

NIDCAP Federation International (NFI)

Founded in 2001, the NFI is an international, non-profit membership organization. The NFI encourages highly attuned implementation of the Newborn Individualized Developmental Care and Assessment Program (NIDCAP) for all intensive, special care and newborn nurseries around the world. The NFI serves as the authoritative leader for research, development, and dissemination of NIDCAP, and for the certification of trainers, healthcare professionals, and nurseries in the NIDCAP approach.

“Great things are done by a series
of small things brought together.”

VINCENT VAN GOGH

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Greetings from the Editor

It is a pleasure to write this editorial as the Senior Editor of the *Developmental Observer*. I was excited to be the successful applicant and I hope to see the *Developmental Observer* continue to serve the members of the NIDCAP Federation International (NFI). It is certainly one of the successful resources and I look forward to working with you the members in making it an interactive newsletter for all things NIDCAP.

I come with a history of editing a journal, a publication record and facilitating writing workshops. So you can see I do like to see the written word and using visuals as a way of communicating information. I am working with an enthusiastic editorial team and I am sure together we will continue to meet your needs for an informative and resourceful newsletter. I would encourage you to submit stories about your work and experiences with NIDCAP (email to: developmentalobserver@nidcap.org) as together we are a strong group making a difference for newborn infants and their families. We need to let the world know.



Kaye Spence, AM

An exciting direction for the *Developmental Observer* is to be indexed on ScholarWorks at Indiana University, USA. This will be one of my goals in 2019 to ensure the back issues are archived and future issues are easy to find for all who are interested. Watch this space for more information.

This issue includes the abstracts from the 2018 NIDCAP Trainers Meeting successfully held in Porto, Portugal. For those lucky enough to attend it was an informative and exciting meeting with the hosts excelling themselves with their hospitality. The abstracts included in this issue come from many countries such as Australia, Belgium, Canada, Denmark, France, Italy, Iran, Kingdom of Saudi Arabia, Lebanon, and the USA which demonstrates the global spread of NIDCAP work. You can read about a variety of educational initiatives and some exciting research of the sounds in the environment, care practices such as skin-to-skin care, as well as some innovative ways to support NIDCAP observations through video and observing babies.

A new feature has been introduced in this issue. Jeffrey Alberts our Associate Editor for Science and member of the NIDCAP and Science Subcommittee has provided an enlightening summary of a target article from a recent publication. I hope the readers will be able to take home some useful ideas and help in reading some of the research around NIDCAP related concepts of care.

Enjoy reading this issue and I would like to hear your suggestions for articles and ideas to make the *Developmental Observer* your newsletter.

Kaye Spence AM

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Challenges and Barriers Perceived by Professionals in the Implementation of the NIDCAP Training in a Middle Income Country

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Aims/Purpose

The purpose of this study is to describe the experience and challenges faced during NIDCAP training and implementation in a middle income country. The research questions were the following:

- 1) What are the barriers and challenges perceived by professionals during NIDCAP training and implementation?
- 2) What is the staff's perception regarding the NIDCAP's impact on infants' well-being, parental participation and working conditions in the unit?

Methods

Design: This is a cross sectional survey with descriptive design.

Setting: The study is carried out in a level III neonatal Intensive care unit in a middle income country for two months.

Participants: All nurses and physicians (50) who worked in the NICU for at least one year prior to and during the implementation of NIDCAP training were invited to participate using an online questionnaire.

The Questionnaire: The questionnaire was adapted from a previous Swedish study; it has been used previously to survey staff opinion after NIDCAP implementation in several European countries. The questionnaire is based on the Theory of Planned Behavior (TOPB); it includes 19 questions that measure the perception of staff, and is divided into five factors: attitude (8 items), perceived behavioral control (4 items), subjective norm (4 items), intention (2 items) and behavior (1 item). The items are formulated as statements using a five point Likert scale ranging from 1 (totally disagree) to 5 (totally agree); another six related questions were added to monitor the process of NIDCAP implementation. Questions related to participants' characteristics and open ended questions were formulated to explore the staff experiences during the NIDCAP training implementation.

Procedure: After Institutional Review Board approval his participants were invited to answer an anonymous online survey after being briefed about the study.

Statistical Analysis: The Statistical Package for Social Sciences (SPSS), version 24 will be used for quantitative analysis. Mean scores and 95% confidence intervals of the means will be calculated for the 19 items measuring the impact of NIDCAP on NICU conditions.

Results/Findings

The Institutional Review Board approval has been secured. The questionnaire was adapted and piloted by five health care professional for clarity of content and applicability to our setting. They stated the tool is simple, easy to use and applicable to our setting; the language is clear and the content is understandable. No modifications to the existing questions were made. Additional questions were added as described above.

Analysis will be done after completion of the survey. Results will be compared amongst the different participants' based on their demographic characteristics. The content of the open ended questions will also be analyzed.

Conclusion

There is limited research exploring challenges faced by NICU nurses during the implementation of NIDCAP training in a middle income setting. This study will be the first to describe nurses' perception regarding the impact of NIDCAP training on infant well-being, parental participation and staff development. Understanding barriers in this particular setting of an Arabic speaking country will help translate NIDCAP theory to practice in other settings similar to ours. Findings would serve as grounds for us and others to promote and improve NIDCAP implementation in limited resource areas.

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Contributions

We would like to thank all of our individual donors for their generous support of the NFI and its continuing work.

Evaluation of “CLE” an Intermediate Family Centered Developmental Care Program Based on the Theoretical Concept of the Newborn Individualized Developmental Care and Assessment Program (NIDCAP)

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Aims/Purpose

The Belgian government has always been very supportive concerning the implementation of individualized family-centered developmental care in newborn units. Since 2012 the implementation of NIDCAP has been subsidized by the government. This project evolution demonstrated the benefit of NIDCAP on care practices¹ and revealed the need for intermediate NIDCAP-based programs.^{2,3} This requires facilitation of NIDCAP implementation in Newborn Intensive Care Units (NICUs) on the one hand, and development of programs adapted to the reality of Intermediate Newborn Care Units on the other hand. These findings matched the observations of the Brussels NIDCAP training center.

For a couple of years, a group of Belgian NIDCAP professionals worked on an intermediate developmental care program. This program, called CLE (Compréhension du Langage de l'Enfant), was finalized three years ago after consulting other NIDCAP trainers. It is similar to the Family and Infant Neurodevelopmental Education (FINE) program.

The Belgian federal government funds NIDCAP, FINE and CLE training in Belgium.

Methods

Two questionnaires were conceived:

- The first was designed for CLE trainees and evaluates training, impact on caregiving, collaboration with families, and the trainees' feedback on implementation in the newborn unit.
- The second questionnaire was designed for parents and evaluates parent satisfaction with the guidance received, and the impact on parent involvement in decision-making and their ability to understand their baby.

Results

In Belgium, 11 hospitals received financial support for CLE training. Between October 2017 and June 2018, 34 caregivers started the CLE program and 32 trainees completed the training in six hospitals.

- 97% indicated the CLE training has induced a lot of changes in the way they take care of babies.
- 97% indicated training led to changes in the way they work with families.
- 100% said the training helped them to question their own practices.
- 97% said the training helped them to reflect on unit care practices.
- 97% are satisfied with the training quality.
- 94% indicated the training met their expectations.

42 questionnaires were completed by parents.

- 95% indicated the CLE program helped them to better understand their baby.
- 93% felt encouraged to take part in decision-making.
- 95% thought the CLE program is helpful to parents.

Conclusion

The CLE program promotes the practice of family-centered developmental care. It meets professionals' and parents' expectations. An ongoing assessment of the evolution of developmental care practices in Belgian hospitals carried out by the authorities, should highlight the impact of this training on future results at the national level. The CLE program does not replace formal NIDCAP training but can help prepare units for the training as well as reduce the gap between practices carried out by NIDCAP certified professionals and the rest of the team. It meets the needs and specificities of Level 2 newborn units in Belgium.

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Online Video-based Supplement for Assessment of Preterm Infant Behavior (APIB) and Newborn Individualized Developmental Care and Assessment Program (NIDCAP) Education

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Aims

In response to repeated requests for enhanced educational materials for NIDCAP and APIB training, NIDCAP Federation International (NFI) members were asked in October 2016 to share photos and videos for the creation of a photographic library.

Video offers several advantages over verbal or written communication and education, and has been shown to improve technical and non-technical neonatal resuscitation skills.¹ The presentation of large amounts of information in a limited amount of space and time, simplifying complex/abstract concepts, demonstrating how concepts/subjects in motion relate to one another, engaging audience attention and retention of information are enhanced²; all these are educational goals of NIDCAP Training.

Our experience of video-supplemented NIDCAP education concurs with these findings. Thus, we have created an online video-based tool to Supplement APIB and NIDCAP Education. Our goals were to a) create this tool, b) present this work at the 2018 NIDCAP Trainers Meeting (NTM) for feedback from the NFI membership, and c) invite collaboration from the membership to expand this preliminary work.

Methods

Parents and staff providing care to NICU Infants (N=21), at the Stollery Children's Hospitals, gave written consent for videotaping of caregiving interventions. A variety of caregiving procedures, (clinical examinations including the APIB, diaper changes, needle sticks, procedures, etc.) were captured on video. Videos reviewed by JMT and AN were categorized according to Synactive Subsystems, (for the NIDCAP section)³ and Systems, Packages or Summary Scales (for the APIB section).⁴ Many video clips raised questions related to NIDCAP observations and/or APIB examinations and scoring and were placed in a separate section, 'Platform for Debate'. Videos in the Platform for Debate section were linked to feedback forms to facilitate e-mail communication with the Edmonton NIDCAP Training Centre Canada (ENTCC), so that NFI members can offer their perspectives and insights. All videos were uploaded to a password protected database and website.

Results/Findings

Video captured more detail than transcription onto NIDCAP observation sheets. Similarly, video of APIB exams led to more detailed scoring, than the scoring based on examiner's memory. The videos often provided a different view of the infant, com-

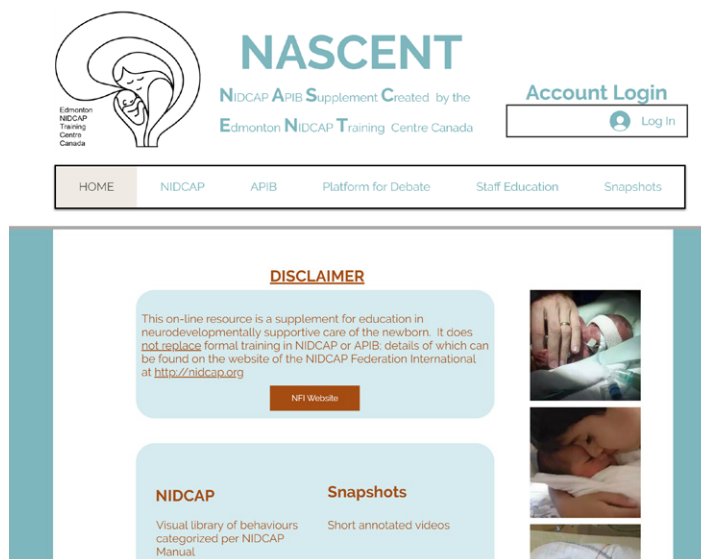


Image of the NASCENT homepage.

pared to that of the observer, thus affording a more complete record of the infant's behavioral patterns. The videos will be shown during our presentation at the Trainers Meeting. We invite discussion at the NTM regarding members' feedback about the user-friendliness and utility of this resource and the possibilities of forming a Working Group to expand this work.

Conclusion and Further Plans

We will continue to record and upload videos, and welcome others to submit videos for inclusion in this online learning resource. We anticipate this resource will be used by NIDCAP and APIB trainers and trainees as a supplement to the NFI Training Manuals. We hope the "Platform for Debate" section will serve as a forum for collaborative discussion about the complexities of neurobehavioral observation and scoring. Electronic resources support trainers and trainees to review and discuss the complexities of behavioral responses and APIB scoring online which may shorten the time required for training. Such resources also allow review of behavioral response patterns and corresponding APIB scores not observed during formal training days. We hope the online communication channel of this resource will enhance the skills of all who strive to provide NIDCAP-based, individualized neurobehavioral care for infants in their nurseries.

Addendum: In discussion with senior author Juzer Tyebkhan, the NASCENT program has been recognized as a new teaching tool under the auspices of the NFI's Program Committee. NASCENT is a promising new tool to support APIB and NIDCAP training.

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Behavioural Language of Preterm Infants: Cardiorespirography and Video Recording of Motor Behaviour as an Integration of the Newborn Individualized Developmental Care and Assessment Program (NIDCAP) Observation

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Background

Understanding early preterm infants' strengths, vulnerabilities, thresholds to stress and disorganization, and behavioural state regulation is of great importance in view of the daily care in the NICU and stabilization of preterm infants. Preterm infants display observable behaviours along three main systems: the autonomic, the motor and the state systems. These behaviours according to the NIDCAP method are coded and recorded on a score sheet based on naturalistic observation, performed with unaided eyes.

Aim

The primary aim of the study is to check whether cardiorespirography (CRG) and video recording of the motor behaviour may enrich the information derived from the NIDCAP observation.

Method

We tested a neurophysiological approach to the three NIDCAP observation systems using a cardiorespiratory monitor available in all intensive care units and a time-synchronized video recording of the single motor behaviour of preterm infants. CRG consists of recording heart rate (HR), heart rate variability (HRV), respiration rate, and morphology of the respiration curve and oxygen saturation curve. Time synchronized video recording of the single movement patterns (general movements, startles, tremors, twitches, myoclonic jerks, stretches, trunk arching, isolated arm and leg movements, and eye movements) was performed and compared with the CRG data. From the four main behavioural state parameters (eye movements, body movements, HRV, type and morphology of respiration), we depicted the behavioural state profile. The NIDCAP observation of the infant was also simultaneously performed.

Subjects

Two hours of CRG and video recording were performed in eight healthy preterm infants from the age of 27 weeks postmenstrual

age (PMA) during a NIDCAP observation. Body weight at birth ranged from 635 grams to 900 grams. The mean gestational age at the time of CRG recording was 31.5 weeks PMA, varying from 28 to 34 weeks PMA.

Preliminary results

Autonomic system: Single isolated acute episodes (short apnea, bradycardia, oxygen desaturation) were present in all eight newborn infants, with various incidence and severity. All had a spontaneous resolution without external intervention. Vagal tone (derived from the HRV curve) seemed to be well differentiated and age-adequate with different amplitude and cycles per minute in active sleep (AS) and quiet sleep (QS) in five infants only.

Motor system: Startle and twitches were seen only in QS whereas general movements, tremors, stretches, myoclonic jerks, trunk arching, and isolated arm and leg movements were predominantly seen in wakefulness and AS. A normal quality of GMs (N GMs) was seen in five infants but a poor repertoire GMs (PR GMs) was observed in another three preterm infants.

State system: The state profile showed a clear behavioural state organization and cyclicity in six infants. In two infants whose PMA was less than 30 weeks, the state organization was hardly recognizable and indeterminate sleep prevailed.

Conclusions

CRG and synchronized video recording of the spontaneous and interactive behaviour of the preterm infants add extra information to the NIDCAP observation and drives the attention of the staff to those signs of immaturity/instability that deserve further attention and care.

Australian Neonatal Nurses' Perceptions of Neurodevelopmental Care

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Aims/Purpose

The value of supporting neurodevelopmental outcomes by reducing stress and noxious stimuli in the NICU has been established in the literature over the past 20 years.^{1,2} Developmental care and its application in the clinical setting is reported as inconsistent, yet there is no literature exploring neonatal nurses' perceptions of developmental care and its application within the Australian context. We undertook this survey to gauge the current practices across Australia as part of a planning exercise for future neurodevelopmental care (NDC) training and implementation of NIDCAP.

Methods

The survey was modified from a tool exploring Neonatal Nurses Perceptions of Family Centered Care and Developmental Practices in the United States of America.³ The modified survey consisted of thirty six questions exploring nurse's personal perceptions and beliefs relating to family centered care, developmental care and skin to skin practices. Additional questions relating to NDC education attendance were included by local researchers. The survey was distributed via the online Qualtrics[®] platform to seven hundred and eighty three (n=783) specialty neonatal nurses in Australia.

Results

One-hundred and seventy three (n=173) nurses completed the survey with a 22 percent response rate. Statistical analysis of the data utilised Fishers Exact test for association and unadjusted odds ratios. Statistically significant associations were demonstrated for: Place of employment (nursery versus combined neonatal intensive care/nursery unit) with combined units associated with increased support for open visiting hours (p=0.023) and skin to skin holding (p=0.009). Supportive positioning (p=0.026) and recognition of the influence of the NICU layout/design (p=0.055) was also positively associated with combined units. Respondent Post Graduate education levels were associated with increased recognition of the influence of the NICU environment (p=0.025). Whilst lower levels of agreement (not statistically significant) were seen in all groups relating to parental involvement in care, and support of peers or the multidisciplinary team to facilitate skin to skin holding.

Differences were noted between rural (n=21) and metropolitan (n=150) respondents access to NDC education. Seventy one (71) percent of NDC training for rural respondents occurred outside their hospital. With rural center respondents two times more likely to have completed education greater than six months



ago (p=0.005). Of concern the majority of respondents (64%) who had attended education in the past two years had received less than one hour of NDC education. With eight percent indicating they had never attended NDC education.

Conclusion

Respondents in this study demonstrated high levels of support for the concept of NDC. In the context of this survey, location, place of employment and level of education were identified as influencing the application of NDC components. Given the NIDCAP community's role in providing educational and consultative support in the NICU and special care nursery settings to ensure effective delivery of neurodevelopmentally supportive, individualized, and family-centered care understanding the potential influence of location and country specific factors is essential. Exploring the unique geographical differences seen within the global healthcare setting can ensure context specific needs are met when implementing NDC education programs including NIDCAP.

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Critical Thinking, Reflection, and Action Research as Cornerstones of NIDCAP Implementation

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Aims

To describe the foundations necessary to develop a Newborn Intensive Care Unit (NICU) training and staff development plan that will effectively support the changes in environment and care required for successful implementation of developmental care in the NIDCAP model.¹ To determine the research method which is most appropriate and the abilities that professionals need to implement NIDCAP in the NICU. The aim of this presentation is to focus on Action Research, Reflection, and Critical Thinking as Cornerstones of NIDCAP Implementation.

Methods

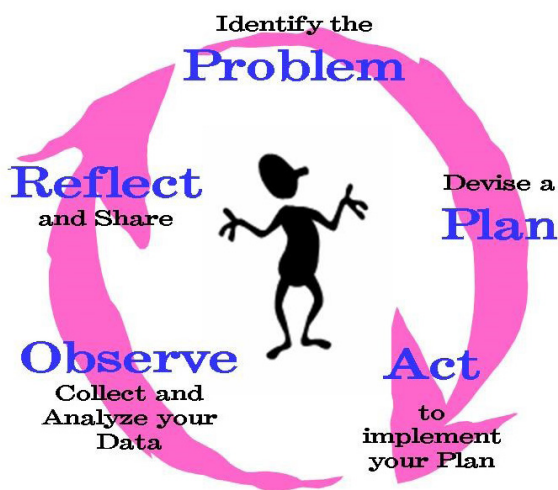
Review of literature and results of author's previous grounded theory qualitative research on critical thinking process.²

Results

NIDCAP is an evidence based model that focuses on system change.¹ A change would require the acceptance of new ideas or a new structure. Action research is methodologically flexible to the point that it encourages methodological triangulation/pluralism approaches. The process seeks to have full engagement by researchers and participants. The process is truly collaborative. An action or change is the focal point of the process. The decision to implement the action or change is in the hands of the stakeholders. The conclusion and subsequent action must reflect the collective thinking of the group. Early work is attributed to Lewin, a social psychologist, who is cited frequently as the

first person who coined the term action research. Simplistically, Lewin said that for a change to occur, individuals would need to unfreeze—give up their ideas about something or give up the dominant structure.³ They would then need to change. An important characteristic of action research is the empowerment of others. Change may come in the form of individual or group empowerment, greater community capacity to solve shared problems, or transformed organizational structures.

An important part of the change or action phase of the research process is reflection. Data recorded during reflection are important contributions to the theory that emerges from the action research study.⁴ Reflection is a very important skill for professionals within the NIDCAP model. It is a skill used in two contexts - during events and after them. It involves the use of decision making and evaluation. Reflection is a process whereby experience is examined in ways that give meaning to interaction; interaction and engagement are very important components of the NIDCAP Model. Reflection is most closely associated with human interactions and especially clinical events too. Some reasons why reflection is important in nursing and in helping to implement NIDCAP in the NICU are: Correcting practice, Understanding self; others; Professions, and challenging assumptions. There are two types of reflection: in action and on action in three levels: Superficial, Medium, and Deep.⁵ One of the most popular models of reflection is Gibbs' model.⁶ In the NIDCAP model, developmental specialists need this ability for writing journal pages on his/her observation of premature and caregiver behavior and



Elements of Action Research Method



Gibbs, G. (1988). Learning by Doing: A Guide to Teaching and Learning Methods

to foster good relationships with other staff, as well as the infant's family. Reflection is a subset of critical thinking and one that is used in close association with experience.

Critical Thinking is another cornerstone of NIDCAP implementation. According to the results of qualitative grounded theory research in Iran, critical thinking is the art of thinking and the mental challenge of how you are thinking. It is an essential concept, a fundamental ability and necessary means for human evolution and the overcoming of the problems of life in society, workplace and education. It is also an essential ability to achieve self-efficacy, autonomy and professional development.⁷ Decision making, leadership and ethical practice are all founded upon an ability to think critically. We use critical thought to select resources, to utilize knowledge and to evaluate evidence. Traditionally, our thinking has been designed for routine, habit, automation and fixed procedure. But the problems we now face, and will increasingly face, require a radically different form of thinking, thinking that is more complex, more adaptable, and more sensitive to divergent points of view.⁸ The ability to think critically is considered an essential educational outcome for today's college graduates⁹ and necessary to NIDCAP implementation.

Conclusion

The goal of the NIDCAP Model is to bring about a shift from protocol-based to strategic process thinking and from task-oriented to relationship-based care. To achieve these goals and implement NIDCAP, there is a need for professionals to be familiar

with three cornerstones including: Action Research, Reflections and Critical Thinking. It is recommended that medical and nursing schools focus on special training programs to improve these abilities in students, since creating behavior is easier than changing behavior. Also, enhance these abilities in NICU nurses and medical staff through continuing education workshops before and during NIDCAP Implementation.

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How to Move a Ventilated Baby From Bed/Incubator to Skin-to Skin In a Safe Way

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Aims

For premature and full term infants who need help from a ventilator for breathing, it can be difficult to hold the infant skin-to-skin and often depends on the nurses who are present at the time. Lying skin-to-skin is a way to treat premature babies. The specific aims of this project were:

1. To increase the opportunity for skin-to-skin contact for as many infants as possible, as early as possible, including those intubated.
2. To develop a formal guideline: *How to move the baby from bed/incubator skin-to-skin with parents in a safe way* to help the families, nurses and physicians.

Methods

The literature recommends disconnecting the intubated infant when moving the infant. The project set out to show that moving an infant to their parent for skin-to-skin while still connected

to the ventilator is possible. A literature review was done, and based on that, plus many in-depth discussions with NICU staff, a set of procedures and guidelines were developed. The steps and procedures were documented with photographs showing how simply and beautifully one can move an infant from bed/incubator to their parent. The guideline: *How to move the baby from bed/incubator skin-to-skin with parents in a safe way* was completed in two years, and the nurses and doctors work together to use it and make skin-to-skin a reliable part of the infant's treatment process.

Conclusion

Skin-to-skin care is an important component of NIDCAP care recommendations and a way to strengthen the family centered care. With the development of the guidelines on how to safely move intubated infants into skin-to-skin positioning, the unit now has the opportunity to offer skin-to-skin holding to all children in the unit.

Advancement of Promoting Developmental Care in Belgium

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Federal Public Services (FPS)

Aims

The Belgian Federal government promotes Family Centered Developmental Couplet Care nationally.¹ Since 2012 the Federal Public Services (FPS) has encouraged hospitals to train their medical and nursing staff in developmental care (DC) through educational contracts. Belgian hospitals with such an educational contract are offered financial support and four free DC conference days annually. Moreover, the FPS assigned two DC coordinators to visit these neonatal units. From 2015 till 2017 NICUs training their staff in Newborn Individualized Developmental Care and Assessment Program (NIDCAP®) received financial support by the federal government. In June 2017, the FPS began subsidizing DC training, specifically Family Infant Neurodevelopmental Education (FINE) and Compréhension de Langage de L'enfant (CLE) in neonatal units had not didn't receive financial support up to that point.

The objectives of this project are:

- To evaluate the impact of the educational contract on the implementation and evolution of DC practices
- To assess the effect of NIDCAP® professionals working in the neonatal unit on DC practices

Methods

58 out of 61 hospital sites with an educational contract completed a self-evaluation of their DC practices in the period of 2016-2017. The results of the questionnaire were analyzed in a descriptive manner. A semi-quantitative analysis was then performed for which the institutions received a score on a scale of 1 to 10 regarding a specific item in order to be able to weigh their respective importance on DC practices. The questionnaire comprised five scales: "Environment", "Bed and Sleep", "Care Practices", "Feeding" and "Couplet Care". The sum of the obtained scores from the five scales were calculated with a maximum score of 100. With these figures the NICUs and level II units are able to situate their positions set against the median value.

Results

NICUs scored significantly higher than level II units on the implementation of DC practices, in all scales but "Feeding" (Environment, (Z=2.1804, p=0.0292), Bed and Sleep Practices (Z=2.0135, p=0.0441), Care Practices (t(49.08)=-5.43, p<0.0001), Couplet Care (Z=2.0966, p=0.0360) and Total Score (t(56)=-3.22, p=0.0021).

Units employing NIDCAP® professionals scored higher. Significant differences were found between teams with and without NIDCAP® professionals (Bed and Sleep (Z=2.8321, p=0.0046), Care Practices (t(56)=2.94, p=0.0047), Feeding (t(56)=2.07, p=0.0426), Couplet Care (Z=2.1149, p=.0344) and Total Score (t(56)=3.22, p=0.0021) but not on the "Environment" scale.



A small but significant correlation ($r=0,389$, $p= 0.0019$) was found for the number of NIDCAP® professionals working in a unit and the scores for DC practices. The more NIDCAP® certified personnel working in a unit, the more DC practices were implemented.

Between 2014-2017, in the 35 hospitals that participated every year, a distinctive positive evolution of DC practice was observed. The Total Score average increased with 14 points.

Discussion

Taking bias into account (self-evaluation, sample size, lack of controls), these results are merely an indication of the invested work in DC within these neonatal units. NICUs apply more DC practices than level II units and the recruitment of NIDCAP® professionals resulted in more DC practices. Nevertheless, this project has allowed all the involved units to identify their relative positions within the DC project and use this information to grow. Moreover, based on the quantitative data, the DC project has both illustrated the units' evolution as well as highlighted areas of improvement.

Conclusion

It is important to continue this project and to incentivize more units to join in or advance DC practices. For a more thorough evaluation of this project, another study is recommended that includes more NIDCAP Professionals and a control site. The creation of a national label in DC will be taken into consideration.

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Diversification of Developmental Care Trainings: How and Why?

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Newborn Individualized Developmental Care (NIDCAP) is the *gold standard* of early intervention training. Unfortunately, despite intense efforts to disseminate this program, the training is not accessible to a large proportion of neonatal professionals due to high costs, duration of the training, and supportive systems organization.

Aims/Purpose

To offer different types and levels of training for neonatal professionals.

Methods

Training programs have been selected if the intervention is cue-based and family-centered, has an acceptable level of evidence and is in agreement with the NIDCAP philosophy.

The Brest training center is offering:

- **Introduction to patient- and family-center developmental care** (two days) created by Nathalie Ratynski and Jacques Sizun in 2000.
- **Family and Infant Neuro-developmental Education¹ (FINE)** (level II: practical skills) created by Nikk Conneman, Monique Oude Reimer, Esthervan der Heijden and Inga Warren (12 weeks)
- **The Support of Feeding for Fragile Infants (SOFFI)²**, created by Erin Ross and Kathleen Philbin (two days)
- **The Newborn Behavioral Observation (NBO)³** (two days) a clinical relationship-building tool derived from the Newborn Behavioral Scale (NBAS, Yvette Blanchard as trainer)
- **The Infant Behavioral Assessment and Intervention Program (IBAIP)⁴**, (three one-week sessions during one year)

created and trained by Rodd Hedlund (part of a randomized controlled trial)

Results/Findings

- Short training programs could be considered as an introduction to the NIDCAP Training;
- Thousands of professionals from French-speaking NICUs (level II or III), maternity units or follow-up clinics or private medical offices have been trained with a high satisfaction level;
- This catalogue offers an opportunity to reach people working outside the level III NICUs; and
- Short courses trainers could be future candidates to become NIDCAP trainers

Conclusion

This strategy participates to the financial stability, the independence and the sustainability of the Brest NIDCAP Training Center.

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Working on the National System: The French Experience

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NIDCAP is theory-guided, relationship-based and **system-oriented**. According to Gilkerson & Als, “Changes in the larger system affect the dynamics within the smaller unit”.¹ Therefore it appears important to act at a national level to support NIDCAP dissemination.

Aims/Purpose

To describe strategies developed at a national level in France during the last decade to support developmental care and NIDCAP implementation.

Methods

The goals were:

1. To create guidelines on family-centered developmental care;
2. To disseminate evidence-based data;
3. To train future neonatologists to the basis of early intervention;
4. To create a special partnership with national parents’ groups
5. To act at a political level to change national laws.

Results/Findings

The Groupe de Reflexion sur l'Environnement En Néonatalogie (GREEN), a special interest group from the Société Française de Neonatalogie (SFN), including two parents groups (SOS prema and CIANE), is publishing texts on the parents' role, the optimal NICU environment, postural support, skin to skin.

- A French book "Soins de développement en néonatalogie: de la recherche à la pratique" edited in 2014² is the reference for professionals and trainees.
- A one-day session on developmental care has been integrated in the curriculum of pediatric and neonatal training
- NIDCAP professionals participated in the "Assises de la prématurité", a special event created by the SFN, SOS prema

and politicians and in the study group "prematurity and vulnerable newborns" at the Assemblée Nationale.

- NIDCAP professionals are participating in the training of local and national parents' representatives.

Conclusion

Active participation of neonatologists, implication of the national scientific society, close collaboration with parents group and contacts with politicians have created a positive climate for NIDCAP dissemination and implementation in France.

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The Gold Standard for Excellence in Newborn Individualized Developmental Care

What All Newborn Infants and Their Families Deserve

Newborn Individualized Developmental Care and Assessment Program (NIDCAP)

The Newborn Individualized Developmental Care and Assessment Program (NIDCAP), originated in 1984 by Heideise Als, PhD, is the only comprehensive, family centered, evidence-based approach to newborn developmental care. NIDCAP focuses on adapting the newborn intensive care nursery to the unique neurodevelopmental strengths and goals of each newborn cared for in this medical setting. These adaptations encompass the physical environment and its components, as well as, the care and treatment provided for the infant and his or her family, their life-long nurturers and supporters.

Assessment of Preterm Infants' Behavior (APIB)

The Assessment of Preterm Infants' Behavior (APIB) (Als et al., 1982) is a comprehensive and systematic research based neurobehavioral approach for the assessment of preterm and fullterm newborns. The APIB provides an invaluable diagnostic resource for the advanced level clinician in support of developmental care provision in a nursery.

NIDCAP Nursery Program

The NIDCAP Nursery Program provides a comprehensive resource for the self- evaluation by a nursery system of its strengths and goals for integration of NIDCAP principles into all aspects of their functioning. Highly attuned implementation of NIDCAP care for infants and their families, as well as for the staff, in a developmentally supportive environment is a goal as well as a process. External review and validation by the NFI may be sought when a nursery feels it has achieved this distinction. Nurseries that have achieved NIDCAP Nursery certification serve as a model and an inspiration to others. For information on the nursery self-assessment resources as well as the certification process and its eligibility requirements, please see: www.nidcap.org; and/or contact Rodd E. Hedlund, MEd, NIDCAP Nursery Program Director at: nidcapnurserydirector@nidcap.org or 785-841-5440.

Skin-to-Skin Contact Activates Oxytocin Release and Correlates to Parent Engagement

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Background/Significance

Over 15 million premature infants are born annually around the world. It has been optimistically yet incorrectly proposed, that healthy preterm infants without major complications eventually catch-up developmentally to term infants. Research shows these preterm infants remain increasingly disadvantaged on many neurodevelopmental outcomes. Parental touch, especially during skin-to-skin contact (SSC) has the potential to reduce the adverse consequences of prematurity. SSC is an evidenced based strategy that increases parental proximity and provides an interactive environment known to enhance infant physiologic stability and affective closeness between parent and infant. Evidence suggests SSC activates oxytocin release in mothers, fathers and infants.

Relevance to NIDCAP

This study provides evidence to support developing relationships between mothers, fathers and premature infants. Early responsive and synchronous contacts with parents may positively influence cognitive and developmental outcomes for premature infants. Parental engagement creates an opportunity guide future research on how to increase parents' active participation with their premature infants.

Aims/Purpose

The purpose of this research study was to examine bio-behavioral mechanisms of SSC for parents and preterm infants. Specifically, is there a relationship between salivary oxytocin and cortisol levels and parental engagement as measured with the Parent Risk Evaluation on Engagement Model and Instrument (PREEMI)?

Methods:

This randomized cross-over design study used a 3-day time-frame conducted in the Newborn Intensive Care Unit (NICU). Twenty-eight stable preterm infants (30 0/7 – 34 6/7 weeks gestational age between 3 -10 days old) and their mothers and fathers participated. After informed consent, each triad was randomly assigned to one of two sequences: Maternal-SSC on day 1 and Paternal-SSC on day 2; or Paternal-SSC on day 1 and Maternal-SSC on day 2. Infants' and parents' saliva samples for oxytocin and cortisol were collected 15-min pre-SSC, at 60-min during-SSC, and 45-min post-SSC. Parental engagement was measured using the PREEMI just prior to hospital discharge.

Results

Data analysis was performed using IBM SPSS version 18. Data were not normally distributed; therefore Pearson's correlation was used to measure the relationship between salivary oxytocin and cortisol levels with maternal and paternal engagement composite scores. Multivariable linear regression models were used to model the effect of maternal and paternal oxytocin and cortisol levels independently on engagement composite scores, adjusting for infant oxytocin and cortisol levels respectively. There was a significant negative correlation between paternal oxytocin levels and paternal engagement ($r = -0.43$; p -value = 0.03) and a significant negative correlation between infant oxytocin levels and maternal engagement ($r = -0.54$; p -value = 0.004). There was no significant interaction between maternal oxytocin or maternal cortisol levels and maternal engagement scores. However, the adjusted linear regression model showed that as infant oxytocin levels increased maternal engagement scores significantly decreased (β : -0.04; p -value = 0.01). The unadjusted linear regression model showed that as paternal oxytocin levels increase paternal engagement scores significantly decrease (β : -0.14; p -value = 0.03). Linear regression, adjusted for infant oxytocin and cortisol levels, showed that as paternal oxytocin levels increase there was a significant decrease in paternal engagement (β : -0.16; p -value = 0.03) and as paternal cortisol levels increased there was a significant decrease in paternal engagement (β : -68.97; p -value = 0.05).

Conclusions

Salivary oxytocin and cortisol levels significantly influence parental engagement. Oxytocin facilitates social sensitivity and attunement necessary for developing relationships and nurturance for emotional and physical health. Defining parent engagement facilitates identification of parent-risks and needs for intervention to optimize outcomes for premature infants.

Statement of Financial Support

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Reducing Noise Through Awareness in the NICU

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Aims/Purpose

In the NICU, environment sounds and noise can be challenging for the preterm and/or sick newborn baby. Reducing noise to provide an environment with appropriate and meaningful auditory experiences such as parents' voices is important. Elimination of loud noises will furthermore benefit the families and staff. In 2016, the NICU at Rigshospitalet - Copenhagen University Hospital, collaborated with SoundEar™, a company that develops noise-meters for indicating and collecting noise levels, to develop a software program that was appropriate and easy to use. The aim was to support reduction in noise levels at the NICU through different layers of nudging: The noise meters with displays should help staff and families become aware of their own noise levels and change their noisy behavior. The software helps staff become aware of when and where noise levels are critical and something should be done differently. The software sends out noise reports on a weekly basis via email to key staff members, who use these reports as a basis for further discussion about noise at staff meetings.

Methods

Inspired by participatory research methods, SoundEar co-created the software program for hospital use with a group of staff from the NICU. Noise-meters were installed in all rooms. Half of the noise meters were anonymous white boxes, which solely measure and collect noise levels. The other half of the noise meters also have a display with an ear, that lights up green, yellow or red, indicating the current level of noise in the room. All the noise meters transfer noise measurement data wirelessly to a central computer, where it is accessible to staff through software. After having the SoundEar devices in the NICU for a few months, questionnaires about the perceived unit noise levels, and whether the SoundEar devices seemed to have changed anything, were distributed among the staff.

Results/Findings

It was determined that only a few staff members should be responsible for driving to the hospital to measure noise reduction rather than all staff members. Software-generated data was used to gather insights for the staff to discuss at weekly meetings. These insights turned into auto-generated noise reports being sent to key staff members to be discussed with staff.

Fourteen staff members, primarily nurses, answered the questionnaire, with 78.6 % reporting that the SoundEar devices had made them more attentive to noise levels. The same amount reported to have changed some of their behaviour because of the SoundEar devices. The change that most staff members reported to have made, was when unpacking syringes and other types of medical equipment outside of patient rooms, because they no-

ticed that the ripping of plastic made unnecessary noise around the babies. Others reported lowering their voices and lowering the noise level of alarms as changes they had made after the installation of the SoundEar devices. Several staff members also reported to have seen an increase in parents' attention to noise levels, and that they commented on noise to other visitors and siblings, thereby spreading the attention to noise.

Conclusion

A useful software program was developed to help strive to reduce unnecessary noise and promote appropriate surroundings in the NICU. Generation of daily or weekly reports of sound levels in each room may be used to promote and evaluate targeted noise-reduction activities.



The 29th Annual NIDCAP Trainers Meeting

Members of the Board of Directors and delegates in Porto, Portugal

Even Moderate Visual Stimuli Leads to Behavioural Responses in Term and Preterm Infants

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Introduction

Very preterm infants (VPI) are exposed to atypical visual stimuli in the hospital. Their visual system was shown to be mature enough to allow them to physiologically react to ecological visual stimuli in the NICU from 28 weeks post-menstrual age (PMA).¹ These stimuli have also been shown to induce sleep disruption.² However, little is known about their behavioural responses to light level changes of different amplitudes, encountered in the hospital environment.

Aims

We aimed to evaluate the behavioural responses of VPIs to light level changes of different intensities. Our goal was also to follow longitudinally the development of these responses in VPIs until term corrected age and to compare them to the responses of full-term newborn infants.

Methods

We included 25 term newborn infants and 26 VPIs at Strasbourg University Hospital (France) from September 2016 to June 2017. The VPIs were studied at three distinct PMA: 32, 36 and 40 weeks PMA. Infants were recorded during sleep when they were lying on their back, in a nest. Three different light

stimulations (34, 100 and 300 lux above basal light level) were presented in a random order for a duration of 5 seconds. Video recordings were centred on the infant's face to appreciate their behavioural responses assessed by the NFCS (Neonatal Facial Coding System) score, reduced to four items, in 10 seconds epochs.³ The maximum NFCS score over the period of 60 seconds post stimulation was retained and was compared to the NFCS score determined during the 10 seconds preceding the stimulation (T test).

Results/Findings

We observed a significant increase in the mean NFCS scores from the pre-stimulation period to the post-stimulation period, represented by the mean of maximal scores of post stimulation periods. This was noted regardless of the intensity of stimulation and whatever the PMA (all, $p < 0.05$). In preterm infants at 40 weeks PMA, mean NFCS score were significantly higher at 100 lux ($T_{(36)} = 2.9$, $p = 0.006$) and at 300 lux ($T_{(36)} = 2.8$, $p = 0.009$) compared with those following 34 lux stimulations: respectively 1.6 (+/- 1.0) and 1.6 (+/- 1.1) vs 0.72 (+/- 0.83) for 34 lux. We found this same difference at 32 weeks of PMA. The average NFCS score to 34 lux stimuli was 1.2 +/- 0.9 versus 1.8



Mission

The NFI promotes the advancement of the philosophy and science of NIDCAP care and assures the quality of NIDCAP education, training and certification for professionals and hospital systems.

Adopted by the NFI Board, April 29, 2017

Vision

The NFI envisions a global society in which all hospitalized newborns and their families receive care in the evidence-based NIDCAP model. NIDCAP supports development, enhances strengths and minimizes stress for infants, family and staff who care for them. It is individualized and uses a relationship-based, family-integrated approach that yields measurable outcomes.

Adopted by the NFI Board, October 20, 2017

+/- 0.9 at 100 lux ($T_{(36)} = 2.3$, $p = 0.02$) or 1.9 +/- 0.9 to 300 lux ($T_{(37)} = 2.3$, $p = 0.02$). The mean NFCS score was significantly higher at 32 compared to 36 weeks PMA for a 100 lux light stimulation: 1.9 (+/- 0.8) vs 1 (+/- 1.1) ($T_{(40)} = 2.8$, $p = 0.04$). Similar results were observed for a 300 lux light stimulation: 1.9 (+/- 0.9) versus 1.2 (+/- 1.2) ($T_{(42)} = 2.0$; $p = 0.05$). The main results are summarized in Figure 1.

Conclusion

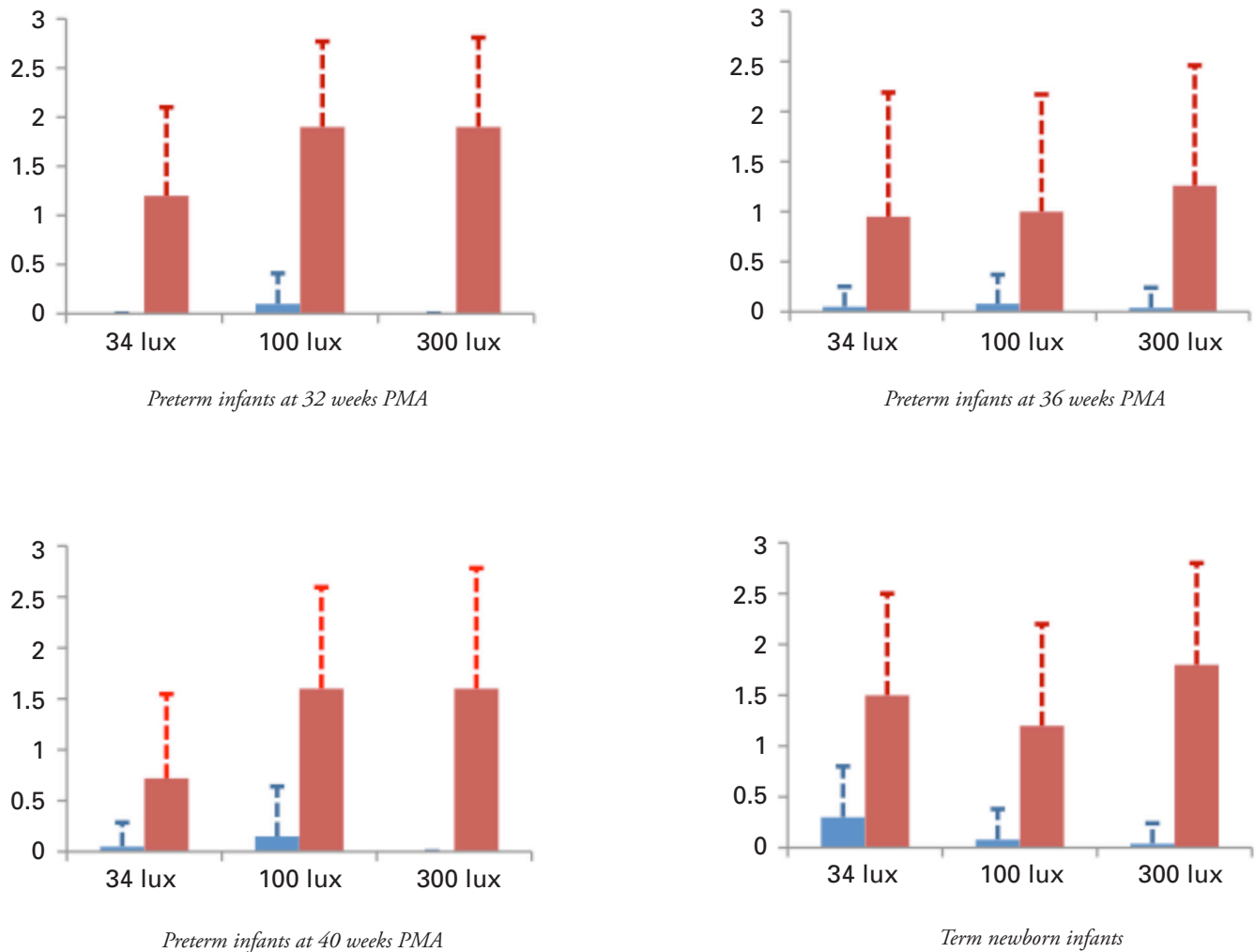
Even low-intensity visual stimulation leads to behavioural responses, measurable through scales evaluating pain and discomfort. This was present in all subgroups of infants, regardless of the level of immaturity of the newborn infants. The level of light stimulation and gestational age appeared to be the main determi-

nants of the intensity of discomfort. All these results have clinical implications and support the need for better attention to light level changes during the hospital stay.⁴

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FIGURE 1. Variation in NFCS score by population and intensity



Mean NFCS scores during pre-stimulation periods are represented in blue and during post-stimulation periods in red. The vertical bars represent the standard deviation. * $p < 0.05$, Student's T test

Development of Cortical Integration of Visual Stimuli in Very Preterm Infants

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Introduction

Very preterm infants (VPI) are exposed to atypical visual stimuli in the hospital. They are able to exhibit physiological and behavioural responses to ecological visual stimuli in the NICU from 28 weeks post-menstrual age (PMA).^{1,2} However, little is known about their cortical responses to light level changes and the development of this cortical integration until term post-menstrual age (PMA).

Aims

We aimed to evaluate the cortical responses of VPIs to light level changes of different intensities. Our goal was also to follow longitudinally the development of the cortical integration of these stimuli in VPIs until term corrected age and to compare them to the responses of full-term newborn infants.

Methods

We included 25 term newborn infants and 26 VPI at Strasbourg University Hospital (France). The VPIs were studied at three distinct ages: 32 (n=21), 36 (n=23) and 40 (n=21) weeks PMA. Two different light stimulations (100 and 300 lux above basal light level) were presented in a random order for duration of

5 seconds. Oxyhemoglobin and deoxyhemoglobin changes were recorded by multi-channel near infrared spectroscopy (NIRx[®]). Optodes were positioned using the EEG 10-20 classification to explore the areas of interest.³ The first regions of interest were occipital (O) visual areas: OI (middle and superior occipital gyri), OII (inferior occipital gyrus and calcarine sulcus), pariéto-occipital (PO: middle occipital gyrus and angular gyrus). We also recorded hemodynamic changes in frontal areas (F: middle frontal gyrus) and prefrontal areas (pF: middle frontal gyrus and orbitary frontal gyri). After a specific pretreatment of the data we carefully rejected artifacts. Oxyhemoglobin variations were analyzed from baseline (10 s) to 25 s post-stimulation by ANOVA for repeated measure.

Results/Findings

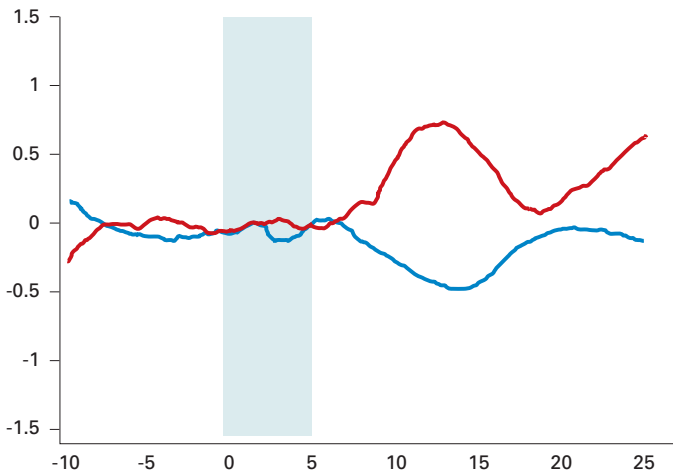
A 100 lux stimulus triggered a significant increase in oxyhemoglobin (0.6 to 1.4 $\mu\text{mol/L}$) in visual areas as early as 36 weeks PMA ($p < 0.01$). This response was also fully present in full-term infants but less present at 32 weeks PMA. Increases in oxyhemoglobin were also noted in frontal areas, but only in VPIs at 40 weeks PMA. All these results are shown in Table 1. At term corrected age, the profile of responses of VPIs and full-term new-

TABLE 1. Cerebral activation in response to a 100 lux light stimulation in different groups

			Full term	Preterm infants at 40 weeks PMA	Preterm infants at 36 weeks PMA	Preterm infants at 32 weeks PMA
Frontal areas	Prefrontal	L	-	↑ F (69, 1104) = 1.48 ; p < 0.01	-	-
		R	-	-	-	-
	Frontal	L	-	↑ F (69, 1104) = 2.54 ; p < 0.01	-	-
		R	-	↑ F (69, 897) = 1.39 ; p = 0.02	-	-
Occipital areas	Pariéto-occipital	L	-	-	-	↑ F (69, 828) = 1.63 ; p < 0.01
		R	↑ F (69, 828) = 1.93 ; p < 0.01	↑ F (69, 759) = 1.56 ; p < 0.01	↑ puis ↓ F (69, 1173) = 2.40 ; p < 0.01	-
	Occipital I	L	↑ F (69, 897) = 2.38 ; p < 0.01	-	-	-
		R	↑ F (69, 828) = 2.34 ; p < 0.01	↑ F (69, 690) = 1.67 ; p < 0.01	↑ F (69, 759) = 1.34 ; p = 0.04	-
	Occipital II	L	-	-	↑ F (69, 1173) = 1.50 ; p < 0.01	-
		R	↑ F (69, 828) = 1.34 ; p = 0.04	-	↑ F (69, 1035) = 2.35 ; p < 0.01	-

The arrow shows the sense of variation of oxyhemoglobin; L: left; R: right

FIGURE 1. Cerebral responses measured in one occipital area (left OI) at 40 weeks PMA after a 300 lux light stimulation



Variation of oxyhemoglobin (red line) and deoxyhemoglobin (blue line)

borns were different in both occipital and frontal areas ($p < 0.05$).

A 300 lux stimulus triggered cerebral activation mainly in the frontal and prefrontal areas whatever the age of the infants. An increase in oxyhemoglobin was present at 32 weeks of PMA in the frontal and prefrontal areas and in the occipital areas from 36 weeks of PMA. An oxyhemoglobin decrease was also seen in some regions of interest. We present in Figure 1 the responses measured in one occipital area at 40 weeks PMA.

Conclusion

Cerebral hemodynamic responses to 100 and 300 lux stimuli were inconsistent but present in at least one visual area in full-term infants and as early as 36 weeks PMA in VPIs. At 32 weeks PMA, variations of oxyhemoglobin were more inconsistent, more moderate and less diffuse. They were mainly found for higher intensities. The pattern of cortical activation for one stimulation was variable in the different age groups. We observed different profiles of oxyhemoglobin responses in term and VPIs at 40 weeks PMA. These results suggest a possible impact of premature birth and of the early visual environment on the developmental trajectory of the visual system with potential alteration of the neuronal network. These results support the need for better attention to light level changes during hospitalization.⁴ The long term effects of the early visual environment should be evaluated further.

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Changes of Culture in Implementation of Developmental Care (NIDCAP Approach)

Cala B

NICU Department Improvement Program, MOH, Saudi Arabia (KSA)

Aims

The overarching goal of the project was to assess the need for, implement and evaluate the change process of bringing the NIDCAP approach to developmental care to Newborn Intensive Care Units (NICU) in KSA by:

- Implementing changes in the hospital culture to fully comprehend NIDCAP as a systematic framework to support newborns and their families;
- Supporting staff to appreciate the family as vital members of the NICU community and recognizing family involvement as essential for sustaining positive effects on physical, cognitive, and psychosocial development as well as to prevent or ameliorate complications of prematurity;

- Supporting the caregiving staff to understand the importance of skin-to-skin Kangaroo Care (KMC) to infant development and infant/parent relationships.

Background

In Saudi Arabia, 264 hospitals provide tertiary NICU care to 64% of the population, which in 2017 included 277,431 live births, of which 3% were considered high medical risk prematurely born infants. NIDCAP was introduced in 31 KSA Ministry of Health (MOH), Maternal Child Health (MCH) NICUs. These units had essentially no previous exposure to developmental care except for a three month introduction from a US group from Minnesota without consistent follow-up.

Methods

For this project, NIDCAP introduction began initially in one hospital in Riyadh in 2013; the Ministry of Health NICUs were introduced in May, 2017. The introduction included the NIDCAP goals to change the culture of practice to one in which caregiving staff demonstrate attitudes, values, knowledge, and skills individualized to each infant's developmental agenda and based on behavioral observation.

Discussions during the presentation included: shifting care from a task-oriented to an individualized care approach; eliminating the standard one hour per day parent visiting policy and supporting active participation of the family in caregiving. These concepts were novel, and described as 'eye opening' to the nursery caregiver representative from the Ministry of Health.

Subsequent training activities included: Neonatal Mini Symposia offered to different regions, updates and orientation for health workers, visits and assessment using the NIDCAP Nursery Assessment Manual, implementing mandatory Developmental Care Competencies for NICU nurses and orientation to multidisciplinary staff, introductory training with FINE Level 1 to 79 NICU caregivers at investigator's own NICU (The Children's Hospital, King Fahad Medical City, Riyadh) with plans to bring professionals to NIDCAP Training. Outcome of this work has already resulted in a change in the culture of care as shown by a move to implement Developmental Care, and the institution of a *NICU Improvement Program* within the Ministry of Health. The *MOH NICU Improvement Program* oversees developmental care for premature infants in the NICU which will have a major impact on the future of newborns in KSA. The program supports standardizing NICU facilities according to NIDCAP principles; screening for hearing, Critical Congenital Heart Defects (CCHD), Retinopathy of Prematurity (ROP), and Respiratory Syncytial Virus (RSV); vaccination; breastfeeding advocacy; free Natural Family Planning (NRP) consults; S.T.A.B.L.E. (Sugar, Temperature, Airway, Blood pressure, Lab work, Emotional support) Program course enrollment for NICU nurses and physicians; and monthly reports of Key Performance Indicators (KPI) based on the Vermont Oxford Network benchmarks.

In support of this effort, the investigators have embarked on NIDCAP Nursery Certification from the NIDCAP Federation International (NFI) and joined the NFI and the European Foundation for the Care of Newborn Infants (EFCNI) in the celebration of 2017 World Prematurity Day and International Kangaroo Care Day.

Results/Progress to date

- Policy development permitting and encouraging parents to have unrestricted access to their infant and to hold skin-to-skin (KMC) is the most challenging part. This is related to culture sensitivity around clothing and modesty and in communicating the documented importance of KMC.
- Developmental Care began in May 2017 with follow-up visits scheduled for twice a year.

- One hospital successfully initiated KMC to their nursery during the first year of implementation.
- Three day courtesy visits were scheduled to hospital leaders of nurseries using the NIDCAP Nursery Assessment Manual scoring tool.
- Orientation and lecture were made available to multidisciplinary staff of the hospital including NICU nurses and physicians.
- Recommendations based on the Nursery Assessment Manual scoring, that indicated strengths and challenges, were discussed with multidisciplinary NICU staff with reassessment planned after 6 months.
- Orientation, awareness and lectures given introducing NIDCAP Developmental Care reached:
 - NICU Nurses 1,337/2000, 66.85%;
 - NICU Physicians 334/700, 47.71%;
 - Multidisciplinary Teams 905/6,500, 13.92%;
 - Lecture, awareness, symposium and orientation 31/77, 40.25%;
 - Hospital Visits 31/35, 88.57%;
 - Professionals from the 4 hospitals not visited due to critical area and culture, were however, identified and guided to introduce developmental care to their staff.

Conclusion

The NIDCAP approach to Developmental Care necessitates a change of NICU culture which helps healthcare professionals and healthcare institutions most fully benefit from the impact of Developmental Care. Developmental Care improves the NICU culture and gives parents and families the opportunity to play a major role in the care of their newborns and it changes the culture to fully comprehend how NIDCAP Developmental Care supports newborns and their families.

**CALL for EXPRESSION of INTEREST
to JOIN the EDITORIAL TEAM**

We are calling for expressions of interest from NFI members to join the Editorial Team. We would like global representation. Email Senior Editor Kaye Spence at: developmentalobserver@nidcap.org



A Statement on State and Feeding Efficiency

Jeffrey R. Albers
Indiana University, NFI Science Committee, Associate Editor for Science

Target article: Griffith, T., Rankin, K., & White-Traut, R. The relationship between behavioral states and oral feeding efficiency in preterm infants. *Advances in Neonatal Care*, 2017;17(1), E12 – E19.

As every NIDCAP practitioner or student knows, a behaving infant continuously presents troves, if not torrents of observational information. The science and art of NIDCAP observations reside, in part, in the extraction of meaningful portions of these behavioral data.

A recent report by Griffith, Rankin, and White-Traut (2017) illustrates the principle that behavior provides a wealth of information. At times, there may be such a storehouse of riches that a database can be tapped for knowledge beyond that which inspired the original investigation! Indeed, the present Target Article is such a “secondary analysis”. Originally, there was conducted a large, randomized control study (RCT) of a developmental intervention for preterm babies. For the present report the authors extracted quantitated observations made in the one-minute prior to the major manipulation that was being studied. From the data in that pre-trial period and in part of the feeding data, the present study was created.

Thus, Griffith et al. examined “The relationship between behavioral states and oral feeding efficiency in preterm infants”. With this secondary analysis, they were able to make some valuable contributions. I’ll discuss a few points that might be of interest to *Developmental Observer* readers. The end-point in their analysis was *oral feeding efficiency*, measured in mL/min. The results were taken from the first 10 min of the 30 min feeding period in the RCT. They limited the interval for the measure to avoid contamination by fatigue in some of the fragile babies. Babies were held and fed by bottle by the research nurse. This was part of numerous steps of careful standardization.

From video recordings of the 1-min pre-test period, each baby’s state was independently encoded by two trained observers, blind to the purpose of the study; inter-observer reliability was excellent (> 98%). For each 15-second segment of observation, the dominant (> 8-seconds) behavioral state (e.g., alert, sleep, drowsy, crying states) was determined. From these data, the proportion of time spent in each state was quantified and then examined in relation to the baby’s feeding efficiency.

The researchers used a couple of different “regression” statistics to analyze the results. These methods enabled them to determine whether there were statistically significant relations between singular and combined variables for each baby and that baby’s feeding. Although these are all *correlational* measures (and we understand that correlations do not prove causation), the various levels of each behavioral state as well as different characteristics of the babies (e.g., age, weight, risk assessment



Photograph by Emanuel Angelicas

scores, etc) were built into the tests. This greatly strengthened the interpretive power of the correlational results.

The outcomes were clear: the more time a baby was in alert states in the minute before feeding, the greater the feeding efficiency.

Conversely, the greater the time spent in a sleep state in the pre-feeding minute, feeding efficiency was proportionately diminished. Take a look at the paper: Figure 1 shows that when a baby spends about 45 seconds of the pre-feeding minute in an alert state, feeding efficiency is about 50% greater than if they are in an alert state for 10 seconds!

The authors were able to make some assertions concerning the meaning of their findings for NICU practice: Careful assessment of infant behavioral state is vital for effective, developmentally-supportive feeding. Avoid feeding when infants are sleeping; if a baby is in a drowsy state, use interventions such as sensory stimulation to help the baby transition to an alert state before attempting to feed orally. You will appreciate the value of NIDCAP observational skills in this context.

It is worth noting that babies born preterm typically present a distinct “sleep architecture” that differs from that of term babies. Young, prematurely born babies spend far more time in active sleep and, importantly, their development is marked by important changes in sleep-wake distributions as well as transitions between states. Again, NIDCAP skills and sensitivities will serve you and the babies well for achieving superior support and care.

There is more to absorb from the article; hopefully, this commentary is informative and will motivate you to read the full paper. You are certainly invited to discuss it on one of our forums.

Visit: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5269441/> to access the full target article.

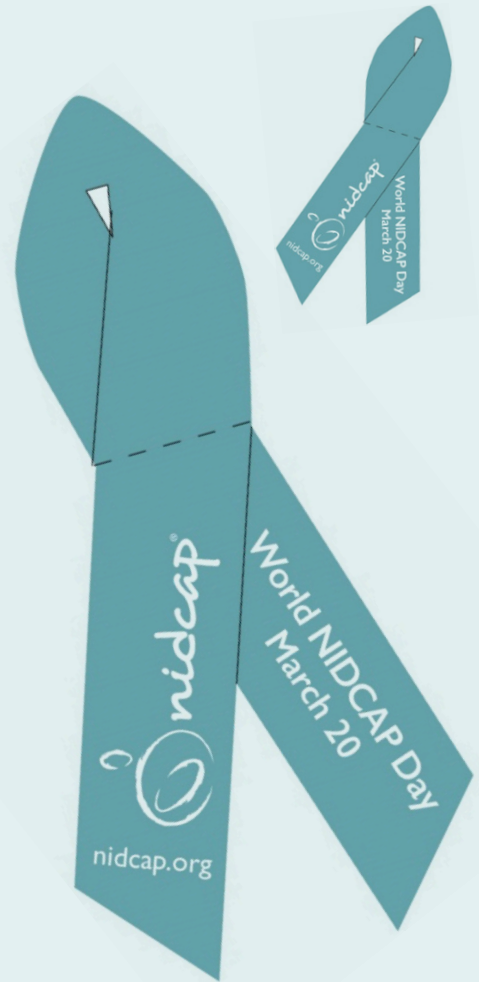
World NIDCAP Day

March 20, 2019 is the first annual World NIDCAP Day. Initiated by the NIDCAP Federation International, World NIDCAP Day is an opportunity to recognize and build awareness of the importance of providing NIDCAP care for hospitalized newborns and their families. Hospitalized newborns represent new beginnings faced with uncertainty due to their preterm birth or a newborn illness. NIDCAP care is essential for their overall health and wellbeing.

Celebrate World NIDCAP Day with us...

- Wear **Teal**
- Promote NIDCAP and World NIDCAP Day in your nursery, hospital and community
- Share photos/events on social media using #NIDCAP
- #NIDCAPpartneringwithfamilies and #worldNIDCAPday
- Illuminate landmarks in your area in the color **Teal**

Watch www.nidcap.org for more details soon...



NIDCAP Care in the Moment

Waking up calmly with a parent's gentle presence

The 30th Annual NIDCAP Trainers Meeting

October 5-7, 2019

Sheraton Portsmouth Harborside Hotel
Portsmouth, New Hampshire, USA

Contact Jim Helm on behalf of the NFI
Jimhelm27@gmail.com



Developmental Observer Submission Guidelines

The *Developmental Observer* is the official newsletter of the NIDCAP Federation International. We would like to receive submissions from the membership on any topic related to NIDCAP work either training, experiences or on the broader issues that support our work. We will also consider creative works that reflect NIDCAP work.

If you have an idea please let me know and we can work through the submission process. If English is not your first language we can help with some of the language issues.

The *Developmental Observer* is an open access on-line newsletter available on the NFI website for members as well as other visitors to the site. It may also be distributed by other networks and lists. It is indexed and archived through ScholarWorks at Indiana University, USA.

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All articles are to be submitted to the Senior Editor Kaye Spence AM via the email developmentalobserver@nidcap.org. You will receive acknowledgement of your submission. An editorial review process occurs and once complete you will be notified of publication of your article.

Article submission guidelines

Title of your article/story

Name of the author(s) and professional credentials

Organization and/or affiliation

An email contact address and a WhatsApp contact if available.

Submitted in MS word

Arial font– size 12 pitch

Double spaced

Number each page

Word length – 800 – 1500 words

Pictures 300dpi (please ensure you have permission to use and include a statement indicating this).

Diagrams, graphs and tables (embed in your document and send as a separate file)

We would also like to receive 'Letters to the Editor' for publication. These can be between 50-150 words.

Developmental Observer

The Official Newsletter of the NIDCAP®
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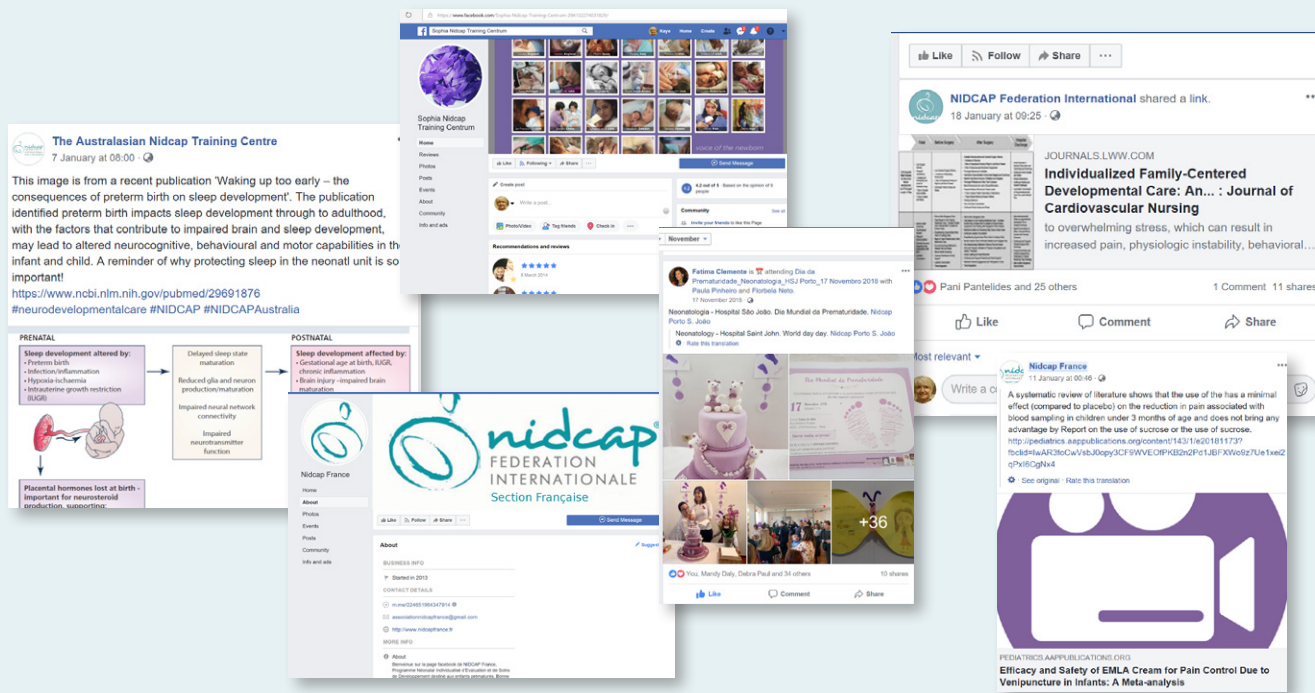
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NIDCAP on the Web

NIDCAP Training Centers – Facebook Pages

Many of the Training Centers and NIDCAP groups have established their own Facebook pages. These pages provide useful resources for members and by joining the groups and sharing the pages you are helping to spread information about NIDCAP. Here are a few to get you started. If you know of others please send an email to developmentalobserver@nidcap.org and let me know for inclusion in the next issue.



The NFI [NIDCAP Blog](#) offers observations from many different perspectives on NIDCAP and its implementation, such as NIDCAP and APIB training, Nursery Certification, the science behind the approach, the family experience with NIDCAP, the NFI, and much more. We encourage you to visit the [NIDCAP Blog](#) and to leave comments for our bloggers and our NIDCAP community in general. If interested in becoming a guest blogger please contact Sandra Kosta at sandra.kosta@nidcap.org.

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NIDCAP TRAINING CENTERS

by order of establishment

National NIDCAP Training Center

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Sooner NIDCAP Training Center

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Karolinska NIDCAP Training and Research Center

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Australasian NIDCAP Training Centre

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Become a Member of the NFI

The NFI has expanded opportunities for membership. Please join us! For more information and the online application form, visit our website at: www.nidcap.org or email us at nfimembership@nidcap.org