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Title: Treatment of preterm infants with high-flow nasal cannulae: A review of the evidence

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Body: Background: High-flow nasal cannulae (HFNC) are gaining popularity as a form of non-invasive respiratory support for preterm infants, and are proposed as an alternative to nasal continuous positive airway pressure (NCPAP) in a variety of clinical situations. Objectives: We critically examined the published evidence for the mechanism of action, efficacy and safety of HFNC as a treatment for preterm infants. Methods: Internet-based literature search for relevant, original research articles on use of HFNC in preterm infants. PubMed, Medline, and the Cochrane Library were searched, search terms [high flow OR high-flow] AND nasal cannula(e), without language restriction. Results: The search produced a total of 73 articles; 15 studies were included in the review. Distending pressure generation from HFNC increases with increasing flow rate and decreasing infant size, and varies according to the amount of leak around the prongs. HFNC may be as effective as NCPAP at improving respiratory parameters such as tidal volume and work of breathing in preterm infants, but perhaps only at flow rates above 2 Litres/minute. Only four published randomized controlled trials (RCTs) of HFNC use in preterm infants were found; only two of these compare HFNC to NCPAP, and all are small. Based on the current, limited evidence, HFNC appears to be inferior to NCPAP as post-extubation support, and ineffective when used to wean from NCPAP. There are no RCTs of HFNC as a treatment for early respiratory distress. Conclusions: The efficacy and safety of HFNC in preterm infants remain to be determined, and further RCTs in the settings of primary support from birth, post-extubation support, and weaning from NCPAP are required.