

# Audit: Temperature Monitoring in Patients Undergoing Pre-Hospital Emergency Anaesthesia (PHEA)

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## Background

Patients who are critically unwell may become hypothermic for a number of reasons<sup>1</sup> and this has a negative impact on multiple physiological systems. Hyperthermia can also have deleterious effects, for example in patients with brain injury<sup>2</sup>. It is also clear that anaesthetised patients are more likely to arrive in the emergency department (ED)<sup>3</sup> with a low temperature.

## Aim

The aim of this audit was to evaluate temperature monitoring and recording in patients undergoing PHEA with Devon Air Ambulance and identify areas for improvement.

## Methods

All patients who had undergone PHEA since 2019 were identified using HEMSBase. The questions we wanted to ask are as follows:

1. Was a pre- and post-RSI temperature recorded?
2. Was the patient normothermic at ED handover?
3. Was the patient hypothermic at any point?
4. Were temperature management methods recorded on HEMSBase?

Standards not set as a similar audit had not previously been done; these would be agreed after this audit and then regularly re-audited. The only standard in place was that all patients should be normothermic on arrival in ED.

Normothermia defined as being between 35.0C and 37.9C. A time period of 10 minutes was chosen as being an acceptable period of time from last recorded temperature to ED handover.

## Results

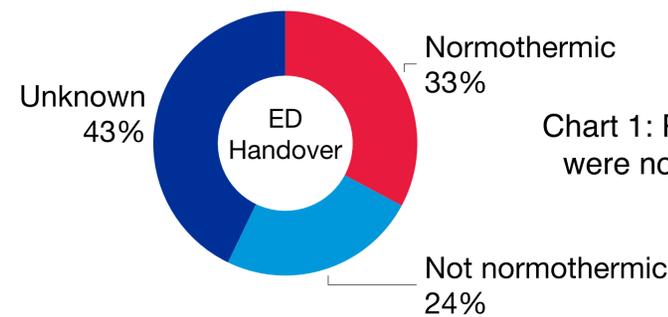


Chart 1: Proportion of patients who were normothermic at handover

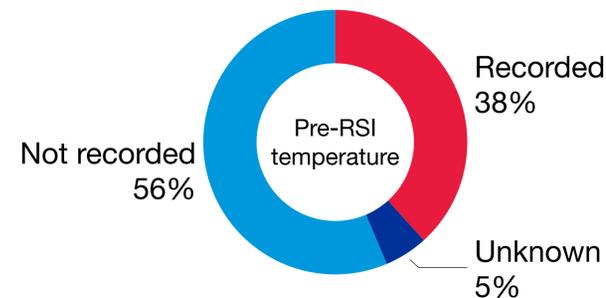


Chart 2: Proportion of patients whose temperature was recorded prior to induction (RSI = rapid sequence induction)

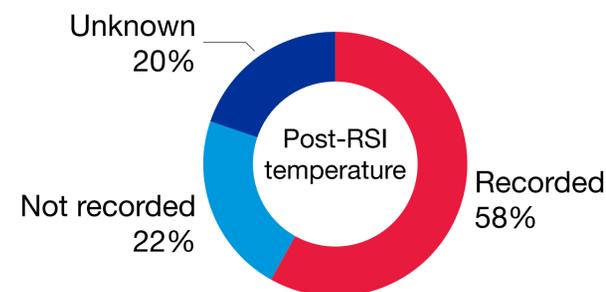
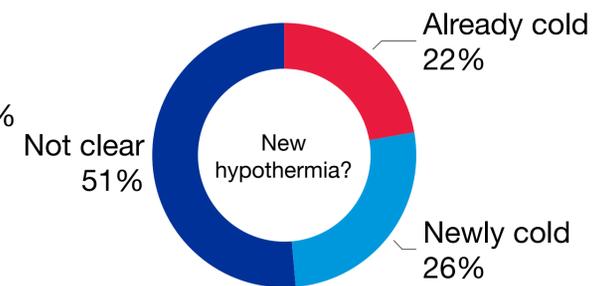
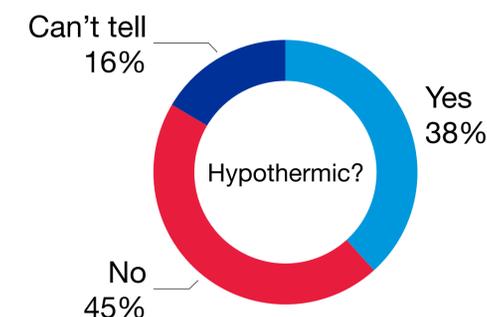


Chart 3: Proportion of patients whose temperature was recorded post-induction



Charts 4 (Left) & 5 (right): Proportion of patients who became hypothermic, further divided by whether or not this was entirely new hypothermia

## Results & Discussion

There is room for improvement, but temperature monitoring is improving. For example, oesophageal thermometers (OT) were first used in 2020 and in 45% of cases over the study period. Temperature control methods were recorded in 38.29% of cases (e.g. heated blankets).

The only pre-existing audit standard was that patients should arrive in ED normothermic. This occurred in 33%; the others were either hypo/hyperthermic or had not had their temperature recorded in the 10 minutes prior to arrival. In 5% of cases (see chart 2) it was not possible to know if a pre-RSI temperature was taken. This could be due to a time having not been recorded for the RSI, a lack of any observations at all on HEMSBase, or temperatures not being linked to a time.

Chart 3 shows the proportion of patients whose post-RSI temperature was recorded (58%); in 22% a temperature was not recorded and in 20% it is not possible to tell from the data. This is due either to times having not been linked to the temperatures, mis-reading of equipment (one case - OT misplaced), or timing of RSI having not been given. 38% of PHEA patients had an episode of hypothermia; in 26% of those, this was new following RSI (see charts 4&5). There were three cases of patients being hyperthermic post-RSI. Only one of these was new.

## Going forward

The project has identified areas for improvement and has led to the commencement of a thermal management quality improvement project. This will include the implementation of a heat loss bundle of care which launched this autumn, a review of the packaging module of the response bags and a re-audit in November.

## References:

1. Faulds M, Meekings T. Temperature management in critically ill patients. *Continuing Education in Anaesthesia, Critical Care and Pain*. 2013. Vol 13 (3) pp75-79.
2. Bain AR, Morrison SA, Ainslie PN. Cerebral oxygenation and hyperthermia. *Frontiers in Physiology*. 2014; Vol 5
3. Langhelle A, Lockey D, Harris T, Davies G. Body temperature of trauma patients on admission to hospital: a comparison of anaesthetised and non-anaesthetised patients. *Prehospital Care*. 2012; Vol 29 (3) pp 239-242