3M Bair Hugger™ Normothermia System

Case study

The effect of anaesthetic room pre-warming on the incidence of inadvertent perioperative hypothermia: a quality improvement project.[1]

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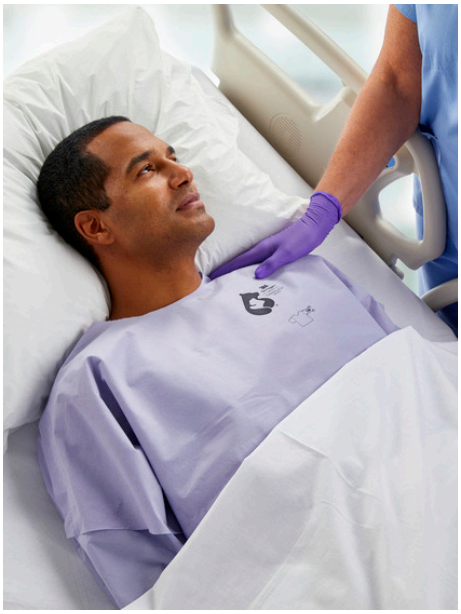
Introduction

Inadvertent perioperative hypothermia (IPH) is defined as a core body temperature less than 36°C.[2] Both regional and general anaesthesia can result in IPH, with the risk increasing for patients with a high ASA grade, undergoing emergency surgery or low BMI.[3]

IPH is a serious complication of surgery which has been linked to infections, shivering, bleeding, adverse cardiac events and changes to drug metabolism.[3] NICE guidelines recommend that all patients are warmed for a minimum of 30 minutes before anaesthesia is administered,[4] however it has been demonstrated that pre-warming for just 10 minutes is effective at reducing hypothermia rates.[5]

A recent quality improvement study, sought to determine whether pre-warming patients in the anaesthetic room had a positive effect on the incidence of hypothermia in urology patients entering the post-anaesthesia care unit (PACU).[1]



3M™ Bair Hugger™ Universal Gown with Thinsulate™ Insulation

Method

34,800
patients since 2017

Urology
patients were found to have the highest IPH

34.9%
entering PACU with a temperature <36°C

Retrospective temperature data was analysed from 34,800 patients (2017–2022). Urology patients were found to have the highest IPH rate, with 34.9% entering PACU with a temperature <36°C.

A plan-do-study-act (PDSA) cycle was used to implement anaesthetic room pre-warming in urology. This consisted of meetings with staff, education on the importance of pre-warming, and an online teaching package on how to use the new 3M™ Bair Hugger™ Universal Gown with Thinsulate™ Insulation which is designed to facilitate pre-warming, in addition to intra-operative forced-air warming.

Patients were warmed pre-induction, whilst inserting lines or establishing spinal anaesthesia. Run charts were used to determine the effect of this intervention on the incidence of IPH.

Results

The study intervention occurred over an 8-week period and included 319 patients with a mean surgical time of 104 minutes. The mean time of pre-warming was 22 minutes.

The incidence of IPH before the project was 40.8%. This decreased to 29.5% during the intervention of pre-warming, which was statistically significant.[1]*

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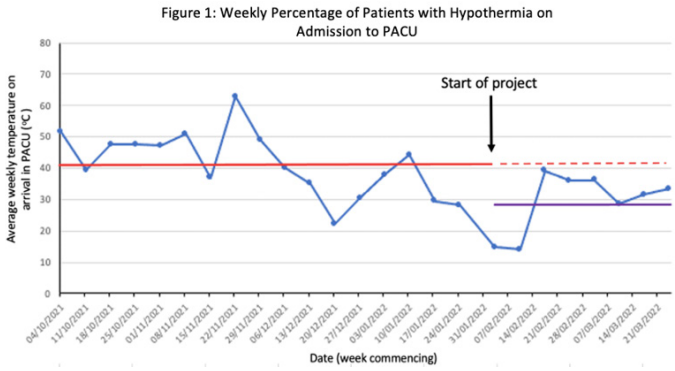

Figure 1. Run chart showing weekly median percentage of patients that were hypothermic (<36°C) on admission to the post-anaesthesia care unit (PACU). The red line shows pre-intervention incidence of hypothermia (40.8%). The purple line shows incidence of hypothermia after the pre-warming intervention (29.5%).[1]

*Run chart theory states that if, following an intervention, a 'run' of eight subsequent measurements lie consistently below the previous median value then the change is deemed to be statistically significant.[6]

Conclusion

This study demonstrates that anaesthetic room pre-warming is successful at **reducing the proportion of hypothermic patients by 11.3%.**[1]

11.3%

References

1 Rona J, Andrzejowski J, Wiles M. The effect of anaesthetic room pre-warming on the incidence of inadvertent perioperative hypothermia: a quality improvement project. *Anaesthesia* 2022, 77 (Suppl.4), 6–44.
2 Torossian A, Bräuer A, Höcker J, Bein B, Wulf H, Horn E. Preventing Inadvertent Perioperative Hypothermia. *Deutsches Ärzteblatt international*. 2015;112(10):166–172.
3 Riley C, Andrzejowski J. Inadvertent perioperative hypothermia. *BJA Education*. 2018;18(8):227–233.
4 National Institute for Health and Care Excellence. NICE Clinical Guideline. [CG65]. Apr 2008.
5 Horn E, Bein B, Böhm R, Steinfath M, Sahili N, Höcker J. The effect of short time periods of pre-operative warming in the prevention of peri-operative hypothermia. *Anaesthesia*. 2012;67(6):612–617.
6 Harrison S. [Internet]. Sheffieldmca.org.uk. 2012 [cited 25 March 2022]. Available from: https://www.sheffieldmca.org.uk/UserFiles/File/Harrison_Run_Charts_an_Introduction.pdf

Disclaimer

3M provided enough Bair Hugger Universal Gowns to prewarm all urology patients in the study.
The study was completed independently, and views are not necessarily reflected by 3M.