Benefits of Pre-Operative Passive Warming On Surgical Patients Undergoing Regional Anesthetic Procedures
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BACKGROUND
- Pre-operative patient warming is a key factor to maintaining normothermia throughout the perioperative process.  
- From March 2016 through March 2017, VUH Perioperative Services saw a 54% increase in number of preoperative regional anesthetic procedures (RAP) performed on surgical patients.
- Use of regional anesthetic procedures (RAPs) has been associated with reduced postoperative pain, faster patient recovery, and improved postoperative functional status.  
- Factors such as reduced ambient room temperature, amount and length of time of skin exposure during RAP placement can contribute to development of hypothermia.  

PROBLEM
- VUH Perioperative Services warming protocol calls for pre-operative warming with either active or passive measures.
- Active, forced warm air is the typical method used for pre-operative warming in VUH Perioperative Services.
- At VUH, use of forced-warm air is not feasible during RAP placement due to sterility requirements, patient positioning, and time constraints.
- Patients undergoing pre-operative RAP at VUH require significant body surface exposure placing them at risk for development of hypothermia.

PURPOSE
- Determine if pre-operative passive warming methods will maintain body temperature throughout the perioperative process in patients receiving regional anesthetic procedures at VUH.
- Determine if the passive warming approach contributes to reduced length of patient stay in the VUH Post Anesthesia Care Unit (PACU).

Research Question
- Will application of pre-operative passive warming methods maintain normothermia in patients receiving regional anesthetic procedures?

DESIGN & CONCEPTUAL FRAMEWORK
- Quasi-experimental, non-randomized passive warming trial based on Roy’s Adaptation Model.
- Central focus of the Roy Model is adaptation.
- Five major concepts
  - Person - RAP patients
  - Environment - cool ambient air & prolonged skin exposure
  - Health - normothermia
  - Adaptation - passive warming
  - Nursing - application of warming measures
- This QI project was deemed exempt by VUH IRB.

OUTCOME DATA
- Comparison of tympanic temperatures between warming groups at 4 points in the perioperative process:
  - Admission
  - Hand-off to OR
  - Post-Induction
  - Admission to PACU
- Comparison of length of PACU stay in minutes for RAP patients receiving passive warming as compared to RAP patients warmed according to standard unit protocol

RESULTS
- No difference in mean temperatures was found between groups post-induction or upon PACU admission.
- Additionally, 51.9% of the passive group (n = 28) experienced an increase in temperature from admit to transfer to OR compared to a 48.2% (n = 26) of the retrospective group. (Fig. 1)
- A statistically significant, positive correlation was found between hand-off temperature and admission temperature with age (p = 0.18).
  - As individual age increased, a greater positive difference between admit and hand-off temperatures was noted.
- Passive group averaged a 13.5-minute shorter LOS in PACU than retrospective group. (Fig. 2)

CONCLUSIONS & IMPLICATIONS
- Passive warming methods maintained patient temperatures throughout the perioperative process equally as well as the standard unit protocol.
- Older participants responded better to passive warming measures. As age increased, patient temperature also increased.
- Passive warming measures afford the VUH RAP patient population opportunity to receive benefits of pre-operative warming when previously pre-operative warming in this population was not feasible.
- Passive warming is a suitable, cost-effective alternative when forced-air warming is not feasible. Use of passive measures at VUH could result in a cost savings of over $7 per RAP patient.

REFERENCES