RCS
ADVANCING SURGICAL STANDARDS

CORESS is a confidential reporting system for surgery. The purpose of CORESS is to promote safety in surgical practice, both within the NHS and in the independent sector.

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coress feedback

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The central theme of this edition illustrates the importance of checks: checks to ensure an alternative diagnosis is not missed; checks to confirm correct prescriptions; checks related to the operating environment and checks to ensure appropriate investigations are available.

We are grateful to the clinicians who have provided the material for these reports. The online reporting form is on our website (www.coress.org.uk) which also includes all previous Feedback Reports. Published contributions will be acknowledged by a 'Certificate of Contribution' which may be included in the contributor's record of continuing professional development.

Perioperative hypotension of cardiac origin (Ref 88)

An elderly man with a history of TIAs and claudication underwent routine elective repair of a symptomatic left inguinal hernia under general anaesthesia. During the procedure, the patient had two hypotensive episodes, treated by the anaesthetist with boluses of ephedrine. Surgery was uneventful but 4 hours after the operation, the patient had a further hypotensive episode on the ward, (BP 70/40; Pulse 75 /min). This was treated by the F1 doctor with 500ml of colloid. An ECG was normal. A further 4l of crystalloid and colloid were given overnight for subsequent hypotensive episodes.

The following morning haemoglobin was measured at Hb 6.4 g/dl, (albumin 23; PCV 0.18), although there was no evidence of bleeding or haematoma in the wound. The patient was transfused with 4 units of blood but remained hypotensive. The F1 doctor noted that oxygen saturation levels were diminished and requested a chest x-ray which demonstrated bilateral pleural effusions. A Troponin I test was elevated at 23.86 ng/ml (normal - < 0.1 ng/ml), confirming diagnosis of myocardial infarction. Fluids were stopped and furosemide administered. The patient was transferred to the Coronary Care Unit and eventually made a satisfactory recovery.

Reporter's comments

In a patient with peripheral and cerebro-vascular disease, co-existing coronary disease is highly likely and myocardial infarction should be considered as a potential cause of peri-operative hypotension. FBC, ECG and Troponin I or T should be checked before administering over-zealous fluid resuscitation. Absence of chest pain and a normal ECG can occur in patients with myocardial infarction. Haemodilution can contribute to an apparently low haemoglobin concentration and may exacerbate myocardial ischaemia. Fluid overload (reflected by chest x-ray findings, low albumin, PCV and haematocrit) and inappropriate transfusion, in the absence of an obvious cause of bleeding, may have compounded the situation in this case.

CORESS comments

The Royal College of Anaesthetists' representative on the Advisory Board had the following comments:

In an elderly patient with significant co-morbidities it would have been advisable for the patient to have been pre-assessed in an anaesthetic pre-assessment clinic; appropriate investigations performed and an anaesthetic plan discussed – including the advisability, or not, of a general anaesthetic. The patient is most likely to have had an NSTEMI – non ST elevated myocardial infarction - in the perioperative period, as evidenced by the raised Troponin I. Whether this resulted from a period of hypotension or whether the hypotension was a manifestation of the MI is unclear.

The ward staff and F1 doctor responded appropriately to the initial hypotensive episode by administering 500ml of colloid. Subsequent administration of a 4 litres of fluid and 4 units of blood in response to further hypotensive episodes, without consideration of diagnoses other than hypovolaemia secondary to haemorrhage, was an error. The failure of the patient to respond should have alerted the FI to seek senior help and this should have been reinforced by the ward staff.

Such eventualities can be reduced by the use of risk assessment scores such as the Patient At Risk Score (PARS) or the Modified Early Warning Score (MEWS). These scoring systems assess deviation from the normal, for a basket of vital signs: systolic BP, heart rate, respiratory rate, temperature and level of consciousness. Summation of the scores for each variable results in a total, from which the need for the patient to be transferred to an HDU/ICU environment can be judged.[1]

References

1. Ridley S. The recognition and early management of critical illness. *Ann R Coll Surg Engl* 2005; **87:** 315–322

Inadvertent diathermy injury to liver (Ref 94)

I undertook a laparoscopic cholecystectomy as part of a waiting list initiative in a neighbouring hospital. After port placement, I lifted up the left lobe of the liver with the hook diathermy to perform some of the dissection. On elevating the liver, significant burn damage to the lobe resulted. The diathermy was active yet there was no audible alarm or other indication to suggest this.

This was obviously a worrying situation and I promptly removed the diathermy hook from the abdomen. Investigation revealed why this inadvertent injury had occurred. A series of three events led to the problem. Firstly, the surgeon who normally worked in that theatre preferred to work in silence and routinely switched the diathermy alarms off. (I hadn't realised that each diathermy machine has a volume control with which it is possible to turn the sound off completely). Secondly, the yellow cutting pedal, which I don't routinely use, had been placed underneath the lip of the table. When the operating table was placed in reverse Trendelenburg position and tilted to the right (the third confounding factor), the table pressed on the cutting pedal, activating the electrode. As the alarm was off, there was no way to be aware of this.

Reporter's comments

A series of learning points arise out of this incident. The main point is that an alarm must never be completely switched off. It is surprising, having switched an alarm off, that when the machine is switched back on again, on the next occasion; the alarm is not reactivated at a default level.

My own theatre staff confirmed that they would never completely switch an alarm off and that checking alarm levels every morning was part of the theatre setup routine. When pedals are not being used they should remain within the view of the surgeon. Possibly, if one pedal is not to be used, then this diathermy component should be set to zero using the current controls.

I think there is a case to be made for all diathermy machines to be modified so that it is impossible to completely switch a sound alarm off and that any sound alarm should automatically reset to a default level when the machine is switched on.

CORESS comments

The basic lesson here is that surgeons should be thoroughly familiar with the equipment that they rely on whilst operating. Injury caused by faulty diathermy equipment and inappropriate use is well- recognized. Make sure that you know what the controls on your diathermy machine do, and confirm that the settings are those that you require before using diathermy. Ensuring that the diathermy is properly set up should form part of the preoperative checklist.

MHRA has produced a series of educational modules to address the issues associated with use of devices, which may be of value to surgeons. Relevant modules covering electrosurgery (diathermy) and operating tables are available on the website: www.mhra.gov.uk/conferenceslearningcentre/index.htm

Consecutive cholecystectomies? (Ref 99)

A middle-aged female patient was referred to the outpatient clinic with a history of intermittent right upper quadrant pain and the report of an ultrasound scan, performed at a local community hospital, which described a contracted gallbladder with multiple gallstones. She gave a past history of appendicectomy and laparoscopic hernia repair, both performed more than 10 years previously. She was booked for elective laparoscopic cholecystectomy and seen in the preassessment clinic which elicited the same history of previous surgical procedures.

On the morning of her surgery she underwent informed consent for laparoscopic cholecystectomy when the procedure to remove her gall bladder was explained to her. At laparoscopy, adhesions around the gallbladder fossa were found and when these were taken down she was found to have no gallbladder. A second opinion was sought from a hepatobiliary surgeon, who confirmed the findings. After surgery, a frank discussion took place with the patient and it transpired that the patient had previously had "an operation on her gallstones", but thought that she still had a gallbladder. She made an uncomplicated recovery and went home. A critical incident form was completed.

Reporter's comments

An incomplete past medical history was obtained from this patient, perhaps because of her lack of understanding of previous treatment and this was compounded by an erroneous ultrasound report, leading to inappropriate surgery.

CORESS comments

An ultrasound is best interpreted as a dynamic investigation. Without the scan itself, many surgeons would accept a report from an ultrasonographer known to them. However an ultrasound scan is relatively cheap and easy to repeat. Surgeons should maintain a high index of suspicion and a repeat scan should have been undertaken pre-operatively in any circumstances of doubt. A check of the date of the ultrasound report was essential since the reported scan may have preceded the patient's previous surgery. Finally, if the patient had been given a copy of the discharge summary following previous surgery, this might have helped to resolve her (and the surgeon's) confusion about past procedures.

Double doses (Ref 92)

A patient, who had been written up on the ward drug chart for Tramadol prn to be given postoperatively, was inadvertently given consecutive double doses when he returned from theatre with two drug charts. It transpired that the anaesthetist had written up a second chart when the original could not be found (it had dropped onto the floor in the anaesthetic room).

The original chart was eventually located and returned to the ward with the patient, leaving both charts in circulation.

Reporter's comments

Always check all the drug charts of the patient before and after theatre to ensure no duplication of medication has taken place. Electronic drug chart prescribing facilities exist in some trusts, where duplication of medications is automatically prevented. Confirmation of appropriate prescription should form part of pre- and post-operative check lists.

CORESS comments

Duplication of drug administration is a problem. Electronic prescribing is not necessarily a panacea and vigilance still has to be preserved. Similarly, some theatre check lists already include an assessment concerning drug administration records. As a corollary, the NPSA Clinical Board of Surgical Safety has recently emphasised the need for scrupulous recording of drugs given intra-operatively, both on the operation note and in formal drug administration records.

Appendicular mishap resolved (Ref 93)

As an F2 doctor I have been keen to build my logbook of surgical procedures in the lead up to interviews for Core Surgical Training. After observing and assisting in a number of open appendectomies I was keen to perform this procedure unassisted for the first time. With the supervision of my registrar I performed the procedure, talking through it as I proceeded. On opening the peritoneum it was evident that I had cut through a loop of small bowel which was adherent to the peritoneum following previous surgery. My registrar helped me to repair the defect in two layers, using a 3.0 absorbable monofilament suture. This setback did not delay the operation for long and the patient was discharged the following day.

Reporter's comments

This was a technical error during an otherwise straight forward operation. Unfortunately these things do occasionally happen. The important factor is to recognise injury when this does occur, to ask for appropriate assistance when necessary and to learn from the experience. I will always palpate the peritoneum for adherent bowel in future and probably won't forget this case in a hurry.

CORESS comments

Experienced surgeons may not find much to enhance their operative performance in this account. However CORESS encourages trainees to submit cases. The trainee here submitted a comprehensive account which has been edited a little for brevity. Reporting of cases such as this aids reflective practice, forms a useful basis for case-based discussions and encourages awareness of generic aspects of safety in surgery. Mortality and morbidity meetings provide fertile grounds for reports. Encouraging trainees to contribute to the reporting process should help to promote awareness of safety issues early on in clinical practice.

Finally…

Following reported cases of problems with vascular closure devices in the last issue of CORESS Feedback, readers may be interested to know that MRHA have issued a useful poster providing guidance on the use of these devices, which covers:

- pre-deployment imaging
- angle of insertion
- wound healing
- existing haematomas
- instructions for use.

The poster can be found at: http://www.mhra.gov.uk/Publications/Postersandleaflets/CON076415

Scope for improvement?

MHRA are aware of an issue where a laryngoscope failed to light during an emergency procedure and no replacements were available.

- Where laryngoscope blades and handles are to be used (especially where this use is not routine) a spare handle, blade and batteries should be readily available

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This issue contains cases which once again highlight the need for appropriate pre-operative checks. The problem of lack of familiarity with new equipment is a perennial cause for concern. Always ensure that you know how the equipment you intend to use works, that the necessary components are present and functional and that you've practised using the new equipment **before** encountering your patient.

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Missing kit mishap (Ref 95)

I was performing a laparoscopic gastric bypass on a male patient with a BMI of 54 and had arranged with a surgical instrument company representative to try out a new circular stapling head for gastro-enteric anastomosis. Everything was going smoothly and I had placed the new circular stapling head, when I asked the representative for the laparoscopic handle portion of the stapler to complete the anastomosis. A silence ensued, the rep went pale and I felt that trickle of perspiration between the shoulder blades when she told me she had only brought the standard handle, which did not match the head. I waited in vain whilst efforts were made to obtain another handle, but eventually converted to a hand-sewn anastomosis. A post-operative leak occurred (inevitably) and the patient developed a wound infection, but survived. Eventually to his satisfaction (and his surgeon's relief!), he began to lose weight.

Reporter's comments

This occurred pre-WHO checks which, if in existence, might have saved the day. Always ask the rep to bring TWO of everything – there is always the possibility of stapler failure, dropping the handle on the floor, de-sterilisation etc.

CORESS comments

This case is one of several, recently received by CORESS, in which operative delays have occurred because vital equipment was missing. ALWAYS check, yourself, that the correct equipment is present, that the parts match and can be assembled and preferably, that a spare is available. Particularly when using new equipment, make sure you are familiar with its operation and assembly of component parts. If possible, practice using the equipment in a simulated setting first.

Flaming (n)eck! (Ref 96)

An elderly patient was admitted for day case surgery to excise a lipoma from the back of her neck under local anaesthesia. The patient was placed prone, the operation site was cleaned with an alcohol-based skin preparation and draped. The patient was given mild sedation and oxygen through nasal cannulae. It appears that the disinfectant solution had collected in the patient's hair because, when diathermy was applied to cauterise a small wound edge bleeding point, the patient's head was suddenly engulfed in flames. The fire was rapidly extinguished but left small burns to one ear and loss of a large portion of hair.

Reporter's comments

Several factors contributed to this incident. A flammable skin preparation was used and the presence of residual alcohol after cleaning went unrecognised. Accumulation of oxygen from the nasal cannulae beneath the drapes may have acted as an accelerant. The diathermy spark acted as an ignition source. Always be vigilant to the risk of surgical fires, particularly when operating on head or neck or in areas where a skin preparation solution may pool.

CORESS comments

All alcohol preparations are flammable. Even lower concentrations of alcohol containing solution (eg povidone-iodine containing 30% alcohol) carry a moderate flammability risk with a documented flash point of 34°C.[1]

There should be no hazard if alcoholic preparations are used correctly:

- the amount used should be adequate to keep the site wet for the recommended time
- sufficient time must be allowed for alcohol-based skin preparations to dry thoroughly before commencing the procedure to ensure that all combustible ingredients have evaporated
- the preparation should be allowed to evaporate completely before electrocautery, diathermy or laser instruments are switched on
- pooling of excess liquid below the patient or in cavities or bodily contours should not be allowed to occur.

References

1. Centre for Healthcare Related Infection Surveillance and Prevention. *Recommendations for Surgical Skin Antisepsis in Operating Theatres.* Queensland Health, August 2009. http://www.health.qld.gov.au/chrisp/resources/rec_prac_skinprep.pdf

Tracheostomy confusion (Ref 97)

A tracheostomised patient with no available previous medical records was admitted requiring urgent abdominal surgery. The patient was only able to give a limited verbal history to the on-call anaesthetists. The patient was handed over to a new on-call team before surgery, and a trainee re-assessed the patient in the anaesthetic room. On hearing the patient speak, the doctor assumed the upper airway was patent and pre-oxygenation was attempted via a face mask. It became rapidly apparent there was no oropharyngeal communication with the trachea, and that the patient had a tracheostomy tube sitting in an end-tracheal stoma, with an indwelling tracheo-oesophageal valve permitting speech. Anaesthesia and ventilation were delivered via the tracheostomy, and the rest of the procedure was undertaken uneventfully.

Reporter's comments

With improving outcomes from chemo- and radiotherapy and organ preserving surgery, patients with laryngectomies are seen less frequently. Tracheostomy care is increasingly delivered by specialist nurses, and as a result junior doctors gain little experience in tracheostomy management.

CORESS comments

Some tracheostomised patients may still have a patent upper airway, permitting delivery of gases, and occasionally intubation, but this must never be assumed. Most laryngectomy patients will have a visible permanent stoma in the neck, but some wear a bib, external one-way valve, or retain a tube to prevent stomal closure. Many laryngectomy patients have indwelling tracheo-oesophageal valves allowing them to produce oral speech, therefore the ability of the patient to speak must not be taken as a sign of upper airway patency.

This case highlights once again the importance of good handover communications, appropriate use of pre-operative checks. CPR training should include the care of tracheostomised patients, and all doctors should be aware of the principles of safe management for such patients.

Urethral balloon inflation during urinary catheterisation (Ref 100)

An elderly male with known prostate cancer, in addition to colonic cancer with liver metastases, developed urinary retention and was referred to hospital where a Foundation Year 1 doctor performed urethral catheterisation. Catheterisation was painful and the balloon of the catheter was inflated although no back flow of urine was obtained. The doctor left the ward with instructions to contact her in 2 hours time if no urine had passed. After two hours time, no urine had passed and the patient began passing frank blood and clots. The catheter balloon had been inflated in his prostatic urethra causing trauma. Urological assistance was obtained and the catheter inserted into his bladder with drainage of urine prior to inflating the balloon.

The next day the patient had passed 2500ml of frank haematuria, and the bleeding continued. The patient had abnormal clotting secondary to his liver metastases. After consultation with the haematologist, the patient was treated with fresh frozen plasma 15ml/kg and vitamin K 10mg IV for 3 days. Following this the haematuria ceased and the patient was discharged to palliative care.

Reporter's comments

The admitting doctor continued to catheterise the patient despite the procedure being painful, and did not seek help. The catheter balloon was inflated before flash back of urine was seen, causing trauma in the prostatic urethra. Despite the patient being in painful urinary retention, the doctor left the patient, before seeing any urine to drain from the catheter.

CORESS comments

Prostatic disease may render catheterisation difficult. However, in the event of significant pain or difficulty introducing a urinary catheter, attempts at catheterisation should cease and expert help should be obtained. Care should always be taken to avoid inflating the catheter balloon unless this is in the bladder. Failure to pass urine via the catheter, in a patient with urinary retention should have alerted the practitioner in this case, to the fact that the catheter was inappropriately sited. Always measure and document residual urine volumes ensuring that the output fits the clinical picture.

Finally...

The Medicines and Healthcare products Regulatory Agency (MHRA) receives many reports of incidents involving infusion pumps. These incidents are of concern as many result in patient harm or death, primarily from over-infusions. MHRA have recently released a revised Device Bulletin on Infusion Systems which can be found at: http://www.mhra.gov.uk/Publications/Safetyguidance/DeviceBulletins/CON007321

This publication has been updated to take into account changes in devices and practices, as well as information gained from the investigation of adverse incidents and current trends in the use of infusion systems.