Safe Anaesthesia Liaison Group

PATIENT SAFETY UPDATE

Including the summary of reported incidents relating to anaesthesia

01 APRIL 2014 TO 30 JUNE 2014

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.

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 (M&M) 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.

ON THE SALG AGENDA

SALG Patient Safety Conference

The date for the 2014 SALG Patient Safety Conference has been confirmed as Wednesday 1 October 2014. This year the event will be held in Belfast at the Belfast Waterfront Conference Centre. To book your place please visit the College website.

SALG Survey working group

The SALG core members voted for the following topics to be the top three priorities for the survey working group to consider: Morbidity and Mortality meetings, the WHO Surgical Safety Checklist, and double-checking of drugs. The group is currently being formed.

Risk of inadvertently cutting in-line (or closed) suction catheters

NHS England issued an alert1 on 17 July on the risk of inadvertently cutting in-line (closed) suction catheters. The alert follows a recent incident where an in-line (or closed) suction catheter was left in the endotracheal tube (ET tube) by mistake. When the ET tube was cut, the suction catheter was also cut and the tip remained in the ET tube. The incident was not noticed for several days and during this time the tip of the suction catheter migrated into the patient’s main airway. The tip was identified on a chest X-ray and subsequently removed by bronchoscopy.

**Intravenous Dantrolene**

SALG sent an alert to Safety Network members in July from the manufacturers of intravenous dantrolene (Dantrium IV). The alert aimed to raise awareness of a manufacturing issue in which undissolved dantrolene sodium crystals were seen following reconstitution of the product. The MHRA required the licence-holder to contact all anaesthetists to inform them of the problem, and have issued a ‘Drug Safety Update’. The licence-holder will supply a filter needle with new stock of the product, along with leaflets and stickers directing clinicians on their use. Existing stock is unaffected and does not require filtering. Filtration will not affect efficacy, and intravenous dantrolene should be administered as currently recommended following filtration.

**Joint NRLS and MHRA reporting portal for device incidents**

MHRA and NHS England are in the process of undertaking an initiative to simplify adverse incident reporting and increase the quality of reports. The latest update was issued in March 2014 and stated:

> “MHRA and NHS England have jointly issued two patient safety alerts and supporting guidance to help simplify reporting, and to help healthcare providers increase incident-reporting involving medication errors and medical devices. This work is the result of extensive stakeholder engagement, and aims to increase the quantity and quality of adverse incident reports to both organisations. It will also enable us to provide effective and regular feedback to healthcare providers in order to promote patient safety.”

The eventual aim is to have a single portal for reporting. This will complement the introduction of Medical Device and Medicines Safety Officers into NHS hospital trusts.

   www.mhra.gov.uk/NewsCentre/CON395245

**LEARNING POINTS FROM REPORTED INCIDENTS**

Making use of cognitive aids and standard operating procedures in anaesthesia: wrong-side blocks, retained swabs and syringe labelling and checking.

➤ Right-side femoral block given instead of left-side.

➤ The patient was a prolonged weaner from mechanical ventilation… successfully weaned and decannulated. Over 48 hours developed a collapsed/consolidated left lung requiring re-intubating for a bronchoscopy. At bronchoscopy it was noted that a tube-like structure was present from the mid-trachea, passing through the left main bronchus into the left lower lobe ... the ENT surgeons performed a rigid bronchoscopy to remove the object. This turned out to be a trach swab that is used on ITU for cleaning the inner tubes of tracheostomies.

➤ Chest X-ray showed the guide-wire to be in a position through right internal jugular vein.

➤ Critically ill patient on intensive care… haemodynamically unstable and required repeated boluses of metaraminol. Each bolus of metaraminol was flushed with saline. The saline syringe was stored in a blue tray used for the administration of medications. The syringe used for inflating the endotracheal tube cuff was not labelled and somehow landed in the blue tray for the administration of medications and was mistaken for the saline syringe. A further dose of metaraminol was given and flushed with the syringe thought to have saline in, but once given, the consultant realised it was the syringe used to inflate the endotracheal tube cuff.

A survey conducted by a group of anaesthetists in England and presented at the 32nd Annual European Society of Regional Anaesthesia and Pain Therapy Congress in 2013 suggests that almost one-third of the 244 respondents had been involved in wrong-sided nerve blocks. The authors noted that the incidence may be greater than the 1 in 3765 reported by Cohen et al, with under-reporting remaining an issue. SALG recommends the use of the cognitive aid, Stop before You Block (SBYB). The tool can be accessed via the AAGBI and RCoA websites. Jenkins describes the supporting evidence for use of cognitive aids in anaesthesia practice.
NHS England, via the Surgical Services Patient Safety Expert Group, commissioned a ‘Never Events Task Force’ to examine and clarify the reasons why Surgical Never Events persist. The report was published in February 2014, and the recommendations covered three main themes: standardisation, education and harmonisation. As a direct outcome from the report, the College of Operating Department Practitioners (CODP) was commissioned to scope the development of ‘core generic processes for conducting surgical procedures in operating environments wherever they are located’. NHS England has now established a reference group to take forward the development of the national standards and implementation of the wider recommendations in the report. The standards are currently scheduled for completion in January 2015.

Local initiatives about how to prevent guide wire retention would be welcomed by SALG – perhaps there is a simple aid already out there waiting to be shared.

Critical events in ICU can be particularly stressful. It is well accepted that stress may be associated with a change in cognition and behaviour. These may in turn result in reduced performance and mistakes in sequential procedures; more simply, we make mistakes. All syringes should be labelled, and guidance on labelling is available on the AAGBI and RCoA websites. The National Patient Safety Agency (NPSA) published a guide on the safer use of injectable drugs in 2007.

1 Lie, J. A questionnaire on the prevention of wrong-sided nerve block in the North Western Deanery. ESRA Academy. September 2013; 33220.

**Residual anaesthetic drugs in cannulae and intravenous lines**

- **First use of octopus extension post GA on ward. Patient had difficulty swallowing and talking. No apnoea.** Responded to oxygen via facemask. Possible residual atracurium in other limb of Y connector refluxed on flushing post GA. Documented flush of one lumen of line post agents on anaesthetic chart. Patient made full recovery.

- **Patient who had received neuromuscular blockade for genitourinary procedure. LMA removed prior to recovery; stable and talking in recovery. Drip turned on. Patient had respiratory arrest. Airway controlled, patient ventilated. Evidence of fade on nerve stimulator. Re-curarisation. Patient has memory of not being able to breathe. Muscle relaxant still in drip line.**

Octopus extension sets do not contain anti-reflux valves; the above report suggests that atracurium may have tracked back into the second (unflushed) lumen. NHS England released a patient safety alert in April 2014 which can be accessed on the NHS England website. Some centres have moved to include a check that all vascular access and lines have been flushed with saline prior to leaving theatre in the sign-out part of the safety brief; it’s quick and easy and potentially saves lives. Bowman’s editorial describes the root cause and identifies some of the contributing factors in such events, and suggests approaches to minimise the risk. Oglesby et al developed their eye-catching safety posters in direct response to a residual-drug-in-cannula critical incident; the posters are available for use locally by contacting the authors directly or via SALG.

Airway fires

➤ The patient had a right upper lobectomy for ca… subsequently had a bare metal stent placed in the bronchus intermedius… granulation tissue had encroached into the stent causing almost total occlusion of the stent. The surgeon was administering diathermy to the granulation tissue using a flexible bronchoscope passed through a rigid scope to direct a diathermy probe. After approx 40min of operating, a flash was noted on the flexible bronchoscope monitor, followed by a second flash. The flexible bronchoscope was taken out and saline immediately flushed down the rigid bronchoscope. The distal 1.5cm or so of the diathermy probe and the flexible bronchoscope showed signs of severe fire damage. Subsequent inspection of the airway showed fire debris and scorching of the bronchus intermedius. The patient emerged from anaesthesia uneventfully, with no breathing difficulty, but was placed in a HDU for closer monitoring. The following day the patient had a collapsed right lung… returned to theatre and removed a quantity of sloughing mucosa that was occluding the stent… returned to theatre again on the second post operative day for inspection but no further intervention was required. The patient appears to have sustained no lasting damage.

The risk of airway fire is well documented in laser and electrocautery procedures in ENT surgery where the ignition source (laser, electric current) in the presence of oxygen in a concentration >21% +/- nitrous oxide will reduce the temperature at which any fuel may catch fire. Nitrous oxide should be avoided, the FiO2 should be 0.21 and a 50ml syringe prefilled with saline should be at hand. Staff are required to think and act quickly in the event of an airway fire, and theatre-teams should practice simulated emergency situations to prepare for these alarming life-threatening events.1


Hip fracture surgery, cardiovascular collapse and bone cement implantation syndrome

➤ A 96 year old patient came into theatre to undergo a left hip hemiarthroplasty. An incident occurred in the anaesthetic room where the patient deteriorated. The surgery proceeded on with the patient’s state. The patient deteriorated some more and passed away on the theatre table shortly after the cement was inserted.

➤ 91 year old patient, for a revision of her periprosthetic femoral fracture, ASA 3, known to be complicated surgery. Mentally alert, happy for surgery to proceed. DNR CPR discussed and form signed with patient and her daughter and son prior to surgery. GA with femoral nerve block given, arterial line and cardiac output monitoring done. Patient very stable until the surgeon inserted the cement. Blood pressure and oxygen saturations dropped to unrecordable values for about 10 minutes.

➤ Shortly after cementing the hemiarthroplasty in place (to treat hip fracture) the patient became tachycardic.

Mortality in elderly hip-fracture patients was noted in the December 2013 issue of the PSU. Since then the National Hip Fracture Database has published its Anaesthesia sprint audit of practice (ASAP)1, available on the AAGBI and HQIP websites. This audit suggests that there may be a group of patients susceptible to cardiovascular collapse at the time of femoral canal instrumentation/cement insertion. The British Orthopaedic Association (BOA) has posted a response2 to the recent BMJOpen publication on bone cement implantation syndrome (BCIS). In their study, Rutter et al3 interrogated the National Reporting and Learning System database for cases of severe acute deterioration in association with cement and hemiarthroplasty. The group conclude that BCIS is identified as a cause of death or severe harm in 1 in 2900, cases and suggests that there is incomplete adoption of the published best practice measures to mitigate the risk (identify at-risk patients, maintain normovolaemia, extra vigilance at time of cement implantation, pressurised lavage of the femoral canal, pressure-vent catheter, retrograde cement insertion using a cement gun and good communication). The BOA stress that some patients may suffer harm at the time of femoral instrumentation/cement insertion, but that the use of cemented hemiarthroplasty is associated with clinical advantage and reduced 30-day mortality. Management of bone cement implantation syndrome is covered in a Continuing Education in Anaesthesia, Critical Care and Pain article4.
Tracheostomy care

- During planned surgical tracheostomy of an ITU patient the airway was lost at the changeover of the endotracheal tube (ETT) to a tracheostomy tube. The ENT registrar asked for the ETT to be withdrawn but was unable to insert the tracheostomy tube at initial attempts and the patient rapidly desaturated to SpO\textsubscript{2} 40%. Attempts at re-inserting the ETT by the anaesthetic senior registrar were unsuccessful. As soon as the ENT registrar was able to insert the tracheostomy tube, and allow ventilation, CPR had to be commenced to support cardiac output (BP 40/20). When the tracheostomy tube was successfully inserted and we were able to ventilate end-tidal CO\textsubscript{2} was obtained but a low level (approx. 1 KPa).

There are regular reports to the NRLS of patient safety incidents involving tracheostomies. NAP4\textsuperscript{1} identified tracheostomy care as an area for review and development in anaesthesia and ICM. The National Tracheostomy Safety Project (NTSP), part of the Global Tracheostomy Collaboration, aims to improve the management of patients with tracheostomies. They are working with other organisations to develop a national tracheostomy safety resource. Their website contains helpful emergency algorithms and elearning opportunities.

The National Confidential Enquiry into Patient Outcome and Death have published the report of the Healthcare Quality Improvement Partnership supported review of quality of care provided to patients who undergo tracheotomy\textsuperscript{2}. The report describes current care, and makes recommendations on the organisation of care, tube insertion and care, multidisciplinary care, complications and adverse events and outcomes.

Serious complications of routine procedures – central venous catheters, epidurals and spinals

- Received post mortem report for patient who died. Suggest cause of death was haemothorax as a complication of central line. Likely to be erosion of tip.
- Very poorly patient who was on 18ml/hr of quadruple strength noradrenaline, via a right sided internal jugular CVP line. On rolling the patient the line came out. It was found to have not been sutured into place.
- Patient underwent laparotomy for treatment of perforated duodenal ulcer... Multiple co-morbidities and was unwell. A central venous catheter was inserted in theatre for monitoring and drug administration in right side of neck…. took longer than normal to wake up... extubated at the end of surgery and transferred to ICU for further care. She deteriorated and soon intubated in ICU. Nurse spotted central line showing high pressure on transduced line... blood gas from the central line catheter that established catheter to be in carotid artery.
- This incident was reported by a member of staff... as a result of further investigation by the coroner it has been necessary to report it again. During the investigation of the patient death it was found that a central venous catheter had pierced through a part of the heart wall, leading to death. As a matter of caution and concern it is necessary to report this as equipment failure. Concern that the CVC failed to operate correctly during insertion and punctured the heart wall.
- Patient had elective R TKR under GA + spinal anaesthesia... 3 days post op I was informed by the surgeon that patient had still reduced sensation and minimal motor function in operated leg but the surgeon wasn’t
initially too concerned as there had been some progress. On examination, I found that patient had normal sensation and movement in her R foot and ankle but reduced sensation and almost no movement in R knee. Bladder and bowel function normal. Concerned about nerve injury after spinal anaesthesia.

The January–March 2013 PSU featured NG tube placement and the July–September 2013 PSU featured complications of central lines and neuraxial blocks associated with severe morbidity and mortality. The use of standardised procedures and robust monitoring protocols cannot be over-emphasised.

The timely identification of neurological deficits occurring in association with neuraxial blockade provides the best chance for good patient outcome. Unexplained motor block after a regional technique should prompt immediate action; NAP3\(^2\) identified organisational deficiencies and delays as a cause of avoidable harm.


**Patient transfers – planning prevents poor performance**

➤ This patient was transferred to attend Vascular Imaging Unit due to a gastrointestinal bleed. The Patient came to the Critical Care Department post procedure. It was brought to my attention that the patient was transferred in an ambulance with a qualified nurse who had no experience of acute patient transfers without a medical escort present. During the transfer it is documented that the patient’s primary blood pressure observation was 77 systolic 51 diastolic then further reduced to a systolic blood pressure of 62. The patient then received 100ml saline only.

Choosing the most appropriate member of staff to undertake the transfer of the critically unwell or the potentially critical unwell patient can be extremely demanding, and even more so when resources are tight. The AAGBI guideline Interhospital Transfer\(^1\) and the Intensive Care Society Transport of the Critically Ill Adult\(^2\) are valuable resources in the provision of safe transfer services.


**Patient positioning**

➤ Patient proned on the CT scanner table to allow for interventional procedure. Arms brought up over the head to facilitate entry into the scanner. Pressure points padded and eyes closed and taped. Procedure lasted 2.5 hours. Patient extubated and taken to recovery. Later that evening reported weakness in both arms.

➤ Patient woke up from prolonged urological procedure complaining of right leg pain. Despite continuing pain compartment syndrome was missed, despite a review by the on-call orthopaedic junior doctor who felt this was cellulitis. The patient has lost the entire compartment of the right lower leg.

Patient positioning during surgery is a well-recognised source of morbidity. Anticipation is paramount in avoiding the morbidity in the first place, whilst recognition ensures prompt and correct treatment. Positioning is reviewed in the RCoA Continuing Education publication.\(^1\) Key points to consider are: communication, skilled staff in adequate numbers, and anticipation of changes in physiology with different patient position and checking and securing equipment after position change.

APPENDIX: INCIDENT DATA SUMMARY

A total of 7463 anaesthesia-related incidents were reported during the specified time period. 20 incidents were reported using the anaesthetic eForm; seven (35%) of these incidents were reported to the National Reporting and Learning System (NRLS) within one day of occurrence. 13 (65%) of the incidents reported to the eForm were reported as ‘near miss’ (harm was prevented from reaching the patient). 7443 incidents were reported using Local Risk Management Systems (LRMS); 26 (0.3%) of these incidents were reported within one day and 3416 (46%) were reported more than 30 days after they had occurred. Of the incidents reported via LRMS, 884 (12%) were reported as near miss.

All incidents reported via the eForm, and all those reported to the LRMS graded as ‘death’ or ‘severe harm’, were reviewed by the Patient Safety Team, now part of the Patient Safety Function within NHS England (formerly the NHS Commissioning Board). Consultant anaesthetists from the RCoA or AAGBI reviewed incidents identified as having potential cause for concern. No information about the trusts was disclosed in this review; only information about the incident. Most incidents reported via the eForm were completed by consultant anaesthetists, although the eForm is available to all members of the perioperative 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: www.eforms.nrls.nhs.uk/asbreport.

The RCoA and AAGBI continue to work with the NRLS team at Imperial and the patient safety function of NHS England. SALG would like to emphasise that processes for sharing and learning incidents remain firmly in place. Staff are urged to continue to use the eForm (or your local reporting systems) to report patient safety incidents 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 reported rapidly 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 April 2014 to 30 June 2014. 18 deaths were reported though LRMS and 1 via the anaesthetic eForm.

INCIDENT TYPE

Figure 2 shows the type of incidents that occurred within the anaesthetic specialty that were reported using LRMS or the anaesthetic eForm for the period 1 April 2014 to 30 June 2014. The categories were determined at local level.