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Abstract Title: Can peripheral temperature measurement reflect core temperature in patients undergoing hypothermic surgery? A comparison of 3M™ SpotOn™ temperature stickers to esophageal temperature.

Introduction: The gold standard for temperature measurement for neurosurgical procedures performed under mild hypothermia is an invasive esophageal temperature probe. The 3M™ SpotOn™ temperature monitoring system is a noninvasive skin sticker designed to measure core temperature through zero-heat-flux technology. Our study aims to see if SpotOn™ reflects esophageal temperature during mild hypothermia. Secondly, we plan to evaluate if there are accurate alternative sites for sticker placement.

Methods: This is an ongoing IRB-approved study. Patients had an esophageal temperature probe and SpotOn™ stickers placed over the forehead (standard placement per 3M™), the carotid artery, and the axillary artery. Temperature from all sites was measured continuously during the cooling and rewarming period.

Statistical Analysis: Bland-Altman models for multiple observations per individual and linear mixed effects models were computed in the statistical program “R”.

Results/Data Analysis: Carotid and axillary temperature measurement performed as well as the forehead temperature measurement. All sites correlated reasonably well to esophageal temperature during normothermia and cooling, but were increasingly inaccurate immediately upon rewarming.

Conclusions: SpotOn™ temperature stickers function well over the carotid and axillary artery as alternatives to the recommended forehead site. However, SpotOn™ sticker reliability may be limited in the immediate rewarming period in hypothermic surgery.