

Safety Action Notice

Reference **SAN(SC)19/02** Issued **08 November 2019** Review Date **08 November 2020**

Depleted batteries in intraosseous injectors

Source: This Safety Action Notice is issued in association with NHS Improvement and Healthcare Improvement Scotland. The content is based on Patient Safety Alert NatPSA/2019/001/NHSPS, issued by NHS Improvement on 05 Nov 2019

Summary

Delays may occur in administering intraosseous (IO) medication if a battery-powered IO injector with a depleted battery is used. Recommendations are given on replacement of battery-powered IO injectors, pre-use checks and user training.

Action

- 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, i.e. green LED²
 - b) a prompt that a flashing red LED² 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

Action by

- NHS Boards and any other organisation providing NHS funded-care that use battery-powered intraosseous injectors.

Deadlines for action

Actions underway: 22 November 2019

Actions complete: 05 May 2020

Problem / background

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 injector¹. The battery is sealed within the device and cannot be recharged or replaced². Some models may lack a battery power indicator and the first sign a battery may be depleted will be when it does not work.

Problem / background (continued)

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

Additional Information

TECHNICAL NOTES

Patient safety incident reporting

The (English) 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.

Additional Information (continued)

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/)

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.

Distribution

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Enquiries

Enquiries (and adverse incident reports) in Scotland should be addressed to:

Incident Reporting & Investigation Centre (IRIC)

NHS National Services Scotland

Gyle Square, 1 South Gyle Crescent, Edinburgh EH12 9EB

Tel: 0131 275 7575 Email: nss.irc@nhs.net

Report options are available on the HFS website: [How to report an Adverse Incident](#)
Further information about reporting incidents can be found in [CEL 43 \(2009\)](#) or by contacting IRIC at the above address.