

Foreign body aspiration during intubation, advanced airway management or ventilation

Date of issue: 1 September 2020 **Reference no:** NatPSA/2020/006/NHSPS

This alert is for action by: All acute, specialist and ambulance trusts, independent providers of NHS-funded surgical or critical care, and mental health trusts with electro-convulsive therapy (ECT) suites.

This is a safety critical and complex National Patient Safety Alert. Implementation should be co-ordinated by an executive lead (or equivalent role in organisations without executive boards) and supported by clinical leaders in anaesthetics and resuscitation.

Explanation of identified safety issue:

Loose items unintentionally introduced into the airway during intubation, ventilation or advanced airway management (known as foreign body aspiration [FBA]) can lead to partial or complete airway blockage or obstruction. If the cause is not suspected, this can be fatal.¹ Complications following FBA may not be immediately recognised due to sedation and anaesthesia and may be postoperatively misdiagnosed as asthma, chronic obstructive pulmonary disease (COPD), or stridor.²

An example incident reads:

“patient presented in ED following repeated GP attendance, 4 months post anaesthesia with worsening respiratory symptoms. Symptoms resolved after removal of ECG backing plastic [from the respiratory tract].”

In a recent six-year period, five incidents were identified where a foreign body (FB) was aspirated, and a further four incidents where the FB was identified during intubation and removed. The most common types of FB identified in incident reports were transparent backing plastic from electrocardiogram (ECG) electrodes and plastic caps of unclear origin. This is likely to be an under-estimate of the true number of incidents as many may go unrecognised.

During our investigation we also identified that:

- some breathing circuit components with untethered caps are still available to purchase
- airway trays for routine or planned procedures are frequently prepared in advance, but left uncovered, and as a result loose FBs may become attached to breathing system devices
- the ends of breathing system hoses are not routinely closed between patient cases; allowing the potential for loose plastic objects to enter the breathing hose system.

Actions required

Actions to be completed by 1 June 2021

1. Amend current purchasing,^A and introduce ongoing controls on purchasing, to ensure ECG/ECT electrodes have either large sheet backing for multiple electrodes or fully coloured or patterned individual backing in:
 - a) all areas where intubation or advanced airway management regularly occurs (including theatres, emergency departments, ECT suites, and emergency ambulances).^B
 - b) all resuscitation trolleys/emergency response kits containing intubation or advanced airway equipment and containing ECG electrodes.^B
2. Amend current purchasing,^A and introduce ongoing controls on purchasing, to ensure all breathing system components have either ports with tethered caps or no port.
3. Review other equipment used for, or alongside, intubation and advanced airway management during resuscitation, anaesthesia or ventilation, and if any include small loose components, purchase safer alternatives if available.
4. Develop or amend local protocols to include:
 - a) a process step that requires any pre-prepared intubation and advanced airway management devices to be covered or protected until used; this may include reinserting them in their packaging.
 - b) a process step to close the end of the reusable breathing system hose in between patient cases; either using bespoke caps supplied with the system or by attaching to the circuit mount.^C

For further detail, resources and supporting materials see: <https://www.england.nhs.uk/2020/09/foreign-body-aspiration-during-intubation-advanced-airway-management-or-ventilation/>

For any enquiries about this alert contact: patientsafety.enquiries@nhs.net

Additional information:

Notes

- A. NHS Supply Chain are working with suppliers to support availability of products within the compliance timeframe.
- B. This Alert does not require changing to the large sheet/coloured/patterned type in areas other than those specified in actions 1a and 1b. However, changing to them across the whole organisation will likely be easier; compared with maintaining ongoing checks and barriers against one type being unintentionally reintroduced into the areas where they should never be used.
- C. Caps for breathing system hoses are available, either as a separate item within the system packaging, or pre-attached on a hinge joint for some coaxial systems. The circuit mount on anaesthetic machines should be used in line with manufacturer instructions for use (IFU) and infection control guidance.

Patient safety incident data

The National Reporting and Learning System was searched on 25 August 2020 for incidents reported as occurring on or after 1 April 2014 with keywords relating to 'cap' and 'block'. A further search was performed using the same dates and keywords 'transparent', 'plastic' and 'blockage'. Eight incidents were associated with FBA:

- four referred to plastic entering the breathing system hose – one IV plastic cap, one unspecified plastic cap and two thin plastic film (potentially electrode backing)
- four involved foreign bodies introduced during intubation – all of which specified ECG electrode backing.

An additional incident reported to the NRLS in 2019 (our ref PSI463) not identified by these keywords described a tear off portion from a sachet of lubricating gel which the patient managed to cough out following extubation of an I-gel[®] device.

This is likely to be an under-estimate of the true number of incidents, as FBs introduced during ventilation, intubation or advanced airway management may not always be recognised at the time. Post-procedure, symptoms are unlikely to be specifically associated with the potential for FBA and, as a result, it is likely that many incidents of FBA go unrecognised. Additionally, it was difficult to identify a comprehensive NRLS search strategy.

While organisations are predominantly using breathing system products (e.g. HME filters) with tethered caps, some products with untethered caps are still available despite recommendations from the Expert Group on blocked anaesthetic tubing (EGBAT) report.¹

References

1. Department of Health. (2004). EGBAT report: Protecting the breathing circuit in anaesthesia. https://webarchive.nationalarchives.gov.uk/20120105190039/http://www.dh.gov.uk/prod_consum_dh/groups/dh_digital_assets/@dh/@en/documents/digitalasset/dh_4081826.pdf
2. Justin C. Hewlett, *et al.* (2017). *Foreign body aspiration in adult airways: therapeutic approach*. <https://www.ncbi.nlm.nih.gov/pubmed/29221325>

Resources

1. Association of Anaesthetists. (2012). *Checking anaesthetic equipment*. <https://anaesthetists.org/Home/Resources-publications/Guidelines/Checking-Anaesthetic-Equipment>
2. NHS Clinical Evaluation Team. (2018). Clinical Review: adult ECG electrodes. <https://wwwmedia.supplychain.nhs.uk/media/Clinical-Review-for-Adult-ECG-Electrodes-February-2018.pdf>.

Stakeholder engagement

- National Patient Safety Response Advisory Panel (for a list of members and organisations represented on the panel, see <https://www.england.nhs.uk/patient-safety/patient-safety-alerts/>)
- The Clinical and Product Assurance (CaPA) function of NHS Supply Chain
- Safe Anaesthesia Liaison Group (SALG)

Advice for Central Alerting System (CAS) officers and risk managers

This is a safety critical and complex National Patient Safety Alert. In response to [CHT/2019/001](#) your organisation should have developed new processes to ensure appropriate oversight and co-ordination of all National Patient Safety Alerts. CAS officers should send this Alert to the executive lead nominated in their new process to coordinate implementation of safety critical and complex National Patient Safety Alerts, copying in the leads identified on page 1.