

Does Caffeine Use Support Suck/Swallow/Breathe Coordination at Breast and Bottle, and Lead to an Earlier Discharge?

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Do premie babies need their “cup of coffee” each day to improve feeding skills at breast or bottle when they are adjusted to 34 weeks gestation or above?

Caffeine is a common pharmacologic treatment for apnea, and for extremely premature infants who are born at 24, 25, 26 weeks gestation,¹ continuing caffeine may be just what the doctor ordered. Just like you and I need our coffee in the morning to function, does an extremely premature infant benefit from their “coffee” through their daily dose of caffeine through the adjusted age of 34-37 weeks? This is the time they are working on coordination of suck/swallow/breathe, improved intake and maintaining stable vital signs during feeding experiences at the breast or bottle.

Research shows that caffeine affects respiration in the following ways: increased minute ventilation, improved carbon dioxide sensitivity, decreased periodic breathing, and decreased hypoxic depression of breathing.²

If a baby maintains the intervention of caffeine while setting the foundation for feeding skills, would they be able to maintain stable vital signs, improve organization of behavior, and improve intake in a shorter amount of time? Therefore, decreasing time spent in the hospital?

The literature also shows that caffeine is safe and effective, but the therapeutic window for use has not been established. Eichenwald³ suggests that a baby be free of apnea/bradycardia events off positive pressure for five to seven days or at 33-34 weeks PMA. But could the baby continue caffeine support while



Infant bottle feeding.

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working on suck/swallow/breathe coordination at breast and/or bottle, which may begin around 34 weeks PMA? If babies are given the support of caffeine during this time, when an additional activity, such as breast and bottle feeding, is being presented, it may improve the positive experience of feeding and lead to improved intake and the main goal of full oral feeding for discharge home.

The transition to oral feeding requires that a baby demonstrates physiological stability. To assist the infant, we need to understand how they maintain optimal oxygenation during oral feeding and how they can self-regulate their oxygen status.⁴ Swallowing momentarily interrupts breathing, which requires work for organization with the suck/swallow/breathe pattern. Could caffeine support the organization needed to achieve full oral feeds more quickly?

Many authors discuss the use of caffeine with suggestions to be proactive, rather than reactive to apnea episodes at rest and during oral feeds. Some suggest that caffeine may be needed longer for the extremely premature infant to support the developing lung. It is discussed that the common practice is to discontinue caffeine between the 33-34 PMA. It was noted that apnea still occurs and is not trivial in the 35-39 PMA. It is suggested that continuing caffeine past 35 weeks is a possible treatment plan that could have a significant clinical impact. However, physicians seem reluctant to keep an infant on caffeine past 34 weeks with concern that it may delay discharge. It may be possible that staying on caffeine longer could in fact, speed up discharge. If de-saturations are closely observed and recorded, the need to extend the use of caffeine will become

“Swallowing momentarily interrupts breathing, which requires work for organization with the suck/swallow/breathe pattern.”

evident. If the medication was not discontinued until three to five days post last incident of a desaturation, the baby has support while feeding, and could in fact discharge from the unit sooner avoiding the need to prolong hospitalization to monitor for desaturations to ensure that the baby is stable.

Caffeine's favorable effect on cardiorespiratory physiology in stabilizing systemic and cerebral hemodynamics and its capacity to mitigate hypoxic respiratory depression may play a part in neuroprotection.⁵ Kumar and Lipshultz⁵ suggest that the therapeutic window for caffeine will need continued research to understand the favorable outcomes that may be achieved for premature infants.

Dabin² discussed the wide variation in discontinuing caffeine, and the need for more studies to assist with the balance of avoiding apnea episodes and delaying discharge if caffeine is not discontinued soon enough.

Along my journey as an Occupational Therapist in the NICU, I had the privilege of working with two wonderful premature babies born at 24.6 weeks gestation and 24.4 weeks gestation. They were similar weight, 715 grams, and 760 grams. Both needed oxygen support and caffeine support. My focus was on the caffeine support and how it may assist with improved success with breast and bottle feeding.

Baby A, was born at 24.6 weeks gestation and had caffeine discontinued at 36.3 weeks. At that time, we only expected the baby to attempt to bottle feed every other feeding due to respiratory effort made during feeds, and difficulty with completing his feeds. He always

seemed to need to “catch his breath” and would take 35-70% of his feeds, but remember, he was only trying to nipple feed every other feeding. He was too tired the rest of the time.

Baby B, was born at 24.4 weeks gestation and had the caffeine discontinued at 37.6 weeks gestation. Baby B was able to take advantage of the benefits of caffeine for 10 days longer than Baby A. At the time that the caffeine was discontinued for Baby B, he was consistently taking above 50% of his feeds and was bottle feeding on a cue based schedule and showing an appropriate coordination of suck/swallow/breathe.

Baby A was discharged home at 42.5 weeks and had a gastrostomy tube placed due to the inability to maintain enough energy to complete oral feeds. Baby B was discharged home at 40.5 weeks, taking full oral feeds.

When looking back at the journeys of these two babies, it may have been advantageous for Baby A to continue caffeine longer as he continued to improve with

breast and bottle feeding skills. It may have assisted him to have a better foundation for coordinating suck/swallow/breathe during feeding if the discontinuation of caffeine was considered when the baby was above 35 weeks corrected age, on cue based feeds, and taking 50% or more of each feeding orally. And, most importantly, continuing caffeine if the baby had experienced any desaturations or bradycardias in the last three to five days.

Further studies would benefit outcomes and help to establish guidelines for using caffeine and considering feeding skills and intake at the time of discontinuing the support that caffeine offers.⁶ A solution may be in correctly and efficiently charting and recognizing a desaturation and/or bradycardia and keeping a close eye on the baby's stability when nipple feeding and at rest.

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Letters to the Editor (continued from p.11)

Thank you for the new look issue of the Developmental Observer. I particularly enjoyed the first article “NIDCAP from a Parent's Perspective” – it's incredible to hear that baby Benjamin was a week old before he was even put in his bed! And the way the NICU/health system is set up to have them progress to a family room and the neonatal home care is inspirational.

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