National Patient Safety Alert

NHS

Depleted batteries in intraosseous injectors

Date of Issue:	5 November 2019	Reference No:	NatPSA/2019/001/NHSPS

This alert is for action by:

Acute trusts, ambulance trusts and any other organisation providing NHS funded-care that use battery-powered intraosseous injectors.

This is a safety critical and complex National Patient Safety Alert. An executive leader (or the equivalent role in organisations without executive boards) should co-ordinate its implementation, supported by the appropriate clinical resuscitation lead.

Explanation

The intraosseous (IO) route (that is, through the bone marrow) is used to access the venous system when intravenous access is not possible, often in emergency situations. IO access is most commonly achieved using a battery-powered injector[1]. The battery is sealed within the device and cannot be recharged or replaced[2]. Some models may lack a battery power indicator and the first sign a battery may be depleted will be when it does not work.

In a recent three-year period, 42 incident reports described delay in administering IO medication because an IO injector had a depleted battery. The impact of this is difficult to assess given the patients were already in cardiac arrest or critically ill, but several reports indicated the delay may have affected the effectiveness of resuscitation.

Insight from stakeholders suggest:

- IO injectors without battery indicators remain in use
- IO injectors may be kept in 'IO kits' that are sealed in opaque bags, making it difficult to routinely check their battery indicator lights
- Routine checks of battery indicators are not always in place
- Staff may not know that change in the battery power indicator light means that the device needs to be replaced
- The injector stalling might be mistaken for battery failure
- Limited awareness of how to continue IO access manually if the injector cannot be used.

For further detail, resources and supporting materials see:

improvement.nhs.uk/resources/patient-safety-alerts

Actions required

Actions to commence as soon as possible and to complete by 5 May 2020

1. Identify and replace any battery-powered IO injectors **without** a battery indicator light
2. For battery-powered IO injectors **with** a battery indicator light, ensure resuscitation equipment checklist (and 'make ready' equipment checks and replenishment in ambulance trusts) includes:
   a. how to check the device, and where to record that the indicator light shows the battery is working ie green LED[2]
   b. a prompt that a flashing red LED[2] means the IO injector must be replaced, and how to obtain a replacement
3. Review training materials [A] and competency frameworks and ensure they include how to avoid the injector stalling mid-use and what to do if this occurs

Failure to take the actions required under this National Patient Safety Alert may lead to CQC taking regulatory action.

Additional Information:

TECHNICAL NOTES

Patient safety incident reporting

The National Reporting and Learning System (NRLS) was searched on 23 April 2019 for incidents occurring on or after 1 April 2016 with the keywords relating to battery and intraosseous, including abbreviations.

42 reports linked a delay in obtaining IO access to battery depletion, of which 32 related to patients in cardiac arrest and, the rest to other emergencies such as hypothermia or hypovolaemic shock. Most incidents occurred during ambulance service interventions in the patient's home or a public space. Patients ranged in age from newborn to over 80 years.

References

1. The battery-powered IO injectors predominantly used by NHS acute and ambulance trusts are listed on NHS Supply Chain.
2. Guidance from a leading manufacturer of battery-powered IO injectors states that "a green light indicates it is suitable for use, a flashing red light indicates there is only 10% of battery life remaining. Purchase and replace [the injector] when the red LED begins blinking".

Resources

A. Teleflex, the main supplier of battery-powered IO injectors, provide training and resource materials on its website. The training materials include techniques to avoid stalling, how to overcome stalling and how to continue the procedure manually if unable to resume use of the injector.

Stakeholder engagement

- National Patient Safety Response Advisory Panel (for a list of members and organisations represented on the panel, see improvement.nhs.uk/resources/patient-safety-alerts/)

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 *The introduction of National Patient Safety Alerts* issued via CAS on 17 September 2019, your organisation should be developing new processes to ensure executive oversight and coordination of safety critical and complex National Patient Safety Alerts. CAS officers should send this Alert to the executive leader nominated in their new process to co-ordinate implementation of safety critical and complex National Patient Safety Alerts, copying in their clinical resuscitation leads. If CAS officers do not yet know which executive leader will coordinate the implementation of safety critical and complex National Patient Safety Alerts, they should send this Alert to their Chief Nurse and Executive Medical Director (or equivalent roles, including in organisations without executive boards).

This alert asks for co-ordinated implementation across the trust/organisation, and so should not be disseminated to individual teams or departments by the CAS officer.