



## Clinical Research Trial of Bottle Nipples: Choosing the Best Nipple for the Individual Neonate

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Not every bottle/nipple works for every baby but making frequent changes of feeding method is not helpful either. This was the premise for our bottle trial. By identifying bottles/nipples that would work best in specific situations and modeling the practice of using a consistent feeding plan, we hoped to change the feeding practices in our unit and improve feeding outcomes. In 2007, the Feeding Team (Occupational and Speech Therapy) and nurses in the NICU at Golisano Children's Hospital at Strong decided to conduct a bottle/nipple trial. Goals of the trial included: (1) to decrease in the over-use of specialty bottles for mild feeding issues, (2) to find nipple choices that provided more consistent feeding experiences, and (3) to provide an opportunity to educate staff on how nipple choices can affect infant feeding skills. Through collaboration on this clinical trial, the occupational and speech therapists also hoped to educate the NICU nurses about the role of the Feeding Team.

### Procedure

At the initiation of the trial the NICU stocked the nipples primarily Abbott nipples and a couple cleft palate babies. The first stage of the trial was to identify the bottle/nipples to be used. The Occupational Therapist researched varieties of bottles and nipples and set up a vendor fair where nurses and therapists were encouraged to meet with vendors, trial bottles in the clinic setting, and provide feedback on each feeding system. The bottle/nipples that were selected for the trial were Evenflo Comfi, Dr. Brown's, Bionix, Second Nature and Enfamil.

The next stage of the trial was the formation of a group of NICU Nurses to assist the therapists with trialing the selected bottles/nipples and getting feedback. These nurses were educated on the features of each nipple, the possible benefits of each nipple and the process for entering an infant in the trial.

The third stage of the trial was to assess bottles/nipples in a trial using nurses' feedback. Nurses who cared for infants in the trial were encouraged to provide feedback on how the bottle worked and whether it was better than what was currently used in the NICU. At approximately 24 hours into the trial, the Occupational Therapist followed up with parents and nurses of the entered infants to answer questions and get verbal feedback. All of this data was then entered into a spread sheet and analyzed for trends.

### Results

**Bionix Controlled Flow Baby Feeder** bottles are a complex institutionally available feeding system that adjusts flow from 0 to 5. None of the infants who used the bottle were receptive to the nipple with tube through the center. This feeding system has multiple pieces to wash and reassemble, as well as the least accessible for families to purchase.

**Dr. Brown's Bottles** are a commercially available bottle advertised for use with infants with gas or reflux. The level 1 (slow flow) nipple, with a consistent slow flow and minimal free dripping, was easier for some preemies to handle compared to the other nipple choices. Dr. Brown's nipples/ bottles are silicone and more similar to the pacifiers used for the NICU infants. Staff were pleased with the fact the bottle/nipples were easily accessible in many local stores and that the nipples come in levels preemie to level four.

An unanticipated result in using the Dr. Brown's system was a better ability to independently pace infants who gulped and fed very quickly. This resulted in a more reasonably timed and less stressful feeding for the infant.

Some concerns about the Dr. Brown's bottle/nipple centered on measuring the amount consumed, the size/shape of the wide-mouth bottle and number of pieces in the system. Since this feeding system lacks the ability to measure amounts less than 1 ounce, providing and measuring small volumes was difficult. Because the Dr. Brown's bottle is made of 4 pieces cleaning and reassembly before and after each feeding is more labor-intensive.

**Mead-Johnson Nipples** are a complementary product with formula purchase for our institution but are not available in most local stores. Mead-Johnson nipples were found to be similar to the Abbott nipples that were previously being used. Both of these nipples did not have consistent flow and both dripped spontaneously. The crosscut nipple was found to be useful when an infant is receiving formula with multiple additives or thickener.

**Evenflo Comfi Nipples** are commercially available and are in many local stores. The trial results showed that these nipples were most appropriately used with infants with a poor seal and leakage as well as those who need a no drip nipple because of long rest breaks. However, some staff identified that lack of drip can be a problem for some infants. Since there is no drip to remind infants to continue/initiate suck, they must work to keep formula flowing. Evenflo nipples are silicone, a familiar material to NICU infants who use silicone pacifiers. Parents appreciated that these nipples can be used on most bottles.

**Haberman Feeder** is a commercially available bottle that can be rotated to adjust the flow or squeezed to facilitate the feeding. Both staff and parents found the assembly challenging and frustrating because of the number of pieces. Although commercially available, the system may not be easily accessible in stores and is more expensive compared to other bottles.

**Mead Johnson Cleft Feeder** is a bottle/nipple system manufactured for infants with craniofacial abnormalities. This system has either a long thin nipple or a long flat nipple and a soft plastic bottle that can be squeezed to facilitate flow during feeding. At times nursing staff found this bottle hard to squeeze and recommended that parents practice with it prior to using it with their infant. This is a less expensive option than the Haberman and has fewer pieces so that assembly and care are easier.

**Pigeon** is an institutionally available bottle that is designed for infants with cleft palates. The trial found that it was most appropriately used on infants with a neurological impairment who need increased stimulation. The large, soft, non-drip nipple provides stimulation to the roof of the mouth while the soft underside makes it easy for infants to create milk transfer. The multiple pieces that need to be washed and reassembled made it less favorable for staff. Both nurses and parents were concerned about the lack of accessibility in local stores and that the bottles came with Japanese instructions rather than English.

**Second Nature** is manufactured for breastfed infants because the way it releases milk is similar to the human breast. The nipple head is flat with multiple holes to release milk more naturally. None of the infants who trialed it were receptive to its shape, therefore Second Nature was not found to be a useful bottle in our setting.

**Abbott Nipples** are complementary with formula purchase for our institution and are not available in local stores. Abbott standard nipples are equal to the Mead-Johnson standard nipples. Abbott nipples have inconsistent flow between nipples and they tend to drip/free-flow when infants stop sucking. Both the preemie and Special Care nipples were found to have too-fast a flow for most infants in the trial. Their NUK/orthodontic nipple worked well for some infants who exhibit limited cupping of the tongue during sucking and those who required more stimulation to the roof of the mouth. However because the Abbott NUK/orthodontic nipples are not shaped the same as the commercially available NUK nipples the transition to home was difficult.

## Summary

Based on the results of the trial, the unit decided to purchase a supply of Dr. Brown's and Evenflo nipples which would be kept in a restricted area for distribution by the Feeding Team. It was recommended that in addition to keeping the new bottles restricted that the Haberman and Pigeon bottles also be pulled from the supply room and only be accessible through the Feeding Team. The Mead Johnson Cleft Palate Feeder remained in the supply room to be used for those infants with cleft palates without a feeding consult.

## Follow up

Two years after the trial was completed, the Feeding Team reviewed the results and the current status in the NICU. The Bottle Resource Group was no longer active in the unit but some members continue to consult as resources regarding feeding. In addition the Feeding Team noted that they were still receiving more referrals than prior to the trial and that staff consulted the feeding team to problem solve when making feeding choices. Dr. Brown is the most commonly used specialty bottle and the use of the Haberman bottle has dropped off significantly.

During this time the unit completed a second trial to look specifically at the Enfamil slow flow nipples. It was found that these were a better match for many of our preemies who were learning to feed orally and the decision was made to make these available to staff in the supply room. A series of educational emails and posters was created to facilitate the appropriate use of slow flow nipples and consistency when feeding.

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### About the Author:

Meghann Rose, a graduate of Keuka College, is a practicing pediatric Occupational Therapist at Strong Memorial Hospital-Galisano Children's Hospital in Rochester, NY. She works primarily in the NICU where she specializes in feeding, development, splinting, and brachial plexus injuries. Meghann is also a member of the NICU developmental care committee, the brachial plexus clinic and acts as a feeding consultant to the pediatric GI clinic. Meghann is also a loving wife and mother of her 2 children.

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