency of a proposed procedure. The key factors to consider are:

1. The urgency of the proposed procedure. In many life or limb threatening situations (e.g. cardioversion of a cardiac arrhythmia causing significant cardiovascular compromise, or an orthopaedic procedure to correct distal limb ischaemia) the patient is unable to wait and the main question becomes the choice of sedation/ anaesthetic technique rather than the possibility of deferment.
2. The proposed depth and duration of sedation. Longer periods of sedation, greater sedation depth and airway interventions may stimulate airway reflexes (coughing, hiccoughs or laryngospasm) and gastro-intestinal motor responses (gagging or recurrent swallowing) leading to gastric distension, regurgitation or vomiting.
3. Patient factors. Conditions such as raised intracranial pressure, hiatus hernia and gastrointestinal obstruction are known to delay gastric emptying, and these patients may be at greater risk. Gastric emptying may also be delayed in patients who have previously undergone upper gastrointestinal surgery, in those recently injured or receiving opioids, and in pregnancy. Morbidly obese patients may be at risk, because the intra-abdominal pressure is higher and the incidence of hiatus hernia is greater than in non-obese patients. The timing of food intake in relation to the injury is also important.

Part 2 Recommendations for safe sedation in the Emergency Department

Therefore, each patient requires a thoughtful assessment of the urgency and benefit of the procedure compared to the risks of sedation. This assessment and the resulting decision should be recorded in the clinical notes, and discussed with the patient whenever possible. To assist with the decision-making process a North American committee of emergency physician sedation researchers have developed a 'tool to permit emergency physicians to identify prudent limits of sedation depth and timing in light of fasting status and individual patient risk factors', but goes on to state that 'the advisory is not intended to assert a legal standard of practice or absolute requirement'.[9] Overall, this clinical practice advisory is an attempt to more clearly articulate the required risk-benefit calculation, but includes an explicit expectation that further judgement will be required on a case-by-case basis.

Acting on increased aspiration risk

Where the risk of aspiration is significantly increased steps should be taken to mitigate this risk. Suggested approaches include:

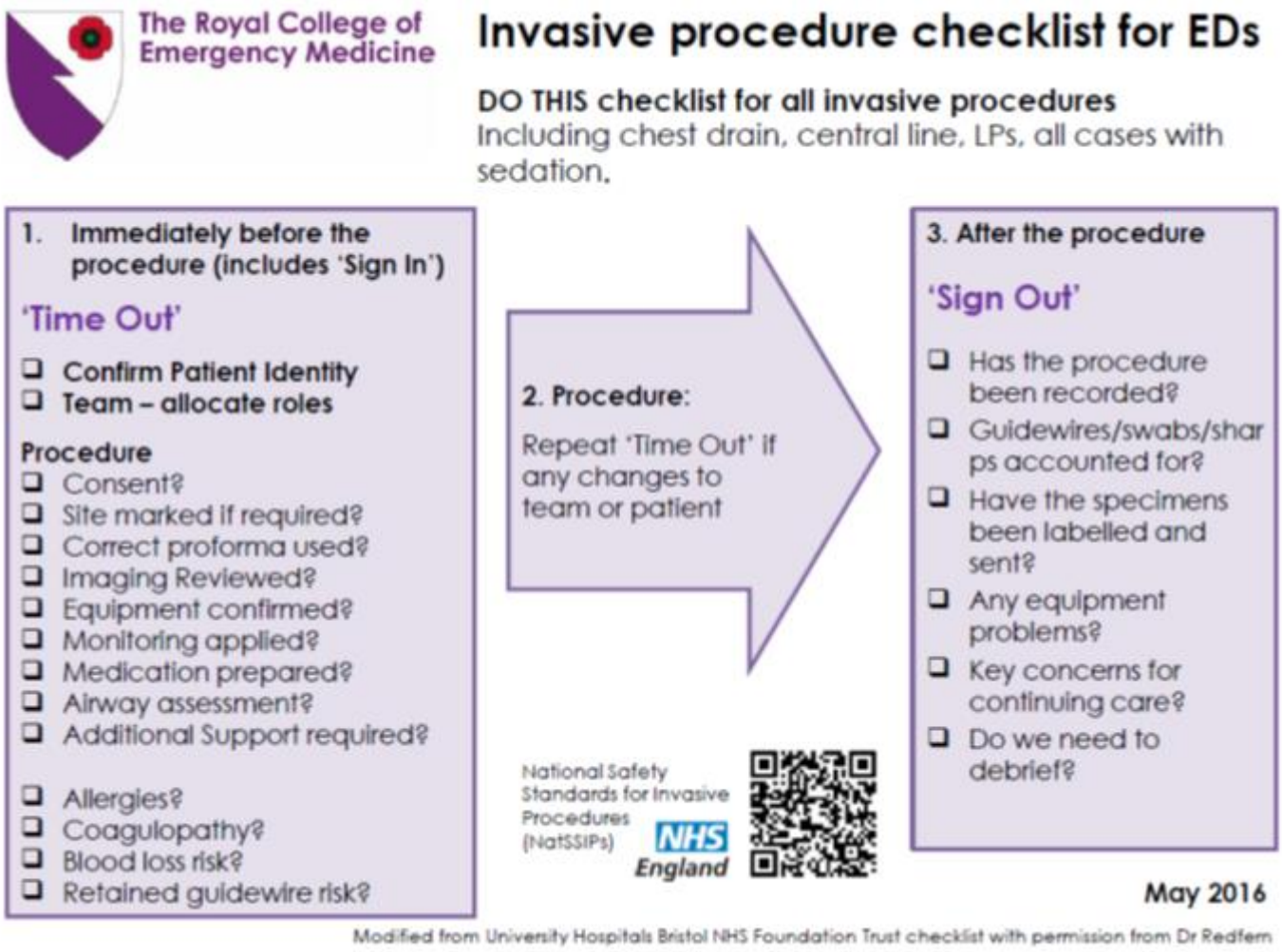
- Delaying the procedure, if clinically appropriate.
- Adopting an alternative technique. Rapid sequence induction of anaesthesia and tracheal intubation is considered the 'gold standard' where there is an increased aspiration risk, but pulmonary aspiration may still occur.[10] In addition, RSI introduces other risks, such as inability to intubate or ventilate the patient and the risk of adverse reaction to induction and neuromuscular blocking drugs.
- Regional anaesthetic techniques may allow the required procedure to be performed with no or minimal sedation.
- Reducing the depth and duration of sedation. This increases the risk of procedural failure, but may be appropriate in some instances.
- Consider whether the administration of ranitidine or proton pump inhibitors, metoclopramide and sodium citrate is appropriate to neutralise gastric acid and promote gastric emptying.

In all cases of increased aspiration risk the advice of an expert sedationist should be sought. However there is no consensus on this subject, even among experts.[11]

Audit

All sedation practice should be audited; individual Emergency Departments should develop audit standards and markers.

Appendix 8 Invasive procedure checklist for EDs



Appendix 9 Procedural Sedation Checklist

Click here to download the checklist and proforma

Date		Patient name			
Time		Date of birth	affix label		
		Hospital number			
Planned procedure:					
Planned sedation level:	minimal				
	moderate sedation				
	deep sedation				
	dissociative sedation				
Patient factors:					
Age:		yrs	Weight		Kg
Pregnant:	Yes		No		
Relevant co-morbidities	IHD	COPD/asthma	Obese		
	Schizophrenia	other:			
Allergies					
Normal Medications					
Acute Medications					
Recreational drugs or alcohol					
Previous anaesthetic	Yes		No		
Anaesthetic complications					
Date and time of last food					
Date and time of last oral fluid intake					
ASA grade (please circle)	**ASA I**	A normal healthy patient			
	ASA II	A patient with mild systemic disease			
	ASA III	A patient with severe systemic disease			
	ASA IV	A patient with severe systemic disease that is a constant threat to life			
	ASA V	A moribund patient who is not expected to survive without the operation			
Difficult Airway?	**no concern/ mild concern/significant concern**				
Features to consider:					
BMV ventilation:	beard, no teeth, obesity, trauma, cachexia				
LMA:	Look for characteristics of difficult intubation, Evaluate mouth opening and				
Laryngoscopy:	thyromental distance, assess Mallampati score, look for Obstruction, assess Neck				
Crithyroidotomy:	mobility. (LEMON) Check front of neck.				
Consent: sedation	verbal		written		lacks capacity	
procedure	verbal		written		lacks capacity	
Preprocedural ECG:	Y		N		
Pain before procedure	mild (0-3)		moderate (4-6)		severe (7-10)
Pain post-procedure	mild (0-3)		moderate (4-6)		severe (7-10)

Patient Information

Name:

Hosp No: Affix patient label:

	Name	Grade	Speciality
Sedating Practitioner			
Procedural Assistant			
Nursing staff			

Location for procedure: Resus Y ☐ N ☐ Other (details)

Date:															
Time:															
Respiratory rate (bpm)															
SpO2 %															
Oxygen delivered (l/min or															
Blood pressure: Systolic/ Diastolic (mmHg)	240														
	230														
	220														
	210														
	200														
	190														
	180														
	170														
	160														
	150														
	140														
	130														
Heart Rate (bpm)	120														
	110														
	100														
	90														
	80														
	70														
	60														
	50														
	40														
	30														
Drugs	Units														

Capnography used: Y ☐ N ☐

Level of sedation achieved: minimal sedation ☐ moderate sedation ☐ deep sedation ☐ dissociative sedation ☐ anaesthesia ☐

Interventions needed: none ☐ hypotension rx ☐ BMV ☐ LMA ☐ ETT ☐ reversal agent ☐ other ☐

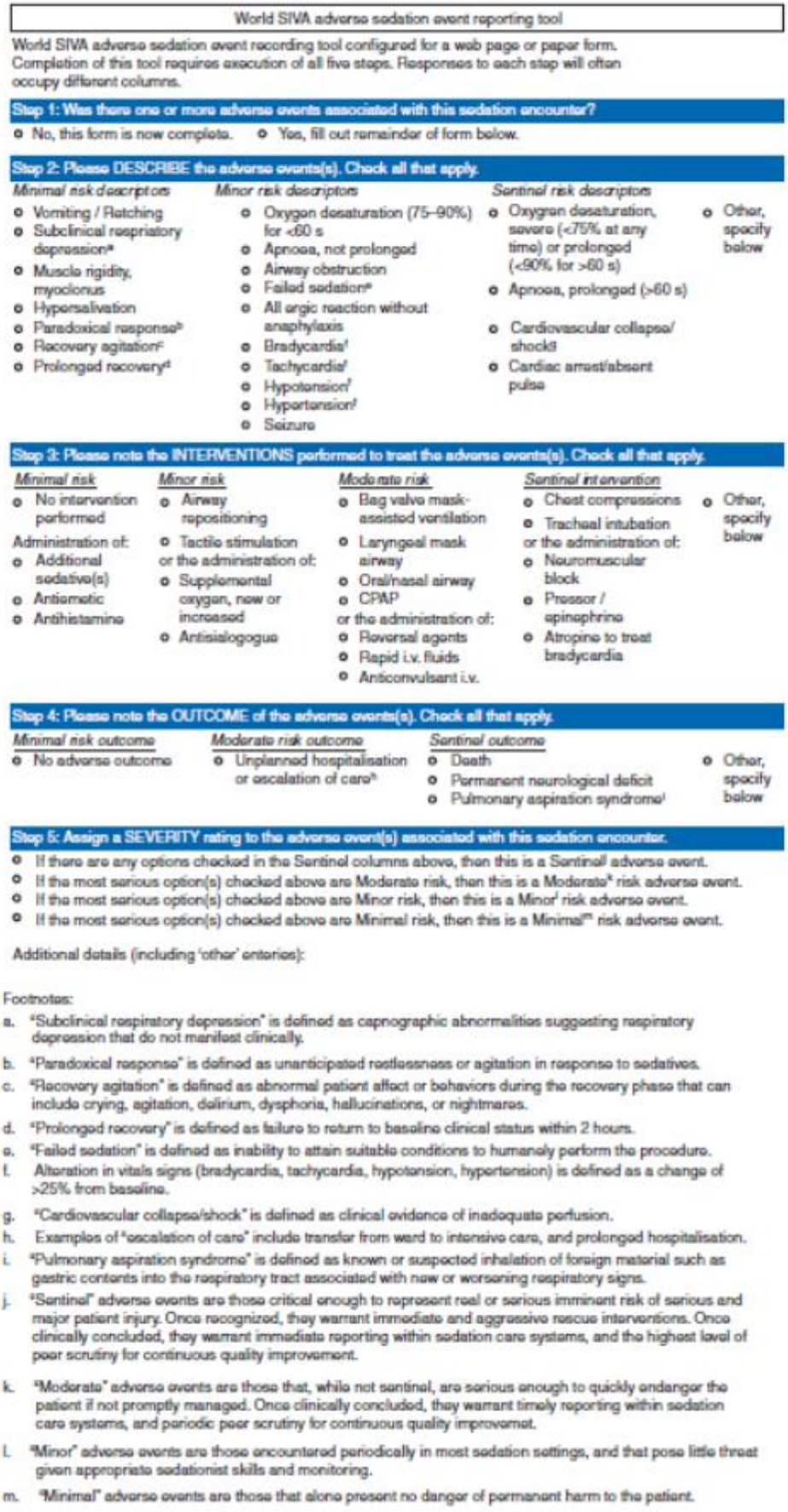
Adverse events: none ☐ hypoxia ☐ hypotension ☐ adverse reaction ☐ vomiting ☐ cardiac arrest ☐ aspiration ☐ death ☐

Procedure Successful: yes ☐ no ☐ Sedating Practitioner signature:

Discharge Advice given: verbal ☐ written ☐

Patient satisfaction with procedure: /10

Appendix 10 World SIVA adverse sedation event reporting tool



World SIVA adverse sedation event reporting tool

World SIVA adverse sedation event recording tool configured for a web page or paper form. Completion of this tool requires execution of all five steps. Responses to each step will often occupy different columns.

Step 1: Was there one or more adverse events associated with this sedation encounter?

- No, this form is now complete.
- Yes, fill out remainder of form below.

Step 2: Please DESCRIBE the adverse event(s). Check all that apply.

Minimal risk descriptors
- Vomiting / Retching
- Subclinical respiratory depression[a]
- Muscle rigidity, myoclonus
- Hypersalivation
- Paradoxical response[b]
- Recovery agitation[c]
- Prolonged recovery[d]

Minor risk descriptors
- Oxygen desaturation (75–90%) for <60 s
- Apnoea, not prolonged
- Airway obstruction
- Failed sedation[e]
- Allergic reaction without anaphylaxis
- Bradycardia[f]
- Tachycardia[f]
- Hypotension[f]
- Hypertension[f]
- Seizure

Sentinel risk descriptors
- Oxygen desaturation, severe (<75% at any time) or prolonged (<90% for >60 s)
- Apnoea, prolonged (>60 s)
- Cardiovascular collapse/ shock[g]
- Cardiac arrest/absent pulse

- Other, specify below

Step 3: Please note the INTERVENTIONS performed to treat the adverse event(s). Check all that apply.

Minimal risk
- No intervention performed

Administration of:
- Additional sedative(s)
- Antiemetic
- Antihistamine

Minor risk
- Airway repositioning
- Tactile stimulation

or the administration of:
- Supplemental oxygen, new or increased
- Antisialogogue

Moderate risk
- Bag valve mask-assisted ventilation
- Laryngeal mask airway
- Oral/nasal airway
- CPAP

or the administration of:
- Reversal agents
- Rapid i.v. fluids
- Anticonvulsant i.v.

Sentinel intervention
- Chest compressions
- Tracheal intubation

or the administration of:
- Neuromuscular block
- Pressor / epinephrine
- Atropine to treat bradycardia

- Other, specify below

Step 4: Please note the OUTCOME of the adverse event(s). Check all that apply.

Minimal risk outcome
- No adverse outcome

Moderate risk outcome
- Unplanned hospitalisation or escalation of care[h]

Sentinel outcome
- Death
- Permanent neurological deficit
- Pulmonary aspiration syndrome[i]

- Other, specify below

Step 5: Assign a SEVERITY rating to the adverse event(s) associated with this sedation encounter.

- If there are any options checked in the Sentinel columns above, then this is a Sentinel[j] adverse event.
- If the most serious option(s) checked above are Moderate risk, then this is a Moderate[k] risk adverse event.
- If the most serious option(s) checked above are Minor risk, then this is a Minor[l] risk adverse event.
- If the most serious option(s) checked above are Minimal risk, then this is a Minimal[m] risk adverse event.

Additional details (including 'other' entries):

Footnotes:

a. "Subclinical respiratory depression" is defined as capnographic abnormalities suggesting respiratory depression that do not manifest clinically.

b. "Paradoxical response" is defined as unanticipated restlessness or agitation in response to sedatives.

c. "Recovery agitation" is defined as abnormal patient affect or behaviors during the recovery phase that can include crying, agitation, delirium, dysphoria, hallucinations, or nightmares.

d. "Prolonged recovery" is defined as failure to return to baseline clinical status within 2 hours.

e. "Failed sedation" is defined as inability to attain suitable conditions to humanely perform the procedure.

f. Alteration in vitals signs (bradycardia, tachycardia, hypotension, hypertension) is defined as a change of >25% from baseline.

g. "Cardiovascular collapse/shock" is defined as clinical evidence of inadequate perfusion.

h. Examples of "escalation of care" include transfer from ward to intensive care, and prolonged hospitalisation.

i. "Pulmonary aspiration syndrome" is defined as known or suspected inhalation of foreign material such as gastric contents into the respiratory tract associated with new or worsening respiratory signs.

j. "Sentinel" adverse events are those critical enough to represent real or serious imminent risk of serious and major patient injury. Once recognized, they warrant immediate and aggressive rescue interventions. Once clinically concluded, they warrant immediate reporting within sedation care systems, and the highest level of peer scrutiny for continuous quality improvement.

k. "Moderate" adverse events are those that, while not sentinel, are serious enough to quickly endanger the patient if not promptly managed. Once clinically concluded, they warrant timely reporting within sedation care systems, and periodic peer scrutiny for continuous quality improvement.

l. "Minor" adverse events are those encountered periodically in most sedation settings, and that pose little threat given appropriate sedationist skills and monitoring.

m. "Minimal" adverse events are those that alone present no danger of permanent harm to the patient.

Appendix 11: References

[1] NCEPOD. Scoping our practice 2004

[2] NPSA. Rapid Response Report: Reducing risk of overdose with midazolam injection in adults December 2008

[3] NICE. Clinical Guidelines (CG112): Sedation in children and young people 2010; RCEM Summary of NICE CG112 June 2012

[4] AoMRC. Safe sedation practice for healthcare procedures – standards and guidance 2013

[5] RCoA and RCEM. Safe sedation of adults in the emergency department 2012

[6] NHS England. National Safety Standards for Invasive Procedures https://www.england.nhs.uk/wp-content/uploads/2015/09/natssips-safety-standards.pdf 2015

[7] RCEM. Invasive procedure checklist for EDs 2016

[8] ASA. Physical Status Classification System 2014