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MINI REVIEW

The newborn behavioural observations system: A relationship-building intervention to support families in the neonatal intensive care unit

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Abstract

Aim: Relationship-based interventions for neonatal intensive care unit families have potential to improve parent and infant outcomes; yet, their implementation has been modest within systems of care for high-risk newborns. The purpose of this paper is to describe a relationship-building intervention, the newborn behavioural observation system, summarise the evidence supporting its use, and address its clinical application for high-risk parent–infant dyads in the neonatal intensive care unit.

Methods: We summarise the extant literature describing the use of the newborn behavioural observation system in high-risk populations.

Results: While the body of literature supporting the use of the newborn behavioural observation system is modest, several randomised controlled studies have highlighted statistically significant and clinically meaningful gains in infant development and parental mental health. In these studies, the intervention was often integrated into existing systems of care and included high-risk parent–infant dyads.

Conclusion: The newborn behavioural observation system is a promising intervention designed to support the early challenges of high-risk infants and their parents. Future research should examine its effects in diverse neonatal intensive care unit populations and professionals, strive for continuity of care from inpatient to post-discharge follow-up and developmental support services, and include more longitudinal studies.

1 | INTRODUCTION

Advances in neonatal intensive care over the past decades have led to dramatic improvements in infant survival and reduction in disability. However, the risks of cognitive impairment and social and emotional challenges among children and young adults born preterm remain high. In addition to the risk of brain injury that accompanies prematurity, primary altered neuronal maturation may also contribute to developmental disability.[1] It is well established that the perinatal period is a sensitive stage during which sensory, social and emotional experiences influence synaptic development and important aspects of subcortical brain architecture.[2] What, then, are the implications for infants and their parents when postnatal life begins in the neonatal intensive care unit (NICU)? Brain development that would typically occur in the intrauterine environment is disrupted and, in the course of receiving lifesaving care, the neonate's

Abbreviations: ANOVA, analysis of variance; BDI-2, Battelle Developmental Inventory, 2nd edition; BSID-III, Bayley Scales of Infant Development-III; CESD, Center for Epidemiologic Studies Depression scale; CGA, corrected gestational age; EAS, Emotional Availability Scales; EI, early intervention; EPDS, Edinburgh postnatal depression scale; GA, gestational age; HVI, Home Visiting Index; IPKS, Index of practitioner knowledge and skills; MANCOVA, multivariate analysis of covariance; NBAS, Neonatal Bbehavioural Assessment Scale; NBO, Newborn behavioural observations system; NDKQ, newborn developmental knowledge questionnaire; NICU, neonatal intensive care unit; NIDCAP, newborn individualised developmental care and assessment program; PASS, perinatal anxiety screening scale; RCT, randomised controlled trial; SCID-5, structured clinical interview for DSM-5.

expected early postnatal experience is dramatically changed. For infants, the moment by moment sensory and interpersonal encounters of the first days and sometimes weeks of life (which is determining brain architecture) is radically different from that of the typical term newborn and marked by multiple caregivers, frequent invasive and painful procedures, and variable contact with their parents. These children, whether due to prematurity, acute illness or congenital anomalies, are likely to experience early diminished self-regulatory capacity compared to healthy term newborns, leading to communication cues that are more difficult to read and greater challenges with social engagement. Parents of babies in the NICU face high levels of stress, mood disorders and anxiety symptoms.[3] They must grieve the loss of a healthy birth experience and often cope with a range of responses including fear, guilt, displacement as parents and lack of confidence in their caregiving capacity. Parental internal distress may in turn interfere with the capacity to engage in sensitive caregiving. In summary, during a critical window of relationship-predicated development, the infant and parent each face challenges in their capacity to engage with one another that may hinder the infant's development, the parent's well-being, and the ongoing quality of the relationship between them.

As neonatal intensive care has evolved, NICUs are striving to become increasingly family-centred, welcoming parents' presence and involvement in their infants' care. In addition, over the past two decades, a myriad of both NICU and post-discharge based interventions have aimed at supporting infant development, parental mental health and the early parent–infant relationship. In general, most such interventions can be roughly categorised under three headings: sensory-based experiences; parent–infant interaction guidance; and infant assessment, intervention and support programmes. In recent reviews, some of these interventions have shown promising effects on maternal traumatic stress, maternal depression, infant weight growth, infant development and mother–infant interactions[4,5]; yet, their implementation has been modest within systems of care for high-risk newborns; that is, babies who are at higher risk for adverse developmental or other health outcomes than the typical newborn, whether due to prematurity, neonatal illness, congenital anomalies or parent risk factors such as substance use disorder or mental illness. There remains no firm consensus for how to best meet the intertwined goals of supporting early development, parent mental health and parent–infant relationships in NICU care.

In a timeline parallel to many of the modern advances in neonatology, T. Berry Brazelton and colleagues recognised the individuality of each newborn and synthesised the understanding of early neurobehavioral functioning in the Neonatal Behavioural Assessment Scale (NBAS).[6] His colleague, Heidelise Als, extended this understanding to the preterm infant in the Assessment of Preterm Infants' Behaviour[7] and the Synactive Theory of Development,[8] leading the development of the Newborn Individualised Developmental Care and Assessment Program (NIDCAP).[9] The purpose of this paper is to describe the Newborn Behavioural Observation System (NBO),[10] an intervention with roots in both the NBAS and the Synactive Theory of Development, aimed at supporting the newborn–parent relationship through shared observation and understanding of the infant's behaviour as communication. Adopting a collaborative, non-didactic stance between professional and parent with a shared curiosity about the emerging personhood of the infant, the NBO offers a unique contribution to family-centred care. We discuss its adaptation to the NICU setting, the small but promising body of evidence supporting its use, and the gaps and challenges in NICU-specific research.

Key notes

- Sensitive caregiving is important for infant development and parental well-being and supports a healthy parent–infant relationship.
- The newborn behavioural observations (NBO) system is a relationship-building intervention focused on understanding infant behaviour as communication to support early parenting.
- Research supporting the NBO as an effective intervention for infant development and parental well-being is promising, albeit modest, though research specific to the NBO in the neonatal intensive care unit is needed.

1.1 | Description of the intervention

The NBO is a brief, flexible intervention designed to help parents understand their baby's competencies, challenges and individuality, to inform caregiving and contribute to the development of a positive parent–infant relationship from the very beginning. Although real-time observations provide valuable information about the baby's functioning in the moment, these observations are emphatically not portrayed as assessments. The NBO is inherently strength based, seeking to understand *who the infant is* rather than *what is wrong with them* and honours the parent's perspective and experience with their child. Through shared, non-judgemental observation, the self-regulatory limitations of the infant are placed into developmental context while parents' knowledge of their child is respected and amplified and moments of connection between parent and infant are underscored and celebrated.

The NBO is described in the TIDieR format in Table 1.

Training in the NBO consists of a 2-day in-person or virtual workshop followed by self-study of the NBO handbook, hands-on practice and mentoring. Curricular content includes practical skills in the administration of the NBO items along with theoretical frameworks to understand and support the contributions and tasks of the *infant*, the *parent* and the *practitioner* during the NBO. For the *infant*, Als' Synactive Theory of Development is the framework used to understand early infant behavioural organisation and state regulation during a time of rapid brain development.[8] For the *parent*, a loose hierarchy of psychic and regulatory tasks is proposed to understand

TABLE 1 TIDieR table for the newborn behavioural observations system.

Brief Name	Newborn Behavioural Observations System (NBO)
Why	Understanding the newborn as a unique individual and their behaviour as communication can guide sensitive caregiving and support early parenting, particularly because NICU-hospitalised families are at risk for: • Adverse developmental outcomes for the baby • Mental health disorders for the parents • Difficulties in the early parent–infant relationship
What (materials)	• NBO 'kit' consisting of a small red ball, penlight and rattle • NBO Recording form • NBO Parent Summary form • NBO Fidelity Checklist Materials are provided as part of in-person or virtual NBO Training workshops delivered by the Brazelton Institute or one of its international affiliates. *Understanding Newborn Behaviour and Early Relationships: The Newborn Behavioural Observations (NBO) System Handbook* is available in paperback and ebook formats through Brookes Publishing (www.brookespublishing.com) and online booksellers.
What (procedures)	*Administration* (*10–30 minutes, depending on the baby's state and fragility and the parent's responses*) The NBO consists of up to 18 structured observations designed to both demonstrate the infant's competence and mildly challenge their self-regulatory capacity. Which items are included is guided by the baby's states (sleep, wake, cry), stress signs and parental responses during the encounter. The primary goal of every NBO is to use the infant's behaviour as communication to guide sensitive caregiving and support the caregiver–infant relationship. The 18 NBO items: Sleep protection to light / Consolability Sleep protection to sound / Response to face and voice Motor tone upper and lower extremities / Response to face Rooting / Orientation to voice Sucking / Orientation to rattle Hand grasp / Visual tracking of red ball Shoulder and neck tone – pull to sit / State regulation Crawling response / Response to stress Crying / Activity level *Documentation* NBO Recording Form (*10 minutes*) 3-point scale for each item and free text areas to summarise strengths and challenges. As an observational tool, not an assessment, the 3-point scale is meant only for descriptive purposes and has not been standardised or validated. NBO Parent Form (*15 minutes*) Documents the NBO for caregivers and consists of a narrative section and an area in which observed behaviours and their meaning in terms of strengths, preferences and challenges are simply described 'in the baby's voice'.
Who provided	Wide array of perinatal practitioners, including physicians, nurses, midwives, psychologists, social workers, allied health professionals, home visitors and doulas. With appropriate mentoring, peer support personnel can also implement the NBO.
How	Face-to-face encounter by a trained practitioner with the infant and at least one caregiver
Where	Any inpatient or outpatient setting, ideally conducted in a quiet, dimly lit room where all present can comfortably gather around the infant. In real world practice, practitioners adapt to the constraints of their work environments.
When and how much	As an observational, relationship-building tool, there is no minimum or maximum number of times the NBO is administered.
Tailoring	• Inherently flexible such that items are chosen or omitted based on the infant's state and tolerance and the caregiver's needs and responses • The self-regulatory capacities observed in the NBO are generally achieved by 3 months CGA, though may be later in fragile infants
Modifications	• Originally designed for term newborns but be adapted for younger or more fragile neonates with careful attention to the infant's capacity for stimulation

what parents may face during this sensitive phase in parent–infant relationship and family functioning. And lastly, to support the *practitioner*'s parallel scaffolding as they enter into relationship with the infant and parent, the NBO training elaborates on practitioners' tasks and the qualities that offer support to both the infant and the parent. Awareness of cultural differences in parenting and the risks of implicit bias are woven through the curriculum.

1.2 | Implementation process

The NBO was originally designed for infants beginning at 37 weeks corrected gestational age (CGA). The typical term newborn will 'outgrow' the NBO by 3 months of age. The NBO is designed to be used flexibly in both inpatient and outpatient settings by a wide array of practitioners, including nurses, physicians, allied health professionals, social workers, psychologists and even peer mentor professionals with appropriate training and mentoring. With only simple equipment required, the intervention is decidedly low-tech and has been implemented across the spectrum of settings from highly resourced intensive care units to rural villages in low-income countries. Parents are encouraged to include whomever they consider to be an important member of their baby's world in NBO sessions.

1.3 | Adaptation and modification

While the NBO was originally developed for full-term infants, many NICU-based practitioners and NBO training faculty have discovered its utility to support parent–infant relationships with preterm and other fragile newborns. To this end, the NBO must be modified with close monitoring of the infant's tolerance of handling and threshold for stimulation. Although the NBO is taught as a stand-alone encounter, many practitioners as well as NBO training faculty report that, in the real world, they leverage the flexibility of the NBO to weave its therapeutic approach and contents into their existing roles with newborns and families. The NBO items are also often integrated into routine care activities as well as during quiet times when parents are holding their baby at the bedside. In the NICU context, particularly given the NBO's foundation in the Synactive Theory of Development, this can create a common language of behaviour observation among various therapists, nurses, physicians, perinatal mental health providers and parents. The NBO also informs providers' clinical impressions about the infant and helps to develop intervention strategies with parents that are individualised to their infant, rather than generic developmental guidance. For example, a physical therapist may use the NBO as part of a developmental session to promote optimal movement patterns, encourage social interaction and facilitate state regulation. The session could occur prior to the infant's routine care and feeding time, allowing therapist to observe with parents how their infant sleeps and wakes (i.e. habituation items); moves, tolerates position change and handling during routine cares (NBO motor items); and interacts when held at the bedside before/after feeding (responsiveness items). Speech therapists and lactation consultants may use the NBO motor, consolability and state regulation aspects to promote oral feeding skills. Regardless of discipline, all providers can use the relationship-building principles and choose specific NBO items to provide individualised, family-centred, 'moment by moment care' that optimally supports parent–infant interaction. Given its nature as an observational tool, the NBO can be repeated over time throughout the developmentally relevant window. While this approach begins in the NICU setting, it can extend to post-NICU services such as infant follow-up, outpatient care and Early Intervention (EI) services.

The use of the NBO in the NICU provides an opportunity to engage with parents and support them in learning their baby's unique developmental skills at a critical time when environmental, emotional, and systemic barriers can negatively impact the emerging parent–infant relationship.

1.4 | Research on effectiveness

The available literature on the NBO has so far demonstrated that it is a versatile tool used by a range of professionals who work in diverse clinical and cultural settings.[11] While the NBO is used clinically in the NICU, its effects have not yet been studied in that setting. It has, however, been examined in early intervention with high-risk infants with past NICU stays.[12–14]

Although there is limited research on the effects of the NBO, a number of studies with rigorous methodologies have recently been published examining a range of outcomes including those for parents, the parent–infant relationship, infant development, and practitioner confidence.[12–16] The following summary focuses on the research that has emerged to date from the most rigorous studies and/or closest to the current population of interest (high-risk infants and their families), as well as those outcomes that address the key challenges we have outlined in our framing of the NBO's rationale, including self-regulatory challenges for high-risk newborns, mental health risks for parents of high-risk newborns, and resultant threats to sensitive caregiving with downstream consequences on infant development.

As summarised in the CONSORT table (Table 2), six published papers on the NBO meet the above criteria.[12–17] Some of those studies were conducted with first time mothers,[15–17] and some in the EI setting.[12–14] All studies provided home-based NBO interventions with three of the studies also including NBO interventions in the hospital setting prior to discharge home.[15–17] The frequency of NBO interventions ranged from two to eight sessions. Outcome measures were varied and included findings on parental mental health such as reduced postpartum depressive symptoms and reduced anxiety[14,16,17] Increased maternal sensitivity to the infant during parent–infant interaction was also noted in two studies.[15,17] In the study with high-risk infants in early intervention, improvements in infant developmental outcome was noted and mothers receiving the NBO intervention had greater

TABLE 2 Table of Randomized Controlled Trials of the NBO following the CONSORT guidelines

	McManus BM, Nugent JK. *J Reproduc and Infant Psychol.* 2011;29(4):395–403	McManus BM, Nugent JK. *J Behav Health Serv Res.* Jul 2014;41(3):381–9	McManus BM, Blanchard Y, Murphy NJ, Nugent JK. *Infant Ment Health J.* Nov 2020;41(6):757–769
Trial Design	RCT	RCT	RCT
Eligibility criteria for participants	EI-eligible infants <6 wks (corrected age), caregiver >18yo who spoke or wrote English or Spanish	EI-eligible infants <6 wks (corrected age), caregiver >18yo who spoke or wrote English or Spanish	EI-eligible infants <6 wks (corrected age), caregiver >18yo who spoke or wrote English, Spanish or French fluently
Settings	Home-based	Home-based	Home-based
Interventions	4–6 weekly home visits (up to 8) from an EI NBO certified provider	4–6 weekly home visits (up to 8) from an EI NBO certified provider	3–4 weekly home visits from an EI NBO certified provider
Outcomes Measures	Index of Practitioner Knowledge and Skills (IPKS) following the final home visit	Home Visiting Index (HVI) following the final home visit	Bayley Scales of Infant Development-III (BSID-III) Adaptive and Social Emotional Scale by phone interview at 3 and 6 months CGA; Battelle Developmental Inventory, 2nd edition (BDI-2) at EI entry and 6-months CGA. Centre for Epidemiologic Studies Depression Scale (CESD) at 3 and 6 months CGA
Sample size	$N = 18$ EI providers (intervention = 9; usual care = 9)	$N = 38$ parents (intervention = 25; usual care = 13)	$N = 38$ (intervention = 16; control = 22)
Statistical methods	Adjusted mixed linear regression models to examine group differences in knowledge and confidence IPKS subscale scores	Adjusted mixed linear regression models to examine group differences in HVI sub-scale scores	Adjusted quantile median regression (due to skewed data) to estimate group differences in the change in each outcome measure between EI entry and 3 months and 6 months
Outcomes and estimation	NBO providers reported greater confidence (mean difference = 2.2, $p < 0.05$) than usual care providers. No difference observed in knowledge subscale scores.	NBO group reported higher quality of care related to facilitating optimal parent–infant social interaction (mean difference = 3.1, $p < 0.05$). No differences were observed for the other sub-scales.	At 6 months: Greater gains in BSID-III Communication ($b = 1$ [0.2, 1.8]), BSID-III Self Care ($b = 2$ [0.1, 3.9]), BDI-2 Perception and Concepts ($b = 2$ [0.4, 3.6]), and BDI-2 Attention and Memory ($b = 3$ [0.4, 6]) scores (i.e., 0.67 effect size); marginally significant higher scores BDI Social Role ($b = 1.5$ [−0.8, 2.9]) and Gross Motor ($b = 2.1$ [−0.6, 4.8]); greater decline in maternal postnatal depressive symptoms ($b = -2.0$ [−3.7, −0.3]).
Harms	None reported	None reported	None reported
Limitations (potential bias, imprecision)	Small sample size and limited follow-up	Small sample size and limited follow-up	Small sample size. No baseline CES-D or BSID; limited (6 months) follow-up
Generalisability	Home-based programming for high-risk infants and their families	Population-based programming for families with high-risk infants	High-risk infants in early intervention and their mothers

improvements in depressive symptoms than the control group.[14] There is also some evidence to suggest that mothers and providers endorse the NBO as being helpful in promoting optimal parent–infant interaction.[12,13]

In synthesising the extant literature evaluating the impact of the utility and effectiveness of the NBO, several key themes emerge. First, multiple doses may matter. More specifically, in the reported studies demonstrating an association of the NBO with better infant and parent outcomes, families received at least two intervention touchpoints.[12–17] While these studies did not explore the mechanism to explain why multiple better outcomes, we offer a couple of hypotheses. First, the primary goal of the NBO is to strengthen the parent–infant relationship and secondly to strengthen the parent–provider relationship. To this end, the NBO reinforces successful parenting strategies that support infant's early neurobehavior and neurodevelopment. More touchpoints with families using this strengths-based approach likely have ripple effects on critical areas of the family's routine including infant feeding, sleeping and self-soothing. Moreover, the NBO's emphasis on bolstering the parent–provider relationship suggests that multiple NBO touchpoints may result in greater trust, openness and engagement in the developmental strategies discussed during the NBO session.

The second main finding of the literature synthesis is that the positive effects of the NBO are observed in the setting of greater risk. That is, studies that included high-risk mothers or high-risk infants showed more clinically meaningful maternal and infant outcomes. Whether due to the fragile infant's cues being more difficult to read, a mental health disorder that interferes with the parent's

Nugent J, Bartlett J, Von Ende A, Valim C. *Infants and Young Children*. 2017; 30:257–268	Nugent J, Bartlett J, Valim C. *Infants and Young Children*. 2014; 27:292–304	Nicolson S, Carron SP, Paul C. *Infant Ment Health J*. May 2022;43(3):455–473
RCT	RCT	RCT
Primiparous low-risk dyad vaginally delivered 36–42 weeks GA, recruited on postpartum unit	Primiparous low-risk dyad vaginally delivered 36–42 weeks GA, recruited on postpartum unit	Primiparous dyad recruited prenatally before 36 weeks; mother with current positive screen for anxiety and/or depression or history past mental illness
Hospital and home-based.	Hospital and home-based	Hospital and home-based
One NBO on postpartum unit within 2 days of birth and one home visit NBO at 1 month of life	One NBO session on postpartum unit within 2 days of birth and one home visit NBO at 1 month of life	Three NBOs, 1 in first week of life in hospital or at home, and two sessions at age 2 and 4 weeks at home
CARE-Index- (Sensitivity in parent–infant interaction) at 4 months of age	Edinburgh Postnatal Depression Scale (EPDS) at one-month postpartum visit	Emotional Availability Scales (EAS) 4th Edition, BSID-III, and Structured Clinical Interview for DSM-5 (SCID-5) at age 4 months (endline) Newborn Developmental Knowledge Questionnaire (NDKQ) prenatally at 36 weeks, and endline; EPDS Perinatal Anxiety Screening Scale (PASS) at prenatal baseline and endline
$N = 35$ (intervention = 18; control = 17)	$N = 112$ (intervention = 57; control = 55.	$N = 74$ (intervention = 40; control = 34)
Multiple logistic regression analysis with regard to the binary outcome variables, sensitivity in mothers, and cooperativeness in infants, hospital and maternal age	Fisher's exact test for proportion of mothers with EPDS >12 Multiple logistic regression, adjusting for hospital, infant gender and mother's education	Linear mixed models to analyse group differences in depression and anxiety symptoms; MANCOVA to examine between-group differences in EAS; ANOVA to examine between group differences on endpoint psychosocial and infant development measures; Effect sizes expressed as Cohen's d (CI = 95%)
Adjusted OR favoured NBO group for: 'sensitive mother' index 4.95, $p = 0.068$, infant cooperativeness 6.56, $p = 0.035$	NBO was associated with lower levels of depression scores ($p = 0.05$), NBO was associated with a reduction in the risk of major depression by over 75% during the first month after birth.	At 4 months: Positive effect on EAS ($p = 0.049$), and maternal knowledge of infant development ($p = 0.03$); no significant differences in endpoint distress characteristics; NBO group with significant reduction in anxiety symptoms over time $p = 0.014$) and a significant decrease in depression symptoms ($p = 0.006$)
None reported	None reported	None reported
Small sample size and limited (4 months) follow-up	Small sample size and no baseline EPDS	PASS requires further validation; Concern about the validity of reporting individual EAS scales
Mothers at risk for postpartum depression.	Mothers at risk for postpartum depression	Mothers at risk for perinatal depression and/or anxiety

capacity to engage in sensitive caregiving, or a comorbid combination of both conditions, the high-risk dyad faces greater potential for misattunement. Accordingly, with greater risk may come greater opportunity for the NBO to meaningfully improve the parent–infant relationship with attendant positive parental and infant outcomes.

Finally, implementation appears to be important. Specifically, studies that embed the NBO in real world clinical settings provide the most realistic pathways for translation of research findings into improved standard of care practice. For example, one study embedded the NBO into Early Intervention, with NBO training provided to EI providers.[14] Additionally, the study leveraged existing program infrastructure to align with eligibility, service delivery and outcome measure data collection processes to streamline the study procedures to maximise efficiency, reproducibility and sustainability after the study period.

2 | DISCUSSION

Based on the current research, the NBO shows promise for supporting high-risk infants and parents within existing systems of care. Future research should include larger sample sizes with longer follow-up to better understand at-risk children's developmental trajectory over time. Outcomes research with the NBO should continue to target parental mental health and should specifically include non-birthing parents as well as the extended family system. Given that

the vast majority of preterm infants are born in low- and middle-income countries (LMICs) and that the NBO is a low-tech intervention that has a track record of integration into wide array of care models, more research on its effectiveness in LMICs should be prioritised, with recognition of the importance of culturally congruent outcome measures.

While there is a pressing need to better understand the role of the NBO in the NICU setting, this research will face several challenges. Questions include how often the NBO is administered and by whom – therapy staff, bedside nurses, mental health clinicians, or all of the above? Measuring fidelity in NBO delivery is not straightforward, perhaps even more so in the NICU setting where many modifications of NBO items are needed. The NBO fidelity checklist developed in one recent study[17] emphasises the practitioner's interactional skills and practices that we believe are central to the intervention rather than focusing on which or how many NBO items are administered. Finally, challenges for the NICU parent–infant dyad do not end at hospital discharge. Study designs that include both inpatient and post-discharge components are likely to be best positioned for success. To this end, the authors have a research protocol in development that involves providing NBO intervention beginning in the NICU and spanning the first 3 months post term in community-based care. The flexibility of the NBO, focus on providing individualised care, and emphasis on supporting the parent–infant interaction create a unique opportunity to examine its effectiveness in a variety of clinical settings. These NBO attributes also present challenges for researchers related to variability in the NICU population, differences in dose and content of NBO sessions and disparate access to post-NICU services. Yet, contemporary research frameworks such as dissemination and implementation science offer strategies to leverage this variability to understand best practices to optimally support parent–infant relationships.

While NICUs must choose from among a multitude of development- and family-support interventions to benefit their patients, the NBO has unique qualities that deepen family-centred care. Beyond dyadic, the NBO has evolved over time to be truly triadic, including frameworks not only for understanding the infant's contribution to caregiving relationships but also for considering the parent's tasks in engaging with their infant and the practitioner's role in scaffolding the infant-parent relationship. Rooted in Brazelton's appreciation of the unique personhood of the newborn and in Als' Synactive Theory of Development, and fundamentally incorporating the authority of the parent's understanding of their own baby, the NBO may foster a common language and stance across many professional disciplines in the NICU. The resulting experience of repeated positive regard and respect from the care team for the infant, for the parents, and for the paramount importance of their relationship may characterise an ideal therapeutic environment of not only a neonatal but also a *parenting* intensive care unit.

The perinatal period represents a critical developmental window of experience-mediated brain development. By extension, an intervention such as the NBO which targets the quality of the parent–infant relationship in the perinatal period may have outsized potential impact given its timing during this critical developmental window. These considerations underscore the importance of developmental support services which begin in the NICU and then bridge to post-discharge care, including EI and NICU follow-up care.

3 | CONCLUSIONS

Advances in neonatal intensive care have moved the goal in caring for ill and preterm neonates from surviving to thriving. Best practice models for optimisation of developmental outcomes are undoubtedly multipronged, based in the Synactive Theory of Development, attentive to sensory experience, and focused on the critical role of the infant's primary caregivers, both during the inpatient birth hospitalisation and ongoing post-discharge developmental support. Alleviation of parental mental distress as integral to NICU care reaps benefits for the parent, the infant and the health of the dyadic relationships. Finally, comprehensive care of the NICU patient also includes addressing social determinants of health that interfere with a NICU parent's ability to participate in their infant's care. In this sensitive developmental window, every moment matters so that even temporary supports may yield foundational benefit.

The NBO is by no means a silver bullet in the quest to improve developmental outcomes for children who begin their extrauterine lives in the NICU. Indeed, there are likely no such silver bullets. However, given accumulating evidence of its effectiveness in supporting parental mental health, infant development and the quality of primary caregiving relationships combined with its strength-based, low-tech and flexible nature, the NBO deserves consideration for incorporation into NICU and post-NICU care for high-risk infants and families. Accompanying research to refine our understanding of how best to implement this tool will better delineate the NBO's place in the armamentarium of care for our youngest and most fragile world citizens and their families.

AUTHOR CONTRIBUTIONS

Lise C. Johnson: Conceptualization; writing – review and editing; writing – original draft. **Beth McManus:** Conceptualization; methodology; writing – review and editing; writing – original draft. **Yvette Blanchard:** Writing – original draft; writing – review and editing. **J. Kevin Nugent:** Writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

Drs Johnson, Blanchard and Nugent are co-developers of the NBO and co-authors of *Understanding newborn behaviour and early relationships: The Newborn Behavioural Observations (NBO) system handbook*.

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