NEONATOLOGY TODAY

Peer Reviewed Research, News and Information in Neonatal and Perinatal Medicine

Volume 16 / Issue 7 | July 2021

NEONATOLOGY TODAY

ISSN: 1932-7137 (Online), 1932-7129 (Print)
All editions of the Journal and associated manuscripts are available on-line:
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www.Twitter.com/NeoToday

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A Retrospective Study of Parent's First-Hand Experience of Premonitions and Other Anomalous Aspects of the SIDS Phenomenon: A potential "SIDS early warning system?"

Eric Sage, Nancy Maruyama, RN, BSN, NCBF, Joseph R. Hageman M.D.

Abstract:

The main purpose of this study is to determine the incidence of premonition in SIDS parents vs. Non-SIDS/Control Group parents and to test for a number of other anomalous "markers" noted anecdotally by decades of in the field observation. Evidence of premonition and these other "markers" as consistent elements of the SIDS phenomenon could serve as an "early warning system" for a future SIDS event if confirmed by larger studies.

Methodology: Both groups of SIDS parents and Control parent participants completed electronic questionnaires on the SurveyMonkey platform for statistical analysis.

Results: The results of this pilot study indicated statistically significant differences between the SIDS parent and Non-SIDS control study groups for premonition and a set of other anomalous markers.

Conclusion: The authors believe that this pilot study of premonition and other markers may provide an "early-warning" system for an impending SIDS event if confirmed with future larger studies.

Importance: This pilot study confirms results of the value of premonition as well as other anomalous observations by parents whose infants may be at risk for a SIDS event. This study deserves to be confirmed by larger studies and, if so, confirmed indicates a reliable "early warning system" for an impending SIDS event. We face the problem if this SIDS event represents the small percentage of infants who will die of SIDS, even if a diagnostic evaluation and management, including hospital admission and monitoring, may not prevent death from SIDS. However, if this premonition is predictive of Sudden Unexplained Infant Death (SUID) secondary to a potentially preventable etiology, this infant death may be preventable.

Key Points

Question: Are premonitions and other anomalous factors more frequently noted in SIDS parents compared with Non SIDS control parents?

Findings: The results of this pilot study confirm and expand upon the statistically-significant results of the 1992 study by Hardoin, Henslee and Sheehan indicating that premonition, along with the presence of a consistent set of other anomalous factors may serve as a reliable "early-warning" system for an upcoming SIDS event within one week's time if these results are confirmed with larger studies.

Meaning: Though outside the parameters of traditional clinical studies, this pilot study along with a list of peer-reviewed findings on the subjects of premonition, intuition and the like, points to the necessity of further research in this area.

"Though outside the parameters of traditional clinical studies, this pilot study along with a list of peer-reviewed findings on the subjects of premonition, intuition and the like, points to the necessity of further research in this area."

Introduction

Parents of SIDS infants have described premonitions prior to the death of their infants to pediatric providers for many years, including in a study by Hardoin and colleagues (1). Pregnant mothers have expressed concern about their fetuses, which have been described as premonitions before their infants are stillborn (2,3). In a survey study by Erlandsson and colleagues, 392 of 614 (64%) of women of stillborn infants had a premonition that their unborn baby might be unwell (2).

A simple search amongst SIDS Support Groups on Facebook or postings on YouTube provides additional anecdotal examples for these factors, such as this posting from March 25th, 2021(5)

Having recognized two of the markers (unusual gaze/tendency to stare and "old soul/wise character") surveyed for in this Facebook post, Eric Sage (one of this study's authors) reached out to the mother and was able to confirm that she had experienced a premonition of her son's death.

Interestingly, premonition as a feature of the SIDS phenomenon has been previously studied/presented in a 1992 paper by The Southwest SIDS Research Institute reporting a 21.8% incidence among SIDS parents compared to a 2.4% incidence in Non-SIDS parents. This study was revisited, expanded, and republished in 2007 in book form titled "The Voice Within (1,2)"

In preparation for this pilot study, Eric met with Dr. Hardoin and Judith Henslee at their office in Lake Jackson, Texas. At that time, Dr. Hardoin indicated that his team felt that though still statistically relevant, the 21.8% of reported premonitions amongst SIDS Parents was being significantly underreported by this group due to the plain strangeness of the experience, along with the associated guilt/shame of having pre-knowledge and having done nothing to prevent their infant's death from happening (1). More recently, Meadow and colleagues have also studied the clinical intuition of bedside providers in the neonatal intensive care unit (NICU) regarding the survival and neurodevelopmental outcome of critically ill neonates (6).

The main purpose of this study is to determine the incidence of premonition in SIDS parents vs. Non-SIDS/Control Group parents and to test for a number of other anomalous "markers" noted anecdotally by decades of in the field observation. Evidence of premonition and these other "markers" as consistent elements of the SIDS phenomenon could serve as an "early warning system" for a future SIDS event.

" Evidence of premonition and these other "markers" as consistent elements of the SIDS phenomenon could serve as an "early warning system" for a future SIDS event."

Methods

Setting, Design, and Participants:

SIDS Parents

Working from a list of 517 SIDS parents who had previously taken part in a SIDS study (Torres personal communication, August 31st, 2017) and who had authorized contact for further research, a survey of 58 questions was sent out via email through SurveyMonkey.com. Of these, 117 returned as undeliverable leaving a potential pool of 400 respondents. The survey closed with 100 responses in total (25% response rate). From the 58 questions, we identified eight key questions/markers that consistently appeared together and produced statistically relevant results. (See questions in Table below.)

These SIDS parents were asked various questions; Yes/No, Multiple Choice, and Open Field (Appendix). When respondents answered Yes to one of the factors being tested for, they were asked to provide further information/detail in the following Open Field question. Evidence of premonition and these other "markers" including unusual gaze or tendency to stare by the infant, unusual electrical or mechanical phenomenon associated with the time period of the infant's death, infant perceived as "wise" or "old soul," infant advanced on standard developmental milestones, and delivery issues were the areas of information on which the questions were based.

Of the 100 respondents who completed the survey, 86 were from the United States (U.S.)., 12 international, and two unknowns.

Survey responses were collected from 1/8/18 to 3/19/18.

Control Group

A survey of 38 questions was launched through the SurveyMonkey platform for U.S. parents of children up to 18 years. The survey received 138 responses, of which 32 were eliminated as invalid due to not having been completed or because of other disqualifying criteria on the part of the respondents (Answered as Mickey Mouse etc.), providing a total response pool of 106 participants. The shorter length of this survey was due to the fact that some questions relating directly to the experience of the SIDS event were not included as they were not pertinent to this Control Group. These non-SIDS parents were asked various questions; Yes/No, Multiple Choice, and Open Field. In the cases where respondents answered Yes to one of the factors being tested for, they were asked to provide further information/ detail in the following Open Field question. The survey ran from 3/22/18 to 4/20/18.

Methodology

Statistical tests were carried out to determine if the proportions of positive responses were the same between the SIDS parents and Non-SIDS control groups. Subsequent p-values were obtained from the statistical tests for each result category. The null hypothesis is that the proportion of positive responses from the control group is the same as that from the parents' group. The alternative hypothesis is that positive responses are not the same between the control and parents groups. If the number of positive responses for each group is greater than 5, sample sizes are considered large enough, and thus, proportions are approximately normally distributed. In this case, 2 proportions z-tests will be carried out to obtain p-values. If the number of positive responses for any group (either control or parents group) is less than 5, proportions have deviated from normality; thus, z-tests are no longer appropriate. Fisher's exact test will be carried out instead, and p-values will be obtained from this test. The overall p-value is also calculated by comparing all positive counts across all categories between control and SIDS parents groups. A p-value of < 0.05 was considered statistically significant. Work performed by Hong Tran, Ph.D. Bioinformatics, MSc. Statistics, Virginia Tech.

Results: The comparison of the experiences of the SIDS parents with the control Non-SIDS parents is presented in the Table. The statistically significant differences between the SIDS parent and Non-SIDS parents' groups included: the premonition of infant's death: SIDS Parents 48.98% vs. Non-SIDS Parents 1.88%, Unusual gaze/ tendency to stare: 27.84% vs. 13.21%, Old Soul/ Wise: 12.0% vs. 1.88%, and delivery issues: 53.13% vs. 23.58%.

"This pilot study identified a statistically significant difference between the SIDS Parents and the Non-SIDS Control Group for a combination of common anomalous factors both pre and post the SIDS event."

Discussion

This pilot study identified a statistically significant difference be-

Table 1

Category	Control Group (N = 106)	SIDS Parents (N = 100)	P.value	Statistical test
Premonitions of child's death	1.88%	48.98%	1.455e-16	Fisher's exact test
Timing of Premonition < 1 Week	5.00%	22.20%	0.0006	2 proportion z-test
Timing of Premonition < 1 Day	5.00%	37.70%	2.141e-08	2 proportion z-test
Unusual gaze/ tendency to stare	13.21%	27.84%	0.0149	2 proportion z-test
Delivery Issues	23.58%	53.13%	2.389e-05	2 proportion z-test
Unusual behaviors; Old Soul/ Wise	1.88%	12.00%	0.0046	Fisher's exact test
Was your child "advanced" in any way; physically, communicatively, other?	27.36%	28.57%	0.969	2 proportion z-test
Anomalous Electrical or Mechanical Event(s)	8.49%	12.00%	0.547	2 proportion z-test
Total comparison	10.8%	30.30%	1.346e-22	2 proportion z-test

tween the SIDS Parents and the Non-SIDS Control Group for a combination of common anomalous factors both pre and post the SIDS event. The presence of these "pre- "common factors in the SIDS Parents group indicates that these could serve as a reliable "early-warning" system within one week of the SIDS event based on the reporting that 22.2% of these individuals experienced a premonition within one week of the event, and an additional 37.7% within one day of the event.

This is important because now some thirty years later, the world has changed significantly as to its acceptance of and willingness to discuss things of this anomalous nature. This change may explain the difference between the 1992 reporting of 21.8% and this study's 48.98%. The numbers are practically identical in the Non-SIDS Control Group, with 2.4% in the Hardoin study vs. 1.88% in this pilot study (2,6).

It would be hard to overstate the importance of finally identifying SIDS infants prior to their deaths reliably. If confirmed with larger studies, this newly identified potential "early-warning" system

Table 2: Answers from SIDS Parents

Q: Did you experience any type of premonition regarding your SIDS experience?

1. The event happened at nine weeks of age. At eight weeks, she was fine, and I was imagining what I might write on the dedication section of my Ph.D. (I was working on it at the time). I saw a short dedication to 'my daughter who lived such a short time, with a date of birth, date of death and a Bible verse, 'The Lord gives, and the Lord takes away, blessed be the name of the Lord, Job 1.21. I didn't think anything of it at the time, but it was strong and odd, and when I did write my Ph.D. a couple of years later, that was the dedication I used.
2. It was a very detailed daydream. I pictured myself home with her, and something was wrong, and I couldn't help her. It was three days before she passed away.
3. A week before death, I started worrying and even asked hospital for a breathing monitor, even though he seemed fine. The hospital refused to give me a monitor as they said he was fine. Also, I had these shoes for him, I never could believe that he would ever wear them.

Q: Did your child have an unusual gaze/have a tendency to stare?

1. Very alert from the moment of birth. Always staring as if looking directly at you.
2. He seemed to look right through you. He would stare right into our eyes for long periods of time without getting overstimulated or bored per se like "normal" babies do.
3. Well we just thought that it was amazing that he could hold our gaze like that - like for example, our other kids would get overstimulated when they would look at your eyes for too long at age but he would just be able to just look at your eyes for forever and - just like locked his eyes in with yours and just stare at you without getting you know how they get kind of over stimulated and they turn their heads to the side - they just they don't they can't just do something like that for so long at such a young age.

Q: Unusual behaviors; Old Soul/Wise

1. My child was a very laid-back baby and rarely cried. Seemed to me like he had an old soul.
2. She was a very quiet baby. We referred to her as an old soul.
3. I thought he was quiet and thoughtful, and there was something special about him.

SIDS Survey Questions

SIDS Parents

1. Did you experience any unusual physical phenomenon (electrical or mechanical) during the time you had to spend with your child or in the period associated with their loss? i.e., lights turning off or on unexpectedly, equipment doing the same or suddenly not working etc.?
2. Did you experience any type of premonition regarding your SIDS experience?
3. If yes, please describe your premonition, was it visual, auditory, was it detailed/ realistic, or more suggestive?
4. Who experienced the premonition associated with this SIDS occurrence; father, mother, anyone else? (Grandparent, aunt/uncle, sibling, caretaker, other).
5. When did this premonition or series of premonitions occur?
   - Prior to birth
   - Constant fear/Constant since the time of birth
   - One month or greater
   - One week or greater
   - Less than one week
   - Within one day
6. Was there anything unusual about the delivery of the child, i.e., back labor, breech etc.?
7. Was your child "advanced" in any way, physically, communicatively, other?
8. Did your child have an unusual gaze/have a tendency to stare?

Non- SIDS Parents – Control Group

1. Did you experience any unusual physical phenomenon (electrical or mechanical) during your child's first year of life, i.e., lights turning off or on unexpectedly, equipment doing the same or suddenly not working etc.?
2. Did you experience any type of premonition regarding the health of your child during your child's first year of life?
3. If yes, please describe your premonition, was it visual, auditory, was it detailed/ realistic, or more suggestive?
4. Who experienced the premonition; father, mother, anyone else? (Grandparent, aunt/uncle, sibling, caretaker, other).
5. When did this premonition or series of premonitions occur?
   - Prior to birth
   - Constant/ongoing
   - 1-3 months
   - 3-6 months
   - 7-12 months
6. Was there anything unusual about the delivery of the child, i.e., back labor, breech etc.?
7. Was your child "advanced" in any way, physically, communicatively, other than during their first year of life?
8. Did your child have an unusual gaze/have a tendency to stare during their first year of life?

provides the medical and scientific communities the opportunity to study these infants for the possible mechanism(s) that trigger these SIDS events. It offers a much greater opportunity to provide the intervention(s) necessary potentially to eradicate this phenomenon.

The results of this pilot study point directly to special non-natural faculties and/or supernatural sources of information that together work to offer an "early-warning" system for an impending SIDS event. The authors here share representative answers from the SIDS Parents group to illustrate both the consistency of these experiences and how truly "anomalous" they appear to be in the Table.

Limitations

The limitations of this study are that it is a retrospective pilot study and so subject to potential recall bias. However, much of this is offset through contemporaneous notes and/or sharing the premonitions and other markers with family or friends, creating a larger witness pool to these anomalous aspects of the SIDS phenom-

enon. The clinical utility of this screening tool recognizes the need to develop the proper teaching protocol whereby parents could be informed of the markers to be conscious of, without creating additional concern on the part of these new parents.

"The limitations of this study are that it is a retrospective pilot study and so subject to potential recall bias. However, much of this is offset through contemporaneous notes and/or sharing the premonitions and other markers with family or friends, creating a larger witness pool to these anomalous aspects of the SIDS phenomenon."

Author Comment and Conclusions

As an R.N. and the current Executive Director for Sudden Infant Death Services of Illinois, Inc., I have spent the last 35 years (since the SIDS death of my son in 1985) meeting with and companioning many SIDS parents through their grief journey. I had a premonition of my son's death the day before he died, and when I share it with some newly bereaved parents, I am amazed at how many of them also state that they, too, had a premonition of their infant's death.

While the outcome may not have changed after the premonition, there is still purpose in this study because it validates those of us who experienced a premonition prior to our infant's death. It opens the door to a larger study that could include grandparents, adult siblings of bereaved parents, and surviving siblings. It can also alter the beginning of the grief journey because the parents may feel that they have been "heard" by the doctor.

Finally, these infants can potentially be identified before the SIDS event creates as a worst-case scenario the first-time pool of infants who can be studied before their deaths. As a best-case scenario, these deaths once and for all can be eliminated through determining the causative trigger(s) through testing or through other medical interventions.

"Finally, these infants can potentially be identified before the SIDS event creates as a worst-case scenario the first-time pool of infants who can be studied before their deaths. As a best-case scenario, these deaths once and for all can be eliminated through determining the causative trigger(s) through testing or through other medical interventions."

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Acknowledgments. *We thank Drs. Fizza Naqvi, and Hunter Eason for their help, contributions, and advice.*

Disclosures: Disclosures: Physician Advisory Board, Owlet, Inc.

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COVID-19 Vaccine Acceptance In Pregnancy

Priya Desai, OSM IV., Gagandeep Kaur ,OSM IV., Fanglong Dong, PhD, Maria Hellen Rodriguez, MD

Abstract:

***Background**: Early in the COVID-19 pandemic, limited data existed regarding the safety and efficacy of the COVID-19 vaccine in pregnant women. As such, many pregnant women have reservations about receiving the COVID-19 vaccine. However,pregnant women are of particular concern as they are considered a vulnerable population due to the increased risk of severe complications from COVID-19. This study investigates the willingness of pregnant patients to receive the vaccine before and after discussion with a health care provider.*

***Methods**: 124 pregnant women were surveyed from February to March of 2021 at a perinatal center. Patients were queried about their willingness to receive the COVID-19 vaccine before and after reading a fact sheet and discussing the vaccine's safety with a provider.*

***Results**: There was a statistically significant effect of discussing the vaccine with a physician regarding patients' willingness to receive the COVID-19 vaccine. Additionally,patients who received the annual influenza vaccine were significantly more likely to get the COVID-19 vaccine.*

***Conclusion**: Pregnant women were more willing to receive the COVID-19 vaccine afterdiscussion with a health care provider. The importance and impact of health education should be given special consideration in medical offices.*

" While COVID-19 vaccines will soon become available to the general public, there remains uncertainty about the safety and efficacy of the COVID-19 vaccine in pregnant women amongst healthcare professionals."

Introduction:

The COVID-19 pandemic has caused 2.7 million deaths worldwide, including more than 500,000 in the United States. While COVID-19 vaccines will soon become available to the general public, there remains uncertainty about the safety and efficacy of the COVID-19 vaccine in pregnant women amongst healthcare professionals.

Lactating and pregnant women were not included in the original phase 3 COVID-19 vaccine clinical trials. Therefore limited data exist regarding long-term outcomes in pregnancy. However, the COVID-19 infection is of particular concern in pregnancy. More than 73,000 infections and 80 deaths have been documented in pregnant women since the start of the pandemic in the United States. Infected pregnant individuals are at increased risk for severe illness, admission to the intensive care unit, mechanical ventilation, pregnancy complications, and death compared to non-pregnant counterparts. (1)

Given the vulnerability of this population, the American College of Obstetricians and Gynecologists and the CDC recommend the authorization and use of the COVID-19 vaccines in pregnant women. Several studies have analyzed the acceptance and willingness of the general population to receive the COVID-19 vaccine in the United States. However, there is limited data regarding the attitudes and perceptions of pregnant women towards receiving the vaccine. The decision to receive the vaccine is asource of confusion and conflict for many pregnant women, making this an important topic of discussion between patients and obstetrics and gynecology providers. (2-5)

Objectives/Purpose:

This study investigates pregnant patients' willingness to receive the COVID-19 vaccine before and after discussion with a health care provider.

Demographic factors associated with vaccine willingness were also studied.

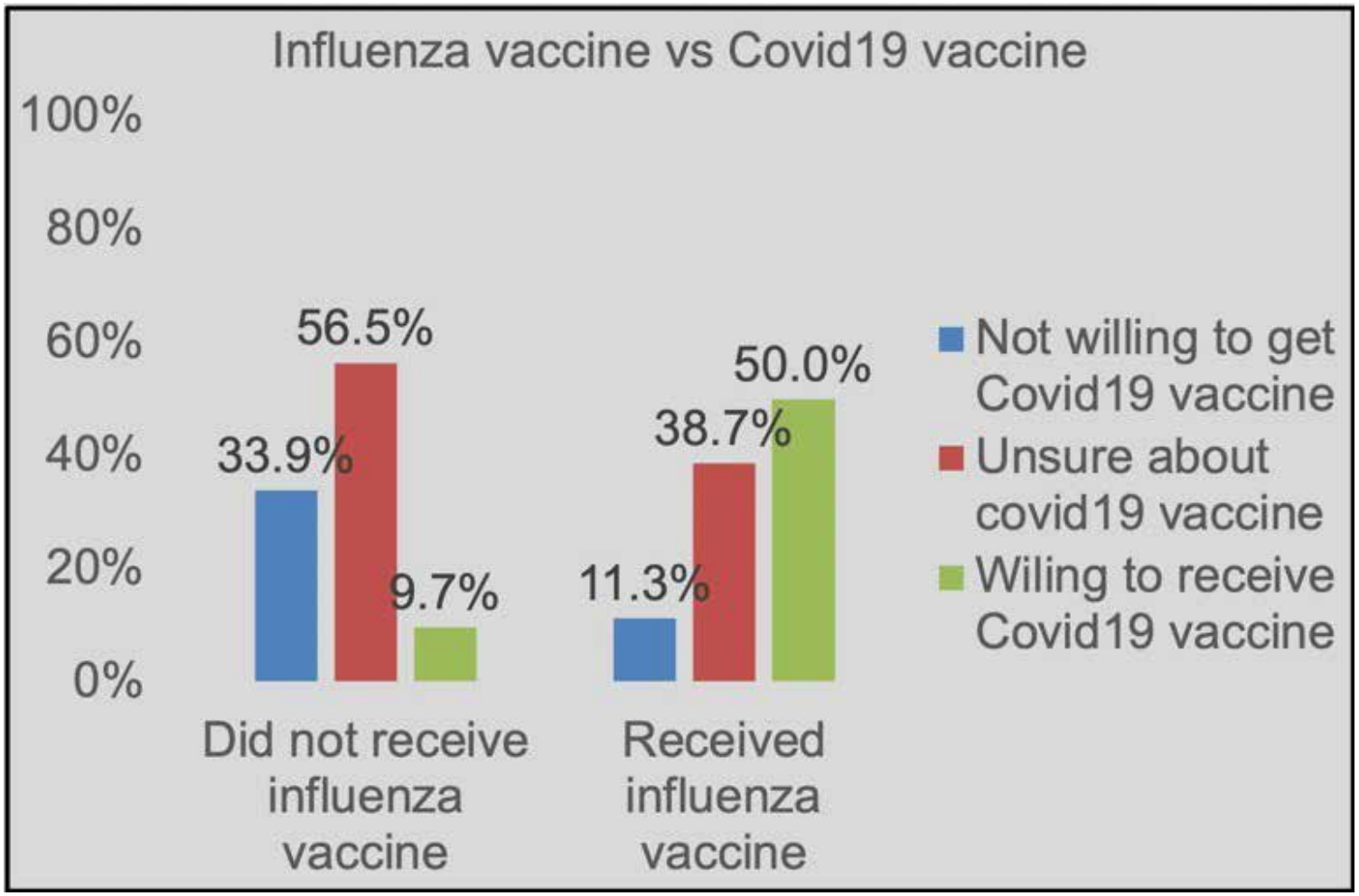
"An anonymous cross-sectional survey of pregnant women ages 18 years or older was conducted at Pomona Valley Hospital's perinatal center between February and March 2021. Patients were queried about their willingness to receive the COVID-19 vaccine before they were given any information. Data on demographic factors, including race, religion, education level, marital status, and prior vaccine history, were also collected."

Methodology:

An anonymous cross-sectional survey of pregnant women ages 18 years or olderwas conducted at Pomona Valley Hospital's perinatal center between February and March 2021. Patients were queried about their willingness to receive the COVID-19 vaccine before they were given any information. Data on demographic factors, including race, religion, education level, marital status, and prior vaccine history, were also collected. Patients were then asked to read a fact sheet about the safety of the COVID-19 vaccines in pregnant women and discussed the information with a provider. A comparison between the pre and post willingness to receive the COVID-19 vaccine was conducted. A p-value <0.05 was considered to be statistically significant. The study received IRB approval from the Pomona Valley Hospital institutional review board.

Results:

A total of 124 patients were included in the final analysis, with an average age of 29.9 (SD=2.89) years and an average gestational age of 31.2 (SD=6.69) weeks. More than half (58.9%, n=73) were



Hispanic, and almost half (49.2%) had a highschool or lower degree. The majority (89.1%, n=106) of participants were in their first trimester of pregnancy. Half (50%, n=62) of the participants reported that they received influenza in the past, and more than half (59.7%, n=74) reported receiving the Tdap vaccine. Those who received the annual influenza vaccine were significantly more likely to get the COVID-19 vaccine (50% vs. 9.7%, p<0.0001). Additionally, those who had previously discussed the COVID-19 vaccine with a physician were significantly more likely to receive the vaccine (45.8% vs. 26.0%, p=0.0426). There was a statistically significant effect of discussing the vaccine with a healthcare provider and providing patients with a fact sheet regarding patients' willingness to receive the COVID-19 vaccine (p<0.0001).

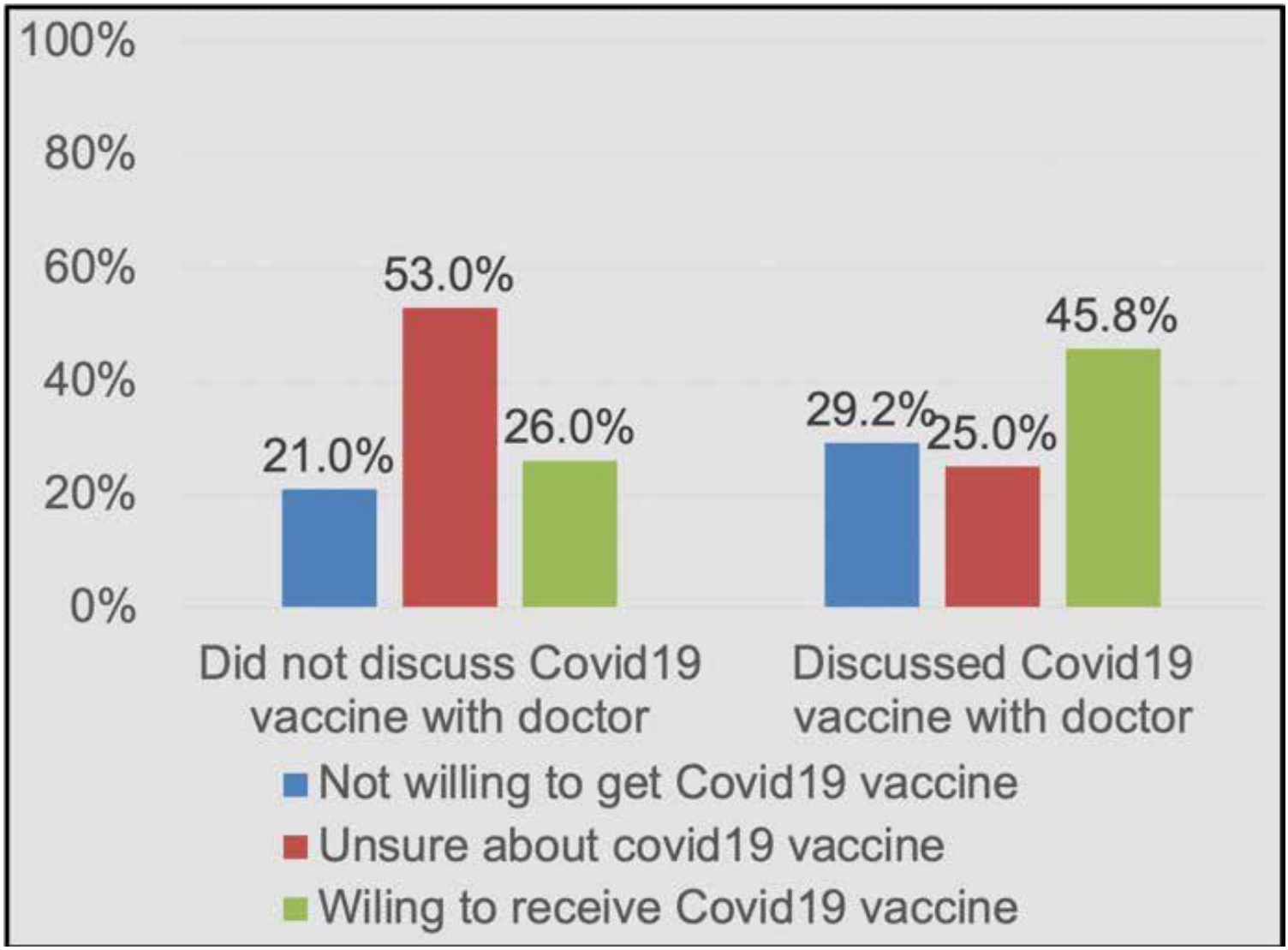
Conclusions/Discussion:

In this cross-sectional sample of patients, pregnant patients who discussed the COVID-19 vaccine with a healthcare provider were statistically more likely to express willingness to receive the vaccine. This study also found that higher education level and previous influenza vaccination are factors associated with vaccine willingness.

Although not statistically significant, women with an associate's degree or higherwere more willing to receive the COVID-19 vaccine when compared to women with a high school education or less. This result is consistent with a study discussed in Ceulemans et al. (6), which reported that pregnant and breastfeeding women with low to medium education levels were less likely to get the COVID-19 vaccine when it became available to them. Similarly, unemployment was associated with vaccine hesitancy. Fisher et al. (7) reported that anti-vaccine attitudes, lack of trust in the healthcare system and vaccine development, and the need for more information regarding the safety and efficacy of the vaccine were amongst the reasons for intending not to be vaccinated. Many other previous studies have similarly reported increased willingness to receive the COVID-19 vaccine among patients with higher education.

"In this cross-sectional sample of patients, pregnant patients who discussed the COVID-19 vaccine with a healthcare provider were statistically more likely to express willingness to receive the vaccine. This study also found that higher education level and previous influenza vaccination are factors associated with vaccine willingness."

Another independent factor that played a role in willingness to receive the COVID-19 vaccine was previous influenza and Tdap vaccination. Women who had received influenza and Tdap vaccination were more likely to receive the COVID-19 vaccine than those unvaccinated. According to Fisher et al. (7), evidence



shows that patients whose physicians recommend a vaccine are more likely to be vaccinated than patients whose physicians do not. Prior influenza and Tdap vaccination may be reflective of attitudes toward and trust in vaccinations in general.

Pregnant women have historically been excluded from many vaccine trials. As a result, there is a lack of evidence supporting the safety and efficacy of vaccines in this specific population. Data on vaccine safety in pregnant women are often drawn from the limited number of inadvertent exposures during pregnancy. There is a critical need for the inclusion of pregnant women in vaccine trials, given the vulnerability of this population to developing severe illness with COVID-19. Vaccination of pregnant women can also decrease household transmission of COVID-19 among children too young to receive the vaccine (8). Greater evidence on vaccine safety amongst pregnant women can increase vaccine confidence and trust in both pregnant women and their obstetrics providers.

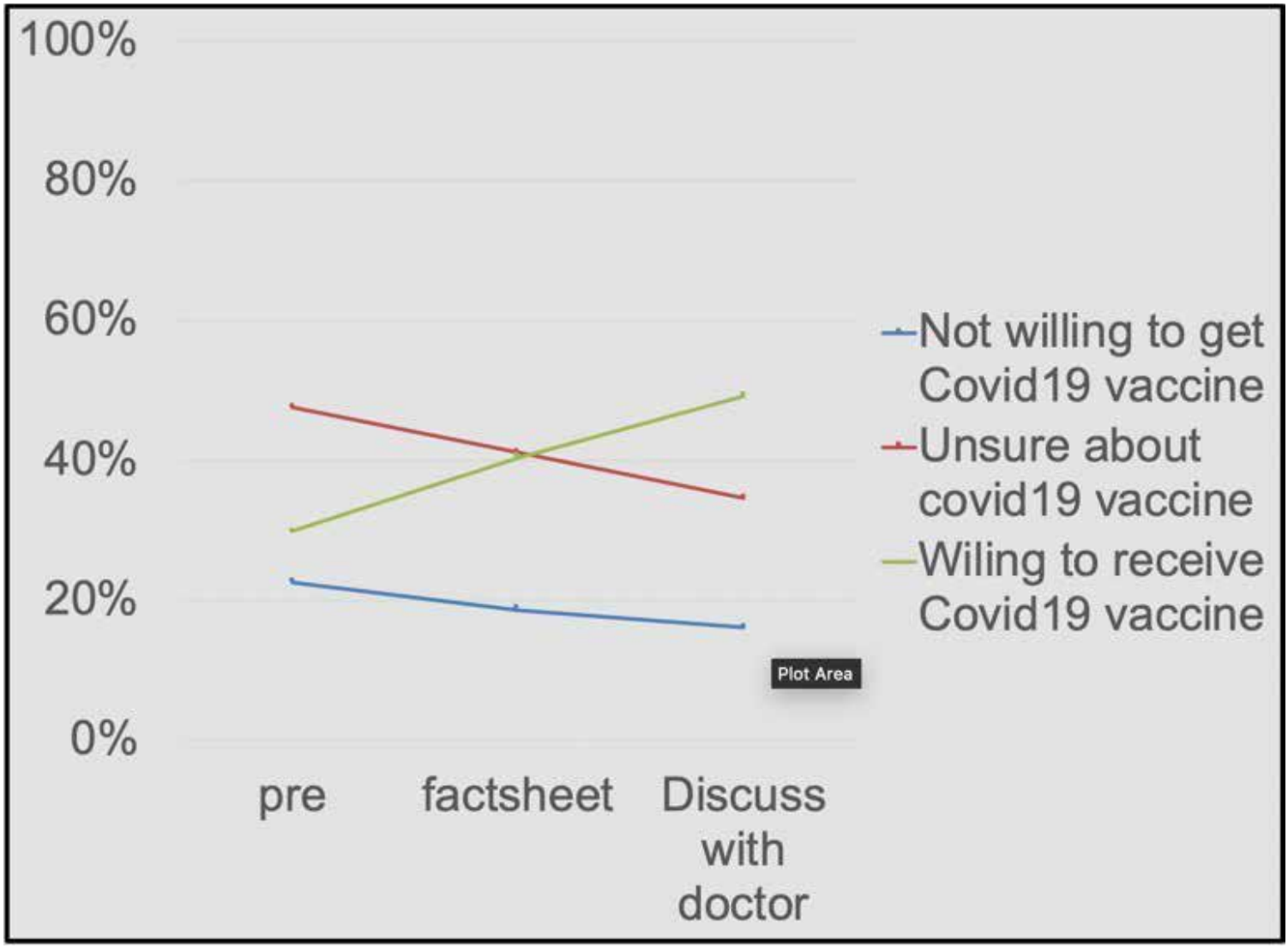
After reading the informational fact sheet and discussing it with a health care provider, more women were willing to receive the COVID-19 vaccine. Similarly, the effect of educational intervention on vaccine acceptance was studied in China in 2019. (9) The attitude towards and willingness to receive the HPV vaccine was documented before and after an informative presentation. More students were willing to vaccinate themselves after health education. Policymakers should give efforts to educate vulnerable populations more consideration in order to improve vaccine acceptance.

The potential limitations of this study include a sample restricted to 124 patients at a single perinatal center. Furthermore, several patients reported having already beenoffered the COVID-19 vaccine due to their employment status as essential workers.

Lastly, patients who had already discussed the COVID-19 with their primary care providers may have had access to safety information regarding the vaccine prior to reading the COVID-19 fact sheet from their obstetrics provider.

Future studies should investigate potential reasons for vaccine reluctance and effective methods to deliver information to patients to encourage vaccine acceptance. (9) Preliminary findings from the largest study conducted to date on mRNA COVID-19 vaccine safety in pregnant women currently indicate no obvious safety concerns for this population. (10) As the United States finds itself at a turning point in the COVID-19 pandemic, it is more important than ever to prioritize strategies to promote vaccine acceptance.

More pregnant women were willing to receive the COVID-19 vaccine after discussion with a healthcare provider. Prior influenza and Tdap vaccination and higher education level were factors associated with greater vaccine willingness. The importance and impact of regular health education should be given special consideration in the pregnant patient population.



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Disclosures: The authors have indicated no conflicts of interest.

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- Topics may include Perinatology, Neonatology, and Younger Pediatric patients.
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SHARED DECISION-MAKING PROTECTS MOTHERS + INFANTS DURING COVID-19

KEEPING MOTHERS + INFANTS TOGETHER

Means balancing the risks of...

- HORIZONTAL INFECTION
- SEPARATION AND TRAUMA

EVIDENCE

We encourage families and clinicians to remain diligent in learning **up-to-date evidence**.

PARTNERSHIP

What is the best for this unique dyad?

SHARED DECISION-MAKING

- **S** EEK PARTICIPATION
- **H** ELP EXPLORE OPTIONS
- **A** SSESS PREFERENCES
- **R** EACH A DECISION
- **E** VALUATE THE DECISION

TRAUMA-INFORMED

Both parents and providers are confronting significant...

- FEAR
- GRIEF
- UNCERTAINTY

LONGITUDINAL DATA

We need to understand more about outcomes for mothers and infants exposed to COVID-19, with special attention to:

- MENTAL HEALTH
- POSTPARTUM CARE DELIVERY

NEW DATA EMERGE DAILY. NANN AND NPA ENCOURAGE PERINATAL CARE PROVIDERS TO ENGAGE IN CANDID CONVERSATIONS WITH PREGNANT PARENTS PRIOR TO DELIVERY REGARDING RISKS, BENEFITS, LIMITATIONS, AND REALISTIC EXPECTATIONS.

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4:00 p.m. Eastern time

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Gravens By Design: Selected Abstracts from the 34th Annual Gravens Conference on the Environment of Care for High Risk Newborns: Resiliency and Change in the NICU

Robert White, MD

Selected abstracts from the the 34th Annual Gravens Conference are presented below:

Poster Abstracts Table of Contents:

Gravens2021-2

Title: Healthy Soundscape: Creating a safe, developmentally supportive, and sustainable sound environment for preterm infants.

Authors: Maxwell Corrigan, MS, MT-BC, NICU-MT, Orlando Health Winnie Palmer Hospital; Pierce Mooney, BS, Parsound

Background and purpose: Sound is perpetual in the Neonatal Intensive Care Unit (NICU). Everything from lifesaving medical equipment, respiratory devices, incubator motors, personnel voices, refrigerators, cleaning equipment, and doors contribute to collective sound in the NICU (i.e., the NICU Soundscape). Noise is anything unpleasant to the listener. Additive NICU sounds can create a setting that is saturated with noise, loud, and prevents healing and development. The American Academy of Pediatrics (AAP) has published guidelines for acceptable loudness in the NICU, set in place and unchanged since the 1990's. The AAP continues to recommend that NICU's maintain an environment no louder than 45 A-weighted decibels (dBA) on average (leq) and never to have loudness greater than 70 dBA. Noise in the NICU is associated with increased physiological instability, behavioral distress, and long-term developmental problems for preterm infants. Infants constantly disturbed by noise cannot sleep and grow. Solutions exist like reduced motor loudness inside incubators, more individual spaces for infants to help remove them from sound, and staff education to reduce conversation volume. Unfortunately, the newest cutting edge incubators with quieter motors are very expensive and not practical for most NICUs to invest in entire new fleets of beds, adapting to single rooms requires an entire restructuring of a NICU unit or new hospital, and staff education has proved to only have significant effect for short periods. Plus, sound is pervasive and unavoidable in many instances, preterm infants are often in open beds, and access to certain sound like parental voice is vital to early brain development. Healthy Soundscape is a device to reduce noise and promote a healthier sound

environment for patients in the NICU, regardless of bed type or existing sound in the environment. The device integrates three different elements to achieve these ends: sound monitoring, active and passive noise reduction, and controlled positive sound input.

Budget and resources: The research and development of this product was supported through capital investment by the Executive Board at Orlando Health.

Materials and methodology: Healthy Soundscape utilizes wireless over-ear device for each side of the infant head. Unlike other earmuffs used in the NICU, Healthy Soundscape is specifically designed for long-term use and utilizes cutting edge materials, such as silicone-based material for earpads and an antimicrobial exterior, that allows for easy sterilization and extended use for this population. Also, Healthy Soundscape incorporates noise cancelling abilities, a decibel monitoring system, and infant-friendly speakers. The over-ear devices are secured by a standard warming hat or headgear designed for CPAP. The devices operate independently for each ear, as infants are repositioned in a consistent daily schedule. The device can be adjusted or removed when an infant is in sidelying position. Healthy Soundscape is designed for use in preterm infants 24 weeks through 34 weeks corrected gestational age (GA) because this population is at the highest risk without it. The device uses both passive and active noise control to reduce sound entering the infant ear to AAP guideline levels. Embedded microphones constantly monitor the amount of sound at the ear, ensuring loudness at the ear never exceeds unhealthy levels. These microphones augment noise control and generate sound analyses for the healthcare team. Healthy Soundscape has three main operating settings: 1) noise reduction setting for use during infant sleeping and other quiet times, 2) positive sound playback (e.g., recorded maternal singing) for use when infant is of appropriate age, awake, and would benefit from general neurodevelopmental support, and 3) voice filter setting for staff or parents to appropriately talk/sing to the infant. Healthy Soundscape utilizes noise reduction technology concurrently with each setting, providing a safeguard to minimize unwanted noise. This noise cancelling ability is catered specifically to the NICU based on preliminary evidence of loudness (dBA levels) and frequency bands produced in NICU environments and by common equipment in the NICU.

Impact: It has been historically difficult for NICUs to control their soundscape on a large-scale level. Newer NICUs and hospitals can sometimes mitigate noise through the application of individual rooms and staff education with short-term efficacy. Regardless of a NICU's ability to reduce sound to acceptable levels, preterm infants still require a healthy dose of positive sound for neurodevelopment or comfort purposes. Healthy Soundscape targets noise directly at the level of the infant's ears. Furthermore, Healthy Soundscape has the option to track sound metrics that the infant experiences so clinicians can study this data as it relates to infant comfort and development. Finally, Health Soundscape allows for the safe integration of positive sounds, safeguarded against excessive loudness and noise, so infants of the appropriate age and condition can receive vital sound needed for brain development and comfort. Through computer modeling and non-human trials, Healthy Soundscape has shown to be safe and effective in its functions. Next steps include a human clinical trial starting summer of 2021. This study will regard tolerability of the device, ease of use for bedside staff using the device primarily, and clinical outcomes related to comfort, sleep, and growth.

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Learning Objectives:

1. Audience will learn about the specific parameters of noise and sound that exist in the NICU, including decibel and frequency metrics.
2. Audience will learn about the advances and limitations of current solutions for reducing noise in the NICU.

Audience will gain a detailed understanding of Healthy Soundscape, in terms of technology, functions, clinical use, and future study.

Gravens2021-4

Abstract Title: Therapist Education and Massage for Parent-Infant Outcomes (TEMPO): A feasibility study of a therapist-led program for parents of extremely preterm infants

Authors' names, degree(s), and institution:

Dana McCarty, PT, DPT

University of North Carolina at Chapel Hill and UNC Children's Hospital

Background and Purpose: Physical therapists (PTs) and Occupational Therapists (OTs) play an important role in supporting extremely preterm (EP) infants and their parents through developmentally-supportive care during and after long-term hospital stays. While there is strong evidence that motor interventions improve (e.g., cerebral palsy), or even cure (e.g., torticollis), a number of pediatric conditions, little is known about the influence of parent-delivered motor interventions (PDMIs) in the Neonatal Intensive Care Unit (NICU) on outcomes of EP infants and their parents.

Budget and Resources: The TEMPO study is currently being funded by the National Center for Complimentary and Integrative Health (NCCIH) of the NIH (3KL2TR002490-02S1). It is a 3-year project (2019-2022) with a $256,731 budget.

Program, Materials, or Methodology: The Therapist Education and Massage for Parent-Infant Outcomes program (TEMPO) is a structured, therapist-led program developed to train and support parents to deliver PDMIs and massage beginning in the first 4 weeks of life and continuing throughout the first year of life. TEMPO uses weekly educational sessions during hospitalization and digital platforms after hospital discharge to provide education and support until the infant is 12 months old (corrected age). One aspect of this study that is innovative is the inclusion of a secondary parent (usually the biological father). An additional innovation is that the TEMPO program enhances standard care by structuring the nature and frequency of therapist-parent interactions to increase the parent's comfort with massage and mobility activities with their infant. Parents have the option of in-person or virtual education sessions to optimize convenience and regularity of visits.

This was a prospective single group, non-randomized study of 30 infant-parent dyads. The primary objective of this program was to conduct a pilot study to demonstrate TEMPO's feasibility and acceptability (Aim 1). Secondary objectives included refinement of TEMPO to facilitate PDMIs and massage during neonatal intensive care hospitalization and after discharge based on the quantitative and qualitative data from Aim 1, and to use the sample data to estimate population parameters needed for planning a future study.

Regarding outcome measures, the following infant sociodemographic factors are being collected: date of birth, gestational age at birth, birth weight, and race/ethnicity. The following parent factors are being collected via survey: age, race/ethnicity, highest education completed, insurance type. Parent outcome measures include the Acceptability of Intervention Measure (AIM), Feasibility of Intervention Measure (FIM), Patient-Reported Outcomes Measurement Information System Adult Profile Short Form Anxiety (PROMIS-Anxiety), Centers for Epidemiologic Studies Depression Scale (CESD), Parenting Sense of Competence Scale (PSOC), Postnatal Attachment Questionnaire (PAQ) or the Paternal Postnatal Attachment Questionnaire (PPAQ) depending on maternal or paternal status, salivary cortisol pre and post-massage session, and a parent interview. Optional secondary parent measures include the Fetzer Original Attachment Questionnaire-Question 1 only (FOA-1) and the PAQ or PPAQ, depending on maternal or paternal status. The following infant outcome measures are being collected: salivary cortisol pre- and post-massage, Infant Behavior Questionnaire-Revised Very Short Form (IBQ-R Very Short), Test of Infant Motor Performance (TIMP) at hospital discharge, and the Bayley Scales of Infant Motor Development-IV (BSID-IV) at 12 month follow-up.

Our central hypothesis is that parent participation in the TEMPO program will reduce symptoms of anxiety and depression, while increasing parent sense of competence and parent-infant bonding. We anticipate that thee parental outcomes will mediate infant motor outcomes both in the hospital and at follow-up.

Impact or Results: Through this ongoing NCCIH-funded KL2 pilot study, TEMPO has already demonstrated high levels of feasibility and parent acceptability (Aim 1), as well as potential effectiveness. At the time of this proposal, 100% of parents (24/24) approached consented to participate, and all parents of surviving infants remained enrolled for the duration of hospital stay. At discharge, 100% of parents "agreed" or "completely agreed" that TEMPO was feasible and acceptable on the Feasibility and Acceptability Intervention Measures. At 2-month outpatient follow-up, 80% of parents reported doing daily PDMIs, and 100% reported doing massage at least 2-3 times weekly. Furthermore, in mothers for which both pre and post-massage salivary cortisol levels were recorded, 90% had reduced salivary cortisol levels post-massage, indicating a potential neurobiological mechanism for how this intervention alleviates maternal stress. Given high levels of compliance and promising preliminary results, we plan to further define appropriate dosage, frequency, and refinement of the TEMPO intervention in a future pragmatic trial (Aim 2).

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Learner Objectives:

At the end of this presentation, the learner will be able to:

1. Describe a comprehensive parent education program that includes motor and massage activities for extremely preterm infants in the NICU.
2. Describe the benefits of infant massage for parents and extremely preterm infants.
3. Consider implementing portions of TEMPO through creative evaluation of their own NICU's resources, structure, and discipline-specific expertise.

Gravens2021-5

Abstract Title: Emotional closeness among NICU fathers: A descriptive qualitative study

Authors' names, degree(s), and institution:

Valérie Lebel, N, PhD., Post-doctoral researcher, Department of Nursing Science, University of Turku, Finland; Professor, Université du Québec enOutaouais, Canada

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Emilie Gosselin, N., Ph.D., Post-doctoral fellow, McGill University, Ingram Schoolof Nursing, Canada

Anna Axelin, N, Ph.D., Associate professor, Department of Nursing Science,University of Turku, Finland

Background and Purpose: There are few descriptions of fathers' views of emotional closeness toward their preterm infants in the literature, and the uniqueperception of fathers with an infant in the neonatal unit is not well understood. Understanding closeness from their perspective is essential because they experience the hospitalization of their infant in a different way than the mother, and it may be challenging for them to develop father-infant emotional closeness.This study explored experiences and instances of emotional closeness from theperspective of fathers as well as factors influencing their feelings of emotional closeness during their infant's hospitalization in the neonatal unit.

Methodology: This qualitative descriptive study design employed one-on-one interviews with fathers recruited in a level 3 neonatal unit. The convenience sample was composed of fathers of an infant born at less than 35 weeks gestation and admitted to the neonatal unit. A socio-demographic questionnaire was completed by the fathers to collect information on their characteristics as well as the characteristics of their infant. Fathers also completed a self-report diary every day for two weeks to indicate when they felt emotional closeness andwhat they were doing at the time (i.e., present in the unit, doing skin-to-skin care,holding, involved in infant's care, including feeding, pumping, bathing, diaper change, singing, talking, reading and other). An interview guide was used to conduct semi-structured interviews with the fathers. The questions probed the fathers' perceptions about emotional closeness, when it occurs and the factors favouring or hindering it. Interviews lasting approximately 30 minutes took placeat a location chosen by the father or via Zoom (digital platform), at the time chosen by the participant, after they had completed the self-report diary. The diary completed by each participant was used during the interview to enable the participant to explain the elements indicated and improve the researcher's understanding of participants' perceptions about emotional closeness and when they felt it. The interviews were recorded to permit verbatim transcription by a research team member. The socio-demographic questionnaire and self-report diary were analyzed with descriptive statistics. The interview data were analyzed based on the thematic analysis method. Subsequently, emerging themes and sub-themes were considered according to dimensional analysis, which aims to explain all the elements that constitute and characterize a complex phenomenon.

Results: Eight fathers took part in this study. The participants were 32 years old,on average, and the gestational age at birth of their infant was 29 weeks, on average. All the fathers were salaried employees and married or living with their partner. For seven of them, the infant was their first child, while one father had another child at home. All fathers (100%) reported feeling emotional closeness inthe self-report diary. They reported emotional closeness each and every time they were present in the neonatal unit (100%), when the mother was present (100%), when the mother was involved in care (100%), and most of the time theywere holding the infant or doing skin-to-skin care (87.5%). Identified dimensions of emotional closeness for fathers included the process of emotional closeness, the context in which emotional closeness was felt by fathers, the properties that defined it, the conditions that influenced it and the consequences related to emotional closeness. According to the participants, emotional closeness is a complex feeling that develops over time and is influenced by a multitude of factors. It occurs when fathers were present in the neonatal unit and when they were not. It is part of the father-infant relationship development.

In conclusion, findings of this study contribute to our understanding of the dimensions of emotional closeness for fathers. By knowing more about their perspective concerning emotional closeness, nurses can direct their interventionsto enhance father-infant emotional closeness and they may better understand their experience.

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Thomson, G, Flacking, R, George, K, et al. Parents' experienc-

es of emotionalcloseness to their infants in the neonatal unit: A meta-ethnography. EarlyHuman Development. 2020; 149 (2020): 105155.

Learner Objectives:

Acknowledge the experience of NICU fathers regarding emotional closenesstoward their infant at the NICU.

Recognize and understand the multiples dimensions of emotional closeness for NICU fathers.

Gravens2021-17

Title: Exploring how to engage and better support parents in the NICU

Authors: Jessica T. Fry, MD[1]; Suzanne Jackson, BSM[2]; Kerri Z. Machut, MD[1]

1. Department of Pediatrics, Northwestern University Feinberg School of Medicine, Chicago, IL, and Division of Neonatology, Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL
2. Project Management Institute, Chicago, IL, and parent research partner

Background and Purpose: Parents who experience having children hospitalized in a NICU report this as a uniquely stressful experience(1), and go on to demonstrate higher rates than other new parents of post-partum depression and post-traumatic stress disorder(2). Three variables have been identified as important in determining which parents will be most negatively affected: pre-existing mental health conditions, the severity of the baby's medical condition and the level of emotional support for parents during the NICU experience(3). We performed a needs assessment of parental support in our NICU with the hypothesis that NICU parents would describe a need for expanded family support, including peer-to-peer support.

Methodology: We performed a prospective, descriptive study to gather perspectives of parents whose children were discharged from our regional NICU regarding their experiences of support and ideas for improvements. Parents were considered eligible for inclusion if their child was approaching discharge after a NICU stay of ≥ 5 days. We excluded parents who were less than 18 years of age and non-English or non-Spanish speakers. Parents were identified by census review/discussion with the unit research coordinator and were approached by study team physicians. At the time of enrollment, parents completed a brief demographic questionnaire. Parents were then given a choice for data collection – either semi-structured phone interview or online survey completed approximately two weeks after discharge. Both study versions included the same questions, which were developed collaboratively by all study team members. Interviews were conducted and recorded by a study physician over the phone, with subsequent third party transcription. RedCap survey link was emailed to parents. We performed a chart review after subjects completed either the interview or survey to collect infant clinical data (diagnosis, birthweight, gestational age, age at admission, length of stay, time interval since discharge, durable medical equipment at discharge). We continued enrollment, data collection, and data analysis until thematic saturation. Our targeted sample size was 20 participants. Interview transcripts and survey answers were coded by study team physicians using NVivo software with conventional content analysis to assess for parental themes. Disputes were resolved through collaborative discussion.

Results: From June to August 2020, 56 parents of 42 infants were approached, and 54 agreed to initial enrollment. Three parents who completed enrollment were not approached for further data collection due to changes in infant clinical status. A total of 22 parents went on to provide provided answers to our semi-structured questions. Characteristics of study parents and their infants are listed in Table 1. When asked to describe types of support that they encountered or desired during a NICU stay, parents reported numerous specific items. Six broad categories of support emerged from parental descriptions: encouragement and assistance from friends or family outside of the NICU setting; material assistance (such as parking, food, and temporary housing) provided through association with the NICU; quality of communication and education provided by NICU staff; relationships made with NICU staff members; programs organized by the NICU to provide parents with emotional support; and connections made with other NICU parents either in person or online. Given that data was collected during the COVID-19 pandemic, parents described the pandemic as adding to feelings of social isolation while in the NICU. Parents described multiple areas where currently available support could be improved, including communication, orientation to all available resources, preparation for hospital discharge, availability of primary nurses, availability of mental health resources, development of a NICU parent "community, " and enhanced support for when they were not able to be present at bedside. The majority of parents (82%) endorsed the idea of providing uniquely family-centered support by engaging "veteran" NICU parents in multiple different roles, including direct peer-to-peer support to provide hope through connection. Throughout our study, parents identified unique and important ways NICUs can support families and build resiliency. With the significant changes brought about by COVID-19 pandemic, these supports are more critical than ever for NICU families.

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Learner Objectives:

1. Define the various types of support parents describe as important during a NICU stay.
2. Identify various ways the COVID-19 pandemic may impact NICU parents experience of support.
3. Discuss the potential development of a "veteran" or "resource" NICU parent program

Table 1: Infant and parent characteristics	
Characteristics	n (%) or median (25th%, 75th%)
Infants	22
Sex, female	8 (36)
Estimated gestational age, completed weeks	36 (34, 37)
Birth weight, kg	2.6 (1.6, 3.0)
Multiple	1 (4.5)
Age at admission, days	2.5 (1, 6.8)
Length of stay at center, days	22 (13, 66)
Birth at co-located delivery hospital	7 (32)
Mechanical ventilation, any	14 (64)
Mechanical ventilation, ≥ 7 days	4 (18)
Surgery, any	11 (50)
Discharge with durable medical equipment	13 (59)
Parents	30 (both parents responded for 8)
Sex, female	22 (73)
Age, ≤ 25 years	7 (23)
Age, 26 - 35	16 (53)
Age, 36 - 45	4 (13)
Age, ≥ 45	3 (10)
Primary language, English	29 (97)
Race, white	17 (57)
Ethnicity, Hispanic	7 (23)
Married or long term partnership	23 (77)
College degree	17 (57)
Employed full-time	15 (50)
Maternity leave, weeks	11 (0, 12)
Have other children	14 (47)

Gravens2021-19

Title: Providing Consistent Developmentally Appropriate Sensory Experiences in a Community Level III NICU

Authors: Malathi Balasundaram, MD[1,2], Stephanie Miller, MD[1,2], Arlene R. Fleming, BSN, RNC-NIC[2], Dharshi Sivakumar, MD[1,2], Melinda Porter, MS, RN, CNS, NNP-BC, C-NNIC[2]. Pediatrics, Neonatology, Stanford University School of Medicine, Stanford, CA[1] and El Camino Hospital NICU, Mountain View, CA [2].

Background and Purpose: When an infant is premature, their protective intrauterine environment is replaced by the Neonatal Intensive Care unit (NICU) where they experience procedural touch/handling, movement, strong smells, sounds, lights, frequent nociceptive pain, and disruption of sleep during their critical sensory development stage[1]. The mismatch of underdevelopment and intense NICU environment may cause physiologic instability, adversely affect growth and development, and ultimately impact long term neurodevelopmental outcomes.[1] Providing appropriate positive sensory experiences can potentially optimize brain development and reverse the high rates of morbidity among high risk infants.[2,3] Studies defining the sensory interventions are related to tactile, auditory, vestibular, visual, olfactory, taste, and kinesthetic sensation.[1] We implemented quality improvement (QI) work to focus on three sensory interventions (tactile, auditory, taste).

Budget and Resources: $16,360 grant from Hope to Health, El Camino Health Foundation.

Program, Materials, or Methodology: We are a 20-bed Community Level 3 NICU with approximately 3900 deliveries and 400 NICU admissions per year. Our Family Centered Care (FCC) team performed a literature search and addressed sensory interventions in three areas:

1. Tactile: Early Skin to Skin Care (SSC) and "Out of the Box" (OOTB) time (swaddle hold plus SSC). Our goal was for earlier first SSC time and increased total OOTB time by 20%. We collected baseline data from the electronic health record (EHR) of all forms of tactile stimulation focusing on SSC and swaddle holding. An educational board was posted in the NICU that outlined evidence based best practices along with step-by-step instructions and photos on how to safely transfer critically ill infants to allow for first holding within 48 hours. All MDs, RNs, and RTs were asked to review the content. Informational handouts regarding the benefits of SSC and a personalized keepsake "First Hold Certificate" for parents were created. Nurses and RTs were trained on how to safely transfer intubated infants to parents for SSC. Once education was completed, staff were encouraged to document the time spent (minutes in a range) performing SSC and swaddle holding each time these events occurred. Figures 1 and 2 show the improvement in time to first hold for infants ≤ 30 weeks and 30-35 weeks, and Figure 3 shows average minutes per day each baby had OOTB time.
2. Taste: Our goal was for earlier first oral colostrum care. During prenatal consultation the neonatologists emphasized the importance of establishing maternal milk supply and provided the parents with a video on how to perform Hand Expression (HE). We focused on improving maternal milk supply with the goal that mothers would express colostrum shortly after delivery. We formed a team of HE champions in L&D on each shift. The champions worked with a lactation consultant who developed hands-on skills training and a hand expression competency checklist. All L&D nurses then completed the competency items with the champions. The training included real time assistance with actual hand expression. NICU and Mother Baby Unit (MBU) nurses were also recruited and trained in the same manner to disseminate a consistent message and continuous reinforcement of HE during the postpartum period. Figure 4 shows the decrease in time for infant to receive first colostrum.
3. Auditory: Our goal was to read to babies to provide positive vocal exposure for 10 mins/shift (total of 30 mins/day) for all admissions. Reading was done by either parents or staff. We recruited interested staff to become part of our Reach Out and Read (ROAR) program. We designed a book bag, decided which books to include in the bag, and obtained a grant to fund the program for one year. We also created a parent brochure, staff information letter, crib card reminder, and decorated the existing library for a launch party in February 2020. We gave ROAR book bags to all NICU admissions starting July 2020. Figure 5 shows the average minutes "read to baby" time which is close to the goal of 30 mins/day.

Barriers to the project were the time involved in creating committees, training the staff, creating EHR flow sheets, the dissemination of information about the new flow sheets and how to document accurately, and time spent collecting and interpreting data from the EHR. We overcame the barriers by lengthening the time to complete the project.

Impact or Results: Our baseline mean for initial SSC for 30-35 week infants was 27 hours of life (HOL) which decreased to 12 HOL (see Figure 2) and for ≤ 30 weeks decreased from 174 HOL to 65 HOL (Figure 1). We achieved our goal to improve OOTB time from 89 to 153 minutes per day (Figure 3). We improved the time to receive first oral colostrum from 22 HOL to 8 HOL (Figure 4). We improved "read to baby" to 17 minutes per day for all

Figure 1

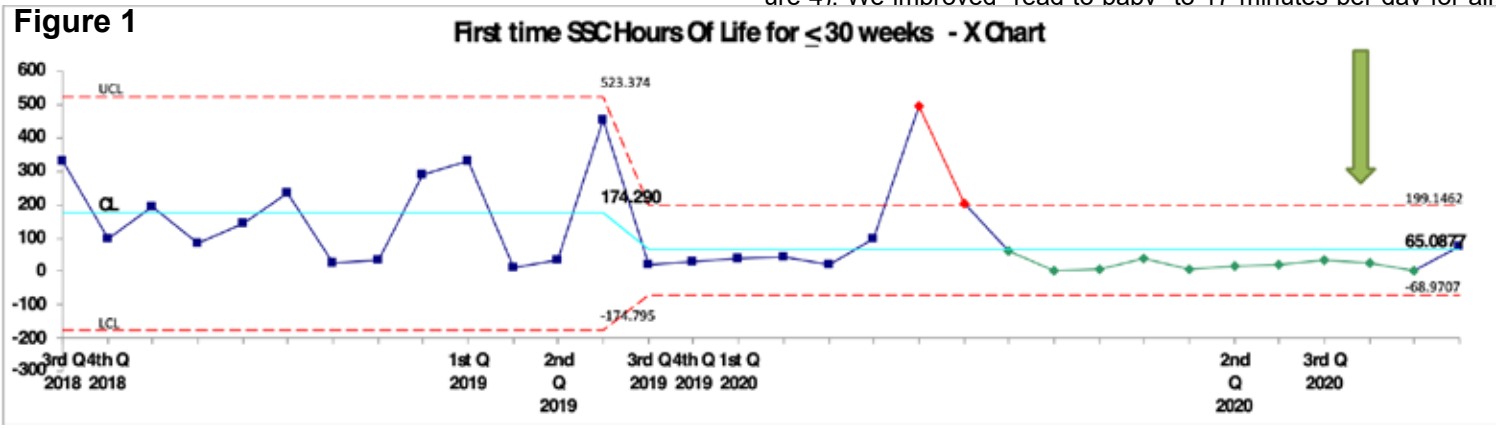


Figure 2

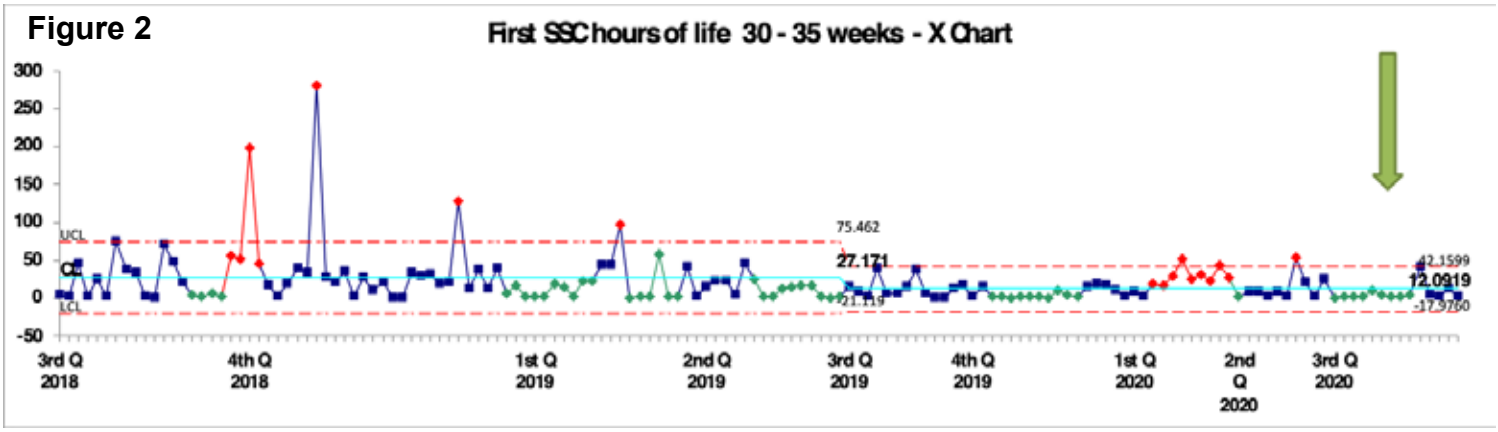


Figure 3

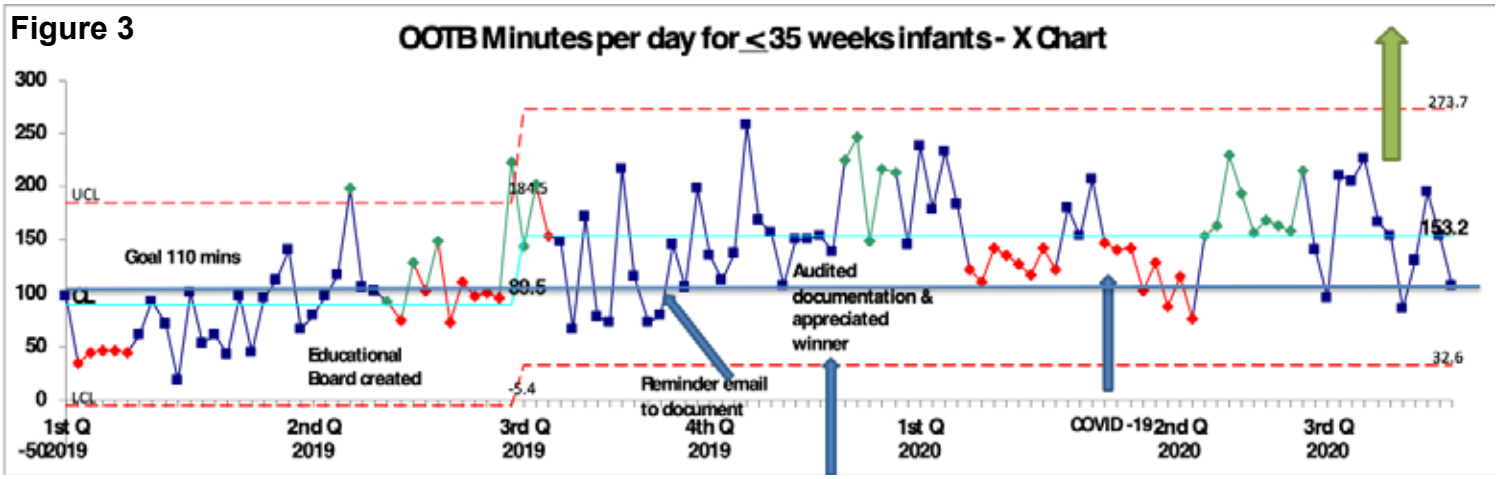


Figure 4

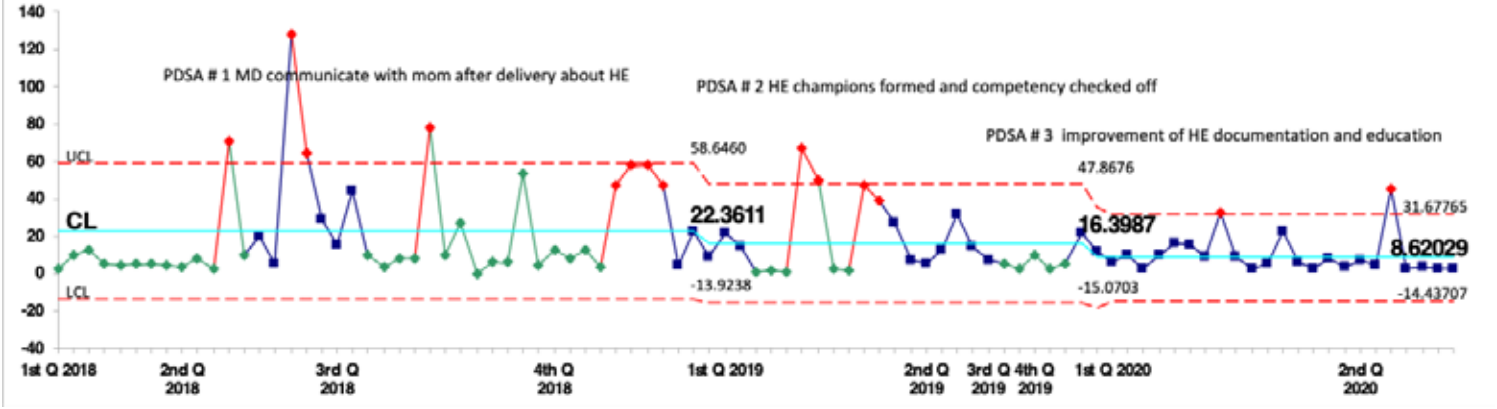
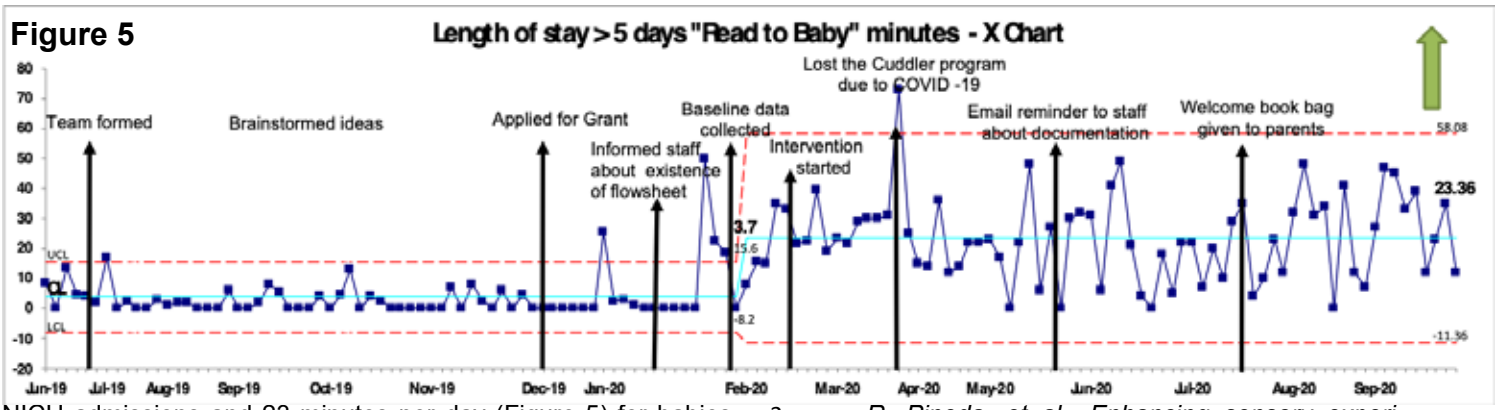


Figure 5



NICU admissions and 23 minutes per day (Figure 5) for babies who stayed in the NICU > 5 days. Our results are limited by the small number of very low birth weight babies in our cohort, and might be hard to generalize to larger academic NICUs. We'd like to continue our sensory work by focusing next on reducing pain using positive touch while administering painful procedures and reducing the noise level in our unit.

Acknowledgement: Jody Charles, RN, MSN, NE-BC (Nursing Manager); Family Advisory Board

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Learner Objectives:

1. To recognize the importance of developing standardized consistent sensory integrated developmental care in every NICU.
2. To learn about new ways of tracking family centered developmental care time provided in every NICU.
3. To educate parents about the benefits of providing sensory integrated developmental care.
4. and discipline-specific expertise.

Gravens2021-20

Abstract Title: Therapist Education and Massage for Parent-Infant Outcomes (TEMPO): A feasibility study of a therapist-led program for parents of extremely preterm infants

Authors' names, degree(s), and institution:

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University of North Carolina at Chapel Hill and UNC Children's Hospital

Background and Purpose: Physical therapists (PTs) and Occupational Therapists (OTs) play an important role in supporting extremely preterm (EP) infants and their parents through developmentally-supportive care during and after long-term hospital stays. While there is strong evidence that motor interventions improve (e.g., cerebral palsy), or even cure (e.g., torticollis), a number of pediatric conditions, little is known about the influence of parent-delivered motor interventions (PDMIs) in the Neonatal Intensive Care Unit (NICU) on outcomes of EP infants and their parents.

Budget and Resources: The TEMPO study is currently being funded by the National Center for Complimentary and Integrative Health (NCCIH) of the NIH (3KL2TR002490-02S1). It is a 3-year project (2019-2022) with a $256,731 budget.

Program, Materials, or Methodology: The Therapist Education and Massage for Parent-Infant Outcomes program (TEMPO) is a structured, therapist-led program developed to train and support parents to deliver PDMIs and massage beginning in the first 4 weeks of life and continuing throughout the first year of life. TEMPO uses weekly educational sessions during hospitalization and digital platforms after hospital discharge to provide education and support until the infant is 12 months old (corrected age). One aspect of this study that is innovative is the inclusion of a secondary parent (usually the biological father). An additional innovation is that the TEMPO program enhances standard care by structuring the nature and frequency of therapist-parent interactions to increase the parent's comfort with massage and mobility activities with their infant. Parents have the option of in-person or virtual education sessions to optimize convenience and regularity of visits.

This was a prospective single group, non-randomized study of 30 infant-parent dyads. The primary objective of this program was to conduct a pilot study to demonstrate TEMPO's feasibility and acceptability (Aim 1). Secondary objectives included refinement of TEMPO to facilitate PDMIs and massage during neonatal intensive care hospitalization and after discharge based on the quantitative and qualitative data from Aim 1, and to use the sample data to estimate population parameters needed for planning a future study.

Regarding outcome measures, the following infant sociodemographic factors are being collected: date of birth, gestational age at birth, birth weight, and race/ethnicity. The following parent factors are being collected via survey: age, race/ethnicity, highest education completed, insurance type. Parent outcome measures include the Acceptability of Intervention Measure (AIM), Feasibility of Intervention Measure (FIM), Patient-Reported Outcomes Measurement Information System Adult Profile Short Form Anxiety (PROMIS-Anxiety), Centers for Epidemiologic Studies Depression Scale (CESD), Parenting Sense of Competence Scale (PSOC), Postnatal Attachment Questionnaire (PAQ) or the Paternal Postnatal Attachment Questionnaire (PPAQ) depending on maternal or paternal status, salivary cortisol pre and post-massage session, and a parent interview. Optional secondary parent measures include the Fetzer Original Attachment Questionnaire-Question 1 only (FOA-1) and the PAQ or PPAQ, depending on maternal or paternal status. The following infant outcome measures are being collected: salivary cortisol pre- and post-massage, Infant Behavior Questionnaire-Revised Very Short Form (IBQ-R Very Short), Test of Infant Motor Performance (TIMP) at hospital discharge, and the Bayley Scales of Infant Motor Development-IV (BSID-IV) at 12 month follow-up.

Our central hypothesis is that parent participation in the TEMPO program will reduce symptoms of anxiety and depression, while increasing parent sense of competence and parent-infant bonding. We anticipate that thee parental outcomes will mediate infant motor outcomes both in the hospital and at follow-up.

Impact or Results: Through this ongoing NCCIH-funded KL2 pilot study, TEMPO has already demonstrated high levels of feasibility and parent acceptability (Aim 1), as well as potential effectiveness. At the time of this proposal, 100% of parents (24/24) approached consented to participate, and all parents of surviving infants remained enrolled for the duration of hospital stay. At discharge, 100% of parents "agreed" or "completely agreed" that TEMPO was feasible and acceptable on the Feasibility and Acceptability Intervention Measures. At 2-month outpatient follow-up, 80% of parents reported doing daily PDMIs, and 100% reported doing massage at least 2-3 times weekly. Furthermore, in mothers for which both pre and post-massage salivary cortisol levels were recorded, 90% had reduced salivary cortisol levels post-massage, indicating a potential neurobiological mechanism for how this intervention alleviates maternal stress. Given high levels of compliance and promising preliminary results, we plan to further define appropriate dosage, frequency, and refinement of the TEMPO intervention in a future pragmatic trial (Aim 2).

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Learner Objectives:

At the end of this presentation, the learner will be able to:

1. Describe a comprehensive parent education program that includes motor and massage activities for extremely preterm infants in the NICU.
2. Describe the benefits of infant massage for parents and extremely preterm infants.
3. Consider implementing portions of TEMPO through creative evaluation of their own NICU's resources, structure, and discipline-specific expertise.

Gravens2021-28

Abstract Title: More Psychologists Needed in the NICUs Across the Country: A national survey's results

Authors' names, degree(s), and institution:

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Lacy Chavis, Psy.D. John Hopkins All Children's Hospital, St.Petersburg, FL

Background and Purpose:

Consultation and therapy provided by doctoral level, uniquely trained psychologists in Neonatal Intensive Care Units (NICU) is a growing field. Psychologists provide great value in a NICU setting because of the knowledge and training they have on Perinatal Mood and Anxiety Disorders, Infant and Early Childhood Development, and Infant Mental Health, or the power of the relationship between an infant and their caregiver. NICU psychologists can meet the needs of both the infant and the parent(s) as they experience a life altering traumatic event.

While psychologists in the NICU may seem like an obvious choice, there are few NICUs across the country that have a dedicated psychologist to meet the ongoing needs of families in the NICU. As members of the National Network of NICU Psychologists (NNNP), one of our missions is to expand the service of NICU psychology in NICUs across the nation. We recognize this will help families to reach their highest potential despite the unfortunate incidence of a NICU hospitalization and the medical needs or complications that may follow.

Budget and Resources:

We did not have a budget for this project. We donated our time, in kind. We administered an electronic survey using google forms.

Program, Materials, or Methodology:

In order to make a case for units without a dedicated psychologist, we wanted to look at the psychology services provided by US News and World Reports' top hospitals. We pulled a list from 2015-2019 of hospitals that ranked in the top 50 institutions for the specialty of Neonatology. We obtained a list of 67 national hospitals. From this list, we filled in contacts that included psychologists, social workers, nursing directors, parent coordinators, or administrative staff. The survey was sent to these contacts who were given a month to respond to the 19 question survey. They were sent two reminders over the course of survey timeline, in addition to the initial email invitation. There were no incentives provided for the completion of the survey.

There were two main limitations to the project. The first was that there were 14 institutions that were ranked in the US News and World Reports top 50 hospitals however, we were unable to locate an appropriate contact to send the survey. Additionally, of the 53 institutions that received the survey only 16 completed the survey. It is worth noting that all of the institutions that responded to the survey had psychology services available in their NICU at varying capacities.

Impact or Results:

With the data collected, we hope to encourage and support new NICU psychologist positions across the country. US News and World Reports now acknowledges having a dedicated NICU psychologist as a quantifiable asset contributing to the overall score of a Neonatology Division. The results from this survey will be used to construct an advocacy tool that others can use to demonstrate the need, the importance, and the foundational structure for a NICU psychologist position. These results will also be written up in a manuscript to highlight the psychology services currently provided by several US News and World Reports top ranking hospitals in Neonatology.

The survey was sent to 53 respondents and we received 16 responses from 15 different institutions. It is worth noting that all respondents had psychologist services available in the NICU in some capacity. About 69% respondents have a dedicated psychologist for the NICU and of these there was considerable variability in percentage of FTE dedicated to neonatology, (n=5) had 100% of time; (n=2) 80-90% time; (n=2) 30% time; (n=7) 10-20% time allocated. Strikingly, 36% (n=4) indicated psychology services were restricted to outpatient follow-up clinic. Ninety four percent (n=15) of respondents work in an environment with a Fetal Care Center (FCC) affiliated with a children's hospital, and 40% (n=6) have a psychologist dedicated to a FCC. The majority of providers (69%) are billing for services with health and behavior codes being the prominent method (n=9) and also psychotherapy codes (n=2). All respondents indicated having social work support dedicated to the NICU. Psychology training experiences in the NICU are offered at half of the institutions (n=8), with 75% of these opportunities being at the doctoral or post-doctoral level.

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Learner Objectives:

1. Identify range of psychology services available across sample of fetal care and level 3-4 NICUs
2. Discuss opportunities for further growth within the field of NICU psychology to ensure adequate support for infants and families, during and after their NICU experience.

Gravens2021-32

The Use of Telemedicine for Assessment of Neurodevelopmental Delays During the 2020 COVID-19 Pandemic

Leslie-Anne Dietrich, MD, Alicia Quim, BA, and Alice Gong, MD

Contact Info: University of Texas Health San Antonio, San Antonio, TX, Email DietrichL3@uthscsa.edu

Presentation Preference: Oral Abstract Session and/or Poster

Presentation

Background and Purpose:

Coronavirus disease 2019 (COVID-19) was declared a pandemic by the World Health Organization on March 11, 2020. As stay at home orders were instituted in-person scheduled visits at the University Hospital neurodevelopmental follow-up (PREMIEre) program declined.

The PREMIEre program has provided follow through care for high risk infants discharged from the level IV Neonatal Intensive Care Unit (NICU) at University Hospital in San Antonio, TX since 1979. The population is majority Hispanic from San Antonio and surrounding Texas and Mexico regions. Criteria for follow through care are infants born ≤ 32 weeks gestational age (GA) and/or ≤ 1500g birthweight, as well as infants at high risk for neurodevelopmental delays (ex. meningitis, hypoxic ischemic encephalopathy, stroke). The children are monitored for developmental progress until 3-5 years of age. The staff consists of 2 neonatologists, 1 Pediatric nurse practitioner, 1 psychologist, and 3 case managers. Four staff are certified in performing the Prechtl General Movements Assessment (GMA), 6 in the Hammersmith Infant Neurological Evaluation (HINE), 3 in the Bayley Scales of Infant Development (BSID) and 1 in the Differential Ability Scales (DAS).

The GMA, based on visual Gestalt perception from video recordings of infant's body movements from birth to 20 weeks corrected gestational age (cGA), has a 95-98% sensitivity of risk for cerebral palsy (CP) during the fidgety timeframe. The HINE is used for early CP identification in infants 2-24 months; a score < 56 at 3 months has a 90% sensitivity and predictability of CP. Beginning Spring 2019 we integrated the GMA and HINE into our clinic's neurodevelopmental testing algorithm. In January 2020 we transitioned from the BSID-III to the digital format of the BSID-IV and BSID-IV Social-Emotional and Adaptive Behavior (BSID-IV SOEM ADBE). The Vineland-3 Adaptive Scales (Vineland-3) is a caregiver-completed questionnaire that provides additional information on social and adaptive behavioral domains of the child.

The COVID-19 pandemic brought progress to a halt. Supporting neurodevelopment of our most fragile patients is important, more so during a pandemic. Many of our families have difficulties providing neurodevelopmental activities their children need with school closures and virtual therapies. In Summer 2020 we developed a process of telemedicine-based visits. We hypothesized that telehealth visits, although limited in physical interaction with children, could help identify neurodevelopmental delays to allow for continued referral for services, and maintain family support.

Program/Methodology:

Our team worked together to problem solve and develop a plan such that neurodevelopmental monitoring continued. We considered tests that could be conducted virtually and remain valid and reliable. We took into account parent capabilities, language barriers, and staff availability. We elected to use the virtual HINE (vHINE), GMA, Ages and Stages Questionnaire (ASQ-3), BSID-IV SOEM ADBE and Vineland-3. The ASQ-3 was administered via phone and the BSID-IV SOEM ADBE and Vineland-3 could be administered electronically. Our previously in-person weekly clinic meetings were converted to video.

For our patients, a GMA was obtained prior to NICU discharge and again via WebEx video meeting at 3-4 months cGA along with a vHINE. If normal, we would schedule the next visit for 1-year cGA; if abnormal, we had a follow-up vHINE in 3-4 months. For the vHINE instructions were reviewed with the family prior to scheduled visit. During the visit a caregiver is given step by step verbal instruction with use of a doll prop on how to perform the exam and the health care provider observes and scores. An ASQ-3 is also performed to complete the assessment.

For patients ≥12 months, we initially trialed the Vineland-3 and subsequently, transitioned to the BSID-IV SOEM ADBE and ASQ-3 for children ≥12 months, but < 3 years old and the Vineland-3 for children 3-5 years old.

Results:

We have had 123 visits completed. We have performed 22 GMAs (2 poor repertoire and 20 positive fidgety) and 37 vHINEs (mean score 63.3 ±5.5, 2.3 ± 1.8 asymmetries). Parents completed 67 ASQ-3s, 47 Vineland-3s, and 23 BSID-IV SOEM ADBEs. In the Vineland-3 13 communication, 14 daily living skills, 11 socialization, 16 adaptive behavior, and 15 motor skills scores were moderate-low to low. In the BSID-IV SOEM ADBE 13 communication, 9 daily living skills, 11 socialization, 9 adaptive, and 8 social-emotional scores were low-average to extremely low. Twenty-nine patients referred for additional services, mainly speech therapy. Three patients were identified as potentially being at high risk for development of cerebral palsy (CP). We recognize the vHINE has not yet been validated as a tool for identifying early CP. Furthermore, there is the possibility of inaccurate reporting by caregivers on the questionnaires.

Conclusions:

Challenges met during this process include lack of family access to internet and technology, family's limited time to complete questionnaires and telehealth visits, technological difficulties for caregivers and staff, and family resistance to virtual therapy visits. Our clinic staff also dealt with transition to a new electronic medical system. Additionally, clinic faculty had to ensure the telehealth format would translate well for learners (students, residents, and fellows).

There is no replacement for in-person visits and the ability of a provider to perform a physical exam and neurodevelopmental testing. But we have found benefits to this unique telehealth-based model. Compliance has improved. We are able to reach families who live in rural Texas communities and Mexico. In the future, telemedicine could be considered as a tool for follow through of families who have difficulty completing in-person visits and would otherwise be lost to follow-up. We have shown feasibility in the setting of a pandemic and that telemedicine can be useful in assessment and management of neurodevelopment of a high-risk pediatric population.

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Gravens2021-43

Abstract Title: Parents' Infant Feeding Decision-Making Experiences in the Neonatal Intensive Care Unit (NICU): A Proposed Feminist Poststructural Exploration.

Authors:

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Marjolaine Héon, PhD, RN, Faculty of Nursing, Université de Montréal

Background & Purpose: Ensuring optimal nutrition for premature and/or critically ill infants is a key concern for NICU healthcare providers given the impacts of early nutrition on short and long-term health outcomes[1,2]. Feeding trajectories for NICU infants are diverse and influenced by a myriad of factors, many of which lie outside of the family's control. In a breast(chest)feeding-dominant culture, NICU parents are tasked with making complex infant feeding decisions, such as whether to breast(chest) feed, express their own milk, provide donor milk, formula feed and many combinations of these methods. Coupled with other stressors of NICU parenthood, the additional expectations related to infant feeding decisions may impact long-term parental mental health. Notably, the distinct pressures to breast(chest) feed can lead to destructive feelings of anxiety, guilt, and shame,[3,4]. Adding to these complexities, the ongoing COVID-19 pandemic has generated conflicting information about lactation safety and family presence in the NICU, particularly if a parent tests positive for COVID-19[5]. Consequently, NICU parents and care providers are now navigating infant feeding-related decisions during increasingly complicated times. As such, the proposed critical qualitative study will use a Feminist Poststructural (FPS) approach to address the overarching research question: *What are the experiences of parents related to their infant feeding decisions in the NICU setting?* The objectives are to explore and deconstruct:

- How the socio-cultural, political, institutional and gendered understandings of infant feeding influence NICU parents' feeding-related decisions.
- The influence and impact of 'outsiders' (e.g., the NICU healthcare team, other family members and/or friends) on NICU parents' infant feeding decisions.
- How NICU parents navigate relations of power relative to their infant feeding decisions.
- The impacts of the COVID-19 pandemic as perceived by parents relative to their infant feeding decisions while admitted to the NICU.

Methodology: Guided by a feminist poststructural (FPS)[6] framework, the experiences of ~10 to 12 purposively-sampled NICU parents whose infants were admitted to a mixed Level II/III NICU in Atlantic Canada will be explored via in-depth, semi-structured, individual, face-to-face interviews. The use of a FPS framework in nursing research offers the ability to understand, challenge and change the personal, social and institutional 'status quo' practices in various settings[7]. It supports the critical exploration of relations of power, agency, and language while also identifying areas requiring action and change[8,9]. In order to understand NICU parents' infant feeding decisions, Discourse Analysis (DA) will be used to interpret their verbatim interview transcripts. DA is considered to be a cornerstone of FPS methodology[7]. Using an iterative process, the interviews, analysis and interpretation will occur concurrently. Throughout the proposed study, NICU Parent Partners and other key unit stakeholders, including direct care RNs, clinical nurse specialists, lactation consultants, neonatologists and the NICU leadership team will be active collaborators in the research process. An audit trail and ongoing researcher reflexivity practices will be employed throughout.

Potential Impact: A review of current scholarly discourses demonstrates that in-depth, critical explorations of NICU infant feeding decision-making are lacking. Existing literature in this area largely focuses on decision-making processes more broadly, with decisions related to infant feeding either briefly mentioned or only forming a very small portion of a larger study. To the best of our knowledge, none have applied a feminist poststructural approach to explore NICU parents' infant feeding decision-making experiences. Ultimately, it is anticipated that using this dynamic lens will offer a novel approach to NICU infant feeding research, supporting actions to empower parents in their infant feeding decisions as well as to inform future intervention studies[6]. Lastly, it is anticipated that the participant narratives emerging from the proposed exploration will provide timely insight into parents' feeding experiences in the wake of the global COVID-19 pandemic.

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COVID-19

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HYGIENE TIPS

MOUTH
- Wear a face mask or face shield.
- If in car, wear mask & put windows down.
- NO cloth face masks for children younger than 2yrs.
- Avoid kissing

EYES
Wear protective eye gear (glasses)

HANDS
ALWAYS wash your hands

CLOTHING
- Wear a jacket when dealing with infected.
- DO NOT share clothing, sheets, or pillows.

SELF ISOLATION

- Sick should be separate from household.
- Room with window preferred
- Aerate room 3x day.
- Create a room divider with sheet.
- Keep water and sanitation liquids near
- Keep garbage bag in room.
- Don't cuddle with pets.

6 FT

Practice social distancing

BATHROOM

- Sanitize EVERYTHING.
- Clean after every use.
- Patient gargle Listerine every morning & night.

KITCHEN

- Use SEPARATE utensils.
- Clean utensils separately.
- If sick avoid the kitchen.

TRACK COVID-19 NEAR YOU BY VISITING COVIDNEARYOU.ORG

#STOPTHESPREAD

PROTECT

- If infected, notify everyone in contact from the past 10 days.
- Ask Dept. of Health for further assistant.
- Call 211 for FREE delivery services.

If you are feeling sicker, DON'T WAIT. Call your doctor immediately.

MIORA

Visit Miora.org

Brought to by Miora in partnership with United2Care

COVID-19

DETENER LA PROPAGACIÓN EN CASA

Qué hacer cuando usted o un ser querido está infectado.

CONSEJOS DE HIGIENE

BOCA
- Use una mascarilla o careta
- Si está en el automóvil, use una máscara y baje las ventanas
- NO mascarillas de tela para niños menores de 2 años.
- Evitar besos

OJOS
Use equipo de protección para los ojos (lentes)

MANOS
SIEMPRE lávate las manos

ROPA
- Use una chaqueta cuando se trata de infectados.
- NO comparta ropa, sábanas o almohadas.

AISLAMIENTO

- Los enfermos deben estar separados del hogar.
- Habitación con ventana preferida
- Airear la habitación 3x al día
- Crea un separador de ambientes con sábana.
- Mantener agua y líquidos de saneamiento cerca
- Mantenga una bolsa de basura en la habitación.

6 FT

Practica el distanciamiento social

BAÑO

- Desinfecte TODO.
- Limpiar después de cada uso
- El paciente hace gárgaras con Listerine todas las mañanas y noches.

COCINA

- Use utensilios SEPARADOS.
- Limpie los utensilios por separado.
- Si está enfermo, evite la cocina.

SIGUIR COVID-19 VISTAR COVIDNEARYOU.ORG

#STOPTHESPREAD

PROTEGER

- Si está infectado, notifique a todos los contactos de los últimos 10 días.
- Pídale al Departamento de Salud por más ayuda.
- Llame al 211 para obtener servicios de entrega GRATUITOS.

Si te sientes más enfermo, NO ESPERES. Llame a su médico de inmediato.

MIORA

Visitar Miora.org

Traído por Miora en asociación con United2Care

Ways to Manage Covid 19 @ Home

Household

1. Stay 6 feet apart from others at all times.
2. Wear protective covering over mouth and eyes (mask AND shield/goggles/glasses) when near others. (Do not put masks on children under 2 years old)
3. Gargle with antiseptic mouthwash in the morning and evening.
4. Wash hands 10-12x a day, before each meal for at least 20 seconds.
5. Keep good ventilation throughout home. (open windows/doors) where possible
6. Do not share towels, blankets, pillows with sick.
7. Call 211 for assistance/free delivery of services.
8. Wear protective clothing (jacket, gloves, mask) that can be removed after being around infected.

Stop the Spread at HOME

MIORA

Sick

1. Self-isolate by staying in separate room with separate bathroom where possible. Don't go into shared spaces.
2. Create a room divider with sheet, if shared space is unavoidable.
3. Ventilate room with fresh air at least 3x per day.
4. Keep water and sanitation products in room.
5. Keep plastic garbage bag in room.
6. Protect pets - don't cuddle.
7. Notify contacts in last 10 days.
8. Don't wait! Call doctor if symptoms get worse.

Maneras de manajer COVID-19 en casa

Hogar

1. Manténgase 6 pies de distancia de los demas en todo momento.
2. Use una cubierta protectora sobre la boca y la máscara para los ojos Y el protector / gafas / anteojos cuando esté cerca de otras personas. No ponga máscaras a niños menores de 2 años.
3. Hacer gárgaras todas las mañanas y noches con productos de enjuague bocal antiséptico que contienen alcohol.
4. Lavesé la manos 10-11 veces al día, y antes de cada comida por lo menos 20 segundos.
5. Mantéga Buena ventilacion en toda la casa. Abra las ventanas y puertas cuando sea posible.
6. No compartá toallas, cobijas, y almohadas con personas que esten infectados.
7. Llame al 211 para obtener servicios de entrego gratuitos.
8. Use ropa protectora, chaqueta, guantes, máscara que se pueda quitar después de estar cerca de infectados.

Detén la propagacion en casa

MIORA

Enfermo

1. Aíslese permanecindo en una habitación separada con baño separado. No vayas a espacios compartidos
2. Si no se puede aislarse crea un separador de ambiente con una sabana.
3. Ventile la habitacion con aire fresco por lo menos 3 veces al dia.
4. Mantenga agua y productos de saneamiento en la habitacion.
5. Mantenga una bolsa de basura en la habitación.
6. Proteja a las mascotas, no las abrace.
7. Notifique a todos los contactos de los últimos 10 días.
8. No espere! Si se siente peor llame a su medico.

SHARED DECISION-MAKING

PROTECTS PARENTS + BABIES

COVID-19

INFORMED PROVIDERS

- **S**eek participation
- **H**elp explore options
- **A**ssess preferences
- **R**each a decision
- **E**valuate the decision

CARE DELIVERY REQUIRES PARTNERSHIP

NPA

NANN

nationalperinatal.org/NPAandNANN

NATIONAL PERINATAL ASSOCIATION

CORONAVIRUS

COVID-19

RELIABLE RESOURCES:

- CDC: 2019 Novel Coronavirus
- The Lancet: COVID-19 and pregnancy
- MotherToBaby: Coronaviruses
- WHO: Emerging respiratory viruses

STAY INFORMED.

National Perinatal Association

www.nationalperinatal.org

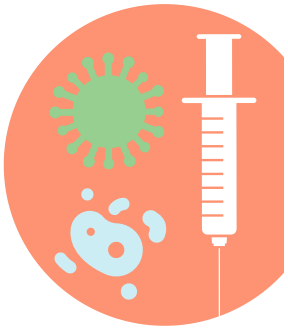
PROTECT YOUR FAMILY FROM

RESPIRATORY VIRUSES

flu coronavirus pertussis RSV

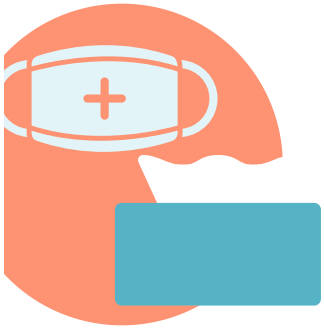
WASH YOUR HANDS

often with soap and water for 20+ seconds. Dry well.



GET VACCINATED

for flu and pertussis. Ask about protective injections for RSV.



COVER COUGHS AND SNEEZES.

Sneeze and cough into your elbow.

USE A HAND SANITIZER THAT IS 60%+ ALCOHOL.

STAY AWAY FROM SICK PEOPLE

Stay at home to protect vulnerable babies and children. Avoid crouds when out.

National Perinatal Association

nicuparentnetwork.org

nationalperinatal.org

NPN NICU PARENT NETWORK

SHARED DECISION-MAKING PROTECTS MOTHERS + INFANTS DURING COVID-19

KEEPING MOTHERS + INFANTS TOGETHER

Means balancing...

Risk of horizontal infection

Risks of separation and trauma

EVIDENCE

We encourage families and clinicians to remain diligent in learning **up-to-date evidence**.

PARTNERSHIP

SHARED DECISION-MAKING

What is the best for this unique dyad?

- **S**EEK PARTICIPATION
- **H**ELP EXPLORE OPTIONS
- **A**SSESS PREFERENCES
- **R**EACH A DECISION
- **E**VALUATE THE DECISION

TRAUMA-INFORMED

Both parents and providers are confronting significant...

- FEAR
- GRIEF
- UNCERTAINTY

LONGITUDINAL DATA

We need to understand more about outcomes for mothers and infants exposed to COVID-19, with special attention to:

- MENTAL HEALTH
- POSTPARTUM CARE DELIVERY

NEW DATA EMERGE DAILY.
NANN AND NPA ENCOURAGE PERINATAL CARE PROVIDERS TO ENGAGE IN CANDID CONVERSATIONS WITH PREGNANT PARENTS PRIOR TO DELIVERY REGARDING RISKS, BENEFITS, LIMITATIONS, AND REALISTIC EXPECTATIONS.

Partnering for patient-centered care when it matters most.

National Association of Neonatal Nurses

nann.org

National Perinatal Association

nationalperinatal.org

NICU-NET

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Peer Reviewed

Technical Brief: The Importance of Bioactivity in Human Milk and Human Milk–Based Products

Mindy Fuzsey, RNC-NIC, MSL-BC, Biranchi Patra, PhD, MBA

Adequate, appropriate nutrition is vital for optimal growth and development in infants born prematurely. Human milk is a complex, dynamic, bioactive fluid with a myriad of compounds that make it the perfect nutrition for infants. Human milk also provides many protective factors against morbidity and mortality. (1) Numerous studies have been conducted to identify the components of human milk and their influence on infant health and development. Many bioactive compounds are now recognized for their importance in immunity, growth, neurodevelopment, and overall long-term health as outlined in the table below.

"Numerous studies have been conducted to identify the components of human milk and their influence on infant health and development. Many bioactive compounds are now recognized for their importance in immunity, growth, neurodevelopment, and overall long-term health as outlined in the table below."

Intake of human milk is especially critical for babies born prematurely, with a mother's own milk (MOM) being the best feeding option. In addition to supporting growth, development, and immunity, human milk has been shown to help mitigate the primary morbidities of prematurity, including necrotizing enterocolitis (NEC), retinopathy of prematurity (ROP), bronchopulmonary dysplasia (BPD), and late-onset sepsis (16,17) There are often barriers to an adequate supply of MOM while premature infants are in the neonatal intensive care unit (NICU). Maternal/infant separation, the physical mechanics of pumping or hand expression, maternal illness, stress, and anxiety all play a role in the production of MOM. (18)

When an adequate amount of MOM is not available, the use of donor human milk is recommended. (19) Similar to human blood and plasma, human milk carries with it the risk of pathogen transmission. In order to ensure donor human milk is safe for this vulnerable NICU population, it must undergo a pathogen inactivation process to remove potential transmissible microbiological contaminants.

Pathogen Inactivation Methods

There are several methods of pathogen inactivation in use by donor milk providers. Each method has a different effect on the bioactivity of components found in human milk.

Vat and Holder Pasteurization: Heating milk to a set temperature to inactivate contaminants, including bacteria and viruses. The process may reduce the activity and concentration of milk en-

Component	Bioactive Compound	Function
Protein	Immunoglobulins	Protect against bacterial and viral infections by binding pathogens, neutralizing toxins and viruses, and blocking colonization and penetration of pathogens. (2)
	Lactoferrin	Bacteriostatic and bactericidal activities; antiviral and antifungal properties; helps control excess inflammatory response by reducing oxidative stress at the molecular level. (3-6)
	Lysozyme	Supports antibacterial (6) and immunoprotective functions (7)
Fat	Arachidonic Acid (ARA)	Supports growth, brain development, immunity, and immune response (8)
	Docosahexaenoic Acid (DHA)	Supports myelin sheath and brain cell membrane development; supports retinal photoreceptor development. (9)
	Linoleic Acid/a-Linolenic Acid (LA/a-LA)	Precursors of ARA and DHA; essential fatty acids must be obtained through the diet. Fatty acids are necessary for the maturation of multiple organ systems, growth, and regulation of inflammation in infants. (10-11)
	Milk Fat Globule (MFG)	Provides rapid availability of energy; influences lipid metabolism and absorption rates; contains essential fatty acids, DHA, and ARA. (12-13)
	Milk Fat Globule Membrane (MFGM)	Supports structural and functional maturation of the infant gastrointestinal tract; modulation of the gut microbiota; antimicrobial, anti-inflammatory, and prebiotic functions; cognitive development (6, 12-14)
Carbohydrate	Human Milk Oligosaccharides (HMOs)	Prebiotic (supports commensal bacteria), antimicrobial, anti-inflammatory; may modulate the immune response and support brain development and cognition. (15)

zymes and some bioactive proteins.

Retort Sterilization: Commercial canning method that exposes milk to high temperature and pressure. This method inactivates bacteria and viruses and results in greater damage to bioactive proteins compared to vat and Holder pasteurization. (20)

The Impact on Protein

Of the many nutrients in human milk, protein is essential for growth, neurodevelopment, and immune response in premature infants. Human milk proteins are especially complex and susceptible to the various processing methods used in the dairy and food industries, including shearing (or pressure) and temperature. Since the physiochemical properties of individual proteins differ, processing affects the proteins differently. For example, whey proteins, including immunoglobulins, are heat labile and can be wholly denatured with heat. (21)

The impact on proteins from the combination of pressure and temperature varies. When the shear rate (breaking down) and the temperature are both low, changes to the proteins are reversible. However, once the temperature exceeds 72°C and fragmentation and reformation of aggregates occurs, those changes result in permanent protein damage. (22)

A protein's function depends on its structure; therefore, scrutiny must be given to human milk processing methods. Irreversible changes to protein structure, which likely occur with retort sterilization, will negatively impact biological function.

Damage to antibodies due to high temperature and pressure causes the loss of shape, removing the ability to recognize and bind to antigens, the protective feature antibodies typically provide. (23) Studies suggest that some milk proteins are particularly resistant to proteolysis in the infant gastrointestinal tract, which may reflect the importance of these proteins remaining intact for non-nutritional bioactive function. By remaining intact, for example, secretory IgA (sIgA) can aid in the development of the infant's immune system and protect against infection. (24)

"Milk homogenization and heating milk to high temperatures cause structural and compositional changes to the MFGM may decrease MFGM bioactivity. Homogenized MFGMs lack the structural integrity to exert functions in the digestive tract, where bioactivity is needed for gut health."

Human Milk Homogenization

Milk homogenization and heating milk to high temperatures cause structural and compositional changes to the MFGM may decrease MFGM bioactivity. Homogenized MFGMs lack the structural integrity to exert functions in the digestive tract, where bioactivity is needed for gut health. Heating at 80°C (176°F) for 10 minutes may cause extensive protein denaturation and formation of supramolecular aggregates. (25)

Human milk gangliosides are important components of the MFGM with implicated bioactivities in neural and brain development and maturation of the immune system and the gastrointestinal tract. While different heat treatments appear to have similar effects on the individual and total MFGM ganglioside content of human milk, homogenization in combination with heat treatment may have a negative impact. Specifically, Salcedo et al. (2018) found that Holder pasteurization, high-temperature, short-time (HTST), ultrahigh temperature (UHT), and retort sterilization had a small but variable effect on the individual and total MFGM ganglioside content. However, the authors postulate that homogenization of milk may alter the digestibility and/or bioavailability of MFGM gangliosides due to the disruption of the MFGM structure. This release of gangliosides from the disrupted MFGM likely makes them more sensitive to heat treatment and may result in reduced biological activity. (26)

Effects of Processing on Bioactive Components

In 2018, the Journal of Human Lactation published study results comparing the macronutrient (protein, carbohydrate, fat), immune-protective protein, and HMO content of human milk from three independent milk banks that use pasteurization (Holder vs vat techniques) or retort sterilization. Results showed that protein and fat concentrations were significantly ($P < .05$) less in the retort sterilized samples compared with the Holder and vat pasteurized samples, respectively. The concentrations of IgA, Immunoglobulin G, Immunoglobulin M, lactoferrin, lysozyme, -lactalbumin, casein, osteopontin, and alpha-1-antitrypsin proteins were significantly ($P < .05$) less in the retort sterilized samples compared with vat and/or Holder pasteurized samples. The total HMO concentrations with vat pasteurization were similar to the human milk reference. The concentration of the HMOs containing fucose, sialic acid, and nonfucosylated neutral sugars was significantly ($P < .05$) less in retort sterilized compared with vat and Holder pasteurized samples. (20)

What is the take-away?

Bioactivity matters, and MOM is best. But when enough MOM is not available, it is vital to select the right human donor milk and/or human milk-based product. To ensure the preterm infants under your care have the best possible outcomes, select a product that has been extensively evaluated in multiple clinical studies with results published in peer-reviewed journals. Understanding the effects of the different processing methods on bioactivity will help you make a clinically sound decision when nurturing your fragile patients.

Click here to learn more about processing methods, industry safety standards, and bioactivity.

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READ NPA's statement: **BLACK LIVES MATTER**

Thirteen-year-old Emily Rose Shane was tragically murdered on April 3, 2010 on Pacific Coast Highway in Malibu, CA. Our foundation exists to honor her memory.

In Loving Memory

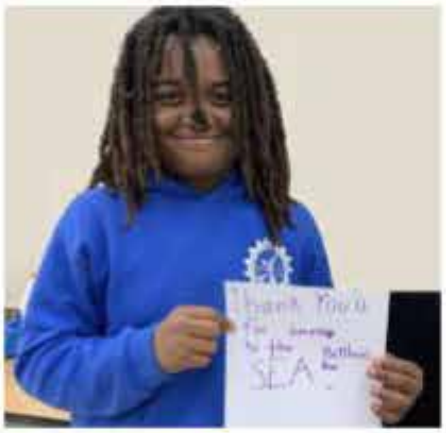
August 9, 1996 - April 3, 2010

Each year, the Emily Shane Foundation SEA(Successful Educational Achievement) Program provides academic and mentoring support to over 100 disadvantaged middle school students who risk failure and have no other recourse. We have served over 700 children across Los Angeles since our inception in the spring of 2012. Due to the COVID-19 outbreak, our work is in jeopardy, and the need for our work is greatly increased. The media has highlighted the dire impact online learning has caused for the very population we serve; those less fortunate. **We need your help now more than ever to ensure another child is not left behind.**

Make a Difference in the Life of a Student in Need Today!
Please visit emilyshane.org

Sponsor a Child in the SEA Program

The average cost for the program to provide a mentor/ tutor for one child is listed below.



1 session	$15
1 week	$30
1 month	$120
1 semester	$540
1 year	$1,080
Middle School	$3,240

The Emily Shane Foundation is a 501(c)3 nonprofit charity, Tax id # 27-3789582. Our flagship SEA (Successful Educational Achievement) Program is a unique educational initiative that provides essential mentoring/tutoring to disadvantaged middle school children across Los Angeles and Ventura counties. All proceeds directly fund the SEA Program, making a difference in the lives of the students we serve.

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Non-Linear Algorithms in Supervised Classical Machine Learning

Monalisa Patel, MD, John B. C. Tan, PhD, Fu-Sheng Chou, MD, PhD

Our June data science column discussed the differences between bottom-up statistical modeling and top-down machine learning modeling. In machine learning, we provide the machine with input and output data (the training data set), we choose one or more algorithms, and we provide a range of hyperparameters to the machine. The machine will "learn" the data and figure how to associate the input data with the output data. After "learning", we then test the machine with the test data set to assess the model's performance. We also used linear regression as an example to demonstrate how regularization (LASSO and Ridge) is used in machine learning to improve "prediction." This month, we would like to take a deeper dive into discussing two major types of classical machine learning and introducing several "non-linear" algorithms to the readers.

"This month, we would like to take a deeper dive into discussing two major types of classical machine learning and introducing several "non-linear" algorithms to the readers."

Supervised vs. Unsupervised Learning

The difference between supervised vs. unsupervised learning is whether output data is provided to the machine. In other words, supervised learning requires both input and output data, but unsupervised learning requires only input data. As you may have already guessed, unsupervised learning is performed to allow the machine to "learn" the patterns hidden in the data, with the goal of grouping observations that are similar together. A commonly used algorithm in unsupervised training is called "K-means clustering, " where K was provided for the machine to cluster the data into K groups. This type of machine learning can be used to study novel disease states or novel cell types based on clinical or molecular data (1).

"In supervised learning, on the other hand, both input and output data are provided. Based on that, the machine then creates a prediction model, which will create predictions on a new set of data (the testing data set)."

In supervised learning, on the other hand, both input and output data are provided. Based on that, the machine then creates a prediction model, which will create predictions on a new set of data (the testing data set). This supervised learning methodology will lead to classification (categorical data type, e.g., BPD or not) or regression (continuous data type, e.g., cognitive scores on Bayley-III). Some algorithms are only used for classification, some are only for regression, and some are applicable to both classification and regression.

Non-linear supervised machine learning algorithms

K-nearest neighbors

K-nearest neighbors (KNN) is a model that classifies data points based on the points that are most similar (closest) to it. It trains the machine to make an "educated guess" on how an unclassified point should be classified. It uses proximity as a representation for "sameness". The algorithm takes a bunch of labeled points and uses them to learn how to label other points. To label a new point, it looks at the labeled points closest to that new point (those are its nearest neighbors). Once it checks with the "K" number of nearest neighbors, it assigns a label based on whichever label most of the neighbors have. Using the geometric distance to decide which is the nearest item may not always be reasonable or even possible; the type of the input may, for example, be text, where it is not clear how the items are drawn in a geometric representation and

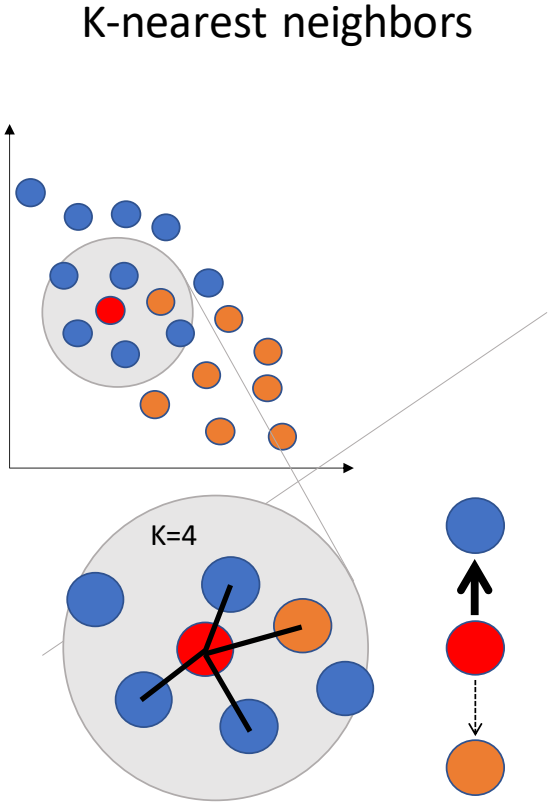

Figure 1. Visual depiction of the K-nearest neighbors algorithm.

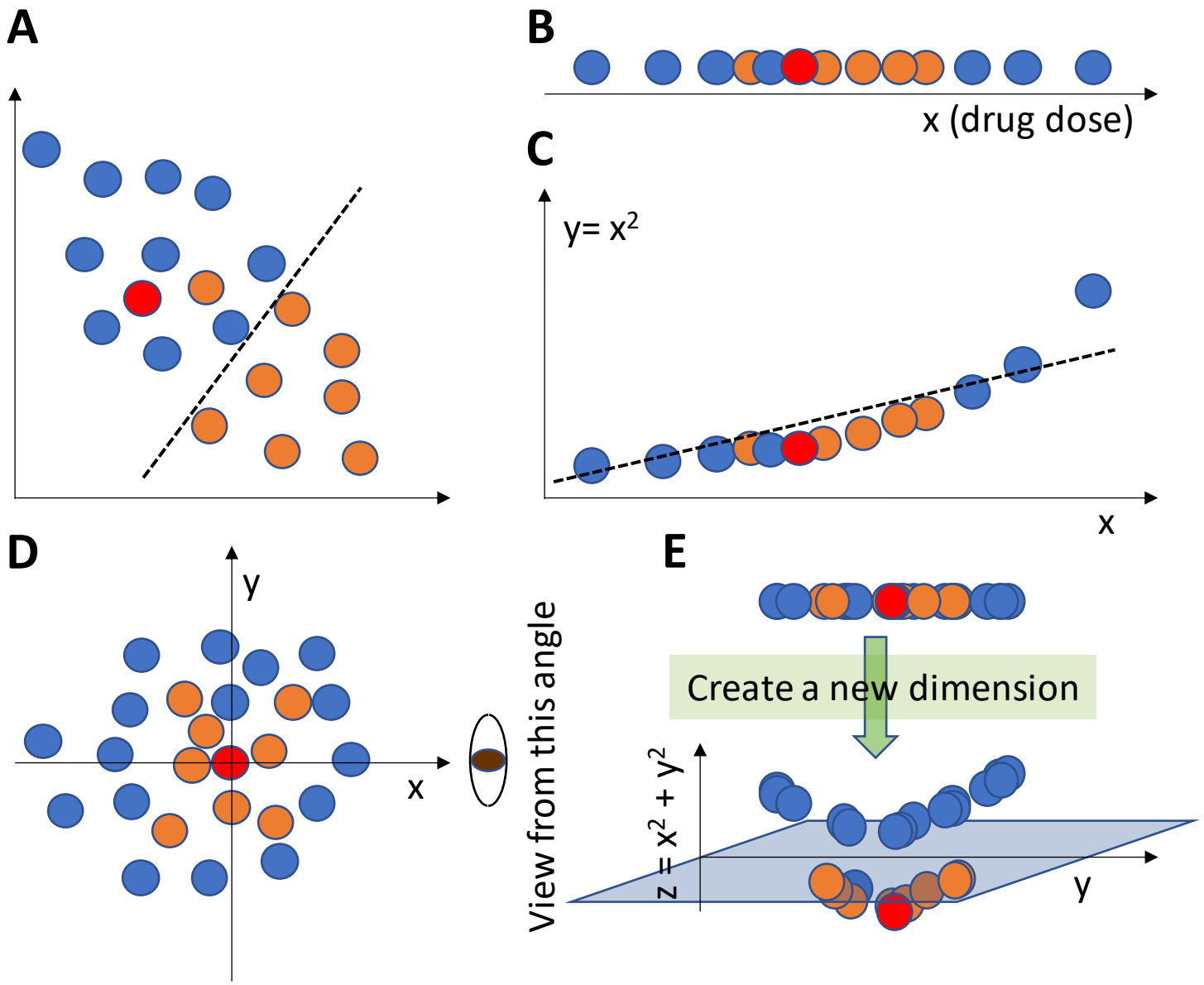

Figure 2. Visual depiction of support vector machine algorithms. (A) linear support vector machine. (B, C) Kernelized support vector machine with polynomial transformation. (B) Kernelized support vector machine with radial transformation in a 3-dimensional space. Note that in reality, a radial kernel is in a space with infinite dimensions, which is not illustratable.

how distances should be measured. One should therefore choose the distance metric on a case-by-case basis. KNN was used in the algorithm to predict diabetic retinopathy (2,3). Disadvantages include the susceptibility to overfitting (thus poor generalization), therefore not performing well in a high dimension dataset (as opposed to supporting vector machine, see below). Figure 1 showed a visual depiction of KNN.

Support vector machine

Support Vector Machine (SVM) is a supervised machine learning algorithm that can be used for both classification or regression challenges. However, it is mainly used in classification problems. In the SVM algorithm, we plot each data element as a point in n-dimensional space (where n is the number of features you have).

The value of each feature is the value of a particular coordinate. Then, we perform classification by finding a point/line/plane (the hyperplane) that differentiates the two classes very well. Support vectors are simply the coordinates of individual observations that are used to build a "soft margin" for classification, allowing some degree of misclassification in exchange for better generalizability (the bias-variance trade-off) (Figure 2A). Cross-validation is used to determine how much misclassification is allowed to have the best bias-variance balance. SVM can be linear or kernelized. When linear SVM is applied, it is assumed that the data are separable by a hyperplane that is one dimension lower than the data (Figure 2A).

"What if a hyperplane cannot easily separate the data? This is when kernel functions come into play. In the face of data that a hyperplane cannot be easily separated, kernel functions allow us to add dimensions to the data to allow for hyperplane separation, in other words."

What if a hyperplane cannot easily separate the data? This is when kernel functions come into play. In the face of data that a hyperplane cannot be easily separated, kernel functions allow us to add dimensions to the data to allow for hyperplane separation, in other words. Additional features are created (but not really from the computational standpoint, thanks to kernel tricks) to increase the dimensionality of the data, allowing us to separate data that were once inseparable. For example, in Figure 2B, where the x-axis denotes drug dose, the doses that are too high or too low result in one outcome (blue), and the doses in the middle result in the other outcome (orange). In this case, there is no single point that can successfully classify the outcome (into blue and orange). What a kernel function can do here is to bring in another dimension. For example, in Figure 2C, a polynomial kernel was introduced by having the y-axis be the drug dose to the power of two. In the two-dimensional space, the distance between two data points is calculated to identify the support vectors (the data points that establish the margin for each class). Subsequently, a line can be drawn to separate the two classes. In another example, the two-dimensional data are centered (Figure 2D). An imaginary eye is viewing the data from the end of the x-axis to render the view depicted in Figure 2E. Z-axis was added to the data by taking the sum of the square of the features x and y. Now the data can be separated by a horizontal plane that goes between class orange and class blue. This calculation is a simple example of another kernel function called the Gaussian radial basis function (RBF kernel or radial kernel). The radial kernel places the data points in a space with N dimensions where N is infinite, allowing a hyperplane of N-1 dimensions to separate the classes.

SVM can be used in image classification, spam detection, etc. It is very good for a small dataset with high dimensionality (many features or variables). The disadvantages of SVM are that it requires a high level of processing power. Additionally, the precise relationship between input and output features may be challenging to interpret, given high dimensionality. SVM use includes face

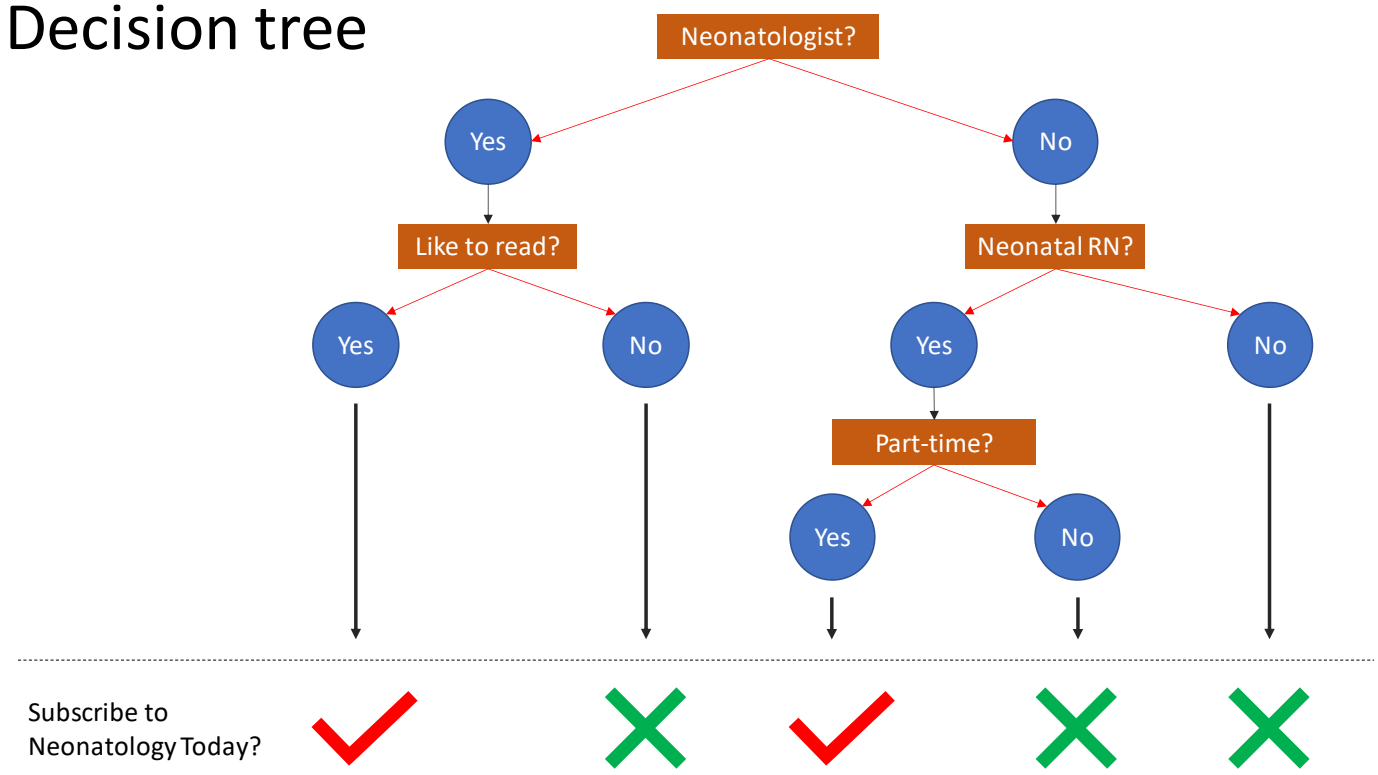

Figure 3. Visual depiction of a decision tree.

recognition, image classification, cancer classification, etc. (4).

Decision tree-based algorithm

Decision trees build classification or regression models in the form of a tree structure. It breaks down a data set into smaller and smaller subsets while at the same time an associated decision tree is incrementally developed. It works like a flow chart, separating data points into two similar categories at a time from the "tree trunk" to "branches" to "leaves," where the categories become more finitely similar. This situation creates categories within categories, allowing for organic classification with limited human supervision. The final result is a tree with decision nodes and leaf nodes. A decision node has two or more branches, and a leaf node represents a classification or decision. An example of a decision tree is depicted in Figure 3. Decision trees can handle both categorical and continuous data types but are particularly useful if the input data are categorical. Decision trees can help physicians identify patients at a higher risk of developing a serious condition or needing an intervention such as mortality or requiring a gastrostomy tube placement (5–7). The disadvantage of decision trees is that they do not work well with smaller datasets, and decision trees are very prone to overfitting with the training data, and therefore not generalizable. They are also very sensitive to small changes in the input data. For the above reasons, the random forest algorithm was developed, in which case hundreds to thousands of trees were generated, each taking a subset of the features in the data set. Random forest takes care of the issues associated with hypersensitivity to small changes in the data and overfitting. However, it does not address another disadvantage with decision tree-based algorithms: the intolerance of missing values in the data set.

"Random forest takes care of the issues associated with hypersensitivity to small changes in the data and overfitting. However, it does not address another disadvantage with decision tree-based algorithms: the intolerance of missing values in the data set."

Summary

In this article, we introduced the definitions of supervised vs. unsupervised learning. We also introduced three non-linear classical machine learning algorithms, namely KNN, SVM, and the decision tree. These non-linear algorithms distinguish themselves from traditional clinical research by rethinking the linear assumptions of the data to quantify the association between the independent and dependent variables. We hope you enjoyed the read.

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Disclosure: The authors identify no conflict of interest

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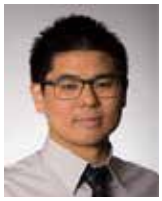

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Neonatology Today's now has a digital presence. The site is operational now and defines the future look of our digital web presence. By clicking on this https://www.neonatologytoday.org/web/., researchers can download individual manuscripts both in digital format and as part of the original PDF (print journal). While the PDF version of Neonatology Today will continue in its present form, we envision that the entire website will be migrated to this format in the next several months. We encourage you to take a look, "kick the wheels," and let us know where we still need to improve.. We are working towards making the website more functional for subscribers, reviewers, authors and anyone else. Although we have not yet applied for inclusion in the National Library of Medicine Database (Pub-Med), this new format meets several of the important metrics for this ultimate goal. As of December, 2020, NT has its own account with CrossRef and will assign DOI to all published material.

As we indicated last month, we look forward to a number of new features as well.

1. An online submission portal: Submitting a manuscript online will be easier than before. Rather than submitting by email, we will have a devoted online submission portal that will have the ability to handle any size manuscript and any number of graphics and other support files. We will have an online tracking system that will make it easier to track manuscripts in terms of where they are in the review process.
2. Reviewers will be able to review the manuscript online. This portal will shorten the time from receipt of review to getting feedback to the submitting authors.
3. An archive search will be available for journals older than 2012.
4. A new section called news and views will enable the submission of commentary on publications from other journals or news sources. We anticipate that this will be available as soon as the site completes the beta phase
5. Sponsors will be able to sign up directly on the website and submit content for both the digital and PDF issues of Neonatology Today.

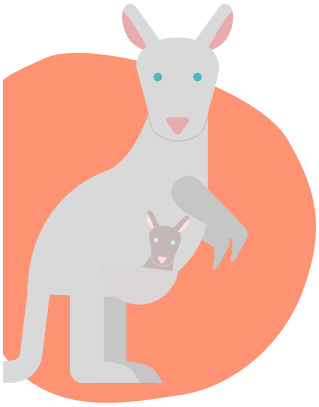
Neonatology Today will continue to promote our Academic True Open Model (ATOM), never a charge to publish and never a charge to subscribe.

If there are any questions about the new website, please email Dr. Chou directly at:

fu-sheng.chou@neonatologytoday.net

SUPPORTING KANGAROO CARE

SKIN-TO-SKIN CARE DURING COVID-19



GET INFORMED ABOUT THE RISKS + BENEFITS

work with your medical team to create a plan

GET CLEAN

WASH YOUR HANDS, ARMS, and CHEST

with soap and water for 20+ seconds. Dry well.

PUT ON FRESH CLOTHES

change into a clean gown or shirt.

IF COVID-19 + WEAR A MASK

and ask others to hold your baby when you can't be there

National Perinatal Association

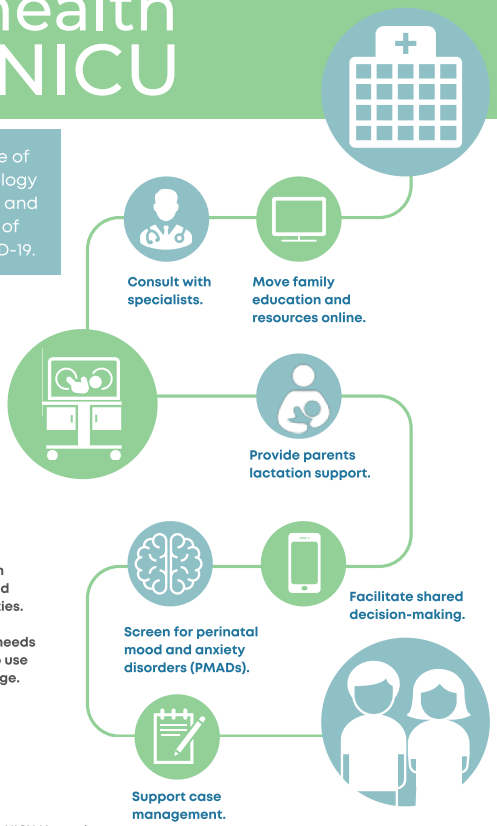
nicuparentnetwork.org

NPN NICU PARENT NETWORK

nationalperinatal.org/skin-to-skin

Telehealth in the NICU

The thoughtful use of telehealth technology can improve care and minimize the risks of exposure to COVID-19.



The move to telehealth services can compound inequities and disparities. Assess each family's technology skills and needs - including the need to use their preferred language.

My Perinatal Network and My NICU Network are products of a collaboration between National Perinatal Association (NPA) and NICU Parent Network (NPN).

myNICUnetwork.org

The Village Son

A Life's Journey

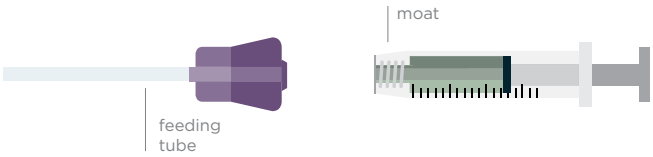
Iranian village to a university professor in the United States of America in this memoir. As a boy, his unruly behavior was sedated by scholastic challenges as a remedy. At age twelve, he left home for junior high school in a provincial capital. At first, a lack of self-esteem led him to stumble, but he soon found the courage to tackle his subjects with vigor. He became more curious about the world around him and began to yearn for a new life despite his financial limitations. Against all odds, he became one of the top students in Iran and earned a scholarship to study medicine in Europe. Even though he was culturally and socially naïve by European standards, an Italian family in Rome helped him thrive. The author never shied away from the challenges of learning Italian, and the generosity of Italy and its people became part and parcel of his formative years. By the time he left for the United States of America, he knew he could accomplish whatever he imagined.

Houchang D. Modanlou

SAFETY IN THE NICU

New tubes, new problems?

A new tubing design meant to eliminate tubing misconnections has introduced new challenges for the NICU population. Pediatric providers must deliver medication in small volumes to tiny patients with high levels of accuracy. The new tubing design, known as ENFit®, could present dosing accuracy and workflow challenges.



DOSING ACCURACY

- The moat, or area around the syringe barrel, is difficult to clear. Medication can hide there, inadvertently increasing the delivered dose when the syringe and feeding tube are connected; patients may receive extra medication.

INFECTION RISK

- The moat design can increase risk for infection if residual breast milk or formula remains in the moat and transfers to the feeding tube.

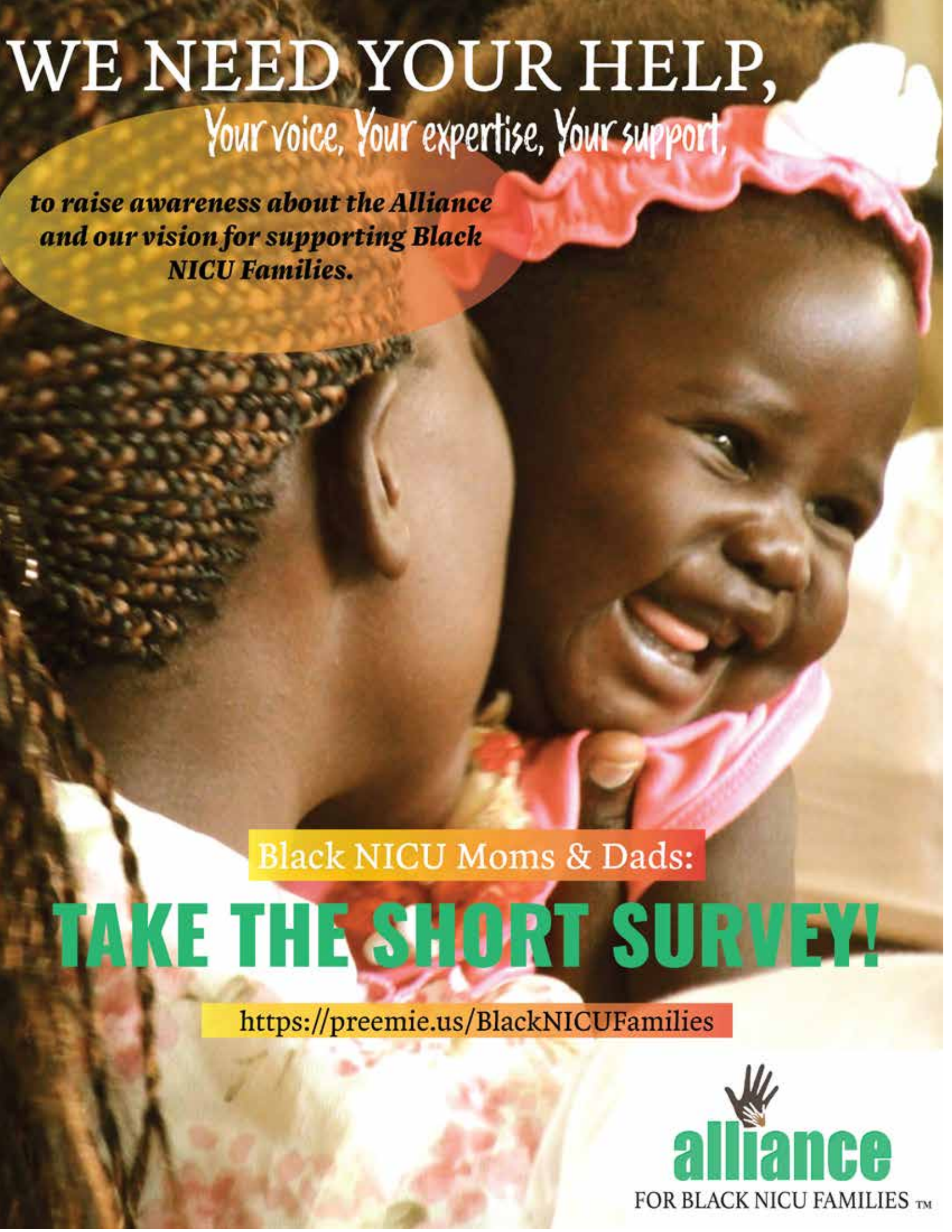
WORKFLOW ISSUES

- Increased nursing workflow is seen with additional steps for clearing syringe moats, cleaning tube hubs, and using multiple connectors.

Improved standards are important to protect patients from the dangers of tubing misconnections. But we must avoid mitigating existing risks by creating new ones.

Individual hospitals should consider all factors impacting their NICU patients before adopting a new tubing design.

ENFit® is a registered trademark of GEDSA


WE NEED YOUR HELP,
Your voice, Your expertise, Your support,
to raise awareness about the Alliance and our vision for supporting Black NICU Families.
Black NICU Moms & Dads:
TAKE THE SHORT SURVEY!
https://preemie.us/BlackNICUFamilies
alliance
FOR BLACK NICU FAMILIES ™

Focus on Fathers for Promoting Safe Sleep and Breastfeeding

Alison Jacobson

first candle

Saving babies. Supporting families.

First Candle's efforts to support families during their most difficult times and provide new answers to help other families avoid the tragedy of the loss of their baby are without parallel.

"In 2020 First Candle hosted a series of focus groups in Georgia, Michigan, and Connecticut to understand the impact of implicit bias, cultural norms, and socio-economic issues on individuals' access to information about the American Academy of Pediatrics' infant safe sleep guidelines and the choice to adopt them."

In 2020 First Candle hosted a series of focus groups in Georgia, Michigan, and Connecticut to understand the impact of implicit bias, cultural norms, and socio-economic issues on individuals' access to information about the American Academy of Pediatrics' infant safe sleep guidelines and the choice to adopt them.

We had five groups in each state: moms, breastfeeding moms, dads, grandparents, and in-home care providers.

It was among the dads where we discovered the greatest opportunities to increase behavior change regarding safe sleep. Here are some highlights of the insights we gleaned from our focus groups:

Dads are more engaged than ever. Each of the dads spoke passionately about caring for his baby and equally sharing responsibility with mom. They shared stories with each other about how they care for their baby and want to be involved in parenting.

Dads feel marginalized by health care providers. Many dads spoke about how they felt ignored by in-home care providers and medical staff both during the birth and at the pediatrician's office. Because of COVID-19 restrictions, most dads could not even attend prenatal and well-baby visits, but when they did, they felt the conversation and questions were directed towards mom. There was very little acknowledgment of their presence.

"Because of COVID-19 restrictions, most dads could not even attend prenatal and well-baby visits, but when they did, they felt the conversation and questions were directed towards mom. There was very little acknowledgment of their presence."

Dads do not have enough information. Whether it was due to COVID-19 or the inability to be present during in-home or office visits, dads do not feel they receive much information about safe sleep and breastfeeding. What they learn about safe sleep usually is what they hear from mom second-hand. Because of this, they are unsure about how to support mom in breastfeeding and how to create a safe sleep environment. One dad, an emergency medical technician who had been present at a Sudden Unexplained Infant Death (SUID) event, felt that the safe sleep guidelines are "mere opinions," not facts, and therefore do not necessarily need to be adopted.

Dads always defer to mom. Dads have strong opinions, especially around bed-sharing, but they generally do not share this with mom. Many dads expressed that they "freak out" having a baby in bed with them, and it makes them nervous. But, they believe that

"mom knows best" and that their opinions will always be second to mom.

Dads want to receive information in different ways. Dads are less likely to read brochures about safe sleep or breastfeeding, as they feel the information is directed towards mom. It is generally images of mom and baby on brochures, and there is no specific information geared towards dad. They do not see themselves reflected in the materials. Dads also prefer to learn information from other dads. They are less inclined to read materials or listen to a care provider but would be open to listening to recommendations in a group setting of other men in places they frequent, such as gyms, barbershops, and men's organizations.

"Dads also prefer to learn information from other dads. They are less inclined to read materials or listen to a care provider but would be open to listening to recommendations in a group setting of other men in places they frequent, such as gyms, barbershops, and men's organizations."

How First Candle is responding to these insights.

Since 2017 we have been conducting our Straight Talk for Safe Sleep program, (1) a train-the-trainer initiative for hospitals, social service agencies, health departments, and in-home care providers. The program works with participants to recognize implicit bias and learn how to engage families in dialogues about the "whys" and "hows" of safe sleep that reflect their lived experiences. This program offers up to five contact hours to nurses.

We are now expanding our focus on how to engage dads, to empower them to support moms in breastfeeding and explore safe sleep options. This will include training providers on how better to address dads during prenatal visits, during birth and follow-up well visits, and establishing programs specifically geared towards dads.

We are creating a Dad Ambassador's group of male community influencers, i.e., coaches, ministers, barbers, media personalities, and sports figures, who can deliver safe sleep messaging to new dads as well as future dads.

To learn more about First Candle's Straight Talk for Safe Sleep program and how to bring it to your hospital, contact Barb Himes, Director of Education and Bereavement Services, at Barb@First-Candle.org.

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1. *https://firstcandle.org/straight-talk-for-infant-safe-sleep/*

Disclosure: The author is the Executive Director and Chief Executive Officer of First Candle, Inc., a Connecticut not-for-profit 501c3 corporation.

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About First Candle

First Candle, based in New Canaan, CT, is a 501c (3) committed to eliminating Sudden Infant Death Syndrome and other sleep-related infant deaths while providing bereavement support for families who have suffered a loss. Sudden unexpected infant death (SUID), which includes SIDS and accidental suffocation and strangulation in bed (ASSB), remains the leading cause of death for babies one month to one year of age, resulting in 3,600 infant deaths nationwide per year.

Re-Implementation of a Neonatal ICU training program for Respiratory Therapists

Kelly Welton, RRT-NPS

"In recent years, in Southern California, two major NICU training courses for Respiratory Therapists have closed their doors. This requires hospitals with NICUs to take on the full responsibility to train their own staff."

In recent years, in Southern California, two major NICU training courses for Respiratory Therapists have closed their doors. This requires hospitals with NICUs to take on the full responsibility to train their own staff. NICU is a specialized skill set that requires consistent practice. Annual skills days are not enough. NRP every two years is not nearly enough exposure to all the things RT's and RN's are required to remember in the NICU. In addition, Covid and the staffing demand required every hospital in the US to pull every resource available to concentrate on the needs of the pandemic. Training for anything else took a back seat.

Different hospitals assign their RT staff to NICU according to various guidelines, including staff seniority, Union guidelines, or just plain necessity. For example, some hospitals require all RT's to rotate through all areas of the hospital: ER, PICU, NICU, Adult ICU, and more. Other hospitals allow NICU/Peds RT's to work only with babies and children, no adults. Some hospitals promote staff based on their choice of patient population or responsibility, i.e., an RT can choose a career ladder by expanding their patient type (learn NICU or Pediatrics) or expand their role (take on supervisory or lead responsibilities).

Different hospitals treat new grads differently. A typical path requires a new grad RT to do 'floor care' for a certain amount of time before being 'promoted' to ICU. This practice makes no sense, as most RT programs' last semester is dedicated entirely to critical care. If they are lucky, students might get to spend one week in a NICU. After graduation, a new RT may express interest in working in the NICU, only to find that they must learn to work the entire rest of the hospital first. Depending on the size of the hospital, the length of time from NICU class in RT school to actual NICU orientation may be years. Many children's hospitals require one year of experience before hiring a new grad. When the day comes, and they are finally offered a NICU orientation, many discover their education and practice (if any) has been severely diminished. Also, consider RT's and RN's who work in adult hospitals who would like to learn a new skill to expand their scope and pursue new career avenues at other hospitals.

The closure of the two NICU course venues prompted me as an RT Educator to put together every shred of NICU education and skills materials I had. Before Covid eviscerating everything on my calendar for 2020, many students of my live Pediatric RT courses often remarked on the course evaluation, "could I please put on a NICU course?"

In soliciting help from various organizations to put a class together, no one seemed equipped or willing to step forward.

With an initial sketch of what would make good content in mind, I had to prioritize. How many days should the class be? How should the content progress? With these 2 issues solved (5 days' worth of content, start with absolute beginners and move to more complex topics) one question remained: How am I going to talk for five days straight by myself?

I talked up the idea to anyone who would listen: fellow RT's, RN friends, Neonatologists, everyone. Months later, as if by magic, an RT friend from a former employer showed up one day to tell me she had another NICU RT who wanted to help with the class and a medical director interested in helping. If you build it, they will come…… Moreover, build it we did.

" The biggest challenge to presenting online is figuring out how to do an essential part of NICU training: hands-on practice. We were getting our big fingers and hands around the tiniest nasal CPAP mask, securing it in the right place, and giving surfactant without moving the ET tube one millimeter"

Precisely 18 months later, we went live. Covid had us take a left turn with our live presentation plans, and upload everything online, which proved to be good practice for our content in terms of timing and difficulty level for NICU newbies. The biggest challenge to presenting online is figuring out how to do an essential part of NICU training: hands-on practice. We were getting our big fingers and hands around the tiniest nasal CPAP mask, securing it in the right place, and giving surfactant without moving the ET tube one millimeter. Watching what changing conventional ventilator and HFOV settings will do to waveform graphics and a test lung—securing the ET tube without taping the baby's eyes shut—using a flow-inflating bag for the first time without ending up on +20 of PEEP.

At the end of our first 3-day session, we debriefed on how things went. Evaluations were good. Our timing was only slightly off. We

did not get to some subjects and needed two more people to staff the hands-on stations. Some topics needed more detail; some could use less detail. This course will probably span four days in the future, given the skill level required in a NICU. However, for a start, we believe we laid a good, solid foundation for the attendees to work with a preceptor (sooner rather than later) and start implementing the ideas and methods they were taught.

Interested in hosting a 3-day Academy of Neonatal Care course? Please contact: Educator@academyofneonatalcare.org..

Disclosures: The author is President of the Academy of Neonatal Care, A Delaware 501 C (3) not for profit corporation.

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"

I want to learn to work in NICU... but how?

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SESSION 1

Maternal Complications and High -Risk Pregnancies - Fetal Lung Development - Fetal Circulation - CBG'S, Cord Gases, and TCOM'S - Neonatal Assessment - NICU Ventilator Settings - HFNC in NICU - Surfactants - Infection Control- Hands-on workshop

SESSION 2

Neonatal Pneumonia and Sepsis - Oscillator basics - Neonatal Chest X-Rays - HFNC vs. CPAP - Apneas and Bradycardias - Intraventricular Hemorrhage - Neonatal Respiratory Distress Syndrome- Non-Invasive Ventilation - Prove yourself as a NICU Newbie -and Hands on workshop

SESSION 3

Ventilator waveforms - ECMO - iNO update - Jet ventilators - Infection Control in the NICU - Psych-social aspect of NICU Care - Transports - and Hands-on Workshop -And MORE!

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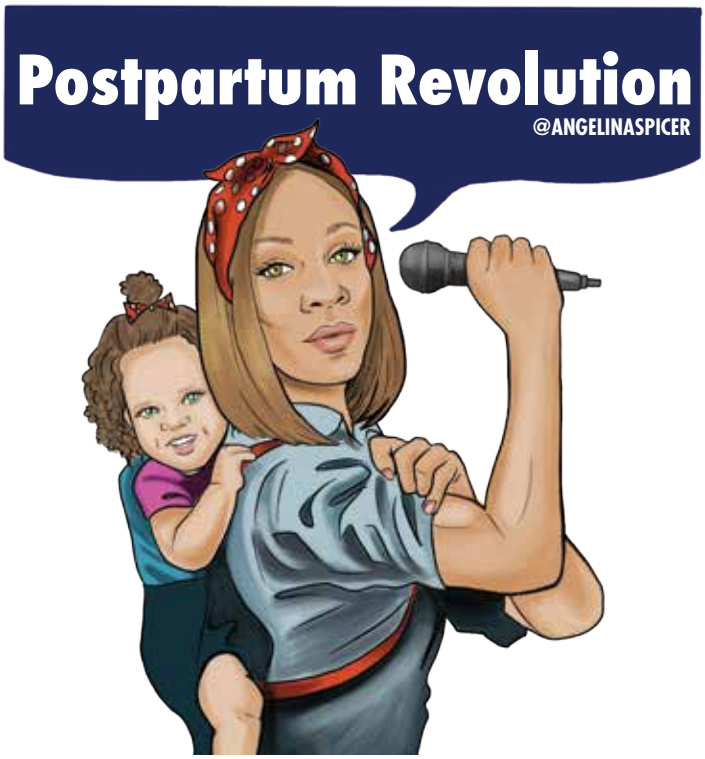
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COPING WITH COVID-19

KEEP PATIENTS UP-TO-DATE WITH CHANGES IN POLICIES SO THEY KNOW WHAT TO EXPECT. LISTEN TO THEIR CONCERNS.

Provide culturally-informed and respectful care.

TELL PARENTS HOW YOU WILL KEEP THEM AND THEIR BABIES SAFE DURING THEIR NICU STAY.

Use technology like video chat apps to include family members who can't visit the NICU.

myNICUnetwork.org

and

National Perinatal Association
NICU Parent Network

My Perinatal Network and My NICU Network are products of a collaboration between NPA and NPN.

TOP 10

RECOMMENDATIONS FOR THE PSYCHOSOCIAL SUPPORT OF NICU PARENTS

SUPPORT 4 NICU PARENTS

Essential evidence-based practices that can transform the health and well being of NICU families and staff

based on the National Perinatal Association's Interdisciplinary Recommendations for Psychosocial Support of NICU Parents

1 PROMOTE PARTICIPATION

Honor parents' role as primary caregiver. Actively welcome parents to participate during rounds and shift changes. Remove any barriers to 24/7 parental involvement and avoid unnecessary separation of parents from their infants.

Welcome!

2 LEAD IN DEVELOPMENTAL CARE

Teach parents how to read their baby's cues. Harness your staff's knowledge, skills, and experience to mentor families in the principles of neuroprotection & developmental care and to promote attachment.

3 FACILITATE PEER SUPPORT

Invest in your own NICU Parent Support program with dedicated staff. Involve veteran NICU parents. Partner with established parent-to-parent support organizations in your community to provide continuity of care.

4 ADDRESS MENTAL HEALTH

Prioritize mental health by building a team of social workers and psychologists who are available to meet with and support families. Provide appropriate therapeutic interventions. Consult with staff on trauma-informed care - as well as the critical importance of self-care.

5 SCREEN EARLY AND OFTEN

Establish trusting and therapeutic relationships with parents by meeting with them within 72 hours of admission. Follow up during the first week with a screening for common maternal & paternal risk factors. Provide anticipatory guidance that can help normalize NICU distress and timely interventions when needed. Re-screen prior to discharge.

6 OFFER PALLIATIVE & BEREAVEMENT CARE

Support families and NICU staff as they grieve. Stay current with best practices in palliative care and bereavement support. Build relationships with service providers in your community.

7 PLAN FOR THE TRANSITION HOME

Set families up for success by providing comprehensive pre-discharge education and support. Create an expert NICU discharge team that works with parents to find specialists, connect with service providers, schedule follow-up appointments, order necessary medical supplies, and fill Rx.

8 FOLLOW UP

Re-connect with families post-discharge. Make follow-up calls. Facilitate in-home visits with community-based service providers, including Early Intervention. Partner with professionals and paraprofessionals who can screen families for emotional distress and provide timely therapeutic interventions and supports.

9 SUPPORT NICU CARE GIVERS

Provide comprehensive staff education and support on how to best meet families' psychosocial needs, as well as their own. Acknowledge and address feelings that lead to "burnout."

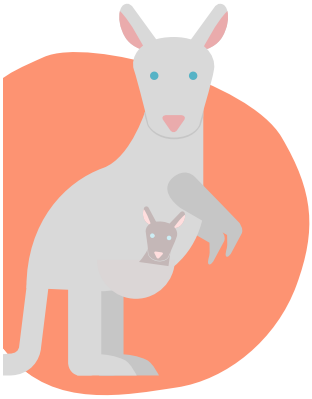
10 HELP US HEAL

Welcome the pastoral care team into your NICU to serve families & staff.

SUPPORT4NICUPARENTS.ORG

SUPPORTING KANGAROO CARE

SKIN-TO-SKIN CARE DURING COVID-19



GET INFORMED ABOUT THE RISKS + BENEFITS

work with your medical team to create a plan

GET CLEAN

WASH YOUR HANDS, ARMS, and CHEST

with soap and water for 20+ seconds. Dry well.

PUT ON FRESH CLOTHES

change into a clean gown or shirt.

IF COVID-19 + WEAR A MASK

and ask others to hold your baby when you can't be there

National Perinatal Association

nicuparentnetwork.org

NPN NICU PARENT NETWORK

nationalperinatal.org/skin-to-skin


TAKE THE NECESSARY STEPS TO
ELIMINATE INEQUITIES
Prioritize health + racial equity as a goal.
Make health equity and implicit bias training mandatory.
Communicate with parents using plain language.
Partner with Black parents to deliver bias free care.
Hire, retain, or partner with Black Preemie family support groups + professionals to fill diversity gaps.
Make digital + virtual resources available
Encourage reading to Preemie babies while bedside.
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Keeping Your Baby Safe
during the COVID-19 pandemic
How to protect your little one from germs and viruses
Even though there are some things we don't know about COVID-19 yet, there are many more things that we do know. We know that there are proven protective measures that we can take to stay healthy.
Here's what you can do...
Wash Your Hands
This is the single, most important thing you can do to stop the spread of viruses.
Use soap.
Wash for more than 20 seconds.
Use alcohol-based sanitizers.
Limit Contact with Others
Stay home when you can.
Stay 6 feet apart when out.
Wear a face mask when out.
Change your clothes when you get home.
Tell others what you're doing to stay safe.
Provide Protective Immunity
Hold baby skin-to-skin.
Give them your breast milk.
Stay current with your family's immunizations.
DONATE
Take Care of Yourself
Stay connected with your family and friends.
Sleep when you can.
Drink more water and eat healthy foods.
Seek mental health support.
Immunizations Vaccinations save lives. Protecting your baby from flu and pertussis lowers their risks for complications from coronavirus.
WARNING
Never Put a Mask on Your Baby
Because babies have smaller airways, a mask makes it hard for them to breathe.
Masks pose a risk of strangulation and suffocation.
A baby can't remove their mask if they're suffocating.
If you are positive for COVID-19
Wash with soap and water and put on fresh clothes before holding or feeding your baby.
Wear a mask to help stop the virus from spreading.
Watch out for symptoms like fever, confusion, or trouble breathing.
Ask for help caring for your baby and yourself while you recover.
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Raising Global Awareness of RSV

Global awareness about respiratory syncytial virus (RSV) is lacking. RSV is a relatively unknown virus that causes respiratory tract infections. It is currently the second leading cause of death – after malaria – during infancy in low- and middle-income countries.

The RSV Research Group from professor Louis Bont, pediatric infectious disease specialist in the University Medical Centre Utrecht, the Netherlands, has recently launched an RSV Mortality Awareness Campaign during the 5th RSV Vaccines for the World Conference in Accra, Ghana.

They have produced a personal video entitled "*Why we should all know about RSV*" about Simone van Wyck, a mother who lost her son due to RSV. The video is available at www.rsvgold.com/awareness and can also be watched using the QR code on this page. Please share the video with your colleagues, family, and friends to help raise awareness about this global health problem.

RSV GOLD

A Global Mortality Database for Children with RSV Infection

The RSV awareness video was produced in collaboration with the Bill & Melinda Gates Foundation

The Survey says RSV

5 THINGS YOU CAN DO TO CELEBRATE NICU AWARENESS

1 Educate Yourself
Did you know that more than half of the babies admitted to NICUs were not born prematurely? See our fact sheets.

2 Post on Social Media
See examples at nicuawareness.org and nationalperinatal.org/NICU_Awareness

3 Recognize NICU Staff
Let them know the difference they are making in our babies' lives. Write a note, send an email, or deliver a gift to show them that you appreciate them.

4 Share Your Story
Most people have never heard of a NICU before. Let others know about the extraordinary care that NICUs provide.

5 Join Our Community
Get involved. Become a member of our organizations and share your talents.

This project is a collaboration between

Project Sweet Peas + National Perinatal Association

www.nicuawareness.org
www.nationalperinatal.org/NICU_Awareness

Peer Reviewed

Goldilocks and the NICU Part 2: Oxygen, the Necessary Evil

Rob Graham, R.R.T./N.R.C.P.

I dedicate this column to the late Dr. Andrew (Andy) Shennan, the founder of the perinatal program at Women's College Hospital (now at Sunnybrook Health Sciences Centre). To my teacher, my mentor and the man I owe my career as it is to, thank you. You have earned your place where there are no hospitals and no NICUs, where all the babies do is laugh and giggle and sleep.

"In utero development occurs in a relatively hypoxic environment with PaO2 of approximately 20 mmHg, (1) thus even room air represents a hyperoxic environment to the newborn infant."

In June's Neonatology Today column we discussed "just right" values relating to $PaCO_2$. This month's focus is on oxygen.

In utero development occurs in a relatively hypoxic environment with PaO_2 of approximately 20 mmHg, (1) thus even room air represents a hyperoxic environment to the newborn infant. To protect the infant from hyperoxia and resulting formation of reactive oxygen species (ROS) (free radicals), just prior to term gestation non-enzymatic antioxidants (i.e. glutathione, vitamins C and E, and carotenoids) cross the placenta and endogenous antioxidant systems are up-regulated immediately prior to birth and are further up-regulated upon exposure to room air. Glutathione (GSH) is by far the most abundant antioxidant in the human body, and premature infants have low levels of GSH. (2)

In the premature infant the transition to the hyperoxic extra-uterine world is poorly mitigated due to several complex and interconnected factors. The transfer of antioxidants through the placenta does not take place, and there are both developmental deficits in antioxidant defenses and impairment of the ability to rapidly mount an antioxidant response when exposed to hyperoxia[2]. The plethora of conditions thought to be at least caused in part by ROS have been described as "Oxygen radical disease in neonatology". (3) These pathologies include chronic lung disease (CLD), intraventricular hemorrhage (IVH), retinopathy of prematurity (ROP), necrotizing enterocolitis (NEC), periventricular leukomalacia (PVL), renal damage, hemolysis[2] and patent ductus arteriosis (PDA). (3)

The increased production of ROS and reactive nitrogen species (RNS) resulting from oxidative stress also alter nitric oxide (NO) signaling by reducing NO bioavailability.

ROS are a natural byproduct of metabolism (i.e. superoxide, hydrogen peroxide) and are normally quickly reduced. In the absence of antioxidant reduction (such as in the premature infant) peroxinitrite is formed from the reaction of superoxide and NO, and hydroxyl radical results from the reaction between hydrogen peroxide and iron or copper. Additional ROS can also be produced by ischemia/reperfusion, infection, hyperoxia, inflammation, free iron and Fenton reaction and mitochondrial respiratory chain. Additionally, ascorbylperoxides (AscOOH, another oxidant) are commonly present in parental nutrition and are poorly reduced in the premature infant due to low levels of GSH. Higher levels of AscOOH in the urine in the first week of life are associated with increased incidence of CLD and death. (2)

"Traditionally, premature infants have been antioxidant supplements such as vitamin E and A in an effort to reduce oxidative stress based on the concept of "antioxidant imbalance". Simply administering antioxidants or their precursors may not be a silver bullet."

Traditionally, premature infants have been antioxidant supplements such as vitamin E and A in an effort to reduce oxidative stress based on the concept of "antioxidant imbalance". Simply administering antioxidants or their precursors may not be a silver bullet. For instance, premature infants have been shown to be deficient in selenium, an element essential for antioxidant enzyme function. Supplementation with selenium has not been shown to reduce either CLD, ROP, or improve survival. (2)

Several other antioxidants have been studied. Cysteine is a precursor to GSH and its administration improved nitrogen balance in premature infants but also resulted in more metabolic acidosis. Similarly, n-acetylcysteine (NAC) serves as a de novo precursor to GSH production, however NAC supplementation has not shown to improve pulmonary outcomes in extremely low birth weight infants. Superoxide dismutase (SOD) has been extensively studied in the prevention of CLD, however Cochrane metanalysis failed to find sufficient evidence to support any improvement in respiratory outcomes. Of note is a post-hoc analysis that showed a

reduction in ROP. ROP severity above stage 2 was 42% in the placebo group compared to 25% in the treatment group. SOD is well tolerated with no serious adverse effects; as such further investigation for ROP prevention is worthwhile. Nuclear factor erythroid 2 (NFE2)-related factor 2 (Nrf2) is a transcription factor which serves multitude functions. Recently its role in reducing oxidative stress (OS) has come under scrutiny. It holds great promise in reducing OS in the premature population. (2-4)

"Because they are essential in the regulation of several cellular processes and serve as signaling molecules for several biological processes, simply eliminating ROS is not an option. (2)"

Because they are essential in the regulation of several cellular processes and serve as signaling molecules for several biological processes, simply eliminating ROS is not an option. (2)

OS could be described as a gift that keeps on giving. From a pathophysiological perspective, many diseases of prematurity likely represent a convergence between injury and ROS induced alteration in development. These may result in increased susceptibility to chronic diseases in adulthood and possibly more rapid aging[2] (excessive ROS can shorten telomeres). (5) Indeed, metanalysis shows adults born pre-term are at higher risk of hypertension, myocardial infarction, stroke, type I and II diabetes, metabolic syndrome, and lung disorders. (5)

Mitochondria have been known as the cell's powerhouse since before I studied biology in high school in the early 1970s. More recently mitochondrial dysfunction has been implicated in the development of lung disease. Both the lungs and brain of the premature infant are immature both structurally and functionally. While developmental pathways are different between brain and lung tissue, both require energy. This depends on proper mitochondrial function.

90% of ATP production occurs in the mitochondria[2]. This process results in the production of mitochondrial reactive ROS. Damaged mitochondrial DNA has been implicated in the aging process as well as several neurodegenerative diseases. (6) It stands to reason that the lack of antioxidants in the premature infant results in the presence of more mitochondrial reactive ROS, potentiating the damage of mitochondrial DNA. The resulting mitochondrial dysfunction reduces the amount of energy produced, which in turn may result in abnormal development. Recently, endothelial mitochondrial function in human cells isolated from umbilical cord blood has been shown to strongly predict the risk of poor pulmonary outcomes. (2)

Pulmonary parenchyma and vasculature can also be damaged directly by oxygen toxicity. ROS production can also increase with the administration of inhaled NO (iNO) and, conversely, result in further pulmonary vasoconstriction. (2)

What about FiO_2? At what point does FiO_2 result in lung damage? Delivering greater than 60% oxygen to an adult for greater than 24 hours at normal barometric pressure results in lung injury[7]. Higher pressures associated with mechanical ventilation can only exacerbate this. But what about neonates, particularly the extremely premature? Many clinicians (and studies) use and FiO_2 of 0.6 as the upper limit of acceptability or as part of failure criteria in non-invasive ventilation. Others may use 0.5 or 0.4, but where do these numbers come from?

When neonatology was in its infancy (no pun intended!) an infant of 32-34 weeks gestation was considered very premature and at high risk of demise. Supplemental oxygen and CPAP were the only tools of the day; there was no choice but to accept whatever level of oxygen a baby required to maintain sufficient PaO_2, whatever the consequences, even if that meant eventual death. Today we have pushed the limit of viability down to 22 weeks gestational age (GA), and we have sophisticated ventilators and surfactant at our disposal. Obviously, the difference in the state of physiological development between an infant of 22 weeks GA and one of 34 weeks GA are incomparable.

"The field of neonatology today is completely different than it was 60 years ago and yet when it comes to FiO_2 little has changed. If anything, with the push to early extubations and avoidance of intubation at all costs, our tolerance of high oxygen levels has increased."

The field of neonatology today is completely different than it was 60 years ago and yet when it comes to FiO_2 little has changed. If anything, with the push to early extubations and avoidance of intubation at all costs, our tolerance of high oxygen levels has increased. At what point does the cost of OS exceed the cost of intubation and mechanical ventilation, especially when using proven lung protective strategies?

There is very little information regarding the development of antioxidant defense in the premature infant after birth. Markers of OS are higher in preterm infants 3 days after birth than their term counterparts, as well as vitamin E and SOD. Similarly, oxidative protein products and hydroperoxide levels in plasma are higher 7 days post birth, and urine 8-hydroxy-2-deoxy guanosine (8OHdG) levels may be elevated for up to 100 days post birth compared to term infants. (5) Antioxidant mechanisms do improve with postnatal age. For example, blood vitamin A and E levels are higher in preterm infants at discharge than at birth, and SOD levels are higher at 40 weeks corrected than at preterm birth[5]. How these levels compare to normal term infants was not stated. Of note is a study that showed elevated lipid peroxidation was higher in adolescents (13-15 years of age) born preterm independent of history of CLD relative to those born at term.

Oxygen influences cell division, growth and structure. Lung tissue cultured in 80% O_2 c.f. 20% O_2 show a marked decrease in viability, more cell death and lower ATP content. Lower ATP content indicates mitochondrial impairment which reduces the ability of cells to grow. Severe mitochondrial impairment results in cell necrosis rather than apoptosis since apoptosis requires energy to occur: decreased apoptosis is a hallmark of CLD. In addition, alveolar macrophages were abundant in cells cultured at 20% but not in 80%. (8)

This brings us back to FiO_2. 10-week-old rats exposed to varying O_2 concentrations showed no difference in levels of derivatives of reactive oxygen metabolites (DROMS) after 24 hours of expo-

sure to 20.9% or 35.5% O_2, but they increased at 39.8%, 62.5% and 82.2% O_2 over the same time period, the highest levels being reached at 82.2% O_2. Morphological changes in red blood cells were also observed at the latter levels. Levels of biochemical antioxidant potential did not increase with increasing O_2 concentration indicating no adaptation. The authors concluded that exposure to FiO_2 above 0.40 for 24 hours resulted in excessive levels of oxidative stress. (9) It is important to note these rats were adults, not preterm pups. As well, the antioxidant systems in rats are somewhat different than in humans; for instance, rats produce their own vitamin C.

Given that O_2 concentrations above 40% tax adult antioxidant capacity, it stands to reason that the premature infant's antioxidant capacity is likely overwhelmed at lower concentrations. Regardless, an FiO_2 of 0.40 remains an acceptable parameter in the NICU. Furthermore, the lower the post-partum age the more easily these systems are swamped since they have not yet fully developed. If we are to follow the precautionary principle, we should be exposing our premature patients to the lowest possible O_2 concentrations, particularly during the first week of life, and this should most certainly be lower than 40% if at all possible. I submit that less is better, and the best, safest FiO_2 is 0.21. It is the general practice in the unit in which I work to give surfactant (either minimally invasive or INSURE) to any infant on non-invasive support who requires 30% O_2 or more.

"Given that O2 concentrations above 40% tax adult antioxidant capacity, it stands to reason that the premature infant's antioxidant capacity is likely overwhelmed at lower concentrations. Regardless, an FiO2 of 0.40 remains an acceptable parameter in the NICU."

Even after the endogenous antioxidant system is fully functional the consequences of OS remain. Studies have shown that despite increased use of non-invasive modes of ventilation the duration of respiratory support and supplemental O_2 have increased, and pulmonary function (PF) at 8 years of age was worse in a cohort studied from 2005 compared to an earlier cohort from 1997. While all former preterm children had PF impairment relative to their term counterparts, the degree of impairment increased with history of CLD or requirement of supplemental O_2 at 36 weeks corrected age. (10) This supports the surmission that prolonged exposure to supplemental O_2 results in greater airway smooth muscle proliferation leading to reactive airway disease.

What are the implications for respiratory support? The benefits of an "open lung" approach to respiratory support are well known but at the bedside all too often what represents an "open lung" is misunderstood. Too many clinicians are still fixated on "rib counts" on a chest film without considering the quality of the lung fields; are they hazy or patchy or well aerated? Optimum PEEP coincides with optimum compliance. At optimum PEEP several factors interact favourably, such as compliance, cardiac output, and tissue oxygenation. (11) Simply put, when PEEP is optimum, ventilating pressures and FiO_2 are lowest and SpO_2 is highest at a given FiO_2. If FiO_2 is low and blood pressure is acceptable the patient is likely physiologically **not** hyperinflated, regardless of what a chest film might show. Ventilation mode also must be considered, for what is considered "hyperinflated" in a conventional mode of ventilation may be perfectly acceptable in a high frequency mode since large tidal breaths do not contribute to sheer stress. Simply put, when mechanically ventilating a premature infant, one should aim for settings that minimize FiO_2. This includes non-invasive ventilation (NIV).

Finally, there are many other factors that increase the production of ROS and resulting OS. While growth and development require significant energy, the premature infant's limited ability to feed and absorb nutrients from their immature gut necessitates supplementing nutrition parenterally. As previously mentioned, TPN preparations contain ROS. Breast milk is well known to be the best food for babies and its benefits are particularly pronounced in the preterm population. Formula, and fortifiers it contains, increase OS compared to breast milk. Blood transfusions increase the production of ROS due to increased iron availability, and phototherapy increases the production of ROS. OS is also greater in infants who are small for gestational age. Inflammation secondary to infection is another contributor to the formation of ROS and OS[5]. While our focus on OS has been on pulmonary development, OS also affects brain development. Readers interested in OS effects on neurodevelopment are directed to reference 5.

In conclusion, it is time clinicians reevaluate the use of O_2 in the premature population with an eye to reducing OS and its sequelae. This includes lowering our tolerance for high FiO_2 in NIV.

Our patients deserve nothing less.

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Disclosures: The author receives compensation from Bunnell Inc for teaching and training users of the LifePulse HFJV in Canada. He is not involved in sales or marketing of the device nor does he receive more than per diem compensation. Also, while the author practices within Sunnybrook H.S.C. this paper should not be construed as Sunnybrook policy per se. This article contains elements considered "off label" as well as maneuvers, which may sometimes be very effective but come with inherent risks. As with any therapy, the risk-benefit ratio must be carefully considered before they are initiated.

NT

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Thirteen-year-old Emily Rose Shane was tragically murdered on April 3, 2010 on Pacific Coast Highway in Malibu, CA. Our foundation exists to honor her memory.

Each year, the Emily Shane Foundation SEA(Successful Educational Achievement) Program provides academic and mentoring support to over 100 disadvantaged middle school students who risk failure and have no other recourse. We have served over 700 children across Los Angeles since our inception in the spring of 2012. Due to the COVID-19 outbreak, our work is in jeopardy, and the need for our work is greatly increased. The media has highlighted the dire impact online learning has caused for the very population we serve; those less fortunate. **We need your help now more than ever to ensure another child is not left behind.**

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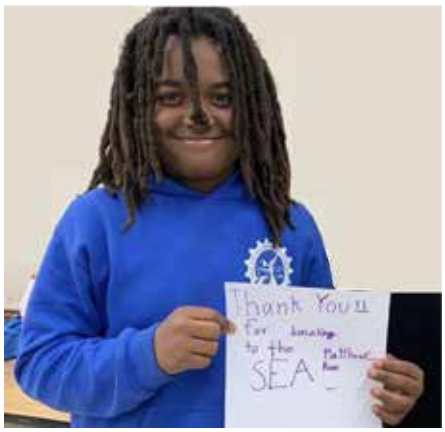
Please visit emilyshane.org

Sponsor a Child in the SEA Program

The average cost for the program to provide a mentor/ tutor for one child is listed below.



1 session	$15
1 week	$30
1 month	$120
1 semester	$540
1 year	$1,080
Middle School	$3,240

The Emily Shane Foundation is a 501(c)3 nonprofit charity, Tax id # 27-3789582. Our flagship SEA (Successful Educational Achievement) Program is a unique educational initiative that provides essential mentoring/tutoring to disadvantaged middle school children across Los Angeles and Ventura counties. All proceeds directly fund the SEA Program, making a difference in the lives of the students we serve.

National Perinatal Association Health Equity Group

Sigride Jean-Sicard BSN, MSN, PNP-PC,CLC

The National Perinatal Association (NPA)is an interdisciplinary organization that strives to be a leading voice for perinatal care in the United States. Our diverse membership is comprised of healthcare providers, parents & caregivers, educators, and service providers, all driven by their desire to give voice to and support babies and families at risk across the country.

Members of the NPA write a regular peer-reviewed column in Neonatology Today.

National Perinatal Association

Educate. Advocate. Integrate.

"This interview is part of an ongoing series highlighting the lives and perspectives of people working to improve health equities in perinatal spaces."

This interview is part of an ongoing series highlighting the lives and perspectives of people working to improve health equities in perinatal spaces. This month, we asked about the journey and career of Sigride Jean-Sicard, a NICU nurse and nurse practitioner, who is also in the first generation of her family to be born in the United States after her parents migrated from Haiti.

Even from a young age, Sigride has known she wanted to work in medicine.

"My mom is an early education teacher for 3- and 4-year-olds, and I think I get my love [of] children, especially babies, from her," she said. "Once I decided that I wanted to go into nursing, I always knew I wanted to work with children."

That work, as a nurse in the pediatric critical care float pool, brings her to pediatrics, the PICU, and the NICU. There, some of her life experiences as a first-generation migrant have affected how she relates to patients and their families.

"I think that my perceptions are slightly different because I am first generation," she said. Both of her parents were born in Haiti and met while living in the U.S., and they speak both English and Haitian Creole at home.

"As a young child, I also had classic books in French. Two specifically I can remember are Beauty and the Beast and A Little Mermaid. I also grew up listening to my dad's music tapes in French.

"So when I have patients of color who have only been in the country for a couple of years or even patients of color that have lived in the U.S. their entire lives, I feel as though I have something in common with them. When interacting with patients whose children are going to be first-generation, I think of it as 'You have done an amazing thing for your child. They can be and do anything they wish to do. I feel like I am a perfect example of that.'"

Her experiences as a first-generation migrant also support a belief that "even for people of color who have lived here their entire lives, race doesn't have to have to be a barrier that holds you back. You can still succeed."

Some of this carries echoes of the support she received from her parents, whom Sigride regards as role models for herself and her two older sisters, "because they are so hardworking and determined." She attributes her success to them because "they've always encouraged us no matter what our endeavors have been."

"That work, as a nurse in the pediatric critical care float pool, brings her to pediatrics, the PICU, and the NICU. There, some of her life experiences as a first-generation migrant have affected how she relates to patients and their families."

Also, while she is not sure if she has noticed any barriers she has faced specifically due to her being a woman of color, she said, "... it was definitely evident that there were only four people of color in my entire nursing class, which consisted of roughly two hundred ... people."

Before nursing school, however, Sigride thought she wanted to pursue pre-medical studies and enrolled at Providence College in Providence, Rhode Island, for one year. She then transferred to Quinnipiac University in Hamden, Connecticut, where she met with faculty from their nursing program and had experiences that changed her trajectory.

"When I got to listen to the beating heart of a newborn simulation doll, I knew this was what I *had* to do," she said. "It was the most amazing thing."

This motivated Sigride to transfer into the nursing prerequisite classes and apply to the nursing program. By the end of the semester, she had been accepted into the program. Even with the change in majors during her first year, Sigride graduated in four years, as she had planned, even though it required that she take multiple classes during the summer.

During the early stages of her nursing education, Sigride worked as a labor and delivery scrub tech and had a pivotal experience when helping with a cesarean section "on a baby that came out very sick.

"I was able to follow the case and see what then occurred in the special care nursery," she said. "I got to see the attending doctor perform a procedure on the baby so that the baby could be given blood. It was at the moment I again had a *wow* moment." It was clear to her then: "I want to be able to do that!!"

So, during her senior year of nursing school, Sigride applied to nurse practitioner school. "I am and was very determined. This was my dream, and I was not going to let anything get in my way," she said.

"But the patient families with whom she interacts don't always know her academic history, so we asked about the ways she may have been able to offer support because of her cultural connections and experiences."

After graduating with her nursing degree, Sigride obtained her Master's Degree in Nursing from Northeastern University.

But the patient families with whom she interacts don't always know her academic history, so we asked about the ways she may have been able to offer support because of her cultural connections and experiences.

"I have definitely and many a time walked into a patient's room and seen their faces light up when they see that I am a person of color as well and that I look like them," she said.

"Also, sometimes I have heard in the nursing report that a parent or parents have been difficult. However, I would then meet them and then have no issues with the parent. It has often made me wonder whether or not it had something to do with me looking like them, a person of color.

"One instance I can think of that happened was a mother ... of color that had multiple complications. Rightfully so, she was *very* anxious during her pregnancy. Towards the end of the pregnancy, she presented to antenatal every day because she was worried there was something wrong with her baby. The day she ended up being admitted, the nurse was very rude to her and said very unprofessional things such as, 'my shift already ended. I shouldn't be here right now.'"

"It was when she told me this that I wondered to myself, 'Would this have happened if she were white? Would the nurses have been more understanding of this mom's perfectly appropriate anxiety that caused her to come to antenatal multiple days in a row?'

"Although the hospital I work at [has] a large amount of people of color [on staff], I still couldn't help but wonder if this would have happened if the mom was white. It has become more evident in recent years of the innate discrimination that lies within the U.S., especially in the health care system and the subconscious discrimination that many people have."

That curiosity is an ongoing theme in Sigride's reflections. "I embrace learning about different cultures and their values and beliefs," she said. "It is and always has been something I find interesting."

In addition to having opportunities to do that, she also has her dream job, where she said she gets to work with parents and babies of color almost every day who look exactly like her.

The Health Equities Workgroup of the National Perinatal Association would like to thank Sigride Jean-Sicard for generously sharing her time and stories with us and allowing us to share them with you.

For more information about the NPA Health Equities Workgroup or to give feedback or suggest someone you think we should interview, please contact Tiffany A Moore, PhD, RN, SANE-A at tamoore@unmc.edu

Disclosure: The National Perinatal Association www.nationalperinatal.org is a 501c3 organization that provides education and advocacy around issues affecting the health of mothers, babies, and families.

NT

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United Kingdom

admin@cambridgescholars.com
www.cambridgescholars.com

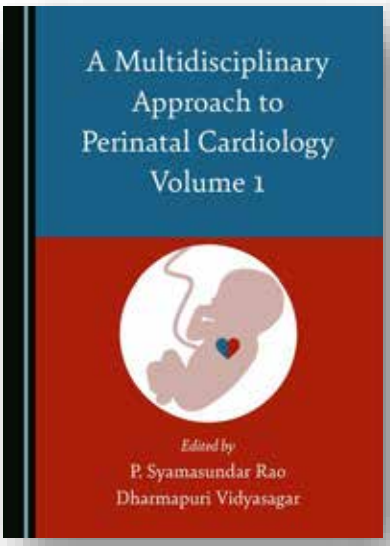
Fax +44 (0)191 265 2056

Cambridge Scholars Publishing is registered in the United Kingdom.

Companies House Reg. Number: 4333775.
VAT Number: 108280727.

A Multidisciplinary Approach to Perinatal Cardiology *Volume 1*

Edited by P. Syamasundar Rao and Dharmapuri Vidyasagar



Hardback

ISBN-13:
978-1-5275-6722-1

ISBN-10:
1-5275-6722-2

Date of Publication:
24/04/2021

Pages / Size:
794 / A5

Price:
£99.99

Book Description

Recent developments in diagnostic and therapeutic aspects of cardiac and neonatal issues have advanced the care of the newborn. To achieve excellence in cardiac care, however, close interaction and collaboration of the pediatric cardiologists with neonatologists, pediatricians, general/family practitioners (who care for children), anesthesiologists, cardiac surgeons, pediatric cardiac intensivists, and other subspecialty pediatricians is mandatory. This book provides the reader with up-to-date evidence-based information in three major areas of neonatology and prenatal and neonatal cardiology. First, it provides an overview of advances in the disciplines of neonatology, prenatal and neonatal cardiology, and neonatal cardiac surgery in making early diagnosis and offering treatment options. Secondly, it presents a multidisciplinary approach to managing infants with congenital heart defects. Finally, it provides evidence-based therapeutic approaches to successfully treat the fetus and the newborn with important neonatal issues and congenital cardiac lesions. This first volume specifically explores issues related to perinatal circulation, the fetus, ethics, changes in oxygen saturations at birth, and pulse oximetry screening, diagnosis, and management.

About the Editors

Dr P. Syamasundar Rao, MD, DCH, FAAP, FACC, FSCAI, is Professor of Pediatrics and Medicine and Emeritus Chief of Pediatric Cardiology at the University of Texas-Houston Medical School. He received his medical degree from Andhra Medical College, India, and subsequently received post-graduate training both in India and the USA before joining the faculty at the Medical College of Georgia, USA, in 1972. He has also served as Chairman of Pediatrics at King Faisal Specialist Hospital and Research Center, Saudi Arabia, and Professor and Director of the Division of Pediatric Cardiology at the University of Wisconsin and St. Louis University, USA. He has authored 400 papers, 16 books and 150 book chapters, and is a recipient of numerous honors and awards.

Dr Dharmapuri Vidyasagar, MD, MSc, FAAP, FCCM, PhD (Hon), is currently Professor Emeritus in Pediatrics at the University of Illinois, Chicago, where he served as Professor of Pediatrics for four decades. He is a graduate of Osmania Medical College, India. He has published over 250 papers and authored several books with a focus on prematurity, neonatal pulmonary diseases and neonatal ventilation. His goal is to reduce neonatal mortality in the USA and around the world, and he has received multiple awards and honors including the Ellis Island Award.

A Multidisciplinary Approach to Perinatal Cardiology Volume 1 is available now in Hardback from the Cambridge Scholars website, where you can also access a free 30-page sample.

My NICU Network
My Perinatal Network

National Perinatal Association + NICU Parent Network

Online L&D Staff Education Program

Caring for Pregnant Patients & Their Families:

Providing Psychosocial Support During Pregnancy, Labor and Delivery

WWW.MYPERINATALNETWORK.ORG

Continuing education credits provided by

pac-lac

About the Program

- **WHO SHOULD TAKE THE PROGRAM?** This program is designed for both office and hospital staff in all disciplines that interact with pregnant patients and their families. A key focus is recognizing risk factors for perinatal mood and anxiety disorders, and mitigating their impact through provision of trauma-informed care.

- **WHY TAKE THE PROGRAM?** Families will benefit when staff have improved skills, through enhanced parental resilience and better mental health, and improved parent-baby bonding leading to better developmental outcomes for babies. Benefits to staff include improved skills in communicating with patients; improved teamwork, engagement and staff morale; reduced burnout, and reduced staff turnover.

- **HOW DOES THE PROGRAM ACHIEVE ITS GOALS?** Program content is representative of best practices, engaging and story-driven, resource-rich, and developed by a unique interprofessional collaboration of obstetric and neonatal professionals and patients. The program presents practical tips and an abundance of clinical information that together provide solutions to the emotional needs of expectant and new parents.

- **HOW WAS THE PROGRAM DEVELOPED?** This program was developed through collaboration among three organizations: a multidisciplinary group of professionals from the National Perinatal Association and Patient + Family Care, and parents from the NICU Parent Network. The six courses represent the different stages of pregnancy (antepartum, intrapartum, postpartum), as well as perinatal mood and anxiety disorders, communication techniques, and staff support.

Program Objectives

- Describe principles of trauma-informed care as standards underlying all communication during provision of maternity care in both inpatient and outpatient settings.
- Identify risk factors, signs, and symptoms of perinatal mood and anxiety disorders; describe treatment options.
- Define ways to support pregnant patients with high-risk conditions during the antepartum period.
- Describe obstetric violence, including ways that providers may contribute to a patient's experience of maternity care as being traumatic; equally describe ways providers can mitigate obstetric trauma.
- Describe the importance of providing psychosocial support to women and their families in times of pregnancy loss and fetal and infant death.
- Define the Fourth Trimester, and identify the key areas for providing psychosocial support to women during the postpartum period.
- Identify signs and symptoms of burnout as well as their ill effects, and describe both individual and systemic methods for reducing burnout in maternity care staff.

Continuing education credits will be provided for physicians, clinic and bedside nurses, social workers, psychologists, and licensed marriage and family therapists. CEUs will be provided by Perinatal Advisory Council: Leadership, Advocacy, and Consultation.

PROGRAM CONTENT

COMMUNICATION SKILLS CEUs offered: 1

Learn principles of trauma-informed care, use of universal precautions, how to support LGBTQ patients, obtaining informed consent, engaging in joint decision-making, delivering bad news, dealing with challenging patients.

Faculty: Amina White, MD, MA, Clinical Associate Professor, Department of OB/Gyn, University of North Carolina, Chapel Hill, NC; Sue Hall, MD, MSW, FAAP, St. John's Regional Medical Center, Oxnard, CA; Karen Saxer, CNM, MSN, University of North Carolina Maternal-Fetal Medicine, UNC Women's Hospital, Chapel Hill, NC; Tracy Pella, Co-Founder & President, Connected Forever, Tecumseh, NE.

PERINATAL MOOD AND ANXIETY DISORDERS CEUs offered: 1

Identify risk factors for and differential diagnosis of PMADs (perinatal mood and anxiety disorders), particularly perinatal depression and/or anxiety and posttraumatic stress syndrome. Learn the adverse effects of maternal depression on infant and child development, and the importance of screening for and treating PMADs.

Faculty: Linda Baker, PsyD, psychologist at Unstuck Therapy, LLC, Denver, CO; Sue Hall, MD, MSW, FAAP, neonatologist at St. John's Regional Medical Center, Oxnard, CA; Angela Davids, Founder of Keep 'Em Cookin', Baltimore, MD; Brittany Boet, Founder of Bryce's NICU Project, San Antonio, TX.

PROVIDING ANTEPARTUM SUPPORT CEUs offered: 1

Identify psychosocial challenges facing high risk OB patients, and define how to provide support for them, whether they are inpatient or outpatient. Recognize when palliative care is a reasonable option to present to pregnant patients and their families.

Faculty: Amina White, MD, MA, Clinical Associate Professor, Department of OB/Gyn, University of North Carolina, Chapel Hill, NC; Sue Hall, MD, MSW, FAAP, neonatologist at St. John's Regional Medical Center, Oxnard, CA; Angela Davids, Founder of Keep 'Em Cookin', Baltimore, MD; Erin Thatcher, BA, Founder and Executive Director of The PPROM Foundation, Denver, CO.

PROVIDING INTRAPARTUM SUPPORT CEUs offered: 1

Describe how to manage patient expectations for labor and delivery including pain management; identify examples of obstetric violence, including identification of provider factors that may increase patients' experience of trauma; learn how to mitigate patients' trauma, and how to provide support during the process of labor and delivery.

Faculty: Sara Detlefs, MD, Fellow in Maternal-Fetal Medicine, Baylor College of Medicine, Houston, TX; Jerry Ballas, MD, MPH, Associate Clinical Professor, UCSD Health System, Maternal-Fetal Medicine, Department of Obstetrics, Gynecology and Reproductive Sciences, University of California at San Diego, San Diego, CA; MaryLou Martin, MSN, RNC-NIC, CKC, Women's and Children's Services Nurse Educator, McLeod Regional Medical Center, McLeod, SC; Claire Hartman, RN, IBCLC, Labor & Delivery, University of North Carolina Hospital, Chapel Hill, NC; Crystal Duffy, Author of Twin To Twin (from High Risk Pregnancy to Happy Family), and NICU Parent Advisor, Houston, TX; Erin Thatcher, Founder and Executive Director of The PPROM Foundation, Denver, CO.

PROVIDING POSTPARTUM SUPPORT CEUs offered: 1

Define the 4th Trimester and the importance of follow-up especially for high risk and minority patients, learn to recognize risk factors for traumatic birth experience and how to discuss patients' experiences postpartum; describe the application of trauma-informed care during this period, including support for patients who are breastfeeding and those whose babies don't get to go home with them.

Faculty: Amanda Brown, CNM, University of North Carolina Hospital, Chapel Hill, NC; ; Sue Hall, MD, MSW, FAAP, neonatologist at St. John's Regional Medical Center, Oxnard, CA; Crystal Duffy, Author of Twin To Twin (from High Risk Pregnancy to Happy Family), and NICU Parent Advisor, Houston, TX.

SUPPORTING STAFF AS THEY SUPPORT FAMILIES CEUs offered: 1

Define burnout and compassion fatigue; identify the risks of secondary traumatic stress syndrome to obstetric staff; describe adverse impacts of bullying among staff; identify the importance of both work-life balance and staff support.

Faculty: Cheryl Milford, EdS, Consulting NICU and Developmental Psychologist, Director of Development, National Perinatal Association, Huntington Beach, CA; Sue Hall, MD, MSW, FAAP, neonatologist at St. John's Regional Medical Center, Oxnard, CA; Erin Thatcher, BA, Founder and Executive Director, The PPROM Foundation, Denver, CO

Cost

- RNs: $10/CEU; $60 for the full program
- Physicians, licensed clinical social workers (LCSWs), licensed marriage and family therapists (LMFTs): $35/CEU; $210 for the full program
- Although PACLAC cannot award CEs for certified nurse midwives, they can submit certificates to their own professional organization to request credit. $35/CEU; $210 for the full program

Contact help@myperinatalnetwork.org to learn more.

Faculty

Linda Baker, PsyD
Psychologist at Unstuck Therapy, LLC, Denver, CO.

Jerasimos (Jerry) Ballas, MD, MPH
Associate Clinical Professor, UCSD Health System, Maternal-Fetal Medicine, Department of Obstetrics, Gynecology and Reproductive Sciences, University of California at San Diego, San Diego, CA.

Amanda Brown, CNM, MSN, MPH
University of North Carolina-Chapel Hill Hospitals, Chapel Hill, NC.

Sara Detlefs, MD
Fellow in Maternal-Fetal Medicine, Baylor College of Medicine, Houston, TX.

Sue L. Hall, MD, MSW, FAAP
Neonatologist, Ventura, CA.

Claire Hartman, RN, IBCLC
Labor & Delivery, University of North Carolina Hospital, Chapel Hill, NC.

MaryLou Martin, MSN, RNC-NIC, CKC
Women's and Children's Services Nurse Educator, McLeod Regional Medical Center, McLeod, SC.

Cheryl Milford, EdS.
Former NICU and Developmental psychologist, in memoriam.

Karen Saxer, CNM, MSN
University of North Carolina Maternal-Fetal Medicine, UNC Women's Hospital, Chapel Hill, NC.

Amina White, MD, MA
Clinical Associate Professor, Department of Obstetrics and Gynecology, University of North Carolina, Chapel Hill, NC.

Parent/Patient Contributers:

Brittany Boet
Founder, Bryce's NICU Project, San Antonio, TX.

Angela Davids
Founder, Keep 'Em Cookin', Baltimore, MD.

Crystal Duffy
Author of Twin To Twin (from High Risk Pregnancy to Happy Family), and NICU Parent Advisor, Houston, TX.

Tracy Pella, MA
Co-Founder and President, Connected Forever, Tecumseh, NE.

Erin Thatcher, BA
Founder and Executive Director, The PPROM Foundation, Denver, CO.

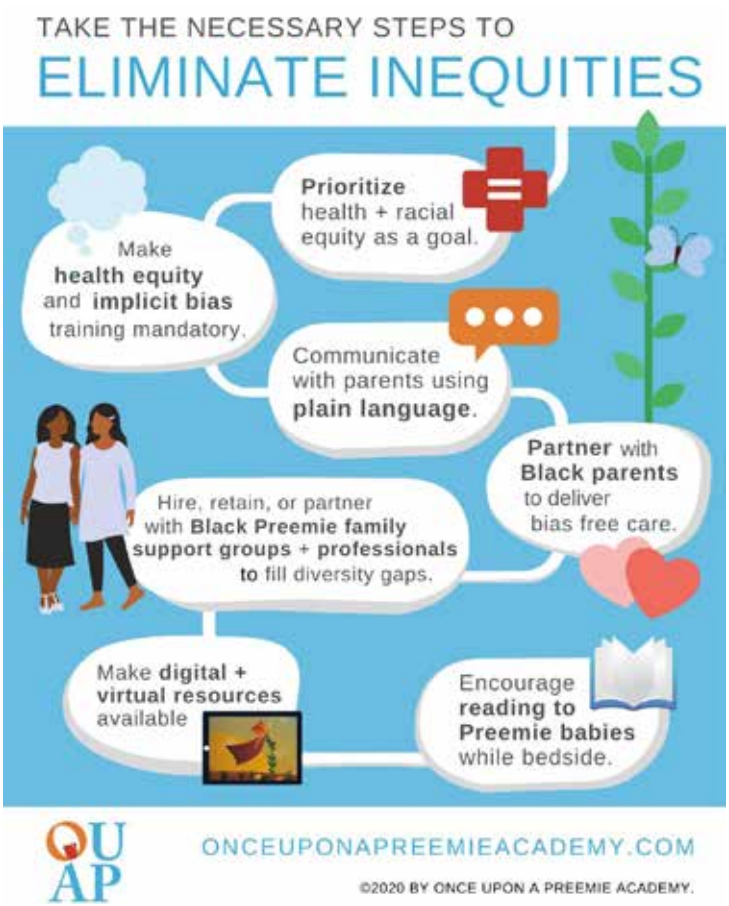
CANCELLATIONS AND REFUNDS

- For Individual Subscribers:
  - If you elect to take only one course, there will be no cancellations or refunds after you have started the course.
  - If you elect to take more than one course and pay in advance, there will be no cancellations or refunds after payment has been made unless a written request is sent to help@myperinatalnetwork.com and individually approved.
- For Institutional Subscribers:
  - After we are in possession of a signed contract by an authorized agent of the hospital and the program fees have been paid, a 50% refund of the amount paid will be given if we are in receipt of a written request to cancel at least 14 (fourteen) days prior to the scheduled start date for your hospital's online program.
  - Refunds will not be given for staff members who neglect to start the program. Also, no refunds for those who start the program, but do not complete all 6 courses within the time frame allotted.

For Physicians: This activity has been planned and implemented in accordance with the Institute for Medical Quality and the California Medical Association's CME Accreditation Standards (IMQ/CMA) through the Joint Providership of the Perinatal Advisory Council: Leadership, Advocacy and Consultation (PAC/LAC) and the National Perinatal Association. PAC/LAC is accredited by the Institute for Medical Quality/California Medical Association (IMQ/CMA) to provide continuing education for physicians. PAC/LAC takes responsibility for the content, quality and scientific integrity of this CME activity. PAC/LAC designates this activity for a maximum of 6 *AMA PRA Category 1 Credit(s)TM*. Physicians should only claim credit commensurate with the extent of their participation in the activity. This credit may also be applied to the *CMA Certification in Continuing Medical Education*.

For Nurses: The Perinatal Advisory Council: Leadership, Advocacy and Consultation (PAC/LAC) is an approved provider by the California Board of Registered Nursing Provider CEP 5862. When taken as a whole, this program is approved for 7 contact hours of continuing education credit.

For CAMFT: Perinatal Advisory Council: Leadership, Advocacy, and Consultation (PAC/LAC) is approved by the California Association of Marriage and Family Therapists to sponsor continuing education for LMFTs and LCSWs. CE Provider #128542. PAC/LAC maintains responsibility for the program and its content. Program meets the qualifications for 6 hours of continuing education credit for LMFTs and LCSWs as required by the California Board of Behavioral Sciences. You can reach us at help@myperinatalnetwork.org.



SHARED DECISION-MAKING PROTECTS MOTHERS + INFANTS DURING COVID-19

KEEPING MOTHERS + INFANTS TOGETHER

Means balancing the risks of...

- **HORIZONTAL INFECTION**
- **SEPARATION AND TRAUMA**

EVIDENCE

We encourage families and clinicians to remain diligent in learning **up-to-date evidence**.

PARTNERSHIP

What is the best for this unique dyad?

SHARED DECISION-MAKING

- **S** EEK PARTICIPATION
- **H** ELP EXPLORE OPTIONS
- **A** SSESS PREFERENCES
- **R** EACH A DECISION
- **E** VALUATE THE DECISION

TRAUMA-INFORMED

Both parents and providers are confronting significant...

- **FEAR**
- **GRIEF**
- **UNCERTAINTY**

LONGITUDINAL DATA

We need to understand more about outcomes for mothers and infants exposed to COVID-19, with special attention to:

- **MENTAL HEALTH**
- **POSTPARTUM CARE DELIVERY**

NEW DATA EMERGE DAILY. NANN AND NPA ENCOURAGE PERINATAL CARE PROVIDERS TO ENGAGE IN CANDID CONVERSATIONS WITH PREGNANT PARENTS PRIOR TO DELIVERY REGARDING RISKS, BENEFITS, LIMITATIONS, AND REALISTIC EXPECTATIONS.

Partnering for patient-centered care when it matters most.

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National Association of Neonatal Nurses

National Perinatal Association

FREE ONLINE EDUCATION

Coping with COVID-19

A viral pandemic

A racial pandemic within a viral pandemic

Will mental illness be the next inevitable pandemic?

WWW.MYNICUNETWORK.ORG

and

National Perinatal Association
NICU Parent Network

Extending Postpartum Coverage for Medicaid Moms

Michelle Winokur, DrPH, and the AfPA Governmental Affairs Team, Alliance for Patient Access (AfPA)

The Alliance for Patient Access (allianceforpatientaccess.org), founded in 2006, is a national network of physicians dedicated to ensuring patient access to approved therapies and appropriate clinical care. AfPA accomplishes this mission by recruiting, training and mobilizing policy-minded physicians to be effective advocates for patient access. AfPA is organized as a non-profit 501(c)(4) corporation and headed by an independent board of directors. Its physician leadership is supported by policy advocacy management and public affairs consultants. In 2012, AfPA established the Institute for Patient Access (IfPA), a related 501(c)(3) non-profit corporation. In keeping with its mission to promote a better understanding of the benefits of the physician-patient relationship in the provision of quality healthcare, IfPA sponsors policy research and educational programming.

"Expectant mothers and their unborn infants are monitored, measured, and closely watched for almost a year before birth. However, nearly half of new moms are at risk of losing their health insurance just two months after their baby arrives."

Expectant mothers and their unborn infants are monitored, measured, and closely watched for almost a year before birth. However, nearly half of new moms are at risk of losing their health insurance just two months after their baby arrives.

For Medicaid, 60 days is the minimum coverage period required by law. After that, some women, especially those who live in states that did not expand Medicaid under the Affordable Care Act, do not have a clear path to continued coverage.

But it looks like that may be changing.

Extending Postpartum Coverage

A provision in the COVID-19 rescue package, passed in March, gives states the option to extend postpartum coverage to 12 months after birth starting in April 2022. (1) If every state opted in, insurance would be extended for approximately 2 million moms. Moreover, it is not for just pregnancy-related care. States that chose to extend coverage are required to provide full Medicaid benefits.

Extended Medicaid coverage will likely reduce "churn" for new moms when they move between insured and uninsured. Data show that approximately one-third of women experience a coverage disruption between conception and postpartum. As expected, that can mean gaps in care, increased emergency department use, and worse health outcomes.

States Take Action

As of June 24, 19 states had already taken some action to extend their coverage. (2)

Offering extended coverage after the end of the public health emergency but before April 1, 2022, will require states to use only state funds to pay for the care or obtain permission in the form of an 1115 waiver.

Three states – Missouri, Illinois, and Georgia – already had their waiver requests approved. Georgia's extension is for six months; the others are for 12. Massachusetts, New Jersey, and Maryland have requests pending with the federal government.

California has taken the biggest steps toward expanding coverage. Last year, policymakers authorized the use of state funds to provide up to 12 months of postpartum Medicaid coverage for moms who have a maternal mental health condition, such as postpartum depression. The policy has been in place since August 2020; the state legislature is currently considering a bill that would more broadly extend coverage.

About Medicaid Coverage

Medicaid insures nearly half of all babies born in the United States. That is, in part, because uninsured low-income women become eligible for Medicaid when they become pregnant.

"Medicaid insures nearly half of all babies born in the United States. That is, in part, because uninsured low-income women become eligible for Medicaid when they become pregnant."

As a jointly funded state and federal program, Medicaid minimum coverage and eligibility requirements are established by the Centers for Medicare and Medicaid Services. States must cover pregnant women with incomes up to 138% of the federal poverty level, about $17,700. Many choose to cover those with higher incomes. Some provide coverage for women who make up to 380% of the federal poverty level, or around $48,000.

Prioritizing Maternal Health

Creating the opportunity for states to expand postpartum Medicaid coverage is just one of the Biden administration's initiatives to improve maternal and infant health. This approach aims to address preventable maternal mortality and morbidity, which are worse in the United States than in other high-income countries.

Reducing churn through extended coverage should benefit moms from communities of color, who disproportionally experience loss of insurance coverage and worse maternal health outcomes, including preventable death. Black women in the United States are 2-3 times more likely to die from a pregnancy-related complication than non-Hispanic white women.

The federal government has opened the door to change the health course for new moms across the country. Now, it is up to policymakers in each state to make the opportunity possible for its residents.

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2. https://www.healthaffairs.org/do/10.1377/hblog20190913.387157/full/
3. https://www.kff.org/medicaid/issue-brief/medicaid-postpartum-coverage-extension-tracker/

Disclosures: Michelle Winokur, DrPH, is the Policy Communications Director for the Alliance for Patient Access.

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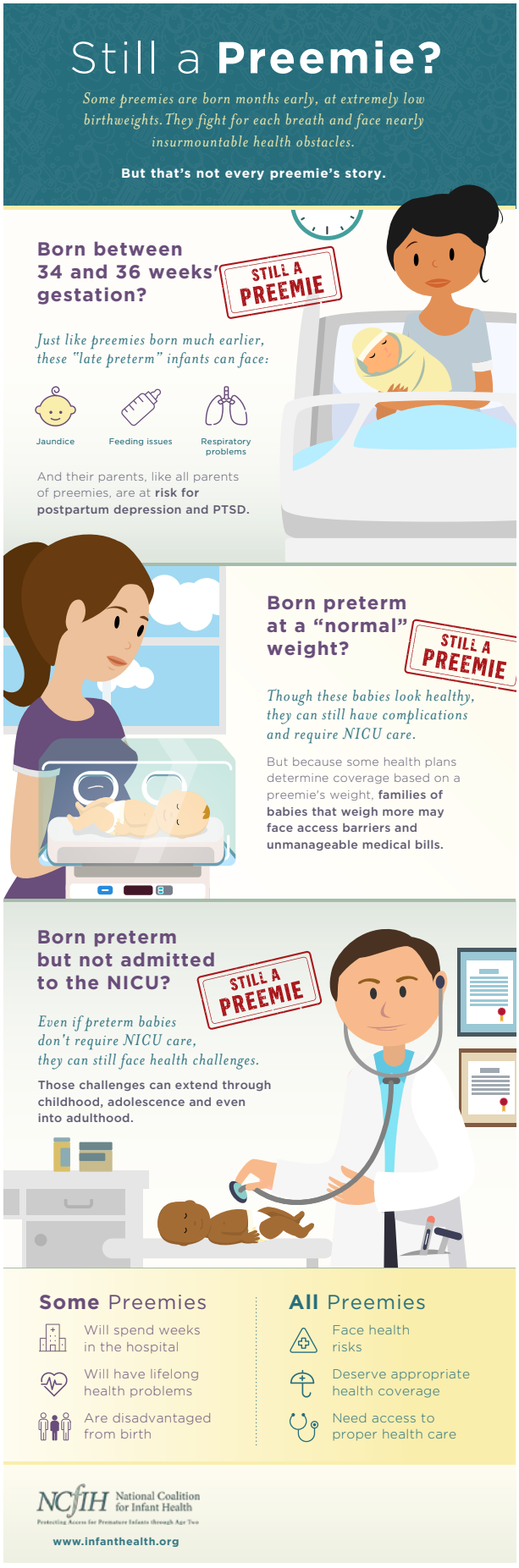

Keeping Your Baby Safe

during the COVID-19 pandemic

How to protect your little one from germs and viruses

Even though there are some things we don't know about COVID-19 yet, there are many more things that we do know. We know that there are proven protective measures that we can take to stay healthy.

Here's what you can do...

Wash Your Hands

- This is the single, most important thing you can do to stop the spread of viruses.
- Use soap.
- Wash for more than 20 seconds.
- Use alcohol-based sanitizers.

Limit Contact with Others

- Stay home when you can.
- Stay 6 feet apart when out.
- Wear a face mask when out.
- Change your clothes when you get home.
- Tell others what you're doing to stay safe.

Provide Protective Immunity

- Hold baby skin-to-skin.
- Give them your breast milk.
- Stay current with your family's immunizations.

Take Care of Yourself

- Stay connected with your family and friends.
- Sleep when you can.
- Drink more water and eat healthy foods.
- Seek mental health support.

Immunizations Vaccinations save lives. Protecting your baby from flu and pertussis lowers their risks for complications from coronavirus.

WARNING

Never Put a Mask on Your Baby

- Because babies have smaller airways, a mask makes it hard for them to breathe.
- Masks pose a risk of strangulation and suffocation.
- A baby can't remove their mask if they're suffocating.

If you are positive for COVID-19

- Wash with soap and water and put on fresh clothes before holding or feeding your baby.
- Wear a mask to help stop the virus from spreading.
- Watch out for symptoms like fever, confusion, or trouble breathing.
- Ask for help caring for your baby and yourself while you recover.

We can help protect each other.

Learn more

www.nationalperinatal.org/COVID-19

National Perinatal Association

The Gap Baby: An RSV Story

A collaborative of professional, clinical, community health, and family support organizations improving the lives of premature infants and their families through education and advocacy.

The National Coalition for Infant Health advocates for:

- **Access to an exclusive human milk diet** for premature infants
- **Increased emotional support resources** for parents and caregivers suffering from PTSD/PPD
- **Access to RSV preventive treatment** for all premature infants as indicated on the FDA label
- **Clear, science-based nutrition guidelines** for pregnant and breastfeeding mothers
- **Safe, accurate medical devices** and products designed for the special needs of NICU patients

www.infanthealth.org

I CAN Digitally Involved (I CANDI): Taking Action to Engage Pediatric and Young Patients in Medicines R&D

Amy Ohmer

iCAN
International Children's Advisory Network

"Now in the 7th year, iCAN was launched June 22, 2015, by founder Dr. Charlie Thompson to support children around the world living with rare, chronic, and complicated diagnoses. Today, iCAN has 30 chapters around the world which provide opportunities to youth members to share their expert stories and experiences."

As the summer season settles in, the worldwide support of children and young people through pediatric clinical research continues to be a cool topic. In June, the International Children's Advisory Network, Inc. (iCAN) shared learnings within a European Patients Academy on Therapeutic Innovation (EUPATI) session called Taking Action to Engage Pediatric and Young Patients in Medicines R&D. This session was designed to showcase the global community of support for the inclusion of kids in medicine, research, science, and innovation. A special thank you to our fantastic iCAN youth members for helping to create a testimonial video and our many friends and colleagues who shared their voices to iCAN to support the importance of clinical research collaboration with kids' families and the pediatric healthcare community.

If you have some time to watch, this is a great session. The session was moderated by a youth advisor, Anastasia Semaan, and Jana Popava, EUPATI, and featured three speakers from KIDS Barcelona and one young person from KIDS France. You may remember Mitch Herndon and Danya Kaye from UCB and Dr. Bob Phillips from our iCAN Scotland Summit in 2018.

The link to the video is on the "iCAN Video page" in the section 'Events':PEOF 2021: Taking action to engage paediatric and young patients in medicines R&D

Feel free to share this video widely.

"Kicking off July, iCAN partnered with Theresa Shalaby, Senior Regulatory Services Manager, Functional Plain Language Summaries, Synchrogenix, a Certara Company, to share in support for how to involve young people throughout the lay summary review. "

Kicking off July, iCAN partnered with Theresa Shalaby, Senior Regulatory Services Manager, Functional Plain Language Summaries, Synchrogenix, a Certara Company, to share in support for how to involve young people throughout the lay summary review. The presentation #409 SL: Recent Developments and Strategies in Pediatric Drug Development Documentation was given during the DIA 2021 on July 1st, 2021. If you are a member of DIA, the presentation will be available through August 2021.

For the second week of July, iCAN will be sharing their exciting annual event: *Jumo Health presents the* iCAN 2021 Virtual Summit? This year, from June 12th - June 16th, 2021, at 10:00 a.m. - 12:00 p.m. daily (EST), iCAN will offer an interactive series of sessions to support learnings through the patient perspective as well as industry learnings on innovation, science, and pediatric

research. Children from ages 8-18 meet with stakeholders to share their knowledge and expertise while learning from pediatric healthcare community leaders. Registration will be open through the end of the summit and is available to all at www.icanresearch.org. Come check us out and learn from the kids! As a reminder, once the summit closes, all sessions will be shared through recordings found on www.icanresearch.org.

See us at the American Academy of Pediatrics (AAP) NCE from October 8th - 12th, 2021. We will be in Booth #563, conveniently located near the lunch and refreshments area. We hope to see everyone there as we will be sharing a new youth-led research project and our partner, Hope for Henry.

As a reminder, if any kids are not involved in an iCAN chapter but would like to participate, iCAN offers a Virtual Chapter to accommodate any child, anywhere in the world. There is no cost to create a chapter or for a child to participate, as iCAN is supported through sponsoring partnerships. Starting a chapter is free and easy to do, as iCAN helps each group to get started and up and running. If you would like to sponsor a child, a chapter, or our summit, please contact us by email at info@icanresearch.org or visit www.icanresearch.org

#iCANMakeADifference #iCAN #iCANBeDigitallyInvolved #DIA 2021 #EUPATI #iCAN2021Summit

Disclosure: *The author has no conflicts of interests to disclose.*

NT

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OPIOIDS and NAS

When reporting on mothers, babies, and substance use

LANGUAGE MATTERS

I am not an addict.

I was exposed to substances in utero. I am not addicted. Addiction is a set of behaviors associated with having a Substance Use Disorder (SUD).

I was exposed to opioids.

While I was in the womb my mother and I shared a blood supply. I was exposed to the medications and substances she used. I may have become physiologically dependent on some of those substances.

NAS is a temporary and treatable condition.

There are evidence-based pharmacological and non-pharmacological treatments for Neonatal Abstinence Syndrome.

My mother may have a SUD.

She might be receiving Medication-Assisted Treatment (MAT). My NAS may be a side effect of her appropriate medical care. It is not evidence of abuse or mistreatment.

My potential is limitless.

I am so much more than my NAS diagnosis. My drug exposure will not determine my long-term outcomes. But how you treat me will. When you invest in my family's health and wellbeing by supporting Medicaid and Early Childhood Education you can expect that I will do as well as any of my peers!

Learn more about Neonatal Abstinence Syndrome at www.nationalperinatal.org

National Perinatal Association

Clinical Pediatric Surgery: A Case-Based Interactive Approach

With generous grants from the Mirella and Lino Saputo Foundation in Canada and the Colorectal Teams Overseas Foundation in the United States, Dr. Sherif Emil and Dr. Marc Levitt have secured a limited number of copies of their books for distribution to surgeons in low and middle income countries who can benefit from the books but do not have the means to buy them. The following books are included:

- **Clinical Pediatric Surgery: A Case-Based Interactive Approach** *By Sherif Emil* ISBN 9780367635602
- **Pediatric Colorectal and Pelvic Surgery: Case Studies** *By Victoria A. Lane, Richard J. Wood, Carlos Reck, Marc A. Levitt* ISBN 9781138031777
- **Fecal Incontinence and Constipation in Children: Case Studies** *By Onnalisa Nash, Julie Choueiki, Marc Levitt* ISBN 9780367151614
- **Pediatric Colorectal and Pelvic Reconstructive Surgery** *By Alejandra Vilanova-Sanchez, Marc A. Levitt* ISBN 9780367136475

These copies will be distributed completely free of charge, including free shipping, according to the criteria below upon receiving an eligible application. These copies are **not** intended to be for the sole use of the recipient only. Surgeons and trainees who receive these copies have to pledge to make them available to all their trainee and consultant colleagues at their institution, in order to maximize distribution of the book. There is a limit of one copy per institution. Recipients also have to pledge to send an email confirmation of receipt. **We ask those who do not believe that the books will be of much use in their practice or those who can afford to buy the books to refrain from applying for a gratis copy, in order to allow us to distribute the books in the most efficient and effective manner.**

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2.	Specialty:	First Priority:	Pediatric Surgery
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5.	Practice mix:	At least 75% non-private practice	
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Please provide a short statement (4-5 sentences) indicating how the books may contribute to your training or practice:

Attestation

I confirm that I am a trainee in pediatric surgery or a consultant in pediatric surgery in a low or low middle-income country who commits at least 75% of my practice to providing surgical services to public patients who do not reimburse me for my services. I confirm that these textbooks will contribute significantly to my training or practice, and that I do not have the financial means to purchase the books. I pledge to share the books with all pediatric surgical trainees and consultants in my institution who stand to benefit from the knowledge provided in the book. I pledge to provide email confirmation to Dr. Sherif Emil (Sherif.Emil@McGill.ca) upon receipt of my copies.

_____ _____ _____
Name **Signature** **Date**

Respiratory Syncytial Virus is a

Really Serious Virus

Here's what you need to watch for this RSV season

Coughing that gets worse and worse

Breathing that causes their ribcage to "cave-in"

Rapid breathing and wheezing

Bluish skin, lips, or fingertips

RSV can be deadly. If your baby has these symptoms, don't wait.

Call your doctor and meet them at the hospital.

If you baby isn't breathing call 911.

Thick yellow, green, or grey mucus that clogs their nose and lungs, making it hard to breathe

Fever that is higher than 101° Fahrenheit which is especially dangerous for babies younger that 3 months

National Perinatal Association

www.nationalperinatal.org/rsv

PROTECT YOUR FAMILY FROM

RESPIRATORY VIRUSES

flu coronavirus pertussis RSV

SOAP

WASH YOUR HANDS
often with soap and warm water.

GET VACCINATED
for flu and pertussis. Ask about protective injections for RSV.

COVER COUGHS AND SNEEZES.
Sneeze and cough into your elbow.

USE AN ALCOHOL-BASED HAND SANITIZER.

STAY AWAY FROM SICK PEOPLE
Avoid crowds. Protect vulnerable babies and children.

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1.

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Common Sense High Reliability Organizing (HRO) in the Response to COVID-19

Daved van Stralen, MD, FAAP, Thomas A. Mercer, RAdm, USN

Abstract:

We find descriptions of common sense in the domains of anthropology, artificial intelligence, and psychiatry. This is the common sense for adaptation, a form of practical intelligence that better predicts success in everyday experiences, if not real-world survival. This common sense is experienced-based knowledge rather than rule-based. When unexpected situations occur, it supports continuous assessments and decisions to adjust to the conditions at hand. Overwhelmingly practical, common-sense deals with a concrete situation on its own terms. Common sense describes cultural knowledge and behaviors. Inquiry drives practical common sense.

> ***" Proficiency in solving academic problems appears to decline from early to late adulthood, while the ability to solve practical problems is maintained or increases through late adulthood (1). We respect academic prowess, yet we seek practical expertise."***

Introduction

"We want someone experienced." Proficiency in solving *academic* problems appears to decline from early to late adulthood, while the ability to solve *practical* problems is maintained or increases through late adulthood (1). We respect academic prowess, yet we seek practical expertise.

The "old hand" had a sixth sense, always seeming to know where failure could occur. This was not a "devil's advocate" approach without the philosophical depth that criticizes without solutions, nor is it fear-mongering. The old hand pondered the situation and took straightforward action. Or told us to "do it." The authors recall these old hands who could foretell failure in the future. Just as often, they told us what to do when we could not see that future. It seemed needless work at the time, for something that we could not understand how it could happen. Journeymen, ironworkers, and miners always watched the novice (2, 3). Other times they watched us struggle, just far enough away, it seemed, to gloat at our hapless efforts getting the job done. The moment we struggled the most, the old hand walked over and gave us a simple solution, watching us, waiting *with* us for the moment we needed them. They were always teaching in this no-nonsense way, and it was after we had accumulated experience only (1, 4) that we recognized what we had learned from them. When events overwhelmed us, these same old hands walked up, saying, "Life's tough." They were in commiseration; we knew, at that moment, they had once been where we were then. All along, they had been helping us, standing along with us. They would never leave.

The authors learned this form of common-sense problem solving, also known as "lessons learned in blood," through similar dynamics starting decades apart in multiple, diverse domains. One author (DvS) queried experienced people in numerous countries and disciplines about their early, formative years. Did they have such old hands? It seems uniform; they all did.

> ***" Various definitions interfere with discussions of common sense used by operators in high-risk situations. Our paper discusses common sense from intimate connection with the environment, knowledge, and experience handed down and focuses on consequences from inaction and consequences of actions taken."***

Numerous disciplines discuss common sense as an entity: high-risk occupations (5), philosophy (6, 7), science (8), psychiatry (9), psychology (1, 10), anthropology (11), sociology (12, 13), social psychology (14), logic (15), reasoning (16), artificial intelligence (17), and robotics (18). Various definitions interfere with discussions of common sense used by operators in high-risk situations. Our paper discusses common sense from intimate connection with the environment, knowledge, and experience handed down and focuses on consequences from inaction and consequences of actions taken.

This is the common sense for adaptation, a form of practical intelligence that better predicts success in everyday experiences, if not real-world survival (1, 19-21). This common sense is experienced-based knowledge rather than rule-based (22). When unexpected situations occur, it supports continuous assessments and decisions to adjust to the conditions at hand.

About Common Sense

We do not accept the equivalency of common sense with common knowledge. Granted that common sense derives from shared, common knowledge, but our focus is solving the difficult problem embedded within the environment (23). This level of problem-solving is above that of the participant having acquaintance yet

superficial experience with such situations. Working in direct danger with responsibility for self and others is quite different from standing alongside. We must recognize the situational and environmental effects on mental performance, awareness, reasoning, and leadership (24-27). Our discussion also does not include the superficial approach that relies on cliché, cool words, slang, and efforts to maintain the image of knowledge. Much of the academic criticism of common sense is directed at these categorizations of common sense. The visibility of practical common sense rapidly decreases with time and distance from events.

"Much of the academic criticism of common sense is directed at these categorizations of common sense. The visibility of practical common sense rapidly decreases with time and distance from events."

John McCarthy (15), in a position paper formalizing common sense for artificial intelligence, described *common sense* knowledge:

"Common-sense knowledge includes the basic facts about events (including actions) and their effects, facts about knowledge and how it is obtained, facts about beliefs and desires. It also includes the basic facts about material objects and their properties."

This is not common sense from the dominant account, generalized for standardization and support of the normative stance. Ours is the practical or operational common sense, a method absorbed in practice from voices without the privilege of being heard. Immersed in events hidden from spectators, this is knowledge too easily disregarded and lost.

Common sense has diverse meanings and uses. Common sense as shared beliefs and a shared way of thinking (1, 10) becomes embedded in social knowledge, binding a culture or social group to each other and their past. Sometimes referred to as "uncommon sense," what we generically refer to as common sense also describes methods of solving routine or everyday problems. While "old hands" often display common sense by helping novices assimilate into an organization, others weaponize common sense by isolating outgroups or individuals they judge as undesirable. Whether common or uncommon, such sense informs science even as it becomes part of the battle between scientific experts and laypeople, each perceiving themselves as having possession of expertise.

A pregnant mother with a highly infectious disease delivers an infant who does not have the infection. Management of the mother and infant follow published guidelines. The mother and infant are discharged without complications (28). Free of context, the reader could view this case report as trivial. The reader would then miss the influence of the pandemic COVID-19 as it brings together uncertainty, ambiguity, threat, stress, and fear, creating tumultuous medical, social, and political environments in which we operate that can, indirectly and unconsciously, drive treatment decisions (29).

The above case report focused on problem-solving through the structure of common sense rather than the use of common-sense knowledge. More specifically, this is solving problems from *within* using subjective common sense. Conversely, an objective common knowledge perspective is associated with spectators or observers, a normative stance, or a fixed-point frame of reference (23). The spectator will not recognize "the thought and handwringing that has gone into making care plans for our newborns in the era of COVID. Some may even perceive this 'mindful indifference' as just 'indifference,' intellectual laziness, and/or lack of compassion/concern for the newborn," Poj Lysouvakin (29). Nor can the spectator appreciate the time and effort to gain common sense nor the anxiety during its application, described by Jaclyn Eisenberg(29):

The anxious feeling we all shared before walking into the room of a patient whose mother had COVID-19 and wondered if this particular patient could be the one to infect us while hoping that anxiety did not prevent us from providing good patient care. We also did not include the sense of helplessness we felt when we discharged this infant to a home where his mother was his primary caretaker - we did our best to keep him safe in the hospital but knew the best place for him was home with his family.

"We describe this as the VUCA-2T environment (Volatility, Uncertainty, Complexity, Ambiguity-Threat, and Time Compression, see Table 1) (24), modified from the US Army concept VUCA (33, 34) and the anthropologic concept of liminality (35)."

High-Reliability Organizing, an activity (the "verb" to *organize for high reliability*), engages the indeterminate, ambiguous, or ill-structured problem embedded in the environment, addresses the abrupt, exigent circumstance, and responds to catastrophic failure (23, 30-32). We describe this as the VUCA-2T environment (Volatility, Uncertainty, Complexity, Ambiguity-Threat, and Time Compression, see Table 1) (24), modified from the US Army concept VUCA (33, 34) and the anthropologic concept of liminality (35). Such situations do not often readily translate into straightforward problems with definitive constituents, rules, and outcomes (7, 23, 25). Inquiry is active and operational, supporting authority migration and information flow, enlarging small cues, and evaluating context (7, 32, 36).

Table 1. VUCA-2T

Volatility	The rapid, abrupt change in events
Uncertainty	Lack of precise knowledge, need for more information, unavailability of the necessary information
Complexity	A large number of interconnected, changing parts
Ambiguity	Multiple interpretations, causes, or outcomes
Threat	Impaired cognition and decision-making
Time Compression	Limitation acquiring information, deciding or acting before consequential changes

Common Sense

Overwhelmingly practical, common-sense deals with a concrete situation on its own terms. The person "just knows it" (11, 37, 38).

" a person's thoughts and actions from an intelligent interpretation of a situation before acting (1, 15). The individual solves the problem not fully knowing which facts are relevant for problem-solving and obtaining knowledge about the environment solely through observation and participation (15, 37)."

The common-sense world is one "in which we find things partly joined and partly disjoined" (39). Common sense is a method for practical problem solving, guiding a person's thoughts and actions from an intelligent interpretation of a situation before acting (1, 15). The individual solves the problem not fully knowing which facts are relevant for problem-solving and obtaining knowledge about the environment solely through observation and participation (15, 37). An example is the experience of a senior school bus driver participating in evacuations preceding a hurricane landfall:

"A hurricane two days from landfall threatened nursing homes and trailer parks in a coastal city. School buses were the only vehicles that could accommodate and transport groups of people with their wheelchairs, bicycles, musical instruments, suitcases, and personal belongings. Except for wheelchairs, school bus drivers had no policy, procedures, or training for this, which included driving on the narrow roads of trailer parks with limited room to maneuver. Supervisors said drivers for the wheelchair buses were to follow FEMA instructions, not school board policy. The fire department provided each bus a firefighter responsible for what to do, where to go, and who could also monitor the rear of the bus for backing maneuvers."

"Several locations, especially nursing homes, had multiple school buses in a parking lot not meant for buses. There was no intuitive entry and exit drive for multiple buses. The only area in a city with sufficient space for maneuvering multiple school buses, with few exceptions, is the school bus yard. Bus drivers relied on a system with other trained drivers for backing and were unaccustomed to working with firefighters who used a different backing language. The personal belongings people brought did not strap down well using wheelchair straps."

"Arriving at a nursing home, I found buses in different directions, some drivers not sure which direction to drive. Some busses needed backing, but the drivers were not sure of the firefighters' backing directions. Difficulties loading several busses delayed their departure, further blocking movement. Knowing we were to follow FEMA instructions, I began shouting to the drivers, "We work for FEMA! So, we follow their rules!" [FEMA had no rules for this.] "Don't you know FEMA wants us to do this!" "We have to get this done!" Drivers moved their busses and figured out the backing instructions. I quickly developed a way to modify wheelchair straps to hold things. This was rushed due to demands from a large number of people."

"I arrived on a bus at another facility. A driver was directing traffic, but buses were arriving from both directions into the parking lot with inadequate space for turn-around and a single exit point where buses were also entering. All the drivers were earnestly arriving to remove patients. The dispatcher told the buses to use a specific entry, leaving about six buses on-site facing different directions. Using my previous phrases, I had one lane stop, and I took a bus to drive it past the narrow bottleneck. When drivers saw their busses could fit, they followed. The buses could have blocked the only exit route had they become entrapped against each other while passing along the narrow drive. It would have been unclear which direction the buses should move to not increase the entrapment. This created a traffic flow pattern, the parking area emptied, and buses had room to enter."

"At another assisted care facility, the buses became jammed. I parked my bus out of the way. We had two drivers per bus. My partner helped to load wheelchairs while I directed traffic, again, using my "FEMA phrases." The buses arrived from multiple directions. I stepped in to develop a system for loading and directing traffic, then began directing buses to come from one direction. We had no plan for this, not even for a specific site. This continued throughout the day, constantly figuring out a plan at each site." Cary van Stralen, Pinellas County (Florida) School District

Although the use of common sense is deprecated from a normative frame or scientific view, we often define common sense by the *absence* of its use: a person who "lacks" common sense can appear hapless and easily confused as they blunder everyday problems; they have difficulty allotting attention to priorities, discerning relevance among facts; and they fail to comprehend their limited understanding. They do not understand what they do not understand (11, 15, 38). Explaining things or teaching them can be difficult, perhaps due to "their" common sense being different or incompatible. When the person's lack of commo-sense places them in the "uneducable" category, it becomes a barrier from others or triggers self-selected departure.

We commonly describe the absence of common sense from the point of view of those who have common sense. The abrupt "loss" of common sense can occur to all of us, such as an abrupt loss of structure when learned rules do not work or the experience of being in a situation where we do not belong. We then become those hapless individuals sensing loss of control, impaired perception, failure of words, and distorted senses (19). This situational loss of common sense generates the feeling of vulnerability in the liminal zone (26) and is the basis for Karl Weick's (31) "loss of cosmology" to experienced people. It is appreciating the situational loss of common sense aids in modeling common sense for the novice and interpreting after-action reports. A patient without common sense due to pathology described the experience, "What is it that I am missing? It is something so small, but strange, it is something so important. It is impossible to live without it..." (40).

"We commonly describe the absence of common sense from the point of view of those who have common sense. The abrupt "loss" of common sense can occur to all of us, such as an abrupt loss of structure when learned rules do not work or the experience of being in a situation where we do not belong. We then become those hapless individuals sensing loss of control, impaired perception, failure of words, and distorted senses (19)."

To assume common sense is lacking is to misread the reason common sense is missing or misunderstanding other causes that could contribute to the lack of common sense. Common sense is ecological; it has an adaptive purpose within a specific environment. A person acquires common sense as a learned, modeled behavior from an experienced senior individual *within* that environment. A person cannot acquire common sense without the opportunity to work with an experienced individual. Lack of common sense also occurs in those with intellectual limitations, acquired or congenital, and is a defining component for Autism Spectrum Disorders and schizophrenic vulnerability (9, 40, 41).

More commonly, situational stress responses or fear reactions impair the cognitive abilities necessary for common sense (26). Organizational culture or leadership can sustain fear reactions that cause more damage to various processes than direct damage from the threat itself. This is the ecology of fear (42). How an organization processes information can also sustain fear responses. For example, a bureaucratic culture preoccupied with rules and positions or a pathological culture preoccupied with power and needs (43) creates the ecology of fear that impedes practical common sense.

"How an organization processes information can also sustain fear responses. For example, a bureaucratic culture preoccupied with rules and positions or a pathological culture preoccupied with power and needs (43) creates the ecology of fear that impedes practical common sense."

Conversely, "good" common sense is recognizable. We even admire its contributions to insightful problem-solving. Good common sense starts by effectively coping with everyday problems in an everyday way (11). Sensible people use all their senses for subtle and nuanced information from the environment. Judicious, intelligent, perceptive, reflective use of observation enhances their ability to apprehend the sheer actualities of experience. Common sense then leads to sensible conclusions (11). Common sense as an exquisite adaptation for complex or straightforward everyday problems brings perception and reflection to the issue (11, 38). This intelligence is practical rather than academic (1, 38).

We can discuss practical common sense for high-risk situations with five components – motivation, intention, knowledge, heuristic processes, and action. From these components emerges the five identified HRO characteristics (44) and the mechanisms to achieve HRO – sensemaking, and enactment (45). The reference for HRO activity is always to reality as experienced (4); *reality drives action*. HRO is practice, not theory. We must not treat these as categories or distinct entities; they operate through relations with each other.

Five components of common sense shared across diverse domains

Motivation – responsiveness to phenomena, specifically, pressure to correct disruptions and prevent failures.

Intention – to immediately act and adjust those actions, referencing an immediate, concrete goal.

Knowledge – tacit, concrete, background knowledge from experience that crosses domains.

Heuristic processes – intuition, insight, learning from experience (46).

Action – bridge gaps with engagement (23), think with motor cognition (4).

Inquiry drives practical common sense. For John Dewey (48), "Inquiry belongs to 'action or behavior,' which *takes place in the world*, not just within the mind or within consciousness." It is not uncommon for people to be introduced to HRO solely through the five HRO characteristics and their descriptions. As attitudes, the characteristics make plain the inquiry nature of HRO. While attitudes don't *cause* behaviors to the degree beliefs can, they do influence behavior. Through behavior, HRO "takes place in the world" as inquiry from common sense, a "natural attitude – from which humans see and experience the world" (9). The components of common sense, then, drive the HRO characteristics.

Newborn and Tsunami Common Sense

Common sense begins in the space between concreteness and the abstract, which can be described but not explained. The liminal character of common sense confounds translation to spectators and scientists, though they unknowingly rely on common sense. "Individual physical objects must be discovered before

Table 2. Five characteristics of HRO

Characteristic	Description (44)	Attitude (47)	Behavior
Preoccupation with Failure	Lapse reflects a problem in the system	Attitude toward failure	Engage vulnerability or disruption
Reluctance to Simplify	Reluctant to *accept* simplification	Accept/seek complexity of even simple events	Respond to details, but appropriate details
Sensitivity to Operations	Attentive to line work	Awareness of how one fits into the system	Adjust for the disruption, but continue routine operations
Commitment to Resilience	Regain a dynamically stable state	Perseverance	Overcome failure in real-time
Deference to Expertise	Push decision making down and around	Respect the knowledge and experience of others	Create expertise by deferring to expertise

abstractions can be made from their conceived nature," George Santayana (49). This chasm is the "gap between the apparent reality and one methodically ascertained; between phenomena in their concreteness and particularity, and facts stripped of all that is tangible and individual so that they may be fitted into some all-embracing regularity" (50).

Mouth-to-mouth resuscitation of the newborn provides an example of delayed acceptance despite its use by medical professionals:

"In the country, a young woman was taken up and committed to jail to take her to trial for the supposed murder of her bastard child. According to the information which he had received, he was inclined to believe, from the circumstances, that she was innocent; and yet, understanding that the minds of the people in that part of the country were much exasperated against her, by the popular cry of *a cruel and unnatural* murder, he feared, though innocent, she might fall victim to prejudice and blind zeal.

"[H]aving concealed her pregnancy [concealment of pregnancy was a crime], the baby was delivered during the night by herself. She was suspected, and the room was searched, and the child was found in her box, wrapped up in wet clothes. She confessed that the child was her's but denied having murdered it or having had an intention to do so…[on autopsy] the lungs would not sink in water [a presumptive forensic sign of live birth]. It is so generally known that a child, born dead, may be brought to life by inflating its lungs, that the mother herself, or some other person, might have tried the experiment" (51).

Case I. "The lady of an officer was delivered of a stillborn child. The feet had presented, the labour had been quick, and there was reason to believe that life had not been long extinct. The lungs of the child were, therefore, immediately inflated from my own, while the body was immersed in hot water, and volatile spirit occasionally applied to the nose, mouth, and chest" (52).

Case II. "The wife of [a] housepainter, &c. in Northampton, was delivered of her first child. The labour had been tedious, the liquor amnii having been discharged very early and the face having presented. The child, a female, was stillborn. The circulation of the funis had quite ceased, and the heart of the infant was perfectly still. The face had suffered from hard pressure, was swollen, and marked to a considerable extent with ecchymosis; the lips were a good deal enlarged, remarkably flabby, and pale. There was no sign of animation in any part of the body, and I thought a very faint hope of restoration. But, encouraged by the recollection of the preceding case, I determined on making an attempt, and the fortunate result of it, I have now the pleasure to communicate. Interposing a piece of muslin inflated the lungs from my own mouth, closing the nostrils by the pressure of my fingers. The thorax was compressed after each inflation, and thus artificial respiration was maintained, observing the natural periods of frequency, and keeping in mind the difference of capacity between the child's lungs and my own. In about half an hour, I felt very clearly a faint pulsation of the heart; a little fluttering, I thought I had perceived, once or twice at intervals, a few minutes before, but I was hardly sure of it" (52).

Case III. "After a very severe natural labour of 12 hours, the head was expelled, and the child was then alive. Although the expulsive uterine efforts continued, the body very unaccountably made no progress. The head had been protruded about a quarter of an hour when the child gave several convulsive jerks, indicating its being in danger. I endeavoured to get my finger into the armpit to bring the body down, but it was so high and the head so closely drawn to the external parts that I could not reach the armpit so as to act. After several efforts, the finger was at length hooked with difficulty round the arm, and the body brought down. A quarter of an hour was spent in extracting the body. This child was lifeless, and its appearance in every respect resembled the two former [lifeless at birth, successfully resuscitated]. No time was lost in breathing into the lungs and using the other means, and in half an hour, it gave the usual convulsive gasp to respire. The artificial inflation was carefully continued, and in seven minutes more, it made a second attempt. No progress was made in the respiration. The lungs were now very frequently inflated, and in a short time, the respiration began to improve, and for a minute or two would continue pretty regular, but, unfortunately, whenever the artificial inflation was given up, there was an evident falling off and a tendency to return to a state of stillness. It was not till after the expiry of three hours and a half from the birth that I ventured to desist, the natural respiration being then almost perfect. Everything continued to do well, and he became a very fine healthy boy."

"In estimating the comparative value of the different means used in these cases, I must give a decided preference to breathing into the lungs. No instruments were used; these I have found very troublesome, and I have never been able to inflate the lungs so completely by them as by simply applying the mouth to the child's, at the same time closing its nostrils and gently pressing back the trachea…In some of the cases gentle, and in others more powerful inflation, was found most efficacious."

"I am aware this practice has been objected to. It has been urged that inflating the lungs with air so charged with carbonic acid gas is more likely to destroy than restore life. This objection is plausible but cannot possibly be true. Were it so, no case, such as those detailed where this method was used, could have been restored. A thing of which the uniform tendency is to destroy life, never can in a single instance reanimate, so that these cases show most satisfactorily that expired air may be taken not only safely, but salubriously, into the lungs of another…[B]ut I am sure the usual method of blowing into the lungs does not merit that censure which has been cast upon it. While I would place my chief reliance on insufflation, persevering to repeat it at short intervals" (53).

Desperate young mothers gave mouth-to-mouth resuscitation to save their newborn babies. For these mothers, it was common sense. For physicians, elevated expired CO_2 was "more likely to destroy than restore life." For the courts, the results became forensic evidence in the determination of infanticide or feticide, air in the lung evidence of infanticide. William Hunter described this in 1783 but as a problem for the mother. If the baby dies, then air in the lung suggests the baby was born alive. The vignettes describe how several physicians successfully administered mouth-to-mouth resuscitation to newborn babies in the years 1814, 1817, and 1824, respectively. Such common sense lay dormant for over 150 years.

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The concern for resuscitation about elevated CO_2 in expired air continued through the 1940s. What is often missed to this date is mouth-to-mouth resuscitation to model bag-valve-mask (BVM) resuscitation. BVM is associated with barotrauma and gastric insufflation (54, 55), complications rarely observed with mouth-to-mouth resuscitation. During mouth-to-mouth resuscitation, the rescuer feels the pressure change in lung compliance on inspiration and the end of expiration by the cheek. The author's (DvS) experience administering mouth-to-mouth breathing in the field to an infant, adolescent, and adult later informed his approach for BVM and mechanical ventilation for spontaneously breathing patients (56). As noted by Dr. Wilson in 1829, "I am aware this practice has been objected to."

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Perhaps the difference in common-sense problem solving between the mothers and physicians is the personal impact. For example, a tsunami survival solution is to move to higher ground rapidly. Three tribal groups who survived the December 2004 Indian Ocean tsunami have lived in the region for between 30,000 and 50,000 years: the Moken of the Andaman Sea (57), the Onge tribe on Little Andaman, and the Jarawa on South and Middle Andaman Islands (58). Thousands of Nicobarese who migrated from South East Asia 500 or 600 years ago were dead or missing (58).

They had heard stories of laboon [the "seventh wave"] around the fire; when it comes, they had been told, go to the mountains or head to deep water. For the animist Moken, laboon was sent by ancestor spirits to clear out the world's evils. It would devour everything in its path before all was reborn. "A long time ago, there was a wave so big it covered all but the highest mountain," Tad, a Surin elder, told his family (57).

[The Onge tribe] folklore talks of "huge shaking of ground followed by a high wall of water," according to Manish Chandi, an environmental protection worker who has studied the tribes and spoke to some Onges after the disaster. The aboriginals know about tsunamis, and they know how to deal with them (58).

The Practice of Common Sense

We find descriptions of common sense in the domains of anthropology, artificial intelligence, and psychiatry. In anthropology, common sense describes cultural knowledge and behaviors (11, 50). Artificial intelligence struggles with several gaps that describe common sense – processing large amounts of information (17), the frame problem (37), and constraints due to logic (59). Psychiatry described common sense by its absence. In the early 20th Century, the loss of common sense was a defining characteristic of autism and schizophrenia (41). The following is a distillation of the literature describing *how* common sense is used by practitioners.

Psychosocial

Common sense at the personal level preserves mental health and gives a sense of agency (40). Wolfgang Blankenburg, a German psychiatrist, conducted extensive studies on schizophrenia. He observed that, by overlooking the "obvious as obvious," we "resist" loss of our common sense, preserving our mental health. That is, the obvious does not require exploration (40), allowing us to see things in a fuller, proper perspective. We can quickly grasp the significance of life's discrepancies and disruptions, becoming attuned and grounded (60). Motor cognition comes from the coupling of perception and action, which is also the mechanism of common sense. The parietal cortex during motor cognition distinguishes oneself from others, an essential aspect of agency (61) that is lost in schizophrenia (40).

Common sense, as social knowledge, is the background knowledge for expectations, meaning, and the "rules of the game." It gives the ability to spontaneously share in activities with others (19, 40, 60). Contextual understanding and motor cognition increase the capacity for attunement, the ability to appreciate and be involved with the mental states of others.

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Reasoning

Common sense is improvable and adaptable. A person with common sense learns from new information. Though this appears trite, a computer program will evaluate if new information is relevant, conform to existing information, use the deduction for solutions, and not change a derived solution (the property of monotonicity) (15, 59). On the other hand, a person using common sense can use partially relevant information, distill experience, and a vast store of knowledge into an accessible representation when needed (15, 62). "*We shall therefore say that a program has common sense if it automatically deduces for itself a sufficiently wide class of immediate consequences of anything it is told and what it already knows,*" John McCarthy (15).

Common sense draws its authority from reality by presenting the world in an accessible form, allowing us to derive information from the world (11, 62). Science gives us an explanation of reality, stripped of what is tangible and specific, creating a generalizable abstraction. Common sense then establishes cause-and-effect that is practical rather than theoretical, creating an image of reality for survival (19). Through concrete descriptions of reality, common sense bridges the gap between description and explanation (50). Common sense stimulates our initial approach, guides us at

the beginning, and shows us the first solutions (50).

A person entering a new situation uses common sense to select memory structures, what matters from what does not matter, what is relevant or irrelevant, and selectively attends to the relevant, then changes the details as necessary (11, 59, 60). For artificial intelligence, common sense must become larger and more intimately connected to the world with context formalized into objects (15, 59). Common sense accepts a sharp distinction between description, what we have in context, and explanation, what led to the context. Common sense can move forward from single facts because ordering a few facts is less of a problem. The person uses the senses judiciously, intelligently, perceptively, reflectively. Science does not make such a clear distinction between description and explanation. The context will complicate something new because ordering multiple facts is more complicated, so the next steps become less clear. The person with common sense copes with everyday problems, the foundation of "everyday" experience (11, 50).

Common sense arises from the distilled actualities of experience. In turn, immediate experiences interpreted through common sense feel more real (11, 19, 62). Common sense is an attitude from which we experience the world, denying that it as is a body of knowledge while affirming that it comes without reflection from that experience (9, 11). If the experience does not fit common sense, then the character of the experience is ruled out (19). Lack of common sense in artificial intelligence makes the system "brittle," difficult to extend into new situations (63).

With common sense, we can distinguish relevant, irrelevant, or improbable (9) as well as information that is partially relevant or contingently relevant. Common sense does not have well-demarcated boundaries or compartmentalized knowledge (15). While more elementary than determining true or false, the ability to cross boundaries, use loosely coupled knowledge domains, and weigh value becomes vital in the world of experience. Without common sense, a reaction to this messy organization of knowledge is to demand certitude, construct controlled effortful processing, and have inflexible attachment to the 'axioms of everyday life' (40, 64).

Problem Solving

Common sense judges the probable abilities, causality, and the possible results of different actions instead of the truth (37, 40). The common-sense individual does not know in advance what actions to take. Therefore, goals are judged by the possibility of sequences that can reach the goal (37).

Using common sense, a person can change plans as information is added or updated. Deductive reasoning systems have the property of monotonicity, the term used for its analogy to similar mathematical concepts. In monotonic reasoning, new information does not change a valid conclusion. Adding assumptions for relevancy or reaching a specific conclusion only increases the number of conclusions without discarding the old conclusions (59, 63). Humans do not reason that way. When we receive new information, we adjust our conclusions. We reason non-monotonically because classical logic and scientific reasoning fail us in high-risk situations (65). Formalized modes of nonmonotonic reasoning added to computer systems give "rules of conjecture" rather than "rules of inference." Conclusions appropriate in one set of assumptions can be disconfirmed by adding new assumptions (63). Nonmonotonicity brings artificial intelligence closer to common sense.

Common sense contains heuristic processes such as analogies. Paradoxically, the uncertain methods of partial matching through analogies are more effective at reaching conclusions than the certainty of logic. You do not need a new frame or analogy for every problem. Logic does not represent approximations for solutions, and "a number cannot reflect the considerations that formed it" (59). Science attempts to classify an observed object, subsuming the observation within a known object, thereby preserving order. On the other hand, common sense finds an analogy between what is explored and what is known. Though common sense starts with deductive explanations, it concludes with an analogy (50).

"Novelty can distract as the person describes what is familiar or personally salient rather than used an analogy to develop relevance and meaning. Analogies can act to create a topological space for safer and more effective engagement."

Analogies are used to understand and predict new features of novel domains. Common relations early in the experience are more important than common object descriptions (66). Novelty can distract as the person describes what is familiar or personally salient rather than used an analogy to develop relevance and meaning. Analogies can act to create a topological space for safer and more effective engagement.

Topology

We can understand common sense as a topological space where elements maintain continuity of connectedness despite deformations. The focus is on how the elements are connected, for example, the closeness of connection or overlapping connection (67). This topology differs from the academic approach forming knowledge into logical categories and scientific theories representing compartmentalized knowledge (15, 38). This logic initially seems counter-intuitive, but that is likely from exposure to three-dimensional Euclidean space that comprises much science education. Points and measures comprise Euclidean space, whereas connection and relation comprise the topological space.

Common sense deals with only partially known elements or with information that cannot be separated from irrelevant information (15). Quantitative measures, hierarchy, metrics as points and lines, or discrete representations do not work in the topological, common-sense space (59). Common sense organizes knowledge in topological forms connected for their value to solve problems and support social organization. For Norwegian fishermen, specific elements and categories of the fishing experience form systems and shared conceptions comprising common sense and meaningful social reality (5).

Facts will come together in some conjunction; if their relations are "right," then we have an explanation (50). If we have expectations, then we are surprised if the conjunction of facts has different relations. A topological space allows us to engage from observed relations. Topological space accommodates larger yet more intimate connections for common sense, giving more power and speed to

mental activities (59).

Commonsense experiences time as continuous and branching. We can record the arrested event, elements at the moment in time and use the information to study and discuss. Within the event, the individual works with simultaneous events with the trajectory of the larger event. Though prediction has some value, it is the engagement of the situation where we use common sense to change the trajectory. This is the "sensed" event of experience that we cannot record. Euclidean space has categories; topological space does as well, but they are more open and overlapping with some elements in residual categories.

The topological space contributes to some of the difficulties individuals have described in how they use common sense. We do not have a natural way to describe points without measure. Spatial relations are privileged over relations and connected continuity (67). It seems paradoxical that a person or element at a greater distance influences a person than immediate events or an immediately adjacent colleague.

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The Frame Problem

Healthcare organizations have routine and contingency plans. Medical care units have patient care protocols. Robots have artificial intelligence programs. John McCarthy and Patrick Hayes (37) identified a problem due to the operational environment: "One assumes, as a rule of procedure (or perhaps as a rule of inference), that when actions are performed, all propositional fluents which applied to the previous situation also apply to the new situation." This is the frame problem – how to represent the effects of action without also representing all non-effects. If we add assumptions for the non-effects, monotonic reasoning describes the explosion of new conclusions without change in the original conclusions (59, 63). The frame problem is not part of planning or protocols.

Since its first identification, we now understand that the frame problem includes what properties change and what properties do not change. Any action in the NICU can affect unrelated but concurrent actions, complex interactions, and indirect actions. For example, when a physician responding to low CO_2 levels decreased the ventilator rate and tidal volume for an adolescent on long-term ventilation, a respiratory care practitioner (RCP) reminded the author (DvS) of the reasons for the settings – frequent pneumonia. Also, a recent decrease in tidal volume due to low CO_2 levels had resulted in hypoactive delirium, loss of awareness, and no smiling. At that time, after returning to the previous settings, the adolescent immediately opened his eyes and smiled (in the presence of the author). The problem-solving frame for the physician was mechanical ventilation and blood gas analysis. This situation can produce "euboxia," the belief that things are settled if "all the boxes have good values" (47).

Marvin Minsky (59) proposed that the primary purpose of problem-solving is to understand the problem space. Rather than search for a solution, we find representations or frames that make the problem easier to solve. In effect, rather than narrowing the search through simplification, we search for information that increases the complexity of the problem. Once we better understand the problem space, we more easily find a solution. This paradox is "reluctance to simplify" transformed to "willingness to complexify," possibly a more helpful characterization (Karl Weick, personal communication).

The frame problem contributes to, if not generates, errors. If a system cannot learn from errors from the frame problem, the errors will continue. This does not represent human reactivity (59). The change in the frame or its size interferes with the ability to foresee every consequence of an action. To do this, we would deduce the implications of actions from their descriptions in the plans using relevant implications while ignoring the irrelevant ones (68). Then, during operations, we swiftly gather information, particularly in the unexpected or where we are surprised. However, to be surprised, we would have expected something else, which takes much information. We can reduce our information load using stereotypes, which makes sense as there can only be so many combinations (59, 68). Nevertheless, stereotypes bring bias and prejudice. Common sense is a means of dealing with a large amount of relevant, partially relevant, conditionally relevant, and irrelevant information.

Another cause of frame problem error is the assumption that the representations of the environment accurately encode what it represents. These representations have some sort of correspondence to the actual world, for example, causal, informational, or structural. These representations can be correct, incorrect, or non-existent. We cannot calibrate our representations or mental models against the actual world. Cognitive models don't help us because the mental models in cognition are the *sources* of the frame problems (69).

Common Knowledge, Tacit Knowledge

We distinguish common sense as *problem-solving* from common sense as *knowledge*. Common sense and *common knowledge* are frameworks and phenomena which underwrite much of social life, holding us together as a social group (8, 70). Everyone in the social group knows common knowledge, AND all members know that other members have this knowledge as well. Common sense knowledge is the knowledge that ordinary people use in everyday situations focused on the practical and results rather than the structured, theoretical knowledge science uses to expand knowledge (38). Rather than laws dictating causality, common sense considers "influences," assuming "that almost everything is significant and can exert influence of some sort" (39).

The use of proverbs, jokes, and anecdotes rather than formal doctrines and theories (11) can appear trivial and inconsequential, misleading the spectator or outsider. Taking lightly, this form of common sense comes at grave risk. Compared to their use for general conversation, in a high-risk situation, such phrases intimately tie danger and consequences from an indistinct threat to concrete observations and actions. Common sense will then quickly elaborate a wide range of immediate consequences that artificial intelligence has difficulty doing (15). Common sense supports immediate action to avoid such hidden consequences, thereby producing immediate results. But the results are of a failure avoided. This context is an immediate enacted experience rather than deliberate reflection (11).

We may assume a lack of common sense when the difficulty lies in the assumption of mutual knowledge as common knowledge. *Mutual knowledge* is known by all, except that people don't know that everyone has that knowledge. During a period of multiple deaths and organ transplants, the fatigued PICU team described the transfer of a series of patients to the PICU service for brain death evaluation as "dumps." [A "dump" in healthcare refers to the transfer of care to another service to manage an "easily managed" problem.] The team defined it for the author (DvS) as the transfer of an easily managed patient to avoid work. The author described the admission of an infant, otherwise healthy but for an elective

procedure, to a specialty surgical service in the PICU. This was early in the first year of the unit's existence. Would it have been a "dump" for the surgical service to ask the pediatricians to write feeding orders for the formula? The PICU team believed the surgical resident could contact parents or use house formula. The infant received a substantial volume of formula in relation to medications, aspirated, and then died. The team appreciated that what they had called a dump was simply a problem of common sense to them because of their knowledge and experience. The author never again heard the term "dump."

" The PICU team believed the surgical resident could contact parents or use house formula. The infant received a substantial volume of formula in relation to medications, aspirated, and then died. The team appreciated that what they had called a dump was simply a problem of common sense to them because of their knowledge and experience."

We can also look at how conclusions different from our own are reached (25). Even with error, "thought operates according to the model of common sense" (71). Discovering an error, the organization would turn to remedial education, rules, or discipline. As a frame of thought or cultural trait, the organization would seek to know more about the common-sense reasoning, such as the reasoning behind not seeking consultation or what made the actions appear correct. Common sense drives behaviors more rigorously than religion, philosophy, or science (11).

Common sense and tacit knowledge

Science has a formal, logical, and calculative structure. However, there is also a significant amount of tacit knowledge of those things that can be known only through living the collective life of science in specific expert communities. Such knowledge is **not** universal, immutable, articulated truths that can be knowable by anyone, or anything, anywhere (72). Tacit knowledge and common sense differ across domains (73) and are common only to the extent that two people share similar social and cultural experiences (12).

Common sense organizes knowledge in topological forms with relations for problem-solving, the nearness of relations increasing knowledge rather than logic operators. The person deals with a concrete situation on their terms. This differs from the academic approach of forming knowledge into logical categories (12). "Collective tacit knowledge" is more ontological, having to do with its location in the social collectivity (72), a topological structure.

Common sense treats as facts value judgments related to the socio-cultural environment (72). One difficulty of working with common sense knowledge is the association with identity and self-image. When questioned for a source, the person answers, "I just know it" (12). It was "common knowledge" through the 1990s that "rebound croup" following aerosolized adrenaline led physicians to withhold adrenaline to avoid hospital admission. This belief emerged from the original study using racemic epinephrine for croup, "symptoms often recurred within two hours, suggesting that this form of treatment should not be used in the emergency room and the patient then sent home" (74). Researchers continue to address this belief (75). The author (DvS) queried residents on whether it was rebound from the *use* of adrenaline or was it the fact that adrenaline lasts 0-45 minutes and it had ceased working. Several residents, insisting on the concept of rebound, commonly presented 3-5 critical and emergency care textbooks describing rebound croup and the use of adrenaline as an indication for hospitalization. No one believed in rebound headache after administration of one dose of ibuprofen.

Thus the many armed with prejudice and the few armed with logic fight an eternal battle, the logician charging the physical world with unintelligibility and the man of common sense charging the logical world with abstractness and unreality. The former view is the more profound since association by similarity is the more elementary and gives constancy to meanings. At the same time, the latter view is the more practical since association by contiguity alone informs the mind about the mechanical sequence of its own experience. Neither principle can be dispensed with, and each errs only in denouncing the other and wishing to be omnivorous, as if on the one hand logic could make anybody understand the history of events and the conjunction of objects, or on the other hand as if cognitive and moral processes could have any other terms than constant and ideal natures.

George Santayana (49)

Tacit knowledge is both somatic and cognitive. "Somatic knowledge," a form of biological knowledge like riding a bicycle, is difficult to describe but easy to demonstrate, therefore provides little contribution to Artificial Intelligence (72). Motor cognition is missed as combined somatic and cognitive knowledge, enhancing thinking while acting (45). *Motor cognition* describes how we adjust our actions to changing situations and how we learn through physical actions (76). Motor cognition, then, contributes to somatic common sense when we are actively engaged with an uncertain situation.

"Motor cognition is missed as combined somatic and cognitive knowledge, enhancing thinking while acting (45). Motor cognition describes how we adjust our actions to changing situations and how we learn through physical actions (76)."

Misuse of common sense

We must distinguish practical, common-sense problem solving used in the high-risk environment from common (sense) knowledge and other forms of "common sense" problem-solving. The phrase "common sense" often precedes a statement intended for acceptance without question. However, the characteristics of common sense form an inherent vice, the rapid connections from topological connections that effectively process large amounts of information can lead the inexperienced to believe they have gained insightful truths.

One difficulty working with common sense knowledge is the association with identity and self-image. When questioned for a source, the person answers, "I just know it" (12), and the inquiry ends. Others become offended when suggestions are not acted upon and less than cooperative in the engagement. The identity of individuals using practical common sense lies in the reduction of consequences

Misused common sense supports prejudice and bias. Common sense treats as facts value judgments related to the socio-cultural environment (72). Improper analogies, misidentification of traits as useful, or focus on a few or minor traits can mislead and support bias and prejudice. Individuals using practical common sense can have biases and prejudices independent of common sense but will more likely dismiss them with the severity of consequences.

Facts that conform with a known rule or order become more convincing and more supportive of the rule or order. The individual believes the event is explained and is over or follows current knowledge (50). Contributing to the negative reputation of practical common is the priority of the actual world over scientific concepts and models (11).

"Science translates connections within topological space into hierarchies in Euclidean space (67) with loss of relations and information (50). Common sense derives its power and speed from topological connections."

Science translates connections within topological space into hierarchies in Euclidean space (67) with loss of relations and information (50). Common sense derives its power and speed from topological connections.

Common sense can make it easy to subsume the event or results in preconceived patterns making our bias appear to result from deductive reasoning. It is not entirely invented, and it seems like part of what we know, but it is conformance to "vague self-knowledge" or a habitual way of thinking. It becomes obvious solely from persuasive words or lines of authority (50)

Obviousness and common agreement can assure us of being right to make "common-sense explanations so eminently satisfactory, as well as dangerous." The danger arises from using true knowledge without question, assuming the truth of analogies, leading to the misapplication of true knowledge (50). Practical common sense constantly questions the consequences. It is never over.

Conclusion

People develop their common sense from experience and modeling others while in their youth. What we have described is the practical common sense from lessons learned in blood. The consequences are real; they are deadly. Yes, the individual thinks rapidly, but it is speed from smoothness and intuition. What appears obvious is the rapid recognition of nuance in covert, compensated states. Nevertheless, the individual also ponders the situation and action. The judgment of irrelevancy is one of the more significant and dangerous; learning that irrelevant information was relevant always comes too late. This is practical common sense at the moment

Common sense also forms the basis of science, the initiator of scientific inquiry. Practical common-sense problem solving contributes to the refinement of scientific knowledge and extension of science into new realms. The British anthropologist Siegfried Frederick Nadel enlisted in the Sudan Defence Force early in 1941, later transferring to the British Army, East African Command, with service on the Eritrean-Ethiopian border and in charge of a frontier post (77). Nadel applied "psychological explanations" to anthropology in an effort to better understand the "why." He concludes his chapter "Explanation and Common Sense" with this paragraph (50):

"In a sense, we pile one regularity upon one we assume to be working behind it. The 'need' of both, a summary of the observed regular mode of behaviour and a machine invented to account for it. This is, of course, a circular argument, but the circularity as such is harmless – it is typical of many analytical (i.e., non-deductive) explanations. It is misleading only if it is taken for a deductive explanation, as though we had independent knowledge of the particular 'machine' and its efficiency, and not merely identified (not invented) its presence in an analogous situation. As we shall see, the confusion between invention and identification by analogy is often difficult to avoid; and even the exact sciences make use of such models of machines – and thus admit common sense; for a machine behind the observed regularity of phenomena is the most complete answer to the promptings of common sense. The motions of a round-about are puzzling only until we lift the trapdoor and discover a well-known engine driving the thing. Common sense always urges us to look for such trapdoors."

"Common sense also forms the basis of science, the initiator of scientific inquiry. Practical common-sense problem solving contributes to the refinement of scientific knowledge and extension of science into new realms."

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Disclosures: The authors have no relevant disclosures

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Acknowledgments

Karl Weick, Rensis Likert Distinguished University Professor of Organizational Behavior and Psychology, Emeritus, University of Michigan

Errol van Stralen, Ancora Education

William Gambino, CIV, DoD

Sean D. McKay, Element Rescue, LLC

Laura Elliott, Children's Subacute Center, Community Hospital of San Bernardin

William J. Corr, formerly with the Los Angeles City Fire Department, now deceased


SHARED DECISION-MAKING
PROTECTS MOTHERS + INFANTS
DURING COVID-19
KEEPING MOTHERS + INFANTS TOGETHER
Means balancing the risks of...
• HORIZONTAL INFECTION
• SEPARATION AND TRAUMA
EVIDENCE
We encourage families and clinicians to remain diligent in learning up-to-date evidence.
PARTNERSHIP
What is the best for this unique dyad?
SHARED DECISION-MAKING
SEEK PARTICIPATION
HELP EXPLORE OPTIONS
ASSESS PREFERENCES
REACH A DECISION
EVALUATE THE DECISION
TRAUMA-INFORMED
Both parents and providers are confronting significant...
• FEAR
• GRIEF
• UNCERTAINTY
LONGITUDINAL DATA
We need to understand more about outcomes for mothers and infants exposed to COVID-19, with special attention to:
• MENTAL HEALTH • POSTPARTUM CARE DELIVERY
NEW DATA EMERGE DAILY. NANN AND NPA ENCOURAGE PERINATAL CARE PROVIDERS TO ENGAGE IN CANDID CONVERSATIONS WITH PREGNANT PARENTS PRIOR TO DELIVERY REGARDING RISKS, BENEFITS, LIMITATIONS, AND REALISTIC EXPECTATIONS.
Partnering for patient-centered care when it matters most.
nann.org nationalperinatal.org
National Association of Neonatal Nurses
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FREE RESOURCES FOR YOUR NICU
Coping During COVID-19
Targeted interventions to improve the mental health of parents, infants, families, and providers
BONDING WITH YOUR BABY
HELPING CHILDREN AND FAMILIES COPE
CAREGIVERS NEED CARE TOO
National Network of NICU Psychologists
nationalperinatal.org/psychologists

Respiratory Syncytial Virus:

How you can advocate for babies this RSV season

Track national data and trends at the CDC's website www.cdc.gov/rsv

Identify babies at greatest risk

including those with CLD, BPD, CF, and heart conditions

Teach families how to protect

their babies from respiratory infections

Advocate for insurance coverage for palivizumab prophylaxis so more babies can be protected *

Use your best clinical judgement

when prescribing RSV prophylaxis

Tell insurers what families need

and provide the supporting evidence

National Perinatal Association

*See the NPA's evidence-based guidelines at www.nationalperinatal.org/rsv

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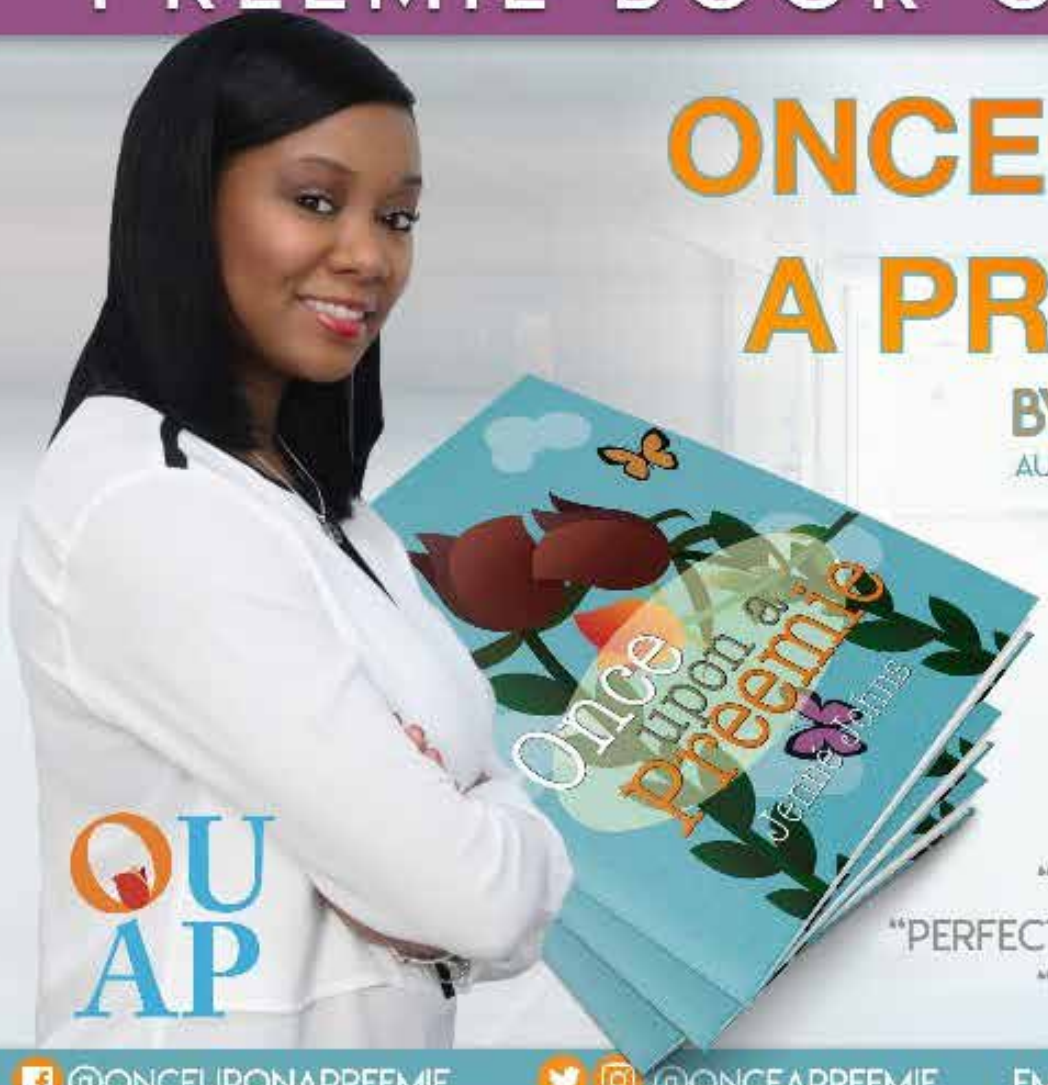

ONCE UPON A PREEMIE

BY JENNÉ JOHNS

AUTHOR | SPEAKER | ADVOCATE

QUAP

"ONE OF A KIND"
"PERFECT FOR PREEMIE FAMILIES"
"ENCOURAGING"

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HUDSON VALLEY PERINATAL PUBLIC HEALTH CONFERENCE
MATERNITY CARE COALITION ADVOCACY DAY

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OPIOIDS and NAS

When reporting on mothers, babies, and substance use

LANGUAGE MATTERS

I am not an addict.

I was exposed to substances in utero. I am not addicted. Addiction is a set of behaviors associated with having a Substance Use Disorder (SUD).

I was exposed to opioids.

While I was in the womb my mother and I shared a blood supply. I was exposed to the medications and substances she used. I may have become physiologically dependent on some of those substances.

NAS is a temporary and treatable condition.

There are evidence-based pharmacological and non-pharmacological treatments for Neonatal Abstinence Syndrome.

My mother may have a SUD.

She might be receiving Medication-Assisted Treatment (MAT). My NAS may be a side effect of her appropriate medical care. It is not evidence of abuse or mistreatment.

My potential is limitless.

I am so much more than my NAS diagnosis. My drug exposure will not determine my long-term outcomes. But how you treat me will. When you invest in my family's health and wellbeing by supporting Medicaid and Early Childhood Education you can expect that I will do as well as any of my peers!

Learn more about Neonatal Abstinence Syndrome at www.nationalperinatal.org

National Perinatal Association

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NIH *Eunice Kennedy Shriver* National Institute of Child Health and Human Development

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Compiled and Reviewed by David Vasconcellos, MSIII

American Academy of Pediatrics Family Snapshot Survey Measures Domestic Violence, Discipline of Children During Pandemic

7 July 10, 2021

A national survey of thousands of families highlights the disruptions and financial stress experienced during the pandemic that may have affected parenting practices and relationships in the home. Spanking has been on the decline in the U.S. and the new study results align with that trend, although about half of parents reported yelling at or threatening their children in the week prior to the survey.

The "family snapshots" survey also found that one in five adult respondents reported experiencing intimate partner violence during the pandemic and that financial worries and other stressors were associated with higher rates of domestic abuse.

The family snapshot conducted by the American Academy of Pediatrics (AAP), in collaboration with the Centers for Disease Control and Prevention (CDC), Prevent Child Abuse America (PCA America), and Tufts Medical Center surveyed 3,000 parents and caregivers of children under the age of 18 years. This was part of a 7-month project in which 9,000 parents responded to questions on the effect of the pandemic on family life. Find the studies here:

- Intimate Partner Violence (IPV) in the Home During the COVID-10 Pandemic
- Child Discipline During the COVID-19 Pandemic

Results from the first survey conducted in November 2020 with 3,000 respondents, including reports covering financial and other changes during the pandemic, can be found here: Family Snapshots: Life During the Pandemic (aap.org).

"This past year was extraordinarily stressful for many families and navigating these stressors has been a challenge for so many," said AAP President Lee Savio Beers, MD, FAAP. "We know that intimate partner violence is devastating for the person being abused and also adversely affects any children in the house who witness it. And in families where children are spanked, it is likelier that a parent or caregiver is experiencing violence, so screening is vital."

There have been concerns about how the COVID-19 pandemic and subsequent shelter-in-place orders increased the risk for intimate partner violence. One in five adult survey respondents reported experiencing partner violence, including 11% who reported experiencing physical violence. Both men and women reported partner violence. In addition, 61% of parents who spanked their children also experienced partner violence, compared with 13% of those who did not spank their children.

Health care professional should ask male and female parents about partner violence in a private setting away from children, family members, and friends, the project team recommend.

Survey questions asked how often parents used a variety of strategies to teach their children good behavior. Positive strategies included explaining to children that their actions were wrong, placing them in timeout, sending them to their room, or distracting them with new activities. Harsh strategies included yelling, threatening, or spanking. Parents were asked how often they had used the techniques in the past week.

Five of six parents in the survey reported they did not spank their children in the past week, although about half of parents reported yelling at or threatening their children.

The survey included standard questions about partner violence sourced from the CDC's Violence Against Children Surveys (VACS). Items on physical violence included slapping, pushing, kicking, punching, beating, choking, burning, and threatening with or using a weapon. Psychological violence included insulting, humiliating, withholding access to money, restricting access to family/friends, tracking activities and whereabouts, and threatening to harm the person. The survey did not include stalking or sexual violence.

Families who are experiencing economic or psychological distress reported higher rates of psychological and physical partner violence, according to the study. Resources offered to families experiencing distress might include community-based partner violence resources, allowing adults to access these resources as needed.

More findings and messages from the survey:

- Parents with higher stress levels reported spanking their children at about the same rate compared to parents who did not report these conditions (14% vs 17%).
- Many parents reported using positive parenting strategies to discipline their children during the pandemic.
- Parents who reported experiencing adverse childhood events reported use of spanking and other harsh discipline. Health care professionals may want to discuss parental mental health and coping, as well as problematic child behavior, when addressing spanking.
- Some parents identified using both harsh and positive discipline. There is opportunity here to support consistent use of positive discipline.
- Parents' use of spanking has been declining in the US. A recent study reported a decrease from 50% in 1993 to 35% in 2017. Results from the survey are consistent with these declining national trends found in other studies.
- Although the sample for this survey is not directly comparable to a 2015 National Intimate Partner and Sexual Violence Survey sample, it is notable that greater percentages of men and women were reporting physical intimate partner violence in the approximate*nine months* after the pandemic began than were reporting physical partner violence in a nationally representative sample in the past *12 months* in 2015.

The stress of the pandemic has been widespread, and families should remember that staying in touch with their pediatrician is more important than ever. Parents should watch for signs of stress in their children and remember that it›s important to not forget about their own stress and to seek help when experiencing violence in the home.

About the American Academy of Pediatrics

The American Academy of Pediatrics is an organization of 67,000 primary care pediatricians, pediatric medical subspecialists and pediatric surgical specialists dedicated to the health, safety and well-being of infants, children, adolescents and young adults. For more information, visit www.aap.org.

About Prevent Child Abuse America

Prevent Child Abuse America is a leading champion for all children in the United States. Founded in 1972 and headquartered in Chicago, we are the nation's oldest and largest organization dedicated to the primary prevention of child abuse and neglect, working to actively prevent all forms of child abuse and neglect before they occur. Our success is founded on a nationwide network of state chapters and nearly 600 Healthy Families America home visiting sites, which directly provide parents and caregivers a wide variety of services and resources that help children grow up to be productive, contributing members of their communities and society. Our comprehensive approach is informed by science—we translate and disseminate innovative research to promote proven solutions that our vast network then puts into action. And we raise public awareness and advocate for family friendly policies at the national, state and local levels to support transformative programs and promote the conditions and contexts that help children, families and communities across the coun-

try thrive.

About Tufts Medical Center and Tufts Children's Hospital

Tufts Medical Center is an exceptional, not-for-profit, 415-bed academic medical center that is home to both a full-service hospital for adults and Tufts Children's Hospital. Conveniently located in downtown Boston, the Medical Center is the principal teaching hospital for Tufts University School of Medicine. The Medical Center features a level one trauma center with rooftop helipad, the largest heart transplant center in New England and a renowned research program, ranking among the top 10 percent of independent hospitals to receive federal research funding. Tufts Medical Center is a founding member of Wellforce. For more information, visit **www.tuftsmedicalcenter.org**.

For Release:

7/1/2021

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NT

American Academy of Pediatrics, Section on Advancement in Therapeutics and Technology

Released: Thursday 12/13/2018 12:32 PM, updated Saturday 3/16/2019 08:38, Sunday 11/17/2019 and Friday 11/20/2020

The American Academy of Pediatrics' Section on Advances in Therapeutics and Technology (SOATT) invites you to join our ranks! SOATT creates a unique community of pediatric professionals who share a passion for optimizing the discovery, development and approval of high quality, evidence-based medical and surgical breakthroughs that will improve the health of children. You will receive many important benefits:

- Connect with other AAP members who share your interests in improving effective drug therapies and devices in children.
- Receive the SOATT newsletter containing AAP and Section news.
- Access the Section's Website and Collaboration page – with current happenings and opportunities to get involved.
- Network with other pediatricians, pharmacists, and other health care providers to be stronger advocates for children.
- Invitation for special programming by the Section at the AAP's National Conference.
- Access to and ability to submit research abstracts related to advancing child health through innovations in pediatric drugs, devices, research, clinical trials and information technology; abstracts are published in Pediatrics.

AAP members can join SOATT for free. To activate your SOATT membership as an AAP member, please complete a short application at http://membership.aap.org/Application/AddSectionChapterCouncil.

The Section also accepts affiliate members (those holding masters or doctoral degrees or the equivalent in pharmacy or other health science concentrations that contribute toward the discovery and advancement of pediatrics and who do not otherwise qualify for membership in the AAP). Membership application for affiliates: http://shop.aap.org/aap-membership/ then click on "Other Allied Health Providers" at the bottom of the page.

Thank you for all that you do on behalf of children. If you have any questions, please feel free to contact:

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Dedicated to the Health of All Children

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The American Academy of Pediatrics is an organization of 67,000 primary care pediatricians, pediatric medical subspecialists and pediatric surgical specialists dedicated to the health, safety and well-being of infants, children, adolescents and young adults. For more information, visit www.aap.org. *Reporters can access the meeting program and other relevant meeting information through the AAP meeting website at http://www.aapexperience.org/*

NT

Cannabis use may be associated with suicidality in young adults

Tuesday, June 22, 2021

NIH study suggests a link between cannabis use and higher levels of suicidal ideation, plan, and attempt.

An analysis of survey data from more than 280,000 young adults ages 18-35 showed

This holiday season 3,600 families won't be celebrating with their baby.

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that cannabis (marijuana) use was associated with increased risks of thoughts of suicide (suicidal ideation), suicide plan, and suicide attempt. These associations remained regardless of whether someone was also experiencing depression, and the risks were greater for women than for men. The study published online today in *JAMA Network Open* and was conducted by researchers at the National Institute on Drug Abuse (NIDA), part of the National Institutes of Health.

"While we cannot establish that cannabis use caused the increased suicidality we observed in this study, these associations warrant further research, especially given the great burden of suicide on young adults," said NIDA Director Nora Volkow, M.D., senior author of this study. "As we better understand the relationship between cannabis use, depression, and suicidality, clinicians will be able to provide better guidance and care to patients."

The number of adults in the United States who use cannabis more than doubled from 22.6 million in 2008 to 45.0 million in 2019, and the number of daily or near-daily users almost tripled from 3.6 million to 9.8 million in 2019. Over the same time span, the number of adults with depression also increased, as did the number of people who reported suicidal ideation or plan or who died by suicide. To date, however, the relationship between trends in cannabis use and suicidality is not well understood.

The current study sought to fill this gap. For their analysis, NIDA researchers examined data from the 2008-2019 National Surveys on Drug Use and Health(link is external) (NSDUH). NSDUH, which is conducted annually by the Substance Abuse and Mental Health Services Administration, collects nationally representative data among the U.S. civilian, noninstitutionalized population age 12 or older on cannabis use and use disorder, depression, suicidality, and other behavioral health indicators. In addition to determining the associations between these factors, the researchers examined whether the associations varied by gender. They examined data from 281,650 young adults ages 18 to 35 years — the age range when most substance use and mood disorders emerge—with an almost even number of women and men.

The researchers compared four levels of past-year cannabis use: no cannabis use; nondaily cannabis use; daily cannabis use, which was defined as use on at least 300 days per year; and presence of cannabis use disorder, which was assessed in the survey and involves meeting specific criteria for a pattern of continued cannabis use despite negative consequences. To determine the presence of depression, they assessed the prevalence of major depressive episodes based on specific diagnostic criteria measured through the survey. To identify suicidality trends, the investigators separately assessed the trends in the prevalence of past-year suicidal ideation, plan, and attempt as reported in the 2008-2019 NSDUH surveys.

The results of the study indicated that even people who used cannabis nondaily, fewer than 300 days a year, were more likely to have suicidal ideation and to plan or attempt suicide than those who did not use the drug at all. These associations remained regardless of whether someone was also experiencing depression. Among people without a major depressive episode, about 3% of those who did not use cannabis had suicidal ideation, compared with about 7% of those with nondaily cannabis use, about 9% of those with daily cannabis use, and 14% of those with a cannabis use disorder. Among people with depression, 35% of people who did not use cannabis had suicidal ideation, compared to 44% of those with nondaily cannabis use, 53% of those who used cannabis daily, and 50% of those who had a cannabis use disorder. Similar trends existed for the associations between different levels of cannabis use and suicide plan or attempt.

Moreover, the researchers found that women who used cannabis at any level were more likely to have suicidal ideation or report a suicide plan or attempt than men with the same levels of cannabis use. For example, among individuals without major depressive episode, the prevalence of suicidal ideation for those with vs. without a cannabis use disorder was 13.9% vs. 3.5% among women and 9.9% vs. 3.0%

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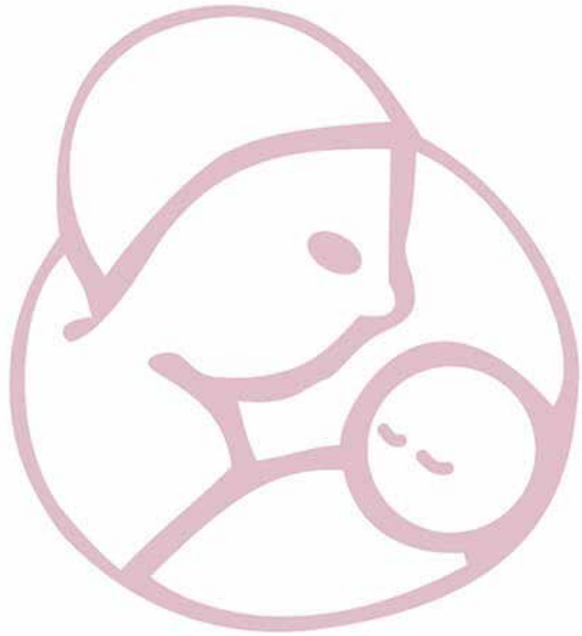
- Licensed Marriage and Family Therapists (LMFT)
- Licensed Professional Clinical Counselors (LPCC)
- Licensed Educational Psychologists (LEP)
- Certified Health Education Specialists (CHES)
- Continuing Respiratory Care Education (CRCE)

www.paclac.org



PAC/LAC's core values for improving maternal and child health have remained constant for over 30 years – a promise to lead, advocate and consult with others.

Leadership

Providing guidance to healthcare professionals, hospitals and healthcare systems, stimulating higher levels of excellence and improving outcomes for mothers and babies.

Advocacy

Providing a voice for healthcare professionals and healthcare systems to improve public policy and state legislation on issues that impact the maternal, child and adolescent population.

Consultation

Providing and promoting dialogue among healthcare professionals with the expectation of shared excellence in the systems that care for women and children.

among men. Among individuals with both cannabis use disorder and major depressive episode, the prevalence of past-year suicide plan was 52% higher for women (23.7%) than men (15.6%).

"Suicide is a leading cause of death among young adults in the United States, and the findings of this study offer important information that may help us reduce this risk," explained lead author Beth Han, M.D., Ph.D., M.P.H., from NIDA. "Depression and cannabis use disorder are treatable conditions, and cannabis use can be modified. Through better understanding the associations of different risk factors for suicidality, we hope to offer new targets for prevention and intervention in individuals that we know may be at high-risk. These findings also underscore the importance of tailoring interventions in a way that take sex and gender into account."

If you or someone you know is in crisis and needs immediate help, call the National Suicide Prevention Lifeline(link is external) at 1-800-273-TALK (8255). Learn more about suicide prevention and ways you can help someone who might be at risk for self-harm.

About the National Institute on Drug Abuse (NIDA): NIDA is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world's research on the health aspects of drug use and addiction. The Institute carries out a large variety of programs to inform policy, improve practice, and advance addiction science. For more information about NIDA and its programs, visit https://www.nida.nih.gov/.

About the National Institutes of Health (NIH): NIH, the nation›s medical research agency, includes 27 Institutes and Centers and is a component of the U.S. Department of Health and Human Services. NIH is the primary federal agency conducting and supporting basic, clinical, and translational medical research, and is investigating the causes, treatments, and cures for both common and rare diseases. For more information about NIH and its programs, visit www.nih.gov.

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NT

CDC encourages layers of protection when school resumes

July 09, 2021

Melissa Jenco, News Content Editor

Editor's note:*For the latest news on COVID-19, visit http://bit.ly/AAPNewsCOVID19.*

Federal health officials are encouraging schools to return to in-person education this fall with layers of protection, including vaccines, masks for everyone who is not fully vaccinated and 3 feet of space between students in classrooms.

The Centers for Disease Control and Prevention's (CDC's) updated guidance released today encourages schools to work with local public health officials to implement these protective measures, taking into account local virus transmission, vaccination rates, the existence of a screening program and health equity.

Vaccination

Everyone ages 12 years and older is eligible to be vaccinated. The CDC called vaccination "one of the most critical strategies to help schools safely resume full operations."

Schools can help improve rates by encouraging vaccination, hosting information sessions, allowing excused absences for vaccination, helping teachers and students find vaccine locations and serving as vaccination sites.

Face masks

Face masks should be worn indoors by everyone ages 2 years and older who is not fully vaccinated, according to the CDC. Outdoors, masks are needed only in crowds or during activities with sustained close contact with people who are not vaccinated.

The CDC notes some schools may opt to require masking for everyone regardless of vaccination status. Everyone riding a school bus must wear a mask even if they are vaccinated, per CDC order. It is recommended schools provide masks to students who need them.

Distance

The CDC continues to recommend students in classrooms stay 3 feet apart. It calls for 6 feet of space between students and adults and between adults.

Not being able to maintain these space recommendations should not keep schools from conducting in-person learning and does increase the importance of using layers of protection.

Cohorts

Schools may choose to keep students and teachers in cohorts, small groups that stay together and have limited interactions with others. However, cohorts should not be based on vaccination status.

Screening testing

The CDC recommends screening testing of people who are not fully vaccinated to help identify those who are infected. This testing should be done at least once a week, and results should be reported within 24 hours. A chart in the guidance provides details about situations in which testing is recommended based on the activity, person and level of community transmission.

Contact tracing, isolation and quarantine

Anyone who is sick should stay home and get tested. A CDC chart provides steps to take if a student becomes sick or is diagnosed with COVID-19. The CDC also has detailed guidance on contact tracing, isolation and quarantine if someone is diagnosed with or exposed to COVID-19.

People who are fully vaccinated and asymptomatic don't need to quarantine or get tested after exposure to someone who is infected.

Additional layers of protection

In addition to the protective measures above, the CDC recommends adequate ventilation, handwashing and cleaning and disinfecting. As local virus transmission declines, schools may decide to remove some of these measures. The CDC recommends if schools decide to remove prevention measures, they remove them one at a time and monitor the impact closely before removing another. Schools also should modify protective measures for people with disabilities or other health issues, if needed.

Sports and extracurricular activities

Unvaccinated students playing indoor sports should continue to wear masks and distance as much as possible. Schools should consider using screening tests for individuals who are not vaccinated before these events to facilitate safe participation and reduce risk of transmission.

Students who are not fully vaccinated and have COVID-19 symptoms should not participate in sports or extracurricular activities and should get tested.

Resources

- AAP interim guidance on school safety during the pandemic
- Information for parents from HealthyChildren.org on in-person school during the COVID-19 pandemic

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American Academy of Pediatrics

345 Park Blvd, Itasca, IL 60143

New AAP main number: 630-626-6000

NT

International study of rare childhood cancer finds genetic clues, potential for tailored therapy

Thursday, June 24, 2021

In children with rhabdomyosarcoma, or RMS, a rare cancer that affects the muscles and other soft tissues, the presence of mutations in several genes, including *TP53*, *MYOD1*, and *CDKN2A*, appears to be associated with a more aggressive form of the disease and a poorer chance of survival. This finding is from the largest-ever international study on RMS, led by scientists at the National Cancer Institute's (NCI) Center for Cancer Research, part of the National Institutes of Health.

The study, published in the *Journal of Clinical Oncology* on June 24, provides an unprecedented look at data for a large cohort of patients with RMS, offering genetic clues that could lead to more widespread use of tumor genetic testing to predict how individual patients with this childhood cancer will respond to therapy, as well as to the development of targeted treatments for the disease.

"These discoveries change what we do with these patients and trigger a lot of really important research into developing new therapies that target these mutations," said Javed Khan, M.D., of NCI's Genetics Branch, who led the study.

"The standard therapy for RMS is almost a year of chemotherapy, radiation therapy, and surgery. These children get a lot of toxic treatments," said the study's first author, Jack Shern, M.D., of NCI's Pediatric Oncology Branch. "If we could predict who's going to do well and who's not, then we can really start to tailor our therapies or eliminate therapies that aren't going to be effective in a particular patient. And for the children that aren't going to do well, this allows us to think about new ways to treat them."

RMS is the most common type of soft tissue sarcoma in children. In patients whose cancer has remained localized, meaning that it has not spread, combination chemotherapies have led to a five-year survival rate of 70%-80%. But in patients whose cancer has spread or come back after treatment, the five-year survival rate remains poor at less than 30%, even with aggressive treatment.

Doctors have typically used clinical features, such as the location of the tumor in the body, as well as its size and to what extent it has spread, to predict how patients will respond to treatment, but this approach is imprecise. More recently, scientists have discovered that the presence of the *PAX-FOXO1* fusion gene that is found in some patients with RMS is associated with poorer survival. Patients are now being screened for this genetic risk factor to help determine how aggressive their treatment should be.

Scientists have also begun using genetic analysis to dig more deeply into the molecular workings of RMS in search of other genetic markers of poorer survival. In this new study — the largest genomic profiling effort of RMS tumors to date — scientists from NCI and the Institute for Cancer Research in the United Kingdom analyzed DNA from tumor samples from 641 children with RMS enrolled over a two-decade period in several clinical trials. Scientists searched for genetic mutations and other aberrations in genes previously associated with RMS and linked that information with clinical outcomes. Among the patterns that emerged, patients with mutations in the tumor suppressor genes *TP53*, *MYOD1*, or *CDKN2A* had a poorer prognosis than patients without those mutations.

Using next-generation sequencing, researchers found a median of one mutation per tumor. Patients with two or more mutations per tumor had even poorer survival outcomes. In patients without the *PAX-FOXO1* fusion gene, more than 50% had mutations in the RAS pathway genes, although RAS mutations did not appear to be associated with survival outcomes in this study.

The researchers believe that although they have identified the major mutations that may drive RMS development or provide information about prognosis, they have only scratched the surface in defining the genetics of this cancer, with many more mutations yet to be discovered. They note that more work is needed to identify targeted drugs for those mutations, and future clinical trials could incorporate genetic markers to more accurately classify patients into treatment groups. Two NCI-sponsored Children's Oncology Group clinical trials are currently being developed using these markers, and all participants will have their tumors molecularly profiled.

The researchers hope that routine tumor genetic testing for rare cancers, such as RMS, will soon be a standard part of the treatment plan, as it is for more common cancers, such as breast cancer.

"Genetic testing is going to become the standard of care," said Dr. Shern. "Instead of just the pathologists looking at these tumors, we're now going to have molecular profiling, and that's a leap forward."

This study was conducted by an international consortium comprised of scientists at NCI and the Children's Oncology Group in the United States, and the Children's Cancer and Leukaemia Group and the National Cancer Research Institute's Young Onset Soft Tissue Sarcoma Subgroup in the United Kingdom. The data are available at clinomics.ccr.cancer.gov/clinomics/public. The research was supported by

NCI and St. Baldrick's Foundation in Monrovia, California.

About the National Cancer Institute (NCI): NCI leads the National Cancer Program and NIH's efforts to dramatically reduce the prevalence of cancer and improve the lives of cancer patients and their families, through research into prevention and cancer biology, the development of new interventions, and the training and mentoring of new researchers. For more information about cancer, please visit the NCI website at cancer.gov or call NCI's contact center, the Cancer Information Service, at 1-800-4-CANCER (1-800-422-6237).

About the National Institutes of Health (NIH): NIH, the nation›s medical research agency, includes 27 Institutes and Centers and is a component of the U.S. Department of Health and Human Services. NIH is the primary federal agency conducting and supporting basic, clinical, and translational medical research, and is investigating the causes, treatments, and cures for both common and rare diseases. For more information about NIH and its programs, visit www.nih.gov.

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NIH COVID-19 testing initiative funds additional research projects to safely return children to in-person school

Friday, July 2, 2021

The National Institutes of Health is funding five additional projects to identify ways of safely returning students and staff to in-person school in areas with vulnerable and underserved populations. The awards are the second installment of the Safe Return to School Diagnostic Testing Initiative, launched earlier this year as part of the NIH Rapid Acceleration of Diagnostics Underserved Populations (RADx-UP) program. The new awards will provide up to $15 million over two years for five projects in California, Arizona, Hawaii, Nebraska and Florida. The 8 initial awards, totaling $33 million over two years, were made in April 2021.

"The new awards reaffirm NIH's commitment to use evidence-based research to inform policy makers of the safest ways to return to schools in vulnerable and underserved communities," said Eliseo J. Pérez-Stable, M.D., director of NIH's National Institute on Minority Health and Health Disparities and co-chair of the RADx-UP program.

The program addresses the needs of children with unequal access to COVID testing as well as those facing barriers to attending school remotely, including children who lack access to computers and internet connectivity, or who may not have family members available to help with virtual learning. Without in-person schooling, many children will miss out on school-based meals, speech or occupational therapy and after school programs. Loss of such services disproportionately affects minorities, socially and economically disadvantaged children, children with disabilities and those with medical complexities, such as those with medication-related problems, mental health issues, severe neurologic conditions or other serious health conditions and those who are dependent on medical technology for daily living. Award recipients also will explore strategies for including preschoolers in return to school efforts.

The new projects will focus on implementing COVID-19 testing regimens for students younger than age 12, who are ineligible for vaccination, exploring the influence of vaccination for eligible staff and students, addressing vaccine hesitancy and seeking information on circulating variants and breakthrough infections. One of the new projects will focus on native Hawaiians and other Pacific islanders, groups not addressed in the previous awards. Researchers will work closely with state, tribal and local officials in planning their investigations.

"The in-person school environment and the wide range of services offered there are critical to the development of our nation's young people. By learning the best practices and methods through research, we can get children back in the classroom safely and equitably," said Diana W. Bianchi, M.D., director of NIH's *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), which is managing the initiative.

RADx-UP℠ is a registered service mark of the Department of Health and Human Services.

About the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD): NICHD leads research and training to understand human development, improve reproductive health, enhance the lives of children and adolescents, and optimize abilities for all. For more information, visit https://www.nichd.nih.gov.

About the National Institutes of Health (NIH): NIH, the nation›s medical research agency, includes 27 Institutes and Centers and is a component of the U.S. Department of Health and Human Services. NIH is the primary federal agency conducting and supporting basic, clinical, and translational medical research, and is investigating the causes, treatments, and cures for both common and rare diseases. For more information about NIH and its programs, visit www.nih.gov.

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Town hall experts describe research, share tips on recognizing long COVID in children

July 09, 2021

Trisha Korioth, Staff Writer

Editor's note:For the latest news on COVID-19, visithttp://bit.ly/AAPNewsCOVID19.

According to an informal poll, about one-third of the AAP town hall attendees said they had cared for patients with long COVID symptoms.

Experts at Thursday's virtual town hall discussed knowledge gaps associated with the long-term impact of COVID-19 infection in children. They urged pediatricians to listen to their patients and said adults and children with post-acute sequelae of COVID-19 (PASC) or "long COVID" may have been brushed off by some physicians because the condition is poorly understood.

Fortunately, the patient community has played a crucial role in shaping the direction of research, particularly related to PASC, said Robert F. Tamburro Jr., M.D., FAAP, senior adviser for clinical research in the Division of Extramural Research at the Eunice Kennedy Shriver National Institute of Child Health and Human Development. He shared information on National Institutes of Health-supported research programs on COVID-19, as well as multisystem inflammatory syndrome in children (MIS-C). They include:

- Collaboration to Assess Risk and Identify Long-term Outcomes for Children with COVID-19, which includes research on MIS-C (https://www.caring4kidswithCOVID.nih.gov).
- Predicting Viral-Associated Inflammatory Disease Severity in Children with Laboratory Diagnostics and Artificial Intelligence (https://www.nichd.nih.gov/newsroom/news/122120-prevail-kids).
- Safe Return to School Diagnostic Testing Initiative (https://bit.ly/3k18U11).
- RECOVER, an initiative that seeks to understand, prevent and treat PASC, (www.recovercovid.org).

Joining Dr. Tamburro were Sarah R. Risen, M.D., FAAP, a pediatric neurologist, and Stuart Berger, M.D., FAAP, a pediatric cardiologist, and chair of the AAP Section on Cardiology and Cardiac Surgery. They described what they have seen at their multidisciplinary clinics in Texas and Illinois, respectively.

Common symptoms of long COVID include dizziness, headaches, fatigue and shortness of breath, tachycardia, palpitations and headaches.

Dr. Berger said data suggest some patients with "long COVID" have autonomic dysfunction symptoms similar to postural orthostatic tachycardia syndrome (POTS). He said POTS is not a primary cardiac problem, but it is important to rule out to ensure the patient does not have underlying cardiac abnormalities.

Dr. Risen suggested pediatricians take a proactive approach with patients who are concerned about ongoing symptoms, noting that "we're beginning to recognize long COVID pretty consistently in a portion of children."

Keeping Your Baby Safe

during the COVID-19 pandemic

How to protect your little one from germs and viruses

Even though there are some things we don't know about COVID-19 yet, there are many more things that we do know. We know that there are proven protective measures that we can take to stay healthy.

Here's what you can do...

Wash Your Hands

- This is the single, most important thing you can do to stop the spread of viruses.
- Use soap.
- Wash for more than 20 seconds.
- Use alcohol-based sanitizers.

Limit Contact with Others

- Stay home when you can.
- Stay 6 feet apart when out.
- Wear a face mask when out.
- Change your clothes when you get home.
- Tell others what you're doing to stay safe.

Provide Protective Immunity

- Hold baby skin-to-skin.
- Give them your breast milk.
- Stay current with your family's immunizations.

Take Care of Yourself

- Stay connected with your family and friends.
- Sleep when you can.
- Drink more water and eat healthy foods.
- Seek mental health support.

Immunizations Vaccinations save lives. Protecting your baby from flu and pertussis lowers their risks for complications from coronavirus.

WARNING

Never Put a Mask on Your Baby

- Because babies have smaller airways, a mask makes it hard for them to breathe.
- Masks pose a risk of strangulation and suffocation.
- A baby can't remove their mask if they're suffocating.

If you are positive for COVID-19

- Wash with soap and water and put on fresh clothes before holding or feeding your baby.
- Wear a mask to help stop the virus from spreading.
- Watch out for symptoms like fever, confusion, or trouble breathing.
- Ask for help caring for your baby and yourself while you recover.

We can help protect each other.
Learn more
www.nationalperinatal.org/COVID-19

National Perinatal Association

PROTECT YOUR FAMILY FROM RESPIRATORY VIRUSES

flu · coronavirus · pertussis · RSV

WASH YOUR HANDS
often with soap and warm water.

GET VACCINATED
for flu and pertussis. Ask about protective injections for RSV.

COVER COUGHS AND SNEEZES.
Sneeze and cough into your elbow.

USE AN ALCOHOL-BASED HAND SANITIZER.

STAY AWAY FROM SICK PEOPLE
Avoid crowds. Protect vulnerable babies and children.

www.nationalperinatal.org

National Perinatal Association

Town hall moderator Anne R. Edwards, M.D., FAAP, AAP chief population health officer, posed several questions from attendees:

When should pediatricians refer a patient with symptoms related to PASC?

Dr. Risen said pediatricians should first think through the entire differential and determine if testing is needed. Then, they can address long COVID symptoms such as sleep problems and try lifestyle interventions such adjusting the daily schedule and addressing hydration. If the patient doesn't respond to first-line management, if symptoms worsen or if there are other red flags, pediatricians might need to refer to specialists.

When should patients see a cardiologist?

"If there's ever any question, early is better," Dr. Berger said.

How do pediatricians support children with symptoms of brain fog and fatigue during the school year?

Dr. Risen suggested an approach similar to when a child returns to learning after a concussion (https://bit.ly/3e3ZU7j). "I think working with the schools and proactively addressing the fact that the child might need more support or will need more support, and then tapering it over time depending on how the child is doing, is the most effective strategy for returning to school."

Finally, Dr. Tamburro said pediatricians can let families know that researchers are working hard to find answers for children. "The advice I want to share is that resources are being made available and that people are hearing their concerns," he said. "Hopefully, we're going to be able to provide the answers … so that (pediatricians) will have the information to best care for these children and their families."

Resources

- COVID-19 Town Hall, https://bit.ly/2VsD9Ug
- Register for the next town hall featuring the 2021 AAP president-elect candidates at 7 p.m. CDT on July 22, https://bit.ly/3yGHTnr.

Contact information for AAP headquarters

American Academy of Pediatrics

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New AAP main number**:** 630-626-6000

NT

Peer Reviewed

The Genetics Corner: A Preterm Infant with Down Syndrome Complicated by Severe Transient Abnormal Myelopoiesis

Robin Dawn Clark, MD

Clinical Summary

A genetics consultation was requested for an 18 day old 30-week two-day gestation male with prenatally diagnosed tetralogy of Fallot and an increased risk for Trisomy 21 by quad screen and NIPT. He had an elevated WBC of 107 at birth with a presumed transient leukemoid reaction and subsequent brain hemorrhage, acute kidney injury, coagulopathy, cholestasis, transaminitis, and non-occlusive portal vein thrombus.

"He had an elevated WBC of 107 at birth with a presumed transient leukemoid reaction and subsequent brain hemorrhage, acute kidney injury, coagulopathy, cholestasis, transaminitis, and non-occlusive portal vein thrombus."

He was born to a 39-year old G3P1SAb1 mother who was offered and declined genetic counseling for advanced maternal age and after a diagnosis of the fetal cardiac defect and a positive NIPT screening test for Down syndrome. An amniocentesis was not performed. The mother presented in preterm labor that did not respond to tocolysis (Magnesium). The male infant was delivered by primary C-section for breech presentation and preterm labor. Apgar scores were 3, 6, and 8 at 1, 5, and 10 minutes. BW 2000 g (97th %ile) BL 43 cm (91st %ile), HC 29 cm (80th%ile). The initial venous pH was 7.12, pCO2 71, BE-7.3. The initial CBC showed an elevated WBC of 107.45 and Platelets 360,000 and 38% blasts. He has required multiple transfusions for anemia and thrombocytopenia. His current WBC was 12.74, RBC 2.7, Hgb 8.7, Hct 24.3, and Platelets 41. He had direct hyperbilirubinemia and worsening transaminitis. He had acute kidney injury and was in the polyuric phase, on diuretics. Chromosome analysis was initially unsuccessful due to a lack of metaphases despite stimulation with pokeweed mitogen (B cell mitogen). Repeat chromosome analysis confirmed Trisomy 21. *GATA1* gene analysis was pending.

A recent abdominal ultrasound showed a non-occlusive thrombus of the left portal vein (noted initially on day 3 of life), slow flow in the IVC and main portal vein, and pulsatile flow in the portal vein. There was reversed flow in the right portal vein and likely in the left portal vein. At about two weeks of age, a head ultrasound exam showed bilateral hemorrhages (Grade 3/4) with worsening ventriculomegaly. The most recent echocardiogram showed tetralogy of Fallot, PDA, moderate tricuspid valve regurgitation, and moderate elevation of pulmonary pressures.

On physical examination, the infant was orally intubated, mechanically ventilated, and sedated with morphine. He had anasarca and features of Down syndrome. The abdomen was distended, tense, and tender with guarding. There was a prominent venous pattern on the abdomen, superior to the umbilicus. The liver edge was palpable 5 cm below the R costal margin. A spleen tip was palpable. The baby had generalized jaundice with a bronze skin tone and scattered petechiae on the torso and extremities.

Discussion

The question posed to the genetics service was whether this baby with presumed Down syndrome had a second disorder responsible for his complicated course and, if so, whether further genetic testing was warranted. Were his features attributable to transient abnormal myelopoiesis (TAM)? A literature review confirmed that the pattern of multiorgan failure, edema, pulmonary hypertension, coagulopathy, anemia, hepatic dysfunction and possible fibrosis, and cholestasis in this patient have all been reported in severe cases of TAM. No further genetic testing was recommended.

"TAM, also called transient leukemia or transient myeloproliferative disorder, is a clonal expansion of immature megakaryocytes (blasts) in 5-10% of infants with Down syndrome, which is likely to be of fetal onset."

TAM, also called transient leukemia or transient myeloproliferative disorder, is a clonal expansion of immature megakaryocytes (blasts) in 5-10% of infants with Down syndrome, which is likely to be of fetal onset. There is evidence that TAM blasts derive from fetal hepatic hematopoiesis rather than bone marrow. Although there are no clear diagnostic criteria for TAM, a clonal *GATA1* (GATA binding protein 1) mutation with or without blasts in the peripheral smear confirms the diagnosis of TAM. In most cases, TAM is asymptomatic, self-limiting, and requires no treatment; spontaneous regression usually occurs within the first few months of life. However, newborns with TAM can present with organomegaly, pericardial effusion, and coagulation disorders. In about 20% of patients with TAM, serious and life-threatening sequelae develop, including hydrops fetalis, anasarca, direct hyperbilirubinemia, hepatic fibrosis/failure, disseminated intravascular coagulation, and death. In its most severe form, TAM is diagnosed in hydropic stillborn infants with Down syndrome.

TAM is a preleukemic disorder. In an excellent review on the subject, Watanabe (2019) notes that the circulating blast in TAM

shares morphologic and phenotypic traits similar to blasts from acute myeloid leukemia associated with Down syndrome (ML-DS). Among survivors of TAM, about 20% go on to develop ML-DS within the first years of life. Children with no clear history of TAM may also develop ML-DS. These children may have a subclinical clonal disease called "silent TAM" that is detectable only with *GATA1* gene analysis utilizing highly sensitive next-generation sequencing techniques.

Dorman and colleagues (2004) reviewed life-threatening complications in five consecutive neonates with Down syndrome and TAM, three of whom were preterm. Four infants, who were critically ill, were treated with cytosine-arabinoside (Ara-C, cytarabine). All five infants survived. Their complications included pulmonary hypertension [n=1], congestive heart disease [n=2], respiratory failure [n=4], pericardial effusion [n=3], abnormal coagulation studies, renal insufficiency, hepatosplenomegaly, hyperbilirubinemia, hydrops fetalis [n=2], and elevated liver enzymes [n=3]. One female, born at 36 weeks four days gestation, who was treated with Ara-C, required RBC and platelet transfusions for nine weeks before her blood counts normalized. Another female who was treated with Ara-C went on to develop ML-DS at age 20 months.

Flasinski *et al.* (2018) demonstrated that low-dose cytarabine treatment helped to reduce TAM-related mortality but did not alter the risk for ML-DS. These authors used low-dose cytarabine to treat German and Dutch patients with Down syndrome who had symptomatic TAM or minimal residual disease (MRD). In their cohort of 102 patients with TAM, all patients had either greater than 5% myeloid blasts or a *GATA1* variant detected in exons 1-3. Of the 81 patients who were molecularly characterized, 78 (96%) showed a mutation in *GATA1*. Eight-six patients entered the intention-to-treat phase of the study. Of these, treatment with low dose cytarabine was completed per protocol in 28/43 symptomatic patients with TAM (high WBC [n=17], hepatic dysfunction and/or cholestasis [n=30], hydrops fetalis [n=7]), and 11/14 asymptomatic patients with MRD at eight weeks, as determined by flow cytometry. No treatment was offered to an asymptomatic and MRD negative group of 29 patients. Although low dose cytarabine treatment did not change the rate of progression from TAM to ML-DS, the authors observed a significantly lower cumulative incidence of early death in the treated symptomatic TAM group [n=28] compared to historical controls [n=45]: 11+/-6% vs. 33+/-7% (P_{Gray}=0.03).

Yamato and coauthors (2021) performed a meta-analysis to identify risk factors that predict leukemia in patients with TAM. They found that no clinical parameters predicted leukemia development. However, in the subgroup of 36 patients with high WBS count (>100x10^9/L), low dose cytarabine therapy significantly improved survival (*P*=0.017). They concluded that TAM patients with life-threatening symptoms should be treated with low-dose cytarabine to reduce the early death rate, and flow cytometric MRD positivity at three months was a significant predictive indicator for leukemia development in patients with TAM.

Although there are many unanswered questions about TAM and ML-DS, our evolving understanding of their interconnected pathogenesis raises the hope that improved diagnosis and management of TAM will result in a longer and healthier life for children with Down syndrome.

Practical Applications

1. Transient abnormal myelopoiesis (TAM) is not always a benign self-limited disease. TAM is a serious and life-threatening disease in up to 20% of affected infants. Complications such as hydrops fetalis, pulmonary hypertension, anemia, coagulopathy, and hepatic fibrosis contribute to significant TAM-related mortality.
2. Low-dose cytarabine is an effective therapy that reduces mortality in severe TAM.
3. Order a CBC with a differential to check for blasts in all newborns with Down syndrome to detect asymptomatic "silent" TAM.
4. TAM survivors, even those with "silent" TAM, are at increased risk for myeloid leukemia associated with Down syndrome and should be monitored closely.

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Disclosures: The authors have no relevant disclosures.

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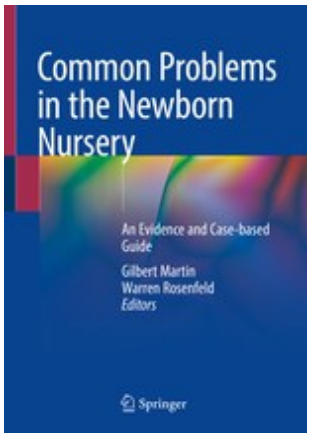

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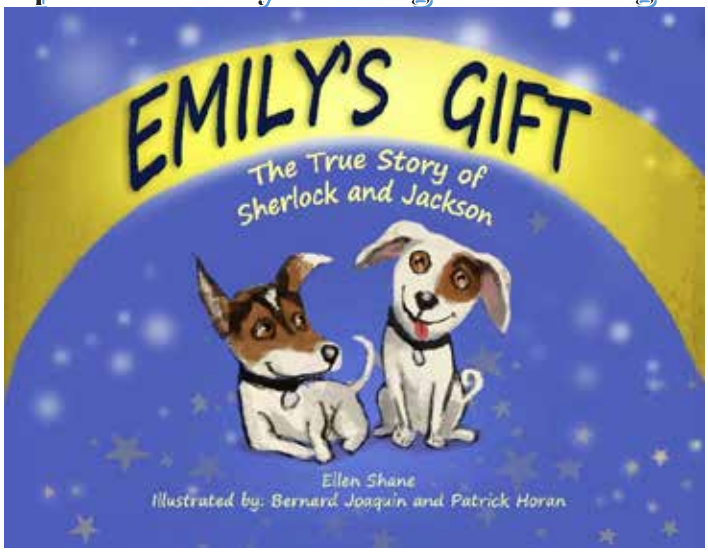

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Infant Health Matters: Respiratory Syncytial Virus (RSV)

Susan Hepworth, Don Null, MD

NCfIH National Coalition for Infant Health

Protecting Access for Premature Infants through Age Two

The National Coalition for Infant Health is a collaborative of more than 200 professional, clinical, community health, and family support organizations focused on improving the lives of premature infants through age two and their families. NCfIH's mission is to promote lifelong clinical, health, education, and supportive services needed by premature infants and their families. NCfIH prioritizes safety of this vulnerable population and access to approved therapies.

Q: What is RSV?

The respiratory syncytial virus is a seasonal virus that causes an infection of the lungs. RSV is the leading cause of hospitalization in children younger than one-year-old. It is quite common, and most infants and children recover in a short amount of time.

Some, however, struggle and may need to be hospitalized and put on a ventilator. While there is a risk for premature infants in particular, even healthy, full-term infants are at risk of severe infection and hospitalization. In fact, the majority of RSV hospitalizations are healthy infants born full-term.

Some infants grow up to have lifelong respiratory problems as a result of their bout with RSV.

Q: Is there a vaccine for RSV?

There is no vaccine for RSV, but vaccine-like products are being developed to help prevent RSV infection in all infants. And one already exists for preterm infants. The problem is that insurance companies have set a very high bar for access. In order to receive treatment, an infant must have been born extremely early, have been a previously sick preterm baby, or be ill when RSV season starts. So, many babies who would benefit from protection instead face the viral season without treatment. That can be dangerous.

I worry that when new treatments come to market for RSV, all infants will face the same access challenges.

We must not let our guard down when it comes to infants and RSV.

Q: Why isn't RSV always taken seriously?

More often than not, the virus is mistaken for a cold or another virus.

In other cases, people do not know how to take it seriously because they are unaware of how RSV is transmitted. Yes, it can be passed by sneezing or coughing on someone. But RSV can also last up to several hours on surfaces such as countertops, toys, and clothes.

"Of all my years of working in neonatal care, 2020 brought the lowest number of RSV patients. Why? Everyone was wearing a mask, washing their hands, and being incredibly cautious. While we have been warding off COVID-19, we have also been warding off RSV."

This makes the virus easily transmittable – and dangerous.

Q: What happened to RSV in infants in 2020?

Of all my years of working in neonatal care, 2020 brought the lowest number of RSV patients. Why? Everyone was wearing a mask, washing their hands, and being incredibly cautious. While we have been warding off COVID-19, we have also been warding off RSV.

It's important to note that the decrease was temporary. We must not let our guard down when it comes to infants and RSV. As the world opens back up, RSV will be back.

Q: What advice do you have for parents and health care providers?

Parents might consider continuing COVID-19 precautions to protect their infant's health. They should also look for the telltale signs of RSV – coughing, wheezing, and difficulty breathing, especially when they perceive pauses in the child's breathing.

As for health care providers, we must do our best to serve as the voice for all infants through education and advocacy. Maybe COVID-19 increased the world's sensitivity to what a virus can do. Health care providers should drive home the point that infants deserve access to preventive treatment that can help protect them from RSV's impact

Disclosure: The author has no relevant disclosures.

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National Coalition for Infant Health Values (SANE)

Safety. Premature infants are born vulnerable. Products, treatments and related public policies should prioritize these fragile infants' safety.

Access. Budget-driven health care policies should not preclude premature infants' access to preventative or necessary therapies.

Nutrition. Proper nutrition and full access to health care keep premature infants healthy after discharge from the NICU.

Equality. Prematurity and related vulnerabilities disproportionately impact minority and economically disadvantaged families. Restrictions on care and treatment should not worsen inherent disparities.

Which Infants are More Vulnerable *to Respiratory Syncytial Virus?*

RSV is a respiratory virus with cold-like symptoms that causes 90,000 hospitalizations and 4,500 deaths per year in children 5 and younger. It's 10 times more deadly than the flu. For premature babies with fragile immune systems and underdeveloped lungs, RSV proves especially dangerous.

But risk factors associated with RSV don't touch all infants equally.*

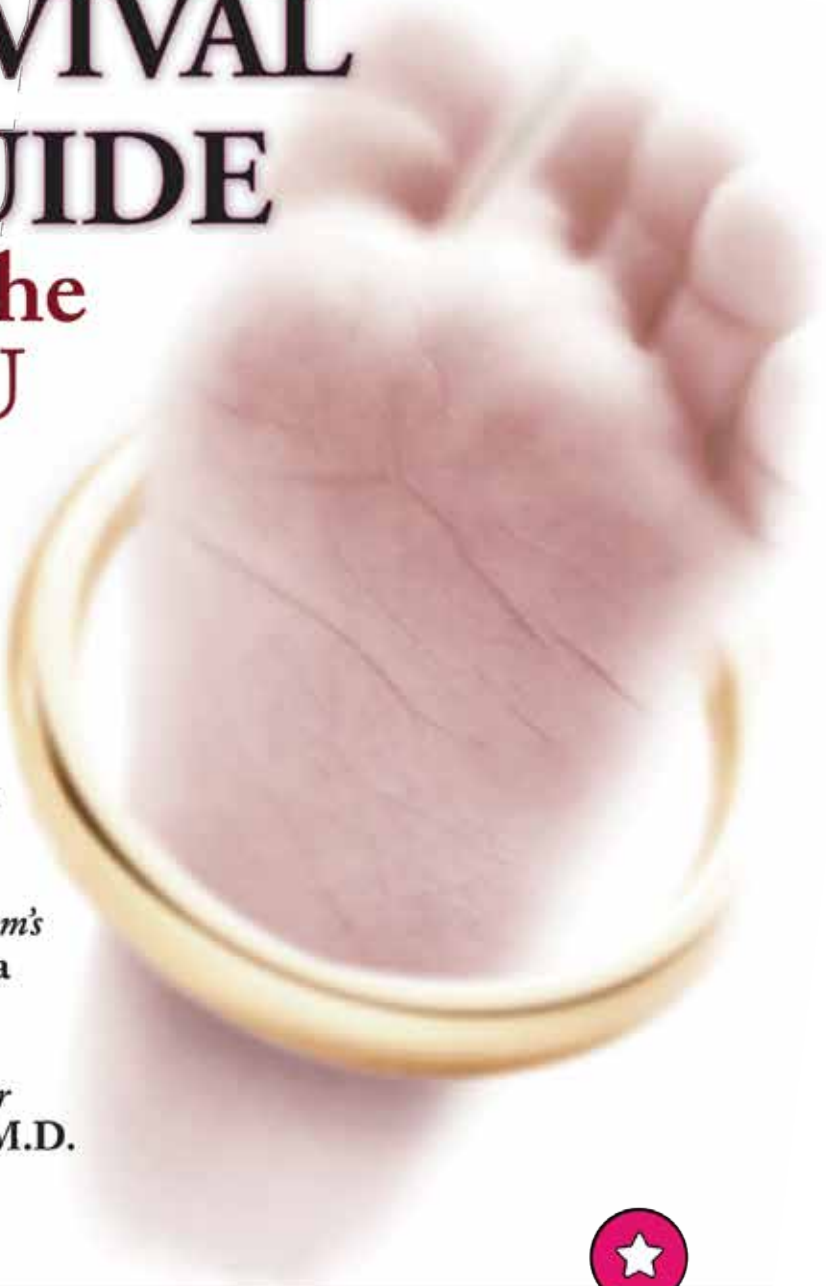
*Source: Respirator Syncytial Virus and African Americans

Caucasian Babies	Risk Factor	African American Babies
11.6%	Prematurity	18.3%
58.1%	Breastfeeding	50.2%
7.3%	Low Birth Weight	11.8%
60.1%	Siblings	71.6%
1%	Crowded Living Conditions	3%

AFRICAN AMERICAN BABIES bear the brunt of RSV. Yet the American Academy of Pediatrics' restrictive new guidlines limit their access to RSV preventative treatment, increasing these babies' risk.

AfPA
Alliance for Patient Access

The Preemie Parent's SURVIVAL GUIDE to the NICU



By

little man's
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&

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with

Medical Editor
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National Statistics

Respiratory Syncytial Virus

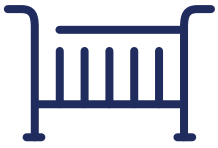
About Respiratory Syncytial Virus

Respiratory syncytial virus, or RSV, is a contagious seasonal respiratory virus that can cause bronchiolitis and pneumonia. It is also the leading cause of hospitalization in babies less than one year old.[1] RSV can be deadly for premature infants and at-risk infants with congenital heart disease or chronic lung disease.

Preventive treatment called palivizumab can protect infants from RSV, but national claims data shows certain babies aren't getting access to this FDA-indicated therapy.

National Health Plan Coverage & Access

A national data supplier provided palivizumab claims for Medicaid and commercial health plans across the nation from January 2019 through December 2019.



"Gap" Babies
Commercial Plans Denied
40%
Medicaid: **25%**

Health plans deny 40% of palivizumab prescriptions for premature infants born between 29 and 36 weeks gestation.

"In-Guidance" Babies
Commercial Plans Denied
25%
Medicaid: **14%**

One in every four prescriptions is denied for infants who should qualify for coverage under standard insurance policies.

This includes severely premature infants born before 29 weeks gestation, babies born before 32 weeks gestation who have chronic lung disease, and babies born with congenital heart disease.

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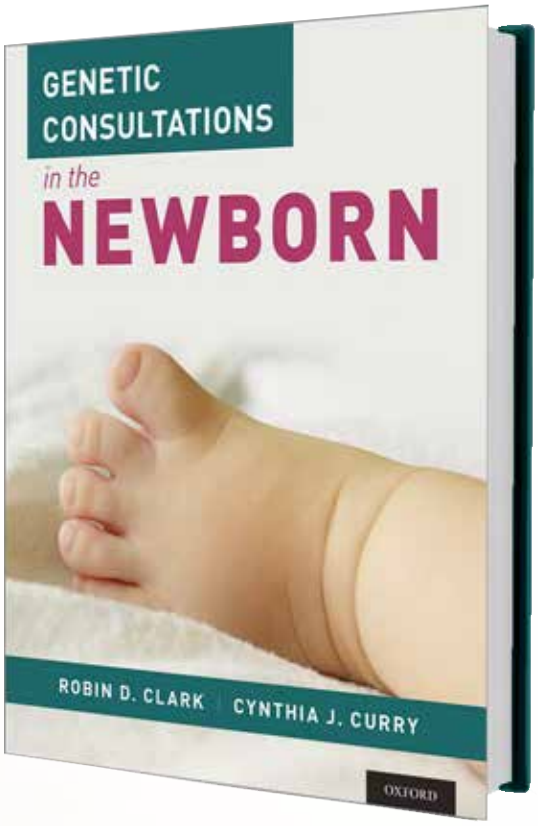

Robin D. Clark | Cynthia J. Curry

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OXFORD

RSV AWARENESS:
A National Poll of Parents & Health Care Providers

Respiratory syncytial virus, or RSV, is far from the common cold. It can lead to hospitalization, lifelong health complications or even death for infants and young children. **In fact, it is the leading cause of hospitalization in children younger than one.**

Yet a national poll of parents and specialty health care providers reveals a startling divide in attitudes toward the virus. While both groups acknowledge RSV as a significant concern, the two populations vary widely in their reported ability to meet RSV's threat head-on. Health care providers vigilantly monitor for the virus, which they report seeing regularly in their practices. Parents, however, feel unequipped to protect their young children.

Meanwhile, specialty health care providers overwhelmingly report that health plan rules and insurance denials block vulnerable infants' access to preventive RSV treatment. Such barriers can put unprepared parents at a double disadvantage. The survey does suggest, however, that education can embolden parents to seek more information about RSV and take steps to protect their children.

KEY FINDINGS

Preparedness

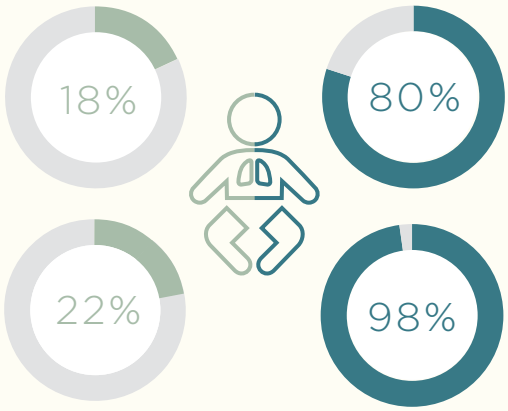
Parents of children age four and under report that understanding of RSV is lacking. That leaves them less than fully prepared to prevent their young children from catching the virus.

Specialty health care providers reiterated these concerns; 70% agreed that parents of their patients have a low awareness of RSV. Meanwhile, specialty health care providers themselves actively monitor for RSV. They reported that:

PARENTS

Only 18% said parents know "a lot" about RSV, reflecting an awareness level that's roughly half that of the flu

Only 22% of parents consider themselves "very well prepared" to prevent RSV.



SPECIALTY HEALTH CARE PROVIDERS

They treat RSV as a priority, "often" or "always" evaluating their patients (80% doctors; 78% nurses)

During RSV season, they are especially vigilant about monitoring patients for symptoms or risk factors for RSV (98%).

Peer Reviewed

Clinical Pearl: Age is just a number: Evidence of Accelerated Biological Aging in Adults Born Extremely Low Birthweight (ELBW)

Melanie Wielicka, MD, PhD, Joseph R Hageman, MD

"With the increasing rates of preterm birth and survival worldwide, a number of studies have started to focus not only on the immediate consequences of prematurity seen in the neonatal intensive care units but also on its long-term effects on adult health."

With the increasing rates of preterm birth and survival worldwide, a number of studies have started to focus not only on the immediate consequences of prematurity seen in the neonatal intensive care units but also on its long-term effects on adult health. There is now evidence that individuals with a history of preterm birth are at a greater risk of developing hypertension, strokes as well as type 1 and type 2 diabetes (1, 2). These chronic medical conditions have been classically associated with increasing age, raising whether ex-preemies are at risk for accelerated aging.

The extent of DNA methylation increases with chronological age. Various "epigenetic clocks" are available to quantify the relationship between methylation and chronological age to determine an individual's "epigenetic" or "biological" age. Increased biological age has been linked to a greater risk of age-related morbidities (3). In their study, Van Lieshout and colleagues collected buccal cells from 45 extremely low birth weight (ELBW) survivors and 49 normal birthweight controls at 30-35 years of age. Epigenetic age was calculated from the weighted average of DNA methylation at 353 cytosine-phosphate-guanine sequences within the DNA methylation sites. The technique used is called the Illumina Infinium Human Methylation EPIC 850k BeadChip array devised by Horvath. They found that men born at ELBW demonstrated accelerated biological aging when compared to age-matched adults born at normal birth weight. The authors suggest that these findings could potentially be related to the increased psychological and physiologic stress premature infants endure (4, 5).

At this time, further studies are still needed to establish the link between accelerated cellular aging in individuals with a history of prematurity and specific outcomes, as well as to identify which subgroups are at the highest risk. Van Lieshout and colleagues point out that male preterm infants are susceptible to worse outcomes, and thus, are at risk for increased stress, which could potentially explain why the differences were only found in males (4, 5). Their findings appear to be supported by Parkinson et al., who used a different molecular marker, telomere length, to study cellular aging in patients with a history of prematurity. They have demonstrated a greater proportion of shorter telomeres in preterm men when compared to term men but were unable to find similar differences in women (6). Interestingly, in a recent study by Raffington et al., the authors analyzed DNA methylation to determine a methylation-based "pace of aging" in children. They have found that a greater socioeconomic disadvantage among white and Hispanic children was associated with a significantly faster pace of aging. This topic should be explored further. It would be imperative to determine if racial and socioeconomic disparities enhance the risk of accelerated aging in individuals with a history of prematurity (7).

"All the emerging evidence has important implications for clinicians, researchers, and policymakers. At the policy level, more data is still needed to establish appropriate screening and preventative guidelines."

All the emerging evidence has important implications for clinicians, researchers, and policymakers. At the policy level, more data is still needed to establish appropriate screening and preventative guidelines. However, when caring for children, adolescents, and adults with a history of prematurity, physicians should closely monitor blood pressure and weight and encourage appropriate nutrition and physical activity. They should also be reminded of the importance of inquiring about preterm birth when obtaining routine medical history, even when encountering patients later in life. Lastly, family members of children born preterm should be counseled on the risk for accelerated aging and increased risk of cardiovascular and metabolic disorders.

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Disclosures: The authors have no conflicts to disclose

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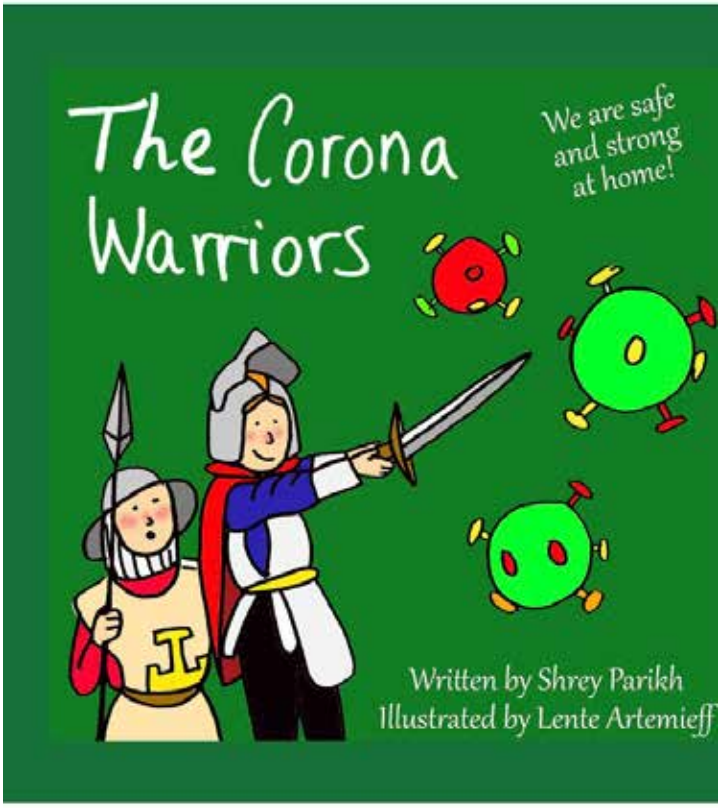

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Summarize the pearl for emphasis.

No more than 7 references.

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OPIOIDS and NAS

When reporting on mothers, babies, and substance use

LANGUAGE MATTERS

I am not an addict.

I was exposed to substances in utero. I am not addicted. Addiction is a set of behaviors associated with having a Substance Use Disorder (SUD).

I was exposed to opioids.

While I was in the womb my mother and I shared a blood supply. I was exposed to the medications and substances she used. I may have become physiologically dependent on some of those substances.

NAS is a temporary and treatable condition.

There are evidence-based pharmacological and non-pharmacological treatments for Neonatal Abstinence Syndrome.

My mother may have a SUD.

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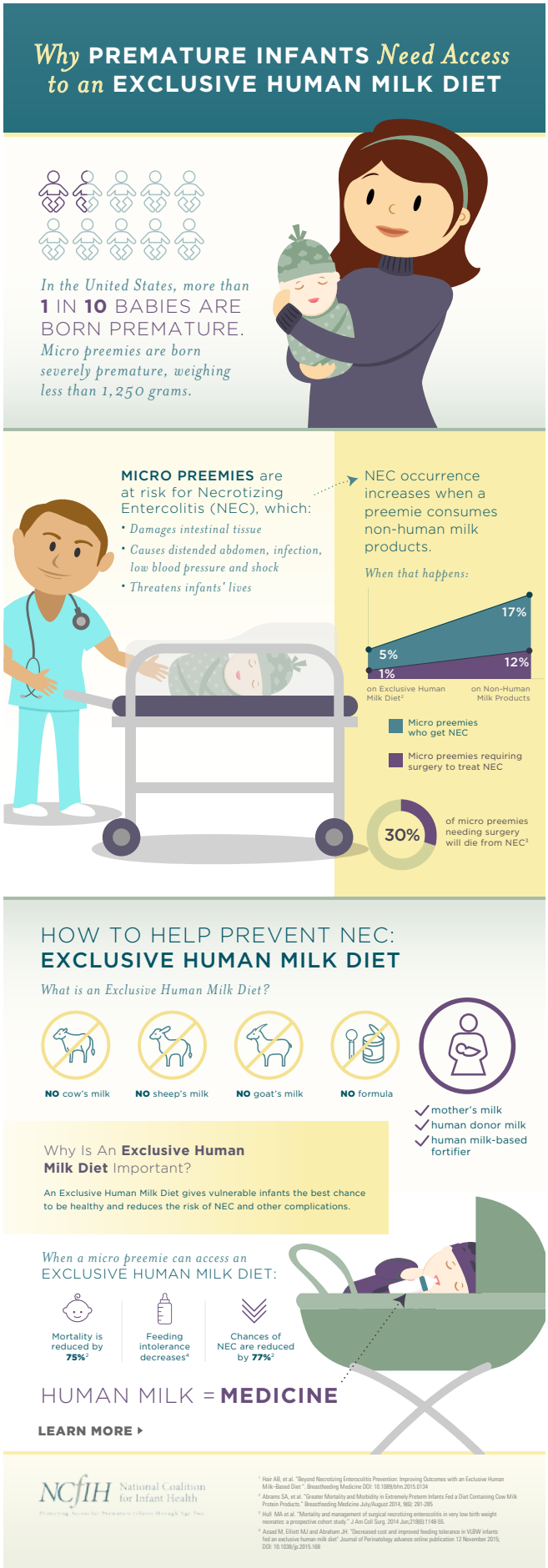
My potential is limitless.

I am so much more than my NAS diagnosis. My drug exposure will not determine my long-term outcomes. But how you treat me will. When you invest in my family's health and wellbeing by supporting Medicaid and Early Childhood Education you can expect that I will do as well as any of my peers!

Learn more about Neonatal Abstinence Syndrome at www.nationalperinatal.org

National Perinatal Association



Interpreting Umbilical Cord Blood Gases Cord Cord Occlusion with Terminal Fetal Bradycardia: Part VI

Jeffrey Pomerance, MD, MPH

"Shoulder dystocia), and it took between five and 10 minutes with various maneuvers (including McRoberts maneuver - removing the legs from the stirrups and sharply flexing them up onto the abdomen) to deliver the entire infant."

Case 17: Shoulder Dystocia with Delayed Delivery

The mother was a 31-year-old, gravida 2, para 0, aborta 1, with an intrauterine pregnancy at 38 3/7 weeks gestation. She was a gestational diabetic taking NPH insulin twice daily. Her hemoglobin A1C was elevated at 7.3%. During her previous pregnancy, her gestational diabetes mellitus was diet controlled. Her group B streptococcus colonization status was negative, and the estimated fetal weight was 3200 g.

During labor, the mother received intravenous insulin at one unit/hour. Artificial rupture of membranes resulted in egress of fluid that was lightly stained with meconium. The FHR pattern was reassuring. Although the mother's maximum temperature was 99.4° F, she received two doses of ampicillin intravenously. About 75 minutes after complete cervical dilatation with the fetus in the OA position, a vacuum extractor was applied with rapid delivery of the head. There was considerable difficulty in extricating the shoulders (shoulder dystocia), and it took between five and 10 minutes with various maneuvers (including McRoberts maneuver - removing the legs from the stirrups and sharply flexing them up onto the abdomen) to deliver the entire infant. Apgar scores were 1 and 6 at one and five minutes, respectively. The infant was intubated, with no meconium found below the cords. Positive pressure bag-tube ventilation with 100% oxygen was applied for approximately two minutes. Birth weight was 4340 g.

Cord blood gas results were as follows:

	Umbilical Vein	Umbilical Artery
pH	7.27	7.16
Pco_2 (mmHg) *(kPa)*	46/*6.13*	61/*8.13*
Po_2 (mmHg) *(kPa)*	27/*3.60*	20/*2.67*
BD (mmol/L)	6	7

A follow-up ABG at about 15 minutes of age was:

	Infant's ABG
pH	7.27
Pco_2 (mmHg) *(kPa)*	30/*4.00*
Po_2 (mmHg) *(kPa)*	96/*2.80*
BD (mmol/L)	13

The infant was given 10 mEq of sodium bicarbonate intravenously. A follow-up capillary blood gas about one hour later was:

	CBG
pH	7.42
Pco_2 (mmHg) *(kPa)*	43/*5.73*
Po_2 (mmHg) *(kPa)*	47/*6.27*
BD (mmol/L)	-3

Interpretation

The umbilical venous blood gas is normal. The umbilical artery sample has a slightly low pH, but the other values are all normal. The relationships between the venous and arterial values are also normal. The difference between the umbilical venous and arterial pHs is 0.11, slightly widened and therefore suggestive of cord occlusion. The initial follow-up ABG on the infant showed mild metabolic acidosis and respiratory alkalosis. The second follow-up blood gas was a CBG. A CBG may not be as accurate as either an ABG or VBG. However, it tends to err in a poorly perfused baby by elevating the Pco_2 and increasing the base deficit. In this case, both the Pco_2 and the base deficit are entirely normal. Therefore, this result is probably accurate.

"Two mechanisms of cord occlusion seem tenable. When shoulder dystocia occurs, the cord is at increased risk of being compressed between a fetal shoulder and the lower uterine segment. Additionally, the umbilical cord suddenly becomes functionally shortened by the descent of the fetal head."

Two mechanisms of cord occlusion seem tenable. When shoulder dystocia occurs, the cord is at increased risk of being compressed between a fetal shoulder and the lower uterine segment. Additionally, the umbilical cord suddenly becomes functionally shortened by the descent of the fetal head. This may be sufficient to put the umbilical cord on a significant stretch. Sudden stretching of the umbilical cord may be different from gradual stretching, as spasm of the vessels may ensue. With shoulder dystocia, sudden functional shortening of the cord or spasm of the cord vessels may be sufficient to occlude both umbilical vein and arteries.

The mechanism by which an infant becomes asphyxiated during shoulder dystocia is not established. The 25th edition of Williams Obstetrics offers only the notion that "shoulder dystocia may be associated with significant fetal morbidity and even mortality." It is likely that asphyxia, when it occurs, is secondary to cord occlusion and perhaps upper body compression during shoulder dystocia and consequent severe neonatal hypovolemia due to both mechanisms.

The effect on blood gases of increasing the time interval between delivery of the head and delivery of the body is contested. Allen et al. have reported that as the time required to deliver the shoulders increased, the 5-minute Apgar scores decreased. Stallings et al. failed to find any association between increasing intervals and either decreased Apgar scores at five minutes or with significant reductions in mean umbilical arterial blood gas parameters. When shoulder dystocia occurs, much force may be brought to bear both on the fetus and potentially on the umbilical cord as well. One would not expect occluded umbilical arteries to reflect the blood gas status of the infant after occlusion.

"Not every fetus in whom there is a considerable delay between delivery of the head and the body is adversely affected. This observation suggests that the mechanism of asphyxia is secondary to umbilical cord occlusion occurring in some fetuses and not in others."

Not every fetus in whom there is a considerable delay between delivery of the head and the body is adversely affected. This observation suggests that the mechanism of asphyxia is secondary to umbilical cord occlusion occurring in some fetuses and not in others. Following the FHR, if possible, during this critical time might allow one to separate those fetuses for whom time is of the essence from those for whom it is not.

Thus, one of several scenarios may accompany shoulder dystocia. Suppose the umbilical cord is compressed between the fetus and the lower uterine segment. In that case, all vessels may occlude, followed by reactive arterial hypertension, during which time the vein remains occluded but umbilical arterial blood flow is restored (if only briefly). Suppose the cord is placed on sufficient stretch or is suddenly stretched. In that case, the umbilical arteries and the umbilical vein may become permanently occluded, mimicking an umbilical cord that had been clamped. Then the umbilical cord blood gas values would reflect only the acid-base status of the infant at the time occlusion occurred.

Under stressful conditions, the length of time during which shoulder dystocia persists may be underestimated. In this case, the estimated time was five to 10 minutes. However, much can happen in this time interval, especially if the fetus is becoming hypovolemic. Mercer et al.(5) suggest that hypovolemia may become extreme. They hypothesize that fetal hypovolemia may result not just from cord occlusion with accompanying transfer of blood to the placenta but also with further transfer of blood to the placenta due to the "tight compressive squeeze of the body in the birth canal." Additionally, loss of the many stem cells present in cord blood may be essential for central nervous system healing and repair. Studies in rats have found that following induced brain damage, human umbilical stem cells can protect the rat's brain from developing a permanent injury.

In those infants who are significantly hypovolemic at birth, volume rather than red blood cells appears to be the critical item, as quite low fetal hemoglobin levels still appear to be sufficient to avoid brain injury. It is possible that simply infusing normal saline might be sufficient. The infant presented in this case was not depressed enough to warrant volume replacement of any sort, but other infants may be.

In the case above, the clinical appearance of the infant at the time of birth suggests that the umbilical cord blood gas values may not accurately reflect the condition of the baby. Obtaining a blood gas directly from the infant shortly after birth will frequently give a more accurate picture and provide insight into the meaning of the cord blood values. By 15 minutes of age, clinically much improved from birth, this infant was spontaneously hyperventilating (Pco_2 of 30 mmHg), compensating for the metabolic acidosis (base deficit of 13) with respiratory alkalosis One hour later, the infant was no longer hyperventilating, and the base deficit was three. The data of Shah et al. and Aschner and Poland) suggest that the administration of sodium bicarbonate does not accelerate recovery from metabolic acidosis.

The infant did well and was discharged home on the third day of life.

Key Points

- Shoulder dystocia appears to have a variable effect on occlusion of the umbilical cord.
- When the umbilical cord is occluded, the mechanism of occlusion may be cord occlusion at the site of shoulder dystocia or sudden stretch of the cord vessels as the head exits the cervix.
- Following the FHR, if possible, during shoulder dystocia, may enable one to separate those fetuses for whom time to delivery is of the essence from those for whom it is not.
- Widened umbilical venoarterial pH differences may occur in association with shoulder dystocia, just as they do in association with other causes of cord occlusion.
- Blood gas samples will only reflect fetal status prior to occlusion.
- Compression of the fetal body during shoulder dystocia may result in a greater transfer of blood to the placenta than in other situations.

Case 18: Breech Delivery with Trapped Head

The mother was a 19-year-old, gravida 1, para 0, aborta 0, with an intrauterine pregnancy at 30 6/7 weeks gestation in active labor. The cervix was five cm dilated and completely effaced with the fetus in breech presentation. Although the mother was advised that the infant should be delivered by cesarean section, she insisted on vaginal delivery. Labor ensued without problem until the aftercoming head became trapped for approximately 12 minutes. A female infant was ultimately delivered with Apgar scores of 0, 1, 5, 7, and 8 at one, five, 10, 15, and 20 minutes, respectively.

Cord blood gas results were as follows:

	Umbilical Vein	Umbilical Artery
pH	7.31	7.20
Pco_2 (mmHg) *(kPa)*	42/*5.60*	57/*7.60*
Po_2 (mmHg) *(kPa)*	44/*5.87*	22/*2.93*
BD (mmol/L)	5	6

Resuscitation included intubation and ventilation, chest compressions, epinephrine via ETT, and placement of a UVC.

At six minutes of life, a blood gas sample was drawn from the UVC, just prior to giving five meq of sodium bicarbonate.

Results from the UVC sample were:

	UVC
pH	7.02
Pco_2 (mmHg) *(kPa)*	48/*6.40*
Po_2 (mmHg) *(kPa)*	75/*10.00*
BD (mmol/L)	19

Birth weight was 1620 g. The infant had mild respiratory distress syndrome, received one dose of surfactant, and was extubated at approximately 24 hours of life. The infant was never tremulous, had good urine output and normal renal function tests. A head ultrasound examination was normal.

Interpretation

The umbilical venous blood gas is normal, except for a slightly elevated Po_2, which is likely secondary to a brief period of slowed blood flow prior to complete occlusion.

The umbilical arterial blood sample results are entirely normal, as are the usual relationships between venous and arterial values. The difference between the venous and arterial pH is widened (>0.10), although only slightly, suggesting that after the fetal head became entrapped, the umbilical cord was occluded, followed by a brief period in which the umbilical artery blood flow was restored while the umbilical vein remained occluded.

"The difference between the venous and arterial pH is widened (>0.10), although only slightly, suggesting that after the fetal head became entrapped, the umbilical cord was occluded, followed by a brief period in which the umbilical artery blood flow was restored while the umbilical vein remained occluded."

The umbilical arterial blood gas values do not represent the situation within the fetus at the time of birth. The umbilical venous blood gas represents the situation in the fetus at the time the fetal head became entrapped during delivery. If entrapment is brief, umbilical cord arterial blood gas values will closely reflect the infant's condition, but as the time of entrapment increases, this becomes progressively less so.

The UVC blood gas sample values obtained at six minutes of life are very different from those drawn from the umbilical cord at the time of birth. The base deficit comes much closer to what one would have expected, considering the clinical history and the infant's appearance at the time of birth. The Po_2 is too high for venous blood, even if the infant were receiving 100% oxygen. This suggests that the UVC extended into the heart and crossed through the foramen ovale into the left atrium, thus reflecting an "arterial" Po_2.

In a breech delivery with head entrapment, the umbilical cord extends from the umbilicus up through the cervical os, next to the infant's head, and then onto the placenta. As the fetal head becomes wedged in the pelvis, the umbilical cord is compressed between the infant's head and the lower uterine segment.

At the time of head entrapment, the umbilical cord becomes functionally shortened by the distance from the breech to the cervical os, likely placing the cord on a significant stretch.

Additionally, average umbilical cord length is significantly shorter in breech compared with cephalic presentations.() However, strong external compression and occlusion of the umbilical cord may make these points moot.

Key Points

- Breech delivery with a trapped head will likely result in complete occlusion of the umbilical cord by compression between the fetal head and the lower uterine segment.
- Wider than normal differences between umbilical venous and arterial pH and Pco_2 suggest an interval when the umbilical vein was occluded, but the umbilical arteries were not.
- Blood in the umbilical vein will then reflect the infant's status prior to this event.

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Disclosure: The author has no disclosures.

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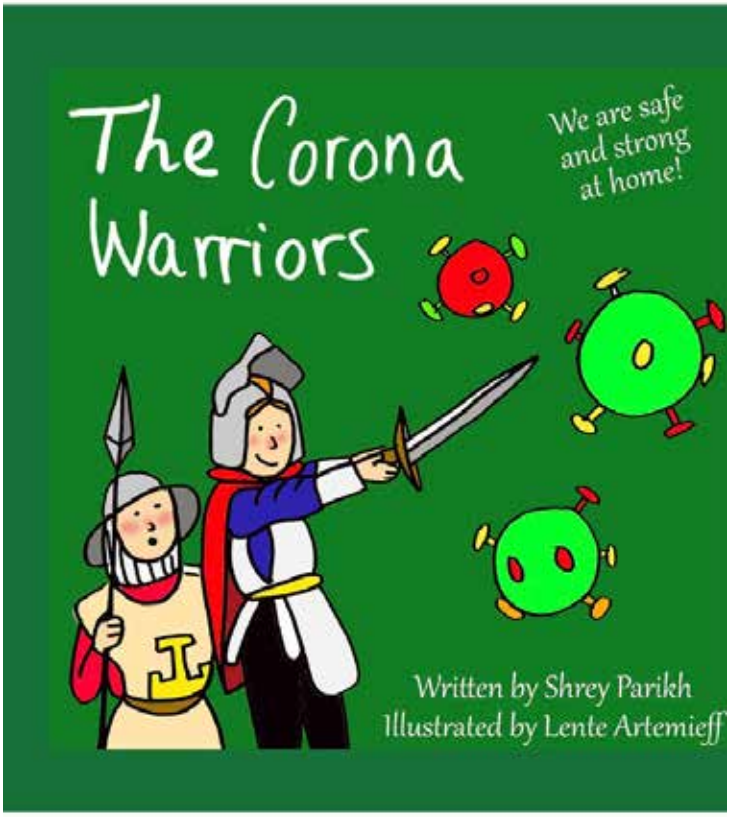

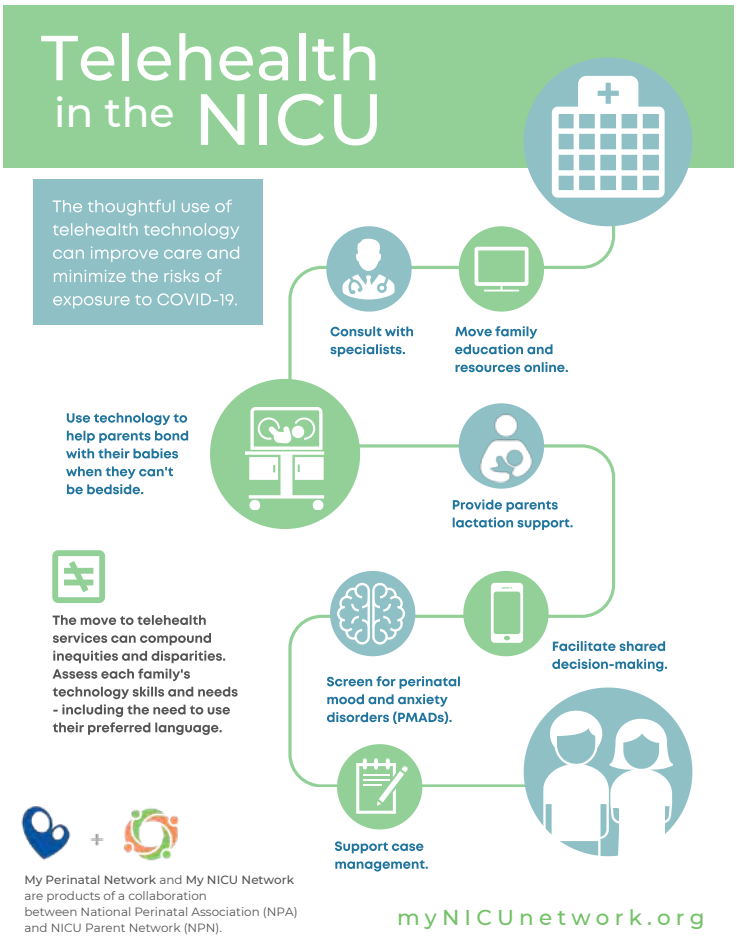

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Medico-Legal Forum
Case Debrief: Mitchell v. Shikora et al.

Jon Fanaroff, MD, JD, Gilbert I. Martin, MD

Procedures can be one of the most gratifying aspects of neonatology. In cases such as intubation, ECMO, or pericardiocentesis, they are lifesaving. Some procedures, such as blood draws, occur multiple times a day in every NICU. All procedures carry risks, and adverse events may occur even though everything was done correctly. While such situations are unfortunate, they are not considered to be medical malpractice. In Pennsylvania, however, a dispute arose over whether juries were entitled to hear about known complications of a procedure. The case, Mitchell v. Shikora et al., ultimately went to the Supreme Court of Pennsylvania. While it involved surgery on an adult, the principles would equally apply in the NICU.

"In Pennsylvania, however, a dispute arose over whether juries were entitled to hear about known complications of a procedure. The case, Mitchell v. Shikora et al., ultimately went to the Supreme Court of Pennsylvania. While it involved surgery on an adult, the principles would equally apply in the NICU. "

Facts:

Gynecologist Dr. Shikora, assisted by a resident, was set to perform a laparoscopic hysterectomy on Lanette Mitchell in May 2016. Laparoscopic operations are performed using instruments and a camera inserted through small (less than a centimeter) incisions. Benefits include less pain and faster healing and recovery. However, before the camera can be inserted, the surgeon must obtain access to the peritoneal cavity, and there can be damage to abdominal organs. Indeed, one study of complications during laparoscopic gynecological cases found that 57% occurred while accessing the abdominal cavity. Unfortunately, this is what occurred to Ms. Mitchell. During initial entry into the peritoneal cavity, her bowel was perforated, and a general surgeon was called in to repair the bowel. For a period, there was an ileostomy pouch.

The Lawsuit

Six months after the surgery, Ms. Mitchell filed a medical malpractice lawsuit against Dr.Shikora and the hospital for "failing to take reasonable precautions to prevent [Mitchell] from suffering complications, injuries and/or damages in connection with the surgery. "For the trial, the plaintiffs asked the judge to prevent the defense from introducing evidence concerning the procedure's risks as being irrelevant, unfairly prejudicial, or confusing. The judge disagreed, and the defense was allowed to present the reasons why a complication can occur even when everything is done correctly. Dr. Shikora testified that bowel perforation is a known complication of laparoscopic surgery since the initial entry into the abdominal cavity is "blind." The expert for the defense noted that Dr. Shikora and the resident met the standard of care during the surgery and that the injury, in this case, was unavoidable and occurred even without negligence since a physician cannot see what is behind the peritoneum. The jury found for the defense, and the plaintiffs appealed.

Superior Court Opinion

A panel of the Superior Court agreed with the plaintiffs, nullified the jury verdict, and ordered a new trial. They felt that the defense should not have been allowed to discuss the risks and complications of the surgery as being "irrelevant, misleading and confusing." In particular, they were concerned that evidence of known complications "would tend to mislead and/or confuse the jury by leading it to believe that [Mitchell's] injuries were simply the result of the risks and complications of the surgery." The defendants appealed this decision, and the Supreme Court of Pennsylvania accepted the case.

Supreme Court of Pennsylvania

The Supreme Court of Pennsylvania reversed the Superior Court decision and found that "evidence of risks and complications of a surgery may be admissible at trial." The Court recognized that

risks and complications evidence may assist the jury in determining whether the harm suffered was more or less likely to be the result of negligence. Therefore, it may aid the jury in determining both the standard of care and whether the physician's conduct deviated from the standard of care.

With this decision, the jury verdict was reinstated, and the defense prevailed in the lawsuit.

"While this is not the type of case that generates headlines, it is the type of case that would have tremendous implications for neonatologists. Imagine trying to defend an adverse outcome after a procedure without discussing the known risks and complications of that procedure!"

Discussion

While this is not the type of case that generates headlines, it is the type of case that would have tremendous implications for neonatologists. Imagine trying to defend an adverse outcome after a procedure without discussing the known risks and complications of that procedure! Just as with laparoscopic surgery, procedures in the NICU such as chest tube insertion and emergent pericardiocentesis are also "blind" and subject to similar complications.

Medical malpractice generally requires the plaintiff to show that the physician was negligent, but if the Superior Court decision remained the law, physicians would end up more in the position of a guarantor, liable anytime a complication occurred regardless of whether that complication was avoidable.

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Disclosure: There are no reported conflicts.

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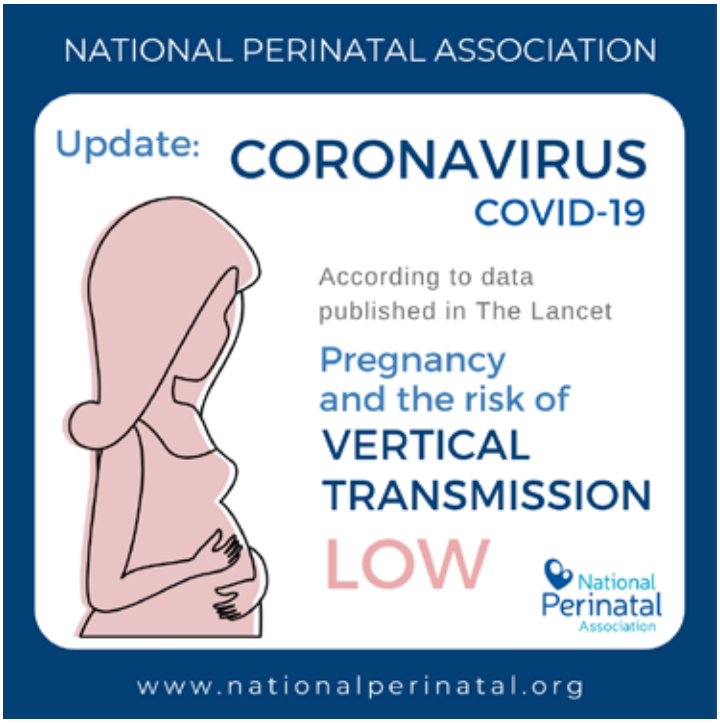


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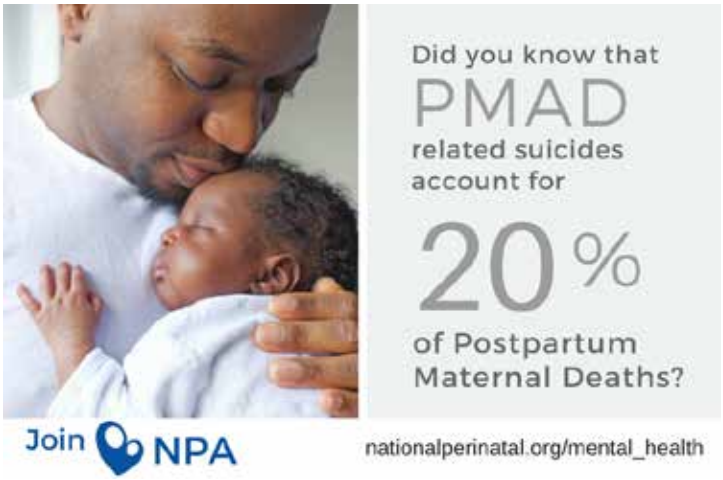
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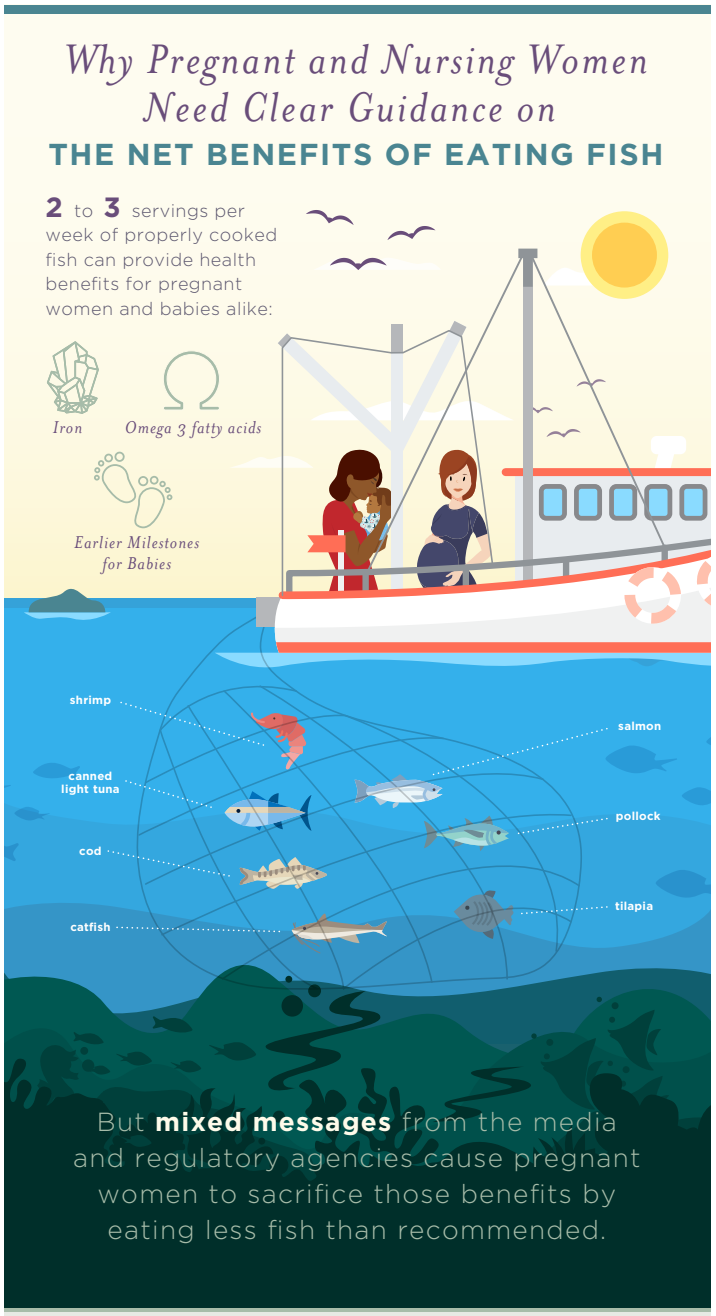
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cod
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salmon
pollock
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Letters to the Editor

Keeping Abreast of the Latest Terminology

"We we writing our previous clinical pearl about the decline in babies in our NICU receiving maternal breast milk, I originally entitled it "Mother's own milk". One of my co authors, Poj Lysouvakon, suggested that we use a more gender neutral word for "mother's own", so I talked with my wife Sally, who is a pediatric nurse at Lurie Children's for 44 years and she suggested 'breast milk.'"

Dear Dr. Goldstein:

We we writing our previous clinical pearl about the decline in babies in our NICU receiving maternal breast milk, I originally entitled it "Mother's own milk". One of my co authors, Poj Lysouvakon, suggested that we use a more gender neutral word for "mother's own", so I talked with my wife Sally, who is a pediatric nurse at Lurie Children's for 44 years and she suggested "breast milk". Another suggestion was "human milk". Then I was talking with another of my colleagues, Allyson Ward, who is an NNP at Comer Children's Hospital about this "controversy", so I could be better informed. She told me that another term being used is actually "chest milk". What terminology are you using in the NICU for the breast milk and what is your perspective about what is appropriate nowadays.

Sincerely,

Joseph R. Hageman, MD (he,him,his)

Section of Neonatology

Director of Quality Improvement

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No one is useless in this world who lightens the burdens of another. Charles Dickens

Dear Dr. Hageman,

In a world increasingly sensitive to gender operatives, it is not unreasonable to ask this question. Certain medical conditions result in the secretion of milk from male, female, or intersex individuals. The most common of these, pregnancy, with the subsequent delivery of an infant, results in a prolactin surge in those who usually identify as female. However, this is not always the case. Indeed, there have been numerous instances where lactation has been documented in individuals who identify as male, usually in association with a pathological condition (e.g., prolactin-secreting tumor), but it is also feasible for lactation to occur with the use of a galactagogue such as Domperidone (Dad's Own Milk – peridone?). (1)

With an increase in gender fluidity and a rejection of increasingly gender-specific terms, perhaps Mother's Own Milk (MOM) is presumptuous. However, regardless of gender or sexual orientation, humans do have breasts and areolas. Although milk does come from the general region of the chest, it lacks specificity. Although there is some evidence that "chest" came to replace "breast" which referred to this same region in bygone days, there is insufficient overlap to use this term. The Spanish language is better able to handle this issue. "El pecho" (a masculine noun) can refer to either the chest or the bosom/breast.

"Certain medical conditions result in the secretion of milk from male, female, or intersex individuals. The most common of these, pregnancy, with the subsequent delivery of an infant, results in a prolactin surge in those who usually identify as female. However, this is not always the case."

Although I routinely hear "Mother's Own Milk" in my practice. I have been prejudiced by the fact that it is almost without exception that this milk has come from those individuals identifying as a mother. A more apt question then may be whether the word "mother" is gender-specific. It may not be. With the proper hormonal conditioning and a uterus that may be congenital or transplanted, an individual of any gender or orientation could functionally give birth and become a mother.(2-4) Etymologically, "mom or mamma" is invariably tied to lactation (i.e., mammary gland). Indeed, some mothers adopt, do not give birth, and do not lactate. In essence, anyone of any orientation who chooses the role could identify as a mother.

I am afraid that I may have confused the issue further. But, there is even evidence that infant biologic sex differences may influence the composition of the milk provided to the infant. (5) Yet, "Mother's Own Milk" is sufficient but not necessary to describe the relationship between the substance that we increasingly define as best for the baby's growth and nutrition and the individual that provides it. (6)

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Sincerely,

Mitchell Goldstein, MD

Editor in Chief

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11175 Campus Street, Suite #11121

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© 2006-2021 by Neonatology Today ISSN: 1932-7137 (online)

Published monthly.

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Erratum (Neonatology Today June 2021

Neonatology Today is not aware of any erratum affecting the June, 2021 edition.

Corrections can be sent directly to LomaLindaPublishingCompany@gmail.com. The most recent edition of Neonatology Today including any previously identified erratum may be downloaded from www.neonatologytoday.net.

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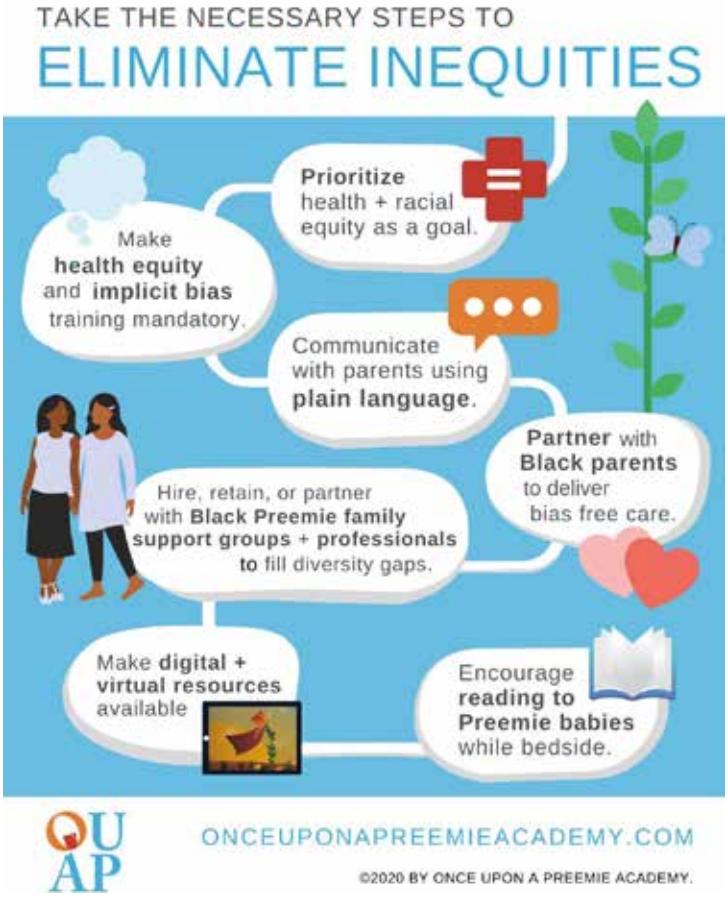

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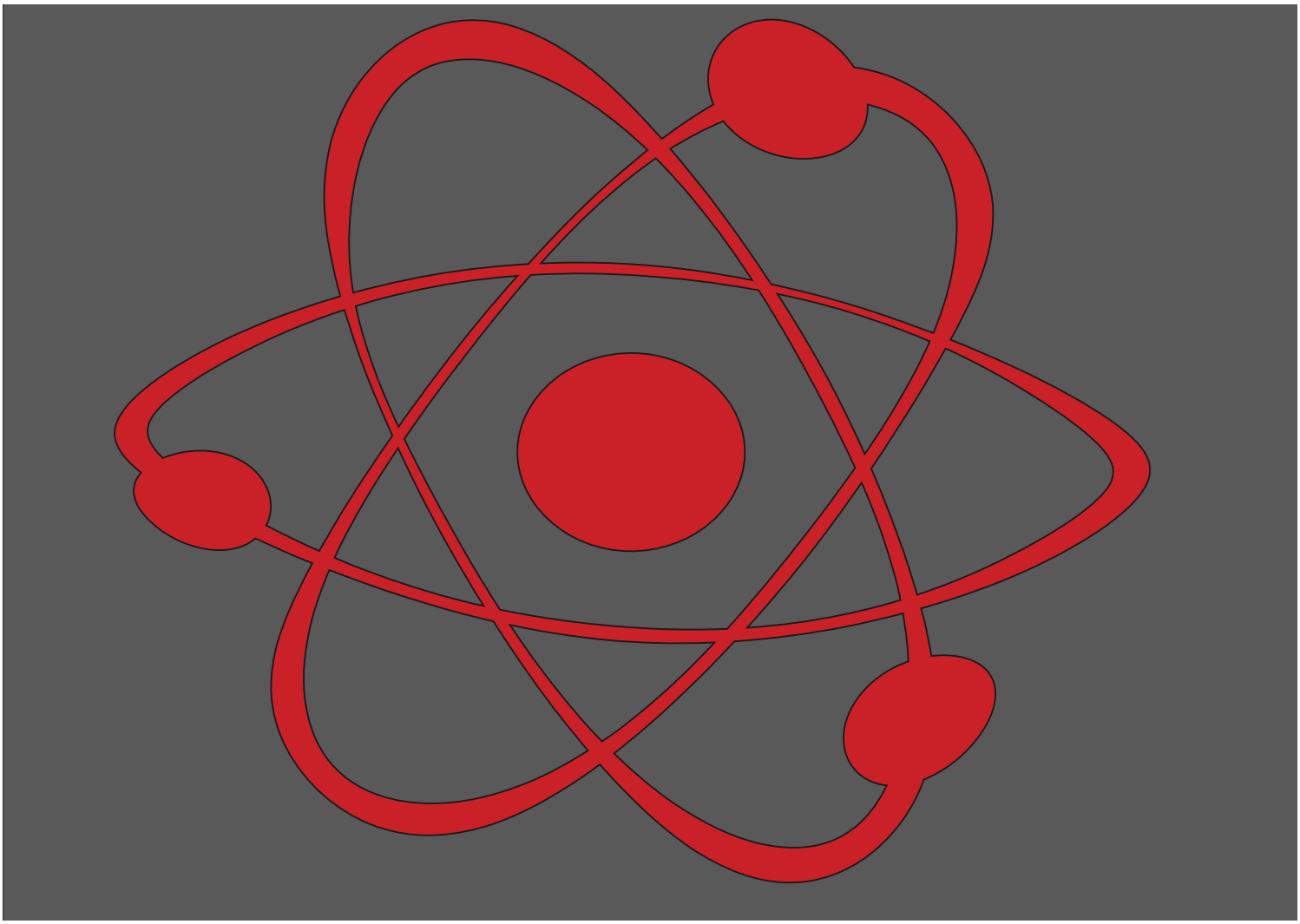

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Will your **PRETERM INFANT** *need* **EARLY INTERVENTION** *services?*

Preterm infants are:

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5x more likely to have learning challenges

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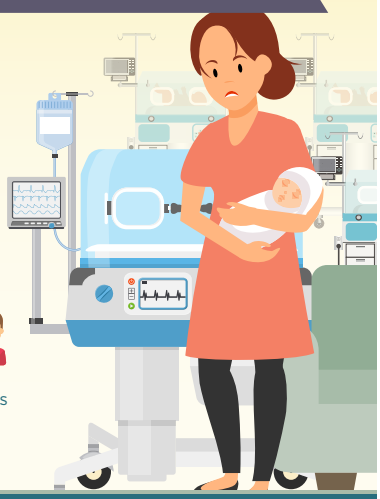

Early intervention can help preterm infants:

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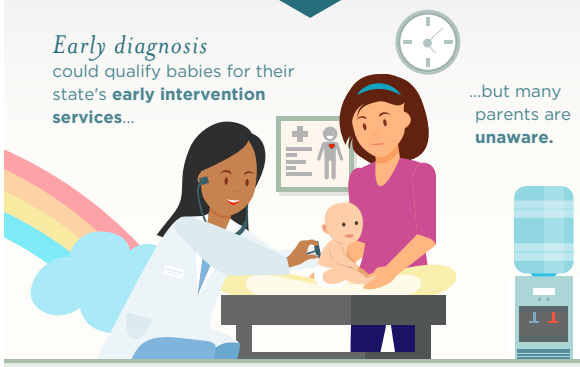
- Process social and emotional situations
- Address physical challenges
- Prevent mild difficulties from developing into major problems

Early diagnosis could qualify babies for their state's **early intervention services**...

...but many parents are **unaware.**



NICU staff, nurses, pediatricians and social workers **should talk** with NICU families about the challenges their baby may face.

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Sin embargo, sólo el 15% recibe tratamiento[1]

LA DEPRESIÓN POSTPARTO **NO TRATADA** PUEDE AFECTAR:

- *La salud de la madre*
- *El sueño, la alimentación y el comportamiento del bebé a medida que crece*[2]
- *La capacidad para cuidar de un bebé y sus hermanos*

PARA AYUDAR **A LAS MADRES A ENFRENTAR LA DEPRESIÓN POSPARTO**

LOS ENCARGADOS DE FORMULAR POLÍTICAS PUEDEN:

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- Proteger el acceso al tratamiento

LOS HOSPITALES PUEDEN:

- Capacitar a los profesionales de la salud para proporcionar apoyo psicosocial a las familias... **Especialmente aquellas con bebés prematuros, que son 40% más propensas a desarrollar depresión posparto**[3,4]
- Conectar a las mamás con una organización de apoyo

NCFIH National Coalition for Infant Health
www.infanthealth.org

[1] American Psychological Association. Accesible en: http://www.apa.org/pi/women/resources/reports/postpartum-depression.aspx
[2] National Institute of Mental Health. Accesible en: https://www.nimh.nih.gov/health/publications/postpartum-depression-facts/index.shtml
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Hyatt Regency Aurora-Denver
Denver, CO
December 1-3, 2021
www.NPAconference.org

Hot Topics in Neonatology®
Gaylord National
National Harbor, MD
December 6-8, 2021
http://www.hottopicsinneonatology.org/

2022 NeoPREP®
An Intensive Review and Update of Neonatal-Perinatal Medicine
January 22-26, 2022
San Antonio, Texas
https://shop.aap.org/live-activities/

42nd Conference on Pediatric Health Care.
Phase 1:
March 10-13 (Orlando, Fl)
Phase 2:
March 24-27 (Virtual)
NAPNAP
https://www.napnap.org/national-conference/

NEO: The Conference for Neonatology
March 2-4, 2022
San Diego, CA
www.neoconference.com

Specialty Review in Neonatology
March 1-6, 2022
San Diego, CA
www.specialtyreview.com

For up to date Meeting Information, visit NeonatologyToday.net and click on the events tab.

NEONATOLOGY TODAY

ISSN: 1932-7137 (Online). ISSN:: 1932-7129 (Print). Published monthly.

Publication
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11175 Campus Street
Suite #11121
Loma Linda, CA 92354
www.NeonatologyToday.net
Tel: +1 (302) 313-9984
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Loma Linda Publishing Company | c/o Mitchell Goldstein, MD | 11175 Campus St, Ste. 11121 | Loma Linda, CA 92354 |
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https://www.nc3rs.org.uk/arrive-guidelines

http://www.icmje.org

https://olaw.nih.gov/policies-laws/phs-policy.htm

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Neonatology and the Arts

This section focuses on artistic work which is by those with an interest in Neonatology and Perinatology. The topics may be varied, but preference will be given to those works that focus on topics that are related to the fields of Neonatology, Pediatrics, and Perinatology. Contributions may include drawings, paintings, sketches, and other digital renderings. Photographs and video shorts may also be submitted. In order for the work to be considered, you must have the consent of any person whose photograph appears in the submission.

Works that have been published in another format are eligible for consideration as long as the contributor either owns the copyright or has secured copyright release prior to submission.

Logos and trademarks will usually not qualify for publication.

This month we continue to feature artistic works created by our readers on one page as well as photographs of birds on another. This month's original artwork is provided by Paula Whiteman, MD. Both Flotation Device (Swan) and Trees in Bloom were drawn by her.

Herbert Vasquez, MD,
Associate Neonatologist, Queen of the Valley Campus
Emanate Health, West Covina, CA
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Manuscript Submission: Instructions to Authors

1. Manuscripts are solicited by members of the Editorial Board or may be submitted by readers or other interested parties. Neonatology Today welcomes the submission of all academic manuscripts including randomized control trials, case reports, guidelines, best practice analysis, QI/QA, conference abstracts, and other important works. All content is subject to peer review.

2. All material should be emailed to: LomaLindaPublishingCompany@gmail.com in a Microsoft Word, Open Office, or XML format for the textual material and separate files (tif, eps, jpg, gif, ai, psd, or pdf) for each figure. Preferred formats are ai, psd, or pdf. tif and jpg images should have sufficient resolution so as not to have visible pixilation for the intended dimension. In general, if acceptable for publication, submissions will be published within 3 months.

3. There is no charge for submission, publication (regardless of number of graphics and charts), use of color, or length. Published content will be freely available after publication. There is no charge for your manuscript to be published. NT does maintain a copyright of your published manuscript.

4. The title page should contain a brief title and full names of all authors, their professional degrees, their institutional affiliations, and any conflict of interest relevant to the manuscript. The principal author should be identified as the first author. Contact information for the principal author including phone number, fax number, e-mail address, and mailing address should be included.

5. A brief biographical sketch (very short paragraph) of the principal author including current position and academic titles as well as fellowship status in professional societies should be included. A picture of the principal (corresponding) author and supporting authors should be submitted if available.

6. An abstract may be submitted.

7. The main text of the article should be written in formal style using correct English. The length may be up to 10,000 words. Abbreviations which are commonplace in neonatology or in the lay literature may be used.

8. References should be included in standard "NLM" format (APA 7th may also be used). Bibliography Software should be used to facilitate formatting and to ensure that the correct formatting and abbreviations are used for references.

9. Figures should be submitted separately as individual separate electronic files. Numbered figure captions should be included in the main file after the references. Captions should be brief.

10. Only manuscripts that have not been published previously will be considered for publication except under special circumstances. Prior publication must be disclosed on submission. Published articles become the property of the Neonatology Today and may not be published, copied or reproduced elsewhere without permission from Neonatology Today.

11. NT recommends reading Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals from ICMJE prior to submission if there is any question regarding the appropriateness of a manuscript. NT follows Principles of Transparency and Best Practice in Scholarly Publishing(a joint statement by COPE, DOAJ, WAME, and OASPA). Published articles become the property of the Neonatology Today and may not be published, copied or reproduced elsewhere without permission from Neonatology Today.

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NEONATOLOGY TODAY is interested in publishing manuscripts from Neonatologists, Fellows, NNPs and those involved in caring for neonates on case studies, research results, hospital news, meeting announcements, and other pertinent topics.

Please submit your manuscript to: LomaLindaPublishingCompany@gmail.com

NICU Baby's Bill of Rights

1- The Right to Advocacy
My parents know me well. They are my voice and my best advocates. They need to be knowledgeable about my progress, medical records, and prognosis, so they celebrate my achievements and support me when things get challenging.

2- The Right to My Parents' Care
In order to meet my unique needs, my parents need to learn about my developmental needs. Be patient with them and teach them well. Make sure hospital policies and protocols, including visiting hours and rounding, are as inclusive as possible.

3- The Right to Bond with My Family
Bonding is crucial for my sleep and neuroprotection. Encourage my parents to practice skin-to-skin contact as soon as and as often as possible and to read, sing, and talk to me each time they visit.

4- The Right to Neuroprotective Care
Protect me from things that startle, stress, or overwhelm me and my brain. Support things that calm me. Ensure I get as much sleep as possible. My brain is developing for the first time and faster than it ever will again. The way I am cared for today will help my brain when I grow up. Connect me with my parents for the best opportunities to help my brain develop.

5- The Right to be Nourished
Encourage my parents to feed me at the breast or by bottle, whichever way works for us both. Also, let my parents know that donor milk may be an option for me.

6- The Right to Personhood
Address me by my name when possible, communicate with me before touching me, and if I or one of my siblings pass away while in the NICU, continue referring to us as multiples (twin/triplets/quads, and more). It is important to acknowledge our lives.

7- The Right to Confident and Competent Care Giving
The NICU may be a traumatic place for my parents. Ensure that they receive tender loving care, information, education, and as many resources as possible to help educate them about my unique needs, development, diagnoses, and more.

8- The Right to Family-Centered Care
Help me feel that I am a part of my own family. Teach my parents, grandparents, and siblings how to read my cues, how to care for me, and how to meet my needs. Encourage them to participate in or perform my daily care activities, such as bathing and diaper changes.

9- The Right to Healthy and Supported Parents
My parents may be experiencing a range of new and challenging emotions. Be patient, listen to them, and lend your support. Share information with my parents about resources such as peer-to-peer support programs, support groups, and counseling, which can help reduce PMAD, PPD, PTSD, anxiety and depression, and more.

10- The Right to Inclusion and Belonging
Celebrate my family's diversity and mine; including our religion, race, and culture. Ensure that my parents, grandparents, and siblings feel accepted and welcomed in the NICU, and respected and valued in all forms of engagement and communication.

Presented by:

NICU Parent Network

NPN NICU PARENT NETWORK

Visit nicuparentnetwork.org to identify national, state, and local NICU family support programs.

*** The information provided on the NICU Baby's Bill of Rights does not, and is not intended to, constitute legal or medical advice. Always consult with your NICU care team for all matters concerning the care of your baby.**


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