Prompt Temperature Assessment in Trauma Patients

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Hypothermia, defined as a temperature of less than 35 degrees Celsius, is a common finding in trauma patients requiring stabilization in the Emergency Department (ED). Trauma patients in hypovolemic shock quickly lose their ability to generate heat effectively. Environmental exposure in the process of extricating, transporting, and exposing during evaluation further contributes to this impaired thermoregulation, which worsens hypothermia.

This temperature dysregulation is clinically significant as the presence of hypothermia, in association with “The Lethal Triad” of coagulopathy and acidosis, contributes to mortality in the trauma patient and is associated with worse outcomes [1]. Additionally, hypothermia contributes to mortality through decreased cardiac contractility, dysrhythmias, and a diminished inflammatory response [2].

Due to this clinical significance, temperature acquisition and documentation (and implied recognition of hypothermia and initiation of rewarming measures) have become a targeted measure in reducing mortality in trauma patients. In fact, the American College of Surgery (ACS) guidelines for standard trauma care dictate that a temperature must be obtained within 30 minutes of arrival for ≥ 90% of trauma patients [3].

At Hennepin County Medical Center’s (HCMC) Emergency Department, temperature documentation has been consistently below the ACS standard. In the past five years, prompt documentation of temperature in trauma patients has been present in approximately 70-80% of patients. We hypothesize this is due to historical inconsistence of obtaining rectal temperature in pediatric patients, lack of real-time documentation, and lack of awareness of the importance of normothermia in trauma patients.

It is our goal to improve temperature documentation to the standard of >90% within 30 minutes of arrival to the emergency department for all tier 1 and tier 2 trauma patients to meet ACS standards by the end of 2025. We have developed a multidisciplinary, tiered approach focused on education and targeted reminders in order to ensure prompt and appropriate documentation.

Additionally, we have sought to develop guidelines for when and how to intervene when trauma patients present with hypothermia in order to streamline interventions in a busy stabilization room. In January 2025, temporal thermometer probes were introduced to the HCMC ED Stabilization Room and instructions for use were distributed to providers and nurses in the department.

In February 2025, concise guidelines for temperature documentation and treatment actions for hypothermic patients were created. These were translated into an infographic which was distributed in March 2025 through a formal presentation, email, and posters displayed in each ED stabilization bay.

Beginning late March 2025 and moving forward, targeted reminders will be sent to nursing staff of pediatric patients without appropriately documented temperatures to provide constructive feedback and reinforce education. We are still working to develop the bandwidth to provide similar targeted reminders for our adult trauma patients.

To assess efficacy of interventions, monthly data on trauma patients is being collected. Notably, we have seen a reduction in undocumented temperatures in both pediatric and adult patients since initiation of this quality improvement project. Though data collection will continue, our hope is that we will continue to see trends toward improvement as this project continues.

Through our interventions, we hope to ensure that the HCMC ED meets the quality standards required for a level one trauma center. Additionally, by emphasizing the importance of temperature documentation and hypothermia intervention, we will decrease morbidity and mortality rates of our high-risk trauma patients.

Once we prove our interventions have achieved the desired improvement, further quality improvement work could focus on assessing hypothermia management in the stabilization bay. Additional studies could identify the promptness and utility of interventions performed after hypothermia was correctly identified in hypothermic trauma patients.

References

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