Safe Anaesthesia Liaison Group

PATIENT SAFETY UPDATE

Including the summary of reported incidents relating to anaesthesia

1 JANUARY 2012 TO 30 MARCH 2012

THIS DOCUMENT AIMS TO ACHIEVE THE FOLLOWING:

➤ Outline the data received, the severity of reported patient harm and the timing and source of reports.
➤ Provide feedback to reporters and encourage further reports.
➤ Provide vignettes for clinicians to use to support learning in their own Trusts and Boards.
➤ Provide expert comments on reported issues.
➤ Encourage staff to contact SALG in order to share their own learning on any of the incidents mentioned below.

MORBIDITY AND MORTALITY MEETINGS

The SALG Patient Safety Updates contain important learning from incidents reported to the National Reporting and Learning System (NRLS). The Royal College of Anaesthetists (RCoA) and the Association of Anaesthetists of Great Britain and Ireland (AAGBI) would like to bring these Safety Updates to the attention of as many anaesthetists and their teams as possible. We would like to encourage you to add this Update to the agenda of your next morbidity and mortality meeting and we would also like to hear your feedback on learning points.

Feedback from M&M meetings on how the Patient Safety Update has informed action can be sent to the SALG administrator at salg@rcoa.ac.uk.

SUMMARY

A total of 3,188 anaesthesia-related incidents were reported during the specified time period. 69% of cases were reported as ‘near miss’ (harm was prevented from reaching the patient), and 7.5% resulted in moderate or severe harm or death (10 deaths reported) (Figure 1).

65 incidents were reported using the anaesthetic eForm; 40% of these incidents were reported to the National Patient Safety Agency (NPSA) within one day of occurrence. 3,123 incidents were reported using Local Risk Management Systems (LRMS); 0.6% of these incidents were reported within one day and 48% were reported more than 30 days after they had occurred (Figure 2).

All incidents graded as death or severe harm were reviewed by the National Patient Safety Agency (NPSA) and if identified as having potential cause for concern, were reviewed by consultant anaesthetists from the RCoA or AAGBI. This review was carried out in accordance with the NPSA’s data sharing protocol (no information about the Trust is disclosed; only information about the incident). Most incidents were reported by consultant anaesthetists, but the eForm is available to all members of the peri-operative team.

As with any voluntary reporting system, interpretation of data should be undertaken with caution as the data are subject to bias. Many incidents are not reported, and those that are reported may be incomplete having been reported immediately and before the patient outcome is known. Clarity of ‘degree of harm’ to patients who experience a patient safety incident is an important aspect of data quality.
ANAESTHETIC eFORM

The anaesthetic eForm was designed to allow specific clinical information relating to anaesthetic incidents to be reported by anaesthetists and other members of the anaesthetic team and can be found at: https://www.eforms.npsa.nhs.uk/asbreport.

The NPSA will be closing in 2012 as a result of the Arms Length Bodies review in 2010. Responsibility for the NRLS has moved to the NHS Commissioning Board and operational management of the NRLS has moved to Imperial College Healthcare Trust. SALG would like to encourage you to continue to use the eForm (or your local reporting systems), and we would like to reinforce the importance of continuing to report patient safety incidents during the transition period so that trends and incidents can be acted upon and learning maximised. The eForm is particularly useful as it provides a mechanism by which high quality information can be rapidly reported by members of the anaesthesia team and disseminated nationally.

DEGREE OF HARM (ACTUAL INCIDENTS)

Figure 1 shows the degree of harm incurred by patients within the anaesthetic specialty during the period 1 January to 31 March 2012. All ten deaths were reported though LRMS, rather than the anaesthetic eForm.

Figure 1
Reported degree of harm

<table>
<thead>
<tr>
<th>Degree of Harm</th>
<th>Number of Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Harm</td>
<td>2,226</td>
</tr>
<tr>
<td>Low</td>
<td>723</td>
</tr>
<tr>
<td>Moderate</td>
<td>204</td>
</tr>
<tr>
<td>Severe</td>
<td>25</td>
</tr>
<tr>
<td>Death</td>
<td>10</td>
</tr>
</tbody>
</table>

TIMELINESS OF REPORTING

Figure 2 shows the time taken to report incidents via the anaesthetic eForm (directly received into the NRLS) and via LRMS (uploaded to the NRLS periodically via local systems) during the period 1 January to 31 March 2012.

Figure 2
Reporting timeliness of anaesthetic incidents

<table>
<thead>
<tr>
<th>Time taken to report an incident</th>
<th>Percentage of reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within same day</td>
<td>0%</td>
</tr>
<tr>
<td>By next day</td>
<td>0%</td>
</tr>
<tr>
<td>Within one week</td>
<td>20%</td>
</tr>
<tr>
<td>Within one month</td>
<td>30%</td>
</tr>
<tr>
<td>More than one month</td>
<td>50%</td>
</tr>
</tbody>
</table>

No Harm | Low | Moderate | Severe | Death | Reporting timeliness (local risk management system) | Reporting timeliness (eForm)
INCIDENT TYPE

Figure 3 shows the type of incidents that occurred within the anaesthetic specialty that were reported using LRMS or the anaesthetic eForm for the period 1 January to 31 March 2012. The categories were determined at local level.

Figure 3
Type of incident reported

SUMMARISED EXAMPLES OF REPORTED INCIDENTS – MEDICATION ERRORS

Medication errors are common in all areas of clinical practice, and have been estimated to occur in around 1:133 anaesthetics. Medication errors are the second most common category of incident reported to the NPSA and many more are likely to remain unreported. Many medication errors do not result in patient harm, but some can have devastating effects, as can be seen in one of the reports this quarter.

Anaesthetists are unusual in that they are responsible for prescribing, dispensing and administering potent drugs, often in rapid succession, whilst monitoring the patient in the complex environment of the operating theatre. The NPSA has issued guidance to reduce medication errors, including a feasibility study exploring the double-checking of anaesthetic drugs. Many errors could be avoided if guidance was better implemented.

Common medication errors in anaesthesia include drug swaps (thiopentone in place of antibiotics, suxamethonium in place of fentanyl or syntocinon); duplication of drugs or errors of drug dosage, particularly opioids or paracetamol in children; and problems with TIVA. Many examples have been described in previous Patient Safety Updates. Further examples of medication errors are described below.
Residual anaesthetic drugs in IV lines have devastating consequences

➤ Patient had appendicectomy. On returning to the ward had IV with short extension flushed with saline. Shortly after had a cardiac arrest... thought that residual muscle relaxant in the line caused a respiratory arrest followed by a cardiac arrest.

The NRLS continues to receive reports of severe harm due to anaesthetic drugs remaining in IV lines, particularly in children. A Signal Alert was published to highlight this concern. The NPSA states: ‘Good practice suggests that after intravenous administration, the anaesthetist should ensure that the cannulae have been flushed through to remove any residual anaesthetic drug before children are returned to recovery wards or wards where they may be given further fluids, antibiotics or pain relief intravenously.’

Take care with charting

➤ Relieved colleague for a break. Patient showed signs of requiring further analgesia. I could not see any evidence that the patient had received paracetamol (not on drug chart/anaesthetic chart and no empty bottle visible) so I administered a dose of paracetamol. Colleague returned... revealed that a dose had already been given.

➤ Repeat dose of antibiotics given (patient record not checked).

➤ Patient had revision hip surgery. PCEA in situ (epidural fentanyl and bupivacaine). Also started on ‘enhanced recovery’ drugs by team previous night, so had MST 10mg first post-op morning as well as the PCEA. (MST omitted by nurses previous night). Reported as slightly drowsy in the morning. Confusion about prescription of systemic and epidural opioids; contributing factor – training, induction of new staff and documentation.

Document all drugs administered consistently, accurately and contemporaneously. Check the patient record before drugs are administered. Automated methods of recording and administering drugs may improve the accuracy and legibility of anaesthetic records in future. Ensure all new staff are aware of local treatment protocols.

Identify latent errors in the anaesthesia environment, do not tolerate safety violations; avoid distractions

➤ I administered two incremental doses of morphine in place of the intended drug atracurium... no consequences because I had intended to administer the morphine at some point anyway... Contributing factors: distraction as had medical student to teach, failure to label syringe and failure to check...

➤ I had a CT1 anaesthetist with me who was preparing drugs... we were talking while this was going on and in the process a syringe was wrongly labelled.

➤ Took a box of ephedrine from drug cupboard... was just about to draw up drug when I noticed that it was adrenaline 1mg (epinephrine) and not ephedrine 30mg. There were two more ampoules of adrenaline in the ephedrine box.

➤ Patient being set up for sitting craniotomy prior to knife to skin. Colleague had been using CVP to give boluses of metaraminol (their preferred method). The metaraminol syringe (labelled) was left attached to CVP line. Colleague asked me to inject a bolus of saline into the CVP line so that we could check Doppler signal. I injected the contents of the syringe into the patient (7.5mg metaraminol). I noticed the blood pressure rising, looked at the syringe and realised what I had done. I alerted the team... aspirated the line and treated (increased depth of anaesthesia and labetalol). The maximum BP was 200/135 and the max HR was 120 sinus rhythm. The effects of the metaraminol bolus lasted about 15 minutes. Young, fit patient – no harm caused.

All drugs should be clearly labelled; the label on both ampoule and syringe should be read carefully before the drug is drawn up or injected. Ideally drugs should be drawn up and labelled by the anaesthetist who administers them.

The workspace should be kept tidy, unused medications disposed of and unused ampoules should not be mixed or replaced in boxes. Keep hazardous drugs separate. Minimise distraction during the preparation and administration of drugs.
Be aware of fixation errors

➤ Anaesthetic equipment checked by both the anaesthetic nurse and the anaesthetist... included checking both the sevoflurane and desflurane vaporisers and checking the anaesthetic machine and vaporisers for leaks (GE Aespire, Datex Ohmeda monitoring, Drager D vaporiser). Patient anaesthetised and transferred to the operating theatre... desflurane set to 7% and fresh gas flow set to less than 1 litre.min⁻¹. Gas analyser did not detect any desflurane being delivered; correct functioning of the gas analyser queried, and reset. Repeated attempts made to reset the analyser. Water trap changed. Fresh gas flows and desflurane increased. Requested further assistance and a consultant colleague and experienced operating department practitioner attended. Patient’s blood pressure was noted to be higher than would be expected but there was no tachycardia (patient taking beta-blockers). New gas analyser brought to the theatre; at the same time surgery ended. New analyser also did not detect any desflurane; sevoflurane administered. When the anaesthetist examined the desflurane vaporiser it was found not to be locked onto the back bar of the anaesthetic machine. The patient recovery was uneventful but at follow up it became apparent that the patient did have recall. Both the consultant anaesthetists who were involved assumed that if the vaporiser could be turned on it must be locked onto the back bar of the anaesthetic machine; it was this assumption that led them to concentrate on the gas analyser as being the cause of the problem.

Be aware of fixation errors and confirmation bias during an anaesthetic crisis. Do not ignore conflicting information; take time out to reassess the situation if appropriate.

Incident reporting is fundamental to improving medication safety. Reports to the NRLS form the basis of Signal Alerts that describe emerging safety issues and Patient Safety Alerts that are cascaded to the NHS in England and Wales.

In summary, it is essential to consider the contribution of human factors and system errors in order to improve medication safety for our patients. Evidence-based strategies have been published to improve the safety environment and reduce drug administration errors during anaesthesia. It would be useful for individual clinicians and departments of anaesthesia to consider these interventions and how they can be applied to their own work environment:

➤ Read the label carefully on the drug ampoule and syringe before drawing up the drug. (Labels on ampoules and syringes should be legible).
➤ Syringes should be labelled.
➤ The drug drawers and workspace should be organised and tidy; similar or dangerous drugs should be separated, or removed if possible.
➤ Labels may be checked by a second person before a drug is drawn up or administered.
➤ Drug errors should be reported and reviewed.
➤ A pharmacist should be appointed to the operating theatre, and changes in drug presentation notified ahead of time.
➤ Similar packaging and presentation should be avoided where possible.
➤ Drugs should be presented in prefilled syringes where possible.
➤ Drugs should be drawn up and labelled by the anaesthetist who will administer them.
➤ Drugs should be colour coded by class, according to national or international standards.
➤ Coding by syringe position, size or needle on the syringe could be used.

A CRITICAL INCIDENT INVOLVING TAP BLOCKS

An anaesthetist contacted SALG directly to highlight a concern about a possible serious complication of TAP block that has not been reported before. Simultaneously, the case had been reported to NRLS and, as a result of the NPSA’s usual process for incidents of this severity, 15 similar incidents had been found. The initial report was:
A man underwent laparoscopic sigmoid colectomy. The operation had to be converted to an open procedure. At the end of the operation bilateral TAP blocks were performed while anaesthetised, consent having previously been given. The TAP blocks were repeated a further three times on the ward over the next two days as PCA alone was inadequate. The patient developed signs of severe sepsis. He had a further laparotomy that did not reveal a source for the sepsis, however some turbid fluid was found and a loop ileostomy was raised. Spreading erythema was noted on the left flank and a clinical diagnosis of necrotising fasciitis was made (but not confirmed by pathology). He underwent an extensive debridement of this tissue.

There was concern at the possibility that TAP blocks had either introduced infection or had pierced the peritoneum and seeded infected fluid into the skin. There is no evidence that aseptic technique was inadequate or that these blocks had punctured the bowel or peritoneum. The blocks were all done using the landmark method.

The other related incidents, that had been found during the NPSA’s search, did not include any graded as severe harm or death. Examples of other problems reported relating to TAP block include inadequate pain relief after wearing off, inability to perform TAP blocks because of lack of equipment and wrong side block. TAP block is a relatively new procedure with relatively few reported complications in the literature.

The introduction of new procedures into clinical practice may have unintended consequences. Policy should be in place to ensure that new procedures are undertaken with an appropriate level of monitoring.

OAA AND SALG EVALUATIONS OF NEURAXIAL CONNECTORS

In partnership with the Obstetric Anaesthetists’ Association, SALG advocate local evaluation of new neuraxial devices introduced following the NPSA Alert. A form for this is downloadable from the OAA website. Data from local evaluations is requested for large scale analysis by the SALG Data Analysis Group. This analysis will take place when a significant body of data has been collected.

Now, we are also requesting that reports of incidents arising from use of the new equipment are submitted for analysis and sharing. A specific form to capture these incidents is available to download from the OAA website. Completed forms should be returned to spinal@rcoa.ac.uk. Any comments or queries on the topic are also welcomed to this email address.

TRACHEOSTOMY SAFETY PROJECT

SALG would like to advocate the Resuscitation Council’s National Tracheostomy Safety Project and in particular, the algorithms ‘Patent Upper Airway’ and ‘Laryngectomy’. Please share these with your colleagues and consider displaying them in your work area.

References and further reading
1 Webster CS et al. The frequency and nature of drug administration error during anaesthesia. Anesth Int Care 2001;29:494–500.