

Congruity of Tympanic Membrane and Oral Electronic
Temperature Measurements

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Abstract

The timely and accurate assessment of body temperature is a routine component of the nursing evaluation of all patients admitted to the Emergency Department. Many diagnostic and treatment modalities are based on the patient's temperature. Oral temperature measurement is the most commonly used method in the Emergency Department setting. Factors such as ingestion of hot and cold liquids, respiratory rate, smoking, technique, and open mouth breathing interfere with the proper oral measurement of body temperature. Recently, an infrared tympanic membrane thermometer has become available. The device is easy to use and provides a nearly instantaneous readout. It is both non-invasive and non-traumatic to the patient. Conceptually, the tympanic membrane is an excellent site for measurement of core temperature, since it is readily accessible and receives its blood supply from a portion of the same vasculature that perfuses the hypothalamus, which contains the temperature-regulating center. The purpose of this proposed study is to compare the relationship between digital infrared tympanic membrane thermometer temperatures and digital electronic oral thermometer

temperatures in adult patients in the Emergency Department. The sample consisted of 30 adult patients between the ages of 18 and 65, admitted to the triage area of an Emergency Department. Tympanic temperatures were measured with a First Temp infrared tympanic membrane thermometer and oral temperatures were ascertained utilizing a Diatek Model 600 electronic thermometer. The order of the tympanic membrane temperature measurement versus the electronic oral temperature measurement was randomized. Temperatures from both sites were performed within 5 minutes of each other. Patients in acute distress or with oral, ear or nasal pathology or trauma were excluded from the sample. Information regarding age, sex, recent ingestion of liquids or smoking was also collected. The average temperature readings were analyzed using a 2 x 2 mixed analysis of variance (ANOVA). Findings indicated no difference between the average temperatures obtained using the tympanic membrane thermometer and those obtained using the digital electronic oral thermometer, in adult patients in an Emergency Department setting. The results of this study comparing temperature assessment methods has implications for nursing practice. It provides data

regarding two thermometry techniques that nurses can utilize to determine accurate temperature measurements. Further research in thermometry needs to be focused on site comparisons in infants and the elderly, accuracy of methods comparing core and peripheral sites, as well as methods in regard to patient comfort, nursing time and costs.