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Coached, Coordinated, Enhanced Neonatal Transition (CCENT): Protocol for a multicentre pragmatic randomized controlled trial for parents of high-risk infants

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ABSTRACT

Introduction

Having an infant admitted to the neonatal intensive care unit (NICU) is associated with increased parental anxiety, stress and depression. These emotions may increase during the transition home from hospital. Enhanced support for parents may decrease parental stress and improve subsequent parent and child outcomes. The Coached, Coordinated, Enhanced Neonatal Transition (CCENT) program is a novel bundled intervention of psychosocial support delivered by a nurse navigator that includes coaching within an Acceptance and Commitment Therapy framework, care coordination, and anticipatory education to support parents of high-risk infants through the first year of life. The primary objective is to evaluate the impact of the CCENT intervention on parent stress at 12 months.

Methods and analysis

This is a multicentre pragmatic randomized controlled superiority trial with 1:1 allocation to the CCENT model versus control (standard of care). Parents of high-risk infants (n=236) will be recruited from 7 NICUs across Canada. Participants randomized to the intervention arm are assigned a nurse navigator who will provide the bundled intervention. Outcomes are measured at baseline, 6 weeks, 4, 12 and 18 months. The primary outcome measure is the total score of the Parenting Stress Index 4th Edition Short Form at 12 months. Secondary outcomes include parental mental health, family empowerment, and parental health-related quality of life for calculation of quality-adjusted life years (QALYs). Qualitative interviews will be conducted to explore parent and health care provider experiences with the CCENT program. A cost-effectiveness analysis will examine the incremental cost of CCENT versus usual care per QALY gained.

Ethics and dissemination

Research ethics approval was obtained for all sites. Results will be shared with all Canadian Level III NICUs, neonatal follow up programs, regional health authorities, and academic forums.

Trial registration number: ClinicalTrials.gov, U.S. National Library of Medicine, National Institutes of Health, #NCT03350243, 11/22/2017. Prospectively registered.

Strengths and limitations of this study

- This is the first large scale RCT assessing a novel bundled intervention of support for parents starting in the NICU and through the first year of life, which includes psychosocial support and coaching within an Acceptance and Commitment Therapy framework, care coordination and education delivered by a nurse navigator.
- This study is multicentre, which increases generalizability, reduces the risk of bias, and allows for broad national dissemination.
- A limitation of this study is that measures of parental stress, mental health, family empowerment, and health service delivery are self-reported and cannot be independently verified.
- The lack of blinding for participants and investigators due to the interpersonal nature of the intervention may contribute to bias. However, data analysts will be blinded to participant allocation.

INTRODUCTION

Medical and technological advances have led to increasing survival of infants born preterm(1) or with complex medical needs(2) who are admitted to the neonatal intensive care unit (NICU). These infants are at risk of medical, cognitive, and developmental sequelae.(2-5) Having an infant admitted to the NICU is associated with increased parental anxiety,(6, 7) stress(8, 9) and depression.(10-12) These emotions increase during the transition home from hospital,(13-15) depending on the child's condition and the parent's readiness for discharge(10) and their medical caregiving role.(16, 17) Discharge is accompanied by a sense of loss as families leave the familiarity of the NICU while severing supportive relationships with health care providers (HCP).(18) A lack of continuity of care post-discharge can negatively impact patient outcomes and parent well-being.(19)

In Canada, post-discharge care includes scheduled appointments with a primary care provider, and for high-risk infants, a neonatal follow-up program that focuses on neurodevelopmental assessment and outcomes.(20, 21) However, there is a lack of direct support for parent psychosocial (psychological and social) needs,(22) and limited research in this area.(23) A systematic review of interventions for NICU parents including psychosocial support, education, and/or developmental interventions reported positive effect on depression and anxiety, but limited effect on stress.(13) Families and HCPs have identified that the tools to address a family's medical and social needs must extend beyond the NICU to include the transition home(9, 15-18, 24-26) and first year of life.(12, 22, 27)

Integrated health care models can support transition from hospital to home by decreasing parental stress, optimizing family empowerment, and improving health care system efficiency(28) and costs.(29, 30) NICU parents may benefit from an integrated intervention including a dedicated key worker,(31) care coordination with the infant's medical team,(22, 24, 32) psychosocial support to cope with stress,(14, 22) and education to prepare for parenting a medically complex infant.(33-35) The role of key worker has been shown to improve health outcomes of high-risk infants,(36) and has sustained benefits to parental mental health.(37) Care coordination is associated with more efficient health care service use and cost savings for families and the health care system.(38) Enhanced psychosocial support for parents(9, 31, 39-47) decreases stress, anxiety, depression,(48) and improves parent–infant attachment and developmental outcomes for preterm infants.(13) Anticipatory guidance and education around development and behaviour in high-risk infants increases confidence in caregiving,(49) decreases parental stress, and facilitates a safe transition home.(35)

Acceptance and Commitment Therapy (ACT) is an empirically-based behavioural therapy involving acceptance, mindfulness, and behaviour change strategies to foster psychological flexibility, which is the willingness to experience difficult events and choose actions in the present moment aligning with one's values.(50) ACT encourages people to embrace their difficult thoughts and feelings rather than avoiding them. Research has shown that increasing psychological flexibility through mindfulness therapies reduced maternal depression during the NICU admission and after discharge.(51) ACT interventions can be delivered by a variety of trained facilitators,(23) and demonstrate improved mental health outcomes for parents of children with life-threatening illness,(52) asthma(53) and autism(54). ACT may be more

appropriate for parents in the NICU compared to interventions such as traditional Cognitive Behavioural Therapy (CBT),(23) which demonstrates effectiveness in reducing depression but not anxiety for NICU mothers.(55)

The Coached, Coordinated, Enhanced Neonatal Transition (CCENT) program is a novel bundled intervention for parents of high-risk infants delivered by a nurse navigator (NN) who provides 1) coaching and psychosocial support within an Acceptance and Commitment Therapy (ACT) framework, 2) care coordination, and 3) anticipatory education around the care for a medically complex infant.

Aims and objectives

The primary aim of this study is to compare the CCENT intervention to standard of care for parents of high-risk infants. The primary objective is a comparison of parental stress between the intervention and control groups using the Parenting Stress Index 4th Edition Short Form at 12 months. The secondary objective is to evaluate the effect of the CCENT intervention on parent-infant interaction, parent empowerment, physical and mental health, psychological flexibility, family experience of care, and infant development outcomes. The tertiary objective is to estimate the incremental cost per parental quality-adjusted life year (QALY) gained of the CCENT intervention compared to usual care, from both a public health care payer and societal perspective. Our outcomes are structured around the Triple Aim framework, which focuses on patient experience of care, population health, and cost.(56)

METHODS AND ANALYSIS

Design

CCENT is a multicentre pragmatic randomized controlled superiority trial. The trial will compare two parallel groups randomized with a 1:1 allocation ratio to the CCENT program versus standard of care (Figure 1). Concurrent qualitative methods will be used to assess experiences with the program. This protocol has been designed according to the SPIRIT reporting guidelines(57) and registered at clinicaltrials.gov (NCT03350243).

[*Insert Figure 1*]

Setting

CCENT will be conducted in the Level III NICUs of seven hospitals in Ontario, Quebec, and British Columbia.

Participants

The target population are parents of high-risk infants, defined as having risk factors/characteristics predictive of neurodevelopmental delay or impairment, medical complexity, and risk of parent-infant attachment impairment. Both parents will be invited to participate, however primary analyses will be conducted on the individual identified as the primary caregiver for the child.

Inclusion criteria

Parents of an infant:

1. Born ≤ 26+6 weeks gestational age (GA) and (must be 30 days old at date of recruitment to ensure viability)
2. Born 27-29+6 weeks GA with ≥ 1 of the following risk factors:
    i) ≥ Grade III intraventricular hemorrhage with post hemorrhagic hydrocephalus
    ii) Retinopathy of prematurity requiring intraocular bevacizumab/anti-vascular endothelial growth factor or laser surgery therapy
    iii) Requires invasive (e.g., intubation) or non-invasive (e.g., CPAP) respiratory support at ≥ 34 weeks GA or supplemental oxygen at ≥ 37 weeks GA
    iv) Requires surgery for management of stage 3 necrotizing enterocolitis
3. With two or more major congenital anomalies as defined by the European Registration of Congenital Anomalies and Twins (EUROCAT) (e.g., atrial septal defect, hypospadias) and length of stay (LOS) in recruiting institution ≥ 14 days
4. With hypoxic ischemic encephalopathy requiring therapeutic hypothermia and LOS in the recruiting institution ≥ 14 days

Exclusion criteria

Parent:

1. Does not speak English or French
2. Is not involved with child's care during the study period (e.g., adoption)

Infant:

3. Is followed by an out-of-province neonatal follow-up program
4. Has previously been discharged home from the hospital
5. Decision or high likelihood of withdrawal of care

Control arm

The control arm will receive the standard of care at their study site: routine primary paediatric care and a neonatal follow-up (NFU) program based on site-specific eligibility criteria. NFU programs typically provide 5-7 visits(21) at 4-8 weeks, 4, 8, 12, 18 and 36 months.(58) The visits consist of neurodevelopmental assessments and monitoring of outcomes.

Intervention arm: Coached, Coordinated, Enhanced Neonatal Transition

In addition to standard of care, participants randomized to the CCENT intervention arm will receive 1) coaching and psychosocial support within an Acceptance and Commitment Therapy (ACT) framework, 2) care coordination, and 3) anticipatory education around the care of a medically complex infant, delivered by a trained nurse navigator (NN). The NN will provide goal-oriented, client-centred coaching that is health-focused,(59) and will guide parents to problem solve challenges.(60)

NNs deliver the intervention over a 12-month period for a minimum of 21 sessions; 5 in the NICU and 6 weekly sessions followed by monthly sessions for months 2-12 post-NICU discharge. Post-discharge support sessions will occur via phone contact with supplemental e-mails.

Coaching and psychosocial support

NNs deliver five in-person sessions (a 20-minute pre-session and four 1-hour sessions) of ACT-based coaching to parents in the NICU, guided by an ACT Manual (details in Appendix A). Additional coaching may occur via phone based on need. Key themes in the ACT curriculum include coping with stress, promoting psychological flexibility, cultivating mindfulness, and values-based goal setting. If infants are transferred or discharged before completing in-person sessions, parents can continue virtually.

Care coordination
NNs deliver care coordination activities grounded in patient- and family-centered care, partnership and empowerment strategies to address health-related needs. These activities include focused relationship building, medical and social problem-solving, and navigation with community resources post-discharge. Activities are tailored to participant need and may occur in hospital or virtually throughout the 12 month intervention period.

Anticipatory education
NNs provide proactive education targeting typical challenges in caring for high-risk infants' health care and developmental needs. A 30-page toolkit and a website of resources were developed by the study team, expert HCPS, and a parent advisory committee to ensure consistent intervention content across sites. Toolkit resources include a transition checklist, guide to the first days at home, and links to provincial community resources for infant and parent health and well-being. NNs provide connection to mental health services as needed.

Nurse navigator training
NN training includes a 3-day experiential training program on ACT core processes and coaching methods provided by two clinical psychologists and a social worker (standardized across sites). The ACT Manual, a 5 session NICU-specific manual of objectives and exercises, was developed in consultation with ACT therapists and psychologists and was reviewed during training. Additionally, NNs undergo 1-day training on care coordination and anticipatory education methods provided by a nurse practitioner. Throughout the study, NNs attend bi-weekly facilitated peer support and ACT practise/feedback sessions with a social worker.

ACT intervention fidelity
NNs will complete the ACT Fidelity Measure (ACT-FM)(61) after every ACT session as a self-assessment of their ACT consistency. To ensure intervention fidelity, all ACT sessions will be audio-recorded and 10% of the sessions will be randomly selected and reviewed by a behaviour analyst (BA) and social worker (SW) using the ACT-FM. The ACT-FM scores of the NN's ACT consistent vs ACT inconsistent responses for each session as determined by the BA and SW will be compared to the NN's self-assessment.

Outcomes and measures
Outcome measures were selected based on their content applicability, reliability and validity. In the case of multiple births, if multiple infants per family are eligible, parents will complete the child-related measures for each eligible infant. Corrected age is used for infants born < 37 weeks GA. Table 1 summarizes the timeline in which measures are collected.

Primary outcome

The primary outcome is parenting stress measured by the Parenting Stress Index 4th Edition Short Form (PSI-4-SF) (36 items, Cronbach's alpha = 0.91).(62-67) Studies of the test-retest reliability of the PSI-4-SF demonstrate high correlation coefficients, supporting the general stability of the test over time and its ability to detect change in stress.(68)

Parent-focused secondary outcomes

1. Health-related quality of life
   The Health Utilities Index (HUI) provides indicators of multiple attributes of health status for use in economic evaluations of health care programs. It has well-established validity and reliability in many clinical contexts (test-retest reliability of 0.767 intra-class correlation coefficient).(69, 70)

2. Empowerment
   The Family Empowerment Scale(71, 72) measures empowerment in families with children who have emotional, behavioral, or mental disorders (34 items, Cronbach's alpha 0.87-0.88).(71)

3. Mental health
   The Edinburgh Postnatal Depression Scale (EPDS) assesses for symptoms of depression and anxiety during pregnancy and the year following birth (10 items, Cronbach's alpha = 0.87).(73, 74) The State-Trait Anxiety Inventory (STAI) Short Form measures state anxiety (how one feels at the moment) and trait anxiety (how one generally feels) (6 items, Cronbach's alpha >0.90).(75, 76)

4. Health care and service delivery
   The Measure of Processes of Care – 20 (MPOC-20) is a validated, reliable self-report measure of parent's perception of the extent to which health services are family-centered (20 items, Cronbach's alpha 0.63-0.90).(77, 78)

5. Transition experience
   The Pediatric Transition Experience Measure (PTEM) is a self-report measure of a parent's perception of transition preparation and support from the hospital (11 items).(79) McDonald's coefficient omega to examine internal consistency reliability was 0.84.(80)

6. Health resource use
   The Resource Use Questionnaire measures resource use relating to the infant's medical needs post-discharge and will be summed over the study interval.(81) The child-parent dyad is the unit of measurement.

7. Psychological flexibility
   The Acceptance and Action Questionnaire II (AAQ-II) measures psychological flexibility, and is an internally consistent measure of ACT's model of mental health and behavioral effectiveness (Cronbach's alpha = 0.84).(82)

Child-focused secondary outcomes

1. Infant health and development
   Medical indicators are collected via chart review. The Brief Infant-Toddler Social Emotional Assessment (BITSEA) is a parent-report screener to identify children at risk for or currently experiencing social-emotional/behavioural problems or delays in competence (42 items, Cronbach's alpha for Problem scale = 0.79, Competence scale = 0.65).(83-85) The Bayley Scales of Infant and Toddler Development Third Edition (BSID-III) assesses infant development with good to strong validity and reliability (Cronbach's alpha 0.57-0.87).(86, 87) The Ages and Stages Questionnaire 3rd edition 18 month (ASQ-18) is a validated questionnaire in which parents rate their child's current skills and development (Cronbach's alpha 0.60-0.75).(88, 89)

2. Infant-parent interaction
   The Nursing Child Assessment Satellite Training Parent-Child Interaction Teaching Scale (NCAST-PCI) assesses caregiver and infant behaviours observed during a structured teaching task (Cronbach's alpha = 0.84).(90, 91)

Additional measures

Participant demographic characteristics are collected by survey. Social support, a potential effect modifier, is measured using the Social Support Questionnaire-Short Form (SSQ-6) (Cronbach's alpha = 0.97).(92, 93) Participants in the control group complete a form listing any mindfulness programs they participated in over the last year to examine potential contamination bias. To capture intervention engagement, the duration and content of all NN-parent interactions are recorded by the NN in a log.

Parent and nurse navigator experience outcomes

Experience outcomes are captured through purposive sampling and semi-structured qualitative interviews with a subset (15-20) of intervention participants at 12 months and HCPs (7-15) including all NNs at study end. The objective of the qualitative component is to ensure an in-depth understanding of the intervention, especially 1) most valuable components, 2) facilitators and barriers, and 3) impact on parent stress and mental health.

Table 1. Measures timeline

MEASURE*	TIME TO ADMINISTER	BASELINE	PRETERM INFANTS			
			6 weeks corrected age	4 months corrected age	12 months corrected age	18 months corrected age
			TERM INFANTS (≥37 Weeks)			
			6 weeks post-enrollment	4 months post-enrollment	12 months post-enrollment	18 months post-enrollment
Participant Information & Demographic Questionnaire	5 min	✓				
Social Support Questionnaire 6	<5 min	✓				
Parenting Stress Index 4 SF	5 min	✓**	✓	✓	✓**	✓

Acceptance and Action Questionnaire II	<5 min	✓	✓	✓	✓	✓
Edinburgh Postnatal Depression Scale	5 min	✓	✓	✓	✓	
Health Utilities Index	5 min	✓		✓	✓	
State-Trait Anxiety Inventory SF	<5 min	✓		✓	✓	
Medical Indicators Form (chart review)***	15 min	✓		✓	✓	
Family Empowerment Scale	5 min	✓			✓	
Measure of Processes of Care 20	5 min	✓			✓	
Pediatric Transition Experience Measure	<5 min		✓		✓ (If not discharged at 6 weeks)	
Resource Use Questionnaire	5-10 min			✓	✓	
NCAST-PCI Teaching Scale***	10 min				✓ In-person/virtual	
BITSEA***	10 min				✓	
Mindfulness Exposure Form (control only)	<5 min				✓	
Qualitative Interviews (intervention only)	45 min				To be invited	
BSID-III***	60 min					✓ In-person
Ages and Stages Questionnaire 18***	10 min					✓

*Participants will be given a window of +/- one month to complete each set of measures
**The second parent will also complete this measure, if enrolled
***Per infant in the study

Sample size

With 200 families there is 80% power to declare significance (with a one-sided test of the null hypothesis at $\alpha = 0.025$) if the intervention decreases the mean total stress score on the PSI-4-SF at 12 months by at least 0.4 of a standard deviation. To allow for up to 15% attrition, a total of 236 families will be recruited. Former studies have not identified a minimal clinically important difference (MCID) for the PSI-4-SF that could be used to estimate sample size calculation. It was assumed that participants would have a mean total stress score of 64(39) and estimates of the standard deviation vary from 15(94) to 19.(39) Therefore, the MCID for which there is sufficient power lies between 6 and 7.6. Differences less than 6.5 points (about 10%) would not be considered clinically important. The range used for the standard deviation (15-19) was confirmed using the data from the first 60 patients.

Recruitment

Research staff screen admissions to participating Level III NICUs for eligibility. A member of the NICU clinical team asks if parents are interested in participating in research. If interested, research staff speak with parents to discuss study procedures and consent. Research staff will obtain written informed consent from all participants for participation in the trial, audio

recording, secondary data access, and qualitative interviews (model consent form in Appendix B).

Randomisation

Consented participants are enrolled and randomized using Research Electronic Data Capture (REDCap).(95, 96) Randomisation is stratified by site and the generation of the allocation sequence is concealed from research staff. Blinding of participants and NNs is not feasible due to the in-person nature of the intervention, however data analysts will be blinded to allocation.

Data collection

Participants are assigned an identification number to ensure confidentiality. Quantitative study data are collected and managed using REDCap. Participants can complete questionnaires online via REDCap, on paper or via telephone as needed. Participants receive a $10 honorarium at the completion of each set of questionnaires ($20 at 12 months), the NCAST visit, and the qualitative interview.

Participants are deemed lost to follow-up after no response to 2 telephone and 2 email contact attempts. If an infant dies after enrollment or a participant withdraws from the study, no further data collection will occur and they will be analyzed according to the intention to treat principle.

Data management

The Women & Children's Health Research Institute (WCHRI) at the University of Alberta will perform system management functions and data cleaning. Missing data and potential sources of bias will be examined and appropriate correction methods determined before data analysis. Data analysis will be performed by the WCHRI in collaboration with the research team. There is no data monitoring committee due to the low-risk nature of the intervention.

Statistical analysis

The intention to treat principle will be used for all analyses. Continuous data will be summarized by the mean and standard deviation for approximately normally distributed variables; median and quartiles (first and third quartiles) will be used for other distributions. Categorical data will be presented by absolute and relative frequencies (n and %). The unit of analysis for outcomes measured at the family level will be the self-identified primary caregiver. The unit of analysis for outcomes measured at the infant level will be the individual infant. A one-sided p-value ≤ 0.025 will be considered statistically significant. All statistical analyses will be performed by SAS 9.4 or later (SAS Institute Inc., Cary, NC, USA).

Primary analysis

The primary analysis will be based on the PSI-4-SF mean total stress score measurement taken at 12 months. Linear mixed models with sites as a random effect and group assignment as a fixed effect will be used for the analysis. Baseline PSI-4-SF value will be included as a covariate in the model.

Secondary analyses

Similar linear mixed models will be used to analyze secondary outcomes. For those outcomes with a measurement taken at baseline the corresponding baseline measurement will be included

as a covariate in the model. To account for multiple births for outcomes measured on infants the linear mixed model for the analysis will include a random effect for family.

For those outcomes with measurements in addition to that taken at 12 months, a linear mixed model accounting for repeated measures will be performed to examine the effect of group allocation and time. Effects of sites and of individual participants will be added as random effects to the model. The effects of the intervention will also be assessed on PSI-4-SF subscale scores. In a sub-group analysis we will examine the effects of potential mediating variables, such as infant health status (e.g., prematurity), parental mental health (e.g., baseline depressive symptoms) and family factors (e.g., sociodemographic factors), on PSI-4-SF total score.

Cost-effectiveness analyses

A cost-effectiveness analysis will be performed to determine the incremental cost of the CCENT intervention compared to standard of care among high-risk infants per quality-adjusted life years (QALY) gained. Utility weights derived from the HUI will be multiplied by the life expectancy of each parent to determine their QALYs. Both a health care system and societal perspective will be used with a 12-month time horizon. All costs and outcomes will be assigned to the family as the unit of analysis. Those families that have more than one eligible child may be analysed separately to preserve independence of observations. In addition to the infant's resource use captured on the RUQ, the CCENT intervention will be micro-costed in terms of labour and supplies. As the study is randomized, patient-level regression will be used to determine mean costs and outcomes per family for the comparators over the 12-month time horizon. Results will be summarized in an incremental cost-effectiveness ratio (ICER) – the ratio of the difference between groups in mean cost per family to the difference in mean QALYs. Extensive sensitivity analyses that examine the effects of varying uncertain parameters on the results will be conducted. Secondary cost-effectiveness analyses that model the incremental cost of CCENT per unit of improvement in other parental outcomes measures will also be conducted.

Qualitative analysis

Interviews will be transcribed verbatim and reviewed for accuracy. Two researchers will independently code transcripts with NVivo 12,(97) using content analysis to identify key concepts, cluster key concepts into categories, and revisit categories to refine them.(98) Content analysis allows for the construction of categories containing data that represent similar meanings to provide insight into the phenomenon of interest.(98) Authors with expertise in qualitative analysis methods will review the coding scheme and findings at interim meetings. Data collection will continue until saturation is reached.

DISCUSSION

Recognition of the importance of parental support in the NICU and during the transition home has been noted in the literature.(14, 22, 24, 33, 34) There is a need for a high-quality clinical trial of this scope and nature. We anticipate that the CCENT program will improve parental stress for parents of high-risk infants. We expect a positive impact on family empowerment, parent-infant interaction, psychological flexibility, child development, and transition experience. We also expect parents to experience better care coordination and more efficient health care utilization. In

turn, we propose this study will lead to a shift in focus of neonatal follow-up across Canada to embed a model of parent support that is longitudinal and includes the transition home.

Several aspects of this trial are novel or innovative. The CCENT program addresses gaps in the literature regarding parental support by delivering a model that is proactive, long-term and encompasses the transition from hospital to home. In order to address the lack of evidence-based interventions supporting fathers of high-risk infants,(6, 13) we have included both fathers and mothers in our study. The qualitative interviews will allow us to identify what aspects of the CCENT program are more or less effective, for whom, and in what contexts.

The study's use of a nurse navigator delivering an integrated care bundle including Acceptance and Commitment Therapy coaching is innovative.(23, 99) NNs were chosen due to the versatility, clinical expertise and social support skills of the nursing role.(100) Engaging nurses present in the NICU ensures guidance begins in the NICU and continues to outpatient care.(31)

Limitations include the risk of refusal or attrition due to the time commitment required. To minimize losses due to retro transfer from level III to level II units prior to completion of the 5 ACT sessions, virtual options are available.

Intervention development
The intervention was developed through 8 teleconferences over a one year period with key stakeholders (including parent-partners) to determine the inclusion criteria and elements of the intervention.

Patient and public involvement
CCENT is embedded within the CHILD-BRIGHT network, which is supported by the Canadian Institutes of Health Research under Canada's Strategy for Patient-Oriented Research.(101, 102) CCENT was created based on priorities set by Canadian patients, families and investigators to increase the likelihood of a transformative impact for children and families. CCENT actively involves graduate NICU families in developing the study design and the intervention content. A parent advisory group meets biannually, with quarterly e-mail conversations with the research team.

ETHICS AND DISSEMINATION

Informed consent will be obtained from all participants by the research staff. Study data are kept confidential by removing identifying information, and all study files are maintained on a password protected secure server.

Adverse event reporting
A parent may be identified as having significant mental health concerns through NN interactions or the EPDS. A safety protocol is in place to ensure parents receive appropriate primary care or emergency services support as needed. All adverse events will be reported to the site research ethics board and primary investigator.

Dissemination

Study team members have direct integration and expertise in neonatal care and follow up locally and nationally, allowing for seamless knowledge translation (KT) to embed key findings into practise, including the use of an NN and the ACT framework. Executive summaries and presentations will be shared with Canadian NICUs. Academic KT will occur through presentation at academic conferences and publications in high-impact, peer reviewed journals. Collaboration with organizations such as the Provincial Council for Maternal and Child Health and Canadian Premature Babies Foundation provides further dissemination opportunities.

TRIAL STATUS

Recruitment began March 2018 at 2 sites and June 2019 at all other sites. 218 of 236 participants are enrolled as of October 2020. The study is anticipated to finish recruitment by January 2021 and data collection by July 2022. Full-length protocol available on request.

AUTHOR CONTRIBUTIONS

Protocol version: 11 (version date: June 28 2020)

Roles and responsibilities:
JO, NM, PC, EC, TD, EK, LL, KO, HP, AS, and EC designed the study and the other authors (KE, AP, KR, LB, WS, and MB) collaborated in the design of the study. AW and MY provided statistical expertise and will conduct the statistical analysis. MM and WU designed and will conduct the cost-effectiveness analysis. JO, NM, KE, AP and SR prepared the initial draft of the manuscript and all authors revised the manuscript. All authors read, provided feedback, discussed and approved the final manuscript.

COMPETING INTERESTS STATEMENT

The authors of this paper declare that they have no significant competing financial, professional, or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

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ETHICS APPROVAL AND CONSENT

The CCENT study has obtained ethics approval from Clinical Trials Ontario (CTO0859) for Sunnybrook Health Sciences Centre, Mount Sinai Hospital, and The Ottawa Hospital. Ethics approval has also been obtained from each pediatric centre: Children's Hospital of Eastern Ontario Research Ethics Board (20170424), The Hospital for Sick Children Research Ethics Board (1000057100), UBC Children's and Women's Research Ethics Board (H18-02154), and McGill University Health Centre Research Ethics Board (20194721).

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The study sponsors were not directly involved in the study design, data collection and analysis, or the writing and publishing of this report. The study sponsors will not have ultimate authority over any of these activities.

FIGURES

Figure 1: Study flow diagram

REFERENCES

1. Saigal S, Doyle LW. An overview of mortality and sequelae of preterm birth from infancy to adulthood. *Lancet*. 2008;371(9608):261-9.
2. Kieran E, Sara R, Claydon J, et al. Outcomes of Neonates With Complex Medical Needs. *Adv Neonatal Care*. 2019;19(4):275-84.
3. PCMCH. Final Report of the Neonatal Follow-Up Clinics Work Group. 2015.
4. Baraldi E, Allodi MW, Löwing K, et al. Stockholm preterm interaction-based intervention (SPIBI)-study protocol for an RCT of a 12-month parallel-group post-discharge program for extremely preterm infants and their parents. *BMC Pediatr*. 2020;20(1):49.
5. Kuo DZ, Lyle RE, Casey PH, et al. Care System Redesign for Preterm Children After Discharge From the NICU. *Pediatrics*. 2017;139(4).
6. Carter JD, Mulder RT, Darlow BA. Parental stress in the NICU: the influence of personality, psychological, pregnancy and family factors. *Personal Ment Health*. 2007;1(1):40-50.
7. Obeidat HM, Bond EA, Callister LC. The parental experience of having an infant in the newborn intensive care unit. *J Perinat Educ*. 2009;18(3):23-9.
8. Al Maghaireh DaF, Abdullah KL, Chan CM, et al. Systematic review of qualitative studies exploring parental experiences in the Neonatal Intensive Care Unit. *J Clin Nurs*. 2016;25(19-20):2745-56.
9. Roque ATF, Lasiuk GC, Radünz V, et al. Scoping review of the mental health of parents of infants in the NICU. *J Obstet Gynecol Neonatal Nurs*. 2017;46(4):576-87.
10. Alkozei A, McMahon E, Lahav A. Stress levels and depressive symptoms in NICU mothers in the early postpartum period. *J Matern Fetal Neonatal Med*. 2014;27(17):1738-43.
11. Treyvaud K. Parent and family outcomes following very preterm or very low birth weight birth: a review. *Semin Fetal Neonatal Med*. 2014; 19(2):131-5.
12. Treyvaud K, Lee KJ, Doyle LW, et al. Very preterm birth influences parental mental health and family outcomes seven years after birth. *J Pediatr*. 2014;164(3):515-21.
13. Benzies KM, Magill-Evans JE, Hayden KA, et al. Key components of early intervention programs for preterm infants and their parents: a systematic review and meta-analysis. *BMC Pregnancy Childbirth*. 2013;13 Suppl 1:S10.
14. Grunberg VA, Geller PA, Bonacquisti A, et al. NICU infant health severity and family outcomes: a systematic review of assessments and findings in psychosocial research. *J Perinatol*. 2019;39(2):156-72.
15. Ballantyne M, Orava T, Bernardo S, et al. Parents' early healthcare transition experiences with preterm and acutely ill infants: a scoping review. *Child Care Health Dev*. 2017;43(6):783-96.
16. Sneath N. Discharge teaching in the NICU: are parents prepared? An integrative review of parents' perceptions. *Neonatal Netw*. 2009;28(4):237-46.
17. Raines DA. Mothers' stressor as the day of discharge from the NICU approaches. *Adv Neonatal Care*. 2013;13(3):181-7.
18. Ronan S, Brown M, Marsh L. Parents' experiences of transition from hospital to home of a child with complex health needs: A systematic literature review. *J Clin Nurs*. 2020;29(17-18):3222-35.
19. Welch CD, Check J, O'Shea TM. Improving care collaboration for NICU patients to decrease length of stay and readmission rate. *BMJ Open Qual*. 2017;6(2):e000130.

20. Sauve R, Lee SK. Neonatal follow-up programs and follow-up studies: Historical and current perspectives. *Paediatr Child Health*. 2006;11(5):267-70.
21. Albaghli F, Church P, Ballantyne M, et al. Neonatal follow-up programs in Canada: A national survey. *Paediatr Child Health*. 2019.
22. Purdy IB, Craig JW, Zeanah P. NICU discharge planning and beyond: recommendations for parent psychosocial support. *J Perinatol*. 2015;35 Suppl 1:S24-8.
23. Esser K, Barreira L, Miller D, et al. Exploring Acceptance and Commitment Therapy for parents of preterm infants. *Paediatr Child Health*. 2020; pxaa003.
24. Aydon L, Hauck Y, Murdoch J, et al. Transition from hospital to home: parents' perception of their preparation and readiness for discharge with their preterm infant. *J Clin Nurs*. 2018;27(1-2):269-77.
25. Bruder MB, Walker L. Discharge planning: Hospital to home transitions for infants. *Topics Early Child Spec Educ*. 1990;9(4):26-42.
26. Garfield CF, Simon CD, Rutsohn J, et al. Stress From the Neonatal Intensive Care Unit to Home: Paternal and Maternal Cortisol Rhythms in Parents of Premature Infants. *J Perinat Neonatal Nurs*. 2018;32(3):257-65.
27. Spittle AJ, Anderson PJ, Lee KJ, et al. Preventive care at home for very preterm infants improves infant and caregiver outcomes at 2 years. *Pediatrics*. 2010;126(1):e171-8.
28. Gröne O, Garcia-Barbero M. Integrated care: a position paper of the WHO European Office for Integrated Health Care Services. *Int J Integr Care*. 2001;1:e21.
29. Wolfe I, Satherley RM, Scotney E, et al. Integrated Care Models and Child Health: A Meta-analysis. *Pediatrics*. 2020;145(1):e20183747.
30. Embuldeniya G, Kirst M, Walker K, et al. The Generation of Integration: The Early Experience of Implementing Bundled Care in Ontario, Canada. *Milbank Q*. 2018;96(4):782-813.
31. Hall S, Phillips R, Hynan M. Transforming NICU care to provide comprehensive family support. *Newborn Inf Nurs Rev*. 2016;16(2):69-73.
32. Hamline MY, Speier RL, Vu PD, et al. Hospital-to-Home Interventions, Use, and Satisfaction: A Meta-analysis. *Pediatrics*. 2018;142(5): e20180442.
33. Whittingham K, Boyd RN, Sanders MR, et al. Parenting and prematurity: understanding parent experience and preferences for support. *J Child Fam Stud*. 2014;23(6):1050-61.
34. Nicolaou M, Rosewell R, Marlow N, et al. Mothers' experiences of interacting with their premature infants. *J Reprod Infant Psychol*. 2009;27(2):182-94.
35. Jefferies AL. Going home: Facilitating discharge of the preterm infant. *Paediatr Child Health*. 2014;19(1):31-42.
36. Broyles RS, Tyson JE, Heyne ET, et al. Comprehensive follow-up care and life-threatening illnesses among high-risk infants: A randomized controlled trial. *JAMA*. 2000;284(16):2070-6.
37. Spittle AJ, Barton S, Treyvaud K, et al. School-age outcomes of early intervention for preterm infants and their parents: a randomized trial. *Pediatrics*. 2016;138(6):e20161363.
38. Clarke JL, Bourn S, Skoufalos A, et al. An Innovative Approach to Health Care Delivery for Patients with Chronic Conditions. *Popul Health Manag*. 2017;20(1):23-30.
39. Halpern LF, Brand KL, Malone AF. Parenting stress in mothers of very-low-birth-weight (VLBW) and full-term infants: a function of infant behavioral characteristics and child-rearing attitudes. *J Pediatr Psychol*. 2001;26(2):93-104.
40. Baía I, Amorim M, Silva S, et al. Parenting very preterm infants and stress in Neonatal Intensive Care Units. *Early Hum Dev*. 2016;101:3-9.

41. Peebles-Kleiger MJ. Pediatric and neonatal intensive care hospitalization as traumatic stressor: implications for intervention. *Bull Menninger Clin*. 2000;64(2):257-80.
42. Bakewell-Sachs S, Gennaro S. Parenting the post-NICU premature infant. *MCN Am J Matern Child Nurs*. 2004;29(6):398-403.
43. Elklit A, Hartvig T, Christiansen M. Psychological Sequelae in Parents of Extreme Low and Very Low Birth Weight Infants. *J Clin Psychol Med Settings*. 2007;14(3):238-247.
44. Klassen AF, Lee SK, Raina P, et al. Psychological health of family caregivers of children admitted at birth to a NICU and healthy children: a population-based cross-sectional survey. *BMC Pediatr*. 2004;4(1):24.
45. Huhtala M, Korja R, Lehtonen L, et al. Parental psychological well-being and cognitive development of very low birth weight infants at 2 years. *Acta Paediatr*. 2011;100(12):1555-60.
46. Zelkowitz P, Na S, Wang T, et al. Early maternal anxiety predicts cognitive and behavioural outcomes of VLBW children at 24 months corrected age. *Acta Paediatr*. 2011;100(5):700-4.
47. Zerach G, Elsayag A, Shefer S, et al. Long-Term Maternal Stress and Post-traumatic Stress Symptoms Related to Developmental Outcome of Extremely Premature Infants. *Stress Health*. 2015;31(3):204-13.
48. Boykova M. Transition from hospital to home in parents of preterm infants: a literature review. *J Perinat Neonatal Nurs*. 2016;30(4):327-48.
49. Zakaria R, Sutan R, Jaafar R. Developing and implementing a health educational package for preemie moms in the care of their baby after hospital discharge. *J Educ Health Promot*. 2020;9:113.
50. Hayes SC, Luoma JB, Bond FW, et al. Acceptance and commitment therapy: model, processes and outcomes. *Behav Res Ther*. 2006;44(1):1-25.
51. Stotts AL, Villarreal YR, Klawans MR, et al. Psychological Flexibility and Depression in New Mothers of Medically Vulnerable Infants: A Mediational Analysis. *Matern Child Health J*. 2019;23(6):821-9.
52. Muscara F, McCarthy MC, Rayner M, et al. Effect of a Videoconference-Based Online Group Intervention for Traumatic Stress in Parents of Children With Life-threatening Illness: A Randomized Clinical Trial. *JAMA Netw Open*. 2020;3(7):e208507.
53. Chong YY, Mak YW, Leung SP, et al. Acceptance and Commitment Therapy for Parental Management of Childhood Asthma: An RCT. *Pediatrics*. 2019;143(2): e20181723.
54. Lunsky Y, Fung K, Lake J, et al. Evaluation of Acceptance and Commitment Therapy (ACT) for mothers of children and youth with autism spectrum disorder. *Mindfulness*. 2018;9(4):1110-6.
55. Mendelson T, Cluxton-Keller F, Vullo GC, et al. NICU-based Interventions To Reduce Maternal Depressive and Anxiety Symptoms: A Meta-analysis. *Pediatrics*. 2017;139(3): e20161870.
56. Steifel M, Nolan K. A Guide to Measuring the Triple Aim: Population Health, Experience of Care, and Per Capita Cost. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2012.
57. Chan A-W, Tetzlaff JM, Gøtzsche PC, et al. SPIRIT 2013 explanation and elaboration: guidance for protocols of clinical trials. *BMJ*. 2013;346:e7586.
58. Day D, PCMCH. Neonatal Follow-Up Implementation Strategy. Toronto, Ontario; 2017.
59. Olsen JM. Health coaching: a concept analysis. *Nurs Forum*. 2014; 49(1):18-29.
60. Foster L, Dunn W, Lawson LM. Coaching mothers of children with autism: A qualitative study for occupational therapy practice. *Phys Occup Ther Pediatr*. 2013;33(2):253-63.

61. O'Neill L, Latchford G, McCracken LM, et al. The development of the Acceptance and Commitment Therapy Fidelity Measure (ACT-FM): A delphi study and field test. *J Contextual Behav Sci*. 2019;14:111-8.
62. Abidin R, Flens JR, Austin WG. The Parenting Stress Index. In R. P. Archer (Ed.), Forensic uses of clinical assessment instruments. Mahwah, NJ: Lawrence Erlbaum Associates Publishers; 2006:297-328.
63. Huhtala M, Korja R, Lehtonen L, et al. Parental psychological well-being and behavioral outcome of very low birth weight infants at 3 years. *Pediatrics*. 2012;129(4):e937-44.
64. Newnham CA, Milgrom J, Skouteris H. Effectiveness of a modified Mother-Infant Transaction Program on outcomes for preterm infants from 3 to 24 months of age. *Infant Behav Dev*. 2009;32(1):17-26.
65. Browne JV, Talmi A. Family-based intervention to enhance infant-parent relationships in the neonatal intensive care unit. *J Pediatr Psychol*. 2005;30(8):667-77.
66. Grunau RE, Whitfield MF, Petrie-Thomas J, et al. Neonatal pain, parenting stress and interaction, in relation to cognitive and motor development at 8 and 18 months in preterm infants. *Pain*. 2009;143(1-2):138-46.
67. Kaaresen PI, Rønning JA, Tunby J, et al. A randomized controlled trial of an early intervention program in low birth weight children: outcome at 2 years. *Early Hum Dev*. 2008;84(3):201-9.
68. Barroso NE, Hungerford GM, Garcia D, et al. Psychometric properties of the Parenting Stress Index-Short Form (PSI-SF) in a high-risk sample of mothers and their infants. *Psychol Assess*. 2016;28(10):1331-5.
69. Furlong WJ, Feeny DH, Torrance GW, et al. The Health Utilities Index (HUI) system for assessing health-related quality of life in clinical studies. *Ann Med*. 2001;33(5):375-84.
70. Boyle MH, Furlong W, Feeny D, et al. Reliability of the Health Utilities Index—Mark III used in the 1991 cycle 6 Canadian General Social Survey Health Questionnaire. *Qual Life Res*. 1995;4(3):249-57.
71. Koren PE, DeChillo N, Friesen BJ. Measuring empowerment in families whose children have emotional disabilities: a brief questionnaire. *Rehabil Psychol*. 1992;37(4),305–321.
72. Singh, NN, Curtis J, Ellis C, et al. Psychometric analysis of the family empowerment scale. *Behav Disord*. 1995;3(2):85-91.
73. Cox JL, Chapman G, Murray D, et al. Validation of the Edinburgh Postnatal Depression Scale (EPDS) in non-postnatal women. *J Affect Disord*. 1996;39(3):185-9.
74. McBride HL, Wiens RM, McDonald MJ, et al. The Edinburgh Postnatal Depression Scale (EPDS): A review of the reported validity evidence. In B. D. Zumbo & E. K. H. Chan (Eds.), Social indicators research series: Vol. 54. Validity and validation in social, behavioral, and health sciences. Springer International Publishing 2014:157-74.
75. Marteau TM, Bekker H. The development of a six-item short-form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). *Br J Clin Psychol*. 1992;31(3):301-6.
76. Tluczek A, Henriques JB, Brown RL. Support for the reliability and validity of a six-item state anxiety scale derived from the State-Trait Anxiety Inventory. *J Nurs Meas*. 2009;17(1):19-28.
77. Cunningham BJ, Rosenbaum PL. Measure of processes of care: a review of 20 years of research. *Dev Med Child Neurol*. 2014;56(5):445-52.

78. King S, King G, Rosenbaum P. Evaluating health service delivery to children with chronic conditions and their families: Development of a refined measure of processes of care (MPOC−20). *Child Health Care*. 2004;33(1):35-57.
79. Desai AD, Zhou C, Simon TD, et al. Validation of a Parent-Reported Hospital-to-Home Transition Experience Measure. *Pediatrics*. 2020;145(2) e20192150.
80. Desai AD, Jacob-Files EA, Lowry SJ, et al. Development of a Caregiver-Reported Experience Measure for Pediatric Hospital-to-Home Transitions. *Health Serv Res*. 2018;53:3084-106.
81. Ungar WJ, Tsiplova K, Millar N, et al. Development of the Resource Use Questionnaire (RUQ–P) for families with preschool children with neurodevelopmental disorders: Validation in children with autism spectrum disorder. *Clin Pract Pediatr Psychol*. 2018;6(2):164-178.
82. Bond FW, Hayes SC, Baer RA, et al. Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance. *Behav Ther*. 2011;42(4):676-88.
83. Briggs-Gowan MJ, Carter AS, Irwin JR, et al. The Brief Infant-Toddler Social and Emotional Assessment: screening for social-emotional problems and delays in competence. *J Pediatr Psychol*. 2004;29(2):143-55.
84. Briggs-Gowan MJ, Carter AS. Applying the Infant-Toddler Social & Emotional Assessment (ITSEA) and Brief-ITSEA in early intervention. *Infant Ment Health J*. 2007;28(6):564-83.
85. Karabekiroglu K, Briggs-Gowan MJ, Carter AS, et al. The clinical validity and reliability of the Brief Infant-Toddler Social and Emotional Assessment (BITSEA). *Infant Behav Dev*. 2010;33(4):503-9.
86. Bode MM, D'Eugenio DB, Mettelman BB, et al. Predictive validity of the Bayley, Third Edition at 2 years for intelligence quotient at 4 years in preterm infants. *J Dev Behav Pediatr*. 2014;35(9):570-5.
87. Ranjitkar S, Kvestad I, Strand TA, et al. Acceptability and Rliability of the Bayley Scales of Infant and Toddler Development-III among Children in Bhaktapur, Nepal. *Front Psychol*. 2018;9:1265.
88. Squires J, Potter L, Bricker D. The ASQ user's guide for the Ages & Stages Questionnaires: A parent-completed, child-monitoring system: Paul H Brookes Publishing; 1995.
89. Schonhaut L, Armijo I, Schönstedt M, et al. Validity of the ages and stages questionnaires in term and preterm infants. *Pediatrics*. 2013;131(5):e1468-74.
90. Sumner GA, Spietz A. NCAST caregiver/parent child interaction teaching manual. Seattle, WA: NCAST Publications. 1994.
91. Farel AM, Freeman VA, Keenan NL, et al. Interaction between high-risk infants and their mothers: The NCAST as an assessment tool. *Res Nurs Health*. 1991;14(2):109-18.
92. Sarason IG, Sarason BR, Shearin EN, et al. A brief measure of social support: Practical and theoretical implications. *J Soc Pers Relat*. 1987;4(4):497-510.
93. Sarason IG, Levine HM, Basham RB, et al. Assessing social support: the social support questionnaire. *J Pers Soc Psychol*. 1983;44(1):127-39.
94. Johnson ER, Davies SL, Aban I, et al. Improving parental stress levels among mothers living with HIV: a randomized control group intervention study. *AIDS Patient Care STDS*. 2015;29(4):220-8.
95. Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42(2):377-81.

96. Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: Building an international community of software platform partners. *J Biomed Inform*. 2019;95:103208.
97. QSR International. NVivo Qualitative Data Analysis Software [Software] (Version 12). 2020.
98. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15(9):1277-88.
99. Parker S, Fuller J. Are nurses well placed as care co-ordinators in primary care and what is needed to develop their role: a rapid review? *Health Soc Care Community*. 2016;24(2):113-22.
100. Manthorpe J, Goodman C, Drennan V, et al. Nurse-led case management in the National Health Service: bridging clinical and social worlds. *Prim Health Care Res Dev*. 2012;13(2):153-64.
101. Fergusson D, Monfaredi Z. Demonstrating the value of patient-oriented research in Ontario. *CMAJ*. 2018;190(Suppl):S53-4.
102. Lough S. Need to define patient engagement in research. *CMAJ*. 2015;187(12):E385-6.

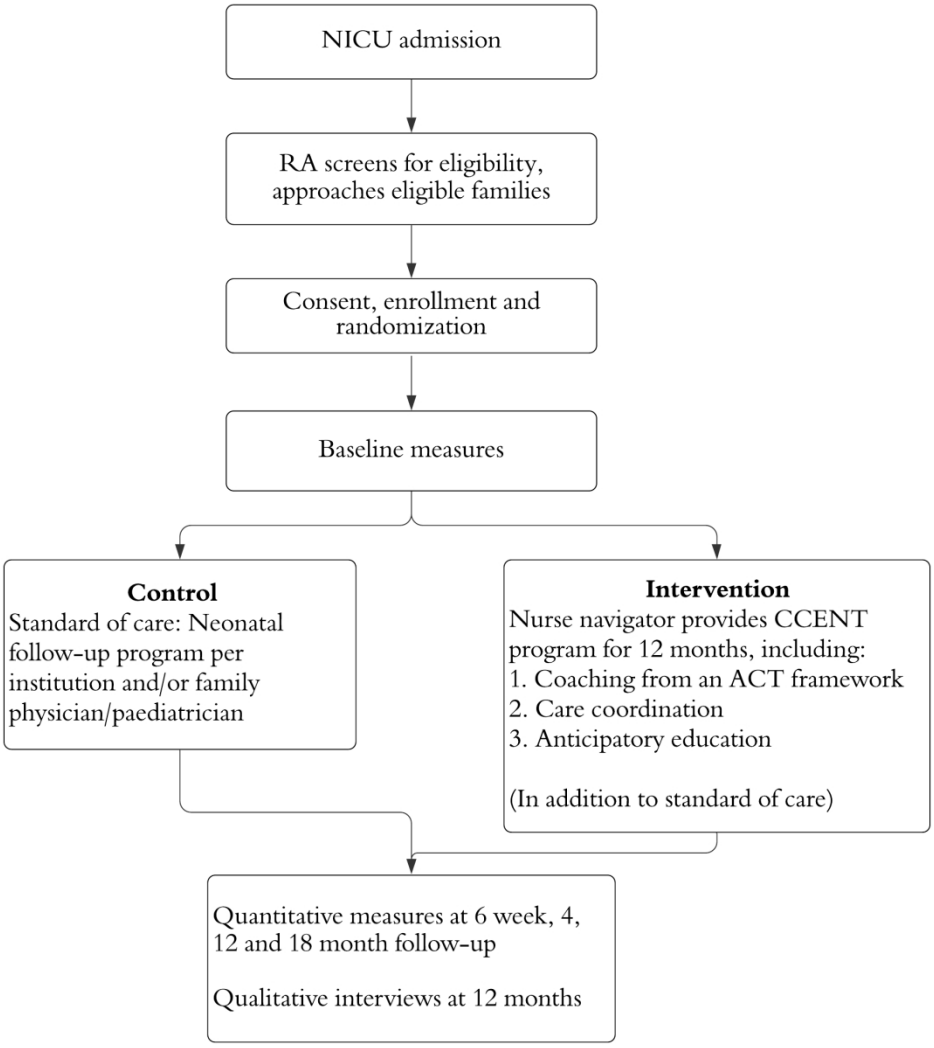

Figure 1. Study flow diagram

APPENDIX LIST

Appendix A: Overview of ACT sessions and curriculum
Appendix B: Model consent form for participants

APPENDIX A: Overview of ACT sessions and curriculum

Session	ACT Core Processes	Objectives	Key Activities
Pre-session (20 min)	1. Values	1. Build rapport 2. Briefly describe what to expect in sessions 3. Answer any questions and let them know other family members can attend	- Complete pre-session worksheet
Session 1: Welcome to the Matrix (1 hour)	1. Values 2. Present moment 3. Committed action	1. Participate in values authorship, an exercise with an aim at focusing on life domains that are uniquely important to each person 2. Connect more deeply with what is most important to us 3. Show up fully for our lives and for the important people in our lives 4. Live the qualities that are most important to each of us 5. Bringing awareness to our behaviour	- The Matrix - Mindfulness exercise: What's important about being here? - Planning a bold move - Sharing appreciations of the session
Session 2: Just noticing (1 hour)	1. Defusion 2. Present moment 3. Acceptance	1. Bring awareness to the thoughts, feelings, sensations, and memories 2. Noticing what our actions are in service of 3. Noticing the short and long term costs and benefits of 'toward' and 'away' moves 4. Bringing awareness to an interaction with someone that is about appreciation rather than problem solving	- Mindfulness exercise: Setting intention - Check-in on bold moves - Functional analysis of the Matrix - The sweet spot exercise - Just notice - Sharing appreciations of the session
Session 3: Watching your thoughts (1 hour)	1. Defusion 2. Acceptance 3. Present moment	1. Loosening rigid repertoires of behaviour in the presence of painful private experiences, such as difficult thoughts, feelings, sensations, and memories	- Thought exercise (e.g., thought factory) - Fish and hooks worksheet - Mindfulness exercise - Noticing hooks and response to hooks - "Hooky" words exercise

		2. Practice creating distance from one's thoughts 3. Learning how to observe experiences rather than being the experience	- Sharing appreciations of the session
Session 4: Staying your course (1 hour)	1. Self as context 2. Present moment 3. Values 4. Defusion 5. Acceptance 6. Committed Action	1. Reflecting on the experience of the sessions 2. Participate in values authorship 3. Clarifying values and awareness on how close you are to 'living' them; reflect without judgment or needless defense	- Review of past sessions - Bullseye exercise - Mountain meditation or sky and weather - Object exercise - Note to future self

APPENDIX B: Model consent form for participants

Consent to Participate in a Research Study

Study Title:

Coached, Coordinated, Enhanced Neonatal Transition (CCENT): A multi-centre pragmatic randomized controlled trial

Principal Investigators:

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Study Sponsor:

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Conflict of Interest:

There are no conflicts of interest to declare related to this study.

Introduction

You are invited to participate in a research study because your child is a patient in the Neonatal Intensive Care Unit (NICU). This consent form describes the research study and what it means to participate. This consent form may have words that you do not understand. Please ask the study staff to explain anything that you do not understand. Please take as much time as you need to think about your decision to participate or not and ask any questions you have. If it is helpful to you, you are encouraged to discuss the study with family, friends, your personal physician, other health professionals, or any members of your community that you trust. All participation is voluntary, and you are not under any obligation to participate.

Why is this study being done?

Infants and parents in the Neonatal Intensive Care Unit (NICU) experience significant stress, including worrying about their child's health, separation from each other, possible painful procedures, and prolonged hospitalization. Support available in the NICU consists of your baby's bedside nurse, medical team, various specialists caring for your baby, and social workers. In addition to the standard supports that are available in the NICU, families and care providers have identified certain medical and social needs that go beyond the care available in the NICU. The purpose of this study is to evaluate a neonatal follow-up model that offers additional support for children and their family during their NICU admission as well as their transition home. In this study, some families will be randomly assigned a dedicated "key worker" (nurse navigator) who will play a supportive role for you and your family during the transition out of the hospital. The results of this study, including your feedback, will be used to improve future care for children in the NICU and their families.

How many participants will be in this study?

It is anticipated that about 250 families will take part in this study, from research sites located at seven hospitals across Canada. Approximately 70 families will be enrolled at SickKids.

How long will the study take?

This length of the study for participants is 18 months and the results will be known in 2022-2023.

What will happen in this research study?

If you decide to participate, you will be "randomized" into one of the groups described below. Randomization means that you are put into a group by chance (like flipping a coin). There is no way to predict which group you will be assigned to. You will have an equal chance of being placed in either group. Neither you, nor the research staff can choose what group you will be in. You will be told which group you are in.

Both groups will receive the standard of care through the neonatal follow-up clinic and will be seen at routine times, which includes follow-up appointments at 6 weeks, 4 months, 12 months, and 18 months corrected age.

<u>Group 1: Parental Coaching and Care Coordination in addition to Standard of Care</u>

If you are randomized to this group, you and your family will be assigned a dedicated key worker, whose role is to offer support and coaching to parents. The key worker's role involves three main components: 1) parental coaching within a mindfulness framework, which involves structured group mindfulness sessions, 2) care coordination, which includes supporting providers in clear communication when

coordinating between acute care, primary care, neonatal follow-up, home and community as well as supporting you in system and resource navigation, and 3) education and anticipatory guidance, which involves providing parents and families with proactive education targeting normal challenges in caring for a child who required care in the NICU.

Four coaching sessions (+ an introductory session) will be offered to the parental caregivers in this group, each will be approximately 1 hour. The sessions will follow an Acceptance and Commitment Therapy and mindfulness framework. These sessions will be offered to families throughout their stay in the NICU, but can be completed virtually if necessary. The key worker will provide support to families during NICU admission, as well as during the transition out of hospital up until 12 months corrected age. This support will come in the form of 6 weekly phone calls post-discharge from the NICU, followed by 10 monthly phone calls (months 2-12 post-discharge). Additional resources may be sent to you by e-mail if you provide your e-mail to the key worker. All caregivers in the child's family are encouraged to participate.

Group 2: Standard of Care

If you are randomized to this group, your child will receive the standard treatment as directed by their care team. The standard of care involves routine neonatal follow-up appointments at 6-weeks, 4-months, 12-months and 18-months corrected age.

What are the study procedures?

As a participant in this study, researchers will be collecting information about you and your child. This information will be carefully stored in a secure study database. Information will be collected in the following way:

1. Questionnaires

Participants in both groups will be asked to complete questionnaires about yourself and your child. The questionnaires will ask questions relating to your level of stress and depression, your feelings of empowerment, your overall health and wellbeing, your experience with service delivery (i.e., coordination among providers and families), family use relating to your child's medical needs, and your child's overall health and wellbeing. The information you provide is for research purposes only. Some of the questions are personal. You can choose not to answer questions if you wish.

There is a chance that during the study you may be identified as experiencing significant depression or anxiety through your responses to the depression questionnaire. The research staff facilitating the surveys will be trained to identify participants with these concerns and will facilitate a referral to the clinical team or identify local services that will provide support. In the event that a safety concern is identified, you will be asked permission to contact your family doctor or primary care provider and you will be asked to make an appointment. If you do not consent for your family doctor or primary care provider to be contacted we will respect your decision, however clinic staff (i.e. social work) will be notified. In the case of an emergency situation emergency services would be contacted instead.

Each questionnaire has a different timeline for completion. Some questionnaires are completed at all five time-points while others might only be completed once. The approximate additional time commitment at each follow-up date is as follows: baseline (60 minutes), 6-weeks (15 minutes), 4-months (30 minutes), 12-months (60 minutes) and 18-months (10 minutes). These questionnaires can be done in person while at your clinic visit, over the phone or online, depending on the method that is most convenient for you. If you choose to complete the surveys online, you will be asked to provide an email address where the survey links can be sent.

2. Direct Assessment

The study staff will administer one assessment, called the Nursing Child Assessment Satellite Training Parent-Child Interaction Teaching Scale, at your child's 12-month follow-up appointment. This involves you teaching your child something new (you can select from a list of possible activities that you think your child would enjoy and be interested in). This interaction will take approximately 10 minutes, and it will be recorded so that it can be scored at a later date. The recording will be de-identified, and stored in a secure, locked location, separate from the study data.

3. Qualitative Interview

At the end of the study, study participants may be invited to participate in a one-on-one interview in order for us to learn more about your experience with the key worker. This will take approximately 45 minutes to complete. The interview will be conducted on the telephone. Interviews will be audio-recorded and will be transcribed and analyzed by the research team. The transcription will be done by members of the research team. Your name or any other identifying information will not be included during the recording, except your voice. The audio recording will be checked by the interviewer/transcriber to ensure no identifying information is transcribed. All audio recordings will be stored on a password protected computer at the Hospital for Sick Children and the transcribed file will be identified by a study ID number.

4. Health Record

As a participant in this study, researchers will collect information about your child's health, clinic visits, tests, and service use from the Neonatal Intensive Care Units records. At the baseline, 4-month, and 12-month corrected age appointments, clinical data relating to your child's growth, development, and medical needs will be collected.

Your child's health card number (OHIP) will be used to link the information to data held at the Institute for Clinical Evaluative Sciences (ICES) in order to provide a complete picture of your child's use of health services. This data will not contain any information that could directly identify you (i.e. name, address, telephone number) and will be pooled with other study data.

This study will collect information from a clinical assessment that is routinely done as part of neonatal follow-up care. The Bayley Scales of Infant and Toddler Development is a developmental assessment that is done routinely as part of neonatal care at the 18-month follow-up appointment and takes approximately 90 minutes to complete. Scores from this assessment will be collected for our analysis. Authorized study staff will access your child's medical record up until the 18-months corrected age follow-up appointment to collect information from this clinical assessment.

What are the risks, harms or discomforts of the study?

We do not expect that you or your child will experience any harm by taking part in this study. Some of the questionnaires ask sensitive questions, which may cause emotional distress. You may choose not to answer these questions. There is an additional time commitment associated with the study procedures. The approximate additional time commitment to complete the assessments at each follow-up appointment is as follows: baseline (60 minutes), 6-weeks (15 minutes), 4-months (30 minutes), 12-months (60 minutes) and 18-months (10 minutes). For participants randomized to the intervention group, there is an additional time commitment of the coaching sessions with the key worker, and subsequent phone calls.

There is a potential for a breach of privacy, however we will take steps to minimize that risk by storing all of the research data in a password-protected database and by storing personally identifying information in a separate place from the study data. There is a potential risk of loss of your confidentiality for the interviews because even though your name will not be part of the audio recording, your voice may still be identifiable as your voice. All audio recordings will be destroyed after transcription and the transcribed file will not contain your name or any identifying information.

Participants in Group 1 (the intervention arm) may have their Acceptance and Commitment Therapy sessions recorded for quality improvement purposes. These recordings will be assessed by a study team member to assess the facilitator's competence in delivering the intervention. These recordings will not be transcribed and participants will not be assessed/analyzed.

Are there benefits from being in the study?

If you agree to take part in this study, the experimental intervention may or may not be of direct benefit to you. This study incorporates a parental coaching and care coordination intervention, which aims to provide families with knowledge, and support them in the role of navigating the healthcare system and in the care of their child. The benefits associated with this may include improved parental stress and well-being, improved family empowerment, improved infant attachment, better coordination of care, more efficient health care utilization, improved service delivery and timely referrals to appropriate health services.

The study may lead to an improved parental support model, which hopes to change the focus of neonatal follow up across Canada to one that involves ongoing parental support and takes into account factors that are important for families as well as those related to the health of the child. The care coordination may be associated with a more efficient use of healthcare resources and lead to cost-savings for families and the healthcare system.

What other choices are there?

You do not have to take part in this study in order to receive treatment or care. If you choose not take part in this study, your child will receive standard treatment as directed by his/her doctor.

What are the optional parts to this study?

Future researchers at the Women and Children's Health Research Institute (WCHRI) at the University of Alberta may want to use data from this study for new research. You have the option of allowing your study data to be re-used by approved researchers. Any of your personal information (i.e. your name, address, telephone number) that can identify you will be removed before files are shared with other researchers. Researchers that wish to use study data must 1) have their new study approved by an ethics board, and 2) sign an agreement ensuring your confidentiality and restricting data use to only the approved study.

I agree to the secondary use of my data to answer future related research questions (optional):

I agree for my study data to facilitate future related research. I understand that my study data may be made available to other researchers, but my identity will be protected, and my confidentiality will be preserved.	_____ Initials

I do NOT agree for my study data to facilitate future related research. I do NOT want my study data to be made available to other researchers. _____ Initials

Can I choose to leave the study?

It is your choice to take part in this study, participation is voluntary. You can change your mind at any time during the research study. The study team may ask why you are withdrawing for reporting purposes, but you do not need to give a reason to withdraw from the study if you do not want to. Withdrawal from the study will not have any effect on the care you or your child will receive at SickKids. If you decide to leave the study, you can contact the Principal Investigator or a member of the study team to let them know. If you choose to leave this study you can decide whether all your data that has been collected is kept and used for the research or deleted.

Will I be paid and/or reimbursed if I join this study?

As a token of our appreciation, you will receive a $10 gift card to either Tim Hortons, Starbucks or Walmart upon completion of the questionnaires at each appointment, with an additional $10 at 12 months, the NCAST visit, and the qualitative interview. In total, you may receive eight $10 gift cards over the course of the 18-month study. Gift cards will be provided to participants in both study groups.

How will my privacy be protected?

We will respect your privacy. No information about you or your child will be given to anyone outside of the study team or be published without your permission, unless required by law.

The SickKids study staff (study investigators, coordinators, and nurses) will collect personal health information about you and your child. This includes things learned from the study procedures described in this consent form and/or information from your child's medical records. They will only collect the information they need for the study. The study will collect personal information that could identify you or your child, such as child's full date of birth, expected date of delivery, discharge date, your name, telephone number, address, and email address.

All personal health information or personal information collected about you will be "de-identified" by replacing your identifiable information (i.e., name) with a "study number". The SickKids study staff are in control of the study code key, which is needed to connect your personal health information/personal information to you. The link between the study number and your identity will be safeguarded and only accessible to the study staff at SickKids. SickKids guidelines include the following:

- All information that identifies you, both paper copy and electronic information, will be kept confidential and stored and locked in a secure place that only the study staff will be able to access.
- Electronic files will be stored securely on hospital or institutional networks or securely on any portable electronic devices.
- No information identifying you will be allowed off site in any form without your consent. Examples include your hospital or clinic charts, copies of any part of your charts, or notes made from your charts.

The following people may come to the hospital to look at your personal health information to check that the information collected for the study is correct and to make sure the study followed the required laws and guidelines:

- Representatives of the SickKids Research Ethics Board and/or Research Quality and Risk Management team.

This study is part of a Canada wide, collaborative research network called CHILD-BRIGHT, involving investigators and collaborators from many Canadian healthcare institutions. Representatives at the CHILD-BRIGHT Data Coordinating Centre (DCC) at the Women & Children's Health Research Institute (WCHRI) will have access to your de-identified study data in order to perform system management functions and data analysis. If you wish to complete the study questionnaires online, your email address will be entered into WCHRI's REDCap system so that automated questionnaire reminders can be sent to you. Your email address will be only used for the purpose of facilitating questionnaire completion. WCHRI's REDCap installation is housed in a secure data centre at the University of Alberta Hospital that is behind the Faculty's firewall. Data will remain on REDCap until all data management and statistical analysis activity has been completed. We anticipate this will be within one year of the last participant's last study related contact with the research team.

The video-recording of the parent-child interaction assessment will be kept separate from the study data and stored in a secure, locked location. The videotapes will be viewed and scored by an individual who is trained in NCAST interpretation. You and your child's faces will be seen by the person assessing the video but they will NOT receive any personal identifying information about you. All study data including the video-recordings will be kept for 10 years as per CIHR guidelines. A health custodian will be consulted to ensure that this information is properly destroyed.

The audio-recording from the telephone interview will be stored on a password protected computer at the Hospital for Sick Children. All audio recordings will be destroyed after transcription and the transcribed file will not contain your name or any identifying information.

For intervention participants who consent, the audio recordings of the Acceptance and Commitment Therapy sessions will be uploaded to the SickKids Research Institute Secure File Transfer Portal and deleted off the recording device right after. After the facilitator's competence is assessed, the recordings will be deleted off the file transfer portal. These recordings will not be transcribed and participants will not be assessed/analyzed.

The study staff will keep any personal health information about you in a secure and confidential location for 7 years and then destroy it according to SickKids policy.

When the results of this study are published, your identity will not be disclosed. You have the right to be informed of the results of this study once the entire study is complete.

Because of the importance of being able to track your child's care across institutions, your child's OHIP number will be encrypted before it is linked to ICES to track your child's use of health services. The encryption process ensures that your child cannot be identified. ICES is a prescribed entity under the Personal Health Information Protection Act (PHIPA) and follows policies and procedures for privacy protection and data security as approved by Ontario's Privacy Commissioner.

Will information about this study be available online?

A description of this clinical trial will be available on the CHILD-BRIGHT website (https://child-bright.ca/ccent). This website will not include information that can identify you. You can search this website at any time.

What are my rights when participating in a research study?

You have the right to receive all information that could help you make a decision about participating in this study. You also have the right to ask questions about this study at any time and to have them answered to your satisfaction. Your rights to privacy are legally protected by federal and provincial laws that require safeguards to ensure that your privacy is respected.

By signing this form, you do not give up any of your legal rights against the study doctor, sponsor or involved institutions for compensation, nor does this form relieve the study doctor, sponsor or their agents of their legal and professional responsibilities.

You will be given a copy of this signed and dated consent form prior to participating in this study.

Will I receive study results?

Research results will be shared through journal publications and academic conferences. When the results of this study are shared, your identity will not be disclosed. You have the right to be informed of the results of this study once the entire study is complete.

You have the right to be informed of the results of this study once the entire study is complete.
If you would like to be informed of the results of this study, please contact the study doctor. In addition, the results of this study will be available on the clinical trial registry (https://clinicaltrials.gov/, NCT0335024).

Who can I call if I have questions about the study?

If you have any questions during your participation in this research study you can contact the Study Doctor, Dr. Julia Orkin at 416-813-7654 x201150 or the research team members listed at the beginning of this consent form.

Research Ethics Board Contact Information

The study protocol and consent form have been reviewed by the SickKids Research Ethics Board (REB). If you have any questions regarding your rights as a research participant, you may contact the Office of the Research Ethics Board at 416-813-8279 during business hours.

Consent to Participate in a Research Study

Study Title: Coached, Coordinated, Enhanced Neonatal Transition (CCENT): A multi-centre pragmatic randomized controlled trial

By signing this research consent form, I understand and confirm that:

1) All of my questions have been answered.
2) I understand the information within this informed consent form.
3) I allow access to my/my child's medical records and as explained in this consent form.
4) I do not give up any of my or my child's legal rights by signing this consent form.
5) I have been told I will be given a signed and dated copy of this consent form.
6) I agree to allow the person for whom I am responsible to take part in this study.

I consent on behalf of _____ (name of child) to participate in this study.

_____	_____	_____
Printed Name of Parent/Guardian	Parent/Guardian Signature	Date (DD/MMM/YYYY)
_____	_____	_____
Printed Name & Role of person who the Consent Discussion	Signature of person who obtained the consent	Date (DD/MMM/YYYY)

Optional:
□ I would like to hear the results of the study when they are available.
Please email me at: _____

For Intervention Participants Only:
The Acceptance and Commitment Therapy sessions may be audio recorded for quality improvement purposes to ensure competence of the facilitator. All recordings are confidential and will be stored on password protected computers until they are reviewed by a study team member subsequently destroyed. The audio recordings will not be analyzed as research data that will be reported elsewhere.

I consent to have the Acceptance and Commitment Therapy sessions audio recorded for quality improvement purposes	Parent/Guardian Initial: _____	Parent/Guardian Initial: _____

Reporting checklist for protocol of a clinical trial.

Based on the SPIRIT guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the SPIRIT reporting guidelines, and cite them as:

Chan A-W, Tetzlaff JM, Gøtzsche PC, Altman DG, Mann H, Berlin J, Dickersin K, Hróbjartsson A, Schulz KF, Parulekar WR, Krleža-Jerić K, Laupacis A, Moher D. SPIRIT 2013 Explanation and Elaboration: Guidance for protocols of clinical trials. BMJ. 2013;346:e7586

		Reporting Item	Page Number
Administrative information			
Title	#1	Descriptive title identifying the study design, population, interventions, and, if applicable, trial acronym	1
Trial registration	#2a	Trial identifier and registry name. If not yet registered, name of intended registry	2
Trial registration: data set	#2b	All items from the World Health Organization Trial Registration Data Set	2
Protocol version	#3	Date and version identifier	14
Funding	#4	Sources and types of financial, material, and other support	18
Roles and responsibilities: contributorship	#5a	Names, affiliations, and roles of protocol contributors	1, 14

Roles and responsibilities: sponsor contact information	#5b	Name and contact information for the trial sponsor	N/A
Roles and responsibilities: sponsor and funder	#5c	Role of study sponsor and funders, if any, in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication, including whether they will have ultimate authority over any of these activities	18
Roles and responsibilities: committees	#5d	Composition, roles, and responsibilities of the coordinating centre, steering committee, endpoint adjudication committee, data management team, and other individuals or groups overseeing the trial, if applicable (see Item 21a for data monitoring committee)	N/A
Introduction			
Background and rationale	#6a	Description of research question and justification for undertaking the trial, including summary of relevant studies (published and unpublished) examining benefits and harms for each intervention	4,5
Background and rationale: choice of comparators	#6b	Explanation for choice of comparators	6
Objectives	#7	Specific objectives or hypotheses	5
Trial design	#8	Description of trial design including type of trial (eg, parallel group, crossover, factorial, single group), allocation ratio, and framework (eg, superiority, equivalence, non-inferiority, exploratory)	5
Methods: Participants, interventions, and outcomes			
Study setting	#9	Description of study settings (eg, community clinic, academic hospital) and list of countries where data will be collected. Reference to where list of study sites can be obtained	5
Eligibility criteria	#10	Inclusion and exclusion criteria for participants. If applicable, eligibility criteria for study centres and individuals who will	6

		perform the interventions (eg, surgeons, psychotherapists)	
Interventions: description	#11a	Interventions for each group with sufficient detail to allow replication, including how and when they will be administered	6,7
Interventions: modifications	#11b	Criteria for discontinuing or modifying allocated interventions for a given trial participant (eg, drug dose change in response to harms, participant request, or improving / worsening disease)	N/A
Interventions: adherance	#11c	Strategies to improve adherence to intervention protocols, and any procedures for monitoring adherence (eg, drug tablet return; laboratory tests)	N/A
Interventions: concomitant care	#11d	Relevant concomitant care and interventions that are permitted or prohibited during the trial	N/A
Outcomes	#12	Primary, secondary, and other outcomes, including the specific measurement variable (eg, systolic blood pressure), analysis metric (eg, change from baseline, final value, time to event), method of aggregation (eg, median, proportion), and time point for each outcome. Explanation of the clinical relevance of chosen efficacy and harm outcomes is strongly recommended	7-9
Participant timeline	#13	Time schedule of enrolment, interventions (including any run-ins and washouts), assessments, and visits for participants. A schematic diagram is highly recommended (see Figure)	9-10
Sample size	#14	Estimated number of participants needed to achieve study objectives and how it was determined, including clinical and statistical assumptions supporting any sample size calculations	10
Recruitment	#15	Strategies for achieving adequate participant enrolment to reach target sample size	10
Methods: Assignment of interventions (for controlled trials)			
Allocation: sequence generation	#16a	Method of generating the allocation sequence (eg, computer-generated random numbers), and list of any factors for stratification. To reduce predictability of a random sequence, details of any planned restriction (eg, blocking) should be provided in a separate document that is unavailable to those who enrol participants or assign interventions	11

Allocation concealment mechanism	#16b	Mechanism of implementing the allocation sequence (eg, central telephone; sequentially numbered, opaque, sealed envelopes), describing any steps to conceal the sequence until interventions are assigned	11
Allocation: implementation	#16c	Who will generate the allocation sequence, who will enrol participants, and who will assign participants to interventions	11
Blinding (masking)	#17a	Who will be blinded after assignment to interventions (eg, trial participants, care providers, outcome assessors, data analysts), and how	11
Blinding (masking): emergency unblinding	#17b	If blinded, circumstances under which unblinding is permissible, and procedure for revealing a participant's allocated intervention during the trial	N/A
Methods: Data collection, management, and analysis			
Data collection plan	#18a	Plans for assessment and collection of outcome, baseline, and other trial data, including any related processes to promote data quality (eg, duplicate measurements, training of assessors) and a description of study instruments (eg, questionnaires, laboratory tests) along with their reliability and validity, if known. Reference to where data collection forms can be found, if not in the protocol	8-11
Data collection plan: retention	#18b	Plans to promote participant retention and complete follow-up, including list of any outcome data to be collected for participants who discontinue or deviate from intervention protocols	11, 13
Data management	#19	Plans for data entry, coding, security, and storage, including any related processes to promote data quality (eg, double data entry; range checks for data values). Reference to where details of data management procedures can be found, if not in the protocol	11
Statistics: outcomes	#20a	Statistical methods for analysing primary and secondary outcomes. Reference to where other details of the statistical analysis plan can be found, if not in the protocol	11-12
Statistics: additional analyses	#20b	Methods for any additional analyses (eg, subgroup and adjusted analyses)	12

Statistics: analysis population and missing data	#20c	Definition of analysis population relating to protocol non-adherence (eg, as randomised analysis), and any statistical methods to handle missing data (eg, multiple imputation)	11-12
Methods: Monitoring			
Data monitoring: formal committee	#21a	Composition of data monitoring committee (DMC); summary of its role and reporting structure; statement of whether it is independent from the sponsor and competing interests; and reference to where further details about its charter can be found, if not in the protocol. Alternatively, an explanation of why a DMC is not needed	11
Data monitoring: interim analysis	#21b	Description of any interim analyses and stopping guidelines, including who will have access to these interim results and make the final decision to terminate the trial	N/A
Harms	#22	Plans for collecting, assessing, reporting, and managing solicited and spontaneously reported adverse events and other unintended effects of trial interventions or trial conduct	13
Auditing	#23	Frequency and procedures for auditing trial conduct, if any, and whether the process will be independent from investigators and the sponsor	N/A
Ethics and dissemination			
Research ethics approval	#24	Plans for seeking research ethics committee / institutional review board (REC / IRB) approval	17
Protocol amendments	#25	Plans for communicating important protocol modifications (eg, changes to eligibility criteria, outcomes, analyses) to relevant parties (eg, investigators, REC / IRBs, trial participants, trial registries, journals, regulators)	N/A
Consent or assent	#26a	Who will obtain informed consent or assent from potential trial participants or authorised surrogates, and how (see Item 32)	10, 13
Consent or assent: ancillary studies	#26b	Additional consent provisions for collection and use of participant data and biological specimens in ancillary studies, if applicable	11
Confidentiality	#27	How personal information about potential and enrolled participants will be collected, shared, and maintained in order to	11

		protect confidentiality before, during, and after the trial	
Declaration of interests	#28	Financial and other competing interests for principal investigators for the overall trial and each study site	15
Data access	#29	Statement of who will have access to the final trial dataset, and disclosure of contractual agreements that limit such access for investigators	11
Ancillary and post trial care	#30	Provisions, if any, for ancillary and post-trial care, and for compensation to those who suffer harm from trial participation	N/A
Dissemination policy: trial results	#31a	Plans for investigators and sponsor to communicate trial results to participants, healthcare professionals, the public, and other relevant groups (eg, via publication, reporting in results databases, or other data sharing arrangements), including any publication restrictions	14
Dissemination policy: authorship	#31b	Authorship eligibility guidelines and any intended use of professional writers	14
Dissemination policy: reproducible research	#31c	Plans, if any, for granting public access to the full protocol, participant-level dataset, and statistical code	N/A
Appendices			
Informed consent materials	#32	Model consent form and other related documentation given to participants and authorised surrogates	Appendix B
Biological specimens	#33	Plans for collection, laboratory evaluation, and storage of biological specimens for genetic or molecular analysis in the current trial and for future use in ancillary studies, if applicable	N/A

BMJ Open

Coached, Coordinated, Enhanced Neonatal Transition (CCENT): Protocol for a multicentre pragmatic randomized controlled trial of transition-to-home support for parents of high-risk infants

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Primary Subject Heading:	Mental health
Secondary Subject Heading:	Health economics, Qualitative research
Keywords:	Neonatal intensive & critical care < INTENSIVE & CRITICAL CARE, HEALTH ECONOMICS, MENTAL HEALTH, NEONATOLOGY, QUALITATIVE RESEARCH

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Coached, Coordinated, Enhanced Neonatal Transition (CCENT): Protocol for a multicentre pragmatic randomized controlled trial of transition-to-home support for parents of high-risk infants

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ABSTRACT

Introduction

Having an infant admitted to the neonatal intensive care unit (NICU) is associated with increased parental stress, anxiety and depression. Enhanced support for parents may decrease parental stress and improve subsequent parent and child outcomes. The Coached, Coordinated, Enhanced Neonatal Transition (CCENT) program is a novel bundled intervention of psychosocial support delivered by a nurse navigator that includes Acceptance and Commitment Therapy-based coaching, care coordination, and anticipatory education for parents of high-risk infants in the NICU through the first year at home. The primary objective is to evaluate the impact of the intervention on parent stress at 12 months.

Methods and analysis

This is a multicentre pragmatic randomized controlled superiority trial with 1:1 allocation to the CCENT model versus control (standard neonatal follow-up). Parents of high-risk infants (n=236) will be recruited from 7 NICUs across 3 Canadian provinces. Intervention participants are assigned a nurse navigator who will provide the intervention for 12 months. Outcomes are measured at baseline, 6 weeks, 4, 12 and 18 months. The primary outcome measure is the total score of the Parenting Stress Index (PSI-4-SF) at 12 months. Secondary outcomes include parental mental health, empowerment, and health-related quality of life for calculation of quality-adjusted life years (QALYs). A cost-effectiveness analysis will examine the incremental cost of CCENT versus usual care per QALY gained. Qualitative interviews will explore parent and health care provider experiences with the intervention.

Ethics and dissemination

Research ethics approval was obtained from Clinical Trials Ontario, Children's Hospital of Eastern Ontario REB, The Hospital for Sick Children REB, UBC Children's and Women's REB, and McGill University Health Centre REB. Results will be shared with Canadian Level III NICUs, neonatal follow-up programs, and academic forums.

Trial registration number: ClinicalTrials.gov, U.S. National Library of Medicine, National Institutes of Health, #NCT03350243, 11/22/2017. Prospectively registered.

Strengths and limitations of this study

- This is the first large scale RCT assessing a novel bundled intervention of support for parents beginning in the NICU and continuing until the end of the first year at home, which includes psychosocial support and coaching within an Acceptance and Commitment Therapy framework, care coordination and education delivered by a nurse navigator.
- This study is multicentre, which increases generalizability, reduces the risk of bias, and allows for broad national dissemination.
- A limitation of this study is that measures of parental stress, mental health, family empowerment, and health service delivery are self-reported and cannot be independently verified.
- The lack of blinding for participants and investigators due to the interpersonal nature of the intervention may contribute to bias. However, data analysts will be blinded to participant allocation.

INTRODUCTION

Medical and technological advances have led to increasing survival of infants born preterm(1) or with complex medical needs(2) who are admitted to the neonatal intensive care unit (NICU). These infants are at risk of medical, cognitive, and developmental sequelae.(2-5) Having an infant admitted to the NICU is associated with increased parental stress due to the NICU environment, alterations in parental role and limitations to caregiving,(6-8) as well as anxiety(9, 10) and depression.(11-13) These emotions increase during the transition home from hospital,(14-16) depending on the child's condition and the parent's readiness for discharge(11) and their medical caregiving role.(17, 18) Discharge is accompanied by a sense of loss as families leave the familiarity of the NICU while severing supportive relationships with health care providers (HCP).(19) A lack of continuity of care post-discharge can negatively impact patient outcomes and parent well-being.(20)

In Canada, post-discharge care includes scheduled appointments with a primary care provider, and for high-risk infants, a neonatal follow-up program that focuses on neurodevelopmental assessment and outcomes.(21, 22) However, there is a lack of direct support for parent psychosocial (psychological and social) needs,(23) and limited research in this area.(24) A systematic review of interventions for NICU parents including psychosocial support, education, and/or developmental interventions reported positive effect on depression and anxiety, but limited effect on stress.(14) Stress is a contributing factor to many mental disorders, and long-term stress increases the risk of depression and anxiety.(25) It is recommended that NICU-related parental stress be treated with immediate and tailored support provided to parents after the birth of a high-risk infant in order to reduce stress and improve well-being and infant neurodevelopmental outcomes.(8) Families and HCPs have identified that the tools to address a family's medical and social needs must extend beyond the NICU to include the transition home(7, 16-19, 26-28) and first year of life.(13, 23, 29)

Integrated health care models can support transition from hospital to home by decreasing parental stress, optimizing family empowerment, and improving health care system efficiency(30) and costs.(31, 32) NICU parents may benefit from an integrated intervention during the NICU admission, transition home and post-discharge period including a dedicated key worker,(33) care coordination with the infant's medical team,(23, 26, 34) psychosocial support to cope with stress,(15, 23, 25) and education to prepare for parenting a medically complex infant.(35-37) A bundled intervention was chosen based on research on care bundles, which contain several evidence-based practices delivered collectively and consistently with the aim of improving patient outcomes.(38) Complex interventions containing several interacting components may work best if tailored to individual circumstances,(39) thus the CCENT intervention allows the key worker flexibility to tailor their interactions to the parents' transition needs, while adhering to the core components of the intervention. CCENT differs from previous interventions in the literature that focus primarily on mother-infant interactions(40) or collaborative family consultation(41) in the NICU, as the focus is a long-term intervention to reduce stress via a novel bundled program including psychosocial support.

The CCENT bundled intervention consists of 3 core elements delivered by a nurse navigator (key worker) that have been shown individually to be effective in similar parental populations. The role of key worker has been shown to improve health outcomes of high-risk infants,(42) and has sustained benefits to parental mental health.(43) Care coordination is associated with more efficient health care service use and cost savings for families and the health care system.(44) Enhanced psychosocial support for parents(7, 33, 45-53) decreases stress, anxiety, depression,(54) and improves parent–infant attachment and developmental outcomes for preterm infants.(14, 55) Anticipatory guidance and education around development and behaviour in high-risk infants increases confidence in caregiving,(56) decreases parental stress, and facilitates a safe transition home.(37)

Acceptance and Commitment Therapy (ACT) is an empirically-based behavioural therapy involving acceptance, mindfulness, and behaviour change strategies to foster psychological flexibility, which is the willingness to experience difficult events and choose actions in the present moment aligning with one's values.(57) ACT encourages people to embrace their difficult thoughts and feelings rather than avoiding them. Research has shown that increasing psychological flexibility through mindfulness therapies reduced maternal depression during the NICU admission and after discharge.(58) ACT interventions can be delivered by a variety of trained facilitators,(24) and demonstrate improved mental health outcomes for parents of children with life-threatening illness,(59) asthma(60) and autism(61). ACT may be more appropriate for parents in the NICU compared to interventions such as Cognitive Behavioural Therapy (CBT),(24) which demonstrates effectiveness in reducing depression but not anxiety for NICU mothers.(62)

The Coached, Coordinated, Enhanced Neonatal Transition (CCENT) program is a novel bundled intervention for parents of high-risk infants delivered by a nurse navigator (NN) who provides 1) coaching and psychosocial support within an Acceptance and Commitment Therapy (ACT) framework, 2) care coordination, and 3) anticipatory education around the care for a medically complex infant during the NICU admission, transition home and first year post-discharge.

Aims and objectives

The primary aim of this study is to compare the CCENT intervention to standard neonatal follow-up care for parents of high-risk infants. The primary objective is a comparison of parental stress between the intervention and control groups using the Parenting Stress Index 4th Edition Short Form at 12 months. The secondary objective is to evaluate the effect of the CCENT intervention on parent-infant interaction, parent empowerment, physical and mental health, psychological flexibility, family experience of care, and infant development outcomes. The tertiary objective is to estimate the incremental cost per parental quality-adjusted life year (QALY) gained of the CCENT intervention compared to usual care, from both a public health care payer and societal perspective. Our outcomes are structured around the Triple Aim framework, which focuses on patient experience of care, population health, and cost.(63)

METHODS AND ANALYSIS

Design

CCENT is a multicentre pragmatic randomized controlled superiority trial. The trial will compare two parallel groups randomized with a 1:1 allocation ratio to the CCENT program versus standard of care (Figure 1). Concurrent qualitative methods will be used to assess experiences with the program. This protocol has been designed according to the SPIRIT reporting guidelines(64) and registered at clinicaltrials.gov (NCT03350243).

[*Insert Figure 1*]

Setting

CCENT will be conducted in the Level III NICUs of seven hospitals in Ontario, Quebec, and British Columbia.

Participants

The target population are parents of high-risk infants, defined as having risk factors predictive of neurodevelopmental delay or impairment, medical complexity, and parent-infant attachment impairment. Both parents will be invited to participate, however primary analyses will be conducted on the individual identified as the primary caregiver.

Inclusion criteria

Parents of an infant:

1. Born ≤26+6 weeks gestational age (GA) (30 days old at recruitment to ensure viability)
2. Born 27-29+6 weeks GA with ≥1 of the following risk factors:
    i) ≥Grade III intraventricular hemorrhage with post hemorrhagic hydrocephalus
    ii) Retinopathy of prematurity requiring intraocular bevacizumab/anti-vascular endothelial growth factor or laser surgery therapy
    iii) Requires invasive (e.g., intubation) or non-invasive (e.g., CPAP) respiratory support at ≥34 weeks GA or supplemental oxygen at ≥37 weeks GA
    iv) Requires surgery for management of stage 3 necrotizing enterocolitis
3. With two or more major congenital anomalies as defined by the European Registration of Congenital Anomalies and Twins (EUROCAT) (e.g., atrial septal defect, hypospadias) and length of stay (LOS) in recruiting institution ≥14 days
4. With hypoxic ischemic encephalopathy requiring therapeutic hypothermia and LOS in recruiting institution ≥14 days

Exclusion criteria

Parent:

1. Does not speak English or French
2. Is not involved with child's care during the study period (e.g., adoption)

Infant:

3. Is followed by an out-of-province neonatal follow-up program
4. Has previously been discharged home from the hospital
5. Decision or high likelihood of withdrawal of care

Control arm

The control arm will receive routine primary paediatric care and neonatal follow-up (NFU) with a multidisciplinary team (including neonatologists, paediatricians, nurses, occupational therapists, and physiotherapists). Participating sites' NFU programs provide a standardized schedule of 5-7 visits(22), typically at 4-8 weeks, 4, 8, 12, 18 and 36 months.(65) The visits consist of neurodevelopmental assessment and diagnosis, medical assessment, and referrals to needed services.(22) Appendix A highlights team members and schedule of NFU visits at each site.

Intervention arm: Coached, Coordinated, Enhanced Neonatal Transition

In addition to standard NFU care, participants randomized to the CCENT intervention arm will receive 1) coaching and psychosocial support within an Acceptance and Commitment Therapy (ACT) framework, 2) care coordination, and 3) anticipatory education around the care of a medically complex infant, delivered by a trained nurse navigator (NN) during the NICU admission and in the year post-discharge. The NN will provide goal-oriented, client-centred coaching that is health-focused,(66) and will guide parents to problem solve challenges.(67) Each site will have one nurse navigator.

NNs deliver the intervention over a 12-month period for a minimum of 21 sessions; 5 in the NICU and 6 weekly sessions followed by monthly sessions for months 2-12 post-NICU discharge. Post-discharge support sessions will occur via phone contact with supplemental e-mails.

Coaching and psychosocial support

NNs deliver five in-person sessions (a 20-minute pre-session and four 1-hour sessions) of ACT-based coaching to parents in the NICU, guided by an ACT Manual (details in Appendix B). Additional coaching may occur via phone based on need. Key themes in the ACT curriculum include coping with stress, promoting psychological flexibility, cultivating mindfulness, and values-based goal setting. If infants are transferred or discharged before completing in-person sessions, parents can continue virtually.

Care coordination

NNs deliver care coordination activities grounded in patient- and family-centered care, partnership and empowerment strategies to address health-related needs. These activities include focused relationship building, medical and social problem-solving (ex. discussions on baby care, emotional well-being, and child health), and navigation with community resources post-discharge. Activities are tailored to participant need and may occur in hospital or virtually throughout the 12 month intervention period.

Anticipatory education

NNs provide proactive education targeting typical challenges in caring for high-risk infants' health care and developmental needs. A 30-page toolkit and a website of resources were developed by the study team, expert HCPs, and a parent advisory committee to ensure consistent intervention content across sites. Toolkit resources include a transition checklist, guide to the first days at home, and links to provincial community resources for infant and parent health and well-being. NNs provide connection to mental health services as needed.

Nurse navigator training
NN training includes a 3-day experiential training program on ACT core processes and coaching methods provided by two clinical psychologists and a social worker (standardized across sites). The ACT Manual, a 5 session NICU-specific manual of objectives and exercises, was developed in consultation with ACT therapists and psychologists and was reviewed during training. Additionally, NNs undergo 1-day training on care coordination and anticipatory education methods provided by a nurse practitioner. Throughout the study, NNs attend bi-weekly facilitated peer support and ACT practise/feedback sessions with a social worker.

ACT intervention fidelity
NNs will complete the ACT Fidelity Measure (ACT-FM)(68) after every ACT session as a self-assessment of their ACT consistency. To ensure intervention fidelity, all ACT sessions will be audio-recorded and 10% of the sessions will be randomly selected and reviewed by a behaviour analyst (BA) and social worker (SW) using the ACT-FM. The ACT-FM scores of the NN's ACT consistent vs ACT inconsistent responses for each session as determined by the BA and SW will be compared to the NN's self-assessment.

Outcomes and measures
Outcome measures were selected based on their content applicability, reliability and validity. In the case of multiple births, if multiple infants per family are eligible, parents will complete the child-related measures for each eligible infant. Corrected age is used for infants born < 37 weeks GA. Table 1 summarizes the timeline in which measures are collected.

Primary outcome

The primary outcome is parenting stress measured by the self-reported Parenting Stress Index 4th Edition Short Form (PSI-4-SF) (36 items, Cronbach's alpha = 0.91).(69-74) The PSI-4-SF evaluates the magnitude of stress in the parent-child relationship, and has three subscales: Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child.(75) Studies of the test-retest reliability of the PSI-4-SF demonstrate high correlation coefficients, supporting the general stability of the test over time and its ability to detect change in stress.(76)

Parent-focused secondary outcomes

1. Health-related quality of life
   The Health Utilities Index (HUI) provides indicators of multiple attributes of health status for use in economic evaluations of health care programs. It has well-established validity and reliability in many clinical contexts (test-retest reliability of 0.767 intra-class correlation coefficient).(77, 78)

2. Empowerment
   The Family Empowerment Scale(79, 80) measures empowerment in families with children who have emotional, behavioral, or mental disorders (34 items, Cronbach's alpha 0.87-0.88).(79)

3. Mental health

The Edinburgh Postnatal Depression Scale (EPDS) assesses for symptoms of depression and anxiety during pregnancy and the year following birth (10 items, Cronbach's alpha = 0.87).(81, 82) The State-Trait Anxiety Inventory (STAI) Short Form measures state anxiety (how one feels at the moment) and trait anxiety (how one generally feels) (6 items, Cronbach's alpha >0.90).(83, 84)

4. Health care and service delivery
   The Measure of Processes of Care – 20 (MPOC-20) is a validated, reliable self-report measure of parent's perception of the extent to which health services are family-centered (20 items, Cronbach's alpha 0.63-0.90).(85, 86)

5. Transition experience
   The Pediatric Transition Experience Measure (PTEM) is a self-report measure of a parent's perception of transition preparation and support from the hospital (11 items).(87) McDonald's coefficient omega to examine internal consistency reliability was 0.84.(88)

6. Health resource use
   The Resource Use Questionnaire measures resource use relating to the infant's medical needs post-discharge and will be summed over the study interval.(89) The child-parent dyad is the unit of measurement.

7. Psychological flexibility
   The Acceptance and Action Questionnaire II (AAQ-II) measures psychological flexibility, and is an internally consistent measure of ACT's model of mental health and behavioral effectiveness (Cronbach's alpha = 0.84).(90)

Child-focused secondary outcomes

1. Infant health and development
   Medical indicators are collected via chart review. The Brief Infant-Toddler Social Emotional Assessment (BITSEA) is a parent-report screener to identify children at risk for or currently experiencing social-emotional/behavioural problems or delays in competence (42 items, Cronbach's alpha for Problem scale = 0.79, Competence scale = 0.65).(91-93) The Bayley Scales of Infant and Toddler Development Third Edition (BSID-III) assesses infant development with good to strong validity and reliability (Cronbach's alpha 0.57-0.87).(94, 95) The BSID-III will be completed at the neonatal follow-up clinic 18-month visit. The Ages and Stages Questionnaire 3rd edition 18 month (ASQ-18) is a validated questionnaire in which parents rate their child's current skills and development (Cronbach's alpha 0.60-0.75).(96, 97)

2. Infant-parent interaction
   The Nursing Child Assessment Satellite Training Parent-Child Interaction Teaching Scale (NCAST-PCI) assesses caregiver and infant behaviours observed during a structured teaching task (Cronbach's alpha = 0.84).(98, 99) The NCAST-PCI may be completed virtually by some participants due to COVID-19 pandemic restrictions.

Additional measures

Participant demographic characteristics are collected by survey. Social support, a potential effect modifier, is measured using the Social Support Questionnaire-Short Form (SSQ-6) (Cronbach's alpha = 0.97).(100, 101) Participants in the control group complete a form listing any mindfulness programs they participated in over the last year to examine potential contamination bias. To capture intervention engagement, the duration and content of all NN-parent interactions are recorded by the NN in a log.

Parent and nurse navigator experience outcomes

Experience outcomes are captured through purposive sampling and semi-structured qualitative interviews with a subset (15-20) of intervention participants at 12 months and HCPs (7-15) including all NNs at study end. The objective of the qualitative component is to ensure an in-depth understanding of the intervention, especially 1) most valuable components, 2) facilitators and barriers, and 3) impact on parent stress and mental health.

Table 1. Measures timeline

MEASURE*	TIME TO ADMINISTER	BASELINE	PRETERM INFANTS			
			6 weeks corrected age	4 months corrected age	12 months corrected age	18 months corrected age
			TERM INFANTS (≥37 Weeks)			
			6 weeks post-enrollment	4 months post-enrollment	12 months post-enrollment	18 months post-enrollment
Participant Information & Demographic Questionnaire	5 min	✓				
Social Support Questionnaire 6	<5 min	✓				
Parenting Stress Index 4 SF	5 min	✓**	✓	✓	✓**	✓
Acceptance and Action Questionnaire II	<5 min	✓	✓	✓	✓	✓
Edinburgh Postnatal Depression Scale	5 min	✓	✓	✓	✓	
Health Utilities Index	5 min	✓		✓	✓	
State-Trait Anxiety Inventory SF	<5 min	✓		✓	✓	
Medical Indicators Form (chart review)***	15 min	✓		✓	✓	
Family Empowerment Scale	5 min	✓			✓	
Measure of Processes of Care 20	5 min	✓			✓	
Pediatric Transition Experience Measure	<5 min		✓		✓ (If not discharged at 6 weeks)	
Resource Use Questionnaire	5-10 min			✓	✓	
NCAST-PCI Teaching Scale***	10 min				✓ In-person/virtual	
BITSEA***	10 min				✓	

Mindfulness Exposure Form (control only)	<5 min				✓	
Qualitative Interviews (intervention only)	45 min				To be invited	
BSID-III***	60 min					✓ In-person at NFU clinic visit
Ages and Stages Questionnaire 18***	10 min					✓

*Participants will be given a window of +/- one month to complete each set of measures
**The second parent will also complete this measure, if enrolled
***Per infant in the study

Sample size

With 200 families there is 80% power to declare significance (with a two-sided test of the null hypothesis at $\alpha = 0.05$) if the intervention decreases the mean total stress score on the PSI-4-SF at 12 months by at least 0.4 of a standard deviation. To allow for up to 15% attrition, a total of 236 families will be recruited. Former studies have not identified a minimal clinically important difference (MCID) for the PSI-4-SF that could be used to estimate sample size calculation. It was assumed that participants would have a mean total stress score of 64(45) and estimates of the standard deviation vary from 15(102) to 19.(45) Therefore, the MCID for which there is sufficient power lies between 6 and 7.6. Differences less than 6.5 points (about 10%) would not be considered clinically important. The range used for the standard deviation (15-19) was confirmed using the data from the first 60 patients.

Recruitment

Research staff screen admissions to participating Level III NICUs for eligibility. A member of the NICU clinical team asks if parents are interested in participating in research. If interested, research staff speak with parents to discuss study procedures and consent. Research staff will obtain written informed consent from all participants for participation in the trial, audio recording, secondary data access, and qualitative interviews (model consent form in Appendix C).

Randomisation

Consented participants are enrolled and randomized using Research Electronic Data Capture (REDCap).(103, 104) Randomisation is stratified by site and the generation of the allocation sequence is concealed from research staff. Blinding of participants and NNs is not feasible due to the in-person nature of the intervention, however data analysts will be blinded to allocation.

Data collection

Participants are assigned an identification number to ensure confidentiality. Quantitative study data are collected and managed using REDCap. Participants can complete questionnaires online via REDCap, on paper or via telephone as needed. Participants receive a $10 honorarium at the completion of each set of questionnaires ($20 at 12 months), the NCAST visit, and the qualitative interview.

Participants are deemed lost to follow-up after no response to 2 telephone and 2 email contact attempts. If an infant dies after enrollment or a participant withdraws from the study, no further data collection will occur and they will be analyzed according to the intention to treat principle.

Data management

The Women & Children's Health Research Institute (WCHRI) at the University of Alberta will perform system management functions and data cleaning. Missing data and potential sources of bias will be examined and appropriate correction methods determined before data analysis. Data analysis will be performed by the WCHRI in collaboration with the research team. There is no data monitoring committee due to the low-risk nature of the intervention.

Statistical analysis

The intention to treat principle will be used for all analyses. Continuous data will be summarized by the mean and standard deviation for approximately normally distributed variables; median and quartiles (first and third quartiles) will be used for other distributions. Categorical data will be presented by absolute and relative frequencies (n and %). The unit of analysis for outcomes measured at the family level will be the self-identified primary caregiver. The unit of analysis for outcomes measured at the infant level will be the individual infant. A two-sided p-value ≤ 0.05 will be considered statistically significant. All statistical analyses will be performed by SAS 9.4 or later (SAS Institute Inc., Cary, NC, USA).

Primary analysis

The primary analysis will be based on the PSI-4-SF mean total stress score measurement taken at 12 months. Linear mixed models with sites as a random effect and group assignment as a fixed effect will be used for the analysis. Baseline PSI-4-SF value will be included as a covariate in the model.

Secondary analyses

Similar linear mixed models will be used to analyze secondary outcomes. For those outcomes with a measurement taken at baseline the corresponding baseline measurement will be included as a covariate in the model. To account for multiple births for outcomes measured on infants the linear mixed model for the analysis will include a random effect for family.

For those outcomes with measurements in addition to that taken at 12 months, a linear mixed model accounting for repeated measures will be performed to examine the effect of group allocation and time. Effects of sites and of individual participants will be added as random effects to the model. The effects of the intervention will also be assessed on PSI-4-SF subscale scores. In a sub-group analysis we will examine the effects of potential mediating variables, such as infant health status (e.g., prematurity), parental mental health (e.g., baseline depressive symptoms), level of intervention engagement, and family factors (e.g., sociodemographic factors), on PSI-4-SF total score. Measures that cannot be completed in person due to COVID-19 pandemic restrictions (i.e. BSID-III) will not be included in the final analysis if there is incomplete data.

Cost-effectiveness analyses

A cost-effectiveness analysis will be performed to determine the incremental cost of the CCENT intervention compared to standard of care among high-risk infants per quality-adjusted life years (QALY) gained. Utility weights derived from the HUI will be multiplied by the life expectancy of each parent to determine their QALYs. Both a health care system and societal perspective will be used with a 12-month time horizon. All costs and outcomes will be assigned to the family as the unit of analysis. Those families that have more than one eligible child may be analysed separately to preserve independence of observations. In addition to the infant's resource use captured on the RUQ, the CCENT intervention will be micro-costed in terms of labour and supplies. As the study is randomized, patient-level regression will be used to determine mean costs and outcomes per family for the comparators over the 12-month time horizon. Results will be summarized in an incremental cost-effectiveness ratio (ICER) – the ratio of the difference between groups in mean cost per family to the difference in mean QALYs. Extensive sensitivity analyses that examine the effects of varying uncertain parameters on the results will be conducted. Secondary cost-effectiveness analyses that model the incremental cost of CCENT per unit of improvement in other parental outcomes measures will also be conducted. All post-discharge resource use will be costed using provincial public payer sources.

Qualitative analysis

Interviews will be transcribed verbatim and reviewed for accuracy. Two researchers will independently code transcripts with NVivo 12,(105) using content analysis to identify key concepts, cluster key concepts into categories, and revisit categories to refine them.(106) Content analysis allows for the construction of categories containing data that represent similar meanings to provide insight into the phenomenon of interest.(106) Authors with expertise in qualitative analysis methods will review the coding scheme and findings at interim meetings. Data collection will continue until saturation is reached.

DISCUSSION

Recognition of the importance of parental support in the NICU and during the transition home has been noted in the literature.(15, 23, 26, 35, 36) There is a need for a high-quality clinical trial of this scope and nature. We anticipate that the CCENT program will reduce parental stress for parents of high-risk infants. We expect a positive impact on family empowerment, parent-infant interaction, psychological flexibility, child development, and transition experience. We also expect parents to experience better care coordination and more efficient health care utilization. In turn, we propose this study will lead to a shift in focus of neonatal follow-up across Canada to embed a model of parent support that is longitudinal and includes the transition home.

Several aspects of this trial are novel or innovative. The CCENT program addresses gaps in the literature regarding parental support by delivering a model that is proactive, long-term and encompasses the transition from hospital to home. In order to address the lack of evidence-based interventions supporting fathers of high-risk infants,(9, 14) we have included both fathers and mothers in our study. The qualitative interviews will allow us to identify what aspects of the CCENT program are more or less effective, for whom, and in what contexts.

The study's use of a nurse navigator delivering an integrated care bundle including Acceptance and Commitment Therapy coaching is innovative.(24, 107) NNs were chosen due to the

versatility, clinical expertise and social support skills of the nursing role.(108) Engaging nurses present in the NICU ensures guidance begins in the NICU and continues to outpatient care.(33)

Limitations include the risk of refusal or attrition due to the time commitment required. To minimize losses due to hospital transfer prior to completion of the ACT sessions, virtual options are available.

Intervention development
The intervention was developed through 8 teleconferences over a one year period with key stakeholders (including parent-partners) to determine the inclusion criteria and elements of the intervention, including the content of the ACT sessions and the resource toolkit.

Patient and public involvement
CCENT is embedded within the CHILD-BRIGHT network, which is supported by the Canadian Institutes of Health Research under Canada's Strategy for Patient-Oriented Research.(109, 110) CCENT was created based on priorities set by Canadian patients, families and investigators to increase the likelihood of a transformative impact for children and families. CCENT actively involves graduate NICU families in developing the study design, intervention content, and knowledge translation activities. A parent representative is a member of the author team, and a parent advisory group meets biannually, with quarterly e-mail conversations with the research team to receive input on study decisions.

ETHICS AND DISSEMINATION

Informed consent will be obtained from all participants by the research staff. Study data are kept confidential by removing identifying information, and all study files are maintained on a password protected secure server.

Adverse event reporting
A parent may be identified as having significant mental health concerns through NN interactions or the EPDS. A safety protocol is in place to ensure parents receive appropriate primary care or emergency services support as needed. All adverse events will be reported to the site research ethics board and primary investigator.

Dissemination
Study team members have direct integration and expertise in neonatal care and follow-up locally and nationally, allowing for knowledge translation (KT) to embed key findings into practise, including the use of an NN and the ACT framework. Executive summaries and presentations will be shared with Canadian NICUs. Academic KT will occur through presentation at academic conferences and publications in high-impact, peer reviewed journals. Collaboration with organizations such as the Provincial Council for Maternal and Child Health and Canadian Premature Babies Foundation provides further dissemination opportunities.

TRIAL STATUS

Recruitment began March 2018 at 2 sites and June 2019 at all other sites. 236 participants are enrolled as of January 2021. Data collection is anticipated to be complete by July 2022. Full-length protocol available on request.

AUTHOR CONTRIBUTIONS

Protocol version: 11 (version date: June 28 2020)

Roles and responsibilities:
JO, NM, PC, EC, TD, EK, LL, KO, HP, AS, and EC designed the study and the other authors (KE, AP, KR, LB, WS, and MB) collaborated in the design of the study. AW and MY provided statistical expertise and will conduct the statistical analysis. MM and WU designed and will conduct the cost-effectiveness analysis. JO, NM, KE, AP and SR prepared the initial draft of the manuscript and all authors revised the manuscript. All authors read, provided feedback, discussed and approved the final manuscript.

COMPETING INTERESTS STATEMENT

The authors of this paper declare that they have no significant competing financial, professional, or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

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ETHICS APPROVAL AND CONSENT

The CCENT study has obtained ethics approval from Clinical Trials Ontario (CTO0859) for Sunnybrook Health Sciences Centre, Mount Sinai Hospital, and The Ottawa Hospital. Ethics approval has also been obtained from each pediatric centre: Children's Hospital of Eastern Ontario Research Ethics Board (20170424), The Hospital for Sick Children Research Ethics Board (1000057100), UBC Children's and Women's Research Ethics Board (H18-02154), and McGill University Health Centre Research Ethics Board (20194721).

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FIGURES

Figure 1: Study flow diagram

REFERENCES

1. Saigal S, Doyle LW. An overview of mortality and sequelae of preterm birth from infancy to adulthood. *Lancet*. 2008;371(9608):261-9.
2. Kieran E, Sara R, Claydon J, et al. Outcomes of Neonates With Complex Medical Needs. *Adv Neonatal Care*. 2019;19(4):275-84.
3. PCMCH. Final Report of the Neonatal Follow-Up Clinics Work Group. 2015.
4. Baraldi E, Allodi MW, Löwing K, et al. Stockholm preterm interaction-based intervention (SPIBI)-study protocol for an RCT of a 12-month parallel-group post-discharge program for extremely preterm infants and their parents. *BMC Pediatr*. 2020;20(1):49.
5. Kuo DZ, Lyle RE, Casey PH, et al. Care System Redesign for Preterm Children After Discharge From the NICU. *Pediatrics*. 2017;139(4).
6. Al Maghaireh DF, Abdullah KL, Chan CM, et al. Systematic review of qualitative studies exploring parental experiences in the Neonatal Intensive Care Unit. *J Clin Nurs*. 2016;25(19-20):2745-56.
7. Roque ATF, Lasiuk GC, Radünz V, et al. Scoping review of the mental health of parents of infants in the NICU. *J Obstet Gynecol Neonatal Nurs*. 2017;46(4):576-87.
8. Caporali C, Pisoni C, Gasparini L, et al. A global perspective on parental stress in the neonatal intensive care unit: a meta-analytic study. *J Perinatol*. 2020;40(12):1739-52.
9. Carter JD, Mulder RT, Darlow BA. Parental stress in the NICU: the influence of personality, psychological, pregnancy and family factors. *Personal Ment Health*. 2007;1(1):40-50.
10. Obeidat HM, Bond EA, Callister LC. The parental experience of having an infant in the newborn intensive care unit. *J Perinat Educ*. 2009;18(3):23-9.
11. Alkozei A, McMahon E, Lahav A. Stress levels and depressive symptoms in NICU mothers in the early postpartum period. *J Matern Fetal Neonatal Med*. 2014;27(17):1738-43.
12. Treyvaud K. Parent and family outcomes following very preterm or very low birth weight birth: a review. *Semin Fetal Neonatal Med*. 2014; 19(2):131-5.
13. Treyvaud K, Lee KJ, Doyle LW, et al. Very preterm birth influences parental mental health and family outcomes seven years after birth. *J Pediatr*. 2014;164(3):515-21.
14. Benzies KM, Magill-Evans JE, Hayden KA, et al. Key components of early intervention programs for preterm infants and their parents: a systematic review and meta-analysis. *BMC Pregnancy Childbirth*. 2013;13 Suppl 1:S10.
15. Grunberg VA, Geller PA, Bonacquisti A, et al. NICU infant health severity and family outcomes: a systematic review of assessments and findings in psychosocial research. *J Perinatol*. 2019;39(2):156-72.
16. Ballantyne M, Orava T, Bernardo S, et al. Parents' early healthcare transition experiences with preterm and acutely ill infants: a scoping review. *Child Care Health Dev*. 2017;43(6):783-96.
17. Sneath N. Discharge teaching in the NICU: are parents prepared? An integrative review of parents' perceptions. *Neonatal Netw*. 2009;28(4):237-46.
18. Raines DA. Mothers' stressor as the day of discharge from the NICU approaches. *Adv Neonatal Care*. 2013;13(3):181-7.
19. Ronan S, Brown M, Marsh L. Parents' experiences of transition from hospital to home of a child with complex health needs: A systematic literature review. *J Clin Nurs*. 2020;29(17-18):3222-35.

20. Welch CD, Check J, O'Shea TM. Improving care collaboration for NICU patients to decrease length of stay and readmission rate. *BMJ Open Qual*. 2017;6(2):e000130.
21. Sauve R, Lee SK. Neonatal follow-up programs and follow-up studies: Historical and current perspectives. *Paediatr Child Health*. 2006;11(5):267-70.
22. Albaghli F, Church P, Ballantyne M, et al. Neonatal follow-up programs in Canada: A national survey. *Paediatr Child Health*. 2019.
23. Purdy IB, Craig JW, Zeanah P. NICU discharge planning and beyond: recommendations for parent psychosocial support. *J Perinatol*. 2015;35 Suppl 1:S24-8.
24. Esser K, Barreira L, Miller D, et al. Exploring Acceptance and Commitment Therapy for parents of preterm infants. *Paediatr Child Health*. 2020; pxaa003.
25. Schneiderman N, Ironson G, Siegel SD. Stress and health: psychological, behavioral, and biological determinants. *Annu Rev Clin Psychol*. 2005;1:607-28.
26. Aydon L, Hauck Y, Murdoch J, et al. Transition from hospital to home: parents' perception of their preparation and readiness for discharge with their preterm infant. *J Clin Nurs*. 2018;27(1-2):269-77.
27. Bruder MB, Walker L. Discharge planning: Hospital to home transitions for infants. *Topics Early Child Spec Educ*. 1990;9(4):26-42.
28. Garfield CF, Simon CD, Rutsohn J, et al. Stress From the Neonatal Intensive Care Unit to Home: Paternal and Maternal Cortisol Rhythms in Parents of Premature Infants. *J Perinat Neonatal Nurs*. 2018;32(3):257-65.
29. Spittle AJ, Anderson PJ, Lee KJ, et al. Preventive care at home for very preterm infants improves infant and caregiver outcomes at 2 years. *Pediatrics*. 2010;126(1):e171-8.
30. Gröne O, Garcia-Barbero M. Integrated care: a position paper of the WHO European Office for Integrated Health Care Services. *Int J Integr Care*. 2001;1:e21.
31. Wolfe I, Satherley RM, Scotney E, et al. Integrated Care Models and Child Health: A Meta-analysis. *Pediatrics*. 2020;145(1):e20183747.
32. Embuldeniya G, Kirst M, Walker K, et al. The Generation of Integration: The Early Experience of Implementing Bundled Care in Ontario, Canada. *Milbank Q*. 2018;96(4):782-813.
33. Hall S, Phillips R, Hynan M. Transforming NICU care to provide comprehensive family support. *Newborn Inf Nurs Rev*. 2016;16(2):69-73.
34. Hamline MY, Speier RL, Vu PD, et al. Hospital-to-Home Interventions, Use, and Satisfaction: A Meta-analysis. *Pediatrics*. 2018;142(5): e20180442.
35. Whittingham K, Boyd RN, Sanders MR, et al. Parenting and prematurity: understanding parent experience and preferences for support. *J Child Fam Stud*. 2014;23(6):1050-61.
36. Nicolaou M, Rosewell R, Marlow N, et al. Mothers' experiences of interacting with their premature infants. *J Reprod Infant Psychol*. 2009;27(2):182-94.
37. Jefferies AL. Going home: Facilitating discharge of the preterm infant. *Paediatr Child Health*. 2014;19(1):31-42.
38. Resar R, Griffin FA, Haraden C, et al. Using care bundles to improve health care quality. IHI innovation series white paper. Cambridge, Massachusetts: Institute for Healthcare Improvement. 2012.
39. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ*. 2008;337:a1655.
40. Welch MG, Hofer MA, Brunelli SA, et al. Family nurture intervention (FNI): methods and treatment protocol of a randomized controlled trial in the NICU. *BMC Pediatr*. 2012;12(1):1-17.

41. Boukydis Z. Collaborative consultation with parents and infants in the perinatal period. Paul H Brookes Publishing; 2012.

42. Broyles RS, Tyson JE, Heyne ET, et al. Comprehensive follow-up care and life-threatening illnesses among high-risk infants: A randomized controlled trial. *JAMA*. 2000;284(16):2070-6.
43. Spittle AJ, Barton S, Treyvaud K, et al. School-age outcomes of early intervention for preterm infants and their parents: a randomized trial. *Pediatrics*. 2016;138(6):e20161363.
44. Clarke JL, Bourn S, Skoufalos A, et al. An Innovative Approach to Health Care Delivery for Patients with Chronic Conditions. *Popul Health Manag*. 2017;20(1):23-30.
45. Halpern LF, Brand KL, Malone AF. Parenting stress in mothers of very-low-birth-weight (VLBW) and full-term infants: a function of infant behavioral characteristics and child-rearing attitudes. *J Pediatr Psychol*. 2001;26(2):93-104.
46. Baía I, Amorim M, Silva S, et al. Parenting very preterm infants and stress in Neonatal Intensive Care Units. *Early Hum Dev*. 2016;101:3-9.
47. Peebles-Kleiger MJ. Pediatric and neonatal intensive care hospitalization as traumatic stressor: implications for intervention. *Bull Menninger Clin*. 2000;64(2):257-80.
48. Bakewell-Sachs S, Gennaro S. Parenting the post-NICU premature infant. *MCN Am J Matern Child Nurs*. 2004;29(6):398-403.
49. Elklit A, Hartvig T, Christiansen M. Psychological Sequelae in Parents of Extreme Low and Very Low Birth Weight Infants. *J Clin Psychol Med Settings*. 2007;14(3):238-247.
50. Klassen AF, Lee SK, Raina P, et al. Psychological health of family caregivers of children admitted at birth to a NICU and healthy children: a population-based cross-sectional survey. *BMC Pediatr*. 2004;4(1):24.
51. Huhtala M, Korja R, Lehtonen L, et al. Parental psychological well-being and cognitive development of very low birth weight infants at 2 years. *Acta Paediatr*. 2011;100(12):1555-60.
52. Zelkowitz P, Na S, Wang T, et al. Early maternal anxiety predicts cognitive and behavioural outcomes of VLBW children at 24 months corrected age. *Acta Paediatr*. 2011;100(5):700-4.
53. Zerach G, Elsayag A, Shefer S, et al. Long-Term Maternal Stress and Post-traumatic Stress Symptoms Related to Developmental Outcome of Extremely Premature Infants. *Stress Health*. 2015;31(3):204-13.
54. Boykova M. Transition from hospital to home in parents of preterm infants: a literature review. *J Perinat Neonatal Nurs*. 2016;30(4):327-48.
55. Pisoni C, Garofoli F, Tzialla C, et al. Risk and protective factors in maternal–fetal attachment development. *Early Hum Dev*. 2014;90:S45-S6.
56. Zakaria R, Sutan R, Jaafar R. Developing and implementing a health educational package for preemie moms in the care of their baby after hospital discharge. *J Educ Health Promot*. 2020;9:113.
57. Hayes SC, Luoma JB, Bond FW, et al. Acceptance and commitment therapy: model, processes and outcomes. *Behav Res Ther*. 2006;44(1):1-25.
58. Stotts AL, Villarreal YR, Klawans MR, et al. Psychological Flexibility and Depression in New Mothers of Medically Vulnerable Infants: A Mediational Analysis. *Matern Child Health J*. 2019;23(6):821-9.
59. Muscara F, McCarthy MC, Rayner M, et al. Effect of a Videoconference-Based Online Group Intervention for Traumatic Stress in Parents of Children With Life-threatening Illness: A Randomized Clinical Trial. *JAMA Netw Open*. 2020;3(7):e208507.

60. Chong YY, Mak YW, Leung SP, et al. Acceptance and Commitment Therapy for Parental Management of Childhood Asthma: An RCT. *Pediatrics*. 2019;143(2): e20181723.
61. Lunsky Y, Fung K, Lake J, et al. Evaluation of Acceptance and Commitment Therapy (ACT) for mothers of children and youth with autism spectrum disorder. *Mindfulness*. 2018;9(4):1110-6.
62. Mendelson T, Cluxton-Keller F, Vullo GC, et al. NICU-based Interventions To Reduce Maternal Depressive and Anxiety Symptoms: A Meta-analysis. *Pediatrics*. 2017;139(3): e20161870.
63. Steifel M, Nolan K. A Guide to Measuring the Triple Aim: Population Health, Experience of Care, and Per Capita Cost. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2012.
64. Chan A-W, Tetzlaff JM, Gøtzsche PC, et al. SPIRIT 2013 explanation and elaboration: guidance for protocols of clinical trials. *BMJ*. 2013;346:e7586.
65. Day D, PCMCH. Neonatal Follow-Up Implementation Strategy. Toronto, Ontario; 2017.
66. Olsen JM. Health coaching: a concept analysis. *Nurs Forum*. 2014; 49(1):18-29.
67. Foster L, Dunn W, Lawson LM. Coaching mothers of children with autism: A qualitative study for occupational therapy practice. *Phys Occup Ther Pediatr*. 2013;33(2):253-63.
68. O'Neill L, Latchford G, McCracken LM, et al. The development of the Acceptance and Commitment Therapy Fidelity Measure (ACT-FM): A delphi study and field test. *J Contextual Behav Sci*. 2019;14:111-8.
69. Abidin R, Flens JR, Austin WG. The Parenting Stress Index. In R. P. Archer (Ed.), Forensic uses of clinical assessment instruments. Mahwah, NJ: Lawrence Erlbaum Associates Publishers; 2006:297-328.
70. Huhtala M, Korja R, Lehtonen L, et al. Parental psychological well-being and behavioral outcome of very low birth weight infants at 3 years. *Pediatrics*. 2012;129(4):e937-44.
71. Newnham CA, Milgrom J, Skouteris H. Effectiveness of a modified Mother-Infant Transaction Program on outcomes for preterm infants from 3 to 24 months of age. *Infant Behav Dev*. 2009;32(1):17-26.
72. Browne JV, Talmi A. Family-based intervention to enhance infant-parent relationships in the neonatal intensive care unit. *J Pediatr Psychol*. 2005;30(8):667-77.
73. Grunau RE, Whitfield MF, Petrie-Thomas J, et al. Neonatal pain, parenting stress and interaction, in relation to cognitive and motor development at 8 and 18 months in preterm infants. *Pain*. 2009;143(1-2):138-46.
74. Kaaresen PI, Rønning JA, Tunby J, et al. A randomized controlled trial of an early intervention program in low birth weight children: outcome at 2 years. *Early Hum Dev*. 2008;84(3):201-9.
75. Abidin RR. Parenting Stress Index: Manual, Administration Booklet, and Research Update. 1983.
76. Barroso NE, Hungerford GM, Garcia D, et al. Psychometric properties of the Parenting Stress Index-Short Form (PSI-SF) in a high-risk sample of mothers and their infants. *Psychol Assess*. 2016;28(10):1331-5.
77. Furlong WJ, Feeny DH, Torrance GW, et al. The Health Utilities Index (HUI) system for assessing health-related quality of life in clinical studies. *Ann Med*. 2001;33(5):375-84.
78. Boyle MH, Furlong W, Feeny D, et al. Reliability of the Health Utilities Index—Mark III used in the 1991 cycle 6 Canadian General Social Survey Health Questionnaire. *Qual Life Res*. 1995;4(3):249-57.

79. Koren PE, DeChillo N, Friesen BJ. Measuring empowerment in families whose children have emotional disabilities: a brief questionnaire. *Rehabil Psychol*. 1992;37(4),305–321.
80. Singh, NN, Curtis J, Ellis C, et al. Psychometric analysis of the family empowerment scale. *Behav Disord*. 1995;3(2):85-91.
81. Cox JL, Chapman G, Murray D, et al. Validation of the Edinburgh Postnatal Depression Scale (EPDS) in non-postnatal women. *J Affect Disord*. 1996;39(3):185-9.
82. McBride HL, Wiens RM, McDonald MJ, et al. The Edinburgh Postnatal Depression Scale (EPDS): A review of the reported validity evidence. Validity and Validation in Social, Behavioral, and Health Sciences. 2014:157-74.
83. Marteau TM, Bekker H. The development of a six-item short-form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). *Br J Clin Psychol*. 1992;31(3):301-6.
84. Tluczek A, Henriques JB, Brown RL. Support for the reliability and validity of a six-item state anxiety scale derived from the State-Trait Anxiety Inventory. *J Nurs Meas*. 2009;17(1):19-28.
85. Cunningham BJ, Rosenbaum PL. Measure of processes of care: a review of 20 years of research. *Dev Med Child Neurol*. 2014;56(5):445-52.
86. King S, King G, Rosenbaum P. Evaluating health service delivery to children with chronic conditions and their families: Development of a refined measure of processes of care (MPOC−20). *Child Health Care*. 2004;33(1):35-57.
87. Desai AD, Zhou C, Simon TD, et al. Validation of a Parent-Reported Hospital-to-Home Transition Experience Measure. *Pediatrics*. 2020;145(2) e20192150.
88. Desai AD, Jacob-Files EA, Lowry SJ, et al. Development of a Caregiver-Reported Experience Measure for Pediatric Hospital-to-Home Transitions. *Health Serv Res*. 2018;53:3084-106.
89. Ungar WJ, Tsiplova K, Millar N, et al. Development of the Resource Use Questionnaire (RUQ–P) for families with preschool children with neurodevelopmental disorders: Validation in children with autism spectrum disorder. *Clin Pract Pediatr Psychol*. 2018;6(2):164-178.
90. Bond FW, Hayes SC, Baer RA, et al. Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance. *Behav Ther*. 2011;42(4):676-88.
91. Briggs-Gowan MJ, Carter AS, Irwin JR, et al. The Brief Infant-Toddler Social and Emotional Assessment: screening for social-emotional problems and delays in competence. *J Pediatr Psychol*. 2004;29(2):143-55.
92. Briggs-Gowan MJ, Carter AS. Applying the Infant-Toddler Social & Emotional Assessment (ITSEA) and Brief-ITSEA in early intervention. *Infant Ment Health J*. 2007;28(6):564-83.
93. Karabekiroglu K, Briggs-Gowan MJ, Carter AS, et al. The clinical validity and reliability of the Brief Infant-Toddler Social and Emotional Assessment (BITSEA). *Infant Behav Dev*. 2010;33(4):503-9.
94. Bode MM, D'Eugenio DB, Mettelman BB, et al. Predictive validity of the Bayley, Third Edition at 2 years for intelligence quotient at 4 years in preterm infants. *J Dev Behav Pediatr*. 2014;35(9):570-5.
95. Ranjitkar S, Kvestad I, Strand TA, et al. Acceptability and Rliability of the Bayley Scales of Infant and Toddler Development-III among Children in Bhaktapur, Nepal. *Front Psychol*. 2018;9:1265.
96. Squires J, Potter L, Bricker D. The ASQ user's guide for the Ages & Stages Questionnaires: A parent-completed, child-monitoring system: Paul H Brookes Publishing; 1995.

97. Schonhaut L, Armijo I, Schönstedt M, et al. Validity of the ages and stages questionnaires in term and preterm infants. *Pediatrics*. 2013;131(5):e1468-74.
98. Sumner GA, Spietz A. NCAST caregiver/parent child interaction teaching manual. Seattle, WA: NCAST Publications. 1994.
99. Farel AM, Freeman VA, Keenan NL, et al. Interaction between high-risk infants and their mothers: The NCAST as an assessment tool. *Res Nurs Health*. 1991;14(2):109-18.
100. Sarason IG, Sarason BR, Shearin EN, et al. A brief measure of social support: Practical and theoretical implications. *J Soc Pers Relat*. 1987;4(4):497-510.
101. Sarason IG, Levine HM, Basham RB, et al. Assessing social support: the social support questionnaire. *J Pers Soc Psychol*. 1983;44(1):127-39.
102. Johnson ER, Davies SL, Aban I, et al. Improving parental stress levels among mothers living with HIV: a randomized control group intervention study. *AIDS Patient Care STDS*. 2015;29(4):220-8.
103. Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42(2):377-81.
104. Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: Building an international community of software platform partners. *J Biomed Inform*. 2019;95:103208.
105. QSR International. NVivo Qualitative Data Analysis Software [Software] (Version 12). 2020.
106. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15(9):1277-88.
107. Parker S, Fuller J. Are nurses well placed as care co-ordinators in primary care and what is needed to develop their role: a rapid review? *Health Soc Care Community*. 2016;24(2):113-22.
108. Manthorpe J, Goodman C, Drennan V, et al. Nurse-led case management in the National Health Service: bridging clinical and social worlds. *Prim Health Care Res Dev*. 2012;13(2):153-64.
109. Fergusson D, Monfaredi Z. Demonstrating the value of patient-oriented research in Ontario. *CMAJ*. 2018;190(Suppl):S53-4.
110. Lough S. Need to define patient engagement in research. *CMAJ*. 2015;187(12):E385-6.

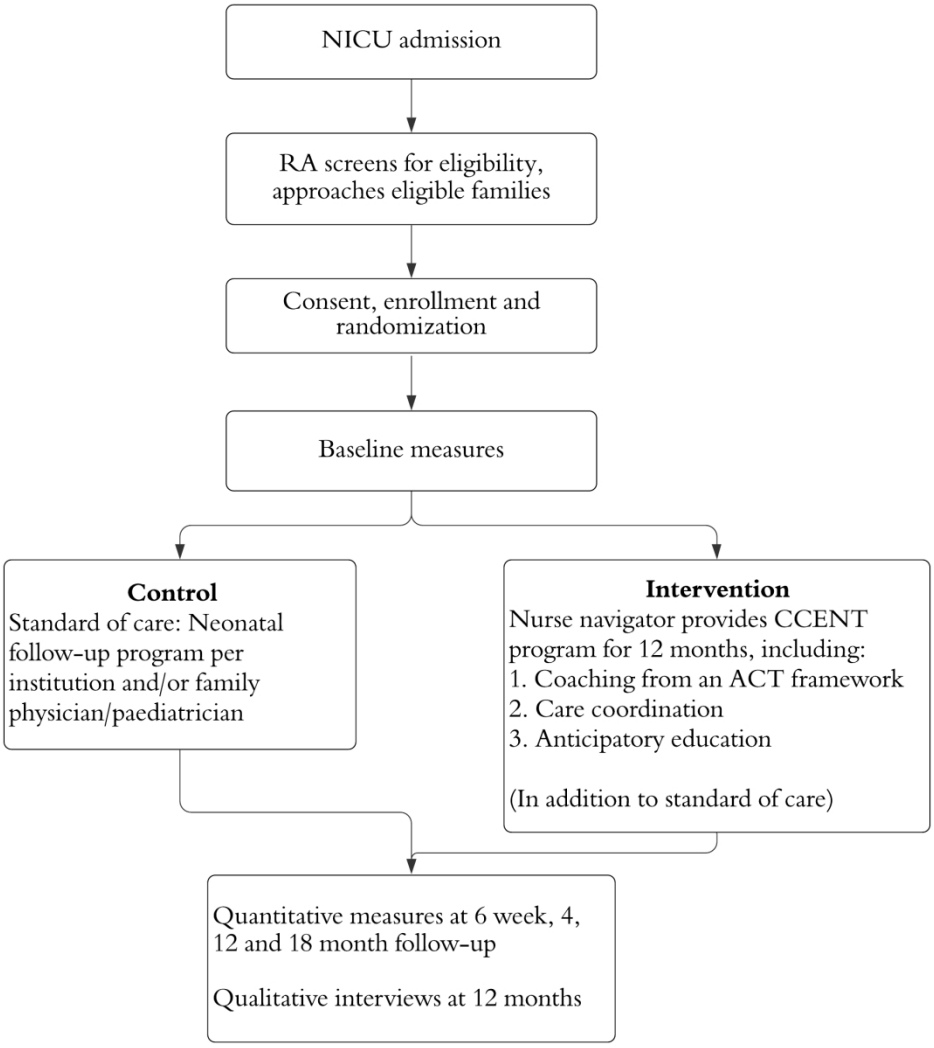

Figure 1. Study flow diagram

APPENDIX LIST

Appendix A: Timing of clinic visits and clinic members in neonatal follow up (NFU) clinics per site
Appendix B: Overview of ACT sessions and curriculum
Appendix C: Model consent form for participants

APPENDIX A: Timing of clinic visits and clinic members in neonatal follow up (NFU) clinics per site

Site	Timing of clinic visits (corrected age)	NFU clinic members
The Hospital for Sick Children, Toronto	• 6 week telephone visit for neurology, premature and PPHN patients. • 4 months • 8 months* • 12 months • 18 months • 36 months *Cardiac visits start at 8 months.	• Neonatologists • Nurse practitioner • Occupational therapists • Physiotherapists • Speech-language pathologists • Psychometrists • Psychologist
Sunnybrook Health Sciences Centre, Toronto	• Post-discharge • 4-6 weeks • 4 months • 8 months • 12 months • 18 months • 36 months • Kindergarten • School	• Neonatologists and developmental paediatricians • Registered nurse • Occupational therapists • Physiotherapist • Speech-language pathologist
Mount Sinai Hospital, Toronto	• 3.5 months • 8 months • 12 months • 18 months • 36 months	• Neonatologists • Nurse practitioner • Occupational therapists • Physiotherapist • Speech language pathologist • Psychologist
Montreal Children's Hospital, Montreal	• Post-discharge phone call • 4 months • 9 months • 18 months • 36 months • Preschool • Subsequent visit and extra visits possible, on clinical basis.	• Pediatricians • Neonatologist • Nurses • *Occupational therapist, Physiotherapist, Psychologist, Speech & language therapist, Audiologist, Social worker, Clinical nutritionist *Services on consultation for developmental surveillance and short interventions
BC Women's Hospital, British Columbia	• 4 months • 8 months • 18 months • 3 years • 4.5 years	• Neonatologists • Nurses • Occupational therapists • Physiotherapists • Speech and language therapists • Psychologists

Children's Hospital of Eastern Ontario and The Ottawa Hospital, Ottawa	• 4 months • 10 months • 18 months • 4 years Additional visits may be booked if concerns are identified	• Neonatologists • Pediatrician and developmental pediatrician • Neonatal nurse practitioner • Registered nurse • Physiotherapist • Psychologist

APPENDIX B: Overview of ACT sessions and curriculum

Session	ACT Core Processes	Objectives	Key Activities
Pre-session (20 min)	1. Values	1. Build rapport 2. Briefly describe what to expect in sessions 3. Answer any questions and let them know other family members can attend	- Complete pre-session worksheet
Session 1: Welcome to the Matrix (1 hour)	1. Values 2. Present moment 3. Committed action	1. Participate in values authorship, an exercise with an aim at focusing on life domains that are uniquely important to each person 2. Connect more deeply with what is most important to us 3. Show up fully for our lives and for the important people in our lives 4. Live the qualities that are most important to each of us 5. Bringing awareness to our behaviour	- The Matrix - Mindfulness exercise: What's important about being here? - Planning a bold move - Sharing appreciations of the session
Session 2: Just noticing (1 hour)	1. Defusion 2. Present moment 3. Acceptance	1. Bring awareness to the thoughts, feelings, sensations, and memories 2. Noticing what our actions are in service of 3. Noticing the short and long term costs and benefits of 'toward' and 'away' moves 4. Bringing awareness to an interaction with someone that is about appreciation rather than problem solving	- Mindfulness exercise: Setting intention - Check-in on bold moves - Functional analysis of the Matrix - The sweet spot exercise - Just notice - Sharing appreciations of the session
Session 3: Watching your thoughts (1 hour)	1. Defusion 2. Acceptance 3. Present moment	1. Loosening rigid repertoires of behaviour in the presence of painful private experiences, such as difficult thoughts, feelings, sensations, and memories	- Thought exercise (e.g., thought factory) - Fish and hooks worksheet - Mindfulness exercise - Noticing hooks and response to hooks - "Hooky" words exercise

		2. Practice creating distance from one's thoughts 3. Learning how to observe experiences rather than being the experience	- Sharing appreciations of the session
Session 4: Staying your course (1 hour)	1. Self as context 2. Present moment 3. Values 4. Defusion 5. Acceptance 6. Committed Action	1. Reflecting on the experience of the sessions 2. Participate in values authorship 3. Clarifying values and awareness on how close you are to 'living' them; reflect without judgment or needless defense	- Review of past sessions - Bullseye exercise - Mountain meditation or sky and weather - Object exercise - Note to future self

APPENDIX C: Model consent form for participants

Consent to Participate in a Research Study

Study Title:

Coached, Coordinated, Enhanced Neonatal Transition (CCENT): A multi-centre pragmatic randomized controlled trial

Principal Investigators:

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Study Sponsor:

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Conflict of Interest:

There are no conflicts of interest to declare related to this study.

Introduction

You are invited to participate in a research study because your child is a patient in the Neonatal Intensive Care Unit (NICU). This consent form describes the research study and what it means to participate. This consent form may have words that you do not understand. Please ask the study staff to explain anything that you do not understand. Please take as much time as you need to think about your decision to participate or not and ask any questions you have. If it is helpful to you, you are encouraged to discuss the study with family, friends, your personal physician, other health professionals, or any members of your community that you trust. All participation is voluntary, and you are not under any obligation to participate.

Why is this study being done?

Infants and parents in the Neonatal Intensive Care Unit (NICU) experience significant stress, including worrying about their child's health, separation from each other, possible painful procedures, and prolonged hospitalization. Support available in the NICU consists of your baby's bedside nurse, medical team, various specialists caring for your baby, and social workers. In addition to the standard supports that are available in the NICU, families and care providers have identified certain medical and social needs that go beyond the care available in the NICU. The purpose of this study is to evaluate a neonatal follow-up model that offers additional support for children and their family during their NICU admission as well as their transition home. In this study, some families will be randomly assigned a dedicated "key worker" (nurse navigator) who will play a supportive role for you and your family during the transition out of the hospital. The results of this study, including your feedback, will be used to improve future care for children in the NICU and their families.

How many participants will be in this study?

It is anticipated that about 250 families will take part in this study, from research sites located at seven hospitals across Canada. Approximately 70 families will be enrolled at SickKids.

How long will the study take?

This length of the study for participants is 18 months and the results will be known in 2022-2023.

What will happen in this research study?

If you decide to participate, you will be "randomized" into one of the groups described below. Randomization means that you are put into a group by chance (like flipping a coin). There is no way to predict which group you will be assigned to. You will have an equal chance of being placed in either group. Neither you, nor the research staff can choose what group you will be in. You will be told which group you are in.

Both groups will receive the standard of care through the neonatal follow-up clinic and will be seen at routine times, which includes follow-up appointments at 6 weeks, 4 months, 12 months, and 18 months corrected age.

<u>Group 1: Parental Coaching and Care Coordination in addition to Standard of Care</u>

If you are randomized to this group, you and your family will be assigned a dedicated key worker, whose role is to offer support and coaching to parents. The key worker's role involves three main components: 1) parental coaching within a mindfulness framework, which involves structured group mindfulness sessions, 2) care coordination, which includes supporting providers in clear communication when

coordinating between acute care, primary care, neonatal follow-up, home and community as well as supporting you in system and resource navigation, and 3) education and anticipatory guidance, which involves providing parents and families with proactive education targeting normal challenges in caring for a child who required care in the NICU.

Four coaching sessions (+ an introductory session) will be offered to the parental caregivers in this group, each will be approximately 1 hour. The sessions will follow an Acceptance and Commitment Therapy and mindfulness framework. These sessions will be offered to families throughout their stay in the NICU, but can be completed virtually if necessary. The key worker will provide support to families during NICU admission, as well as during the transition out of hospital up until 12 months corrected age. This support will come in the form of 6 weekly phone calls post-discharge from the NICU, followed by 10 monthly phone calls (months 2-12 post-discharge). Additional resources may be sent to you by e-mail if you provide your e-mail to the key worker. All caregivers in the child's family are encouraged to participate.

Group 2: Standard of Care

If you are randomized to this group, your child will receive the standard treatment as directed by their care team. The standard of care involves routine neonatal follow-up appointments at 6-weeks, 4-months, 12-months and 18-months corrected age.

What are the study procedures?

As a participant in this study, researchers will be collecting information about you and your child. This information will be carefully stored in a secure study database. Information will be collected in the following way:

1. Questionnaires

Participants in both groups will be asked to complete questionnaires about yourself and your child. The questionnaires will ask questions relating to your level of stress and depression, your feelings of empowerment, your overall health and wellbeing, your experience with service delivery (i.e., coordination among providers and families), family use relating to your child's medical needs, and your child's overall health and wellbeing. The information you provide is for research purposes only. Some of the questions are personal. You can choose not to answer questions if you wish.

There is a chance that during the study you may be identified as experiencing significant depression or anxiety through your responses to the depression questionnaire. The research staff facilitating the surveys will be trained to identify participants with these concerns and will facilitate a referral to the clinical team or identify local services that will provide support. In the event that a safety concern is identified, you will be asked permission to contact your family doctor or primary care provider and you will be asked to make an appointment. If you do not consent for your family doctor or primary care provider to be contacted we will respect your decision, however clinic staff (i.e. social work) will be notified. In the case of an emergency situation emergency services would be contacted instead.

Each questionnaire has a different timeline for completion. Some questionnaires are completed at all five time-points while others might only be completed once. The approximate additional time commitment at each follow-up date is as follows: baseline (60 minutes), 6-weeks (15 minutes), 4-months (30 minutes), 12-months (60 minutes) and 18-months (10 minutes). These questionnaires can be done in person while at your clinic visit, over the phone or online, depending on the method that is most convenient for you. If you choose to complete the surveys online, you will be asked to provide an email address where the survey links can be sent.

2. Direct Assessment

The study staff will administer one assessment, called the Nursing Child Assessment Satellite Training Parent-Child Interaction Teaching Scale, at your child's 12-month follow-up appointment. This involves you teaching your child something new (you can select from a list of possible activities that you think your child would enjoy and be interested in). This interaction will take approximately 10 minutes, and it will be recorded so that it can be scored at a later date. The recording will be de-identified, and stored in a secure, locked location, separate from the study data.

3. Qualitative Interview

At the end of the study, study participants may be invited to participate in a one-on-one interview in order for us to learn more about your experience with the key worker. This will take approximately 45 minutes to complete. The interview will be conducted on the telephone. Interviews will be audio-recorded and will be transcribed and analyzed by the research team. The transcription will be done by members of the research team. Your name or any other identifying information will not be included during the recording, except your voice. The audio recording will be checked by the interviewer/transcriber to ensure no identifying information is transcribed. All audio recordings will be stored on a password protected computer at the Hospital for Sick Children and the transcribed file will be identified by a study ID number.

4. Health Record

As a participant in this study, researchers will collect information about your child's health, clinic visits, tests, and service use from the Neonatal Intensive Care Units records. At the baseline, 4-month, and 12-month corrected age appointments, clinical data relating to your child's growth, development, and medical needs will be collected.

Your child's health card number (OHIP) will be used to link the information to data held at the Institute for Clinical Evaluative Sciences (ICES) in order to provide a complete picture of your child's use of health services. This data will not contain any information that could directly identify you (i.e. name, address, telephone number) and will be pooled with other study data.

This study will collect information from a clinical assessment that is routinely done as part of neonatal follow-up care. The Bayley Scales of Infant and Toddler Development is a developmental assessment that is done routinely as part of neonatal care at the 18-month follow-up appointment and takes approximately 90 minutes to complete. Scores from this assessment will be collected for our analysis. Authorized study staff will access your child's medical record up until the 18-months corrected age follow-up appointment to collect information from this clinical assessment.

What are the risks, harms or discomforts of the study?

We do not expect that you or your child will experience any harm by taking part in this study. Some of the questionnaires ask sensitive questions, which may cause emotional distress. You may choose not to answer these questions. There is an additional time commitment associated with the study procedures. The approximate additional time commitment to complete the assessments at each follow-up appointment is as follows: baseline (60 minutes), 6-weeks (15 minutes), 4-months (30 minutes), 12-months (60 minutes) and 18-months (10 minutes). For participants randomized to the intervention group, there is an additional time commitment of the coaching sessions with the key worker, and subsequent phone calls.

There is a potential for a breach of privacy, however we will take steps to minimize that risk by storing all of the research data in a password-protected database and by storing personally identifying information in a separate place from the study data. There is a potential risk of loss of your confidentiality for the interviews because even though your name will not be part of the audio recording, your voice may still be identifiable as your voice. All audio recordings will be destroyed after transcription and the transcribed file will not contain your name or any identifying information.

Participants in Group 1 (the intervention arm) may have their Acceptance and Commitment Therapy sessions recorded for quality improvement purposes. These recordings will be assessed by a study team member to assess the facilitator's competence in delivering the intervention. These recordings will not be transcribed and participants will not be assessed/analyzed.

Are there benefits from being in the study?

If you agree to take part in this study, the experimental intervention may or may not be of direct benefit to you. This study incorporates a parental coaching and care coordination intervention, which aims to provide families with knowledge, and support them in the role of navigating the healthcare system and in the care of their child. The benefits associated with this may include improved parental stress and well-being, improved family empowerment, improved infant attachment, better coordination of care, more efficient health care utilization, improved service delivery and timely referrals to appropriate health services.

The study may lead to an improved parental support model, which hopes to change the focus of neonatal follow up across Canada to one that involves ongoing parental support and takes into account factors that are important for families as well as those related to the health of the child. The care coordination may be associated with a more efficient use of healthcare resources and lead to cost-savings for families and the healthcare system.

What other choices are there?

You do not have to take part in this study in order to receive treatment or care. If you choose not take part in this study, your child will receive standard treatment as directed by his/her doctor.

What are the optional parts to this study?

Future researchers at the Women and Children's Health Research Institute (WCHRI) at the University of Alberta may want to use data from this study for new research. You have the option of allowing your study data to be re-used by approved researchers. Any of your personal information (i.e. your name, address, telephone number) that can identify you will be removed before files are shared with other researchers. Researchers that wish to use study data must 1) have their new study approved by an ethics board, and 2) sign an agreement ensuring your confidentiality and restricting data use to only the approved study.

I agree to the secondary use of my data to answer future related research questions (optional):

I agree for my study data to facilitate future related research. I understand that my study data may be made available to other researchers, but my identity will be protected, and my confidentiality will be preserved.	_____ Initials

I do NOT agree for my study data to facilitate future related research. I do NOT want my study data to be made available to other researchers. _____ Initials

Can I choose to leave the study?

It is your choice to take part in this study, participation is voluntary. You can change your mind at any time during the research study. The study team may ask why you are withdrawing for reporting purposes, but you do not need to give a reason to withdraw from the study if you do not want to. Withdrawal from the study will not have any effect on the care you or your child will receive at SickKids. If you decide to leave the study, you can contact the Principal Investigator or a member of the study team to let them know. If you choose to leave this study you can decide whether all your data that has been collected is kept and used for the research or deleted.

Will I be paid and/or reimbursed if I join this study?

As a token of our appreciation, you will receive a $10 gift card to either Tim Hortons, Starbucks or Walmart upon completion of the questionnaires at each appointment, with an additional $10 at 12 months, the NCAST visit, and the qualitative interview. In total, you may receive eight $10 gift cards over the course of the 18-month study. Gift cards will be provided to participants in both study groups.

How will my privacy be protected?

We will respect your privacy. No information about you or your child will be given to anyone outside of the study team or be published without your permission, unless required by law.

The SickKids study staff (study investigators, coordinators, and nurses) will collect personal health information about you and your child. This includes things learned from the study procedures described in this consent form and/or information from your child's medical records. They will only collect the information they need for the study. The study will collect personal information that could identify you or your child, such as child's full date of birth, expected date of delivery, discharge date, your name, telephone number, address, and email address.

All personal health information or personal information collected about you will be "de-identified" by replacing your identifiable information (i.e., name) with a "study number". The SickKids study staff are in control of the study code key, which is needed to connect your personal health information/personal information to you. The link between the study number and your identity will be safeguarded and only accessible to the study staff at SickKids. SickKids guidelines include the following:

- All information that identifies you, both paper copy and electronic information, will be kept confidential and stored and locked in a secure place that only the study staff will be able to access.
- Electronic files will be stored securely on hospital or institutional networks or securely on any portable electronic devices.
- No information identifying you will be allowed off site in any form without your consent. Examples include your hospital or clinic charts, copies of any part of your charts, or notes made from your charts.

The following people may come to the hospital to look at your personal health information to check that the information collected for the study is correct and to make sure the study followed the required laws and guidelines:

- Representatives of the SickKids Research Ethics Board and/or Research Quality and Risk Management team.

This study is part of a Canada wide, collaborative research network called CHILD-BRIGHT, involving investigators and collaborators from many Canadian healthcare institutions. Representatives at the CHILD-BRIGHT Data Coordinating Centre (DCC) at the Women & Children's Health Research Institute (WCHRI) will have access to your de-identified study data in order to perform system management functions and data analysis. If you wish to complete the study questionnaires online, your email address will be entered into WCHRI's REDCap system so that automated questionnaire reminders can be sent to you. Your email address will be only used for the purpose of facilitating questionnaire completion. WCHRI's REDCap installation is housed in a secure data centre at the University of Alberta Hospital that is behind the Faculty's firewall. Data will remain on REDCap until all data management and statistical analysis activity has been completed. We anticipate this will be within one year of the last participant's last study related contact with the research team.

The video-recording of the parent-child interaction assessment will be kept separate from the study data and stored in a secure, locked location. The videotapes will be viewed and scored by an individual who is trained in NCAST interpretation. You and your child's faces will be seen by the person assessing the video but they will NOT receive any personal identifying information about you. All study data including the video-recordings will be kept for 10 years as per CIHR guidelines. A health custodian will be consulted to ensure that this information is properly destroyed.

The audio-recording from the telephone interview will be stored on a password protected computer at the Hospital for Sick Children. All audio recordings will be destroyed after transcription and the transcribed file will not contain your name or any identifying information.

For intervention participants who consent, the audio recordings of the Acceptance and Commitment Therapy sessions will be uploaded to the SickKids Research Institute Secure File Transfer Portal and deleted off the recording device right after. After the facilitator's competence is assessed, the recordings will be deleted off the file transfer portal. These recordings will not be transcribed and participants will not be assessed/analyzed.

The study staff will keep any personal health information about you in a secure and confidential location for 7 years and then destroy it according to SickKids policy.

When the results of this study are published, your identity will not be disclosed. You have the right to be informed of the results of this study once the entire study is complete.

Because of the importance of being able to track your child's care across institutions, your child's OHIP number will be encrypted before it is linked to ICES to track your child's use of health services. The encryption process ensures that your child cannot be identified. ICES is a prescribed entity under the Personal Health Information Protection Act (PHIPA) and follows policies and procedures for privacy protection and data security as approved by Ontario's Privacy Commissioner.

Will information about this study be available online?

A description of this clinical trial will be available on the CHILD-BRIGHT website (https://child-bright.ca/ccent). This website will not include information that can identify you. You can search this website at any time.

What are my rights when participating in a research study?

You have the right to receive all information that could help you make a decision about participating in this study. You also have the right to ask questions about this study at any time and to have them answered to your satisfaction. Your rights to privacy are legally protected by federal and provincial laws that require safeguards to ensure that your privacy is respected.

By signing this form, you do not give up any of your legal rights against the study doctor, sponsor or involved institutions for compensation, nor does this form relieve the study doctor, sponsor or their agents of their legal and professional responsibilities.

You will be given a copy of this signed and dated consent form prior to participating in this study.

Will I receive study results?

Research results will be shared through journal publications and academic conferences. When the results of this study are shared, your identity will not be disclosed. You have the right to be informed of the results of this study once the entire study is complete.

You have the right to be informed of the results of this study once the entire study is complete.
If you would like to be informed of the results of this study, please contact the study doctor. In addition, the results of this study will be available on the clinical trial registry (https://clinicaltrials.gov/, NCT0335024).

Who can I call if I have questions about the study?

If you have any questions during your participation in this research study you can contact the Study Doctor, Dr. Julia Orkin at 416-813-7654 x201150 or the research team members listed at the beginning of this consent form.

Research Ethics Board Contact Information

The study protocol and consent form have been reviewed by the SickKids Research Ethics Board (REB). If you have any questions regarding your rights as a research participant, you may contact the Office of the Research Ethics Board at 416-813-8279 during business hours.

Consent to Participate in a Research Study

Study Title: Coached, Coordinated, Enhanced Neonatal Transition (CCENT): A multi-centre pragmatic randomized controlled trial

By signing this research consent form, I understand and confirm that:

1) All of my questions have been answered.
2) I understand the information within this informed consent form.
3) I allow access to my/my child's medical records and as explained in this consent form.
4) I do not give up any of my or my child's legal rights by signing this consent form.
5) I have been told I will be given a signed and dated copy of this consent form.
6) I agree to allow the person for whom I am responsible to take part in this study.

I consent on behalf of _____ (name of child) to participate in this study.

_____	_____	_____
Printed Name of Parent/Guardian	Parent/Guardian Signature	Date (DD/MMM/YYYY)
_____	_____	_____
Printed Name & Role of person who the Consent Discussion	Signature of person who obtained the consent	Date (DD/MMM/YYYY)

Optional:
□ I would like to hear the results of the study when they are available.
Please email me at: _____

For Intervention Participants Only:
The Acceptance and Commitment Therapy sessions may be audio recorded for quality improvement purposes to ensure competence of the facilitator. All recordings are confidential and will be stored on password protected computers until they are reviewed by a study team member subsequently destroyed. The audio recordings will not be analyzed as research data that will be reported elsewhere.

I consent to have the Acceptance and Commitment Therapy sessions audio recorded for quality improvement purposes	Parent/Guardian Initial: _____	Parent/Guardian Initial: _____

Reporting checklist for protocol of a clinical trial.

Based on the SPIRIT guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the SPIRIT reporting guidelines, and cite them as:

Chan A-W, Tetzlaff JM, Gøtzsche PC, Altman DG, Mann H, Berlin J, Dickersin K, Hróbjartsson A, Schulz KF, Parulekar WR, Krleža-Jerić K, Laupacis A, Moher D. SPIRIT 2013 Explanation and Elaboration: Guidance for protocols of clinical trials. BMJ. 2013;346:e7586

		Reporting Item	Page Number
Administrative information			
Title	#1	Descriptive title identifying the study design, population, interventions, and, if applicable, trial acronym	1
Trial registration	#2a	Trial identifier and registry name. If not yet registered, name of intended registry	2
Trial registration: data set	#2b	All items from the World Health Organization Trial Registration Data Set	2
Protocol version	#3	Date and version identifier	14
Funding	#4	Sources and types of financial, material, and other support	18
Roles and responsibilities: contributorship	#5a	Names, affiliations, and roles of protocol contributors	1, 14

Roles and responsibilities: sponsor contact information	#5b	Name and contact information for the trial sponsor	N/A
Roles and responsibilities: sponsor and funder	#5c	Role of study sponsor and funders, if any, in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication, including whether they will have ultimate authority over any of these activities	18
Roles and responsibilities: committees	#5d	Composition, roles, and responsibilities of the coordinating centre, steering committee, endpoint adjudication committee, data management team, and other individuals or groups overseeing the trial, if applicable (see Item 21a for data monitoring committee)	N/A
Introduction			
Background and rationale	#6a	Description of research question and justification for undertaking the trial, including summary of relevant studies (published and unpublished) examining benefits and harms for each intervention	4,5
Background and rationale: choice of comparators	#6b	Explanation for choice of comparators	6
Objectives	#7	Specific objectives or hypotheses	5
Trial design	#8	Description of trial design including type of trial (eg, parallel group, crossover, factorial, single group), allocation ratio, and framework (eg, superiority, equivalence, non-inferiority, exploratory)	5
Methods: Participants, interventions, and outcomes			
Study setting	#9	Description of study settings (eg, community clinic, academic hospital) and list of countries where data will be collected. Reference to where list of study sites can be obtained	5
Eligibility criteria	#10	Inclusion and exclusion criteria for participants. If applicable, eligibility criteria for study centres and individuals who will	6

		perform the interventions (eg, surgeons, psychotherapists)	
Interventions: description	#11a	Interventions for each group with sufficient detail to allow replication, including how and when they will be administered	6,7
Interventions: modifications	#11b	Criteria for discontinuing or modifying allocated interventions for a given trial participant (eg, drug dose change in response to harms, participant request, or improving / worsening disease)	N/A
Interventions: adherance	#11c	Strategies to improve adherence to intervention protocols, and any procedures for monitoring adherence (eg, drug tablet return; laboratory tests)	N/A
Interventions: concomitant care	#11d	Relevant concomitant care and interventions that are permitted or prohibited during the trial	N/A
Outcomes	#12	Primary, secondary, and other outcomes, including the specific measurement variable (eg, systolic blood pressure), analysis metric (eg, change from baseline, final value, time to event), method of aggregation (eg, median, proportion), and time point for each outcome. Explanation of the clinical relevance of chosen efficacy and harm outcomes is strongly recommended	7-9
Participant timeline	#13	Time schedule of enrolment, interventions (including any run-ins and washouts), assessments, and visits for participants. A schematic diagram is highly recommended (see Figure)	9-10
Sample size	#14	Estimated number of participants needed to achieve study objectives and how it was determined, including clinical and statistical assumptions supporting any sample size calculations	10
Recruitment	#15	Strategies for achieving adequate participant enrolment to reach target sample size	10
Methods: Assignment of interventions (for controlled trials)			
Allocation: sequence generation	#16a	Method of generating the allocation sequence (eg, computer-generated random numbers), and list of any factors for stratification. To reduce predictability of a random sequence, details of any planned restriction (eg, blocking) should be provided in a separate document that is unavailable to those who enrol participants or assign interventions	11

Allocation concealment mechanism	#16b	Mechanism of implementing the allocation sequence (eg, central telephone; sequentially numbered, opaque, sealed envelopes), describing any steps to conceal the sequence until interventions are assigned	11
Allocation: implementation	#16c	Who will generate the allocation sequence, who will enrol participants, and who will assign participants to interventions	11
Blinding (masking)	#17a	Who will be blinded after assignment to interventions (eg, trial participants, care providers, outcome assessors, data analysts), and how	11
Blinding (masking): emergency unblinding	#17b	If blinded, circumstances under which unblinding is permissible, and procedure for revealing a participant's allocated intervention during the trial	N/A
Methods: Data collection, management, and analysis			
Data collection plan	#18a	Plans for assessment and collection of outcome, baseline, and other trial data, including any related processes to promote data quality (eg, duplicate measurements, training of assessors) and a description of study instruments (eg, questionnaires, laboratory tests) along with their reliability and validity, if known. Reference to where data collection forms can be found, if not in the protocol	8-11
Data collection plan: retention	#18b	Plans to promote participant retention and complete follow-up, including list of any outcome data to be collected for participants who discontinue or deviate from intervention protocols	11, 13
Data management	#19	Plans for data entry, coding, security, and storage, including any related processes to promote data quality (eg, double data entry; range checks for data values). Reference to where details of data management procedures can be found, if not in the protocol	11
Statistics: outcomes	#20a	Statistical methods for analysing primary and secondary outcomes. Reference to where other details of the statistical analysis plan can be found, if not in the protocol	11-12
Statistics: additional analyses	#20b	Methods for any additional analyses (eg, subgroup and adjusted analyses)	12

Statistics: analysis population and missing data	#20c	Definition of analysis population relating to protocol non-adherence (eg, as randomised analysis), and any statistical methods to handle missing data (eg, multiple imputation)	11-12
Methods: Monitoring			
Data monitoring: formal committee	#21a	Composition of data monitoring committee (DMC); summary of its role and reporting structure; statement of whether it is independent from the sponsor and competing interests; and reference to where further details about its charter can be found, if not in the protocol. Alternatively, an explanation of why a DMC is not needed	11
Data monitoring: interim analysis	#21b	Description of any interim analyses and stopping guidelines, including who will have access to these interim results and make the final decision to terminate the trial	N/A
Harms	#22	Plans for collecting, assessing, reporting, and managing solicited and spontaneously reported adverse events and other unintended effects of trial interventions or trial conduct	13
Auditing	#23	Frequency and procedures for auditing trial conduct, if any, and whether the process will be independent from investigators and the sponsor	N/A
Ethics and dissemination			
Research ethics approval	#24	Plans for seeking research ethics committee / institutional review board (REC / IRB) approval	17
Protocol amendments	#25	Plans for communicating important protocol modifications (eg, changes to eligibility criteria, outcomes, analyses) to relevant parties (eg, investigators, REC / IRBs, trial participants, trial registries, journals, regulators)	N/A
Consent or assent	#26a	Who will obtain informed consent or assent from potential trial participants or authorised surrogates, and how (see Item 32)	10, 13
Consent or assent: ancillary studies	#26b	Additional consent provisions for collection and use of participant data and biological specimens in ancillary studies, if applicable	11
Confidentiality	#27	How personal information about potential and enrolled participants will be collected, shared, and maintained in order to	11

		protect confidentiality before, during, and after the trial	
Declaration of interests	#28	Financial and other competing interests for principal investigators for the overall trial and each study site	15
Data access	#29	Statement of who will have access to the final trial dataset, and disclosure of contractual agreements that limit such access for investigators	11
Ancillary and post trial care	#30	Provisions, if any, for ancillary and post-trial care, and for compensation to those who suffer harm from trial participation	N/A
Dissemination policy: trial results	#31a	Plans for investigators and sponsor to communicate trial results to participants, healthcare professionals, the public, and other relevant groups (eg, via publication, reporting in results databases, or other data sharing arrangements), including any publication restrictions	14
Dissemination policy: authorship	#31b	Authorship eligibility guidelines and any intended use of professional writers	14
Dissemination policy: reproducible research	#31c	Plans, if any, for granting public access to the full protocol, participant-level dataset, and statistical code	N/A
Appendices			
Informed consent materials	#32	Model consent form and other related documentation given to participants and authorised surrogates	Appendix B
Biological specimens	#33	Plans for collection, laboratory evaluation, and storage of biological specimens for genetic or molecular analysis in the current trial and for future use in ancillary studies, if applicable	N/A