

Metheny, Stewart, Smith, et al, 1999; Westhus, 2004).

Carbon Dioxide Monitoring

- CO₂ monitoring is a reliable method to determine incorrect tube placement in the respiratory tract; it requires a capnograph monitor (Ellett, Croffie, Cohen, et al, 2005; Metheny and Stewart, 2002; Metheny, Stewart, Smith, et al, 1999).

Gastric Auscultation

- Auscultation as a verification tool is reliable only 60% to 80% of the time and should not be used without additional methods (Metheny, McSweeney, Wehrle, et al, 1990; Neumann, Meyer, Dutton, et al, 1995).
- Using aspirate and non-aspirate NG tube placement verification methods in combination increases the likelihood for accurate NG tube placement to 97% to 99%, similar to the radiologic chest radiography gold standard of 99% (Ellett, Croffie, Cohen, et al, 2005; Metheny and Stewart, 2002; Metheny, Reed, Berglund, et al, 1994; Metheny, Reed, Wiersema, et al, 1993; Metheny, Stewart, Smith, et al, 1999; Neumann, Meyer, Dutton, et al, 1995; Phang, Marsh, Barlows, et al, 2004; Westhus, 2004; Society of Pediatric Nurses, 2011).

Apply the Evidence: Nursing Implications

There is **good evidence** with **strong recommendations** that a combination of verification methods to confirm NG tube placement will reduce the required number of x-rays in children (Guyatt, Oxman, Vist, et al, 2008; Society of Pediatric Nurses, 2011). These methods include pH testing and visual inspection of the pH aspirate. There is also good evidence that improving the accuracy of predicting NG tube length before insertion will enhance the precision of successful NG tube placement. Auscultation is used in combination with other NG tube verification methods.

Quality and Safety Competencies: Evidence-Based Practice*