Benefits of Cobedding Preterm Twins and Higher-Level Multiples in the NICU

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Author Note

This paper represents my own work in accordance with the School and University Regulations.

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Introduction

Emory University Hospital Midtown (EUHM) is a designated Baby-Friendly hospital, meaning they implement practices that support and promote breastfeeding for new mothers in order to improve patient outcomes for both mother and newborn (World Health Organization & UNICEF, 2009). This certification shows a dedication by EUHM to create an environment that is beneficial for all newborns, including premature twins and multiples. Over the past three decades, the rates of preterm births of multiples has increased by 60%, putting these newborns at higher risk of experiencing neonatal complications (Refuerzo et al., 2010). In an effort to further implement best practices surrounding newborn health, EUHM should adopt evidence-based interventions in their Neonatal Intensive Care Unit (NICU) that respond to this national rise in preterm twin births.

Cobedding is defined as placing two or more newborns in the same incubator or bassinet immediately following birth in order to promote positive physiological and emotional responses. Cobedding is a is a non-invasive and inexpensive nursing intervention that can improve patient outcomes for newborn preterm twins in the NICU who are deemed medically stable. Currently, EUHM does not have any protocols regarding cobedding for preterm twins or multiples on their NICU floor.

Methods

A search of the literature was performed using the search engines Cumulative Index of Nursing and Allied Health Literature (CINAHL) and PubMed. The keywords to perform these searches included: co-bedding, cobedding, co-sleeping, bed-sharing, twins, multiples, NICU, preterm, and premature. In total, four evidence-based articles were included in the review.

The inclusion criterion for selected articles included studies published in English, within the last 10 years, were peer-reviewed, and included a full text of the article. Additionally, included studies must review a population of twins or higher-order multiples that were "preterm", which was identified as 20-37 weeks of gestation. Articles that included a sample population of newborns that weighed less than 1,000g at birth, received ventilator support, required phototherapy, had confirmed/suspected sepsis, had chest tubes, drains or umbilical catheters, or had known congenital abnormalities, were not included in the review. For the purpose of this review, the results of the study apply similarly to both "twins" and "higher-order multiples", and therefore, these terms will be used interchangeably.

Review of Literature

Cobedding is shown to positively impact the quality of sleep, recovery time, and weight gain of newborn premature twins in the NICU when compared to twins who received standard care in separate basinets. The intervention of cobedding has been found to prolong the bond that twins share in utero and help reduce physiological stress brought on by separating the two after birth (Legrand et al., 2017).

According to a study by Hayward et al. (2015), newborn twins had a physiological ability to synchronize with one another in a way that facilitated a mutual circadian rhythm and supported both of their sleep cycles. This synchronization of sleep patterns increased the total amount of time both infants slept, decreased the length and occurrence of crying when awake, and increased the number of hours that sleep was spent in the Rapid Eye Movement (REM), or deep, sleep stage (Hayward et al., 2015). Hayward et al. (2015) hypothesized that newborn twins react more positively outside of the uterus if they have immediate physical contact with their twin, rather than being suddenly deprived of their sibling's contact. This natural coregulation can

help both twins make the transition from womb to postnatal life with greater ease and improve their ability to adapt to the external world (Hayward et al., 2015).

Due to the high risk involved in prematurity, many preterm infants undergo painful and invasive procedures after birth as a part of standard care to ensure they remain stable. On average, of the newborns who received a heel stick to obtain a blood sample, 40% did not receive any form of pain prevention intervention (Badiee, Nassiri, & Armanian, 2014). Cobedding can be used as a nonpharmacological intervention to reduce pain experienced by preterm twins and improve their recovery. Two articles reviewed the impact of cobedding preterm twins on pain level and recovery time after getting a heel lance (Campbell-Yeo et al., 2012*;* Badiee, Nassiri, & Armanian, 2014). The premature infant pain profile (PIPP) score was used to assess level of pain in newborns for both studies. Badiee et al. (2014), discovered the incidence of severe pain, as described by a PIPP score of greater than 12, was less frequent in twins who are cobedding compared to twins who received standard care. The research conducted by Campbell-Yeo et al. (2012) resulted in insignificant evidence to support this variation in pain level between the experimental and control group. However, they did discover a significant decrease in recovery time from painful stimulation in twins who were cobedding over those who recovered separately (Campbell-Yeo et al., 2012).

In relation to weight gain and nutrition, preterm twins that were placed in the same incubator were seen to have an overall increased average in amount of daily weight gain and reduced time spent in hospital recovering from low birth weight (Legrand et al, 2017).

Lastly, a majority of the studies included in this review concluded no statistically significant increase in risk of infection or long-term medical conditions for twins who were cobedding versus twins receiving standard care (Campbell-Yeon et al., 2012; Hayward et al.,

2015; Legrand et al, 2017). Meaning, the benefits of cobedding to the quality of sleep, recovery from painful stimuli and increased weight gain for preterm twins outweighs the potential risks the intervention could pose to their health.

Currently, cobedding is not a regulated intervention and it is unclear the number of hospitals that are implementing this care as official protocol rather than an individual nursing decision. At the moment, the National Association of Neonatal Nurses (NANN) recommends that NICU nurses develop unit protocols that respond to the national increase in number of premature twin births (National Association of Neonatal Nurses Board of Directors, 2011). For this reason, the literature supports that NICU floors begin incorporating cobedding as the standard of care for medically stable preterm twins admitted to the unit.

Evidence Based Practice

Based on the evidence displayed in the literature, the nurses on the NICU floor at EUHM should:

- Advocate for increased protocols regarding premature twins and benefits of cobedding.
    - Institute a standing order that all newborn preterm twins or higher-order multiples who are deemed medically stable are placed in the same basinet as their sibling upon arrival to the NICU.
- Develop an assessment tool for premature twins or multiples that measures qualification criteria for cobedding care.
    - Upon admission to the NICU, the charts of each twin are reviewed. The newborns are assessed based on their Apgar Scores, birth weight, gestational age, vital signs, and provider orders for invasive medical treatments, such as catheters, oxygen supplementation, need for phototherapy, cardiac monitoring, sepsis concern, or prescription for high-risk medications.

    - If the newborns are deemed medically stable, they are automatically placed to cobed with their sibling.

- The nurse manager and nurse educator on the floor should host a "teach and talk" explaining the benefits of cobedding to the NICU nurses, how to appropriately assess if a newborn meets the criteria for cobedding, and how to perform cluster care on newborn twins in the same basinet.
- Produce information for parents of multiples regarding sleep state after leaving the NICU:
    - Develop educational leaflets to give to parents explaining cobedding for multiples along with providing access to this information on the unit's webpage.
    - Require the inclusion of this information in the discharge teaching for parents of twins or higher-order multiples.
- Ensure the nurse researcher on the NICU stays up-to-date on the latest findings regarding cobedding and what other hospitals are doing to incorporate the intervention into their practice.
    - Collect unit-specific data on EUHM's NICU floor regarding how preterm twins are responding to cobedding.
    - Publish findings and relay information to the hospital's board to provide evidence of efficacy and need for further research.

References

Badiee, Z., Nassiri, Z., & Armanian, A. (2014). Cobedding of twin premature infants: calming effects on pain responses. *Pediatrics and Neonatology, 55*(4), 262-268. doi: 10.1016/j.pedneo.2013.11.008.

Campbell-Yeo, M. L., Johnston, C. C., Joseph, K. S., Feeley, N., Chambers, C. T., & Barrington, K. J. (2012). Cobedding and recovery time after heel lance in preterm twins: Results of a randomized trial. *Pediatrics*, *130*(3), 500–506. https://doi-org.proxy.library.emory.edu/10.1542/peds.2012-0010

Hayward, K. M., Johnston, C. C., Campbell-Yeo, M. L., Price, S. L., Houk, S. L., Whyte, R. K., … Caddell, K. E. (2015). Effect of cobedding twins on coregulation, infant state, and twin safety. *JOGNN: Journal of Obstetric, Gynecologic & Neonatal Nursing*, *44*(2), 193–202. https://doi-org.proxy.library.emory.edu/10.1111/1552-6909.12557

Legrand, A., Frondas, A., Aubret, F., Corre, A., Flamant, C., Simon, L., …& Roze, J. C. (2017). Randomised controlled trial shows that co-bedding twins may reduce birthweight recovery delay, parenteral nutrition weaning time and hospitalisation. *Acta Paediatrica, 106*(12), 2055-2059. doi: 10.1111/apa.13885

National Association of Neonatal Nurses Board of Directors (2011). Cobedding of twins or higher-order multiples: NANN position statement #3053. *Advances in Neonatal Care, 12*(1), 61-67. doi: 10.1097/ANC.0b013e31823b53

Refuerzo, J.S., Momirova, V., Peaceman, A.M., Sciscione, A., Rouse, D.J., Caritis, S.N., … Harper, M. (2010). Neonatal outcomes in twin pregnancies delivered moderately preterm, late preterm, and term. *American Journal of Perinatology, 27*(7), 537-542. doi: http://dx.doi.org/10.1055/s-0030-1248940.

World Health Organization & UNICEF (2009). *Baby-friendly hospital initiative: Revised, updated and expanded for integrated care* (NLM classification: WQ 27.1). Geneva, Switzerland: WHO Document Production Services

Appendix 1

Evidence Grid or Evaluation Table

	Author	Date	Evidence Type	Sample/Sample Size	Results-Recommendations	Limitations	Rating Strength/Quality
1	Campbell-Yeo, M.L., Johnston, C.C., Joseph, K.S., Feeley, N., Chambers, C.T., & Barrington, K.J.	(2012)	Randomized controlled trail (RCT)	67 sets of twins (N= 134), 36 sets for cobedding (N=72), and 31 sets for standard care (N=62)	When assessing the efficacy of cobedding preterm twins on pain level and recovery time after a heel lance, results showed that recovery time was faster in twins who were cobed compared to those who were not. However, little evidence conclusively showed a decrease in pain reactivity or variation in pain scores between the two groups.	A limitation of this study was the inability to blind health care providers from knowing whether they were caring for the control or experimental group. As mentioned in a limitation of a previous article, this allows an opportunity for bias to alter the provision of care.	Level I B
2	Badiee, Z., Nasirri, Z., & Armanian, A.	(2014)	Randomized controlled trial (RCT)	50 sets of twins (N=100), 25 sets (N=50) allocated to controlled standard care group placed in separate beds, and 25 sets (N=50) allocated to experimental cobedding group.	Using the PIPP scoring system, results found that more preterm twins in the control group experienced higher levels of severe pain than those in the cobedding group after performing a heel lance. Additionally, there was a decrease in duration of crying after the heel lance in the cobedding twins.	The sample size of this study was not large enough to assess the rates of infection or other negative reactions to cobedding. In order to appropriately evaluate the presence of risks with this intervention, the study required a larger sample group.	Level I B
3	Hayward, K.M., Johnston, C.C., Campbell-Yeo, M.L., Price, S.	(2015)	Randomized controlled trail (RCT)	117 sets of twins (N=234) who were stable preterm	Twins who cobedded spent increased time in the same state, less time in opposite states, were more often in quiet sleep, and cried less than twins in separate	One limitation of the study included the inability to prevent the clinicians/care providers from knowing which treatment group they were caring for. This could allow	Level I A

	L., Houk, S.L., Whyte, R.K., White, S.D., & Caddell, K. E.			twins admitted to the NICU.	bassinets. No difference was found in occurrences of patient safety regarding infection, incidence of caregiver error or rates of apnea. Recommend cobedding for stable preterm twins to promote self-regulation, sleep, and decreased rates of crying without increased risk of harm to the newborns,	bias in treatment of newborns. Additionally, more research is needed to promote a strict regulation or recommendation of the co-bedding intervention.	
4	Legrand, A., Frondas, A., Aubret, F., Corre, A., Flamant, C., Simon, L., Desrobert, C., & Roze, J. C.	(2017)	Randomized controlled trial (RCT)	30 sets of twins; 14 sets (N=28) allocated to cobedding, 16 sets (N=32) allocated to individual incubator	Twins who were cobed were found to have decreased recovery time for low birthweight, reduced initial weight loss, and fewer days spent in the hospital compared to twins who were separated. However, no evidence was found to support alterations in cardio-respiratory effects. In fact, cobed twins were seen to have increased rates of tachycardia compared to separated twins.	This study did not have appropriate resources to measure the exact nutritional impacts of cobedding, only the quantitative understanding of increased weight gain. This does not necessarily translate to improved nutrition in cobed newborns. The sample size was not adequate enough to show statistically significant differences in the data. It is unclear if the increased rates of tachycardia in cobed twins is related to increased stimulation, crowded co-bedding, or another confounding factor. Meaning, it is unclear whether the cause is or is not due to cobedding.	Level I B