PROCEDURAL SEDATION IN ADULTS

CLINICAL AUDIT 2017/18

National Report

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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.
Executive Summary

Overview
A total of 8774 patients presenting to 182 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.

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

<table>
<thead>
<tr>
<th>RCN Standard</th>
<th>National Results</th>
<th>2017/18 (8774 cases)</th>
<th>2015/16 (8845 cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STANDARD 1:</td>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>12%</td>
<td>34%</td>
</tr>
<tr>
<td>STANDARD 2:</td>
<td>There should be documented evidence of the patient’s informed consent unless lack of mental capacity has been recorded.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>46%</td>
<td>68%</td>
</tr>
<tr>
<td>STANDARD 3:</td>
<td>Procedural sedation should be undertaken in a resuscitation room or one with dedicated resuscitation facilities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>74%</td>
<td>93%</td>
</tr>
<tr>
<td>STANDARD 4:</td>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>24%</td>
<td>47%</td>
</tr>
<tr>
<td>STANDARD 5:</td>
<td>Monitoring during procedural sedation must be documented to have included all of: a. non-invasive blood pressure b. Pulse oximetry, c. Capnography, d. ECG</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>20%</td>
<td>45%</td>
</tr>
<tr>
<td>STANDARD 6:</td>
<td>Appropriate oxygen therapy should be given from the start of sedative administration until the patient’s condition is returned to baseline.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>22%</td>
<td>49%</td>
</tr>
<tr>
<td>STANDARD 7:</td>
<td>For invasive procedures, a Local Safety Standard for Invasive Procedures checklist (LocSSIP) or NatSSIP compliant checklist is used.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>69%</td>
<td>100%</td>
</tr>
<tr>
<td>STANDARD 8:</td>
<td>Following procedural sedation, patients should only be discharged after documented formal assessment of suitability, including all of the below:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return to baseline level of consciousness</td>
<td>100%</td>
<td>0%</td>
<td>8%</td>
</tr>
<tr>
<td>Vital signs within normal limits for the patient</td>
<td>100%</td>
<td>34%</td>
<td>62%</td>
</tr>
<tr>
<td>Absence of respiratory compromise</td>
<td>100%</td>
<td>40%</td>
<td>63%</td>
</tr>
<tr>
<td>Absence of significant pain and discomfort</td>
<td>100%</td>
<td>20%</td>
<td>48%</td>
</tr>
<tr>
<td>Written advice on discharge for all patients</td>
<td>100%</td>
<td>17%</td>
<td>38%</td>
</tr>
</tbody>
</table>

**NOTE:** these 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\textsuperscript{1} and NPSA\textsuperscript{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\textsuperscript{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\textsuperscript{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)\textsuperscript{5}, AoMRC guidance (2013)\textsuperscript{4} and NICE CG112\textsuperscript{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, 8774 cases from 182 EDs were included in the audit.

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of relevant EDs</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>National total</td>
<td>182/233 (78%)</td>
<td>8774</td>
</tr>
<tr>
<td>England</td>
<td>159/179 (89%)</td>
<td>7615</td>
</tr>
<tr>
<td>Scotland</td>
<td>6/26 (23%)</td>
<td>430</td>
</tr>
<tr>
<td>Wales</td>
<td>9/13 (69%)</td>
<td>404</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>6/9 (67%)</td>
<td>261</td>
</tr>
<tr>
<td>Isle of Man/Channel Islands</td>
<td>2/3 (67%)</td>
<td>64</td>
</tr>
</tbody>
</table>
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 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).

<table>
<thead>
<tr>
<th>Expected number of cases</th>
<th>Recommended audit sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50</td>
<td>All eligible cases</td>
</tr>
<tr>
<td>50-250</td>
<td>50 consecutive cases</td>
</tr>
<tr>
<td>&gt;250</td>
<td>100 consecutive cases</td>
</tr>
</tbody>
</table>
## Standards

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

<table>
<thead>
<tr>
<th>Standard</th>
<th>Standard type</th>
</tr>
</thead>
</table>
| 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 | Fundamental |
| 2. There should be documented evidence of the patient’s informed consent unless lack of mental capacity has been recorded | 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  
   b. A second doctor, ENP or ANP as procedurist  
   c. A nurse | Fundamental |
| 5. Monitoring during procedural sedation must be documented to have included all of the below:  
   a. Non-invasive blood pressure  
   b. Pulse oximetry  
   c. Capnography  
   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 | Developmental |
| 7. For invasive procedures, a Local Safety Standard for Invasive Procedures checklist (LocSSIP) or NatSSIP compliant checklist is used | 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  
   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 | (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.

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=8774)

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=8774)

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=8774)

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

<table>
<thead>
<tr>
<th>Intended</th>
<th>Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conscious</td>
</tr>
<tr>
<td>Conscious</td>
<td>26.50%</td>
</tr>
<tr>
<td>Minimal</td>
<td>0.36%</td>
</tr>
<tr>
<td>Dissociative</td>
<td>0.08%</td>
</tr>
<tr>
<td>Deep</td>
<td>0.38%</td>
</tr>
<tr>
<td>Not recorded</td>
<td>4.63%</td>
</tr>
</tbody>
</table>

Sample: all patients (n=8774)

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 37.22% 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?

- **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=8774)

  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=8627)

  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.

**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=8774)*

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=8774)

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=8774)

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=8774)

Procedural sedation undertaken in ED is consistently provided by EM practitioners.
Q11 Which agents were used for sedation?

**Sample: all patients (n=8774)**

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=8469)**

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?

**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=8774)*

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=8774)**

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

Sample: all patients (n=8774)

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”.

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=5445)

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=4677)

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=8774)

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=8774)

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=8774)**

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=8774)**

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=8774)

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=8774)

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 8774 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=8774)**

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

Q16f Patient Satisfaction with procedure?

Sample: all patients (n=8774)

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=8774)

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=8774)
Q17a Were the following elements of formal assessment of discharge suitability documented?

**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=4646) - 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.

NOTE: The organisational data is taken from a sample of 112 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 8774 cases from 182 EDs.

Over two thirds of departments in England, Wales, Northern Ireland, 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 64% 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

This report is produced by the Quality Assurance and Improvement Sub Committee of the Quality in Emergency Care Committee for the Royal College of Emergency Medicine.

- Rob Stacey – Member, Quality Assurance and Improvement Sub Committee
- Jeff Keep – Chair, Quality Assurance and Improvement Sub Committee
- Nicola Littlewood - Member, Quality Assurance and Improvement Sub Committee
- Adrian Boyle – Chair, Quality in Emergency Care Committee
- James France – Member, Quality in Emergency Care Committee
- Ian Higginson - Member, Quality in Emergency Care Committee
- Simon Smith - Member, Quality in Emergency Care Committee
- Martin Rolph – Lay Member, Quality in Emergency Care Committee
- Sam McIntyre – Quality Manager, RCEM
- Mohbub Uddin – Deputy Quality Manager, RCEM
- Alexander Griffiths – Quality Officer, RCEM
- Mike King – Analyst, L2S2
- Jonathan Websdale – Analyst L2S2
- Dan Parsonson – Analyst, L2S2
# Appendices

## Appendix 1: Audit questions

### Casemix

<table>
<thead>
<tr>
<th>Q1</th>
<th>Reference (do not enter identifiable data)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2</td>
<td>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)</td>
</tr>
<tr>
<td>Q3</td>
<td>Age of patient on attendance</td>
</tr>
<tr>
<td>Q4</td>
<td>Level of sedation intended</td>
</tr>
<tr>
<td>Q5</td>
<td>Deepest level of sedation achieved</td>
</tr>
</tbody>
</table>

- 16-40
- 41-64
- 65 and above
- Minimal
- Conscious – Moderate
- Deep
- Dissociative
- Not recorded

### Pre-procedure

<table>
<thead>
<tr>
<th>Q6</th>
<th>Were the following elements of pre-procedural assessment recorded in the ED notes? (tick all that apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q7</td>
<td>Was there documented evidence of the patient’s informed consent for the sedation?</td>
</tr>
</tbody>
</table>

- ASA grade
- Prediction of difficulty in airway management
- Pre-procedural fasting status
- Yes - consent given
- No - lack of mental capacity noted
- No - unable to assess mental capacity
- No information

### Procedure

<table>
<thead>
<tr>
<th>Q8</th>
<th>Was the sedation carried out in a resuscitation room or one with dedicated resuscitation facilities?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q9</td>
<td>Which of the following staff were present during the procedure? (tick all that apply)</td>
</tr>
</tbody>
</table>

- Yes
- No
- Not recorded
- 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

<table>
<thead>
<tr>
<th>Q12</th>
<th>Was there evidence of monitoring of the following during the procedure? (tick all that apply)</th>
</tr>
</thead>
</table>
|     | Non-invasive blood pressure (NIBP)  
|     | Pulse oximetry  
|     | Capnography  
|     | ECG |

<table>
<thead>
<tr>
<th>Q13</th>
<th>Did the patient receive appropriate oxygen therapy during the sedation?</th>
</tr>
</thead>
</table>
|     | Yes  
|     | No (go to Q14)  
|     | Not recorded (go to Q14) |

<table>
<thead>
<tr>
<th>Q13a</th>
<th>(Only answer if YES to Q13) please state when oxygen was given</th>
</tr>
</thead>
</table>
|      | From the start of sedative administration  
|      | After complication  
|      | From other point  
|      | Not specified |

<table>
<thead>
<tr>
<th>Q13b</th>
<th>(Only answer if YES to Q13a) Was appropriate oxygen therapy given until the patient’s condition returned to baseline?</th>
</tr>
</thead>
</table>
|      | Yes  
|      | No |

<table>
<thead>
<tr>
<th>Q14</th>
<th>What was the procedure for which sedation was required? (tick all that apply)</th>
</tr>
</thead>
</table>
|     | Joint reduction  
|     | Chest drain  
|     | DC cardioversion  
|     | Other – please state |

<table>
<thead>
<tr>
<th>Q15</th>
<th>Was the sedation to facilitate an invasive procedure?</th>
</tr>
</thead>
</table>
|     | Yes  
|     | No (go to Q16)  
|     | N/A (go to Q16)  
|     | Not recorded (go to Q16) |

<table>
<thead>
<tr>
<th>Q15a</th>
<th>(Only answer if YES to Q15) If for an invasive procedure, was a LocSSIP checklist used (or other NatSSIP compliant checklist)?</th>
</tr>
</thead>
</table>
|      | LocSSIP checklist  
|      | NatSSIP compliant checklist  
|      | State name: ___________  
|      | Other  
|      | State name: ___________  
|      | No  
|      | Not recorded |

### Adverse events

<table>
<thead>
<tr>
<th>Q16</th>
<th>Did any of the following adverse events arise?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oxygen desaturation, severe (&lt;75% at any time) or prolonged (&lt;90% for &gt;60s)</td>
</tr>
</tbody>
</table>
| Q16a | 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  
• Not recorded |
| 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

<table>
<thead>
<tr>
<th>Aberdeen Royal Infirmary</th>
<th>Gloucestershire Royal Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addenbrooke's Hospital</td>
<td>Good Hope Hospital</td>
</tr>
<tr>
<td>Aintree University Hospital</td>
<td>Grantham &amp; District Hospital</td>
</tr>
<tr>
<td>Airedale General Hospital</td>
<td>Hairmyres Hospital</td>
</tr>
<tr>
<td>Alexandra Hospital</td>
<td>Harrogate District Hospital</td>
</tr>
<tr>
<td>Antrim Area Hospital</td>
<td>Heartlands Hospital</td>
</tr>
<tr>
<td>Arrowe Park Hospital</td>
<td>Hereford County Hospital</td>
</tr>
<tr>
<td>Barnet Hospital</td>
<td>Hillingdon Hospital</td>
</tr>
<tr>
<td>Barnsley Hospital</td>
<td>Hinchingbrooke Hospital</td>
</tr>
<tr>
<td>Basildon University Hospital</td>
<td>Homerton University Hospital</td>
</tr>
<tr>
<td>Basingstoke and North Hampshire Hospital</td>
<td>Horton Hospital</td>
</tr>
<tr>
<td>Bassetlaw Hospital</td>
<td>Huddersfield Royal Infirmary</td>
</tr>
<tr>
<td>Bedford Hospital</td>
<td>Hull Royal Infirmary</td>
</tr>
<tr>
<td>Blackpool Victoria Hospital</td>
<td>Ipswich Hospital</td>
</tr>
<tr>
<td>Bradford Royal Infirmary</td>
<td>James Paget Hospital</td>
</tr>
<tr>
<td>Bristol Royal Infirmary (Adults)</td>
<td>John Radcliffe Hospital</td>
</tr>
<tr>
<td>Bronglais General Hospital</td>
<td>Kettering General Hospital</td>
</tr>
<tr>
<td>Broomfield Hospital</td>
<td>King George Hospital</td>
</tr>
<tr>
<td>Calderdale Royal Hospital</td>
<td>King's Mill Hospital</td>
</tr>
<tr>
<td>Causeway Hospital</td>
<td>Kingston Hospital</td>
</tr>
<tr>
<td>Charing Cross Hospital</td>
<td>Leeds General Infirmary</td>
</tr>
<tr>
<td>Chelsea &amp; Westminster Hospital</td>
<td>Leicester Royal Infirmary</td>
</tr>
<tr>
<td>Cheltenham General Hospital</td>
<td>Leighton Hospital</td>
</tr>
<tr>
<td>Chesterfield Royal Hospital</td>
<td>Lincoln County Hospital</td>
</tr>
<tr>
<td>Chorley and South Ribble Hospital</td>
<td>Lister Hospital</td>
</tr>
<tr>
<td>City Hospital (Birmingham)</td>
<td>Luton and Dunstable University Hospital</td>
</tr>
<tr>
<td>Colchester General Hospital</td>
<td>Maidstone District General Hospital</td>
</tr>
<tr>
<td>Conquest Hospital</td>
<td>Manchester Royal Infirmary (Adults)</td>
</tr>
<tr>
<td>Countess of Chester Hospital</td>
<td>Medway Maritime Hospital</td>
</tr>
<tr>
<td>Craigavon Area Hospital</td>
<td>Milton Keynes Hospital</td>
</tr>
<tr>
<td>Croydon University Hospital</td>
<td>Monklands Hospital</td>
</tr>
<tr>
<td>Darent Valley Hospital</td>
<td>Morriston Hospital</td>
</tr>
<tr>
<td>Darlington Memorial Hospital</td>
<td>Musgrove Park Hospital</td>
</tr>
<tr>
<td>Derriford Hospital</td>
<td>New Cross Hospital</td>
</tr>
<tr>
<td>Diana, Princess of Wales Hospital</td>
<td>Newham General Hospital</td>
</tr>
<tr>
<td>Doncaster Royal Infirmary</td>
<td>Noble's Hospital</td>
</tr>
<tr>
<td>Dorset County Hospital</td>
<td>Norfolk &amp; Norwich University Hospital</td>
</tr>
<tr>
<td>Dr Gray's Hospital</td>
<td>North Devon District Hospital</td>
</tr>
<tr>
<td>Ealing Hospital</td>
<td>North Manchester General Hospital</td>
</tr>
<tr>
<td>East Surrey Hospital</td>
<td>Northampton General Hospital</td>
</tr>
<tr>
<td>Eastbourne District General Hospital</td>
<td>Northern General Hospital</td>
</tr>
<tr>
<td>Epsom General Hospital</td>
<td>Northumbria Specialist Emergency Care Hospital</td>
</tr>
<tr>
<td>Fairfield General Hospital</td>
<td>Northwick Park Hospital</td>
</tr>
<tr>
<td>Forth Valley Royal Hospital</td>
<td>Peterborough City Hospital</td>
</tr>
<tr>
<td>Frimley Park Hospital</td>
<td>Pilgrim Hospital</td>
</tr>
<tr>
<td>Furness General Hospital</td>
<td>Pinderfields Hospital</td>
</tr>
<tr>
<td>Hospital Name</td>
<td>Hospital Name</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Poole General Hospital</td>
<td>Princess Alexandra Hospital</td>
</tr>
<tr>
<td>Queen Elizabeth Hospital (Birmingham)</td>
<td>Queen Elizabeth Hospital (Gateshead)</td>
</tr>
<tr>
<td>Queen's Hospital, Romford</td>
<td>Queen's Medical Centre, Nottingham</td>
</tr>
<tr>
<td>Royal Blackburn Hospital</td>
<td>Royal Bolton Hospital</td>
</tr>
<tr>
<td>Royal Devon and Exeter Hospital (Wonford)</td>
<td>Royal Free Hospital</td>
</tr>
<tr>
<td>Royal Oldham Hospital</td>
<td>Royal Preston Hospital</td>
</tr>
<tr>
<td>Royal United Hospital</td>
<td>Royal Victoria Hospital - Belfast</td>
</tr>
<tr>
<td>Sandwell General Hospital</td>
<td>Scarborough General Hospital</td>
</tr>
<tr>
<td>Southampton General Hospital</td>
<td>Southend Hospital</td>
</tr>
<tr>
<td>St Helier Hospital</td>
<td>St James's University Hospital</td>
</tr>
<tr>
<td>Stepping Hill Hospital</td>
<td>Stoke Mandeville Hospital</td>
</tr>
<tr>
<td>The Great Western Hospital</td>
<td>The James Cook University Hospital</td>
</tr>
<tr>
<td>Torbay Hospital</td>
<td>Tunbridge Wells Hospital</td>
</tr>
<tr>
<td>University Hospital of North Durham</td>
<td>University Hospital of North Tees</td>
</tr>
<tr>
<td>Warrington Hospital</td>
<td>Warwick Hospital</td>
</tr>
<tr>
<td>Weston General Hospital</td>
<td>Wexham Park Hospital</td>
</tr>
<tr>
<td>William Harvey Hospital</td>
<td>Withybush General Hospital</td>
</tr>
<tr>
<td>Wythenshawe Hospital</td>
<td>Yeovil District Hospital</td>
</tr>
</tbody>
</table>
Appendix 3: Definitions

Standards definitions

Standard 1
ASA - American Society of Anaesthesiologists Physical Status Classification. 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

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

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.”

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

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>EVIDENCE</th>
</tr>
</thead>
</table>
| 1. Patients undergoing procedural sedation in the ED should have documented evidence of pre-procedural assessment, including: a. ASA grading⁴ b. Prediction of difficulty in airway management⁴ c. Pre-procedural fasting status⁴ | 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 recorded⁴. | 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 sedationist⁴ b. a second doctor, ENP or ANP as proceduralist⁴ 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 |
5. Monitoring during procedural sedation must be documented to have included all of the below:
   a. Non-invasive blood pressure
   b. Pulse oximetry
   c. Capnography
   d. ECG

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

7. For invasive procedures, a Local Safety Standard for Invasive Procedures

-----

Safe sedation practice for healthcare procedures – standards and guidance

• 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.

Safe Sedation of Adults in the Emergency Department 2012 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.

Safe Sedation practice for healthcare procedures – standards and guidance
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.

Safe Sedation of Adults in the Emergency Department 2012 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.
checklist (LocSSIP) or NatSSIP compliant checklist is used.\(^6,7\)

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.

<table>
<thead>
<tr>
<th>8. Following procedural sedation, patients should only be discharged after documented formal assessment of suitability, including all of the below:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Return to baseline level of consciousness(^4)</td>
</tr>
<tr>
<td>b. Vital signs within normal limits for the patient(^4)</td>
</tr>
<tr>
<td>c. Absence of respiratory compromise(^4)</td>
</tr>
<tr>
<td>d. Absence of significant pain and discomfort(^4)</td>
</tr>
<tr>
<td>e. Written advice on discharge for all patients</td>
</tr>
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</table>

Safe Sedation practice for healthcare procedures – standards and guidance

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.

Safe Sedation of Adults in the Emergency Department 2012 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

<table>
<thead>
<tr>
<th>Standard</th>
<th>Patient sample</th>
<th>Calculations</th>
</tr>
</thead>
</table>
| 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**

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<tr>
<th>Related Audit Q</th>
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<th>DATA ITEM NAME</th>
<th>ICD10</th>
<th>SNOMED</th>
<th>DM&amp;D</th>
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**DATA ITEM NAME**

**ICD10**

**SNOMED**

**DM&D**

**UDDA v 3**

**ECDS**

**CDS_Code mapping used for HRG Grouping**

**PbR_Categori y**

**NOTES**

**As per CDS 6.2 Type 010**

**Anaesthesia : local anaesthetic**

**Anaesthesia : entonox**

**Anaesthesia : regional block**

**Anaesthesia : sedation**
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

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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
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. 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. 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’. 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. 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.

Audit

All sedation practice should be audited; individual Emergency Departments should develop audit standards and markers.
Appendix 8 Invasive procedure checklist for EDs

![Invasive procedure checklist for EDs](image-url)

1. Immediately before the procedure (includes 'Sign In')
   - 'Time Out'
     - Confirm Patient Identity
     - Team - allocate roles
   - Procedure
     - Consent?
     - Site marked if required?
     - Correct proforma used?
     - Imaging Reviewed?
     - Equipment confirmed?
     - Monitoring applied?
     - Medication prepared?
     - Airway assessment?
     - Additional Support required?
     - Allergies?
     - Coagulopathy?
     - Blood loss risk?
     - Retained guidewire risk?

2. Procedure:
   - Repeat 'Time Out' if any changes to team or patient

3. After the procedure
   - 'Sign Out'
     - Has the procedure been recorded?
     - Guidewires/swabs/sharps accounted for?
     - Have the specimens been labelled and sent?
     - Any equipment problems?
     - Key concerns for continuing care?
     - Do we need to debrief?

Modified from University Hospitals Bristol NHS Foundation Trust checklist with permission from Dr Redfern

National Safety Standards for Invasive Procedures (NASSIPs)
Appendix 9 Procedural Sedation Checklist

Click here to download the checklist and proforma

Date

Time

Patient name

Date of birth

Suffix label

Hospital number

Planned procedure:

Planned sedation level:

minimal

moderate sedation

depth 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: Normal healthy patient

ASA II: Patient with mild systemic disease

ASA III: Patient with severe systemic disease

ASA IV: Patient with severe systemic disease that is a constant threat to life

ASA V: 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


Consent: sedation

procedure

verbal

written

lacks capacity

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)
<table>
<thead>
<tr>
<th>Procedural Sedation in Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical audit 2017/18</td>
</tr>
<tr>
<td>National Report</td>
</tr>
<tr>
<td>Page 64</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
</tr>
<tr>
<td>Hosp No:</td>
</tr>
<tr>
<td>Affix patient label:</td>
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<table>
<thead>
<tr>
<th>Sedating Practitioner</th>
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<table>
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<tr>
<th>Procedural Assistant</th>
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<table>
<thead>
<tr>
<th>Nursing staff</th>
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</table>

<table>
<thead>
<tr>
<th>Location for procedure</th>
</tr>
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<tbody>
<tr>
<td>Resus Y N Other (details)</td>
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</table>

<table>
<thead>
<tr>
<th>Date:</th>
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<table>
<thead>
<tr>
<th>Time:</th>
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<tr>
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<table>
<thead>
<tr>
<th>Respiratory rate (bpm)</th>
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<table>
<thead>
<tr>
<th>SpO2 %</th>
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<table>
<thead>
<tr>
<th>Oxygen delivered (l/min or)</th>
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<tr>
<th>Blood pressure (mmHg)</th>
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<tbody>
<tr>
<td>240</td>
</tr>
<tr>
<td>230</td>
</tr>
<tr>
<td>220</td>
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<td>210</td>
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<td>200</td>
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<td>190</td>
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<td>180</td>
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<td>170</td>
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<td>120</td>
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<td>100</td>
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<td>70</td>
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<td>50</td>
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<td>40</td>
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</table>

<table>
<thead>
<tr>
<th>Heart rate (bpm)</th>
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</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drugs Units</th>
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</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capnography used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of sedation achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>minimal sedation</td>
</tr>
<tr>
<td>moderate sedation</td>
</tr>
<tr>
<td>deep sedation</td>
</tr>
<tr>
<td>dissociative sedation</td>
</tr>
<tr>
<td>anaesthesia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interventions needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
</tr>
<tr>
<td>hypotension rx</td>
</tr>
<tr>
<td>BMV</td>
</tr>
<tr>
<td>LMA</td>
</tr>
<tr>
<td>ETT</td>
</tr>
<tr>
<td>reversal agent</td>
</tr>
<tr>
<td>other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adverse events</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
</tr>
<tr>
<td>hypoxia</td>
</tr>
<tr>
<td>hypotension</td>
</tr>
<tr>
<td>adverse reaction</td>
</tr>
<tr>
<td>vomiting</td>
</tr>
<tr>
<td>cardiac arrest</td>
</tr>
<tr>
<td>aspiration</td>
</tr>
<tr>
<td>death</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedure Successful</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
</tr>
<tr>
<td>no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discharge Advice given</th>
</tr>
</thead>
<tbody>
<tr>
<td>verbal</td>
</tr>
<tr>
<td>written</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient satisfaction with procedure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>/10</td>
</tr>
</tbody>
</table>

Sedating Practitioner signature:
### Appendix 10: World SIVA adverse sedation event reporting tool

#### 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) associated with this sedation encounter.

<table>
<thead>
<tr>
<th>Minimal risk description</th>
<th>Moderate risk description</th>
<th>Sentinel risk description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vomiting / Retching</td>
<td>Oxygen desaturation (75-90%) for &lt;60 s</td>
<td>Oxygen desaturation, severe (&lt;70% at any time) or prolonged (&lt;50% for &gt;60 s)</td>
</tr>
<tr>
<td>Subclinical respiratory depression*</td>
<td>Apnoea, not prolonged</td>
<td>Apnoea, prolonged (&gt;60 s)</td>
</tr>
<tr>
<td>Airway obstruction</td>
<td>Airway obstruction</td>
<td>Airway obstruction</td>
</tr>
<tr>
<td>Muscle rigidity, myoclonus</td>
<td>Apnoea, not prolonged</td>
<td>Apnoea, prolonged (&gt;60 s)</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>Tachycardia</td>
<td>Tachycardia</td>
</tr>
<tr>
<td>Hypotension</td>
<td>Hypotension</td>
<td>Hypotension + bradycardia</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Hypertension + bradycardia</td>
<td>Hypertension + bradycardia</td>
</tr>
<tr>
<td>Seizure</td>
<td>Seizure</td>
<td>Seizure</td>
</tr>
</tbody>
</table>

#### Step 3: Please note the interventions performed to treat the adverse event(s).

<table>
<thead>
<tr>
<th>Minimal risk</th>
<th>Moderate risk</th>
<th>Sentinel risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>No intervention performed</td>
<td>Airway repositioning</td>
<td>Chest compressions</td>
</tr>
<tr>
<td>Administration of:</td>
<td>Bag valve mask-assisted ventilation</td>
<td>Tracheal intubation</td>
</tr>
<tr>
<td>Additional sedatives(s)</td>
<td>Laryngeal mask</td>
<td>intubation or the administration of:</td>
</tr>
<tr>
<td>Antianxiety</td>
<td>Oral/Intra oral</td>
<td>Neuromuscular block</td>
</tr>
<tr>
<td>Antihistaminos</td>
<td>CPAP</td>
<td>Neuroleptic agents</td>
</tr>
<tr>
<td>Antialgoues</td>
<td>Racial agents</td>
<td>Rapid i.v. fluids</td>
</tr>
<tr>
<td>Anticonvulsant i.v.</td>
<td>Anticonvulsant i.v</td>
<td>Anticonvulsant i.v</td>
</tr>
</tbody>
</table>

#### Step 4: Please note the outcome of the adverse event(s).

<table>
<thead>
<tr>
<th>Minimal risk outcome</th>
<th>Moderate risk outcome</th>
<th>Sentinel outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>No adverse outcome</td>
<td>Unplanned hospitalisation</td>
<td>Death</td>
</tr>
<tr>
<td></td>
<td>or escalation of care*</td>
<td>Permanent neurological deficit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pulmonary aspiration syndrome</td>
</tr>
</tbody>
</table>

#### Step 5: Assign a severity rating to the adverse event(s) associated with this sedation encounter.
- If any options checked in the Sentinel columns above, this is a Sentinel adverse event.
- If the most serious option(s) checked above are Moderate risk, then this is a Moderate* risk adverse event.
- If the most serious option(s) checked above are Minor risk, then this is a Minor* risk adverse event.
- If the most serious option(s) checked above are Minimal risk, then this is a Minimal* risk adverse event.

Additional details (including 'other' entries):

- a. "Subclinical respiratory depression*" is defined as agnostic abnormality 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 manually perform the procedure.
- f. Alteration in vital 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
3. NICE. Clinical Guidelines [CG112]: Sedation in children and young people 2010; RCEM Summary of NICE CG112 June 2012
5. RCoA and RCEM. Safe sedation of adults in the emergency department 2012
7. RCEM. Invasive procedure checklist for EDs 2016
8. ASA. Physical Status Classification System 2014