PATIENT SAFETY UPDATE

Including the summary of reported incidents relating to anaesthesia

01 JULY 2011 TO 30 SEPTEMBER 2011

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
➢ 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 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 OF REPORTED INCIDENTS

A total of 2,736 anaesthesia related incidents were reported during the specified time period. Only 35 incidents were reported using the anaesthetic eForm. 46% of these cases were reported as near miss (harm was prevented from reaching the patient). 46% of the incidents reported via the eForm were reported to the National Patient Safety Agency (NPSA) within 1 day of occurrence (Figure 1).

2,701 incidents were reported using Local Risk Management Systems (LRMS). 16% of these cases were reported as near miss. 50% of incidents were reported via LRMS to the NPSA within 28 days of occurrence (Figure 1).

All incidents graded as death or severe were reviewed by the NPSA and if identified as having potential cause for concern, were reviewed in turn 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, or identifiable information relating to the patient or staff is disclosed; only information about the incident). Most incidents were reported by consultant anaesthetists, but 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 which 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 formally launched in England and Wales on 30th November 2009. There have been 855 completed reports submitted up to 30 September 2011. 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 last year. Responsibility for the NRLS will move to the NHS Commissioning Board. 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.

TIMELINESS OF REPORTING

Figure 1 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 1st July to 30th September 2011.

![Time taken to report an incident](image)

**Figure 1** Reported degree of harm (actual incidents)

DEGREE OF HARM (ACTUAL INCIDENTS)

Figure 2 shows the degree of harm incurred by patients within the anaesthetic specialty during the period 1st July to 30th September 2011. The 6 deaths were all reported though LRMS rather than the anaesthetic eForm.

![Degree of Harm](image)

**Figure 2** Type of incident reported
INCIDENT TYPE

Figure 3 shows the type of incidents that occurred within the anaesthetic specialty that were reported using LRMS or the anaesthetic eForm during the period 1st July to 30th September 2011. The categories were determined at local level.

SUMMARISED EXAMPLES OF REPORTED INCIDENTS FROM ALL CATEGORIES

Anaesthetic machine incidents

➤ The anaesthetic machine was checked preoperatively...when we were ready to put our patient on the ventilator, the ventilator screen displayed some menu options I have never seen before and we were unable to get it to revert to standard settings. We had to replace the entire anaesthetic machine and monitoring...

➤ Upon connection to the ventilator circuit, the anaesthetic machine showed a tidal volume of between 50 and 100ml...this persisted despite clinically delivered good tidal volumes... The anaesthetic machine had passed its self-test successfully prior to the list. After the case, on further discussion with colleagues, it transpired the machine had begun to do this at the end of the case the evening before. No one had reported this officially or taken the machine out of theatre.

➤ Attempt to change soda lime during the case... led to the whole panel coming off, failure of ventilation of the patient... a new machine had to be brought in.

➤ Patient for radiological oesophageal dilatation for stricture...modified rapid sequence induction planned. Grade 2 larynx...no bougie available on equipment trolley. LMA inserted while bougie brought from recovery...

➤ A change in the type of suction unit liners has occurred...an inappropriate type of liner had been placed in the anaesthetic machine suction unit and had not been opened out. The suction appeared to work...however while suctioning the patients airway during extubation, an amount of powder from the suction liner was sucked into the regulator causing immediate device failure.

➤ Uneventful induction of anaesthesia. Transfer to theatre and connection to Primus anaesthetic machine... failure of fresh gas flow despite earlier pass of machine check.

Anaesthetic machine failure during induction of anaesthesia (Drager Fabius). Machine checked pre induction...no apparent leak found. During insertion of lines the end-tidal anaesthetic agent dropped... Engineer found leak to be the water trap in the analyser (allowing room air to be entrained).

We continue to receive reports relating to anaesthetic equipment failures. Some of the incidents may be preventable with thorough pre-use checks and a good knowledge of the equipment that you are working with. The AAGBI is currently updating the safety guideline ‘Checking Anaesthetic Equipment’, which will include an aide memoire to detail checks required at the start of each operating session, checks at the start of each case, and a functional check using a test lung. The guidance will be published in January 2012. Do not use equipment unless you have been trained to use it and if an equipment problem is detected, the machine should be taken out of service until the problem is resolved. Do not forget that the machine check also includes airway equipment and suction apparatus. Problems with medical devices should be reported to the MHRA (www.mhra.gov.uk).

Similar cases, and many other incidents relating to equipment, are discussed in Cassidy CJ et al ‘Critical incident reports concerning anaesthetic equipment: analysis of the UK National Reporting and Learning System (NRLS) data from 2006–8.’ Anaesthesia 2011;66:879–888.

FIRE!

Swab soaked in chlorhexidine gluconate 0.5% in 70% v/v used to wipe out (surgical) cavity. Monopolar forceps diathermy used on bleeding point. Suddenly it felt very hot by my left index finger and I realised the diathermy had set fire to the swab and drapes on the right side of the patient... The swabs and drapes pulled off...flames put out with water and blanket over drapes. Immediately noticed burns to skin on patient on the right lower chest and upper abdomen.

Surgical fires will occur where there is an ignition source (diathermy) and a fuel (alcoholic skin prep and drapes. They are more likely to occur in an oxygen rich environment. In the USA, an estimated 650 surgical fires occur every year, the vast majority of which are preventable. The Anesthesia Patient Safety Foundation has produced a video to describe best practice to prevent operating theatre fires. The NPSA are planning to publish a Signal article in January 2012 with more information on this topic and clinicians are encouraged to look out for it. It is important to know the procedures to follow in the event of a fire in your theatre. The above incident was received from an anaesthetic team member, highlighting the importance of all team members in incident reporting.

More trauma

Patient complained of painful, gritty left eye following a general anaesthetic. According to the anaesthetic notes, her eyes were taped following induction. She has been referred to the ophthalmologists to examine her eye for a suspected corneal abrasion.

Patient on table for PD catheter insertion noted to have very loose tooth. In anaesthetic room, airway instrumented x4 due to difficult intubation. Not noted to cause dental trauma but presumably occurred at that time. Referred to maxfax.

We receive a number of reports of injury due to corneal abrasion occurring during surgery, or damage to teeth. These injuries, whilst not always preventable, cause great distress to patients and should be dealt with in a timely and effective manner, with referral to the appropriate specialist team if necessary.

Inadvertent administration of paralysing agents

Prior to commencing IV fluids on patient, one lumen of a 3 lumen octopus was flushed with 0.9% Sodium Chloride. Shortly after, the child displayed peripheral twitching and became apnoeic. Prior to this, the child had been stable in recovery and the discharge criteria had been met.

SALG continues to be made aware of incidents due to the inadvertent administration of paralysing incidents.
These have occurred either due to the mis-selection of drugs or to the presence of residual anaesthetic agents in cannulae. We would like to draw your attention to the NPSA Signal dated November 2009 about residual drugs in cannulae. SALG is also investigating ways to address this problem and would welcome examples on how practice has been changed in your Trust to avoid these potentially catastrophic incidents.

**Risk of harm from retained guidewires following central venous access**

➤ **20cm long-line inserted into right antecubital fossa by doctor. Patient had IV antibiotics as inpatient and outpatient. On [date] noticed pain in right lower forearm. Arm swollen. Firm area (4mm) felt. Tender but skin not broken. Seen by consultant. Had course of oral antibiotics. Arm remained tender and swollen and patient had enlarged axillary node. Patient had perfusion scan. No evidence of embolism. Had ultrasound and intramuscular foreign body identified... Foreign body found to be a guidewire.**

There have been a number of incidents due to retained guidewires reported to the NPSA, and the NPSA issued a Signal in September 2011 on this topic. We are keen to hear from other Trusts who have conducted a root-cause analysis or adopted a local policy that could be shared via the safety network.

If you have any questions about SALG or patient safety in anaesthesia, or if you would like to share something with the specialty to help make anaesthesia safer, please contact the SALG administrator at SALG@rcoa.ac.uk.

**SALG PATIENT SAFETY CONFERENCE 2011 – SUMMARY OF POSTERS**

The SALG Patient Safety Conference 2011 was held on Monday 3rd October. The standard of the posters submitted was exceptional and some of the content has been summarised below. If you would like any further information on any of the topics covered, or would like to get in touch with any of the authors, please do so via the SALG administrator at SALG@rcoa.ac.uk. Please note that these summaries are provided for information only and SALG does not necessarily encourage the replication of the proposed practices below.

**Anaesthetic Emergencies – Drugs and Equipment Preparedness**

A Gupta, N Nguyen-Lu, A Majumder, Royal Marsden Hospital

The Royal College of Anaesthetists has made recommendations on the preparedness of drugs and equipment available in areas of the hospital in which anaesthesia is delivered (http://www.rcoa.ac.uk/docs/ARB-new-emergencies.pdf). The objectives of this audit were to identify the availability of emergency equipment and drugs across both hospital sites, and to assess the knowledge of anaesthesia staff as to the location of the same. A template of equipment that should be available, based on the published guidelines, was devised to survey each area and a questionnaire on the knowledge of anaesthesia staff was carried out. Our audit highlighted significant deficiencies in availability and organisation of equipment, as well as the knowledge of the location of this equipment. This has lead to several changes including re-organisation and uniformity of emergency airway and resuscitation trolleys, availability of key algorithms, and a more detailed induction to anaesthetic areas.

**Audit of Bed Tipping**

H Cronshaw, S Stavert, E Tighe, Leicester Royal Infirmary

We conducted a prospective audit on emergency tipping of the four most commonly used beds and trolleys within our main theatres department. This was performed in reference to RCoA and AAGBI guidance which states that beds and trolleys used for the care of semi-conscious patients should be capable of being rapidly tipped head down in the event of regurgitation. Over a one day shift we audited 40 ODPs and anaesthetists as to whether they could rapidly tip the beds and trolleys head down and surveyed any previous difficulty they had had with this in an emergency. None of the beds or trolleys audited had an entirely successful tipping rate, highlighting a surprising knowledge deficit of bed tipping mechanisms amongst staff, amongst whom thirty-five per cent stated experiencing problems with this in an emergency.
Checklist for Procedures Needing Sedation on Neurocritical Care Unit

M Galea, J Hell, Southampton University Hospitals

We produced a checklist, based on the WHO Safety Checklist, for procedures needing sedation on the neurocritical care unit (NCCU). We were prompted to do so after an adverse event on our unit in which a patient was given excess propofol for sedation by a neurosurgeon, which led to desaturation and the need of ventilatory support with a face mask. The issues raised by this incident were discussed between all the neurointensive care consultants and unit matron, the checklist was produced, and all staff were made aware of its introduction. We feel that this checklist has improved patient safety, as evidenced by an incident which occurred after its introduction in which a patient admitted to NCCU had wrong name bands and this was picked up when doing the checklist prior to starting a procedure on admission to NCCU.

Development of guidelines to prevent retention of nasopharyngeal packs following an NPSA alert and audit of departmental compliance

T Day-Thompson, A Norman, Worcestershire Acute Hospitals

We gathered baseline data, devised and then audited adherence to Trust guidelines to prevent retention of throat packs. This was in response to an NPSA alert and requirement for at least one documented and one visual indicator of throat pack presence to avoid throat pack retention - a ‘never event’. Our guidelines, which include more than one documented and visual indicator were agreed by local committee and disseminated to all involved stakeholders. Baseline data demonstrated limited use of at least 1 visual and 1 documented indicator, initial audit shortly after guideline introduction showed 100% compliance, however re-audit has demonstrated a small reduction in achievement of this standard.

Difficult Airway, Double Lumen Tubes and Endotracheal Tube Exchange Catheters

P Angadi, C Pradhan, Leicester Royal Infirmary

We conducted a survey to determine the awareness of the danger of using Cook Frova Intubating Catheter® with Double Lumen Tubes (DLT) as tube exchange catheters. Use of this device with a DLT is deemed hazardous as it can cause airway trauma, its tip can be easily sheared off and can get lodged in the patient’s airway. We conducted an online survey in the form of a questionnaire that was sent to the anaesthetic colleagues of our NHS Trust involved with the usage of DLT. Our survey revealed that a significant number were unaware of this hazard which subsequently led us to educate the staff and encourage the use of purpose made soft tip, firm tube exchange catheters in patients with difficult airway requiring DLT.

Human and Organisational Factors Contributing to Adverse Events in Emergency Surgical Patients

M Barley, J Mole, T de Beer, A Hutchinson, Nottingham University NHS Trust

We designed a systematic analysis method to identify organisational and human errors leading to adverse events in emergency surgical patients, which engages the teams involved to produce sustainable solutions. Patients presenting for emergency surgery have a significant morbidity. We wanted to create a ‘just culture’ empowering the clinical teams to effect change and engaging them in analysis of adverse events. We meet monthly with the teams involved and use our systematic analysis tool to facilitate a detailed discussion regarding the event; generating learning and action points which are widely disseminated. Our methodology has been widely accepted and used by several specialties. Clinical teams are enthusiastic about the process, and are developing safer patient pathways.

Intra-operative Anaesthetic Handover: An Audit of the Efficacy of a Structured Handover

R Pandey, S Nayee, R Dravid, A Swami, M Mushambi, Kettering General Hospital/Leicester General Hospital

An intraoperative anaesthetic handover checklist was introduced to improve communication, team working and patient safety. This followed an audit which showed that much of the handover process was informal, poorly performed, was either incomplete or not carried out at all. We audited the handover process and reaudited following the introduction of the intraoperative anaesthetic handover checklist. A significant improvement in the transfer of information in all domains was found following the introduction of the checklist.
Introduction of Electronic Incident Reporting System in Theatres at Royal Bournemouth Hospital

L J Woodward, J R Craig, D M Hargreaves, Royal Bournemouth Hospital

With the aim of encouraging and improving reporting of all incidents, we designed and implemented an electronic form that is filled out for every patient undergoing an anaesthetic. Following a paper based trial of incident reporting, an electronic version was introduced into all theatres at Royal Bournemouth Hospital in June 2010. Since its introduction, incident reporting by anaesthetists in our Trust has increased by more than 20 fold, and has highlighted trends that have led to change in practice.

‘Nil By Mouth’ – Optimization for Safe Anaesthesia?

S Gaffar, D Watson, D Love Royal, Infirmary of Edinburgh/Borders General Hospital

The audit investigated the pre-operative fasting regimen and medication administration in orthopaedic trauma patients at a teaching hospital (TH) and a district general hospital (DGH). Despite evidence supporting shorter fasting periods and administration of vital drugs, change in clinical practice has been slow and patients continue regularly to fast from midnight and have their medications withheld on the morning of surgery. For this audit the medical and nursing notes of all trauma orthopaedic patients, over a 4-week period at each centre, were studied to ascertain the duration of their fast, medications administered on the day of surgery and any medications withheld without medical advice. The results showed the blanket policy of ‘nil by mouth from midnight’ being applied in the TH for all patients, as well as significant variations in drug administration in both the centres, including those concerning medication omissions such as beta blockers, and administrations such as metformin.

Preoperative Pregnancy Testing – An Audit

S B Kadur, M Abosedira, S Jaladi, Princess Royal Hospital Haywards Heath

We assessed the preoperative pregnancy status and its documentation in women in the child bearing period undergoing elective surgery over a period of one month. Undocumented early pregnancy jeopardizes the safety of both mother and fetus by exposing them to the untoward effects of anaesthesia and surgery. On the day of surgery we assessed the pregnancy potential and its documentation based on preoperative pregnancy testing, contraception method & history of hysterectomy. The potential of pregnancy was missed and/or undocumented in almost half of women in the child bearing period presenting for elective surgery.

Re-Audit Of Multidisciplinary Management To Prevent Inadvertent Perioperative Hypothermia (IPH) During The Patient’s 24-Hour Perioperative Journey.

N Jain, P Kuduvalli, Mersey Deanery

We re-audited our current practice with the aim of completing the audit cycle since our primary prospective audit in 2009 and following implementation of recommended action plans. Patients are known to be at risk of developing hypothermia during their perioperative period, consequences being physiological derangement and perioperative morbidity. We retrospectively reviewed case notes over a week of all patients meeting the inclusion criteria, against the NICE standards (April 2008) for the management of IPH. Advances have been made in our adherence to NICE guidelines, further improvements deemed desirable; the majority of our patients were normothermic during their 24-hour perioperative journey and no serious adverse effects occurred due to any short periods of hypothermia.

Survey on Anaesthetic Drug Syringe Labels

A Garg, N Sherwood, Sandwell and West Birmingham Hospitals

Our Trust uses drug class labels such as ‘opioid’ and ‘vasopressor’ instead of drug name labels such as ‘Fentanyl’ and ‘Metaraminol’. Since this is not standard anaesthetic practice, we decided to conduct a survey within the anaesthetic department to look at risk perceived by the use of such labels. When asked about the view that ‘generic labels significantly increased risk of a clinical incident’, we found that most doctors with >10 years experience (53%) disagreed while most doctors with <10 years experience (69%) agreed with the above view. In an emergency situation, 75% would discard drugs and start fresh while 25% would be happy to use drugs with specific labels. Drug class labels have some benefits but with inherent risks, hence we are requesting a review of current syringe labelling guidelines with regards use of drug class labels.
The Use of Throat Packs: Are We Safe
D B Jumani, N Fergusson, Alder Hey Children’s Hospital /Countess of Chester Hospital

We determined the frequency of use and safe management of throat packs during ENT and Maxillofacial surgeries performed under general anaesthesia at Countess of Chester Hospital, UK. In April 2009, the National Patient Safety Agency made recommendations advocating the use of visual and documentary evidence to avoid retention of throat packs. We aimed to evaluate if our current practise was safe. We retrospectively reviewed 87 patients’ case notes that underwent ENT and maxillofacial surgeries during the month prior to the publication of NPSA recommendations. We collected data regarding the incidence of use, documentation and adverse events related to throat pack. Throat pack is commonly used in maxillofacial surgery (23%). Although there were no adverse incidents reported with the use of throat packs, documentation of its use and removal was poor and similar amongst all grades of anaesthetists.

The Use Of Multimedia Resources to Promote the Use of SBAR
M Daunt, A Carney, R Kapila, Nottingham University Hospitals

In 70% of patient safety incidents the root cause is poor communication. Nottingham University Hospitals NHS Trust introduced the communication tool SBAR (Situation–Background–Assessment–Recommendation) in August 2009. We developed a collection of multimedia resources (e-learning package, films, drop-in workshops) to facilitate a culture change of using a new communication method throughout the Trust. Our audit data shows a steady rise in the use of SBAR when making referrals to the Critical Care Outreach team; currently 75%. By continued use of our resources, we are striving to achieve 100% compliance in the use of SBAR by 2012.

The Difficult Airway Trolley – Knowledge of Location Amongst Anaesthetists
J Perinpanayagam, L Wren, N Patel, Ashford and St Peters Hospital

An audit cycle was completed looking at the knowledge of difficult airway trolley (DAT) location by conducting a survey amongst anaesthetists. At our initial training session we were unable to state the location of the DAT and discovered that most senior colleagues were also unaware of trolley locations. We conducted an initial survey of DAT location knowledge amongst trainees and consultants and presented the findings at a departmental meeting in addition to designing and distributing trust specific posters showing all DAT locations. This was followed by a re-audit. Although not all anaesthetists knew the DATs Locations and only 82% had been trained on its use we found a significant improvement in knowledge of DAT location after interventions: there was a 38%, 26% and 64% increase in correct responses for location in St. Peter’s theatres, intensive care unit and accident and emergency respectively.

Use of Bite Blocks and Tube Protectors in ICU
C Joannides, M Watters, Great Western Hospital

Following an incident whereby a patient chewed through 70% of his endotracheal tube, we performed an audit of 21 intensive care units in the South West of England looking at the frequency of airway compromise due to damage to the integrity of endotracheal tubes and the use of tube protectors and bite blocks. We found that no unit routinely used bite blocks or tube protectors; the frequency of such an event was reported as ‘occasional to rare’; only two units used devices in patients who appeared to chew during sedation holds (one unit used a tube protector and the other a rubber bite block); and units with previous experience of these devices stated they limited access to patients’ mouths leading to difficulties in performing oral hygiene, were capable of causing pressure sores and occasionally caused kinking of the endotracheal tube. Most units employed the use of oro-pharyngeal airways, verbal discouragement and early tracheostomies if the patient’s airway was at risk of becoming compromised during sedation holds. This audit highlights that simple alternative management strategies other than bite blocks or tube protectors are most frequently employed to prevent this complication from arising, however, as NAP4 recently reported, airway complications in Intensive Care accounted for 1 in 4 of the cases analysed, therefore should the use of these devices be considered in certain at-risk patients?