Safety Incidents in Critical Care

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The Faculty of Intensive Care Medicine

Introduction

This is the third bulletin based on NHS England/NHS Improvement reports from Datix and related to occurrences from 1 July to 31 December 2020. The timings of the reports and the incident date are not necessarily the same, so this covers those reported to the National Reporting and Learning System (NRLS) since the last bulletin on or before 22 February 2021.

There were 324 incidents reported as moderate, including 49 involving children under two years old and five in the two to 16 years age bracket. Severe incidents totalled 74, including 19 in children under two. There were no severe reports in the two to 16 years age range.

These reports rely on individuals reporting incidents and so cannot be regarded as truly quantitative.

However, they do show areas of concern and are a useful source of reflection and evidence to assist the promotion of safety efforts. To encourage reporting, the information is anonymous, so we rely heavily on the information contained in the original report. Unfortunately, on some occasions reports lack sufficient detail to clearly describe the context of the incident or the key learning point.

Airway, Ventilation and Oxygen

A high number of severe airway incidents were recorded during this time frame. Six incidents involved tracheostomies and seven occurred in orally intubated patients. Six resulted in cardiac arrest; three of these involved tracheostomies. An example of "patient, machine and everything in between" was illustrated by a clogged HME filter. One patient required reintubation because of a swollen glottis, highlighting the need to exclude airway swelling before extubation.

Tracheostomy

A surgical tracheostomy inserted in an ICU patient earlier in the day, originally admitted with an out of hospital cardiac arrest and inferior STEMI, became dislodged resulting in hypoxia, cardiac arrest and death.

A ventilated ICU patient was being turned when the tracheostomy was dislodged. The patient became hypoxic and suffered a fatal asystolic cardiac arrest.

A tracheostomy was dislodged during a turn, leading to hypoxia and cardiac arrest. Downtime was 30 minutes before return of spontaneous circulation (ROSC).

A ventilated patient's head was moved to a more neutral position resulting in displacement and obstruction of the tracheostomy tube. A suction catheter could not be passed via the tracheostomy tube and manual ventilation was ineffective; the patient was then orally intubated. It was not possible to pass a new tracheostomy through the original tracheostomy stoma with the aid of fibre optic bronchoscopy. The incident resulted in very low saturations for 20-30 minutes, even though after intubation an end tidal CO2 trace was present. The blood pressure was low, requiring three x 100 micrograms of adrenaline. Hypoxia continued requiring PEEP of 20 cm H2O and nitric oxide to return to oxygen saturations above 80%.

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A COVID patient underwent a bronchoscopy to clear secretions, during which a tracheostomy cleaning swab was found in the trachea and right main bronchus. This was retrieved with difficulty via the tracheostomy stoma and the patient was reintubated orally, resulting in low saturations and cardiovascular instability. Prone ventilation followed with saturations of 80% on an FiO2 of 1.0.

A Tracoe Twist tracheostomy tube, that had been inserted surgically two days earlier, was found to be fractured across the section that connects the tube to the holder. This had to be urgently replaced in theatre.

Endotracheal Tube, Extubation and Pressure Sores

A patient with COVID was weaned from ventilation and then extubated. The patient struggled to breathe and desaturated. The first attempt to reintubate failed due to glottic swelling, leading to a hypoxic cardiac arrest. Intubation was successful on the second attempt with a return of circulation after nine minutes[1, 2, 3].

Airway obstruction due to a clogged HME filter occurred in a ventilated COVID patient breathing on a spontaneous mode. This resulted in cardiac arrest and unfortunately resuscitation was not successful.

> "A patient suffered a cardiac arrest at induction of anaesthesia for an elective left atrial appendage occlusion. The cause of the cardiac arrest was unclear. The patient was put on ECMO. A right pleural effusion was present and a chest drain inserted to drain it. The patient became increasingly unstable and died. At the post-mortem, a chest drain was identified in the liver.

An endotracheal tube (ETT) had been placed in a patient during a cardiac arrest in the emergency department and secured at 22cm at the teeth. The tube was cut to 24 cm and subsequently proved difficult to secure with an AnchorFast endotracheal tube holder. The connector normally inserted into the ETT came out as the patient bit on the tube. The ETT then migrated into the mouth beyond the teeth and the patient clamped their mouth shut, preventing reconnection. The patient became hypoxic, suffered a cardiac arrest and CPR was commenced. The patient was reintubated and was stabilised.

During a sedation hold a patient "broke" the ETT by chewing. The ETT was removed by medical staff and the patient closely observed to see if reintubation was needed. Fortunately, it was not.

An agitated patient was shaking their head and then vomited. Soon afterwards there was a gurgle from the airway each time the patient moved. A chest X-ray was taken and the ETT was felt to have moved so that it was nearly out of the trachea. A consultant attempted an emergency change of the ETT however, reinsertion proved difficult and oxygen saturations and blood pressure fell, necessitating IV adrenaline. The ETT was reinserted after several attempts.

A subglottic suction port was not functioning for over two weeks on an ETT in a ventilated patient, until replaced by a tracheostomy. Soon after the patient developed a staphylococcus aureus VAP.

A ventilator was delivering excessive pressures resulting in a pneumothorax in a COVID patient being weaned from ventilatory support. No cause has been established.

Chest Drains

A 28 Fr gauge chest drain was passed by blunt dissection through a spot initially marked by radiology and confirmed prior to insertion by the operator using ultrasound. The patient had severe necrotising pneumonia with abscess formation and a complex loculated empyema. 10 minutes after the procedure, blood flowed from the drain and both FiO2 and vasopressor requirements increased. A CT showed that the drain had passed into a pseudoaneurysm in the lung, which was then embolised by interventional radiology.

An apical haemothorax was seen on chest X-ray in a ventilated patient on ICU after an elective AVR and root repair. A percutaneous chest drain was inserted using a Seldinger technique, but good ultrasound views were not obtained. Unfortunately, the drain had been inserted into the SVC with a 4.5 litre blood loss, requiring surgical repair in theatre.

A patient suffered a cardiac arrest at induction of anaesthesia for an elective left atrial appendage occlusion. The cause of the cardiac arrest was unclear. The patient was put on ECMO. A right pleural effusion was present and a chest drain inserted to drain it. The patient became increasingly unstable and died. At the post-mortem, a chest drain was identified in the liver.

Nasogastric Tubes (NG Tubes)

Five out of six nasogastric (NG) tube incidents resulted in aspiration, including one which was incorrectly thought on to be correctly placed on a chest X-ray.

A nasogastric (NG) tube was accidentally inserted into the left main bronchus of a patient with COVID-19. It was removed, reinserted correctly and a satisfactory position was confirmed on chest X-ray. However, the ICU medical team missed the large pneumothorax on the imaging. The pneumothorax was seen by the radiologist, but the medical team were not informed of its presence. Eight hours later the patient arrested, at which point the pneumothorax was diagnosed clinically and a chest drain inserted. It is possible that the original NG tube insertion had caused the pneumothorax.

A NG tube was found to have split at 48cm, which corresponded with the original position at the nares. The NG tube was later inserted further to 61cm, because the chest X-ray showed it was not inserted far enough. A bridle had been used to secure the tube and there was speculation that the bridle might have caused damage however, checks showed the bridle was the correct size for the NG tube. Feed leaked from the split at 48 cm and the patient aspirated.

A NG tube was placed and the position confirmed as satisfactory on chest X-ray by ICU staff. The NG feed commenced followed by increased oxygen requirements, wheeze and reduced air entry at right lung base. The chest X-ray was reviewed and found to show the NG tube passing via the right main bronchus into the right lower lobe.

A NG tube was inserted and the chest X-ray confirmed the correct position at 1100 hrs. The NG feed was started at 2000hrs, which was followed by respiratory deterioration two hours later. A repeat chest X-ray showed the NG tube coiled in the pharynx with the tip abutting the ET cuff. The apices of lung were not included in the original chest X-ray.

> A CVC line was inserted accidentally into the carotid artery and used for vasopressor support. There was no central venous pressure transduction, no check of a CVC line blood gas sample and no chest X-ray.

Arterial and Venous Lines

Arterial Lines

A radial artery line was inserted by a junior doctor, supervised by a more senior colleague. The senior colleague was bleeped away and the guidewire was lost into the artery.

An arterial line either snapped or was severed during attempts to remove the dressing that was holding it in place. The section of the line beyond the hub was lost into the radial artery.

A radial arterial line was removed, but only 1 cm of the line came from the artery. The line was thought to have fractured because the patient had been combative earlier in their stay.

A femoral arterial line was removed. This was followed by an arterial bleed causing a very large haematoma with cardiovascular instability, requiring drainage of the thigh and vascular surgical repair of the right superficial femoral artery.

A femoral haematoma and the development of a false aneurysm occurred in three patients on the ICU. The problem was thought to be caused by a lack of accurately placed compression during the line removal.

Central Venous Catheters (CVC)

including Peripherally Inserted Central Catheter (PICC) and Continuous Renal Replacement Therapy (CRRT) lines

Problems occurred with wrong selection of catheter, loss of Seldinger wire, failure to check the CVC was in a central vein even by pressure monitoring, damage to other structures, and consequences of disconnection and removal. The consequences of injection of irritant drugs into a peripheral line were also reported.

Extravasation of drugs occurred when a 5cm right internal jugular (RIJ) CVC was inserted in a paediatric patient; this was felt to be too short. According to guidance/literature [4, 5], the optimal length of insertion of RIJ CVCs for paediatric patients has been described as: Correct length of insertion (cm) = (height in cm/10) - 1 for patients < or =100 cm in height, and (height in cm/10) - 2 for patients >100 cm in height.

A CVC guidewire was found in a patient on a post CVC insertion chest X-ray.

A CVC line was inserted accidentally into the carotid artery and used for vasopressor support. There was no central venous pressure transduction, no check of a CVC line blood gas sample and no chest X-ray.

A PICC line was inserted via the left basilic vein. Some resistance was felt at 20-25 cm with the internal guidewire. A soft tip guidewire was then inserted via the other lumen and the line advanced into a suitable position. There was slight resistance when the wire was removed. Blood was aspirated from the line, and both an ultrasound and X-ray appeared satisfactory. The patient experienced some pain when the line was used for a blood transfusion. Eight hours of TPN were given via the line with no pressure alarms, but with increasing chest pain. A CTPA revealed malposition of the PICC line outside the left subclavian vein and continuing into the mediastinum.

When a PICC line was inserted, a tourniquet was found already on the arm of the patient.

Systolic blood pressure fell to 40mmHg in a ventilated COVID patient 20 minutes after a left internal jugular vein insertion of a CVC under ultrasound control. A tension pneumothorax was diagnosed, and a left sided chest drain was inserted after a needle decompression had led to a recovery in blood pressure. A chest X-ray confirmed the left pneumothorax.

A CVC was removed from the femoral vein. Later the following day, the patient became tachycardic and hypotensive with a Hb of 49 g/l. There was a swelling in the right groin extending from the midthigh to the lower right flank, confirmed by CT.

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Three incidents occurred when CVCs were inserted without securing sutures or with inadequate sutures:

- A CVC was inserted but not stitched. The CVC was in use for inotropic support when it was accidentally pulled out. Bleeding and hypotension resulted.
- A CVC being used for vasoconstrictor drugs to maintain cerebral perfusion pressure in a patient who returned from theatre with high ICP, was pulled out. The CVC was held in by sticky dressing but no sutures. Although this was noted, the patient was then rolled and the line pulled out.
- A CVC was pulled out during patient position change, despite being held in with two sutures.

A CRRT line became disconnected resulting in some blood loss, and a potential air embolus. The patient rapidly deteriorated and arrested. CPR was discontinued as the patient had DNACPR in place.

An extravasation injury occurred due to neat calcium being given via a peripheral line. This resulted in cellulitis around the peripheral venous line, followed by a blood culture positive for staphylococcus aureus.

ECMO

An ECMO femoral cannulation occurred resulting in major bleeding from the femoral arterial catheter; this procedure is considered high risk in paediatrics due to the risk of limb ischaemia and haemorrhage.

Transport and Transfers

Transfer errors often occur during distracting circumstances; this can lead to major errors or omissions, including failure to set up the receiving ventilator correctly as described in the last bulletin. In addition, delays in starting treatments following a transfer, particularly CRRT, can have major consequences for patients. Another important delay in CRRT is reported in the equipment, staffing and organisation section. Incidents below also highlight patients not being stable for transfer especially those who have not been adequately recovered after surgery, and patients being readied for discharge from ICU.

A patient was not transferred off the transport ventilator upon return from a MRI scan because the registrar returned to MRI to retrieve his bleep. In the meantime, it is not clear how the patient was transferred onto a Maquet ventilator (mode -Automode PC-PS) on 40% oxygen, rate 14/min with a PEEP of 5, Pinsp 5 and Psupport 5. The resulting tidal volume was 160ml, with sats 20-35%. Arterial blood gases pH 7.13, PaCO2 11.0, PaO2 4.3. In response, the patient was urgently bagged on a Waters circuit with 100% oxygen, resulting in a rapid improvement in oxygen saturations.

A hemicolectomy patient was transferred from theatre recovery on a phenylephrine infusion which ran out during transfer to HDU. On arrival the patient had systolic BP of 60 mmHg. This error was compounded by issues during monitoring changeover, whereby portable theatre monitoring was not compatible with new HDU/ICU monitoring, resulting in confusion in a critical situation. Not all staff were trained on the equipment or aware of the change.

A patient was brought directly from theatre to ICU only five minutes after extubation. However, on arrival the pulse oximeter was not picking up. The respiratory rate was low blood pressure was 60 systolic and falling despite metaraminol infusion, leading to cardiac arrest with ROSC after three cycles. The cause was thought to be hypoventilation leading to hypoxia and cardiac arrest.

A COVID patient was transferred to ICU from the ED and found to have a systolic BP of 30 mmHg despite noradrenaline. Cardiac arrest occurred; the patient had ROSC after one cycle and was then intubated.

A patient was brought from theatre recovery with a respiratory rate of 7/min. Recovery observations indicated a respiratory rate of 8/min on the previous three recordings.

A patient on an isoprenaline infusion was transferred by blue light for pacing to another centre. The ambulance was requested with a pacing defibrillator however, it arrived without this facility, as replacement ambulance defibrillators did not have an external pacing capability.

A patient was repatriated from another ICU with no COVID swab performed on arrival despite cough and pyrexia. The patient was tested after 48 hours and found to be COVID positive.

A patient had to wait to receive an urgent CT angiogram because another patient, who was ventilated and COVID positive, had become disconnected from the ventilator, contaminating the scanner. The CT scanner did not reopen until a deep clean was completed. In the meantime, surgeons decided a transfer to another centre was required for likely surgery, leading to a further delay in definitive treatment.

There was a two-hour delay in the transfer of patient requiring CRRT for hyperkalaemia to ICU. This was due to five staff looking after five Level 3 patients and a need to discharge a patient before another admission could occur. There were no ward beds available. The patient had a cardiac arrest upon arrival at the ICU.

A patient was transferred to the ward having been off NIV for less than 24 hours on ICU. The patient was tachycardic and tachypnoeic with a high PaCO2 when they arrived on the ward and was subsequently transferred back to the ICU.

A patient refused the provision of blood products prior to transfer to another centre for a radiological intervention for a GI bleed. On arrival in the receiving ICU, the patient presented with haemorrhagic shock and a haemoglobin of 30g/l.

A patient was transferred from another hospital with a diagnosis of pneumonia and possible acute appendicitis. On arrival the handover indicated that the patient had encephalitis.

Other Invasive Therapies and Monitoring

Cerebral procedures

Faulty drill bits led to the EVD catheter being impossible to remove as it snagged on the skull edge. The burr hole had to be widened to allow it to be removed.

An interventional procedure was carried out to prevent brain complication in a patient who refused blood products prior to treatment. Antiplatelet agents were given to maintain patency of stents. A haemorrhage occurred with falling haemoglobin (Hb). No blood products were given in line with the patient's wishes. Renal failure followed with a decision not to escalate to CRRT because of the likely further loss of Hb and imminent death.

Pacing

It was noted that the setting on a pacing box said VOO, when it had previously said VVI. A pacing technician was called and stated that this was satisfactory, although they declined to attend in person. The patient suffered a VF cardiac arrest later that day.

Cardioversion required three DC shocks in a ventilated ICU patient. The patient was awake during this time and recalls hearing conversations during the procedure.

A temporary pacing wire was inserted in a patient. The patient developed an infection and the wire was removed. This was complicated by the production of a pericardial effusion, which tamponaded, before the patient could be transferred to the catheter lab.

Epidurals, rectus sheath catheters and surgical drains

An epidural and a surgical drain were pulled out during mobilisation of the patient and during patient movement in bed.

One of two rectus sheath catheters which had been used to infuse local anaesthesia was difficult to remove. When it was eventually freed, it was noted that the end of the catheter had snapped off within the patient.

Infections

A number of likely cross infections were reported including:

- A three patient cluster of stenotrophomonas maltophilia over a three week period.
- Four Klebsiella bacteraemias.
- Two E Coli bacteraemias.
- A pseudomonas cross infection.
- Ten healthcare associated COVID-19 infections were reported.
- A patient was visited by a relative whose husband tested positive for COVID-19. As a result, the patient was isolated for 14 days.
- A Carbopenase Producing Organism was identified in a sternal wound.
- CVC infections included a group B strep and an MSSA.
- Two blood cultures showed MRSA.
- Five cases of Clostridium difficile.
- Following building work which affected the air flow to COVID patients in an ICU, patients were treated for aspergillus.

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Investigations

This section includes discussions on which investigations are appropriate, the difficulties of diagnosis in a sedated ventilated patient, correct interpretation of test results, locating abnormal results in electronic notes and filing systems, acting on observations, following up on abnormal results and the impact of delayed tests.

A patient suffered trauma following a fall from a height. Examination revealed a sinus tachycardia 120/min with systolic BP 90mmHg And Hb 88g/l. They were taken for a head CT scan due to a left occipital swelling, but no wider CT trauma scan series or abdominal ultrasound was undertaken. After extubation the heart rate was 130/min but repeat arterial blood gas or Hb was not checked urgently. An incorrect sample was sent for Xmatch from the ED, and there was a six hour delay before the laboratory notified the ICU of this. The replacement sample, taken by hand to the lab, was then lost. Subsequent blood samples showed a high lactate and Hb 60 g/l which led to a repeat CT scan. This showed a splenic grade 4 laceration, which was initially managed conservatively. However, the Hb continued to fall and the patient was taken for coiling of the inferior pole of splenic artery, which was successful.

A proximal humeral fracture was not seen on the initial CT in a ventilated trauma patient. The fracture was diagnosed because of pain during physiotherapy on the ICU.

A patient was admitted with patchy changes on a chest X-ray and lung fields imaged on CT. These were thought to be due to a viral pneumonia and so the patient was transferred to respiratory medicine. A large adrenal adenoma was also found on the CT, but not investigated further as this was thought not to be related to the reason for admission to ICU. The patient was then discharged and suffered flank pain; they were readmitted with a migraine and GI upset and treated with metoclopramide before being readmitted again with a cardiomyopathy. A CT aortogram once again showed a cystic lesion related to the adrenal. Metanephrine levels were found to be high and the patient was referred to the endocrinologists via an electronic system to the outpatients department. However, before being seen, the patient was readmitted to the ICU with a pulmonary oedema thought secondary to the exacerbatory effect of metaclopramide stimulating catecholamine secretion from the adrenal mass, which proved to be a phaeochromocytoma[6, 7].

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A trauma patient was admitted to the ICU with a tibial plateau fracture. The leg was found to be cold, but staff were falsely reassured when a pulse was detected using a Doppler. NICE recommendations state that this method should not be relied upon. A revascularisation was failed and a below knee amputation was required.

An EEG showed a non-convulsive status epilepticus; a repeat EEG one week later showed the same. The test result section on the electronic notes did not display the results as they had been filed under “documents”. The transmission of this information was made difficult because of the alternative sites available for filing of reports in the electronic patient notes.

There was a large discrepancy between a prolonged QT interval when manually calculated (630 ms) and the ECG machine’s automatic calculation (450 ms). A similar discrepancy was retrospectively seen on an earlier ECG. The patient suffered an intraoperative cardiac arrest following the first ECG.

The inability to get a rapid COVID test meant that a receiving hospital refused a patient transfer.

There was a 17-day delay in receiving a positive HIV test; this impacted on the treatment given to a patient.

A patient was admitted following repair of an emergency thoracic aortic aneurysm. The patient’s neurology was monitored and noted. Facial weakness was charted, then weakness in the arm was documented and finally severe bilateral leg weakness recorded. Medical staff were not alerted to these changes.

Organisation and Staffing

Organisation

A hypotensive gynaecology patient collapsed on the ward with bleeding after surgery. The surgical registrar was called to the patient, but did not attend initially and instead gave the patient details to the junior doctor, who called the gynaecology Consultant who was in theatre. The Consultant asked the junior doctor to call the "emergency team" however, the patient details were incorrect and the patient was not located. Eventually the patient was taken back to theatre for relaparotomy.

A patient was admitted to the ICU "for stabilisation" with an acute abdomen. The abdominal CT scan was reported at 0236 and showed small bowel obstruction. There was no clear surgical plan until the following day; the night-time surgical trainee did not know who the on call surgical consultant was and the switchboard did not have the surgical consultant rota.

A lack of cubicle space for a potential COVID patient led to the use of a three-bed bay for one patient.

A patient became positive for COVID on day 16 of their stay. No cubicle was available for treatment with nasal high flow oxygen.

> "During COVID, staffing levels for a least four shifts were felt to be unsafe by the nursing staff working. Nurses were looking after two Level 3 patients each, causing delays to a further five patients.

Staffing

Haemofiltration was not started in a septic patient with acute renal failure and a potassium of 7.44 resulting in ventricular tachycardia, despite a suitable line being in place for the preceding four hours. The patient was being looked after by a new nurse, who was being supported by the nurse-in-charge, who also had her own patient.

Thoracic surgery for a patient with a large spindle tumour, with no evidence of metastases, was cancelled due to a lack of ICU nurses.

A patient for CABG for severe LMS disease was cancelled twice due to a lack of beds. The procedure was rescheduled for a third time. The patient suffered a cardiac arrest preoperatively on the day of surgery.

During COVID staffing levels for a least four shifts were felt to be unsafe by the nursing staff working. Nurses were looking after two Level 3 patients each, causing delays to a further five patients.

A high-risk patient was detained under Section 3 of the Mental Health Act on the ICU. The Registered Mental Health Nurse, booked via an agency, did not arrive.

Nurse staffing was low and exacerbated by the unexpected non-attendance of two agency nurses.

Patient Falls

A carer turned a Level 2 quadriplegic patient on their own causing the patient to fall from the bed banging their head on the floor. A head CT confirmed the patient suffered a frontal bleed.

A confused patient was being assisted by two staff members when a further confused patient started to climb out of a nearby bed. At this point the first patient's legs gave way and they fell back onto the chair, landing on their arm and breaking it.

A patient was helped out of bed to use the commode. The patient was standing by the bed holding onto a zimmer frame. When the Healthcare Assistant stepped away to get new gloves from a box within the room, the patient fell and banged their head.

An orientated and cooperative COVID patient was in a cubicle on high flow nasal oxygen. Staff entered the room when alarms were heard and found the patient on the floor by the bed, with the oxygen disconnected. 100% oxygen was given via a Waters Circuit, frusemide was given and physiotherapy started to help improve the patient's condition. Although there were no obvious injuries, the patient deteriorated and died.

A patient tried to get to their own commode, tripped over their urinary catheter and fell to the floor. There were no major injuries.

An unwitnessed fall was reported in a Level 2 patient who climbed out of bed and fell, hitting their head and fracturing their clavicle. Staff numbers were too few to provide adequate cover which resulted in a second Level 2 patient falling out of bed.

An unsupervised patient got out of a chair, despite the call bell being within reach, and attempted to use the commode. The patient fell and banged their right hip. The injury was painful but no fracture was identified.

Medication Errors

Errors in drug dosage varied between "typo" errors to more subtle allowances for different measures of body weight and knowledge of drug constituents. The importance of speed of action in haemorrhage and precise use of blood products were also illustrated.

> "A request was refused for X-match, Fresh Frozen Plasma, cryoprecipitate and platelets for a patient who was cardiovascularly unstable and bleeding heavily after surgery, despite the request coming from a Consultant Anaesthetist who discussed the situation directly with blood bank staff. The patient was returned to theatre for emergency surgery.

Enoxaparin was not given to a patient who was admitted to ICU after a major surgery within the pelvis. The evening dose of enoxaparin was omitted due to bleeding around the epidural site. The following dose at 1100 was not given because of delayed clotting results. The patient collapsed later that day. The echocardiogram showed signs consistent with pulmonary embolism. The patient was then thrombolysed, but deteriorated and died.

A patient suffered a GI bleed after coadministration of aspirin and edoxaban.

A patient with metastatic lung cancer and pneumonia developed PR bleeding whilst on enoxaparin. Enoxoparin was not discontinued at this point and the problem was not communicated to medical staff. On the third day the patient had massive GI bleed.

A request was refused for X-match, Fresh Frozen Plasma, cryoprecipitate and platelets for a patient who was cardiovascularly unstable and bleeding heavily after surgery, despite the request coming from a consultant who discussed the situation directly with blood bank staff. The patient was returned to theatre for emergency surgery.

A heparin infusion prescribed as 22700 units in 50ml, was labelled as 2270 units in 50 ml syringe. It was unclear which was the true total that had been drawn up.

An incorrect dose of 8.25 mg oral captopril was given instead of 1.25mg.

A gentamicin dose was prescribed at 5mg/kg on the basis of the patient's ideal body weight of 57kg, rather than actual body weight of 81kg.

A noradrenaline infusion ran out, despite indicating that there was a remaining 35ml volume to be infused. Despite rapid efforts to replace the infusion, the patient arrested.

Metaraminol was administered instead of metoclopramide resulting in an episode of hypertension and bradycardia.

5ml of Tetrini multi-fibre feed was given to a patient with multiple food allergies including milk and fish, resulting in anaphylactic shock and cardiac arrest. This feed contains whey protein concentrate and sodium caseinate from cow's milk and fish oil.

A patient developed what was likely to be a dystonic reaction to metoclopramide. The patient was intubated and ventilated to facilitate a CT scan, which was normal.

A patient suffered an anaphylactic reaction to teicoplanin.

A patient was receiving the second of two units of blood while being transfused for bleeding, when they developed back pain and hypotension. The blood had been checked by two staff. The second unit was not for this patient.

A variable rate insulin infusion was stopped in an ICU patient, with no alternative prescribed despite blood sugar climbing to 23 mmol/l.

A patient suffered diabetic ketoacidosis due to an omission of long-acting insulin. A medication review was not performed.

Pressure Ulcers

Reports of pressure ulcers demonstrated several common sources including sores on the buttocks, sacral areas and heels. Ulcers secondary to devices were reported including devices to retain ETT, NG tubes and urinary catheters eroded into surrounding tissues especially when under tension. Prone ventilation contributed further areas.

30 sacral and buttock sores were reported, plus 19 heel or ankle sores and two on the posterior rib-cage.

Ventilation related sores included four related to AnchorFast devices, four lower lips and one cheek ulcer due to ETT pressure.

Tube ties led to one cheek example, plus five at the corners of the mouth.

An arterial line produced a pressure sore, and two cases were associated with the prolonged use of pelvic binders.

NIV contributed to four lesions on the nose, NG tubes produced a further three and pressure from hi-flo nasal oxygen produced another.

A bite block was thought to have promoted two tongue sores.

Five catheter related penile sores were reported.

Three pressure sores were found on the back of the head.

Two arm splints produced sores.

One patient suffered burns to the chest and abdomen from a heating blanket placed directly onto the skin.

Prone ventilation added three cheek ulcers, plus another on the nose and chin.

A Guedel airway pressing on the chin produced an ulcer.

Ulcers were reported on eyebrows, abdominal wall, chest wall and toes, and five related to pressure from a tracheostomy device.

National Patient Safety Alert: Eliminating the risk of inadvertent connection to medical air via a flowmeter

In June, a National Patient Safety Alert was issued asking all providers that use piped medical air to eliminate the risk of inadvertently connecting patients to medical air via a flowmeter instead of oxygen.

Air flowmeters attached to piped medical air outlets are primarily used to drive the administration of nebulised medication; typically for short periods to manage respiratory conditions. Most other uses of piped medical air do not require an air flowmeter.

Due to the proximity of the piped medical air and oxygen outlets at the bedside, and the similarity in design of flowmeters, there is a significant risk when using air flowmeters that patients may be inadvertently connected to medical air instead of oxygen.

The alert asks providers to purchase alternative devices that do not require medical air to be delivered via an air flowmeter. Following this, all medical air flowmeters except those tethered to equipment for niche use should be discarded, and all medical air outlets no longer required should be reversibly capped off.

You can see the full alert by clicking on the following link: **National Patient Safety Alert: Eliminating the risk of inadvertent connection to medical air via a flowmeter**

Click here to view previous issues of the Safety Bulletin along with other safety reports and the ViRUS COVID-19 reports.

Intra-oral kinking of a micro-cuff endotracheal tube (ETT)

Situation

A child with developmental delay, scoliosis and recurrent chest infections was transferred to PICU with SARS-CoV-2 pneumonia. The child was intubated with a size 5.5 micro-cuff ETT for critical hypoxic respiratory failure at their local hospital. The intubation was reported to be straightforward, with a grade 1 laryngoscopy view, but they were notably difficult to ventilate and oxygenate on the ventilator.

Background

The child was transferred by road and required a fraction of inspired oxygen of 0.8 to maintain oxygen saturations of greater than 94%. The retrieval team also reported that a peak inspiratory pressure of as high as 49 cmH2O and PEEP of 8 cmH2O with a 1:1 I:E ratio was required to maintain tidal volume of 6 ml/kg. Upon arrival at PICU, the trachea was central and there was no wheeze or abdominal distension. The capnography waveforms were of normal appearance. A chest X-ray was also done to exclude endobronchial intubation and pneumothorax. The child was noted to be unusually difficult to bag ventilate, and the delivery of tidal volumes were hugely variable with any change in head positioning. They were best ventilated with head-tilt and chin-lift.

Assessment

The nursing team highlighted the 'red-flag' of inability to pass the suction catheter. The course of the ETT was immediately palpated, and a twist was felt in the oropharynx. This finding was confirmed on laryngoscopy, with the ETT demonstrating a significant kink at letter "C" of the RUSCH microcuff tube. The airway was swiftly exchanged, and immediate improvements of both ventilation and gas exchanged were observed.

Recommendations

The polyvinyl polymers of ETT are known to soften at body temperature and have a higher tendency to bend at acute angles, where the pilot tubing exists; and when bending forces are applied away from the anatomical curvature, also known as the "Magill curve" of most conventional tracheal tubes. Kinking of ETT at blind spots such as within the pharynx may happen more frequently in paediatrics than in adults due to the use of straighter tracheal tubes with smaller wall thickness. We would like to raise awareness of this unusual case of difficult bag ventilation and high airway pressure ventilation. If a well-secured tube suddenly becomes temperamental following, or in relation to positional changes, tube malfunction should be suspected. The integrity of the ETT should be interrogated.

Risk of retention of component of tracheostomy insertion kit

Situation

A percutaneous tracheostomy was performed. The procedure appeared to proceed straightforwardly however, during bronchoscopy after the procedure, a foreign body was noted in the lower airway.

Background

On further inspection, the foreign body was a portion of the tracheostomy introducer equipment. The foreign body could not be removed bronchoscopically via the tracheostomy. The patient was therefore reintubated orally and the foreign body removed successfully. The tracheostomy was then resited and the oral ETT removed.

Assessment

The tracheostomy insertion kit used was the Tracoe Experc Dilation Set with a Tracoe Twist. The tracheostomy comes preloaded on an inserter that includes a silicone sleeve to smooth insertion. When the tracheostomy has been appropriately sited, the inserter should be removed. The tip of the silicone sleeve inverts and is removed with the inserter.

The manufacturer's instructions for use highlight that a check must take place to ensure that the silicone sleeve is still located on the inserter after it has been removed.

Recommendations

A similar incident has been reported in the literature and it is highlighted in the manufacturer's instructions for use. It highlights the risk of retention of foreign bodies following invasive procedures. Local checklists will be amended to reflect this incident. The incident has been reported to the MHRA and the manufacturer. The fault is thought to be extremely rare and no obvious cause was found for the tip of the sleeve to break off.

Conclusions

Airway

Reports during this period have shifted focus to a loss of airways for a variety of reasons, including during patient turns or in agitated patients. The reports did highlight the need to ensure that serious glottic oedema is not present prior to extubation. Staff should be aware that some ETTs have less well fitting connectors that may become loose.

Recommendation
Consider the likely safety of the airway after extubation. Consider the need for a leak test and/or laryngoscopy prior to extubation. In more difficult situations consider leaving airway exchange catheter in situ or even tracheostomy.

Recommendation
If airway pressures are high consider "the patient, the machine and everything in between".

The need to consider misplacement of NG tubes and the consequences of misplacement including pneumothoraces was evident. The position of NG tubes in proned patients were reported as very difficult to assess. Markers and lengths perhaps could be clearer.

Recommendation
Actively observe for signs of a pneumothorax after a NG tube has accidentally been placed in the lung.

Arterial and venous lines

The risk of losing Seldinger wires, or even part of the line itself, into the patient was illustrated. The consequences of open lines and air embolism was reinforced, plus very importantly, the need to reduce bleeding from line sites when they are removed. Major bleeding occurred in some cases and pressure may not always have been applied for long enough, in the correct place, to reduce this risk.

Recommendation
Confirm venous cannulation/correct placement of guide wire before proceeding further with CVC insertion. The CVC should be transduced to check waveform before it is used.

Suitable lengths of CVC lines are required to avoid extravasation and other hazards from inappropriately placed side holes on CVCs.

Recommendation
Precisely targeted and appropriate pressure should be applied to line sites after removal.

Delay especially during hand-over periods for starting CRRT for life threatening hyperkalaemia was an issue.

Recommendation
Urgent CRRT should be a priority and delays should be questioned.

Transfers

Distraction at key moments remains an issue, especially when setting up a ventilator.

Recommendation
Handover checklists should be used and interrupting staff during handover should be avoided.

Investigations

The reports highlighted the need to act on findings that may not be immediately relevant, but are important for patient care. Appropriate and consistent filing of results, especially in electronic notes, was found to be a source of delay in acting on important information, as was person to person communication when a life-threatening issue was identified.

Recommendation
Consistent design of user friendly electronic systems is required that allows consistent filing and presentation of results.

Medication Errors

Wrong drug and wrong dose remain a problem. The difficulties of balancing bleeding risk versus thromboprophylaxis were evident, along with the close attention needed to clotting results. Staff should ensure that decisions are followed up in a consistent way.

Pressure ulcers

Pressure ulcers and sores remained a source of pain and trauma for patients, affecting care of the airway as well as more traditional common sites such as the sacrum and buttocks. The effects of tension from NG tubes and urinary catheters were an important source of injury.

Recommendation
Regularly check for pressure exerted by the attachment of NG tubes and tension in NG tubes and urinary catheters.

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