Committee (2015) outlines concerns regarding the safety and accuracy of tympanic temperature measurement in newborns because of the size of a newborn's external ear canal relative to the size of the thermometer probe. To ensure accuracy, the probe, which may be up to 8 mm (0.3 inch) in diameter, must be deeply inserted into the ear canal to allow orientation of the sensor near or against the tympanic membrane. At birth, the average diameter of the canal is just 4 mm (0.16 inch); at 2 years old, it is just 5 mm (0.2 inch). The Canadian Paediatric Society concludes that current infrared tympanic thermometry lacks sufficient safety and precision to meet clinical needs for use in newborn infants and children younger than 2 years old.

Infrared axillary and digital thermometers are used in many neonatal units because they give rapid readings and are easy to clean; studies demonstrate their usefulness in well, full-term newborns. Jones, Kleber, Eckert, et al (2003) compared rectal temperatures of infants younger than 2 months old with calibrated digital thermometers and mercury glass thermometers; this study of 120 infants found that the digital thermometers measured a higher temperature (mean average of 0.7° F; range, 0° to 1.6° F) than the mercury glass thermometers. The researchers concluded that the error in measurement was attributable to the digital thermometer used. Smith, Alcock, and Usher (2013) conducted an extensive review of the literature on temperature measurement in term and preterm infants. These researchers concluded that the most commonly used route when using digital and electronic thermometers for temperature measurement is the axillary route.

Advantages of digital thermometers in neonatal care include relatively easy readability by parents and caretakers in the home, improvement of discharge planning effectiveness, and decreased risk of breakage and associated complications compared with glass thermometers.

Temporal artery thermometers (TATs), in which a battery-powered instrument is gently slid across the newborn's forehead, are available for use in the general pediatric population. Beginning research in the neonatal population suggests TAT may be a reasonable method for newborn temperature measurement. Haddad, Smith, Phillips, et al (2012), in a study of healthy newborns in a mother-baby unit, compared TAT with axillary