PROCEDURE INFORMATION FOR USING A TYPANIC THERMOMETER

Tympanic thermometers have been available for over 10 years, yet many health care providers still question their accuracy. The truth is that tympanic thermometers may be more accurate than traditional thermometers and have other advantages too. For example, they’re easy to use, they produce readings in a few seconds, they’re suitable for patients of all ages, they virtually eliminate the risk of cross-contamination and they’re cost effective. So why the questions? Many health care providers don’t understand how these devices work. What’s more, they may remember early unflattering studies that reflected a misunderstanding of the technology.

THE CORE OF THE MATTER

Core body temperature—the temperature of central circulation and organs is the ultimate goal of temperature measurement. Core body temperature can be directly measured via pulmonary artery catheters, bladder catheters or esophageal probes. The great advantage a tympanic thermometer has over these options is that it measures core temperature noninvasively.

A tympanic thermometer measures the infrared energy that naturally radiates from the tympanic membrane and surrounding tissues. A microprocessor analyzes, converts, and displays the temperatures within a few seconds. Because the tympanic membrane shares the blood supply with the hypothalamus, the body’s temperature-control center, it is a good source for core temperature readings.

Because of this technology, tympanic thermometers reflect core body temperature better than other thermometers used at a peripheral site. Peripheral temperatures can be misleading for several reasons:

- Oral temperatures are influenced by thermometer placement, recent ingestions of hot or cold fluids and rapid breathing.
- Rectal temperatures may vary because of poor blood supply to the area, the insulating effects of stool and the presence of heat-producing microorganisms.
- Axillary temperatures are affected by vasodilation and constriction caused by the body’s response to temperature changes. Thermometer placement and room-air temperature also affect readings. When a patient has a normal body temperature, a peripheral temperature gives you a good estimate of core temperature. But if your patient’s temperature is rising and falling rapidly, the body’s thermoregulatory system will affect peripheral sites and temperatures can significantly lag behind a true core temperature. In this situation a tympanic thermometer has a clear edge.

HOW TO INSURE ACCURACY

- Always use a probe cover with the thermometer or you might get a higher-than-normal reading.
- Use a new probe cover for each measurement. Besides being hygienic, this insures that the thermometer’s optical pathway will be unimpeded by dust, fingerprints and earwax, which can all lower temperature readings.
- Make sure your patient has been indoors for at least 10 minutes before you take his temperature, so that outside-air temperatures won’t skew readings. Also, make sure the patient hasn’t been lying on his ear, which could artificially warm it.
- If a reading seems too low, replace the probe cover and repeat the measurement. Make sure that you use the manufacturer’s recommended technique and that the thermometer is in the desired mode.
- If the reading still seems low; make sure that the lens and probe cover are clean and intact. If the lens is dirty, clean it according to the manufacturer’s instructions. Retake the temperature, paying close attention to technique.

HOW TO TAKE A TEMPERATURE WITH A TYPANIC THERMOMETER

- Gather a tympanic thermometer and new probe covers. Check that the lens is clean and intact. Select a mode - core, oral, rectal or unadjusted. When you set it on the oral temperature mode, for example, the reading will correlate to (but not always duplicate) an oral temperature taken with a glass thermometer. Slide a probe cover over the probe.
- Position your patient so you can view his/her ear canal easily. Then pull his/her ear back and up to straighten the ear canal’s natural curve and provide a clear path to the tympanic membrane as shown. If your patient were under 1 year old, however, you’d pull the ear straight back without pulling it up.
- Place the probe in your patient’s ear, aiming it toward the tympanic membrane. Insert the probe until it seals the ear canal.
- Press the activation button on the thermometer and wait until the time specified. When you have a reading, remove the probe from your patient’s ear and dispose of the cover. Document the temperature.