P#4

Abstract Title:	**Initial Experience with a Non-invasive Warming Catheter in Burn Patients: Retrospective Analysis to Compare Current Use to a Matched Historical Cohort**
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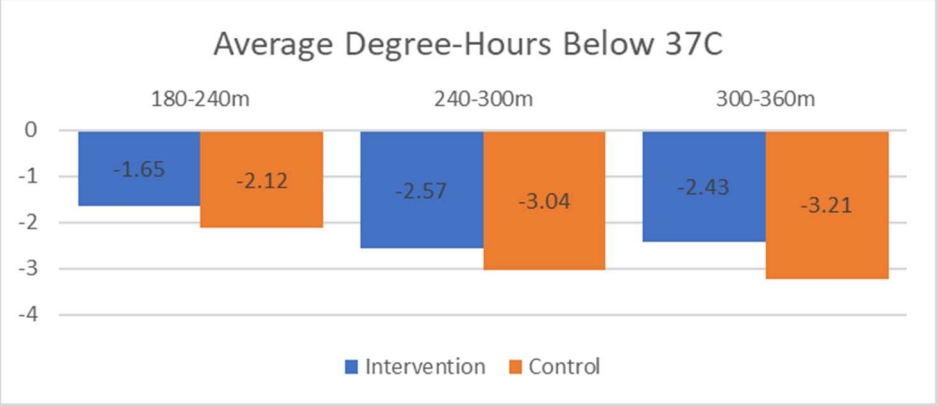
Objective:	Upon completion of the lecture, attendees should be better prepared to: ▪ Determine whether an ETM device maintains normothermia during normal standard of care interventions ▪ Compare and contrast complications that occurs as a result of using an ETM device
Abstract:	**Introduction:** Controlling patient's body temperature remains of major importance for numerous conditions. For example, patients undergoing surgical procedures have reduced blood loss, wound infections, recovery time, shivering burden, myocardial events, and mortality if maintained at normothermia. However, existing methods to warm patients to maintain perioperative normothermia have limitations that result in as many as half of patients undergoing surgery develop inadvertent hypothermia during and/or after their procedure. Because surface covers, such as forced-air warming mattresses, cannot be used to cover a patient requiring exposure for surgery, and because under-body warming is unable to transfer significant heat to the patient without also heating operating staff surrounding the patient, a gap exists in the clinical need to warm complex surgical patients. The aim of this study is to describe initial experience and assess the feasibility and safety of an Esophageal Temperature Management (ETM) device in burn patients being warmed to maintain operative normothermia. Comparison of outcomes will be made to historical controls. Study timeline will be to compare thirty (30) subjects treated in the burn center prior to January 2017 and thirty (30) patients treated in the burn center after January 2017. **METHODS**: This was a retrospective, matched cohort comparative study. Data from patients treated with the EnsoETM from September 2017 through August 2018 during operative procedures were reviewed, and patient temperatures throughout the interventions were compared to matched controls (based on total burn surface area and Baux score) who were not warmed with the EnsoETM. Maintenance of operative normothermia was reported in Degree*Hours and calculated by the following equation: [37°C −Temp below 37°C] × [Hours below 37°C].

RESULTS: An IRB request for exemption, waiver of informed consent and HIPAA waiver prior to reviewing or collecting data. A total of 20 patient records met inclusion criteria and data were extracted for analysis. Ten patients were treated with the EnsoETM, while 10 patients were warmed with only traditional measures (raised OR temperature, forced air or underbody warming devices as available or feasible). In total, 74 surgical procedures were performed; of these, 51 procedures were longer than 3 hours and included in analysis. Patients treated with the EnsoETM demonstrated better maintenance of normothermia with increasing surgical procedure length. Overall, patients in the intervention group were less hypothermic than control (an average of -2.32 Degree*Hours per procedure vs -2.65 Degree*Hours per procedure). When results were stratified by procedure length, the benefits of ETM vs. standard warming methods is more pronounced (Figure 1), despite imbalance in injury severity between groups. No complications from use of the EnsoETM were identified.

Table 1. Patient characteristics.

Group	n	Total Procedures	Total Surgical Time (h)	Avg TBSA(%)	Avg Baux
Esophageal Warming	10	32	119.7	61.4	106
Control	10	42	149.7	50.6	90.

Figure 1. Hypothermia burden between groups for surgical procedures 3 hours or longer.



CONCLUSIONS:

As with any retrospective analysis, many potentially confounding variables are not captured. In our study some temperature readings were missing and required interpolation, details of the warming methods used in the control group were not consistently available, and sources of temperature measurements (Foley, rectal, esophageal, and zero-heat flux thermometry) varied by patient or procedure. Additionally, a larger proportion of control group patients entered the OR febrile (i.e., baseline temperature >38.5C).

Patient warming using an esophageal warming device offers a safe and effective means of reducing the occurrence of inadvertent perioperative hypothermia during major burn surgical procedures. The use of the esophageal warming device could offer the

	additional benefit of reducing room temperature, allowing for a more comfortable operating environment with a reduced risk of sweat contamination in sterile fields. **References and Resources:** [1]. Khan I, Haymore J, Barnaba B, Armahizer M, Melinosky C, Bautista MA, Blaber B, Chang WT, Parikh G, Motta M, Badjatia N: Esophageal Cooling Device Versus Other Temperature Modulation Devices for Therapeutic Normothermia in Subarachnoid and Intracranial Hemorrhage. Ther Hypothermia Temp Manag 2017 [2]. Kalasbail P, Makarova N, Garrett F, Sessler DI: Esophageal cooling and warming during elective non-cardiac surgery. Anesthesia & Analgesia, 2018. [3]. Goury A, Poirson F, Chaput U, Voicu S, Garcon P, Beeken T, Malissin I, Kerdjana L, Chelly J, Vodovar D, Haikel O, Ekherian JM, Marteau P, Vicaut E, Megarbane B, Deye N: Targeted Temperature Management Using The "Esophageal Cooling Device" After Cardiac Arrest (The COOL Study): A feasibility and safety study. Resuscitation 2017, 121:54-61.
Disclosure:	Michael Quinn – No Relevant Financial Relationships to Disclose Robert F. Mullins – No Relevant Financial Relationships to Disclose Shawn Fagan – No Relevant Financial Relationships to Disclose Zaheed Hassan – No Relevant Financial Relationships to Disclose Bounthavy Homsombath – No Relevant Financial Relationships to Disclose Hector Lopez – No Relevant Financial Relationships to Disclose