

Temporal Artery Thermometry
Independent Clinical Studies and Reviews

Accuracy of a noninvasive temporal artery thermometer for use in infants

Greenes DS, Fleisher GR.
Division of Emergency Medicine, Boston Children's Hospital, Harvard Medical School

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"TA thermometer is more accurate than the tympanic thermometer in infants, and it is better tolerated by infants than rectal thermometry."

"TA temperature was significantly closer to equivalence with rectal temperature than was tympanic temperature."

"Using the McNemar test, we found the TA thermometer to be significantly more sensitive than the tympanic thermometer for detecting rectal fever (P.001) and high rectal fever (P=.004)."

"We have found the TA thermometer to be significantly more accurate than the tympanic thermometer for predicting rectal temperature in infants. The TA thermometer is significantly more sensitive than the tympanic thermometer for the detection of rectal fever in infants. In addition, the TA thermometer is better tolerated by patients than the rectal thermometer."

"It is possible, therefore, that in cases with large discrepancies between TA and rectal measurements, the TA thermometer may be correctly reflecting a rapid change in core body temperature, whereas the rectal temperature is lagging behind. For instance, if antipyretics had been given several minutes before the temperatures were measured, the TA temperature might accurately reflect a lowered core body temperature, while the rectal temperature still reflects the preceding fever."

Interview of David Greenes, M.D.

Boston Children's Hospital and Harvard Medical School.

National Public Radio: All Things Considered Radio Program, April 11, 2001

Dr. Greenes: What the thermometer does is, it has what is called a thermistor [thermopile], a unit that is measuring the temperature instantaneously as it is sweeping along the forehead. Over the one or two seconds that you sweep it on a child's forehead, it probably measures her temperature several hundred times. The highest temperature that it finds along its path is the temperature at the Temporal Artery which is an artery very close to the skin right along the side of your head right in the region of the temple. The temperature in that artery is generally believed to be a good reflection of your core body temperature the temperature at the level of your heart.

Dr. Greenes: We measured the temperature with each of these two thermometers on children and compared the reading to the rectal temperature, which is generally considered the standard. Essentially we found that by every measure that we used, the temporal artery thermometer was more accurate than the tympanic.

Interview of Mark D. Widome, M.D.,

Pennsylvania State Milton S. Hershey Medical Center Children's Hospital and Penn State Medical College.

NBC Today Show with Connie Chung, date, 2001

Dr. Widome: This is brand new, not yet available for consumers. This will measure temperature at the temporal artery. It's neat! It's rocket science!

Non-Invasive Infrared Temperature Assessment of the Temporal Artery for Core Temperature Determination in Premature Neonates

Vladimir F. Burdjalov, Adrienne Combs, Sharon Nachman, Stephen Baumgart

Neonatal & Infectious Disease Divisions, Departments of Pediatrics and Nursing, SUNY, Stony Brook, NY

Abstract Preview: *American Pediatric Society and the Society for Pediatric Research*, May 1, 2001

"Infrared scanned temperature over the temporal artery probably better reflects true core temperature in premature babies, and is less invasive than deep rectal or esophageal temperature monitoring. Moreover, serial temperature assessments during re-warming and incubation are easy to perform."

Review Comments by Barry W. McCraw, M.D.

St. Mary's Regional Medical Center, and Millard Henry Clinic Russellville, AR

"Our thermometer continues to be a hit and even the talk of the town!"

"Other clinics have heard about our "spaceage" thermometer. Even our staff nurses from other departments in our multi-specialty clinic love to use "our" thermometer. "It is much easier to use than the ear temp probes; no handling of the ear, which typically scares a child, is a great benefit."

"I have been very impressed with the accuracy of the unit. I would highly recommend it to anyone."

A Comparison of Measurements from a Temporal Artery Thermometer and a Pulmonary Artery Catheter Thermistor - Preliminary Results

DL Carroll, RN, PhD, C Finn, RN, S Gill, RN, J Sawyer, RN, B Judge, RN, MSN

Presented at The Massachusetts General Hospital, Boston, MA 2001 Nursing Research Day, May 9, 2001

"Inferior thermometry increases the risk of morbidity and mortality, and increases cost. The readings from a the thermistor of a pulmonary artery (PA) catheter is considered the 'gold standard' as these readings from the pulmonary artery reflect the temperature of the deep tissues of the body. The use of a PA catheter requires invasive insertion with potential risks and complications. Therefore in seeking out improved thermometry, the temporal artery infrared thermometer has recently been developed."

"There were 130 subjects with a mean age of 65 years, 64% male. Sixty-five percent of the subjects were post-cardiac surgery, with 41% having had coronary bypass surgery. The primary admitting diagnosis was coronary artery disease. Forty-seven percent were felt to be in the warming stage after hypothermic cardiac surgery, with 22% actually diaphoretic. PA catheter thermistor readings were compared to temporal artery (TA) readings at the three locations to assess for differences."

"There were no statistically significant differences between the PA thermistor reading and the TA temperature when taken both on the forehead and behind the ear, the measurement in accordance with the manufacturer's recommendation, or when using just behind the ear."

"There was no correlation in these readings to oral temperature (n=20)."

"Therefore it appears on this preliminary analysis that the temporal artery thermometer is as accurate as a PA thermistor when utilizing the technique of forehead and behind the ear. This technique should be promoted as the most accurate method to collect temporal artery temperature."

New Products for Pediatrics: 1999

Andrew J. Schuman, M.D.
Adjunct Professor of Pediatrics at Dartmouth Medical School, and Hampshire Pediatrics, Manchester, NH

Contemporary Pediatrics, Dec 1999

"Exergen Corp., based in Watertown, MA, has long been an innovator in the development of infrared thermometry

technologies. This year the firm introduced a family of clinical thermometers that measures temperature not in the ear canal, but from the temporal artery as it perfuses the skin of the forehead and nearby tissues.

Exergen's temporal artery thermometers use dual scanners, one that measures ambient environmental temperature and another that gauges the arterial temperature of the patient's skin. The thermometers record over 2,000 readings per second. An internal "heat balance" algorithm determines the arterial temperature, which is displayed on the unit's LED screen.

Clinical studies have shown that the devices are extremely accurate."

High Fever, Meet High-Tech Thermometer: A temporal artery gauge, which detects heat when swept over the forehead, is more precise than many methods.

By Shari Roan, *LA Times Health Writer*, April 9, 2001

"A study published last month in the Archives of Pediatric and Adolescent Medicine found that the temporal artery thermometer detected fevers more often than the popular tympanic thermometer, which is placed in the ear. The method may even prove to be better than taking a rectal temperature, which has been considered the most practical method of getting an accurate reading."

"The new technology 'has been carefully thought out, and it's going to be useful,' says Dr. Keith Powell, chairman of the department of pediatrics at Northeast Ohio Universities College of Medicine."

"Thus, researchers have been pursuing a more precise and convenient method. 'There really is a need for something that is quick, accurate, noninvasive and nonirritating,' says Dr. Gary Fleisher, a temperature expert at Children's Hospital, Harvard Medical School, and the lead author of the new study."

"If people are currently using an ear thermometer, the temporal artery thermometer is more accurate and easy to use," says Fleisher.

"The method works well, researchers say, because the temporal artery, located in the forehead, is directly connected to the heart through the carotid artery. The temporal artery is also close to the skin's surface."

For full papers, abstracts, transcripts or latest studies, contact:
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