Assessing Temperature and Detecting Fever in the Pediatric Hematology/Oncology and Bone Marrow Transplant Population Using the Temporal Artery Thermometer (TAT)

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Purpose: The purpose of this study is to assess how temporal artery thermometers (TAT) and oral/axillary temperature measurements compare in detecting temperatures of 38.3 degrees Celsius and greater in the pediatric hematology/oncology patient population.

Background/Significance: Detecting fevers in the pediatric hematology oncology patient is critical to determining treatment. In turn, detecting an accurate fever as soon as possible via a sensitive temperature tool is imperative to providing effective patient treatment. Current practice in pediatrics is to use oral or axillary methods to assess temperature. Temperature measurement via the rectal route is often considered an ideal method because it more closely reflects core body temperature in comparison with other routes (Moore et. al, 2015). However, rectal temperature measurement is not safe in the pediatric hematology/oncology population due to the increased risk of rectal perforation, transmission of pathogens, and infection (Carr et. al, 2011). Various studies indicate that TAT is an adequate replacement when rectal temperatures cannot be used (Bahorski et. al, 2012; Batra & Goyal, 2013). Also, TAT has been shown preferable by patients and families as it avoids physical discomfort (Reynolds et. al, 2014). Specific aims of this study include: 1.) assess the level of agreement between temporal artery thermometer (TAT) temperature measurements to oral/axillary routes during febrile episodes and 2.) assess ability of TAT to detect fever in the pediatric hematology/oncology population as effectively as oral/axillary methods outlined in standard fever thresholds.

Methods: During this study, when a Hematology/Oncology patient has a temperature measurement of 38.3 degrees Celsius or greater as detected initially a temporal artery thermometer (TAT), the RN or CNA will check patient’s temperature with an oral and/or axillary thermometer in addition. Thereafter, each time a temperature measurement is required, the provider will assess using both the TAT method and the oral or axillary method until the patient’s temperature is no longer 38.3 degrees Celsius or greater. At any given time when a temperature check is required, the two temperature methods must be taken no greater than 15 minutes apart.

Results: Work-in-progress. A febrile episode is defined as the unit of measurement for this study. A maximum of 3 febrile episodes per patient will be included in the sample. Assuming approximately 3 patients per day on the Hematology/Oncology/Bone Marrow Transplant Acute Care Unit experience a febrile episode, in 3 months, there would be approximately 270 febrile episodes. This would produce 80% power to produce a two-sided 95% confidence interval with a width of 0.1 if the sample agreement is 0.70.

Conclusions: We do not have results of this study yet, however, the implications of this study will help inform temperature-taking modalities at our hospital. Depending on what we find, we may adjust temperature thresholds for treating fever when thermometry was assessed using TAT.

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