decreasing the pain associated with heel punctures in preterm and full-term infants; however, the exact dose range that proves optimal effectiveness varies among studies (Stevens, Yamada, Lee, et al, 2013). Evidence indicates that as little as 0.05 to 0.5 ml of a 24% oral sucrose solution is effective in decreasing pain in full-term and preterm infants (Stevens, Yamada, Lee, et al, 2013). The best analgesic effect is achieved when sucrose is administered 2 minutes before the painful procedure with a pacifier or syringe and is repeatedly administered in small amounts (i.e., 0.05 to 0.5 ml) at 2-minute intervals throughout the painful procedure. The effect appears to begin at 2 minutes and lasts about 4 minutes, thus analgesic effect may wane if procedures are prolonged (Stevens, Yamada, Lee, et al, 2013). A number of commercially available oral sucrose solutions now exist. When these are not available, the pharmacy may mix an oral sucrose solution to ensure a clean product. Strict attention must be paid to aseptic technique with this method to prevent contamination of the solution and subsequent problems.

Breastfeeding is correlated with pain relief in full-term newborns undergoing painful procedures, as demonstrated by reduction in infants' crying time and reduction in pain scores, but breast milk given by syringe has not shown the same efficacy as breastfeeding itself (Shah, Herbozo, Aliwalas, et al, 2012). Comparison of sucrose with breastfeeding has produced mixed results, with some authors reporting superior pain relief with breastfeeding (Codipietro, Ceccarelli, and Ponzone, 2008), and some concluding similarity of effect when comparing sucrose to breast milk (Simonse, Mulder, and van Beek, 2012). In the latter study, however, small groups of late-preterm infants (LPIs) were provided with breast milk either by direct breastfeeding (n = 23) or by bottle (n = 23) and were compared with LPIs who received sucrose. Thus, it is difficult to determine optimal pain prevention treatment when comparing breastfeeding with sucrose and more research is needed.

In a small randomized double-blind prospective study of infants younger than 37 weeks gestation, the combination of sucrose and the eutectic mixture of local anesthetic (EMLA) cream demonstrated higher analgesic effect than sucrose alone during venipuncture (Biran, Gourrier, Cimerman, et al, 2011).

Nonpharmacologic strategies unrelated to feeding have also