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Supporting parents to read to their infants on a level 2 neonatal unit: launch of a neonatal library

Growing evidence shows that preterm infants can be at increased risk of communication and literacy difficulties as they acquire skills during their early years. The impact of these difficulties can reduce inclusion in education and social situations for children born preterm. This article summarises the steps taken on a level 2 unit to introduce parents to reading books to their infants through use of a unit library on the neonatal unit.

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Key points

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1. Infants born preterm have increased risk of communication and literacy problems.
2. Introducing literacy through access to a neonatal library is an important addition to family-integrated care.
3. Involving parents in early communication and literacy opportunities on the NNU can have significant benefits for parent-infant co-occupation and infant development.

Starlight neonatal unit (NNU) is a level 2 unit in Barnet Hospital, North London, that supports infants born from 27 weeks' gestation. It has 30 cots, including intensive care cots as well as 10 individualised care rooms where families can stay with their infant as soon as they are clinically stable. Starlight NNU was the first unit in the UK to set up individualised care room provision where parents stay alongside their babies until they are ready for discharge. On Starlight the professional neonatal team incorporate principles of family-integrated care (FIC) within their daily work and this includes involving parents in all aspects of their infant's care. Establishing an occupation-based approach for parents and providing opportunities not only for caregiving but to build nurturing relationships permits parents to develop their own role and identity.¹ This may assist parents to move from a relationship of co-dependence with the NNU team, towards becoming independent and confident in the care of their infant.

Communication with infants on the NNU

Preterm infants are at an increased risk of developing speech, language and communication difficulties.² On a NNU, the use of early communication can help reduce parent stress and can be easily implemented into skin-to-skin care and daily care.^{3,4} Bonding can be an important foundation from which parents can

develop the key early attributes of early communication such as observing infant responsiveness to voices, gaze, alertness, interest in faces and gestures as well as being a responsive interactor to infant cues and states. Communication, interaction and interpreting an infant's early non-verbal cues and vocal attempts are an expected element of the neonatal care provided and encouraged during a range of everyday, functional tasks ranging from feeding time to nappy changing, washing and bathing.³

An important part of care on the NNU includes enabling opportunities for infants to build relationships with familiar family members (**FIGURE 1**). The early pre-feeding and first feeding experiences are essential with skin-to-skin and early breastfeeding opportunities directing parents towards the basic attributes of initial communication such as looking, learning to talk to their infant and reading their infant's cues.⁵ Once infants become stable and used to the presence of their parents, they will learn to develop an interest in interaction, seeking familiar faces and showing cues in response to familiar voices, touch, familiar and calming smells.⁶ Newborn infants have a predisposition to observe human faces, and many bonding strategies can provide face-to-face time experiences.⁷ Parents are emotionally connected to their infants, and this connection can provide a learning platform for the development of communication and interaction.⁸

Environment	Key communication skills encouraged on the NNU
Infant within the incubator	• Support visual observations and build an understanding of infant states: deep sleep / active sleep / drowsy/ quiet alert / active alert / crying • Support and discuss with all parents: visual observations of eye opening, oral movements, infant vocal attempts, infant idiosyncratic body movements in response to others • Encourage visual observations for all states in relation to position, environment, response to voice, non-nutritive sucking on pacifier or hand, responses during tube feeding and during nappy changes, identification of what is happening when heart or respiratory levels change • Response to touch, sound, movement and position within the incubator • Supporting parents to develop core positive communication skills for infants, ie initiation of communication with infant, simplified language, repetition, eye contact, use of natural gestures, responding to infant signals by commenting, providing positive touch, ensuring infant has opportunities to focus on and see parent faces
Infant out of the incubator	• Build on skills outlined above • Continued opportunities for infant to focus on parent faces and voices • Gain confidence by consolidating knowledge of infant's preferences during skin-to-skin, breastfeeding or other early feeding times and cares • For breastfeeding, identify use of parental voice in supporting the infant; identify with parents any changes in suck patterns in response to voice or other stimuli • During feeds, engage with parents to identify preferred pace of feed and signs of irritation, fatigue or satiation • Increase range of communication opportunities, including confident initiation building on learnt infant communication skills at wakeful times, wash/bath times, nappy change time, any painful procedures being undertaken, etc

FIGURE 1 Opportunities for encouraging communication on the NNU.

Literacy on the NNU

Along with early communication, literacy and reading can also strengthen parent-infant interaction and engagement on the NNU. Hearing the maternal voice from an early gestational age has been associated with positive developments in the areas of discrimination of, and interest in, speech sounds and can also enhance maternal-infant attachment.^{9,10} Maternal voice can support the infant by enabling stable physiological signs, ie heart rate and oxygen saturation.¹¹ Yan et al¹² found that an infant's response to both parents' voices on the NNU can have a positive impact on infant brain plasticity, specifically auditory cortex development. Reading is a natural, individualised, non-invasive, non-pharmaceutical and low-cost intervention that supports the principles of developmental care and FIC already used on the unit.

We decided to extend the work that the team was already carrying out on a daily basis with families, by focusing on literacy to add to the variety of care undertaken. Our aim was to create Starlight Library to enhance and support the communication work in place for parents to enable them to choose and read books to their infant while caring for their baby. It was suggested that this could be experienced during skin-to-skin time to create a multi-modal sensory



FIGURE 2 Skin-to-skin care, an opportunity for parents to support their infant to hear their nurturing voice while reading to them.

experience where parents use positive touch and support their infant to smell their familiar scent and hear their nurturing voice while reading to them (**FIGURE 2**). This would be another unit opportunity to support the parent-infant relationship and provide a stable activity alongside the other therapeutic approaches undertaken on the unit.¹³ To enable the team to consider the concept of literacy

and its relevance for families on a NNU, we arranged discussions with the National Literacy Trust.

The National Literacy Trust (NLT)

NLT is a charity dedicated to transforming lives through literacy, particularly in the UK's poorest communities where low literacy is entrenched and inter-generational. The NLT develops programmes underpinned by research, supports early years' settings and schools, campaigns to make literacy a priority for parents and politicians, and establishes 'literacy hubs' and campaigns in a diverse range of communities. NLT programmes and campaigns for families of children aged from birth to five years of age are based on developing the home learning environment, which shows that early language is the foundation for later literacy, with language levels at age two predicting reading at age 11.¹⁴

In addition to supporting language and literacy development, promoting book sharing in the NNU provides a unique opportunity to reduce stress, empower parents and enhance well-being while aiding infant brain development. Creating a language-rich environment within the NNU could set in place patterns of positive behaviour to promote a learning culture at home, once families move on from the unit.

Launching the neonatal library

The library for parents on Starlight NNU was launched in early March this year – on World Book Day. All parents on the unit were invited to attend the event. Books donated to the unit were available for them to explore, and all parents were given their own book to enjoy with their infant. Additional information about early communication and literacy was also made available. Within our FIC setting, we wanted to continue to highlight the importance of early communication with the addition of literacy as part of our approach to support early intervention for preterm infants and their families. To support our book launch, we invited Alison Tebbs from the NLT to discuss literacy engagement for infants with parents (FIGURE 3).

Impact of having access to a unit library

Parents have given positive feedback about having access to a library on the NNU, for example, a father whose daughter was on the NNU reported:

“Having a library was really helpful. As a dad, the feeling of wanting to do more than you can was an ever presence in my mind. Knowing that I could grab a book and read to my daughter while in the incubator helped me feel like I was being useful. There are times you felt like a spare part, but the introduction of the library helped us to bond. Also knowing that I was helping to aide S’s development helped me through the process too.”

A mother whose daughter was on the unit commented:

“The library gave us a purpose as when you no longer knew what to say, you could find a book to read. It was wonderful to escape with your baby and a book knowing you were helping their development. I particularly enjoyed reading poems to B as I know rhyming books are good for brain stimulation. It was reassuring to know that she knew our voices and we could comfort her even when we couldn’t hold her. I now look at the Paddington book we were gifted on B’s book shelf and remember what a lifeline books were in the NNU.”

Other parents commented:

“We found the library to be hugely helpful during our time with our baby girl in NICU. Not only did we feel that it was a great source of stimulation for our baby’s



FIGURE 3 Neonatal Occupational Therapist Elaine McMahon (left) with Alison Tebbs, Early Years Project Manager at the National Literacy Trust, at the launching of the neonatal library on Starlight NNU.

development but it also provided a way to bond with our daughter during the limited time that we could spend with her during the COVID crisis. Being able to read to our baby brought a calming influence into a stressful NICU environment and we were grateful that the NICU provided these books.”

Both communication and literacy provide important core clinical supports for parents on Starlight NNU. As part of our drive to continue to evaluate and improve the quality of service we provide for infants and their families, we plan to complete a clinical audit of both communication and literacy engagement on Starlight NNU with our ‘Starlight Superstars’ parents group.

Recommendations

We are aware of the impact that COVID - 19 has had on all involved in neonatal care, and that necessary changes in practice have taken place. Specifically, given parents may have had limited time on the NNU in the early stages of the pandemic and heightened restrictions in the community for parent support, opportunities for parent–infant communication and literacy time have been impacted. In many instances, infants may have been cared for by adults wearing face masks. At present, it is difficult to predict the outcome of these challenges and changes to typical care provided on a NNU.

We also are aware of and applaud the extensive efforts that neonatal staff have gone to in supporting parents through use of innovative methods to sustain access to and enable positive outcomes for infants

on NNUs. In the present pandemic, we have kept Starlight Library open, but have observed NNU health and safety protocols. Some families can keep a book for more than a day. Once returned to the library, books are placed in a ‘to be cleaned’ box, wiped down, and returned to the library after 76 hours. Setting up a free access library for parents and staff to access will be challenging due to the infection control measures required, and suitable adaptations will be needed. However, we would recommend the following strategies to support early access to literacy when working with parents and others who support infants on a NNU:

- Discuss with parents how they could integrate communication strategies into literacy time
- Provide a range of books to borrow: story, rhyme, song or poetry and include characters representative of the diversity of the local community
- Support parent observation and interpretation of infant cues to watch for response to voice modulation and intensity. This may help shape the type of book parents may wish to read with their infant
- Combine reading time with skin-to-skin where possible; ensure parents are comfortable on a reclined chair
- Support infants in incubators by using positive touch or hand-holding when reading to them
- Books without words can support parents who are less confident with their own literacy skills
- Encourage multi-lingual parents to speak, read and sing in the language they are most familiar with
- Encourage parents to read non-fiction texts aloud if preferred (for example reading football results, newspaper and magazine articles or baby information) so the infant can experience hearing parent voices
- Staff have comprehensive and supportive infant care skills, and can model book sharing and normalise warm interactions with infants if parents do not feel confident
- Search available funding for books to be given as gifts to families, as a book is a precious gift that may be shared over and over through the early years
- Literacy guidance hints and tips for parents can be downloaded from the National Literacy Trust website: <https://literacytrust.org.uk/>

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References

1. **Gibbs DP, Boshoff K, Stanley MJ.** The acquisition of parenting occupations in neonatal intensive care: A preliminary perspective. *Can J Occup Ther* 2016;83:91-102.
2. **Ionio C, Riboni E, Confalonieri E, et al.** Paths of cognitive and language development in healthy preterm infants. *Infant Behav Dev* 2016;44:199-207.
3. **Harding C, Levin A, Crossley SL, et al.** Effects of early communication intervention on speech and communication skills of preterm infants in the neonatal intensive care unit (NICU): a systematic review. *J Neonatal Nurs* 2019;25:177-88.
4. **Shaw RJ, Bernard RS, Stoffer-Isser A, et al.** Parental coping in the neonatal intensive care unit. *J Clin Psychol Med Settings* 2013;20:135-42.
5. **Buil A, Sankey C, Caeymaex L, et al.** Fostering mother-very preterm infant communication during skin-to-skin contact through a modified positioning. *Early Hum Dev* 2020;141:104939.
6. **Gratier M, Devouche E.** The development of infant participation in communication. In: *Early vocal contact and preterm infant brain development* (pp55-69). Springer, Cham: 2017.
7. **Cecchini M, Baroni E, Di Vito C, et al.** Newborn preference for a new face vs. a previously seen communicative or motionless face. *Infant Behav Dev* 2011;34:424-33.
8. **Kinreich S, Djalovski A, Kraus L, et al.** Brain-to-brain synchrony during naturalistic social interactions. *Sci Rep* 2017;7:1-12.
9. **Filippa M, Devouche E, Arioni C, et al.** Live maternal speech and singing have beneficial effects on hospitalized preterm infants. *Acta Paediatr* 2013;102:1017-20.
10. **Filippa M, Kuhn P, Westrup B.** Early vocal contact and preterm infant brain development. Cham, Switzerland: Springer International Publishing: 2017.
11. **Provenzi L, Broso S, Montirosso R.** Do mothers sound good? A systematic review of the effects of maternal voice exposure on preterm infants' development. *Neurosci Biobehav Rev* 2018;88:42-50.
12. **Yan J.** Canadian Association of Neuroscience Review: development and plasticity of the auditory cortex. *Can J Neurolog Sci* 2003;30:189-200.
13. **Pineda R, Bender J, Hall B, et al.** Parent participation in the neonatal intensive care unit: predictors and relationships to neurobehavior and developmental outcomes. *Early Hum Dev* 2018;117:32-38.
14. **Lee J.** Size matters: early vocabulary as a predictor of language and literacy competence. *Applied Psycholinguistics* 2011;32:69-92.

Haematochezia in a preterm neonate

Answers to the quiz on page 253

1. The correct answer is (e)

Signs of abdominal distension with blood in stools points towards a serious illness in a preterm neonate. The baby should be immediately investigated with blood tests and abdominal X-ray to rule out necrotising enterocolitis (NEC) and sepsis. It would be reasonable to perform a coagulation screen as haemorrhagic disease of the newborn or any coagulopathy may present with bloody stools.

2. The correct answer is (a) and (d)

There are dilated featureless bowel loops especially in the right upper quadrant with a suspicion of intramural gas (pneumatosis intestinalis). Other findings suggestive of NEC would include fixed bowel loop on serial X-rays, gas in portal vein and pneumoperitoneum.

3. The correct answer is (a), (b) and (c)

All of the given conditions can present with blood in stools. As discussed previously, NEC is a serious disease that affects the bowel of premature neonates in the first few weeks of life. Numerous studies have shown that breast milk is protective against NEC. Meckel's diverticulum, although rare in this age group, could present with bowel obstruction and

painless bloody stools. The incidence and clinical manifestations of cows' milk protein intolerance (CMPI) in preterm neonates remains poorly understood. Symptoms usually start with introduction of formula milk, however they can sometimes present even in breastfeeding infants due to exposure to cows' milk protein in breast milk due to maternal consumption. The symptoms of CMPI are rather variable and include diarrhoea with/without blood, constipation, vomiting, rash, increased irritability and failure to thrive. The index case had overlapping symptoms consistent with both NEC and CMPI. She was initially managed conservatively for NEC and later commenced on hydrolysed formula milk as her symptoms recurred on trial of cows' milk. Haemorrhagic disease of the newborn at three weeks of life is more common in babies who do not receive vitamin K at birth, which makes it a less likely cause in this case.

4. The correct answer is (b) and (d)

With these symptoms in a preterm baby, management should involve treating as NEC. Enteral feeds should be stopped with nasogastric tube on free drainage, screen for sepsis, start parenteral nutrition and antibiotics. Giving formula milk or increasing feeds is contraindicated in this situation.

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