A time giver for caregivers.

- Data entry steals two thirds of the average physician's day.
- Within seconds, PediNotes can enter NICU patient data from all sources into one easy location.
- Ease the burden of healthcare.
- Invest in wiser time management.

Share with your CIO to try a demo today!

SCHEDULE ONLINE OR CALL pedinotes.com/request-a-demo

info@pedinotes.com  225-214-6421
Prevention of Shaken Baby Syndrome Among High-Risk Neonates: Program Implementation and Evaluation

Rebecca Tortolano, DNP, MS, RN, Michelle E. Neuman, DNP, RN, APN, PPCNP-BC, Shannon D. Simonovich, PhD, RN

Abstract:

Background: Studies suggest that the implementation of high-quality education and support services for caregivers may reduce the incidence of unplanned harm to infants and young children under high-stress circumstances.

Purpose: This pilot study evaluates the usefulness of the Period of PURPLE Crying program in a high-acuity NICU at The University of Chicago Comer Children’s Hospital based on six measurable objectives.

Methods: The pilot study utilized a Likert-style pretest-posttest survey design to evaluate how NICU nurses perceived the Period of PURPLE Crying program. Nurses were educated on the program content during an in-service to teach participants how to utilize the Period of PURPLE Crying program materials to support and educate families about Shaken Baby Syndrome (SBS) and Abusive Head Trauma (AHT).

Results: The intervention effectively increased nursing confidence in delivering the SBS and AHT program in the NICU. Nurses were educated on the period of increased infant crying (National Center on Shaken Baby Syndrome, 2020) (2). The intervention also increased accessibility to available resources pertaining to SBS and AHT. Questions pertaining specifically to the Period of PURPLE Crying were met with overwhelmingly positive response, with the majority (n=33, 97%) of respondents agreeing that the intervention was useful in standardizing SBS education, providing meaningful, effective information on this topic area, and delivering SBS and AHT information promptly.

“The Centers for Disease Control and Prevention (CDC) reports previously describe how “excessive frustration and exhaustion can lead individuals to a breaking point,” leading to Shaken Baby Syndrome (SBS) and Abusive Head Trauma (AHT) in infants (n.d., p. 4) (1).”

Introduction

The Centers for Disease Control and Prevention (CDC) reports previously describe how “excessive frustration and exhaustion can lead individuals to a breaking point,” leading to Shaken Baby Syndrome (SBS) and Abusive Head Trauma (AHT) in infants (n.d., p. 4) (1). Implementing high-quality education related to SBS and AHT coupled with support services for caregivers may reduce the incidence of unplanned harm to infants and young children under high-stress circumstances.

Incidence

Shaken baby syndrome (SBS) is the leading cause of child abuse-related deaths in the United States (U.S.) and most often occurs in infants less than six months of age (National Center on Shaken Baby Syndrome, 2020) (2). Approximately 1,300 cases are reported each year in the U.S., with nearly 80% of survivors suffer long-term disabilities, and it proves fatal for one out of four victims (National Center on Shaken Baby Syndrome, 2020) (2). Unfortunately, data on this problem is likely underestimated as many cases remain unreported and undiagnosed (National Center on Shaken Baby Syndrome, 2020) (2). Abuse of this nature occurs when an infant’s caregiver becomes excessively frustrated, with a higher incidence among those with disproportionate hardships or relationship problems that challenge coping methods (New York State Department of Health, 2010) (3). Other risk factors include those with unrealistic expectations related to normal infant behaviors, individuals that were abused or neglected as a child, domestic violence victims, single parents, preterm infants, children with disabilities, multiples, infants less than six months old, and infants that cry inconsolably frequently (CDC, n.d.) (1).

Prevention

The Period of PURPLE Crying program referred to throughout this publication, and much of the literature to date as the PURPLE program is an education program aimed to reduce the incidence of SBS and AHT through education and caregiver support during the period of increased infant crying (National Center on Shaken Baby Syndrome, 2020) (2).”

“..."
Despite these findings, just eighteen states across the U.S. have adopted the program statewide; see figure 1 in Appendix C (National Center on Shaken Baby Syndrome, 2021) (2). The universal adoption of this program among healthcare and community settings across the nation may improve coping methods for parents and caregivers, offer ongoing support, and reduce the incidence of SBS and AHT.

Cost Implications:
The cost of SBS and AHT per case accounts for millions in healthcare spending (National Center on Shaken Baby Syndrome, 2020) (2). Visits to the emergency department are one of the key drivers of cost for SBS and AHT. Barr et al. (2015) (6) found that the implementation of the PURPLE program in British Columbia decreased E.D. visits related to crying episodes for well babies by 29.5%. This program contributes to better health outcomes for families and reduces the overall cost of such visits for the healthcare system.

Study Purpose:
The purpose of this project was to evaluate the usefulness of the PURPLE program in a high-acuity Neonatal Intensive Care Unit (NICU) at The University of Chicago Comer Children’s Hospital. Before implementing this pilot study, SBS and AHT were routinely discussed as a part of patient education; however, this practice was carried out with minimal guidance, standardization, or clearly defined objectives.

Methods
Study Design:
The study utilized a Likert-style pretest-posttest survey design to evaluate how the PURPLE program was perceived by NICU nurses who agreed to utilize the PURPLE program content to educate parents and caregivers. The Likert scale ranged from one (strongly disagree) to seven (strongly agree). See Appendix A for complete survey content. Surveys were developed for this study and distributed using the Qualtrics software. The proposal was approved by the University of Chicago Institutional Review Board (IRB) as well as DePaul University’s IRB. The University of Chicago’s IRB served as the lead site for overseeing this project. IBM SPSS statistics software was used to analyze data.

Implementation:
Recruitment was completed by following a script asking nurses to partake in an in-service education aimed to teach participants how to utilize the PURPLE program materials to educate families about SBS. At the start of the in-service presentation, participants completed a confidential, Likert-style pre-intervention survey on an iPad or personal smartphone device that evaluated their perception of SBS, knowledge surrounding this topic area, and demographics. The in-service education reviewed the most common cause of SBS and AHT, timeframes of increased infant crying, and data on the incidence of such trauma in correlation with periods of increased infant crying. Nurses were asked to give parents and caregivers the PURPLE program pamphlet, review the education and direct them to the smartphone application to watch the program’s video content. After delivering the intervention for approximately four to six weeks, participants received the post-intervention survey link via email or text message with the same six Likert-style questions on the pre-intervention survey plus an additional three questions specific to the PURPLE program content.

The purchase of the PURPLE program materials was required to deliver this project. The cost of these materials was $2.00 per pamphlet and app code couplet. Five hundred copies of these materials were purchased for a total cost of $1,000.

Measures:
Measurable objectives for this project included: (1) nursing knowledge about SBS and AHT (pretest-posttest question one), (2) nursing confidence in delivering SBS and AHT education (pretest-posttest question two), (3) accessibility to resources related to SBS and AHT (pretest-posttest question six), (4) functionality and efficacy of SBS/AHT education (pretest-posttest question four, post-test questions eight and nine), (5) perception of the value of SBS and AHT education in the NICU (pretest-posttest questions three and five), and (6) message consistency when delivering education about SBS and AHT (post-test question seven). See Appendix A for complete survey content used to measure these objectives.

Results
The study results are summarized in this section. Each participant did not respond to every question on the pre-test and post-test surveys. See Appendix B for all frequencies and means.

Study Sample & Setting:
Data were collected from February to April 2021. Among the participants in this study, 47 individuals responded to the pre-test survey, but only 34 participants responded to the post-test for a response rate of 72%. The demographic data of participants are detailed in Appendix B, Table 1.

Nursing Knowledge:
The majority (n=44, 93.6%) of respondents on the pre-test answered positively to “I feel knowledgeable when it comes to shaken baby syndrome,” with a mean score of 5.70. Similarly, the majority (n=33, 97%) of post-test respondents agreed to a slightly higher degree, with a calculated mean score of 6.0. Despite this increase in the mean score, comparative analysis using the Wilcoxon matched-pairs test determined this change was not statistically significant (p=.792).

Nursing Confidence:
The majority (n=40, 86.9%) of pre-test respondents answered, “I feel comfortable discussing SBS with parents and caregivers of NICU infants,” with an overall agreeable response and a mean score of 5.61. The majority (n=33, 97.1%) of post-test respondents reported an increase in confidence, with a calculated mean score of 6.24. Comparative analysis using the Wilcoxon matched-pairs test confirmed this change to be statistically significant (p=.016),
## Appendix A

### Survey

<table>
<thead>
<tr>
<th>Age:</th>
<th>20-30</th>
<th>31-40</th>
<th>41-50</th>
<th>51-60</th>
<th>61-70</th>
<th>71-80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender:</td>
<td>Male</td>
<td>Female</td>
<td>Other</td>
<td>Prefer not to answer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education Level:</td>
<td>Associates Degree</td>
<td>Bachelor’s Degree</td>
<td>Master’s Degree</td>
<td>Doctoral Degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of experience as an RN:</td>
<td>0-5</td>
<td>6-10</td>
<td>11-15</td>
<td>16-20</td>
<td>21-25</td>
<td>26-30</td>
</tr>
<tr>
<td>Years of Experience in the NICU:</td>
<td>0-5</td>
<td>6-10</td>
<td>11-15</td>
<td>16-20</td>
<td>21-25</td>
<td>26-30</td>
</tr>
<tr>
<td>Shift:</td>
<td>7a-7p</td>
<td>7p-7a</td>
<td>other</td>
<td>________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you complete discharge teaching:</td>
<td>Never</td>
<td>Seldom</td>
<td>Sometimes</td>
<td>Often</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Included on post-test only**

<table>
<thead>
<tr>
<th></th>
<th>(1) Strongly Disagree</th>
<th>(2) Disagree</th>
<th>(3) Somewhat Disagree</th>
<th>(4) Neutral</th>
<th>(5) Somewhat Agree</th>
<th>(6) Agree</th>
<th>(7) Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel knowledgeable when it comes to shaken baby syndrome</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I feel comfortable discussing shaken baby syndrome with parents and caregivers of NICU infants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. NICU nurses should be providing shaken baby syndrome education during discharge teaching</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Time constraints during discharge are a major barrier to discussing shaken baby syndrome (i.e., too much other education to provide, not enough time, too many other tasks to accomplish)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Providing education about shaken baby syndrome in the NICU is useful in preventing unplanned harm to an infant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I am aware of available resources for families and caregivers about shaken baby syndrome</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. The Period of PURPLE Crying program was helpful in standardizing shaken baby syndrome education on our unit**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. The Period of PURPLE Crying program provides effective, meaningful education about shaken baby syndrome**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. The Period of PURPLE Crying program provides education about shaken baby syndrome in a timely manner** (i.e., able to provide SBS education in a reasonable amount of time within discharge teaching)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
concluding that the intervention effectively increased nursing confidence in discussing SBS and AHT with families and caregivers.

**Resource Accessibility:**

In response to “I am aware of available resource for families and caregivers about shaken baby syndrome,” pre-test respondents were largely mixed with a mean score of 3.85 and only a 42.6% agreeable response. Posttest responses reflected a significant change, with a mean score of 5.97. Wilcoxon matched-pairs confirmed that this change was not statically significant (p=.705), concluding that intervention effectively increased SBS and AHT resource awareness for nurses in the study.

**Functionality and Efficacy of SBS/AHT Education:**

Just over half (n=32, 68%) of pre-test respondents agreed that “time constraints during discharge are a major barrier to discussing shaken baby syndrome,” with a calculated mean score of 4.83. Posttest responses found that nurses felt more strongly about time constraints as a barrier to SBS education post-intervention, with 76.4% of respondents reporting agree or strongly agree and a mean score of 5.18. Analysis using Wilcoxon matched pairs confirmed that this result was not statically significant (p=.775). Despite this finding (n=33, 97%) of post-test respondents agreed with the statement that the PURPLE program “provides education about shaken baby syndrome in a timely manner,” demonstrating a mean score of 6.44. Paralleling this outcome, (n=33, 97%) of post-test respondents agreed that the PURPLE program “provides effective, meaningful education about shaken baby syndrome,” with a mean score of 6.52. See Appendix B, Table 2 for frequency data.

**Perception of Educational Value:**

The majority (n=44, 95.7%) of pre-test respondents answered positively to “NICU Nurses should be providing shaken baby syndrome education during discharge teaching,” with a mean score of 6.28. Similarly, the majority (n=33, 97%) of post-test respondents agreed with a calculated mean score of 6.56. Despite an increase in the mean score, comparative analysis using the Wilcoxon matched-pairs test determined this change was not statistically significant (p=.731).

Similarly, the majority (n=42, 91.3%) of respondents on the pre-test answered positively to “Providing education about shaken baby syndrome in the NICU is useful in preventing unplanned harm to an infant,” with a mean score of 6.43. All post-test respondents (n=34, 100%) agreed or strongly agreed, with a calculated mean score of 6.56. Despite an increase in the mean score, comparative analysis using the Wilcoxon matched-pairs test determined this change was not statistically significant (p=.705).

**Consistency of Educational Messages:**

The majority (n=33, 97%) responded on the post-test with some degree of positivity, with responses indicating that the PURPLE program “was helpful in standardizing shaken baby syndrome education on our unit,” with a mean score of 6.35.

---

“The majority (n=33, 97%) responded on the post-test with some degree of positivity, with responses indicating that the PURPLE program “was helpful in standardizing shaken baby syndrome education on our unit,” with a mean score of 6.35.”

---

**Appendix B**

**Table 1 Study Sample**

<table>
<thead>
<tr>
<th>Demographics of Study Sample</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>20-30</td>
<td>11</td>
</tr>
<tr>
<td>31-40</td>
<td>17</td>
</tr>
<tr>
<td>41-50</td>
<td>29</td>
</tr>
<tr>
<td>51-60</td>
<td>17</td>
</tr>
<tr>
<td>61-70</td>
<td>6</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
</tr>
<tr>
<td>Other or prefer not to identify</td>
<td>1</td>
</tr>
<tr>
<td><strong>Education Level</strong></td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>35</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>10</td>
</tr>
<tr>
<td>Doctoral Degree</td>
<td>2</td>
</tr>
<tr>
<td><strong>Years of experience as R.N.</strong></td>
<td></td>
</tr>
<tr>
<td>0-10</td>
<td>27</td>
</tr>
<tr>
<td>11-20</td>
<td>5</td>
</tr>
<tr>
<td>21-30</td>
<td>9</td>
</tr>
<tr>
<td>30+</td>
<td>6</td>
</tr>
<tr>
<td><strong>Years of NICU experience</strong></td>
<td></td>
</tr>
<tr>
<td>0-10</td>
<td>26</td>
</tr>
<tr>
<td>11-20</td>
<td>8</td>
</tr>
<tr>
<td>21-30</td>
<td>12</td>
</tr>
<tr>
<td>30+</td>
<td>4</td>
</tr>
<tr>
<td><strong>Shift</strong></td>
<td></td>
</tr>
<tr>
<td>Day shift</td>
<td>29</td>
</tr>
<tr>
<td>Night shift</td>
<td>6</td>
</tr>
<tr>
<td><strong>Discharge teaching frequency</strong></td>
<td></td>
</tr>
<tr>
<td>Seldom</td>
<td>17</td>
</tr>
<tr>
<td>Sometimes</td>
<td>21</td>
</tr>
<tr>
<td>Often</td>
<td>9</td>
</tr>
</tbody>
</table>

**Discussion:**

Among the six measurable objectives defined in this study, objectives two and three were met with statistical significance. The intervention effectively increased nursing confidence in delivering education about this sensitive topic area, evident by the statistically significant findings among pre-test and post-test responses designed to assess this parameter. The intervention also proved effective in increasing accessibility to available resources on SBS and AHT, similarly evident with statistically significant findings among comparative responses. Of note, pre-test survey responses related to the perceived value of SBS and AHT education infer participants considered education on this topic area valuable before this intervention, with post-test responses implying a heightened awareness of this value beyond these initial measures. Moreover, questions pertaining specifically to the Period of PURPLE Crying presented exclusively on the post-test were met with an overwhelmingly positive response, with the majority (n=33, 97%) of respondents agreeing that the intervention was useful in standardizing SBS education, providing meaningful, effective information on this topic area, and delivering SBS and AHT education.
Table 2 Mean score and frequency summary of pre-and post-survey responses

<table>
<thead>
<tr>
<th></th>
<th>Pre-test survey mean scores</th>
<th>Frequency (rank)</th>
<th>n</th>
<th>Post-test survey mean scores</th>
<th>Frequency (rank)</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel knowledgeable when it comes to shaken baby syndrome</td>
<td>5.70</td>
<td>(1)Strongly disagree</td>
<td>2</td>
<td>6.0</td>
<td>(1)Strongly disagree</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2)Disagree</td>
<td>0</td>
<td></td>
<td>(2)Disagree</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3)Somewhat Disagree</td>
<td>1</td>
<td></td>
<td>(3)Somewhat Disagree</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4)Neutral</td>
<td>0</td>
<td></td>
<td>(4)Neutral</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5)Somewhat Agree</td>
<td>3</td>
<td></td>
<td>(5)Somewhat Agree</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6)Agree</td>
<td>1</td>
<td></td>
<td>(6)Agree</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7)Strongly Agree</td>
<td>9</td>
<td></td>
<td>(7)Strongly Agree</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>Missing</td>
<td></td>
<td></td>
<td>Total</td>
<td>Missing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel comfortable discussing shaken baby syndrome with parents and caregivers of NICU infants</td>
<td>5.61</td>
<td>(1)Strongly disagree</td>
<td>1</td>
<td>6.24</td>
<td>(1)Strongly disagree</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2)Disagree</td>
<td>0</td>
<td></td>
<td>(2)Disagree</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3)Somewhat Disagree</td>
<td>3</td>
<td></td>
<td>(3)Somewhat Disagree</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4)Neutral</td>
<td>2</td>
<td></td>
<td>(4)Neutral</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5)Somewhat Agree</td>
<td>9</td>
<td></td>
<td>(5)Somewhat Agree</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6)Agree</td>
<td>2</td>
<td></td>
<td>(6)Agree</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7)Strongly Agree</td>
<td>9</td>
<td></td>
<td>(7)Strongly Agree</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>Missing</td>
<td></td>
<td></td>
<td>Total</td>
<td>Missing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NICU nurses should be providing shaken baby syndrome education during discharge teaching</td>
<td>6.28</td>
<td>(1)Strongly disagree</td>
<td>1</td>
<td>6.56</td>
<td>(1)Strongly disagree</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2)Disagree</td>
<td>0</td>
<td></td>
<td>(2)Disagree</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3)Somewhat Disagree</td>
<td>0</td>
<td></td>
<td>(3)Somewhat Disagree</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4)Neutral</td>
<td>1</td>
<td></td>
<td>(4)Neutral</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5)Somewhat Agree</td>
<td>8</td>
<td></td>
<td>(5)Somewhat Agree</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6)Agree</td>
<td>2</td>
<td></td>
<td>(6)Agree</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7)Strongly Agree</td>
<td>3</td>
<td></td>
<td>(7)Strongly Agree</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>Missing</td>
<td></td>
<td></td>
<td>Total</td>
<td>Missing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time constraints during discharge are a major barrier to discussing shaken baby syndrome (i.e., too much other education to provide, not enough time, too many other tasks to accomplish)</td>
<td>4.83</td>
<td>(1)Strongly disagree</td>
<td>0</td>
<td>5.18</td>
<td>(1)Strongly disagree</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2)Disagree</td>
<td>6</td>
<td></td>
<td>(2)Disagree</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3)Somewhat Disagree</td>
<td>7</td>
<td></td>
<td>(3)Somewhat Disagree</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4)Neutral</td>
<td>2</td>
<td></td>
<td>(4)Neutral</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5)Somewhat Agree</td>
<td>2</td>
<td></td>
<td>(5)Somewhat Agree</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6)Agree</td>
<td>1</td>
<td></td>
<td>(6)Agree</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7)Strongly Agree</td>
<td>4</td>
<td></td>
<td>(7)Strongly Agree</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>Missing</td>
<td></td>
<td></td>
<td>Total</td>
<td>Missing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Providing education about shaken baby syndrome in the NICU is useful in preventing unplanned harm to an infant</td>
<td>6.43</td>
<td>(1) Strongly disagree (2) Disagree (3) Somewhat Disagree (4) Neutral (5) Somewhat Agree (6) Agree (7) Strongly Agree</td>
<td>Total</td>
<td>Missing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>------</td>
<td>---------------------------------</td>
<td>-------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.56</td>
<td>(1) Strongly disagree (2) Disagree (3) Somewhat Disagree (4) Neutral (5) Somewhat Agree (6) Agree (7) Strongly Agree</td>
<td>Total</td>
<td>Missing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am aware of available resources for families and caregivers about shaken baby syndrome</td>
<td>3.85</td>
<td>(1) Strongly disagree (2) Disagree (3) Somewhat Disagree (4) Neutral (5) Somewhat Agree (6) Agree (7) Strongly Agree</td>
<td>Total</td>
<td>Missing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Period of PURPLE Crying Program was helpful in standardizing shaken baby syndrome education on our unit</td>
<td>NA</td>
<td>NA</td>
<td>6.35</td>
<td>(1) Strongly disagree (2) Disagree (3) Somewhat Disagree (4) Neutral (5) Somewhat Agree (6) Agree (7) Strongly Agree</td>
<td>Total</td>
<td>Missing</td>
</tr>
<tr>
<td>The Period of PURPLE Crying Program provides effective, meaningful education about shaken baby syndrome</td>
<td>NA</td>
<td>NA</td>
<td>6.52</td>
<td>(1) Strongly disagree (2) Disagree (3) Somewhat Disagree (4) Neutral (5) Somewhat Agree (6) Agree (7) Strongly Agree</td>
<td>Total</td>
<td>Missing</td>
</tr>
<tr>
<td>The Period of PURPLE Crying Program provides education about shaken baby syndrome in a timely manner (i.e., able to provide SBS education in a reasonable amount of time within discharge teaching)</td>
<td>NA</td>
<td>NA</td>
<td>6.44</td>
<td>(1) Strongly disagree (2) Disagree (3) Somewhat Disagree (4) Neutral (5) Somewhat Agree (6) Agree (7) Strongly Agree</td>
<td>Total</td>
<td>Missing</td>
</tr>
</tbody>
</table>

**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
Table 3 Wilcoxon Matched Pairs Test

<table>
<thead>
<tr>
<th></th>
<th>Pre-intervention Survey</th>
<th>Post-intervention Survey</th>
<th>Z</th>
<th>Asymp. Sig (2-tailed)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel knowledgeable when it comes to shaken baby syndrome</td>
<td>5.70</td>
<td>6.0</td>
<td>-.264</td>
<td>.792</td>
<td>Retain null</td>
</tr>
<tr>
<td>I feel comfortable discussing shaken baby syndrome with parents and caregivers of NICU infants</td>
<td>5.61</td>
<td>6.24</td>
<td>-2.412</td>
<td>.016</td>
<td>Reject null</td>
</tr>
<tr>
<td>NICU nurses should be providing shaken baby syndrome education during discharge teaching</td>
<td>6.28</td>
<td>6.56</td>
<td>-.344</td>
<td>.731</td>
<td>Retain null</td>
</tr>
<tr>
<td>Time constraints during discharge are a major barrier to discussing shaken baby syndrome (i.e., too much other education to provide, not enough time, too many other tasks to accomplish)</td>
<td>4.83</td>
<td>5.18</td>
<td>-.286</td>
<td>.775</td>
<td>Retain null</td>
</tr>
<tr>
<td>Providing education about shaken baby syndrome in the NICU is useful in preventing unplanned harm to an infant</td>
<td>6.43</td>
<td>6.56</td>
<td>-.378</td>
<td>.705</td>
<td>Retain null</td>
</tr>
<tr>
<td>I am aware of available resources for families and caregivers about shaken baby syndrome</td>
<td>3.85</td>
<td>5.97</td>
<td>-3.438</td>
<td>&lt;.001</td>
<td>Reject null</td>
</tr>
</tbody>
</table>

Appendix C

Figure 1 The PURPLE program implementation map in the U.S.
information promptly. This study supports the use of high-quality, standardized education to improve the quality and functionality of SBS/AHT education in the NICU setting; however, a larger sample would be advantageous in making more definitive inferences about these objectives.

Time Constraints and Patient Education:
An increase in the mean score from 4.83 to 5.18 on the pre-test to post-test responses when considering time constraints during discharge as a major barrier to discussing shaken baby syndrome may highlight an inherent conflict in healthcare. A study published in Clinical Nursing Studies (2017) examined the relationship between nurses’ perceived barriers and patient education, finding that despite the importance nurses placed on patient education, work overload ranked highest among the barriers to delivering education (Livne et al., 2017) (7). Paralleling this notion, the findings of this study may imply that the use of the PURPLE program may offer nurses a means of making workload at discharge more manageable by embedding SBS and AHT education throughout the infant’s hospitalization rather than solely discussing this topic at discharge. Further evaluation is necessary to make a definitive inference about this concept.

Clinical Implications:
Understanding that infants and children with risk factors such as prematurity, special needs, those under the age of six months that are often inconsolable, and multiple births place infants and young children at a higher risk for AHT and SBS and place further emphasis on the importance of utilizing this education program in the NICU setting, as many NICU graduates can be grouped into one of these aforementioned categories. This study may serve as a tool to reinforce and guide the adoption of the PURPLE program in this and other NICUs settings.

Beyond the NICU setting, considerations for how the widespread adoption of this program at the University of Chicago could impact the community should be acknowledged, as this hospital resides in an underserved community. Demographic evaluation of the medical center’s surrounding area further emphasized the need for SBS and AHT education, as disparities prevalent within the community place families at high risk for unplanned infant harm. According to the Journal of Research on Social Work Practice, “Low-income families are significantly more likely to have to contend with domestic violence, as poverty can act as a fueling factor in this type of conflict” (Slabbert, 2016, para. 1) (8). Data from the United States Census Bureau (2018) reported that 42.1% of households in Chicago are single-parent households, compared to 31% across Illinois and 32.7% across the U.S (Statistical Atlas, 2018 (9); U.S. Census Bureau, 2018) (10). This data also concluded that poverty affects 19.5% of households in Chicago, compared to 12.1% in Illinois and 11.8% across the U.S. (U.S. Census Bureau, 2018) (10). Understanding this data in relation to identified risk factors for AHT and SBS emphasizes the significance of incorporating high-quality, effective education into healthcare practices.

Strengths and Limitations:
“Given the commonality of resource challenges among hospitals coupled with the monetary challenges faced while implementing this study, barriers to the widespread use of this education program should be acknowledged and further explored.”

Strengths of this study included the utilization of pre-test post-test design measures for assessing the quality of this education program. Survey responses were collected anonymously, thereby encouraging authentic results. Limiting factors of this study include the small sample size (n=48) and a lower response rate on the post-test (n=34). Other limitations included user error while entering their pre and post-test I.D. numbers into the surveys; this factor made matching survey responses more challenging. Despite these limitations, the study results inferred statistical significance with two of six measures, reinforcing the validity of this intervention.

Future Research:
Although the literature largely supports implementing this program, considerations to the challenges and barriers of implementing a large-scale education program in communities and hospitals alike must be addressed. A study in 2011 utilized cross-sectional surveys to evaluate current AHT educational practices and prevention programs among all North Carolina hospitals and birthing centers to further understand barriers to the adoption of a widespread AHT prevention program. This study reported that hospitals experiencing challenges in providing education on AHT were predominantly in rural communities, smaller hospitals, and those with limited access to abundant resources (Nocera et al., 2011) (5).

During this intervention, the cost to deliver the program was a barrier that nearly disrupted this intervention and would cause this
program to be unsustainable in the long-term without adequate funding. Throughout this project, grant funding was explored to overcome this barrier and may be a real resource for achieving large-scale adoption of this program in the future. Given the commonality of resource challenges among hospitals coupled with the monetary challenges faced while implementing this study, barriers to the widespread use of this education program should be acknowledged and further explored.

A study conducted in British Columbia reviewing 64 cases of AHT events from 2002-2014 found that subsequent costs ranged from $1.6 to $7.1 million in healthcare spending and a societal cost of $354,359,080. Comparatively, the PURPLE program costs approximately $5.00 per infant (Beaulieu et al., 2019) (11). As healthcare continues to shift toward a preventative paradigm, this data strongly emphasizes the need to conduct future research in the U.S. surrounding cost-related barriers to implementing such prevention programs. Additionally, such research offers information to facilitate support from key stakeholders such as policymakers and health care providers, emphasizing that “…investing upstream in well-developed AHT prevention programs, such as PURPLE, not only promote child safety and health but also translates into avoided costs to society” (Beaulieu et al., 2019) (11). Future research must underpin cost-benefit analysis to prevent SBS and AHT to improve health outcomes and reduce future healthcare spending.

Conclusion:
The PURPLE program has been well-studied, with evidence suggesting that ongoing support for parents and caregivers can reduce hospital admissions associated with SBS and AHT and significantly impact the incidence of SBS and unplanned infant harm (Barr et al., 2019) (4). The purpose of this pilot study aimed to evaluate the nursing perception of the PURPLE program in a high-acuity NICU setting based on six measurable objectives. Two of the six Periods of PURPLE Crying objectives showed statistical significance supporting the important goals of this program. To continue improving upon the content and outcomes of the PURPLE program, ongoing evaluation across multivariate settings to further examine the multifaceted nature of unplanned infant harm is critical in the fight against this tragedy and to truly make a meaningful impact on this preventable, dynamic public health issue.

References:

Disclosures: The authors have no disclosures:

Acknowledgments:
The money for this project was gifted as a donation by Dr. Veena Ramaiah to promote research on this topic area. We thank Dr. Ramaiah for making this contribution and this research project possible.

Readers can also follow NEONATOLOGY TODAY via our Twitter Feed @NEOTODAY
**Faculty Mentor**

Veena Ramaiah, MD  
Associate Professor of Pediatrics  
Child Advocacy and Protective Services (CAPS)  
Department of Pediatrics  
The University of Chicago & Biological Sciences  
5721 S. Maryland Avenue  |  Chicago, IL  60637  
CAPS Office:  773-702-4900  
Email:  vramaiah@pedsbsd.uchicago.edu

---

Michelle E. Neuman, DNP, RN, APN, PPCNP-BC  
Clinical Assistant Professor  
DePaul University School of Nursing  
Lincoln Park Campus  
1110 W. Belden Avenue, Suite 400  
Chicago, IL 60614

---

Shannon D. Simonovich, PhD, RN  
DePaul University School of Nursing  
Lincoln Park Campus  
1110 W. Belden Avenue, Suite 400  
Chicago, IL 60614

---

COMING SPRING 2021

**ONCE UPON A PREEMIE ACADEMY**  
In Demand

SIGN UP AND GET  
Academy updates.  
Training news.

YES, SIGN ME UP!

EARN CME/CEU

Learn more, visit  
onceuponapreemieacademy.com

---

NEONATOLOGY TODAY • www.NeonatologyToday.net • June 2021
Discover the Benefits of an On-Unit NICU MRI System

MRIs offer many benefits for newborns in the Neonatal Intensive Care Unit (NICU), but performing off-unit MRIs is incredibly complex and creates many risks for this vulnerable population. On-unit MRI options for NICU patients greatly reduce these risks and can lead to significant benefits that make them cost-effective and clinically superior to off-unit MRIs.

Discover the benefits of on-unit MRI and learn how the innovative, point-of-care Embrace® Neonatal MRI System is transforming neonatal care from inside for patients, parents and NICU staff.

Click to download the full white paper at: www.embracemri.com/embrace-the-benefits
or call us at +1 866 609 1554

Become a part of the transformation.
Discover more at embracemri.com

©2021 Aspect Imaging Ltd. All Rights Reserved.
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
National Perinatal Association
“In this discussion, I will explore these challenges to persuade the reader that there is now strong evidence for the value of extended, intimate human contact for newborns, especially those at high risk and that this concept should be fully implemented in all NICUs regardless of the resources available or demographic served.”

“Developmental Care,” a term often used to encompass both sensory protection and targeted sensory stimulation in high-risk newborns, has faced two serious challenges since its inception:

- It has been difficult to prove its value.
- It has not been easy to incorporate into a NICU culture.

In this discussion, I will explore these challenges to persuade the reader that there is now strong evidence for the value of extended, intimate human contact for newborns, especially those at high risk and that this concept should be fully implemented in all NICUs regardless of the resources available or demographic served.

It has been difficult to prove the value of developmental care:

The primary tenets of developmental care - that newborns should be protected from noxious stimuli and provided with age-appropriate nurturing stimuli by their parents whenever possible - were established in extensive studies decades ago. In the 1950s, John Bowlby (in humans) and Harry Harlow (in monkeys) showed that separating newborns from their mothers led to immediate and lasting psychological changes. Even so, this separation continued to be practiced in newborn nurseries until it was successfully challenged by Marshall Klaus and John Kennell in the 1970s. Their work led to a radical change in maternity services in the newborn nursery but a much lesser degree in the NICU.

As parents continued to be excluded from the NICU or, at best, allowed to “visit” their infants, efforts to enrich the sensory environment in the absence of parental caregiving were introduced, of which the Newborn Individualized Developmental Care and Assessment Program (NIDCAP) is the most notable example. A highly structured, labor-intensive, specialist-based program, NIDCAP became well-established in some NICUs, supported by several trials that suggested efficacy (1), but has not been adopted by a large majority of NICUs because of its cost, complexity, and absence of evidence of a compelling benefit(2). However, several other developmental care-based programs have been introduced, some of which, such as the SENSE program, are actively being studied (3).

Concurrent with these efforts, families have been granted increased access to their infants as both structural and operational barriers are removed. The importance of family participation is emphasized in NIDCAP, SENSE, and similar programs, but the value of simple skin-to-skin care, even without a structured developmental care program, has also been demonstrated.

Perhaps the chief challenge with these efforts has been that neuronal development in the premature infant is still largely a “black box.” The impact of a ventilator change, a dose of surfactant, or most other NICU interventions can be easily demonstrated - if not immediately, then at least within a short time and almost always by the time an infant is discharged. However, there is no such obvious positive response to developmental care that a clinician can appreciate by making rounds. A NIDCAP therapist can detect responses to interventions, as can a nurse when an infant is being held skin-to-skin, but these do not show up on the datasheets or outcome measures that drive decision-making in the NICU. It may well be that more long-term brain deficits are secondary to inadequate developmental care in the NICU than to intraventricular hemorrhage, but we have no real-time markers available to us to study this.
Developmental Care Has Not Been Easy to Incorporate into a NICU’s Culture:

Providing the optimal sensory environment for high-risk newborns throughout their NICU stay is challenging for multiple reasons:

- Parental interaction is often restricted by operational rules or by parental absence.
- Nursing provision of developmental support is seen as secondary and optional in many NICUs. Nurses obtain vital signs, provide feedings, and change diapers in even the most stable infants; they understand there will be consequences if they do not do this. But all these tasks can be accomplished without providing any nurturing stimuli and neglecting this aspect of care rarely brings any consequences to the provider.
- Developmental specialists are costly in that their services generally do not generate revenue.

If developmental care provided immediate evidence of its value or generated revenue, it would be much easier to incorporate into the fabric of NICU care.

Is There a Way Forward?

It is unlikely that strong data to support developmental care or skin-to-skin care in high-risk infants will appear in the near future, given that large, multi-center trials are not currently in progress and are unlikely to be launched due to their cost and complexity.

Fortunately, in an ironic twist that Harry Harlow would best appreciate, we have been able to return to studies in primates to find compelling evidence of the lifelong impact of sensory deprivation caused by the separation of babies from their mothers at birth, expressed in a language that modern-day scientists understand: DNA methylation. In a fascinating TED talk (5), Moshe Szyf describes how early life experience, especially maternal-infant interaction, influences the long-term expression of many genes. Monkey newborns who are separated from their mothers appear healthy, but an examination of DNA methylation of their genome reveals dramatic differences from siblings who remained with the mother. As in Harlow’s studies, the monkeys who provided surrogate care suffered long-term psychological and physical differences that could not be explained by genetic differences or health in infancy. Instead, the lack of normal sensory input early in life led to a permanent change in gene expression that persisted into adulthood. These trials provide evidence that cannot ethically be obtained in humans but is certainly relevant to the NICU environment of care. It requires little imagination to draw a line connecting these findings to the continued high burden of neuropsychological disability seen in NICU graduates.

Epigenetics, then, explains how early life experiences influence the expression of the genetic code, even for neurons yet to form. Changes in DNA methylation that occur early in infancy can have a lifelong impact on health and behavior. Neuronal growth, synaptogenesis, and DNA methylation are not put “on hold” while the infant is in the NICU; therefore, developmentally supportive care, centered around parents whenever possible, is an essential component of state-of-the-art NICU care.

References:


Dr. White is a Fellow of the American Academy of Pediatrics, co-chair of the Gravens Conference, chair of the Committee to Establish Recommended Standards for Newborn ICU Design, co-chair of the Newborn Brain Conference, and an adjunct professor at the University of Notre Dame and the Indiana University School of Medicine.

Disclosures: The author has no relevant disclosures.

Corresponding Author

Robert D. White, MD
Director, Regional Newborn Program
Beacon Children’s Hospital
615 N. Michigan St.
South Bend, IN 46601
Phone: 574-647-7141
Fax: 574-647-3672
Email: Robert_White@pediatrix.com

Caring for Babies and their Families: Providing Psychosocial Support to NICU Parents
7- Module Online Course in NICU Staff Education

COVID-19
STOP THE SPREAD AT HOME
What to do when you or a member of your household is infected.

HYGIENE TIPS

MOUTH
- Wash after every use
- Patient gargles Listerine every morning and night.

EYES
- Wear antiseptic moisturizing lens case

HANDS
- Always wash your hands

CLOTHING
- Wear a jacket when dealing with infected

KITCHEN
- Use separate utensils
- Clean utensils separately

BATHROOM
- If infected, notify everyone in contact twice a day
- Ask Dept. of Health for further instructions
- Call 211 for FREE delivery services.

If you are hosting sick, DON’T WELCOME!

STOP THE SPREAD AT HOME

COVID-19
DETEN la PROPAGACIÓN EN CASA
Qué hacer cuando usted o un ser querido está infectado.

BANO
- Use separate toilet, shower, and bathroom

PROTEGER
- Inside home, wear gloves
- Wear mask
- Be at least 6 feet apart

CONSEJOS DE HIGIENE

BOCA
- Use separate toothbrushes and combs
- Use separate cups
- Keep the room ventilated
- LIMPIEZA
- Use separate single-use hand towels
- Use separate toilet paper

ROPA
- Use separate clothing, sheets, and pillows
- Use separate single-use face masks

AISLAMIENTO
- Use separate blankets
- Limpieza con manos
- Airear la habitación 3x al día

COCINA
- Use utensilios separados
- Limpie los utensilios por separado

MANOS SIEMPRE limpie las manos

MANTENGA AGUA Y LÍQUIDOS DE SANEAMIENTO CERCA

PATIENTES QUE HACEN GÁRGARAS CON LISTERINE TODAS LAS MAÑANAS Y NOCHES.

Si está infectado, notifique a todos los contactos de los últimos 10 días:
- Llame al 211 para obtener servicios de entrega GRATUITOS.

Si tiene más enfermos, NO ESPERE.
Llévelo a su médico de inmediato.

CONSEJOS DE HIGIENE

Self-isolate by staying in separate room with separate bathroom where possible. Don’t get too close to shared spaces.

Create an enclosed space with a door if shared space is unavoidable.

Ventilate room with fresh air at least 3x per day.

Keep plastic garbage bag in room.

Protect pets - don’t cuddle.

Notify contacts within 10 days.

Don’t walk! Call doctor if symptoms get worse.

MAMÁGIGAS 6 pies de distancia las demás en ambientes compartidos.

Use una cobertura protectora sobre la boca y la nariz para la ropa de cama y vestimenta (gafas) antojitos cuando este cerca de otras personas.

Lavado las manos 10-15 veces al día.

Use utensilios separados, cepillos, guantes, máscara que se pueda colgar después de estar cerca de infectados.

Aíslense permaneciendo en una habitación separada con habitación separada. No vaya a espacios compartidos.

Lave las manos al menos 20 segundos.

Evite tocar las cosas que comparten con personas que están infectadas.

Llame al 111 para obtener servicios de entrega gratuitos.

#STOPTHESPREAD

COVIDNEARYOU.ORG

Visitar Miora.org

Brought to you by Miora in partnership with United2Care

HOGAR

Enfermo

STOP THE SPREAD AT HOME

Miora

全国性产科和新生儿协会

COVID-19

COVID-19

CORONAVIRUS

COVID-19

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

STAY INFORMED.
Access free online education

Earn free CME/CNE credits from virtually anywhere through our online portal. The Mednax Center for Research, Education, Quality and Safety (CREQS) provides both live and online learning to meet your educational needs. Visit creqs.com to search, filter and browse the complete array of learning opportunities and register for courses.

Mark your calendar for Neonatology Grand Rounds throughout the year!

Upcoming topics include Transcatheter Patent Ductus Arteriosus (PDA) Closure, The Association of Body Composition and Neurological Outcome, The Role of Hydrocortisone in the NICU and more!

Wednesday, June 2, 2021
4:00 p.m. Eastern time

Wednesday, July 7, 2021
4:00 p.m. Eastern time

Wednesday, August 4, 2021
4:00 p.m. Eastern time

Wednesday, September 1, 2021
4:00 p.m. Eastern time

Wednesday, October 6, 2021
4:00 p.m. Eastern time

Wednesday, November 3, 2021
4:00 p.m. Eastern time

Wednesday, December 1, 2021
4:00 p.m. Eastern time

Webinar topics and speakers subject to change. For more information and to register: mednax.com/NEOGR2021

Accreditation statements are applicable for each of the educational activity webinars listed above.

The Mednax Center for Research, Education, Quality and Safety is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The Mednax Center for Research, Education, Quality and Safety designates this Internet Live activity for a maximum of 1.00 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

The Mednax Center for Research, Education, Quality and Safety is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center’s Commission on Accreditation (#P0258).

The Mednax Center for Research, Education, Quality and Safety designates this Internet Live activity for a maximum of 1.00 nursing contact hour(s). Participants should claim only the credit commensurate with the extent of their participation in the activity.
**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 crowds when out.

---

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

**KEEPING MOTHERS + INFANTS TOGETHER**
Means balancing...

- Risk of horizontal infection
- Risk of separation and trauma

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

**PARTNERSHIP**

- 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.**

**National Perinatal Association**
**nicuparentnetwork.org**
**nationalperinatal.org**

**National Association of Neonatal Nurses**
**nann.org**

---

**NEONATOLOGY TODAY**
**www.NeonatologyToday.net**
**June 2021**
NICU-NET

NICU-NET is a private and moderated forum for neonatology professionals. Membership is available to physicians, nurses, and other caregivers in neonatal and perinatal medicine. Conference announcements and other news of interest to members may be posted here. Please do not post messages with identifiable patient information of any kind. Vendor posts and messages of a commercial nature will be deleted.

To post to the list, send email to nicu-net@nicu-net.org

To subscribe or unsubscribe, send an email to nicu-net-request@nicu-net.org with one of the following commands in the subject line:

join - Join this mailing list.
leave - Leave this mailing list.
subscribe - An alias for 'join'.
unsubscribe - An alias for 'leave'.

Rather than joining by email, if you would like more granular control over your subscription (frequency of digests, vacation holds, etc.), you can navigate to https://nicu-net.org/mailman3/lists/nicu-net.nicu-net.org/, create a username and password, and set, view, or modify your subscription settings.


To contact the list owners, use the following email address:

nicu-net-owner@nicu-net.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

GET INFORMED
SUPPORTING KANGAROO CARE

WEAR A MASK

IF COVID-19 + WEAR A MASK

GET INFORMED
SUPPORTING KANGAROO CARE

WEAR A MASK
“Here we present a case where a preterm infant with severe Tracheal Agenesis (TA) was successfully intubated with LMA during resuscitation at birth and ultimately transferred to a Level IV NICU for a tracheostomy.”

Introduction:
A significant amount has been learned in the past few decades about the basics of using Laryngeal Mask Airway (LMA) intubation, but much remains to be determined about its practical use. Recently, renewed interest in its usage was supported by the Neonatal Resuscitation Program (NRP) course, and, thus, there is increased awareness of managing an airway via LMA. Here we present a case where a preterm infant with severe Tracheal Agenesis (TA) was successfully intubated with LMA during resuscitation at birth and ultimately transferred to a Level IV NICU for a tracheostomy. TA is rare and usually fatal. Few survivors with concomitant Tracheoesophageal Fistula (TEF) who underwent ligation of the distal esophagus with the creation of a spat-fistula and neo-trachea from the proximal esophagus exist. To our knowledge, this case of Tracheal Agenesis is the first of its kind to be reported as successfully managed via LMA.

Case description:
A preterm infant of 34-weeks gestational age was delivered to a 36-year-old Black mother. This was an in vitro fertilization pregnancy with appropriate prenatal care, complicated only by polyhydramnios. She had been found to have a 2-vessel umbilical cord with a subsequent normal fetal echocardiogram. The mother was admitted in spontaneous labor without evidence of chorioamnion-
nitis and received one dose of betamethasone prior to delivery. Prenatal labs negative for HBsAg, HIV, RPR, GC, Chlamydia; GBS was unknown. The infant was delivered by cesarean section for breech positioning with difficult extraction secondary to footling presentation. At birth, the infant was apneic and hypotensive with a low heart rate. Despite visualization of cords, intubation was unsuccessful with an inability to advance the tube with 3.0, 2.5, and 2.0 endotracheal tubes. Ultimately, a premature infant size LMA was placed and secured with subsequent improvement in her heart rate, oxygen saturation, and color. The LMA was secured, and she stabilized on the ventilator. On exam, she had no significant anomalies other than the previously known 2-vessel cord. Her birth weight was 2200 grams, and APGAR scores were as follows: 1, 4, 2, 7, and 8 at 1, 5, 10, 15, and 20 minutes, respectively. The infant was then transferred to a tertiary care center on LMA ventilation (Figure 1). On arrival to the NICU, she was taken to emergent explorative surgery and found to have tracheal agenesis, Floyd Type 1. She required extracorporeal membranous oxygenation (ECMO) but was ultimately provided with a neo-trachea via a novel approach by ENT and pediatric surgery. (1) She was discharged home after ten months in the NICU, status-post trachealization of her esophagus with a tracheostomy and gastric tube in place. She initially did well after discharge with normal neurological development until she passed away from accidental decannulation at 16 months.

**Discussion:**

It is unclear how aerodynamics worked out in this case of Tracheal Agenesis with TEF. Based on exploration by ENT, the patient’s cervical trachea was missing. There seemed to be TEF (Floyd Type I) with the remaining short distal trachea that could potentially be ventilated via the fistula. The three Floyd classifications of TA are as follows: I (20%) – atresia of the proximal trachea with a short distal trachea, normal bronchi, and a TEF; II (60%) – complete tracheal atresia with normal carina and bifurcation of the bronchi; III (20%) – complete tracheal atresia with bronchi arising directly from the esophagus (Figure 2). (2) In such situations where TEF is suspected, LMA intubation (or accidental esophageal intubation) may improve the respiratory status temporarily. TA should be at the top of a differential for any patient who is either having difficulty being intubated or experiencing severe cyanosis with respiratory distress immediately after birth without an audible cry. As with our patient, about half of patients with TA have abnormal prenatal ultrasounds, with polyhydramnios reported most commonly. (3) Many are born prematurely, and most patients have another associated anomaly. (4) There is a known high mortality rate in infants with this rare malformation, with only a 3-month-survival of less than 10%. (5) Tracheotomy is often attempted after birth once

---

**Figure 2. Floyd’s classification of tracheal agenesis.**

- **Type I**
  - atresia of the proximal trachea with a short distal trachea, normal bronchi, and a TEF
- **Type II**
  - complete tracheal atresia with normal carina and bifurcation of the bronchi
- **Type III**
  - complete tracheal atresia with bronchi arising directly from the esophagus

---

**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
This report encourages the use of LMA not only in situations where there is a concern for airway obstruction but also whenever there is difficult intubation, or alternative modes of management are needed, per NRP.

Conclusion:
This report describes a successful airway management case in Tracheal Agenesis with LMA intubation and transport on LMA ventilation. This report encourages the use of LMA not only in situations where there is a concern for airway obstruction but also whenever there is difficult intubation, or alternative modes of management are needed, per NRP. Proactive thinking of the use of LMA is emphasized in place of Bag and Mask Ventilation as primary resuscitation equipment in difficult-to-manage airways.

References:

Disclosures: The authors have no disclosures or conflicts of interest relevant to this case report.
MedEd On The Go® presents
3 Accredited Education Programs in Short-Form Video Format Available for CME/CNE Credits

The Role of Nutrition & Exclusive Human Milk for Very Low Birth Weight Infants

Preventing Bronchopulmonary Dysplasia
1.75 credit hours

Preventing Neonatal Sepsis
0.5 credit hours

Preventing Retinopathy of Prematurity
1.0 credit hour

www.MedEdOTG.com/video/program/609
www.MedEdOTG.com/video/program/608

Stephen E. Wetty, MD
Clinical Professor of Pediatrics
University of Washington
School of Medicine
Seattle, WA

Dan L. Stewart, MD
Professor of Pediatrics & International Pediatrics
University of Louisville School of Medicine
Co-Director of NICU & ECMO
Norton Children's Hospital
Louisville, KY

Jonathan R. Swanson, MD, MSc
Associate Professor of Pediatrics
University of Virginia
Children's Hospital
Charlottesville, VA
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.
MAY 15  KANGAROO CARE AWARENESS DAY

Every moment spent skin-to-skin is time spent bonding, healing, growing

KANGAROO CARE  
#THESNUGGLEISREAL

kangaroo.care  
nicuparentnetwork.org  
nationalperinatal.org/skin-to-skin  
National Perinatal Association
How Are Machine Learning Algorithms Different from Statistical Methods?

Fu-Sheng Chou, MD, PhD

Last month, we kicked off a new series of articles to introduce machine learning to the readers of Neonatology Today. The goal was to take a stepwise approach to deliver key terminology and concepts of this branch of artificial intelligence to the audience. This methodology is finding its way into neonatal and perinatal research. The hope is that when the readers come across manuscripts that involve this methodology for data analysis, there will already be a basic understanding of machine learning and what this term entails. In this issue, the objective is to provide a more in-depth discussion about the fundamental differences between statistical modeling and machine learning algorithms.

“The hope is that when the readers come across manuscripts that involve this methodology for data analysis, there will already be a basic understanding of machine learning and what this term entails. In this issue, the objective is to provide a more in-depth discussion about the fundamental differences between statistical modeling and machine learning algorithms.”

The bottom-up approach in statistical modeling

In statistical modeling, a statistical approach is chosen based on the clinical question or, more often, based on the comfort level of the clinical researchers in the statistical approach selected for the analysis. Linear regression and logistic regression analyses are probably the most commonly utilized methods for the variable association. It usually starts with a “simple” regression analysis where one independent variable is attempted at a time to assess its correlation with the outcome (the dependent variable). As shown in Equation 1, the goal is to calculate “a.” Based on our data, it is straightforward to calculate “a,” but does our data represent the population? This is where statistics come in – to solve this uncertainty (of whether our data represents the universe) and provide an estimate for “a” to infer the population. A predefined p-value cutoff is used to determine whether “a” can be zero or would always be a non-zero value, in which case the association between x and y can be considered as present or “statistically significant.” Those variables (x) that show significant associations individually with y are then incorporated in a “multivariable” regression analysis, where selected variables (e.g., x, x, x, and x in Equation 2) are added together on the right side of the equation. In contrast, the outcome variable remains on the left side. Statistics are then carried out again to assess whether a, a, and a are likely non-zero. After the analysis, if a is determined to be non-zero, we will then say, after adjusting for x, and x, that x is independently associated with y.

\[ y = ax + b \]  

(Equation 1)

\[ y = a_1x_1 + a_2x_2 + a_3x_3 \]  

(Equation 2)

Most of our readers have experienced this analytic method numerous times. I am not trying to provide a statistics review here. Also, this is not the only way to build a statistical model; it is just an example. As one can see, humans select x, x, and x for the multivariable analysis. One may have another equation used to estimate coefficients for x and x only and yet another equation that incorporates x, x, x, and x. Certain additional “goodness of fit” analyses are then performed to determine which equation fits the data and provides the best inference to the population. The final model is then born, and a manuscript is written up – hoping to get published somewhere.

The statistical approach is a bottom-up approach, like building a house brick by brick, step by step, to assess the likely variables associated with the outcome. It is based on rational deduction according to clinical observations and hypotheses. We usually use it to study risk factors; for example, is high-grade intraventricular hemorrhage associated with worse neurodevelopmental outcomes after adjusting other risk factors?

“The statistical approach is a bottom-up approach, like building a house brick by brick, step by step, to assess the likely variables associated with the outcome. It is based on rational deduction according to clinical observations and hypotheses.”

The top-down approach in machine learning modeling

The difference between statistics and machine learning is the “learning” part by the machines. Let us build upon the linear regression model to demonstrate how the machines “learn” from the data.

Here, two methods that have been applied on top of linear regression models allowing the machine to “learn” are 1) least absolute shrinkage and selection operator (LASSO) and 2) Ridge regression. It is commonly called “variable regularization.” Without going into the formulas and mathematical details, and generally speaking, LASSO regression allows the machine to determine whether to “shrink” a coefficient for a variable down, even to 0. When a coefficient approaches 0, that variable is essentially negligible in the equation. In other words, when a coefficient is 0, the machine has learned that this specific variable does not play a role in outcome prediction. The Ridge regression also shrinks the coefficients but, unlike LASSO, does not eliminate any variable. One can think of LASSO and Ridge as putting relative weights on each of the variables being tested. The goal is to minimize the difference between the predictive and actual outcomes and improve statistical inference.

There is an additional advantage for doing regularization. In lin-
ear modeling, the researchers are most concerned about multi-
collinearity, where two or more independent variables are highly
correlated. It leads to variable inflation and inaccurate estimation of
the coefficients. LASSO and Ridge may take care of that. By
adding additional terms, these methods put weights on each vari-
able to reduce the impact of multicollinearity.

What does it mean by putting weights on each variable and re-
ducing the impact of multicollinearity? It means that one does not
have to hand-pick variables like the deductive approach in statisti-
cal model development. By learning from the data, the machine
weighs the variables and determines which ones are important
and which ones not as much. This is a top-down approach. We provide
the predictors and the outcomes. The machines figure out
the in-between.

“By learning from the data, the machine weighs the variables and determines
which ones are important and which ones not as much. This is a top-down
approach. We provide the predictors and the outcomes. The machines figure out
the in-between.”

Hyperparameter

How much LASSO and Ridge will attempt to shrink the variables
is determined before data is fed into the algorithms. What controls
how much to shrink is called a “hyperparameter.” The coefficient
for the penalty term that constrains the coefficients for the vari-
ables, called \( \lambda \), is a hyperparameter. A hyperparameter always
has to be pre-determined by humans before the machine starts to
learn from the data. Feels good here, right? Humans control the
hyperparameters, not the machines, so do not worry. At least in
machine learning, machines are not taking over yet!

The black-box fear

In straightforward linear regression with manageable variable
numbers, it is not too tricky to figure out the “in-between” by as-
sessing how much weight each variable receives and rationalizing
the why post hoc. In cases where there is an enormous num-
ber of observations and numerous variables for each observa-
tion, the “in-between” may start to overwhelm humans. This
process is probably the fear clinicians have when talking about
using machine learning-based models for augmenting clinical
decision-making: how does the machine conclude that this baby
will respond to indomethacin but not that one? Should one trust
an educated guess, should one listen to the machine, or should
one dig up that PDA treatment guideline that was developed ten
years ago? And by the way, in this parallel world where individual
prediction is available with sophisticated models, the flowchart-
based protocol for PDA treatment is probably obsolete. After all,
flowcharts cannot handle more than a handful of variables in their
decision tree.

Do NOT throw everything into the algorithm

Before we conclude this topic, there is a key message that is
very important for our readers. Machine learning is such a novel
approach to neonatal research; researchers and clinicians may
have the temptation to throw all variables they have collected over
the years in a myriad of Excel files into the algorithms to see if
these potential variables predict any outcome. Even though the
researchers will not receive formal complaints from the machines
because the machines cannot and will not complain, this is a dan-
gerous approach and should not be encouraged in the literature.
The reason is simple: humans develop machine learning because
humans cannot handle excessive data. If humans put all the data
they cannot handle together and feed this data into the machines,
humans will soon be drowned, knowingly or unknowingly, by
the data the engines put out on the other end of the algorithm.
Machines “augment” the decision-making process owned by hu-
mans; they do not take over the process. Indiscriminate data entry
leads to indeterminate results. Please do not assume that one can
input all the available data, and the machine will deliver a guide-
book or a policy statement to solve clinical questions. Machine
learning-based predictive model development should follow the
well-established steps developed by experts in the field, just like
statistical models should be developed. The steps may be differ-
ent, but the core spirit is the same.

Ask the machine to develop clinically relevant models

It is also important to be mindful about what outcomes to pre-
dict. Are they clinically relevant? During this COVID-19 pandemic,
many chest x-rays and chest CT scans were performed on patients
to determine the severity and monitor radiographic response. With
access to these image data, researchers hoped to use a branch of
machine learning called deep learning to investigate whether im-
age studies can be used to replace or augment COVID-19 diagno-
sis. In other words, can a machine learning model be developed to
distinguish between pneumonia caused by COVID-19 or by other
etiologies? This seemingly plausible idea goes against the defini-
tion of pneumonia in the first place and makes no sense in clinical
management. As we learned in medical school, pneumonia is a
clinical diagnosis, not a radiographic diagnosis. It is diagnosed
by history and physical exam. We should never start a machine
learning project just because we have the data.

“Machine learning-based predictive model
development should follow the well-
established steps developed by experts in
the field, just like statistical models should
be developed. The steps may be different,
but the core spirit is the same.”

Conclusion

Unlike rigorous hypothesis-driven research, machine learning-
based research is more about outcome prediction, exploration
of novel variables, and comparing the performance of different
algorithms. The predictors are usually already known to have a
potential association with the outcome, albeit can be assumed
loosely and anecdotally, or are tested for hypothesis generation.
These two goals are sometimes combined with learning about
novel variables and then using these novel variables to predict
the outcomes. Going back to the point that was made earlier, do
not throw every variable into the algorithm and wish that magic will
show. It will not, unfortunately.

I hope readers new to machine learning feel a little bit relieved
by this brief comparison between statistics and machine learning.
Machine learning is still mathematics and statistics. It incorporates
additional steps to optimize outcome association systemically. These extra steps are what is perceived as “learning.” There are different algorithms in machine learning, many of which are based on non-linear approaches. We will talk more about these other algorithms next month.

Disclosure: The author identifies no conflict of interest

Neonatology Today’s Digital Presence

Neonatology Today’s new 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/](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

To every NICU nurse who has cared for these precious babies we say .... "Thank you."

Did you know that premature and low birth weight babies have a 4x greater risk for SIDS?

At First Candle we’re educating parents, grandparents and caregivers about safer sleep to make sure all babies reach their first birthday. Learn more at firstcandle.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

Telehealth in the NICU

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

Use technology to help parents bond with their babies when they can't be bedside.

Examine each family's technology skills and needs - including the need to use their preferred language.

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.

Support case management.

Screen for perinatal mood and anxiety disorders (PMADs).

Facilitate shared decision-making.

Move family education and resources online.

Provide parent lactation support.

Consult with specialists.

myNICUnetwork.org

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

New subscribers are always welcome!

NEONATOLOGY TODAY
To sign up for a free monthly subscription, just click on this box to go directly to our subscription page
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.
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
Prenatal Exposure to Cannabis: Adverse Neonatal and Childhood Outcomes

Japmeet Sandhu OMS III, Arun Sengupta OMS III

Since 2012, 16 states have legalized the use of cannabis, and 36 states have legalized medical marijuana. This means that the majority of Americans have access to marijuana. With increased legalization, there are trends of increased usage and the idea of cannabis being a relatively safe drug. Cannabis is the most common recreational drug used in pregnancy. 2016 data from the National Survey on Drug Use and Health revealed that 4.9% of pregnant women aged 15 to 44 reported marijuana use in the past month. In 2015, this percentage was 3.4%. However, the use of marijuana is also underreported. THC, the substance responsible for the psychoactive effects of marijuana, was found in 13.25% of meconium samples of neonates born to mothers who self-reported no marijuana usage. (1) Bayrampour et al. evaluated cannabis use in pregnant women before and after legalization in British Columbia (May 2018 and May 2020). They found that self-reported cannabis use preconception increased significantly after legalization, from 11.74% to 19.38%. Rates of cannabis use during pregnancy also increased from 3.64% to 4.63% after legalization. (2) Despite this increasing usage, scientific literature on the effects of marijuana use while pregnant is limited and mixed. Many early studies were retrospective or did not address confounding variables such as the use of tobacco or other drugs of abuse, mental health, and socioeconomic factors. This results in confusion among practitioners as to how to counsel women about risks of use.

Biologically, cannabis can affect the fetus. The endocannabinoid system (ECS) is made up of cannabinoid receptors and neurochemical cannabinoids. This system is how cannabinoids mediate their effects. The ECS is detectable as early as five weeks gestation and plays an essential role in the early stages of neuronal development and cell survival through processes such as cell proliferation, migration, and differentiation. Thus cannabinoid exposure during this early developmental stage can cause long-term neurobehavioral consequences, which will be discussed later in this article. (3) Cannabis affects the normal transport functions of the placenta throughout pregnancy. THC is highly lipophilic and readily crosses the placenta. It is distributed rapidly to the brain and fat of the fetus after ingestion or inhalation by pregnant women—the concentrations of THC in the fetal blood range from 1/3 to 1/10 of maternal concentrations. (1) THC also can pass into breast milk, demonstrating that cannabis affects not only the fetus but the neonate as well. (4) Cannabidiol, the non-psychoactive substance found in marijuana, can enhance placental barrier permeability to pharmacologic agents and recreational substances. (1) Fetuses who were prenatally exposed to marijuana had significantly reduced levels of molecular substances needed for neuronal cell axonal elongation. These substances are essential for the development of normal neuronal circuitry during early brain growth. This was caused by THC binding to cannabinoid receptors and disrupting the normal ECS signaling and sequencing functions. These cannabinoid receptors are widely distributed in the adult brain; however, in the fetus, these receptors are only found in mesocorticolimbic structures—areas that are important for emotional regulation, cognition, and memory. (3) Rats who were exposed to cannabis prenatally showed cognitive impairments with long-term memory impairment and motor hyperactivity during infancy and adolescence. These rats also had long-lasting changes in emotional reactivity—less social interaction and less social play during adolescence. (5)

“Rats who were exposed to cannabis prenatally showed cognitive impairments with long-term memory impairment and motor hyperactivity during infancy and adolescence.”

In addition to its effects on neonates, cannabis can also affect the pregnant woman. Maternal cannabis use results in an increased resistance and pulsatility index of the uterine artery. This affects uterine blood flow and can lead to increased placental resistance and reduced placental circulation. (1) The occurrence of prematurity labor and placental abruption increased with a higher frequency of marijuana use. When marijuana is consistently used during pregnancy along with tobacco, there is a higher risk of maternal asthma and preeclampsia. (3) Regarding maternal use, only 39% of women reported using it for recreational reasons. The rest used it to help with nausea, vomiting, depression, anxiety, or pain. 92% of women who used marijuana for nausea and vomiting reported relief of symptoms. Studies found that up to 60% of marijuana users report continuous use of it during pregnancy as they believe it to be safer than tobacco. (1) There are demographic trends amongst maternal marijuana users. These women tend to be younger (<25 years), come from households with lower income, and have less than a college education. Many also are unemployed, lack adequate prenatal care, and report having experienced a significant stressor (traumatic, financial, or partner-related) before or during the pregnancy. (6) Women who had a higher level of education were more likely only to use cannabis before pregnancy. These women, who stopped use once pregnant, also had a higher percentage of planned pregnancies. (7)

It is known that women who smoke cigarettes during pregnancy deliver on average an infant whose birth weight is 150-250 grams lower and have a 1–2 day lower mean duration of gestation than nonsmoking women. (8) However, few studies have examined the effects of maternal marijuana use on fetal development while controlling for potential confounding. Conner et al. is one study that adjusts for these confounders. They found that women who smoked marijuana had a higher risk for preterm delivery. If women smoked both tobacco and marijuana, the risk was much higher.
These women were also more likely to deliver infants with lower mean birth weights, lower Apgar scores, or experience stillbirth. When marijuana use began at the beginning of pregnancy and was continuous, lower birth weight can be seen starting in the second trimester. However, if neonates were exposed to marijuana in the third trimester, this lower birth weight was not seen. (9) Again, if marijuana and tobacco were both used consistently, infants had even lower birth weights (< 25th percentile) along with decreased head circumferences (< 25th percentile). The National Academy of Sciences reported that fetuses exposed to marijuana in early pregnancy grew 11.2 g less per week than those not exposed. Those with ongoing marijuana exposure grew 14.4 g less per week. (5) Data from the 2017 Pregnancy Risk Assessment Monitoring System found associations of maternal marijuana use with small for gestational age and low birth weight infants. In pregnant women who used cannabis, the prevalence of delivering an SGA infant was 18.9% and 12.9% for high frequency (> once/week) and low-frequency use (< once/week) respectively. This percent is only 8.6% in women with no cannabis use. The prevalence of delivering a low birth weight infant was 12.1% for high-frequency use and 7.4% for low-frequency use. It is only 5.2% in women with no cannabis use. (10)

Neurological effects can also be seen. Neonates exposed to marijuana in utero show altered arousal patterns, excitability, increased tremors, and exaggerated startle reflexes as measured by the NICU Network Neurobehavioral Scale and Neonatal Behavioral Assessment Scale. These neonates have poor habituation and responses to visual stimuli, but no auditory stimuli. They also have abnormal sleep patterns with decreased quiet sleep and increased sleep motility. These were all observed within the first week of life and persisted from 9 to 30 days. (3) Some of these behaviors are similar to those seen in neonatal abstinence syndrome; however, there is not enough data to support a marijuana withdrawal syndrome. Nonetheless, marijuana use is significantly associated with neonatal morbidity, with an emphasis on neonatal infection morbidity. This is biologically plausible as animal studies have shown immune suppression and T-cell dysfunction with cannabis exposure. (11) Bao reported a case of an 11-day infant born at 36.5 weeks who was found unresponsive with no evidence of suffocation or trauma. The autopsy revealed that she died of anoxia and hypoxia, with no evidence of infection or congenital anomalies. The timing of the onset of the breathing problems suggested a possible role of marijuana exposure. (12) The AAP, ACOG, and American Society of Addiction Medicine recommend all women considering or currently pregnant to be routinely screened for alcohol and drug use, including marijuana. They recommend informed patients about the risks and benefits of prenatal marijuana use, including the potential for harm to the fetus. They also recommend that women who are interested in learning more about prenatal marijuana use consider seeking information from a variety of sources, including family and friends, and even seeking advice from dispensary employees. This indicates the importance of educating health professionals on the effects of marijuana while pregnant. A factor to address in future studies would be the potential for harm to the fetus and the impact of cannabis use on pregnancy outcome.


Disclosures: The authors have indicated no conflicts of interest.

Fellow's Column is published monthly.
- Submission guidelines for "Fellow's Column":
  - 2000 word limit not including references or title page. Exceptions will be made on a case by case basis.
  - QI/QA work, case studies, or a poster from a scientific meeting may be submitted.
  - Submission should be from a resident, fellow, or NNP in training.
  - Topics may include Perinatology, Neonatology, and Younger Pediatric patients.
  - No more than 20 references.
  - Please send your submissions to:
    Elba Fayard, MD, Interim Fellowship Column Editor
    or Japmeet Sandhu, OMS III, Fellowship Column Assistant Editor
    LomaLindaPublishingCompany@gmail.com
National Perinatal Association
PERINATAL MENTAL HEALTH
nationalperinatal.org/position
www.nationalperinatal.org/mental_health

OFFER ANTICIPATORY GUIDANCE
Families need to know that women are more likely to develop depression and anxiety during the first year after childbirth than at any other time in their life.

Educate. Advocate. Integrate.

National Network of NICU Psychologists
www.nationalperinatal.org/psychologists

FREE RESOURCES for your NICU
- Helping Children and Families Cope
- Bonding with Your Baby
- Caregivers Need Care Too

FREE ONLINE EDUCATION
Coping with COVID-19
COPING WITH COVID-19
Trauma-informed Care for Frontline Maternity, Pediatric, and NICU Providers during the COVID-19 Pandemic

SEE ALL OF OUR COURSES
CARING FOR PREGNANT PATIENTS AND THEIR FAMILIES
Providing Psychosocial Support During Pregnancy, Labor and Delivery

CARING FOR BABIES AND THEIR FAMILIES
Providing Psychosocial Support in the NICU

WWW.MYPERINATALNETWORK.ORG
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
June brings us Father’s Day, which can be a difficult time for fathers who have lost a child. First Candle’s bereavement support services have been there for fathers as well as mothers and other family members, and we have come to know Kelly D. Farley, the author of Grieving Dads: To the Brink and Back.

“I have tried to become an advocate of sorts for grieving dads. My goal is to make sure these men feel like they have the permission to grieve, to feel the impact, and express their pain without society trying to hush them because the topic of a child’s death is uncomfortable for those who have not experienced it.”

Because of my book and my advocacy, I receive a lot of requests to write Father’s Day articles about the dark side of the day from the perspective of the guys who have had to bury a child. Is the day harder than most? Yes, but to us grieving dads, it is not much different from the holidays, birthdays, and death anniversaries. They are all difficult to navigate, and each one stirs similar but different emotions.
There is not a day that goes by that we do not think about our absent child. Regardless of the circumstance of their deaths, we miss them deeply. However, there are days where we feel this pain more acutely than other days. Days like Father’s Day remind us that they are not here. We are keenly aware of their absence every single day, and on days like Father’s Day, the hole they left grows a little bigger.

We feel a sense of emptiness on Father’s Day because there is an obvious void that tends to suck the air out of the day, creating a difficult space that we do not know how to navigate. We try our best, but it is hard to explain our feelings to those that haven’t lost a child. It is not fair for us to expect you to understand; you’re one of the lucky ones that have never had to walk in these shoes.

Most of us will try to keep our minds occupied with other living children or by filling the day with busy, mindless tasks. It’s a defense mechanism that helps us to hide from the harsh reality that lurks in the darkness, seeking our whereabouts. It’s a constant battle that we often lose in the early years. Yes, I said years.

This isn’t something that goes away after a year. It’s a burden that weighs heavy on our souls for the rest of our lives. However, the weight lightens dramatically as time moves forward, and we continue to process our loss. The death of a child becomes who we are. It does not define us, but it certainly changes the course of our lives and destroys the naivety we once had.

Regardless of the day, most people will not bring up the fact that your child died because it is too awkward for them. They are not sure if they should acknowledge this day. Let me resolve this confusion: you should acknowledge Father’s Day.

It certainly isn’t a “Happy” Father’s Day. So, what should people say or do?

Try saying something like, “I know this must be a difficult day, but know I am thinking about you.” This statement, or a variation of it, goes a long way with the men that are on the receiving end of it. It might trigger a visible emotion, but know the emotion constantly lurks just below the surface regardless. Though you just don’t see it, it’s just waiting for an opportunity to escape.

I wish all fellow grieving dads a peaceful Father’s Day. If you know a grieving dad, pay them a visit, or make that phone call to tell them that you are thinking about them and their child. - KDF

Disclosure: The authors declared no conflict of interest related to work presented in this manuscript.
Among VLBW decreased from 16.7% in pre-EHR era to 14% in post-EHR era. Among babies born less than 1,500 grams, rates of necrotizing enterocolitis and cystic periventricular leukomalacia, were not significantly affected (Table 2). Retinopathy of Prematurity rate was significantly reduced from 28% to 26%, with a P-value of 0.0045. In the Extreme Low Birth Weight group, there was a decrease in mortality rate from 23% to 18.6% with a P-value of 0.0268, and an increase in CLD rate (Table 3). However, infection control data showed improvement where CLABSI was 3.8% vs 3%, with a P-value of 0.7, VAP 2.1% vs 1.6%, with a P-value of 0.08, and CONS infection 2.1 vs 0.93%, with a P-value of 0.03 (Table 4).

Discussion
Several studies have been conducted in ambulatory services and less intensive areas, assessing the information flow and logistics of electronic health care records on the quality of work performance.12,13 These studies claimed that the patient-related outcomes were better in adult patients, with enhanced overall patient care, less ordered medications and lab requests. Cordero et al demonstrated the advantage of remote evaluation of patients, which was possible through the use of electronic health records.
Psychosocial Aspects of Neonatal Care: Compassionate Care of Infants and their Families

Kelly Welton, RRT-NPS

“Every prospective parent wants and hopes for a healthy baby. They plan for it, and a lot of thought goes into that preparation and planning. They may have already put together the baby’s new room with the bassinet and crib.”

Every prospective parent wants and hopes for a healthy baby. They plan for it, and a lot of thought goes into that preparation and planning. They may have already put together the baby’s new room with the bassinet and crib. They may have gone to great lengths to redecorate it with baby furniture and rearrange things to get ready for the new little one.

They may have even already had a baby shower with lots of people coming and well-wishers bringing them gifts anticipating that day. But instead, they end up with a very tiny, very ill infant. What happens when a mom gives birth to either a premature baby or possibly a term baby who’s very ill? Firstly, the normal bonding process gets interrupted. Usually, a baby is born and placed on Mom’s chest, and the bonding process starts immediately. When the baby is ill, or premature, or needs resuscitation, we whisk that baby away, and the parents often don’t get to see that baby until much later.

From the parents’ perspective, the baby that they believed would be just perfect is not. The baby may be small, and not even look like a baby if it is a VLBW or ELBW. Or the baby may be deformed. When the parents get to see the baby again, the baby has all kinds of tubes and probes attached. This is very stressful for parents who had planned all along for a perfect pregnancy, had a perfect baby shower, and now there will not be a perfect homecoming.

Parents of babies in NICU go through similar feelings as outlined by Elizabeth Kubler Ross in her famous book “On Death and Dying.” (1) Things to remember about this is that these feelings may not happen in order, AND you have to get ready for the new little one.

Parents have different levels of ability to understand what’s going on, not so much referring to their education level, but to absorb everything that’s happening.

“Parents have different levels of ability to understand what’s going on, not so much referring to their education level, but to absorb everything that’s happening.”

There may be anxiety or fear. There may be a language barrier. We’re speaking in English, and they do not understand enough, considering how critically ill their baby is. What about their education level? Is their education level 6th grade, is it high school, is it college? Do they have an engineering degree? Without knowing, it’s just as easy to insult them as it is to talk way over their head.

How can we help these parents cope with everything that’s going on? Things in the NICU with their baby could change in a second. Do they have a support system that will help them with that? If they are equipped to deal with the changes, do they have community support, family, friends, and neighbors that will do things like take their other kids to school or pick them up so they can spend more time with their baby? Do they have religious or spiritual support? And if they don’t, would they like to? We can offer them licensed clinical social workers to help and to direct them to people who can be a source of support for them.

Some parents have very unhealthy coping mechanisms. These are the parents that deny that there are any issues or any problems. They are happy all the time, they are cheerful, everything’s great, they’re very reluctant to receive or seek any help. They may believe that since their baby is just 8 weeks early, that in eight weeks, the baby will be ready to go home, and all will be well. It is also very stressful to take care of babies with parents with that
attitude as a hospital RT or Nurse, or Doctor. It’s imperative not to
disengage from these parents.

Some other thoughts that run through a NICU parent’s mind are
the feelings of failure. Facing feelings of, “my parents and my
spouse’s parents really wanted this grandchild, we planned, we
did all the ‘right things, and now we failed.” This is not true; the
parents are not failures.

When the baby has made it past a certain critical point, other con-
siderations for parents are they’ve got to learn how to care for that
baby in the NICU and at home. We start involving the parents in
the baby’s care in the NICU with small tasks such as changing a
diaper or helping us turn the baby, and they’ve got to learn other
care tasks in preparation for discharge to home. Discharge anx-
ity can happen when the baby’s been in the NICU for a long time,
and the realization hits the parents: The staff taking care of their
baby is there 24 hours a day, seven days a week. And there are
many of us -- Respiratory Therapists, Nurses, Doctors, Occupa-
tional Therapists, Physical Therapists, and more. And they realize:
“Oh -when we get home, it’s just going to be my spouse and me,
maybe my Mom if I’m lucky.” And that’s a daunting task to think
about, “How am I going to do everything that seven people do 24
hours a day by myself with only one other person who’s probably
going back to work?” That’s a significant source of anxiety.

What about the parents of babies that have serious congenital
defects? We must be truthful with the parents, even if the outcome
is uncertain. If you don’t have an answer to their question, find
someone that does. Please don’t sidestep the parents and tell
them to speak to the doctor every time. We can confirm, “yes,
your baby has gastroschisis, and we’re going to determine when
your baby will go to surgery.” Kindness, at this point of their jour-
ney, will be remembered for years. Sometimes when we have a
baby that’s really sick, we do our best just to float into the room,
do what we need to do, and float out. We don’t even acknowledge
that the parents are sitting right there. It’s important to say, “Hello,
how are you today, my name is Kelly, and I am your RT today.”
All that courtesy will be remembered. And be patient with these
parents. Put yourself in their place. These people are entirely
stressed, they’ve had no sleep, they are utterly helpless in terms
of the outcome of this baby, and they may ask the same questions
repeatedly. They’re not dumb; they just want to make sure they
understand as best they can. And with their baby’s status chang-
ing every day, it makes it even more difficult. You can expect the
reactions of shock, anger, fear, guilt, and depression with each
new setback, update, or new event.

It’s not uncommon for a very premature baby to spend 3 months
in the NICU. After surviving the long NICU stay, now the parents
may be performing many of the duties that healthcare person-
nel did. These parents may be slowly learning how to care for a
chronically ill child at home. They may not feel fully prepared for
this and may seem manipulative in getting us to do tasks they
need to practice and master. Parents need reinforcement of skills
and encouragement to do even more. If we do everything for the
parents up to the day of discharge, these babies will only return
to the hospital when the parents feel uncomfortable doing things
like changing a trach or a regulator on an oxygen cylinder. Say-
ing things like, “you’re really good at suctioning. Now let’s practice
taking a tank change!” will help them recognize their learned skills
and hopefully encourage them to do more. The parents may express
complete overwhelm. Saying things like, “Oh my gosh, you didn’t
expect any of this, and look at how much you’ve learned!” can go
a long way.

Some of these babies may go home on monitors, they may go
home with therapy, breathing treatments, they may go home on
oxygen, some of them may even go home on a home ventilator.
When the parents realize that the beautiful baby room they set
up and decorated will look like a hospital room, it is important to
reassure them that it’s OK to feel overwhelmed and just to take
one step at a time.

What can we do for parents of dying children? Staff may anticipate
a baby’s death long before the parents fully grasp the reality. If the
baby takes a turn for the worst, we don’t give up, but we may know
where this is heading. We need to figure out the best way to let
the parents know that things aren’t going really well, but we are
not going to give up, and we will do everything that we can. Sometimes
because of the impending death, staff may withdraw. We don’t
want to answer all their questions anymore. We want to deal with
them as little as possible. When the parents are trying to ask us
serious questions about their child, and we do everything we can
to not engage with the parents, they perceive the staff as being
cold or uncaring.

What about the staff when we have a baby that’s dying? The staff
RT’s, nurses, doctors, and others may feel anger or guilt about
our inability to save the baby. We worked our tail feathers off to
do everything we could. We’ve had this baby on CPAP, high flow,
ventilator after ventilator, oscillator, everything we know to save
this baby, and now the baby is dying. We may feel angry or guilty
and ask, “Did we do everything right?” We play it over and over
in our minds. Did we do everything possible? Maybe we should
have done this instead of that…… Staff need ways to vent these
feelings and not internalize them. Many NICUs hold debriefings
when they lose a baby. Depending on the disease state and de-
gree of prematurity, the average premature infant survival rate can
be 80 to 90% or lower. Are we prepared for that? After the baby
dies, is it OK to attend their funeral? If the parents invite you, it’s
absolutely OK. The family may not even have a funeral for a very
long time because they’re still in shock that their baby was sick,
and it’s going to take a while before they can get to the point of
being able to plan something like that. Remember, for months,
these parents have gone home every day to an empty baby room.
They go home every day to many presents and gifts that people
gave them at the baby shower that might not get used. They go
home every day to a scene that they don’t want to look at unless
there’s a baby in the picture. Now they have to change course
again, and they have a lot on their minds. They also have a lot
on their plate in terms of paperwork, insurance, financial things to
deal with. And they have to plan a funeral in addition to all this,
something that they really didn’t want to think about.

As if having a baby in the NICU isn’t stressful enough, staff often
forget about the parents’ other obligations such as jobs and other
children, or even parents at home to take care of. Parents un-
der stress may lash out at staff or make inappropriate comments.
Please do not take these comments personally. Sometimes the
grandparents get involved, and the stress takes a toll on them,
too. Things come out directed at you. Keep your professional
hat pinned in place, carry on and just know they may not have
the necessary coping skills for all that is going on. Parents also
need time balancing support. Parents may both have jobs; they
may have grandparents who can only visit for a limited amount of time. Two weeks go by, baby’s still in NICU, and now the baby’s grandparents have to go back wherever they came from, so now the parents are left by themselves again, and the baby is still in the NICU. They have other kids at home, nobody there to watch those other kids, and they’ve got to go back to work, and how are they going to manage time with everybody that needs their attention?

When the parents are coping as best they can, what do they need? Parents do need emotional help, and they need support. They may not think they need it, or they may say that they don’t want it, but honestly, they need as much help and support as we can give. Parents’ biggest request is for continuity of care, something out of our control unless we as RT’s, RN’s, and MDs push for it. Could we do our best to have the same babies three days in a row for continuity of care? Because of staffing rules or union rules, some hospitals require everybody to rotate a certain number of days fairly and squarely through a certain number of units. The patient loses out in that scenario because a baby has one RT one day, a different one the next day, and so on. In addition, they’ve got one nurse one day a different one the next because we all have 12-hour shifts. We all work very different schedules, and the parents just don’t know who’s who anymore. You may walk into a baby’s room, and the parents will ask for the RT or the RN there yesterday. Don’t take it personally. It’s not that they don’t want you. They just want someone familiar and consistent. We need to have some empathy for these parents and just let them know that we acknowledge their feelings and that it’s OK to cry and that it’s OK if they’re not sure they can cope with this today. Let them know that we understand what they’re feeling even though we can’t fix it.

Parents need to be able to trust the NICU staff. They need to know that we know what we’re doing and do the best we can. One thing that will really undermine the parents’ trust is every time a new Doctor comes on shift, everything changes. Or, every time a new nurse comes on or every time a new respiratory therapist comes on, more changes get made. In many hospitals, the doctors change shifts every eight hours or 12 hours. You may have a doctor that works for three days straight, but then that doctor goes home, and the next doctor comes in and says, “OK, everybody that’s on PRVC mode is now going to go on pressure control mode. And everybody that’s on high flow is now going to go on SiPap” Parents may ask, “why is it that one doctor uses this and another doctor comes on, and then everything gets changed?” How can we as nurses and RT reassure the parents? Often we just shrug our shoulders and say, “Well, that’s what the doctor wanted,” but that’s not really an answer. We need the family to trust all of the NICU staff that we’re doing our very best and know what we’re doing. Sometimes we think we’re doing the right thing, and we believe we’re being kindest when we just slip in the room and ninja slip out when actually what the parents would really like is an acknowledgment that they exist, an acknowledgment that we as the staff are there for them, and acknowledgment that they’re not bad parents, they’re not failures, they’re not all of the things that they’re feeling. And continual reassurance that we are doing all we can.

References:

Disclosures: The authors have no relevant disclosures.
I want to learn to work in NICU... but how?

Academy of Neonatal Care Summer Course and Workshop

Thursday, Friday, Saturday July 1, 2, 3

Valley Presbyterian Hospital

15107 Vanowen St, Van Nuys, CA 91405

SESSION 1               SESSION 2               SESSION 3

~~7 CEU's Per Day Available~~

0900-1700 Daily


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

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!

Seating is limited: Go Here to register:

AcademyofNeonatalCare.org/register

1 Day: $179  2 Days: $349  All 3 Days: $499

CE provided via California BRN

Masks and Distancing enforced!
Postpartum Revolution
@ANGELINASPICER

Education that is...
- Story-Driven
- Trauma-Informed
- Evidence-Based

Visit us at www.mynicunetwork.org

The preeminent provider of compelling perinatal education on psychosocial support created through interprofessional collaboration

Take our "Coping with COVID-19" program for FREE
A Case Report of Hyperleukocytosis in An Extremely Low Birthweight Neonate

Mehwish S. Sheikh, MD

Abstract:
Hyperleukocytosis is elevation of WBC >100,000/uL. The condition can lead to significant morbidities and can be associated with neonatal sepsis, myeloproliferative disorders of Trisomy 21, Neonatal leukemia, or leukocyte adhesion defect. The diagnosis is challenging in extremely low birth weight premature neonate, and limited literature is found for the preterm population. We present a case of hyperleukocytosis in extremely preterm neonate managed conservatively with a good outcome.

Introduction:
Physiological leukocytosis, white blood cell (WBC) up to 30,000/uL in the neonatal period is well reported. Leukemoid reaction is when WBC >50,000/uL and not because of the myeloproliferative disorder. Hyperleukocytosis (WBC > 100,000/uL) is not as well reported in extremely premature neonates. The condition may be associated with myeloproliferative disorder or LAD, requiring extensive workup and extended days of antibiotic therapy. Some literature supports the watchful waiting in the extremely premature neonate. We present a case of an extremely preterm neonate with hyperleukocytosis, managed conservatively.

Case report
An extremely preterm (~25 weeks gestation age) female born to a multigravida via vaginal delivery in breech presentation. Mother was admitted >7 days for PPROM (Preterm premature rupture of membrane). She had routine antenatal care and was doing well until her admission to the hospital with leakage of clear fluid. She received Mg SO4 per our protocol and antenatal steroids on admission (>7 days before delivery). Mother was Rh-negative, otherwise serology negative and GBS negative.

The NB was admitted with a birthweight of 700 grams. On admission, the baby had respiratory acidosis with a pH of 6.9 and a pCO2 of 108. The baby was switched to HFJV at the time with improving gases.

Further labs revealed the WBC to be 87,000/uL peripheral smear showed 2% bands, 4% promyelocyte, 1% myelocyte, 62% segmented neutrophil, 21% lymphocytes. Hb was 11.4 g/dl and platelet 350,000/ uL.

The baby was started on antibiotics, Fluconazole, adequate hydration through IVF. Repeat CBC at 12 hours of life reported WBC to be 102,000/uL. Peripheral smear showed 6% bands, 4% promyelocyte, 4% myelocyte, 68% segmented neutrophil, 4% lymphocytes. Hb was 12.4 g/dl and platelet 350,000/ uL. CRP <0.1.

Arterial blood gas continued to improve. Clinically, the newborn did not show other signs of sepsis. Lactic acid was 1.84. LDH was 726 U/L.

Pathology review reported Nucleated red blood cell (RBC) within range for age; the left shift was suggestive of a reactive, infectious, or therapeutic process.

The newborn was managed for possible complications of hyperleukocytosis with hyperhydration.

The baby received 36 hours of antibiotics with two doses of Fluconazole. Blood culture was negative.

Placental pathology was reported as placental vasculitis and fetal membranes with chorioamnionitis.

As this was deemed to be most likely a Leukemoid reaction, no further workup was done to investigate the etiology.

The baby was extubated on ~ day of life (DOL) 21 and required DART therapy. The baby was Discharged home on RA with Mild bronchopulmonary dysplasia (BPD) at ~40 weeks of gestation. Stable grade 1 intracranial hemorrhage was present at discharge.

This is an interesting case of an EPT neonate presenting with hyperleukocytosis in the first three days of life without further significant signs of infection, managed conservatively, with a short duration of antibiotic therapy. The WBC trended down to normal range without further investigation within seven days.

Discussion:
Physiologic elevation of leukocytes (<30,000/ uL) in the neonate is well known and is usually associated with a physiological surge of granulocyte colony-stimulating factor. It has been reported to be a predictor of survival in some premature newborns (1). Leukemoid reaction is defined as a WBC count of more than 50,000/uL when associated with etiology other than malignancy. Hyperleukocytosis is defined as a WBC count of more than 100,000/uL and is seen in neonatal leukemia, Leukocyte adhesion defect, and Trisomy 21; management can be challenging in an EPT infant. A literature search is limited for hyperleukocytosis in (extremely low birth weight) ELBW population. We present a case of an
extremely preterm (EPT) ELBW infant with hyperleukocytosis at birth (early onset) with resolution within seven days while following a conservative management approach.

Antepartum factors such as steroid use, chorioamnionitis, funisitis, preterm rupture of the membrane are associated with hyperleukocytosis (2). Our patient was born with extreme prematurity. There was an administration of antenatal steroids >7 days before birth and evidence of histological chorioamnionitis.

Neonatal leukemia is extremely rare (3). Our patient did not have abnormalities of the blood cell lines (no thrombocytopenia or anemia), no significant findings on the exam such as hepatosplenomegaly, leukemia cutis suggestive of leukemia (3); hence we did not proceed with bone marrow biopsy. Close monitoring with daily a CBC was recommended per consultation with Hematology.

The transient myeloproliferative disorder has a 10% incidence in Trisomy 21 (4). It manifests in the neonatal period as hyperleukocytosis and hepatomegaly with increasing circulating blast cells (5). Our patient did not have physical features attributable to Trisomy 21, which sometimes is difficult to assess in EPT. Also, only a few blast cells were seen on pathology review.

Leukocyte adhesion deficiency is described with an incidence of 1 in 1 million (6). LAD 1 is a severe form and can present as hyperleukocytosis, delayed cord separation, and poor wound healing. This defect is most often a diagnosis of infancy, and only two cases in the neonatal period are found in the literature (7).

The diagnosis for the above possible etiologies requires a considerable amount of blood draw, which is challenging in ELBW neonates. We chose to follow the newborn conservatively without further diagnostics.

“We followed the American Committee of Fetus and Newborn 2014 recommendation (12). We treated the baby with 36-hour empiric therapy with extended-spectrum antibiotics. Blood culture was negative, as were inflammatory markers. There was no clinical progression.”

Infectious disease is the second leading cause of neonatal mortality worldwide, preceded only by complications related to preterm birth. Hyperleukocytosis can be a finding in neonatal sepsis. The overall incidence of neonatal sepsis ranges from one to five cases per 1000 live births (8). At the same time, antibiotic stewardship is encouraged to avoid unnecessary exposure to antibiotics in this fragile population. Prolonged use of broad-spectrum antimicrobials in NICU increases the risk of *Candida* colonization and invasive infection, necrotizing enterocolitis, late-onset neonatal sepsis, and death (9,10,11). We followed the American Committee of Fetus and Newborn 2014 recommendation (12). We treated the baby with 36-hour empiric therapy with extended-spectrum antibiotics. Blood culture was negative, as were inflammatory markers. There was no clinical progression.

While following the trend of WBC, we continued to provide hyperhydration to our patient in the first three days of life of up to 120

**Table 1**

<table>
<thead>
<tr>
<th></th>
<th>DOL 1</th>
<th>DOL 2</th>
<th>DOL 3</th>
<th>DOL 4</th>
<th>DOL 6</th>
<th>DOL 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC</td>
<td>87.3</td>
<td>102.3</td>
<td>84.2</td>
<td>44.6</td>
<td>35.2</td>
<td>23.1</td>
</tr>
<tr>
<td>Neutrophils, segmented</td>
<td>62</td>
<td>68</td>
<td>70</td>
<td>75</td>
<td>72</td>
<td>68</td>
</tr>
<tr>
<td>Bands</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Metamyelocytes</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Promyelocyte</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Myelocyte</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lymphocyte</td>
<td>21</td>
<td>4</td>
<td>8</td>
<td>14</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>Reactive lymphocyte</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Basophils</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Monocyte</td>
<td>5</td>
<td>11</td>
<td>10</td>
<td>8</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>
ml/kg/day while keeping close monitoring of fluid balance. Our patient did not require exchange transfusion, as can be performed for extreme cases (3).

Hyperleukocytosis is associated with significant short- and long-term morbidities such as IVH, pulmonary hemorrhage, respiratory failure, RDS, BPD, renal failure, and DIC (13, 14). Our patient did not have IVH at 7 and 28 days of life on screening US, no AKI, was extubated at 21 DOL after requiring DART therapy. The patient did require high-frequency ventilator support in the first seven days of life. These findings have a strong association with prematurity itself. It is hard to associate this even partially with hyperleukocytosis.

Our patient did require pharmacological therapy for clinically significant PDA. This situation may have been attributable to higher fluid intake in the first week of life; however, there is no clear association of clinically significant PDA for TFI of < 150 ml/kg/day in the first weeks of life.

References:

Disclosure: The author has no disclosures.
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
Consultation or Counseling?

Scott D. Duncan, MD, MHA

“A consultation is an evaluation and management (E/M) service provided at the request of another physician or qualified healthcare provider (QHP) to recommend care, diagnostic or therapeutic services for a specific condition or problem. (1)”

Requests for outpatient antenatal or perinatal counseling or consultations are a common scenario in neonatology. Many times, the consultation request will originate from obstetrical services. On rare occasions, the family may request the consultation. A consultation is an evaluation and management (E/M) service provided at the request of another physician or qualified healthcare provider (QHP) to recommend care, diagnostic or therapeutic services for a specific condition or problem. (1) Outpatient consultation codes correspond to Current Procedural Terminology (CPT®) codes 99241-99245.

When providing time-based services for consultation, these CPT® codes are defined as follows¹:

- 99241 typically 15 minutes,
- 99242 typically 30 minutes,
- 99243 typically 40 minutes,
- 99244 typically 60 minutes,
- 99245 typically 80 minutes.

However, the Centers for Medicare & Medicaid Services (CMS) eliminated the use of all consultation codes, inpatient and outpatient, effective January 1, 2010. (2) In doing so, CMS increased the work relative value units for office visits, initial hospital visits, and global surgical codes. Many payors have followed suit, and recommendations may vary on the use of office-based based E/M codes to substitute for the consultation codes. Nevertheless, documentation should include the requesting physician, reason for the consultation, recommendation, and reporting. (3) The physician groups should examine the current state Medicaid physician fee schedule to determine whether consultation codes have been published and valued.

If substituting office-based CPT® E/M codes, the provider should be aware of other changes that occurred on January 1, 2021. 99201 (office visit for the E/M of a new patient up to 15 minutes) was eliminated, and the guidelines for selecting a code changed, focused on medical decision making and time. (4) Current CPT® codes for new patient office visits include:(1)

- 99202 straightforward medical decision making, 15-29 minutes,
- 99203 low-level medical decision making, 30-44 minutes,
- 99204 moderate level of medical decision making, 45-59 minutes,
- 99205 high level of medical decision making, 60-74 minutes.

Preventative medicine counseling CPT® codes are time-based codes and do not differentiate between new and established patients. These codes include: (1)

- 99401 Preventive medicine counseling and/or risk factor reduction intervention(s) provided to an individual (separate procedure); approximately 15 minutes,
- 99402 approximately 30 minutes,
- 99403 approximately 45 minutes,
- 99404 approximately 60 minutes.

Scenario

Mr. and Mrs. Smith have recently moved from out of state to your community. The mother’s previous pregnancy was complicated by gestational diabetes, requiring insulin. That pregnancy resulted in a large for gestational age baby with hypoglycemia, a brachial plexus injury, and muscular ventricular septal defect. In addition, the mother has a sister who had a small VSD as a child. The family asked to consult with you in your neonatal office as they are now expecting their second child and want to explore using a Mediterranean diet to reduce the risk of complications. You spend 30 minutes of face-to-face time counseling the family.

The correct code is:

A. 99252  
B. 99242  
C. 99402  
D. 99203
The correct answer is C.

99402 is a preventive medicine counseling and/or risk factor reduction intervention provided to an individual for approximately 30 minutes. This preventive medicine counseling code may be reported if the family seeks consultation either self-referred or sent by another provider to discuss risk reduction interventions. A risk reduction intervention is defined as seeking advice when there is no present problem but rather to avoid a further problem or complication. These codes are reported based upon the time spent face-to-face providing counseling.

99242 is an office consultation for a new or established patient, which requires these three key components: an expanded problem-focused history, an expanded problem-focused examination, and straightforward medical decision making; typically, 30 minutes.

99252 is an inpatient consultation for a new or established patient, which requires three key components: an expanded problem-focused history and expanded problem-focused examination and straightforward medical decision making; typically, 40 minutes.

99203 is an office visit for evaluating and managing a new patient, which requires three key components: an expanded problem-focused history and expanded problem-focused examination and straightforward medical decision making; typically, 30-44 minutes.

Note that 99401-99404 are not included in the CMS list of expanded telehealth services throughout the national public health emergency, as directed by the CARES act.

Preventative services provided to the mother prior to the delivery are reported using the mother’s insurance. As with other time-based counseling codes, the medical record must include documentation of the total time spent on providing face-to-face consultation and the issues discussed. In the above scenario, there are no current health conditions and the use of ICD-10 Z codes, denoting the reason for the encounter, such as circumstances that may impact one’s health. The appropriate ICD-10 codes would include the following:

- Z76.81 – An expectant parent(s) pre-birth pediatrician visit
- Z82.79 – Family history of congenital malformations, deformations, and chromosomal abnormalities
- Z86.32 – Personal history of gestational diabetes

References:

Disclosure: The author has no disclosures.
The 34th Annual Gravens Conference on the Environment of Care for High Risk Newborns

Virtual Event: March 3, 4, 10, and 17th, 2021
On-demand: March 24 – September 30, 2021

Save the Date: March 3, 4, 10, and 17, 2021   Call for Abstracts: Due Weds, Oct 28, 2020

The 34th Annual Gravens Conference
on the Environment of Care for High Risk Newborns

Resiliency and Change in the NICU
Sheraton Sand Key
Clearwater Beach, Florida
March 3-5, 2021

Visit www.TheGravensConference.com

Registration is open!

https://tools.eventpower.com/reg/index/JzJQgwf9NQ
(Link can be found on conference web page)

Visit: www.TheGravensConference.com
Questions? email nrose@usf.edu
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
**Supporting Kangaroo Care During COVID-19**

**Skin-to-Skin Care**

- **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.

---

**The Pregnant Mom's Guide To Staying Safe During COVID-19**

- **Take Precautions & Limit Interactions**
  - Maintain at least a 30-day supply of your medications.

- **Wash Your Hands, Arms, and Chest**
  - Get informed about the risks + benefits.

- **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.

---

**Keep Prenatal Appointments**

- **Talk to Your Health Care Provider About Staying Safe During COVID-19**
  - Learn more.

---

**Maintain at least a 30-day supply of your medications.**

---

**Talk to your health care provider about staying safe during COVID-19.**

---

**National Perinatal Association**

- nicuparentnetwork.org
- nationalperinatal.org/skin-to-skin
Readers can also follow NEONATOLOGY TODAY via our Twitter Feed @NEOTODAY

New subscribers are always welcome! NEONATOLOGY TODAY
To sign up for free monthly subscription, just click on this box to go directly to our subscription page

MedEd On The Go® presents
3 Accredited Education Programs in Short-Form Video Format
Available for CME/CNE Credits

The Role of Nutrition & Exclusive Human Milk for Very Low Birth Weight Infants

Preventing Bronchopulmonary Dysplasia
1.75 credit hours
WATCH NOW

Preventing Neonatal Sepsis
0.5 credit hours
WATCH NOW
www.MedEdOTG.com/video/program/609

Preventing Retinopathy of Prematurity
1.0 credit hour
WATCH NOW
www.MedEdOTG.com/video/program/608

Stephen E. Wetty, MD
Clinical Professor of Pediatrics
University of Washington School of Medicine
Seattle, WA

Dan L. Stewart, MD
Professor of Pediatrics & International Pediatrics
University of Louisville School of Medicine
Co-Director of NICU & ECMO
Norton Children’s Hospital
Louisville, KY

Jonathan R. Swanson, MD, MSc
Associate Professor of Pediatrics
University of Virginia Children’s Hospital
Charlottesville, VA
New subscribers are always welcome!

NEONATOLOGY TODAY
To sign up for free monthly subscription, just click on this box to go directly to our subscription page

Readers can also follow NEONATOLOGY TODAY via our Twitter Feed @NEOTODAY
Father’s Day: Paternal Depression and the Needs of Fathers in the NICU

Elizabeth Rochin, PhD, RN, NE-BC

Paternal Depression and the Needs of Fathers in the NICU

The National Perinatal Information Center (NPIC) is driven by data, collaboration and research to strengthen, connect and empower our shared purpose of improving patient care. For over 30 years, NPIC has worked with hospitals, public and private entities, patient safety organizations, insurers and researchers to collect and interpret the data that drives better outcomes for mothers and newborns.

“Maternal postpartum depression (PPD) is well studied, and significant resources have been invested in studying and treating PPD. While there continue to be significant barriers to treating PPD in many portions of the United States (US), including the availability of specialists, access, and equity of care, there is a facet of care that has been consistently overlooked: paternal postpartum depression. Meta-analyses have described paternal postpartum depression rates of approximately 10% at and around the time of birth and approaching 26% at six months after birth (1,2). Paternal postpartum depression can be exacerbated, coupled with the uncertainty of unplanned NICU admission. Several studies have supported the findings of increased stress and depression in fathers during NICU admissions (3-5). With this knowledge in hand, fathers’ emotional and psychological needs must be in mind when caring for the family unit during a NICU admission.

“I have never felt so much stress or felt so helpless in all of my life. I felt guilty for seeing our baby boy before my wife who was still recuperating from her [cesarean section]. I could not touch him and felt immediately overwhelmed. I was supposed to support my wife, support my baby, my other children, work. For a fleeting moment, I wanted to run away. Just run away. And felt overwhelmingly guilty for that vicious cycle. Over the next few weeks and months, I found myself not being able to even function. As my wife fell into Postpartum Depression and during a lengthy NICU stay, I felt more and more in the shadows and even more alone. When we visited our baby in the NICU, staff consistently asked how my wife was, but no one asked me how I was. Lord knows I could not reach out to my friends or my family without ridicule or being told to “man up” or “this is normal.” I knew what I was feeling was not normal. But men are not allowed to be depressed after the birth of a baby or allowed the grace for treatment. Our insurance carrier paid for my wife’s treatment but would not pay for mine. I was truly alone”—JB, Father with Paternal Postpartum Depression

“It is imperative to view the needs of fathers and paternal PPD through the lens of disparity. NPIC provides a Race and Ethnicity Dashboard that provides member hospitals a “deep dive” into their reporting by stratifying specific metrics by race and ethnicity.”

The National Perinatal Information Center (NPIC) provides hospital-specific and benchmark data through the NPIC Perinatal Center Database, providing perinatal and neonatal data to members and researchers for over 35 years. National trends reveal episodic and regional variations in NICU admissions, and NPIC has found

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
upward trends over the past five years within hospital membership. With this in mind, it is important to address the needs of the entire family unit; the vast majority of energy and effort within a NICU environment is utilized to support the baby and mother (1) with limited resources and energy spent on other family members, particularly the father. Paternal PPD is an undertreated, underdiagnosed, and under-resourced issue that warrants additional attention (6). As admissions into a NICU increase, it is reasonable to make plans for an increase in paternal PPD.

It is imperative to view the needs of fathers and paternal PPD through the lens of disparity. NPIC provides a Race and Ethnicity Dashboard that provides member hospitals a “deep dive” into their reporting by stratifying specific metrics by race and ethnicity. This dashboard has explored disparities that exist within payer sources and clinical outcomes for both mother and newborn. Within the lens of paternal PPD, there is strong evidence to suggest that racial disparities exist to identify and treat PPD. Maternal PPD within the Black and Brown communities has been studied and shown to have inequities based upon identification, access to treatment, and treatment regimens. Sidebottom and colleagues (7) described the findings of their study in which African American, Asian, and non-white women were less likely to be screened for postpartum depression than their white counterparts. In addition, this study also revealed that women insured by Medicaid and other state programs were less likely to be screened than those with private insurance. In addition, undocumented immigrants are far less likely to seek out services for fear of reporting, deportation, or social service intervention (8,9). With marginalized women already facing barriers to identifying and treating PPD, identification, and barriers to fathers’ identification and treatment of postpartum depression are essential in assuring a strong and stable environment for a baby discharged from the NICU.

Discussion:
Awareness of paternal PPD is key in providing holistic, family-centered care in perinatal and neonatal settings. Developing a unit-specific or division-specific process in identifying paternal PPD, identification of resources, and treatment options can become a pillar for assuring best-in-class care for families and babies in the NICU.

1) Destigmatizing paternal postpartum depression: The stigma that currently exists for mental health disorders is well defined (10). Providing a safe space for fathers to describe their experiences with postpartum depression is absolute and should be a routine aspect of care when a father is at the bedside of a NICU baby. Too often, a father is asked how the mother is doing without the same courtesy of their own query or exploration of their transition into fatherhood.

2) Transgender men and postpartum depression: Transgender people, as a group, have faced stigma, discrimination, and bias, as well as experiencing numerous health disparities (11). Providing a neutral, compassionate environment for diverse families is key to the safe expression of depressive thoughts or experiences. Marginalized people continue to have significant challenges in accessing care and treatment for postpartum depression; early identification and support are essential.

3) Social Determinants of Health (SDOH): Understanding the social determinants in the communities that serve as a NICU referral base provide additional leverage in understanding the stressors and potential barriers of support and stressors to fathers. Potential barriers such as availability of transportation, food security, home environment, employment, and community safety are but some of the social determinants that should be understood by all team members providing care.

4) Paternal NICU Support Groups: Many NICUs around the country have established Parent Advisory Councils/Committees, Support Groups, and other resources for parents of babies admitted to the NICU. Providing space and availability of a father who has experienced paternal PPD could benefit those fathers who may be reluctant to come forward with their concerns or fears.

As families and loved ones prepare to celebrate Father’s Day, take a moment to ask the fathers in your perinatal and neonatal units how they are doing and what support they need. Children of fathers who suffer from ongoing and severe depression are at
higher risk for emotional and behavioral problems, with boys at significantly higher risk (1). From a population health perspective, it is imperative to destigmatize paternal PPD, assure that fathers are supported during their transition into fatherhood, and support the children who depend on them.

References:


The author has no conflicts of interests to disclose.

Corresponding Author:

Elizabeth Rochin, PhD, RN, NE-BC
President
National Perinatal Information Center
225 Chapman St. Suite 200
Providence, RI 02905
401-274-0650
Email: inquiry@npic.org
ONCE UPON A PREEMIE ACADEMY

eLearning Courses
Health and Racial in the NICU

Meet Our Faculty

+ Jenné Johns, MPH
  Once Upon A Preemie Academy

+ Deidre McDaniel, MSW, LCSW
  Health Equity Resources and Strategies

+ Dawn Godbolt, Ph.D.
  National Birth Equity Collaborative

+ Dalia Feltman, MD, MA, FAAP
  Univ. of Chicago Pritzker School of Medicine

+ Chavis A. Patterson, Ph.D.
  Children's Hospital of Philadelphia

+ Terri Major- Kincade, MD, MPH
  Pediatrician and Neonatologist

+ Jenné Johns, MPH
  Once Upon A Preemie Academy

+ Shanté Nixon
  Connect2NICU

+ Ashley Randolph
  Glo Preemies

REGISTER TODAY
OnceUponAPreemieAcademy.com

Health and Racial Equity + On-Demand Continuing Education

The first and only virtual training academy focused on delivering health and racial equity educational programs for perinatal and neonatal healthcare professionals. Our purpose is to raise awareness and offer real-time solutions for addressing health and racial equity.

Continuing Education Partner, paclac.org/continuing-education
Health Equity Column: From History to Action in Improving Maternal, Infant, and Neonatal Health Outcomes

Jenné Johns, MPH, Sheree H. Keitt, DrPH, MPH, CHES

This June, we celebrate, “June-sixteenth” a national holiday to commemorate the ending of slavery in the United States. As we acknowledge the ending of this traumatic lived experience for African American’s we, must also acknowledge the continued harm and injustice faced by African American’s who seek social and racial justice in healthcare. The infant and maternal health crisis faced by Black women and babies forces us as a healthcare community to examine the root causes and deliver equity-oriented solutions to improve the birth outcomes for historically vulnerable yet deserving birthing populations. These equity-oriented solutions expand across the perinatal and neonatal spectrum, as these solutions will save deserving lives and reduce burdens placed on families, communities, and the healthcare system.

The National Healthy Start Association is a leading nonprofit organization focusing on saving our nation’s babies by delivering nationwide equity-oriented solutions. In this interview, I am honored to share highlights of my interview with a leading policy, advocacy, community engagement leader, and Preemie Mom, Dr. Sheree Keitt. Through our interview, as you learn about the equity-focused maternal health initiatives led by Dr. Keitt and the national chapters of the National Healthy Start Association, I encourage you to leverage these resources within your respective institutions and to support the closing of racial and ethnic disparities in perinatal and neonatal health outcomes based on the non-hospital maternal-safety bundles framework.

“Healthy Start program sites are in communities where the infant mortality rate is at least 1.5 times that of the U.S. national average. In addition, the majority of communities are facing racial and ethnic disparities in birth and maternal health outcomes.”

What is your definition of health equity?

When I think about health equity, I use the definition provided by the American Public Health Association and World Health Organization, which states that equity is “when everyone has the opportunity to ‘attain their full health potential,’ and no one is ‘disadvantaged from achieving this potential because of their social position or other socially determined circumstance.” However, I have learned that you cannot address health equity without first focusing on inequity at its core, which is deeply rooted in unjust practices based on race, social and economic status, demographics, and geographic status. All of which affect health, hence the social determinants of health.

What are your organizational priorities for addressing health and racial equity in neonatal care?

The National Healthy Start Association (NHSA) is the membership organization for federal Healthy Start programs. The federal Healthy Start initiative is the Health Resources and Services Administration Maternal and Child Health Bureau’s signature community-based and community-driven program focused on reducing infant mortality. Healthy Start was created as a demonstration project in 1991, primarily focused on improving pregnant women’s access to prenatal care, and has evolved to focus on improving women and men’s health starting preconception and infant health to early childhood. Healthy Start participants experience persistent health disparities, which stem from issues directly related to health equity and social justice. Healthy Start program sites are in communities where the infant mortality rate is at least 1.5 times that of the U.S. national average. In addition, the majority of communities are facing racial and ethnic disparities in birth and maternal health outcomes.

As part of our mission, NHSA aims to be an effective advocate in policies and programs that improve the health status of women, men, and infants and strengthen the capacity of Healthy Start programs and community-based maternal and child organizations nationwide. Over the next three years, NHSA will expand its mission and strengthen our brand and commitment to members. Developing strategic partnerships, engaging consumers in programmatic activities, and successfully communicating the outcomes of

Readers can also follow NEONATOLOGY TODAY via our Twitter Feed @NEOTODAY
Healthy Start projects are among the goals NHSA has put in place to become a more effective and vital organization.

Some of the work that we are doing at the association is below that directly addresses health and racial equity in neonatal care are below:

Alliance for Innovation on Maternal Health Community Care Initiative (AIM-CCI)

In 2019 HRSA awarded the NHSA a cooperative agreement for a five-year project to support the development and implementation of non-hospital maternal safety bundles within community-based organizations and outpatient clinical settings across the United States that serve communities experiencing high rates of maternal morbidity and mortality. NHSA is currently partnering with pilot sites comprised of community-based organizations to work together collaboratively through Local Maternal Safety Workgroups, implement safety bundles, and measure improvement with the goal of improving maternal health outcomes. The ultimate goal of AIM CCI is to establish a standard approach in all communities across the United States. In addition, the maternal safety bundles are framed around equity. Now you may ask if the focus is on maternal health, how does that address health and racial equity in neonatal care?

“The ultimate goal of AIM CCI is to establish a standard approach in all communities across the United States. In addition, the maternal safety bundles are framed around equity.”

Supporting Healthy Start Performance Project (SHSPP)

NHSA works in partnership with the National Institute for Child Health Quality on the SHSPP. The purpose of SHSPP is to promote consistency in service delivery across Healthy Start programs and support Healthy Start grant recipients in providing effective, evidence-based service delivery through training and technical assistance. SHSPP strengthens the implementation of Healthy Start activities by providing capacity-building assistance, including ongoing technical assistance training and education to HS grant recipients in the implementation of activities in accordance with the program’s four approaches to reduce disparities in infant mortality and adverse perinatal outcomes. The four approaches are to 1) improve women’s health, 2) improve family health and wellness, 3) promote systems change, and 4) assure impact and effectiveness through ongoing HS workforce development, data collection, quality improvement (QI), performance monitoring and program evaluation. NHSA is subcontracted through NICHQ to provide training and technical assistance in the area of Fatherhood, Community Action Networks, Maternal Morbidity Mortality, and Women’s Health, and Equity, Implicit Bias and Racism and Disparities lead the Healthy Start Mentoring Program and support the development of publication and presentations and communications strategies to inform community stakeholders about their sustainability strategy.

Where Dads Matter Initiative

Healthy Start projects have consistently expressed a need to make Healthy Start sites more father-inclusive by involving dads in program activities and in the lives of their children and the promotion of responsible fatherhood with or without marriage. During pregnancy, the absence of fathers during increases the risk of fetal and infant morbidities such as low birth weight, preterm birth, and small-for-gestational-age. Women whose partners are more involved in the pregnancy experience better birth outcomes. Moreover, infant death in the first 28 days of life is four times higher when a father is not involved. Based on the literature, father’s presence significantly impacts infant birth outcomes and overall emotional and social well-being. Here at NHSA, we are taking a holistic approach by addressing the social determinants of health so that the total family can achieve health equity.

“Women whose partners are more involved in the pregnancy experience better birth outcomes. Moreover, infant death in the first 28 days of life is four times higher when a father is not involved. Based on the literature, father’s presence significantly impacts infant birth outcomes and overall emotional and social well-being.”

What personal and professional experiences led you to focus on health equity in neonatal care?

I started my career working in health communications, serving as a trusted community voice to build a collaborative of organizations and community members to convene and develop strategies to address racial and ethnic disparities and inequities in maternal and infant health outcomes. At the time, I was not fully aware of the risk factors that can adversely affect the birth outcome of an infant. My background was in marketing and community engagement, so my role was not public health content-based but focused on coalition-building and partnerships efforts. Because of this work, I became passionate about reducing infant mortality and improving maternal health because I was unaware of the disparities and inequities that existed in my own zip code.

After working in maternal and child health for over ten years, while working on my dissertation, focused on preconception health and preterm birth, I became pregnant with Monoamniotic Monochorionic twins. I was told that my babies only had a 50% chance of surviving pregnancy, and if they made it to 32 weeks, they would be delivered via cesarean. I was also told to expect a lengthy NICU stay. My sons were born at 30 weeks and had a NICU stay. Prior to my pregnancy, I focused most of my work on prevention; therefore, I was not fully educated about the NICU and parents’ experiences. After experiencing the NICU, I became more interested in other parents’ experiences, primarily those of color and low-income families. Because of my public health background, I was able to ask the right questions, understand...
the medical terminology, and advocate for my children to have the best care. My NICU experience strengthened my capacity to provide training, technical assistance, and support to community-based organizations serving infants and their families. This experience also opened my eyes to the potential inequities, bias, and other unfair treatment that can occur when a parent does not fully understand things such as the medical rounds, the right to breastfeeding and obtain lactation support, or being engaged in decisions that they have a right to make.

**What is your call to action for the industry as we seek to eliminate health and racial inequities in neonatal care?**

I would like to see hospital systems collaborating with local health departments, community-based organizations, and community members to develop a framework to address health and racial equity. Many organizations are now taking an approach to review program policies and practices from an equity lens to address any unintended or intended consequences that are inequitable. A great way that hospitals can do this through their community health needs assessment (CHNA). Every three years, to maintain their tax-exempt status, nonprofit hospitals are required to conduct a CHNA. Within that CHNA, they must represent the broad interests of the community served by the hospital facility.

I have always valued and encourages community voice and participatory methods to engage community-level organizations and members in the decision-making process of programs and policies that affect their community. The involvement of community voices in CHNAs can create a dialogue about the root cause of equity. In addition, including community members provides an opportunity to voice their lived experiences and provide insight into issues in the community such as lack of resources, housing, or bias that certain groups may have experienced.

“**In addition, including community members provides an opportunity to voice their lived experiences and provide insight into issues in the community such as lack of resources, housing, or bias that certain groups may have experienced.**”

Also, the involvement of community voice can provide support to a hospital in building their internal capacity related to understanding institutional and structural racism. For example, historical trauma can exist in communities suffering from post-traumatic stress passed down from previously experienced trauma from colonialism and federal policies resulting in cultural genocide, enslavement, and medical experimentation. Hospital staff should also be aware of theories such as weathering, which states that there are psychosocial factors in racial/ethnic minority groups living in the U.S. that contribute to their health diminishing over time. To demonstrate, college-educated U.S.-born Black women have worse birth outcomes than white women who are high school dropouts. Furthermore, foreign-born Black women who give birth in the U.S. have similar birth outcomes to U.S.-born white women. This is directly related to the Immigrant Paradox. Individuals who migrate to the U.S. have superior health outcomes than U.S.-born individuals of the same racial and ethnic background. Overall, the assertion is that is foreign-born Black women have not experienced the racism that Black women have experienced across their life course. Having conversations and becoming educated about racism, equity, and disparities are necessary for hospitals to develop any type of framework that addresses health equity.

Overall, I believe the keyword to this question is “action.” The industry must make addressing eliminate health and racial inequities in neonatal care a priority. Also, the strategies should be realistic and actionable and focus on improving the health outcomes of infants AND about actions before birth that may mitigate a pre-term birth or undue stress of a birthing person.

**Disclosure:** The authors have no disclosures.
About the Author: Sheree H. Keitt, DrPH, MPH, CHES:

Title: Senior Program Manager
Organization: National Healthy Start Association
Bio: Sheree H. Keitt, DrPH, MPH, CHES, has over 15 years of working in the nonprofit and public health sectors on the local, state, and national levels. Sheree is currently a Senior Program Manager at the National Healthy Start Association and an Adjunct Professor at Trinity Washington University. Sheree earned a Bachelor of Arts in advertising from Michigan State University, a graduate certificate in public health at the State University of New York, Albany, and both Master of Public Health in Community Health and Doctor of Public Health degrees from Walden University. Sheree is also a certified health education specialist.

About the Author: Jenné Johns, MPH:

President, Once Upon A Preemie www.onceuponapreemie.com
Founder, Once Upon A Preemie Academy www.onceuponapreemieacademy.com

Jenné Johns, MPH is President of Once Upon A Preemie, Founder of Once Upon A Preemie Academy, mother of a micropreemie, author, speaker, advocate, and national senior health equity leader. Once Upon A Preemie is a non-profit organization with a two-part mission: 1.) to donate Once Upon A Preemie books to NICU families in under resourced communities, and 2.) lead virtual health and racial ethnic training programs and solutions to the neonatal and perinatal community through the Once Upon A Preemie Academy. Jenné provides speaking, strategic planning and consultation services for fortune 500 companies focused on preemie parent needs from a cultural lens and reading as a tool for growth, development, and bonding. Jenné is also a national senior health equity thought leader and has led solutions-oriented health equity and quality improvement portfolios for the nations’ largest health insurance and managed care companies.
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.
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
www.nicuawareness.org
www.nationalperinatal.org/NICU_Awareness
Goldilocks and the NICU: What is “Just Right”

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.

“While normal values in adults and older children are fairly static and widely accepted, values in the neonatal population are considerably more dynamic, particularly those relating to respiration and ventilation.”

“Normal values”: what is normal in the neonatal population, particularly in micro-premature infants? While normal values in adults and older children are fairly static and widely accepted, values in the neonatal population are considerably more dynamic, particularly those relating to respiration and ventilation. Adding to this is the post-gestational age (PGA) of the patient; what is acceptable at two weeks PGA may not be advisable nor acceptable at 2 hours PGA. Metabolic compensation via the renal system also plays a role in which values are acceptable and which are not.

The role of PaCO₂ as it pertains to cerebral and pulmonary vascular tone and blood flow is well known. As PaCO₂ increases, cerebral vasculature relaxes, resulting in dilation and increased cerebral blood flow (CBF), whereas, in the lung, the opposite is true. Conversely, as PaCO₂ decreases, cerebral vasculature tone increases, which results in decreased blood flow. Again, the opposite is true in the lung.

In the very preterm infant, CO₂ cerebral vasculature reactivity is reduced during the first 24 hours PGA. CBF changes of 10-30% per 7.5 mmHg change in PaCO₂ have been reported. Decreased PaCO₂ results in decreased CBF progressively until a level of about 20 mmHg, after which point no further reduction occurs. In the brain, autoregulation of blood flow decreases as PaCO₂ rises or falls. This further reduces the already limited ability of cerebral vasculature to compensate for changes in blood pressure, PaO₂ and PaCO₂. It is worth noting that CBF in chronic hypercapnia returns to normal baseline after a few hours. (1) More on that later.

At what point does hypocapnia become significant? PaCO₂ values of less than 40 mmHg are associated with an increased risk of chronic lung disease (CLD), and analysis of infants <29 weeks GA found that those whose PaCO₂ fell below 30 mmHg at any time during the first 48 hours PGA had a significantly increased risk of severe brain injury. (2)

Compensatory mechanisms to mitigate CBF are limited during the first five days PGA, markedly so during the first 24 hours, complicating matters further. By 72 hours PGA the risk of CBF-induced brain injury is significantly reduced, and thus clinicians must be particularly vigilant before this time.

What about oxygen? PaO₂ is different from that of PaCO₂ beyond the opposite vascular response. In the very preterm infant, CBF changes by 15-30% per 7.5 mmHg change in PaO₂. It is very important to note that, unlike PaCO₂, vasoreactivity does not normalize with sustained hyper/hypoxemia; a brief episode of hyperoxia results in vasodilation that persists up to 2 hours in preterm infants. Unlike hypercapnia, hyperoxia to the extent produced in the NICU does not occur naturally. As for hypoxia, the very preterm infant’s cerebral oxygen extraction is likely already maximized and is thus unable to increase to compensate for low PaO₂ or decreased CBF. (1) This changes at approximately 26 weeks GA.(2) From a clinical perspective, it behooves us to prevent hyperoxia not just because of retinopathy of prematurity but also potential brain injury.

This brings us to the routine acceptance of permissive hypercapnia. Often considered PaCO₂ in the 45-55 mmHg range, the upper limit of this range is often much higher, and what upper limits are safe has not been established with high-level evidence. (4)

Originally conceived as a way to reduce lung injury, permissive hypercapnia has not necessarily achieved that end. Many factors
are at play here. Mode of ventilation, volumes delivered, GA all serve to increase or decrease the efficacy of the practice. It is worth noting that the concept was born at a time when ventilation and ventilator options were limited to basic, non-synchronized modes with no volume measurement or targeting. Modern ventilators and modes such as high-frequency oscillation or jet ventilation (HFOV and HFJV) may themselves offer more lung protection than permissive hypercapnia alone.

“One analysis found that permissive hypercapnia virtually eliminated severe hypocapnia, but respiratory outcomes were not significantly better.”

One analysis found that permissive hypercapnia virtually eliminated severe hypocapnia, but respiratory outcomes were not significantly better. The composite outcomes of death or severe intraventricular hemorrhage were associated with higher fluctuations of PaCO2 and the lowest arterial pH. (4) We know that the compensatory ability of the micro premature infant to mitigate changes in PaCO2 is limited and takes time. Faced with a high PaCO2, a clinician often responds to increasing ventilation to rapidly decrease it to a more “comfortable” level. This may not be the best strategy as rapid changes in PaCO2 may be equally or more harmful than hypercapnia itself.

Similarly, when choosing to take the permissive hypercapnia route, it is best to allow PaCO2 to rise gradually and allow renal compensation and the cerebral vasculature to adapt. This should only be done after the first week PGA when the infant is better able to regulate CBF. Permissive hypercapnia is not likely to improve outcomes unless accompanied by judicious adherence to lung-protective ventilation strategies.

“Permissive hypercapnia is not likely to improve outcomes unless accompanied by judicious adherence to lung-protective ventilation strategies.”

What is safe? High PaCO2 has been linked to white matter injury, but confounding factors make it difficult to determine how high and when. For example, a large PDA with a left to right shunting may flood the pulmonary vasculature and precipitate pulmonary hemorrhage while at the same time overwhelming the pre-ductal circulation. In this case, higher PaCO2 may be lung protective through increased pulmonary vascular resistance but at the risk of exacerbating increased CBF and the risk of bleeds. Conversely, a lower PaCO2 may be neuroprotective by decreasing CBF through cerebral vascular vasodilatation but increases the risk of lung damage by decreasing PVR with resulting increase in pulmonary blood flow.

Increasing mean airway pressure (MAP), as will occur with escalating ventilation parameters, also decreases cerebral blood return and increases the risk of brain bleeds. At what point does increasing PaCO2 no longer work to our advantage? It is not uncommon to see pH compensated PaCO2 of 65 mmHg or higher in my clinical practice. This is higher than many units allow, but anecdotally the incidence of severe brain bleeds in the unit in which I practice is unremarkable compared with other units.

The use of HFJV poses another question: Does this mode’s gentle nature negate the need for permissive hypercapnia? The CLD patients I ventilate using HFJV are more challenging to oxygenate than to ventilate, and it is not unusual for them to have PaCO2 in the range of 45-55 mmHg using low ventilating pressure i.e., with delta pressure of < 15 cmH2O. A similar argument could be used for HFOV with volume targeting using low amplitudes.

As GA decreases, the fragility of the cerebral vasculature increases. As the edge of viability has decreased to 22 weeks, GA and ventilators become increasingly sophisticated. Perhaps the risk: benefit ratio no longer favours permissive hypercapnia.

One area that begs investigation, in my opinion, is the use of non-invasive modes of ventilation (NIV). Despite caffeine, apnea, bradycardia, and desaturations are common, particularly in the <26 GA strata. These episodes are undoubtedly associated with spikes in PaCO2 and low PaO2; however, how extreme these are is difficult to assess since nobody will do a blood gas on a baby during an apneic/bradycardiac event. Increasing FiO2 often leads to hypoxemia, and even though brief; the CBF effects linger after FiO2 returns to baseline.

Are these infants at increased risk of neurological injury? Only the SUPPORT trial enrolled infants of 24 weeks GA. This study was well powered with 285 infants of 24-25 weeks GA enrolled in the CPAP arm. Failure criteria included PaCO2 > 65 mmHg and pH < 7.20, values outside the acceptable range in many units. There was no significant difference in the rate of severe intraventricular hemorrhage suggesting that PaCO2 of ≤ 65 mmHg may be safe neurologically; however, this is a single study. (5)

It is not clear to me that NIV affords the degree of lung protection hoped for in the <25-week GA infant, and the incidence of CLD is not significantly different in several studies. (5,6,7) Data from Iowa, where intubation and HFJV are standard practice, shows excellent survival rates in the 22–23-week GA strata. This challenges the perceived benefit of avoiding intubation in this group. It is a virtual certainty that 23 – 24-week GA infants will require intubation. In delaying, I fear we may be causing harm, albeit with the best of intentions.

References:
3. https://www.nature.com/articles/pr2017196.pdf?origin=ppub
7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6966957/

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.

Corresponding Author

Rob Graham, R.R.T./N.R.C.P.
Advanced Practice Neonatal RRT
Sunnybrook Health Science Centre
43 Wellesley St. East
Toronto, ON
Canada M4Y 1H1
Email: rggrp57@yahoo.ca
Telephone: 416-967-8500

Readers can also follow
NEONATOLOGY TODAY
via our Twitter Feed
@NEOTODAY

The PREGNANT MOM’S Guide To Staying SAFE DURING COVID-19

Take precautions & LIMIT INTERACTIONS.

Maintain at least
A 30-DAY SUPPLY
OF YOUR MEDICATIONS.

Keep prenatal
APPOINTMENTS.

Talk to your health care provider about
STAYING SAFE
DURING COVID-19.

LEARN MORE >

National Perinatal Association
PERINATAL MENTAL HEALTH

nationalperinatal.org/position
www.nationalperinatal.org/mental_health

EDUCATE PROVIDERS
All perinatal health care providers need training and education that will help them support families.

Educate. Advocate. Integrate.
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.
Birth Trauma and Post Traumatic Stress Disorder (PTSD)

Birth trauma is a subjective experience: it is always in the eye of the beholder. (2) While we as clinicians cannot diagnose a birth as traumatic, we can recognize its place in obstetric, neonatal, and psychiatric care. Birth trauma is the perception of actual or threatened serious harm to the mother or the infant during any phase of childbirth. (2) The phenomenon of birth trauma is related to criterion A for posttraumatic stress disorder (PTSD): exposure to actual or threatened death, serious injury, or sexual violence through a direct experience, witnessing the event, learning that the event has happened to someone close, or experiencing repeated or extreme exposure to details of a traumatic event. (3) The existence of birth trauma and its potential consequences have been historically under-recognized by professionals and the public because of the societal belief that childbirth should always be a positive experience. (4) In reality, the birth process can be dangerous and requires a woman to put her trust in a medical team that likely includes individuals that the woman has never met. 45% of women who give birth perceive their birth as a traumatic event. (5)

Women who have experienced a traumatic birth describe an array of events that turned the birth from a positive experience into a traumatic one (see Table 1 for a non-exhaustive list of traumatic birth events). (2,6) The potentially traumatic events during childbirth outlined can result in infant complications and admission to a neonatal intensive care unit (NICU). The NICU environment carries with it additional potential traumatic events. A non-exhaustive list of potential NICU-specific traumatic events includes medical intervention at birth, unexpected or prolonged NICU hospitalization, immediate separation from newborn, seeing the infant in the NICU for the first time, code blue events, failed extubations, the NICU waiting room, or surgeries. (7)

No matter the reason that the birth is perceived as traumatic, traumatic birth is a complicated phenomenon. Women who have experienced a traumatic birth have described the following essential themes of birth trauma: perception of lack of caring from those who are supposed to care (feeling abandoned, stripped of dignity, lack of support or reassurance), poor communication from key players, feeling invisible, feeling powerless (betrayals of trust, not feeling protected by staff), and wondering if the ends justify the means (i.e., pondering if having a healthy baby justifies the endured trauma and experiencing guilt associated with that thought). (2)

Morgan Staver BSN, RN, PMH-C

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.

Who experiences birth trauma?

A traumatic birth can happen to anyone: it is independent of race or socioeconomic status. (8) The most important factors regarding how a woman conceptualizes her delivery experience are a) the support she receives from caregivers, b) her involvement in decision-making processes, and c) her expectations of the birth experience and if they were met. (4) Some women are more likely than others to perceive their birth as traumatic due to their previous life experiences. Women with a history of psychological problems, trauma or sexual abuse, anxiety, or nulliparity are more likely than women with none of these experiences to perceive birth as a traumatic event.

Table 1. Traumatic Birth Events

<table>
<thead>
<tr>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stillbirth or infant death</td>
</tr>
<tr>
<td>Emergency cesarian delivery</td>
</tr>
<tr>
<td>Fetal distress</td>
</tr>
<tr>
<td>Cardiac arrest</td>
</tr>
<tr>
<td>Inadequate medical care</td>
</tr>
<tr>
<td>Fear of epidural</td>
</tr>
<tr>
<td>Congenital anomalies</td>
</tr>
<tr>
<td>Inadequate pain relief</td>
</tr>
<tr>
<td>Postpartum hemorrhage</td>
</tr>
<tr>
<td>Manual removal of placenta</td>
</tr>
<tr>
<td>Use of forceps</td>
</tr>
<tr>
<td>Vacuum extraction</td>
</tr>
<tr>
<td>Skull fracture</td>
</tr>
<tr>
<td>Severe toxemia</td>
</tr>
<tr>
<td>Premature birth</td>
</tr>
<tr>
<td>Prolonged or painful labor</td>
</tr>
<tr>
<td>Rapid delivery</td>
</tr>
<tr>
<td>Degrading experiences</td>
</tr>
<tr>
<td>Severe pre-eclampsia</td>
</tr>
<tr>
<td>3rd or 4th-degree laceration</td>
</tr>
<tr>
<td>Hyperemesis gravidarum</td>
</tr>
<tr>
<td>Shoulder dystocia</td>
</tr>
</tbody>
</table>

What is birth trauma?

The recognition of birth trauma is a relatively new phenomenon, first referenced in the scientific literature in the 1990s. (1)

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 and caregivers, educators, and service providers, all driven by their desire to give voice to and support babies and families at risk across the country.

Some women are...

Readers can also follow NEONATOLOGY TODAY via our Twitter Feed @NEO T ODAY
Perceiving birth as traumatic does not always lead to the development of PTSD. Risk factors present before birth (i.e., before or during pregnancy) and during birth influence if a woman who experiences a traumatic birth will develop symptoms of PTSD and how quickly the PTSD symptoms may resolve (see Table 2 for a list of risk factors). (8,9)

PTSD does not occur in all populations equally. In a recent meta-analysis, researchers estimated that the community prevalence of postpartum PTSD is 3.1%. In contrast, the prevalence in the at-risk population (i.e., perinatal risk, trauma history, psychiatric history) is estimated to be 15.7%. (8) In women who develop PTSD after birth, postpartum depression, maternal complications, infant complications, trauma history, negative interactions with staff, (8) poor coping, and stress are all correlated with PTSD symptoms. (9)

“If all PTSD diagnostic criteria are met, but the symptoms do not last for more than one month, a diagnosis of acute stress disorder is more appropriate. (3).”

What is the relationship between birth trauma and PTSD?

Not everyone who experiences a traumatic birth will go on to develop PTSD. While 45% of women state that their birth was traumatic, only around 3% of women develop clinically significant PTSD. (5) As described above, birth trauma fulfills criterion A, exposure to a traumatic event, to diagnose PTSD. Other diagnostic criteria for PTSD broadly include symptoms of re-experiencing, avoidance, negative changes in cognition or mood, and hyperarousal. These symptoms must last for at least one month, cause clinically significant impairment in functioning, and cannot be attributable to another medical condition or substance use. If all PTSD diagnostic criteria are met, but the symptoms do not last for more than one month, a diagnosis of acute stress disorder is more appropriate. (3) It is possible to experience PTSD or acute stress disorder symptoms after a traumatic birth and not meet full diagnostic criteria for either disorder.

How is postpartum PTSD different from ‘general’ PTSD?

While postpartum PTSD meets all the DSM 5 criteria for PTSD, unique factors make it distinct from PTSD resulting from another traumatic event. For instance, childbirth may be the only criterion A event for a PTSD diagnosis that is generally assumed to be a joyous event. Experiencing a seemingly positive life event such as childbirth as traumatic may affect how a woman conceptualizes the legitimacy of the traumatic experience and may influence reporting of symptoms. The symptom presentation of postpartum PTSD shows a unique clustered pattern:

- Re-experiencing and avoidance related to childbirth, with the physical sequelae of birth and the baby acting as a constant reminder of the traumatic birth, and
- Symptoms of arousal and negative alterations in cognition or mood that align with the general PTSD criteria

The social implications resulting from a traumatic birth also affect symptom presentation of postpartum PTSD uniquely from ‘general’ PTSD. The effects of the traumatic birth are experienced by and affect the whole family. A traumatic birth and postpartum PTSD are unique because biologic women exclusively experience PTSD due to birth trauma. The woman-only survivor profile’s clinical, social, and political implications may play a role in the survivor’s experiences after a traumatic birth. (10)

Why does birth trauma matter?

Although most women who experience a traumatic birth do not develop PTSD, the core life experience of childbirth has been corrupted. If a woman develops PTSD after a traumatic birth, she will face potential consequences related to her healthcare and her family and baby’s functioning. Documented behavioral consequences of PTSD due to birth trauma include avoidance of postpartum care, impaired parental-infant bonding, PTSD in a partner who witnessed the birth, sexual dysfunction, avoidance of future pregnancies, elective cesarean births in future pregnancies, difficulties with breastfeeding, yearly anniversary of traumatic birth, low self-esteem, lower birth weight infants, and lower breastfeeding rates.

Table 2. Risk Factors Associated with PTSD After Childbirth

<table>
<thead>
<tr>
<th>Pre-Birth Factors</th>
<th>Birth Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy psychopathology or depression during pregnancy</td>
<td>Subjective distress during labor</td>
</tr>
<tr>
<td>Fear of giving birth</td>
<td>Negative feelings during birth</td>
</tr>
<tr>
<td>Health complications during pregnancy</td>
<td>Lack of control or agency during birth</td>
</tr>
<tr>
<td>Previous counseling for pregnancy or birth problems</td>
<td>Obstetric emergencies</td>
</tr>
<tr>
<td>History of PTSD</td>
<td>Operative births</td>
</tr>
<tr>
<td></td>
<td>Lack of support from staff</td>
</tr>
<tr>
<td></td>
<td>Dissociation during birth</td>
</tr>
</tbody>
</table>
ing rates. (4,6) Potential links also exist between maternal PTSD and infant cortisol, sleeping, and eating problems. There is mixed evidence for the associations between postpartum PTSD and preterm birth, fetal growth, head circumference, mother-infant bonding, and infant development. (11)

Obstetric and neonatal clinicians also should recognize that a traumatic birth experience has a complicated relationship with breastfeeding. A traumatic birth can impede breastfeeding by producing feelings of violation, physical pain, and detachment from the infant. Women who experienced a traumatic birth may perceive a relationship between the trauma and decreased milk supply. Breastfeeding may also produce intrusive flashbacks in some women. However, a traumatic birth can promote breastfeeding in some women because it may be a way for the mother to 'redeem' herself after a traumatic birth or provide an opportunity for grounding, a type of coping mechanism. The reasons why traumatic birth can be a motivating factor for some women but impede breastfeeding in other women are currently unknown. (12)

What should neonatal care providers know about birth trauma?

Obstetric and neonatal clinicians may encounter women who have experienced a traumatic birth more often than they realize. Because seemingly ‘normal’ births may be perceived as traumatic, it is vital for professionals working in this area to ask the mother about her thoughts and feelings about her birth experience. Pay special attention to women whose birth experiences included observable risk factors for a traumatic birth associated with developing PTSD (e.g., operative births or obstetric emergencies). (9) Clinicians should consider assessing women during pregnancy for the factors associated with an increased risk of developing PTSD after birth (e.g., depression during pregnancy, fear of childbirth, poor health or pregnancy complications, and a history of PTSD). (9)

If a patient has experienced traumatic birth or is at risk for developing PTSD, refer her for mental health treatment by a clinician that specializes in perinatal mental health, if possible. There are many effective treatments for PTSD, and the mental health professional will work with the patient to identify a treatment that best fits her needs. Potential treatments include psychotherapy and pharmacotherapy. Psychotherapy may be more likely to lead to a more significant reduction in PTSD symptoms that last longer than using first-line medications such as selective serotonin reuptake inhibitors alone. Trauma-focused psychotherapies effective for PTSD treatment are prolonged exposure therapy, cognitive processing therapy, and eye movement desensitization and reprocessing. (13) Currently, there is no evidence addressing primary prevention of birth trauma. However, expressive writing soon after delivery of a healthy infant may be an effective intervention to prevent the development of PTSD symptoms after childbirth. (4)

Obstetric clinicians should promote factors that have shown to be protective against traumatic birth. The factor with the most empirical support that may reduce a woman’s chance of experiencing a traumatic birth or reduce her likelihood of developing postpartum PTSD is social support during birth. (9) Allowing the presence of a support person during birth is critical to reducing the risk for birth trauma and PTSD. Perceived lack of staff support and negative interactions with staff during delivery are modifiable risk factors for birth trauma and subsequent PTSD that obstetric and neonatal clinicians can target to reduce adverse outcomes.

Conclusion

Just under half of the women who give birth perceive their birth experience as traumatic, and a small but significant percentage of this population develops PTSD. The symptoms and experiences of women who experience traumatic birth are important to evaluate because birth trauma can go unrecognized if not assessed. Clinicians who work with this population should be aware of the risk factors for experiencing birth as traumatic, the risks for developing PTSD after birth, and the potential consequences of postpartum PTSD. Bringing a conversation about birth trauma to our patients can decrease any stigma attached to the experience and potentially identify more women who would benefit from psychiatric care.

“Clinicians who work with this population should be aware of the risk factors for experiencing birth as traumatic, the risks for developing PTSD after birth, and the potential consequences of postpartum PTSD. Bringing a conversation about birth trauma to our patients can decrease any stigma attached to the experience and potentially identify more women who would benefit from psychiatric care.”

References:
Corresponding Author:

Morgan Staver BSN, RN, PMH-C
PhD-PMHNP Student
University of Nebraska Medical Center College of Nursing
Omaha, NE
Email: morgan.staver@unmc.edu

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

Disclosure: The author does not have any conflicts to disclose.

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.


Disclosures: The author does not have any conflicts to disclose.

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.
A Multidisciplinary Approach to Perinatal Cardiology

Volume 1

Edited by P. Syamasundar Rao and Dharmapuri Vidyasagar

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.
Caring for Pregnant Patients & Their Families: Providing Psychosocial Support During Pregnancy, Labor and Delivery

WWW.MYPERINATALNETWORK.ORG
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.
**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.

---

**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 CEUs 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)™. 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.

Follow us online at @MyNICUNetwork
www.myperinatalnetwork.org       Phone: 805-372-1730
The 34th Annual Gravens Conference on the Environment of Care for High Risk Infants
March 3, 4, 10, and 17, 2021: Virtual live
March 24 – September 30, 2021: On-demand
www.thegravensconference.com
Early Bird Registration through Dec. 31, 2020
Maintain at least a 30-DAY SUPPLY of your medications.

Keep prenatal appointments.

Talk to your health care provider about STAYING SAFE DURING COVID-19.

New subscribers are always welcome!

NEONATOLOGY TODAY

To sign up for a free monthly subscription, just click on this box to go directly to our subscription page.
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?

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
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

My Perinatal Network and My NICU Network are products of a collaboration between NPA and NPN. © 2020

National Perinatal Association
NICU Parent Network
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
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

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

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

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 Gap Baby: An RSV Story
Caring for Pregnant Patients & Their Families: Providing Psychosocial Support During Pregnancy, Labor and Delivery

WWW.MYPERINATALNETWORK.ORG
DID YOU KNOW? Postpartum depression affects 10% of fathers.

www.nationalperinatal.org/mental_health

The only worldwide monthly publication exclusively serving Pediatric and Adult Cardiologists that focus on Congenital/Structural Heart Disease (CHD), and Cardiothoracic Surgeons.

Supporting NICU Staff so they can support families

Providing online education that is...
- Story-Driven
- Trauma-Informed
- Evidence-Based

The preeminent provider of compelling perinatal education on psychosocial support created through interprofessional collaboration

www.mynicunetwork.org
What’s in Biden’s Budget Proposal for Moms and Babies?

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.

President Joe Biden’s $6 trillion budget is the highest level of proposed spending since the Second World War. (1) So what does it offer for moms and infants?

Framed as an investment for future generations, the budget calls for funds to:

• Reduce maternal mortality and morbidity rates nationwide. The president identified more than $200 million for programs to improve care for pregnant moms, including the creation of more state pregnancy medical homes. The medical home model aims to coordinate services and supports in a patient-centered way, with the ultimate goal of reducing preterm births.

• Lower health insurance premiums. President Biden’s proposed budget includes funding to make permanent the health insurance tax credits instituted by the COVID-19 rescue package. As it was officially named, the American Rescue Plan reduced the premiums of 9 million people by an average of $50 per month.

• Address disparities in health care. Social determinants of health, the social and economic factors that affect how people live, work, and play, have an outsized role in maternal health outcomes. If Congress approves the president’s proposal, the Centers for Disease Control and Prevention will get another $153 million to support states and territories in their efforts to collect more data and address health inequities caused by social determinants. Related, the administration is interested in doubling the federal investment in community health centers, which play a critical role in providing access to care, including prenatal care, in underserved communities. Expanding this funding, the administration says, would help reduce health disparities.

• Invest in innovation. The president also would like to address some of the most resource-intensive diseases, reducing their burden for the next generation. He proposed $6.5 billion for the creation of the Defense Advanced Research Projects Agency for Health, which would focus on breakthrough treatments and cures for diseases like cancer, diabetes, and Alzheimer’s.

While the proposed budget provides important investments and generous support to those who need it, paying for those programs will depend on increasing revenues or adding to the federal debt.”

Funding the Budget

While the proposed budget provides important investments and generous support to those who need it, paying for those programs will depend on increasing revenues or adding to the federal debt. The president has suggested higher taxes on the wealthy and
corporations to offset much of his new spending. He has also proposed allowing the Trump-era tax cuts on the low and middle class to expire, as scheduled, in 2025.

The president’s proposed budget – and funding suggestions – begin the negotiation process with Congress. The fate and details of his proposal will be hammered out over the coming months.

References:

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

Disclosures: The author has no disclosures

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

Disclosures: The author has no disclosures

Still a Preemie?

Some preemies are born months early, at extremely low birthweights. They fight for each breath and face nearly insurmountable health obstacles.

But that’s not every preemie’s story.

Born between 34 and 36 weeks’ gestation?

Just like preemies born much earlier, these “late preterm” infants can face:
- Jaundice
- Feeding issues
- Respiratory problems

And their parents, like all parents of preemies, are at risk for postpartum depression and PTSD.

Born preterm at a “normal” weight?

Though these babies look healthy, they can still have complications and require NICU care.

But because some health plans determine coverage based on a preemie’s weight, families of babies that weigh more may face access barriers and unmanageable medical bills.

Born preterm but not admitted to the NICU?

Even if preterm babies don’t require NICU care, they can still face health challenges.

Those challenges can extend through childhood, adolescence and even into adulthood.

Some Preemies
- Will spend weeks in the hospital
- Will have lifelong health problems
- Are disadvantaged from birth

All Preemies
- Face health risks
- Deserve appropriate health coverage
- Need access to proper health care

Corresponding Author

Michelle Winokur, DrPH, Policy Communications Director
Alliance for Patient Access (AfPA) Government Affairs Team
1275 Pennsylvania Ave. NW, Suite 1100A Washington, DC 20004-2417
202-499-4114
Email: info@allianceforpatientaccess.org

Readers can also follow NEONATOLOGY TODAY via our Twitter Feed @NEOTODAY
“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.”

The International Children’s Advisory Network, Inc. (iCAN) is about to celebrate a major milestone in a few weeks. 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. With wonderful excitement, we are proud to announce our latest iCAN Chapter - KIDS CHOC-Rady, created by Dr. Carstairs, Chief Population Health Officer, Rady Children’s Hospital and Tiffani Ghere, CHOC Children’s Hospital, Medical Intelligence and Innovation Institute (MI3), International Society of Pediatric Innovation (iSPI). We cannot wait to share the patient voice throughout southern California.

“With wonderful excitement, we are proud to announce our latest iCAN Chapter - KIDS CHOC-Rady, created by Dr. Carstairs, Chief Population Health Officer, Rady Children’s Hospital and Tiffani Ghere, CHOC Children’s Hospital, Medical Intelligence and Innovation Institute (MI3), International Society of Pediatric Innovation (iSPI).”

Continuing the theme of innovation, iCAN hosted the most recent episode of “Ask the Experts” (ATE) with Dr. Anthony Chang (CHOC, AIMed, iSPI) and special guest speakers - Dr. Shareif Taraman, specializing in Neurology and Artificial Intelligence (AI) at Children’s Hospital of Orange County (CHOC), an amazing 15-year-old youth presenter, Sebastian Flores, the creator of...
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).

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!
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.

Criteria for Receipt of Free Copy:

1. Country: Low or Low-Middle Income Country as classified by World Bank.
2. Specialty: First Priority: Pediatric Surgery
3. Practice Environment: First priority: University or academic setting
4. Practice type: Public or university hospital
5. Practice mix: At least 75% non-private practice
6. Institution limits: One copy per institution.

Application for Receipt of Gratis Pediatric Surgery Textbooks

Name (Last, First):
Title:
Full Address (please provide most detailed and accurate street address, NOT PO box):

Phone Number:
Email:
Country:
Specialty:
Status [Trainee (level) or Consultant (years of practice)]:
Hospital Name:
University Name:
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
- Rapid breathing and wheezing
- Breathing that causes their ribcage to "cave-in"
- Bluish skin, lips, or fingertips
- 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

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.

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/rsv
The Academy of Neonatal Care serves to educate Respiratory Therapists, Nurses, and Doctors in current and best practices in Neonatal ICU care. We prepare RT’s new to NICU to fully function as a bedside NICU RT. Our goal is to enrich NICU care at all levels. Beginner to Advanced Practice, there is something for you at:

High-Reliability Organizing (HRO) and Abrupt Change from COVID 19: Failure of Scientific Rationality and Classical Logic

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

Abstract
Neonatologists built the science of neonatology with logic and rationality. The cognitive processes of scientific rationality and classical logic, developed for a structured environment, are poorly defined for operational use. The first impairments from even mild uncontrollable stress are in the cognitive and memory areas of the brain. A ‘cosmology’ event collapses our sensemaking even as we believe in our own rationality. The novice does not have personal anecdotes that are protective in such a collapse. When applying the abstractions of logic to a particular concrete situation, we can fulfill our own sensemaking, or we can make sense for the good of the community. It is the premise and logic that differ. The dominant narrative from scientific rationality and classical logic has become privileged with the loss of knowledge gained during risky operations. Such lost knowledge creates inaccurate models with long-lasting effects on education and policy. In the operational environment, lost knowledge can kill.

“Neonatologists built the science of neonatology from scientific rationality and classical logic. It was gaining life through the extension of neonatology to smaller and sicker babies developed with different forms of rationality and other logic systems.”

Introduction
Neonatologists built the science of neonatology from scientific rationality and classical logic. It was gaining life through the extension of neonatology to smaller and sicker babies developed with different forms of rationality and other logic systems. This is more than a gap between theory and practice (1); it is a gap between the normative stance of a spectator at a fixed point outside the flux of events and the pragmatic stance of a participant engaging the turbulence from within the trajectory of events (2). The liminal threshold beyond which the pragmatic stance operates conceals the rationality and system of logic used by operators. The operator neuromodulates to reduce stress and fear and draws on methods for reasoning with imperfect information in flux. Otherwise, events cascade toward failure.

The obstetrician hands a premature newborn baby to the neonatal team. With the heart rate dropping, the nurse vigorously dries and stimulates the baby, the heart rate increases. The respiratory care practitioner (RCP) gives supplemental oxygen, thrusts the jaw forward, and starts bag-mask ventilation; the heart rate again decreases. Tension is more than emotional; it is physical as the baby is pulled by each caregiver. The physician intubates the infant. The heart rate becomes normal and steady. The baby is now active.

“The tension is more than emotional; it is physical as the baby is pulled by each caregiver. The physician intubates the infant. The heart rate becomes normal and steady. The baby is now active.”

The NICU charge nurse enters the delivery room, and the RCP immediately explains how the nurse missed the need for intubation. The nurse follows with an explanation that the baby needed drying and stimulation—the RCP counters with the need for intubation, evidenced by the pediatrician intubating the baby.

The pediatrician (the author, DvS) stated, “I intubated because the heart rate dropped too low, but the baby had responded to drying and stimulation.” The charge nurse countered, “The nurse is new. We have to get to know you before we can trust you.”

“I came from the fire department. We had a saying; If you don’t trust me, then you can’t be trusted. We trusted new people because we knew we could carry them when they needed it. We had the strength and trust in ourselves that we could carry our partner if needed. That’s how you go into danger.” The pediatrician was startled to note everyone in the room staring at him. The labor nurses approached and said thank you.

Note in this vignette the sources and reliability of the information, the use of reasoning and cognition, and the influence of stress and fear. Each participant believed in themselves, was only a few feet apart, yet inferred different conclusions, made different decisions, then acted in opposition. Each believed in their own rationality and logical conclusions. Yet each was different.

A high-risk situation, or any exigency, necessitates interaction to generate information while also creating structure. With information, we transform abstract concepts into concrete actions. We infer useful conclusions from vague signals or developing circumstances. Reasoned evaluation supports how we think to decide, decide to act, and modify those actions. Then stress and threat mix this up.

Education, planning, rules, and protocols for exigencies such as this all go into the cognitive and memory parts of the brain. The first impairments from even mild uncontrollable stress are in the...
brain’s same cognitive and memory areas. While the participants in the vignette identified the problem of bradycardia, interpretations differed between hypothermia from evaporative water loss versus bradycardia from hypoxemia. Linking these abstract concepts to the concrete situation failed. An element of fear abruptly drives efforts to keep distance from the threat observed in the form of blaming and accusation or by deflection and justification (3). To keep distance from the threat (rapid bradycardia) for self-preservation, the participants explained their own actions and the actions of the others. Information was lost.

“Rationality and reason, along with rules and protocols, derive support from classical logic. We are accustomed to linearity, deduction and analysis, the law of the excluded middle, and the law of non-contradiction.”

Rationality and reason, along with rules and protocols, derive support from classical logic. We are accustomed to linearity, deduction and analysis, the law of the excluded middle, and the law of non-contradiction. In the vignette above, time branched with a course of different possible events between drying with stimulation and hand ventilation with intubation. Beliefs were revised as new information was incorporated or the circumstances changed. A binary truth value did not exist as each circumstance and action could be interpreted right or wrong depending on where they occurred. We began evaluation, but the series of contingencies from each treatment on the other treatment confounded interpretation. Rationality and reason from classical logic were lost.

What appears strongly “right” during the time before an abrupt disruption, based on cognitive science and classical logic, becomes irrelevant amid the exigency. This article describes how the environment of as experienced creates practical rationality and the logic of practice. The mental reaction to the environment creates a gap between scientific rationality and classical logic. This gap does not become visible through investigation or interrogation.

Logic as the use of information

We need relevant information to ensure that our actions match our observed reality and known concepts, reduce error, and confirm the consistency of these concepts. We need relevant information when we purposely risk error to investigate inconsistencies and contradictions between observed reality and known concepts. We strengthen our knowledge with deduction and the analysis of new information. We create knowledge through induction for synthesis when we encounter new information. Information reassures us that we are on a safe path or prepares us at the edge of a crisis. Information reveals contradictions for further investigation. Neonatologists have used the information to extend their experience from our experience provide the mental and emotional stability for careers to evaluate changes and provide context. Mark those in our information is imperfect, unstable, unavailable, and the time to act is limited. Academicians offer theory within the normative stance, yet the NICU is a place of practice from the pragmatic stance. Through engagement, we can bridge the gap between theory and practice (1), discrete concepts and continuous perceptions (8), and the normative stance and pragmatic stance (2). The academic lexicon, though, may not provide effective contributions for that engagement.

Uncertainty and logic

This becomes a fundamental problem for implementing and using HRO – in high risk, how do we rationally use the information and generate reasoned inferences from that information when our information is imperfect, unstable, unavailable, and the time to act is limited. Academicians offer theory within the normative stance, yet the NICU is a place of practice from the pragmatic stance. Through engagement, we can bridge the gap between theory and practice (1), discrete concepts and continuous perceptions (8), and the normative stance and pragmatic stance (2). The academic lexicon, though, may not provide effective contributions for that engagement.

Note the concepts and wording in the academic and professional literature for decision making: cognition, intuition, rational, rationality, logic, analysis, heuristics, biases, error, complexity, chaos, and information processing. Then recall the NICU environment: uncertainty, time compression, stress, emotions, and doubt. Ambiguity may lead us to construct a world that is not true while supported by evidence (9). In the realm of uncertainty and ambiguity, an error has critical functions for decision-making and safety. Error corrects heuristic bias (10). Error, unfortunately, has become an indicator of careless or poor performance to engender fear of the system and supervisors. The inability to neuromodulate the resulting endemic stress-fear-threat (3) corrupts safe and effective operations, creating the ecology of fear (11).

The structured, academic presentation of theory and logic does not match the experience of Neonatologists, particularly in relation to their years of experience. Perhaps we do not sense the utility or the effects of stress on our cognition, rationality, and logic because of the shifting baseline of experience and what we perceive as normal (12). We draw upon anecdotes from early in our careers to evaluate changes and provide context. Mark those infants who will now live and think of all the lives gained. Anecdotes from our experience provide the mental and emotional stability for reflective reasoning and give meaning to the work of the Neonatologist (4, 13). We accept as a baseline the survival and death for infants of certain gestational ages and weights at the beginning of our careers. With experience, we see these babies who previously would have died now thrive. These babies give value to what neonatology has accomplished. The extension of neonatology to gain life is remembered through personal anecdotes triggered by
Today –

“**The novice does not have those anecdotes. Should a baby die, the novice experiences a life cut short while the experienced Neonatologist counteracts the pain with knowledge of lives gained that were once lost.**”

The novice does not have those anecdotes. Should a baby die, the novice experiences a life cut short while the experienced Neonatologist counteracts the pain with knowledge of lives gained that were once lost. This unrecognized stress impairs the rationality of the novice, engenders a beginning sense of futility, and impairs their ability to infer optimism amid critical illness.

Rather than ‘gained life,’ the novice comes to expect babies to live who would have died at the beginning of the veteran Neonatologist’s career.

During the first years of a new PICU, staffing came from ward nurses and NICU respiratory care practitioners (RCP). Several days before Christmas, in the third year of the PICU, 24 infants received mechanical ventilation due to RSV bronchiolitis. At the end of patient care rounds, the level of agitation of the staff became palpable. Finally, the question was asked, “Why can’t we wean these babies and extubate them so they can be home by Christmas?” The question was not about a response to treatment. It emerged from days spent with frightened, anxious parents, limited information and prediction, and the lack of a logical system for understanding. Staff did not have personal anecdotes that would give meaning to their work. The author (DvS) had personal experience with the abrupt death of infants from RSV and had worked to keep these infants alive, un-intubated, pending transfer to a PICU. Thus, the question from the author, “Where did these infants go three years ago? I was at the regional receiving PICU. We did not see infants from this area.” Sometimes we must use our own anecdote to shift the baseline. “These 24 infants would have died three years ago, just days before Christmas. They are alive today and will go home to their parents because of you.”

We had a similar problem with Adult Respiratory Distress Syndrome (ARDS), a disease new to the PICU. After a few weeks of treating ARDS, staff began to urge PICU attendings to encourage parents to withhold ventilator support as the ethical response. Again, we sometimes must artificially shift the baseline with an anecdote. The apparent deterioration from tension pneumothorax indicated a healing lung. We counted the children with ARDS, those who lived, and those who died. Our survival rate of 50% was the national average, but those who lived transferred to the ward after about a month while those who died lingered on the ventilator for 5-7 months. The ones who died were easier to remember because of their longer admission. We were saving the lives of children who otherwise would have died.

The intellectual strength and power of cognitive science, scientific rationality, and classical logic readily give way to the mental effects of novelty, uncertainty, and uncontrollability. Psychological stress is the neuroanatomic reaction, with even minor uncontrollable stress impairing abstract thought, memory retrieval, working memory, cognitive flexibility, and executive functions (14-17). Organizations invest heavily in the objective, structured systems, rely on cognitive flexibility, and presume classical logic will suffice. Yet, even minor stress corrupts their plans while the logic we can use in turmoil is not well identified.

Within the trajectory of turmoil, we must use information. To not use or distrust information is a decision about its use. The search for and evaluation of information delays action even as confirmed information changes or becomes unreliable. Methods of rationality and logic in a stable environment with well-structured problems offer little guidance. People revert to their “common sense.” Karl Weick (18) describes how such a ‘cosmology’ event collapses our sensemaking even as we believe in our own rationality.

Regardless of physical threats and social interactions, we respond to our mental environment in a way that makes sense to us at the moment but becomes refined with reflection as we gain experience. We likely call this “common sense” or “reasoned expertise.” Common sense, rationality, reasoning, and logic become subsumed into an individual’s logic of practice (6). Scientific rationality guides interpretation and understanding, but we must not forget this is objective and reasoned (7). Formal logical systems for truth become difficult when truth shifts or is contingent. Linear classical logic, separated from experience, influences thinking during the experience.

**The Mental Environment of HRO**

Logic and rationality, developed for a structured environment, are poorly defined for operational use. A threshold divides the stable, structured environment from more tumultuous circumstances.

However, what is stable and structured for one person may be tumultuous for the individual a foot away. The threshold dividing these worlds is both physical and mental.

Compared to concrete action, superficial comparison of abstract thought readily puts abstract thought at a higher level of function. This makes sense for abstraction as the depth of reflection versus the immediacy of concreteness. Combining concreteness with action, as Aristotle did, creates a much higher level of thought, the first of Aristotle’s Cardinal Virtues (19). When applying abstractions to a particular concrete situation, we can fulfill our own sensemaking, or we can make sense for the good of the community. The former is a vice, the latter a virtue(19). It is the premise and logic that differ.

“**Rationality and logic are sufficiently developed for stable states that we become accustomed to relying on them for emergencies, despite the differences in premises, truth values, and the rules of inference. Unfortunately, operators may not necessarily agree on which premises to use, their truth value, and whether an inference is possible.”**

=Rationality and logic are sufficiently developed for stable states that we become accustomed to relying on them for emergencies, despite the differences in premises, truth values, and the rules of inference. Unfortunately, operators may not necessarily agree on
which premises to use, their truth value, and whether an inference is possible. At its most basic, we disagree and may disagree quite emotionally. At a deeper and more fundamental level, those with more extensive experience will stop talking.

I had the rear-door position. My weapon was drawn and ready. When the main force went in the front door, I heard yelling and a warning that “they” were running out the back towards another agent and me. When the back door flew open, I was in the ready position (weapon up) and prepped to announce ourselves, etc. That lasted for about ½ a second as the first thing out the door was a snarling and angry German Shepherd - which launched right at me and, when I ducked, went right over me and kept on trucking. The suspect was next out, and he was moving almost as fast and was past me before I could react. I yelled for him to stop, but he was a fast-mover. Could I / Should I have shot him in the back - for a drug offense of unknown size/quantity - no way - and I didn’t see a weapon.

Richard Holbrook, Special Agent, Air Force Office of Special Investigations (AFOSI), joint narcotics raid with local law enforcement assistance, 1984.

An officer-involved shooting, 11:30 pm, limited moonlight. The victim, a 17-year-old male, lay on the driveway in front of a “garage in the rear.” The suspect in a rape assault, he had wielded a knife in a knife-fighter stance running toward a police officer. Examining the victim, I noticed numerous entry wounds in the shins, with a few in the thigh from a shotgun.

“I thought you said you shot him,” I said to the officer. “I did. But when I saw he was a kid, I aimed for the legs. I didn’t want to shoot a kid.”

Daved van Stralen, 1973

**Quote:**

“The rationality and logic used by both operators a decade apart are not described in the academic literature and not amenable to laboratory study.”

The rationality and logic used by both operators a decade apart are not described in the academic literature and not amenable to laboratory study. More seriously, it is not shared across the liminal threshold with those who have underexperienced in the environment of threat, time compression, existential threat, and the obligation to do the right thing.

We must not rely on a predictable, linear flow or trajectory of events, even during a rapid deterioration. In our experience, “punctuated events” abruptly occur to create seemingly unconnected situations. Karl Weick (personal communication) observed these “punctuated events” need “punctuated sensemaking,” the ability to rapidly create a sense of new events almost independent of the most recent experience.

“During a crisis, there is not time to think about each specific bit of knowledge or experience that we depend on to make sense of imperfect information and ambiguity. But having those resources immediately accessible in our minds, we use them in a conceptual decision-making process to frame the decision. We essentially quickly come up with a paradigm of how to solve the problem. It is after the fact that we retrospectively begin to attribute specific reasons for the decisions that we made.”

**Capt. Chesley “Sully” Sullenberger (personal communication)**

The environment of VUCA-2T

Elsewhere we have described the environment of practice (20), that is, the experienced environment we have in common with military operations, public safety, neonatology, critical care, medical care, nursing care, respiratory care, dietetics, K-12 education, social work, and pediatric subacute care. We have worked closely with all these programs with a robust human behavior component in both internal and external environments, a distinguishing feature from socio-technical systems. We call this environment VUCA-2T.

The military concept of “VUCA” describes the new global environment at the end of the Cold War (21, 22) – volatile, uncertain, complex, and ambiguous.

- **Volatility** comes from rapid and abrupt changes in events.
- **Uncertainty** describes the lack of precise knowledge about the situation.
- **Complexity** refers to a large number of interconnected and changing parts coming together.
- **Ambiguity** describes the multiple interpretations, causes, or outcomes for one situation.

VUCA, however, is a military concept. Military professionals carry the implicit assumption that they work in a dangerous and lethal environment. Consequently, the concept of threat is not translated into civilian applications (23).

- **Threat** impairs cognition and decision-making.

Discussions between a special group in SOCOM (Special Operations Command) and the author (DvS) led to the separation of time compression from volatility. Time compression has meaning and carries special information about the environment, distinguishing these events from urgency or time dependence (23, 24). The group now uses VUCA-2T or VUCA-T² (Sean McKay, personal communication) (25).

- **Time compression** describes the limitations on acquiring information, deciding, or acting before consequential changes in circumstances. Time compression is not a quality of time dependence or time-limitation.

**Quote:**

“The liminal zone is the space between the world we know and the world we do not. Old rules do not apply, we have not learned new rules, and we do not know what rules will work.”

The liminal environment

VUCA-2T fits the anthropological experience of liminality as a transition (26) and the operational environment of the HRO. The liminal zone is the space between the world we know and the world we do not. Old rules do not apply, we have not learned new rules, and we do not know what rules will work. This magnifies the gap between theory and practice (1), discrete concepts and continuous perceptions (27), abstractions and concreteness (Karl Weick, personal communication), and the static normative stance and the pragmatic stance from within the trajectory of events (2).
We can infer information in these situations. For that, we must reduce affective responses to threat in known ways, such as acceptance and control of the feeling of fear (20), neuromodulation of stress-fear-threat (3), and social organizing to prevent the ecology of fear (11). Behaviors come in suites coordinated for various purposes (28, 29). These suites of behaviors create sustained, coordinated defensive responses for survival. The primary defensive and survival functions are 1) reflexive, subcortical actions, 2) hindering memory systems from limiting cognition, and 3) volitional behaviors directed toward self-preservation.

Unlike a suite of behaviors, an ensemble of behaviors is learned and is selectively activated by specific threat cues—the ensemble functions for the individual. The behaviors in an ensemble are considered only in relation to the whole, unlike a suite of behaviors where behaviors are considered as a single property with an ecological function. An ensemble of behaviors serves a social and cultural function (30) by maintaining continuity and ongoing social interaction by evoking social support and validating responses from others in ongoing social interaction (31).

“The organized grouping of stress and fear behaviors gives them a semblance of rationality, making them difficult to identify or isolate. Consequently, individuals with maladaptive stress ensembles resist change. Without change, the affective responses as suites of stress behaviors change to behavioral ensembles through operant conditioning”

The organized grouping of stress and fear behaviors gives them a semblance of rationality, making them difficult to identify or isolate. Consequently, individuals with maladaptive stress ensembles resist change. Without change, the affective responses as suites of stress behaviors change to behavioral ensembles through operant conditioning. Maladaptive behavioral ensembles disrupt rationality to become normalized. Agitation, operant anger, and self-protection become leadership styles and management tools that create the ecology of fear (3, 11).

It becomes difficult to distinguish rational and logical reasoning from stress and fear once they become normative. The inability to translate cognitive and affective processes for VUCA-2T, liminality, and HRO theory into the practice of reliability and safety comes with the loss of nuance and missed, subtle cues within the environment (2). Unrecognized is the loss of neuromodulation as a skill and how to acquire the skill.

**Mental responses**

We can adopt rationality as defined by Sen (above) with the caveat that we can have ‘reasoned’ scrutiny, but the reason that is bounded by time and constrained cognition. What is needed for explication and translation of HRO are methods to infer meaningful and relevant information from uncertainty and ambiguity.

We paraphrase Vanessa Heggie’s (32) comments about the science for climbing Mount Everest: predicting what will happen to a premature infant is a matter of life or death – inaccurate models can kill. Consequently, Neonatologists prioritize neonatal respiratory physiology, not in the laboratory but in the NICU.

The mental responses in this environment, the rationality, and the methods for logical inference are not accessible across the threshold. They remain unstudied and under-described except for the disconnected first-person literature of reflective experience. Often this rationality and logic is reflexively rejected by outsiders and spectators. For operators, the acceptance of uncertainty and fear is unique (20), capability calibrates the threat response (3), and operators focus on possibility over probability. The more significant delineator between spectator and operator is the willingness to say, “I don’t know.”

“Often this rationality and logic is reflexively rejected by outsiders and spectators. For operators, the acceptance of uncertainty and fear is unique (20), capability calibrates the threat response (3), and operators focus on possibility over probability.”

The mental environment as experienced has profound effects on rationality and logic, whether effective or putative. As John Hickey, LAFD engineer, advised the author (DvS), “Davey, it’s OK to say, ‘I don’t know.’” A powerful and practical basis for inductivism in an environment at the time of major fires and recent deaths of firefighters. In the fire service during that era, “I don’t know” yielded trust. Yet, in healthcare, such a statement lowers respect and invites a barrage of disconnected, almost random, advice.

Information in all vignettes presented in this article is incomplete and in flux. The meaning of information is contingent on other information and changes in rapid succession. The capabilities of those accompanying the protagonist have a direct effect on rational reasoning and inference.

Probabilities influence deductive rational inference and decision-making. However, during a VUCA-2T event, the individual becomes part of the problem (2, 13) with direct influence on probabilities. When treating patients with poor responses to treatment, staff often echoed the question of parents – “What are the chances of survival?” One author (DvS) would stress that the job of the PICU team was to change those probabilities. If the child had a 20% survival, we work to make it 40%. If 40% survival, we work to make it 60%. Regardless of the percent survival, we work to put our patients into the survival side, approaching 100%. This avoids the unspoken situation of some caregivers quietly reducing their effort as the chance of success becomes the chance of failure followed by resignation and the emotion of failure. Shifting toward the creation of a new probability also shifts thinking from passive cognition to more effective motor cognition (4), Weick’s (33) “We think by acting.”

**Thoroughbred racehorses**

The author (DvS) worked with a partner on the fire rescue ambulance who bet at the races. He made as much money at the racetrack as he did from the fire department. He studied each jockey and horse and how they ran against each other in all combinations. The author asked, “But wouldn’t the jockey hold back once to change the odds and then make more money?” “No,” he answered, “If you hold back once, then the horse does not know when to do it next time. The horse will hold back at the wrong time. A thoroughbred racehorse knows only one way to run – full strength.”
The author shared this story with the staff. The mustang looks wild and free but cannot win the race. The thoroughbred racehorse is disciplined and runs with full strength. In the PICU, we are the thoroughbred.

The author used this metaphor when staff became weary, emotionally depleted, or showed hidden biases or prejudices. Staff did not realize how prejudice and emotional depletion act in negative feedback to create more depletion. Having witnessed complete exhaustion in moments of dire survival, the authors became familiar with the power of that final positive push.

We have only one way to run – full strength.

The dominant account: Planning and rules

Planning to reduce the mental workload during a VUCA-2T event seems prudent.

A police officer led a team of police officers into a building during an active shooter incident. As he moves closer to the shooter, the shots became louder with the stronger smell of gunpowder. Reaching a set of double doors in the hallway, he could not tell if the shots he heard several seconds before came from the cafeteria behind the double doors or around the hallway corner ahead. As he reaches the double doors, another shot rang out, and it was now clear the shot was around the corner ahead and to the left. Moving forward towards the corner with several officers, he noticed several other officers from his team behind him, attempting to open the double doors to confirm what threat was behind them. The leader led rather than directed movement from a fixed point in the hallway. They were not executing the exact communication, movement, cornering, or clearing techniques from training. Coming to a T-intersection in the hallway, he noticed a second team from a different entry arriving around the corner. Natural verbal and visual signaling rather than formal, structured statements avoided the friendly fire. The team around the corner crossed the hallway in front of his team, moving towards the suspect. The suspect had died by suicide.

The recognition of not following “trained techniques” only came to him during my debrief with him. During the event, they simply handled problems.

Steve Papenfuhs, Sergeant, San Jose Police Department (retired)

The authors, including the above author, have interviewed civilians, EMS, firefighters, and law enforcement personnel after a shooting incident. As with this officer, none of the individuals followed the prescribed response (34). They “simply handled problems.” However, the responders to a terrorist shooting effectively evacuated about 400 elementary school children before the arrival of the first law enforcement officer (36).

We must not confuse being around danger with being in it. Scientific rationality and classical logic decontextualize observation and engagement, forming conclusions not tested in the environment. Such conclusions become a substantial portion of the organization’s knowledge, constraining actions in confusing situations (37). Nevertheless, the experienced veteran responds to concrete circumstances, but abstract, ‘rational’ constraints conflict the novice from effective action. However, the narrative of both follows the dominant, ‘rational’ account (38, 39). Positive feedback from these narratives strengthens the dominant account, influencing actions followed by further conforming, though inaccurate, narratives and increasing ignorance of the environment (37).

“Nevertheless, the experienced veteran responds to concrete circumstances, but abstract, ‘rational’ constraints conflict the novice from effective action. However, the narrative of both follows the dominant, ‘rational’ account (38, 39). Positive feedback from these narratives strengthens the dominant account, influencing actions followed by further conforming, though inaccurate, narratives and increasing ignorance of the environment (37).”

The dominant narrative from scientific rationality and classical logic becomes privileged. To spectators, the actions of the experienced veteran then appear irrational, lacking discipline (2, 18, 37-39). Novices follow the dominant ‘rational’ methods, shifting the baseline from the environment to the office (“laboratory”). The lost knowledge creates inaccurate models with long-lasting effects on education and policy. In the VUCA-2T environment, lost knowledge can kill.

The linearity and sequencing of rules and plans produce reason and logic, distracting from the abstract character of rules and plans created apart from concrete reality. The expert following the rules performs poorly (40-43). We must guard against false protective mechanisms such as abstractions, rules, false confidence, or self-admiration.

Formal Logic Systems

Proper reasoning permits the identification of valid patterns of inference while at the same time abstracting their content. The field of symbolic logic derives from Aristotle’s theory of reasoning. We want to connect ideas and observations through reason in a manner that preserves truth. Formal logic systems confirm ideas and infer new ideas while preserving truth. Validity preserves truth by logical necessity; that is, applying the rules of inference to true premises means the conclusion must follow and be true. Validity reflects the accuracy of form that we cannot have a false statement for our conclusion if the premises are true. If the premises are false, the conclusion is still valid; it is simply not a true conclusion. Validity does not ensure true premises; validity only ensures that the premises will lead to a valid conclusion.

An argument is shown to be valid through derivation. A proof is a formal derivation with stated premises, and each non-premise statement in the proof must be true by a specific rule of inference. Therefore, the conclusion in a proof must be true. In a proof, ev-
ery line must be true, making the proof valid. On the other hand, if the premises are false, the argument can be valid since validity depends solely on its form; it is just no proof.

The roots of proof are from Late Latin proba, meaning «a test.» proof of the pudding shall be in the eating (1708). Today’s version is “The proof is in the pudding” (44).

Formal logic systems should only allow us to derive valid conclusions and verify all valid assertions. They have a similar structure: a set of propositions, apply rules of inference, then derive a conclusion to find a truth statement. An argument is derivable if a conclusion can be reached from its premises. An argument is valid if that conclusion cannot be false, given that the premises are true. Derivability and validity form the basis of soundness, completeness, and consistency, critical principles in a formal logic system, and Kurt Gödel’s incompleteness theorems.

“Derivability and validity form the basis of soundness, completeness and consistency, critical principles in a formal logic system, and Kurt Gödel’s incompleteness theorems.”

Soundness. The system must prove only true sentences. An argument is derivable only if it is valid; only valid formulas can be derived. No deduction can take the argument from true premises to a false conclusion. Thus, deductions preserve truth with the claim that everything derivable in the system is true.

Completeness. The system can prove all valid formulas, the converse of soundness. An argument is valid only if it is derivable. A formal system is complete if, for every statement, either the statement or its negation can be derived (proved) in the system. The deductive system can provide a deduction for every valid argument. The form of completeness differs between logic and math where, in math, it becomes the basis for Gödel’s Completeness and Incompleteness Theorems.

Consistency. The system contains no contradictions and contains at least one situation when all formulas are true.

Inconsistency. There is no statement with its own negation that both can be derived within the system. Inconsistency permits a formal system to derive every statement, which means the logic system is meaningless. Triviality in logic describes meaningless.

A formal system of logic has completeness, consistency, and effective axiomatization (necessary for decidability).

Kurt Gödel, completeness, and incompleteness (45)

To have a set of consistent axioms (never a contradiction) and complete (all formulas can be proved) would give mathematics a solid foundation. Gödel used the above concepts to demonstrate that such a foundation is impossible; any foundation for mathematics would be incomplete, there will always be truths that cannot be proved or disproved. He also proved that any set of axioms necessary for decidability could prove its own consistency. Gödel proved there can be no unification of mathematical theory. What can be proved depends on one’s starting assumptions.

The Completeness Theorem. Every valid logical expression is provable. That is, every logical expression is either satisfiable or refutable. First-order logic is semantically complete but not syntactically complete.

First incompleteness theorem. Any consistent formal system within which a certain amount of elementary arithmetic can be carried out is incomplete. This only concerns derivability, not provability.

The Second Incompleteness. The consistency of arithmetic cannot be proved by arithmetic.

Truth and falsity are incompatible. Every proposition is either true or false (law of excluded middle); there is no gradation. The same proposition cannot be both true and false at the same time (law of non-contradiction). We can produce a truth table with a two-value logic, but the proposition has neither a value between truth and falsity nor both simultaneously.

The two principles excluded middle and contradiction, along with identity, form the traditional three “laws of thought.” Once thought to be independent of each other, Alfred North Whitehead and Bertrand Russell (46) use the principles of logic to deduce the ‘law’ of (non)contradiction ((46), 77, 111 equation 3.24) from the ‘law’ of the excluded middle ((46), 101 equation 2.11. (47)). Thus, the two laws are equivalent rather than independent.

To better appreciate how classical logic supports the science and practice of neonatology and resuscitation, we will present a few principles of metalogic, that is, the metatheory of logic. Along with the above elements, a formal logic system demonstrates completeness, consistency, and decidability (axiomatization); the first

| Table: A formal system of logic possesses decidability, completeness, and consistency (45) |
|----------------------------------------|----------------------------------------|----------------------------------------|
| Decidability                           | Completeness                          | Consistency                            |
| Formalized system                      | The law of the excluded middle         | The law of non-contradiction            |
| Axioms and the proof relation to derive conclusions | Every property or statement of the system can be derived from within the system | No statement and its negation can be derived within the system |
| All formal and symbolic logic systems  | Incompleteness (50)                   | Inconsistency (51)                     |
|                                        | - an element cannot be completely classified | - inconsistent premises will yield any well-formed statement |
|                                        | - incomplete or partial information    | - inferential explosion of triviality |
|                                        | - the excluded middle is not enforced  | - explosion, anything follows from a contradiction |
|                                        |                                       | - triviality, little importance because any proposition can be inferred |
two are germane to logic that tolerates contradictions and does not enforce the excluded middle (48, 49).

**Induction and deduction**

Logic supports empirical science. Empirical science develops by evidence from the senses or builds from experience. Logical inference extends evidence in the creation of knowledge while distinguishing truth from falsity. The ability to prove or disprove the properties of knowledge is fundamental in our use of knowledge. This ability lies at the heart of inductive reasoning and deductive reasoning and influences the selection of formalized logic systems.

**“Inductivism and inductive reasoning build knowledge from observation, but in inductivism, knowledge is not truth. Conclusions from inductive reasoning are plausible rather than having the certainty of truth we see with deductive reasoning.”**

Inductivism and inductive reasoning build knowledge from observation, but in inductivism, knowledge is not truth. Conclusions from inductive reasoning are plausible rather than having the certainty of truth we see with deductive reasoning. The strength of inductive reasoning comes from the relentless pressure to confirm the plausible conclusion, described by Leonhard Euler (52) in George Pólya (53):

“[Observations] will lead us continually to new properties which we shall endeavor to prove afterwards. The kind of knowledge which is supported only by observations and is not yet proved must be carefully distinguished from the truth; it is gained by induction as we usually say…Indeed, we should use such a discovery as an opportunity to investigate more than exactly the properties discovered and to prove or disprove them; in both cases, we may learn something useful.”

Euler believed knowledge could be inductively “assured of its truth” by the number of examples: “anybody can satisfy himself of its truth by as many examples as he may wish to develop. And since I must admit that I am not in a position to give it a rigorous demonstration, I will justify it by a sufficiently large number of examples” (52, 53).

The pursuit of inductive confirmation in this fashion can lead to error which then could lead to harm. During the more deliberate extension of a discipline, we can identify and correct inductive errors to reduce the effects of harm (4). Note that in uncertainty, acting or not acting and engaging or not engaging can be equally harmful. In uncertain situations where a consequence exists death, inductive reasoning to identify ‘probably correct’ conclusions engenders vulnerability, which paradoxically increases safety (20). On the other hand, deductive reasoning seems a better approach as the conclusion is guaranteed to be true. However, this is only if the premises are true. We miss the falsity as the safety margin is only putative. The premises for deductive reasoning must be correct.

It is impossible to deductively treat a premature infant, even with knowledge of anatomy and physiology. The pulmonary system is straightforward because it is included in all science classes and physicians are well-versed in physiology. This can lead to over-confidence by a non-Neonatologist.

- Insufficient oxygen in the airways constricts pulmonary arterioles, leading to pulmonary hypertension, right heart strain, and death. We administer supplemental oxygen. The lung can continue to develop and heal from injury through early childhood.
- Excessive oxygen in the airways leads to Retinopathy of Prematurity and blindness. A relatively straightforward balance can be achieved. The influence of the lung on the retina does not become noticeable until after the damage has started. Damage of a few retina cells impairs growth into more retina cells; a small insult inflicts exponential harm.
- Mechanical ventilation increases exposure to bacteria and subsequent pneumonia, increasing the likelihood of death. Prudence guides us to wean the ventilator.
- Excessive work by the diaphragm steals energy necessary for muscle growth and brain development. There is now a mismatch in timelines as pneumonia will likely occur before muscle wasting is noted and long before brain development becomes measurable.
- The infant’s diaphragm contains fast-twitch fibers with fewer fatigue-resistant fibers. A higher breathing rate is adaptive for the infant’s chest with its relatively fixed tidal volume. The need for increased blood supply steals blood from other organs, including the brain.
- Decreased chest expansion is an interoceptive signal carried by the dorsal vagus nerve to the insular cortex. Decreased tidal volume can cause hypoxic delirium, identified by decreased interactions.

The Neonatologist is aware of this, but the balance is an inductive process of contingent interactions with physiological processes, including different time horizons. Outside physicians are unlikely to grasp these diverse balances.

**“The Neonatologist is aware of this, but the balance is an inductive process of contingent interactions with physiological processes, including different time horizons.”**

The limits of logic

Abstractions, rules, and protocols do not reliably have the truth, which interferes with their use as truth premises for logical inference. It seems counterintuitive that abstractions limit reason, but even minimal stress impairs cognition (3, 16), and abstractions can unintentionally be substituted as concrete information.

Alfred North Whitehead’s “Fallacy of Misplaced Concreteness” (54) 52, 57.

In recognition of the dangers of plausible or inductive reasoning, George Pólya (53) characterized the moral qualities of a scientist:

1. The intellectual courage to be ready to revise beliefs
2. The intellectual honesty to change belief for a compelling reason
3. The wise restraint to not change belief wantonly

Doxastic logic and deontic logic are modal logics for belief revision and duty, respectively.
For Karl Popper, one of the most influential science philosophers of the last century, it was not logical that any positive outcomes from experimental testing could confirm a scientific theory. More problematic was *demarcating* scientific theory from non-science when some meaningful scientific statements could not be conclusively verified (55). Rather than verifiability, falsifiability became the criterion of whether a theory was testable (p 95-96) and could then demarcate science from non-science (p 17-19). The forms must be logically possible to verify and falsify. Popper (p 66) differentiated falsifiability, a criterion for the empirical character, from falsification, which requires special rules to regard a system as falsified.

“Popper used ‘inconsistency’ from classical logic for falsifiability to demarcate empirical science from non-science. To accept inconsistency, equivalent to self-contradiction, is to collapse science.”

Popper (55) (p 65-66, 71-73) used the two classes of inconsistency and non-contradiction to determine if a theory is ‘empirical’ or ‘falsifiable.’ Inconsistency and non-contradiction derive from the classical logical law of non-contradiction, as described above in “Classical Logic.” “The importance of the requirement of consistency will be appreciated if one realizes that a self-contradictory system [inconsistent] is uninformative…Any conclusion we please can be derived from it” (p 73). Popper used ‘inconsistency’ from classical logic for falsifiability to demarcate empirical science from non-science. To accept inconsistency, equivalent to self-contradiction, is to collapse science.

We continue to experience the influence of Popper when someone offers a single counterexample as proof you are wrong.

“For it can easily be shown that if one were to accept contradictions, then one would have to give up any kind of scientific activity: it would mean a complete break-down of science. This can be shown by proving that if two contradictory sentences are admitted, any sentence whatsoever must be admitted” (56). [The] “law of contradiction; that is to say, upon the demand that contradictions, whenever we discover them, must be eliminated. Critical error-elimination on the scientific level proceeds by way of a conscious search for contradictions” (57).

_Karl R. Popper_

Though first-order logic seems like a pillar of science, a presentation of its emergence (58) reveals the limitations of first-order logic and describes the benefits of other logic. John Dewey (59), American philosopher, educator, and psychologist, opposed reliance on first-order logic in the natural sciences, disagreeing with the “assumption that logical and formal principles have a direct material and ontological application, rather than conclusions from empirical evidence.”

We can, however, use logical inconsistencies to drive investigation without rejecting available information (60).

**Classical First-Order Logic**

Logic is found in philosophy, mathematics, and computer science, which use logic for different purposes, although similar in structure (61). Classical, or classical first-order logic, has entered medical care through the sciences and humanities. Classical first-order logic tells us what follows from a proposition but does not tell us what to believe when to act, how to manage ambiguity or describe our duty to subordinates, family, or the infant. Classical logic can interfere when the Neonatologist uses inductive processes to guide the neonate’s care (59).

The scientific method uses classical logic closely related to the study of correct reasoning, making this the presumptive correct logic for science (61). Nevertheless, our experience belies classical logic as correct reasoning, as noted in the vignettes above. Classical logic can impair the extension of a discipline.

At the beginning of the author’s (DvS) experience with long-term ventilation, he followed the goal of weaning the child from the ventilator following blood gas evaluation for O₂ and CO₂. One day a child’s grandmother beseeched an LVN to ask if the doctor could leave her grandson on the ventilator. She liked that he smiled, and he had never smiled before. The difference in ventilator management by blood gas versus smile created logical inconsistency in management with staff from various PICUs. Use of the child’s affective response appeared to contradict scientific rationality and logic, along with standard respiratory care references that mechanical ventilation was difficult for a patient to tolerate.

Logical pluralism reflects the possibility that other logic can offer solutions (62). Nonclassical logical operators, given the same premises but with different interpretations of ‘valid,’ can lead to different logical consequences. What one system captures as valid differs from what the other system captures.

“Nonclassical logical operators, given the same premises but with different interpretations of ‘valid,’ can lead to different logical consequences. What one system captures as valid differs from what the other system captures.”

_The classical predicate or first-order logic is a formal language expressing propositions in terms of predicates, variables, and quantifiers. Predicates express propositions as statements involving the arguments with the simplest predicates expressing properties of things. A statement makes an assertion that may be true or false contingent on the values of the variables._

An agitated patient with mechanical ventilation can disconnect from the ventilator. Cardiac arrest can come quickly. Rapid administration of sedative medication brings quick resolution. Sedation is not available in the subacute nursing facility. The author taught the subacute RCPs to hand ventilate for patient calm (63). Over time the property of mechanical ventilation shifted from _enabling life_ to _enhancing life_ as children began smiling, talking, and interacting with parents.

Readers can also follow

**NEONATOLOGY TODAY**

via our Twitter Feed

@NEOTODAY

**NEONATOLOGY TODAY** www.NeonatologyToday.net June 2021
Further extension occurred for infants with weak abdominal musculature who developed acute respiratory distress during a bowel movement. The RCPs learned that mild back-pressure, a PEEP of 8 cm H$_2$O, would prevent ventilator-related agitation. More significant was the experience of hand ventilation for agitation in children with neurological deficits. After a few breaths, they awaken, older children may begin talking. Discussion with a neuropsychiatrist revealed these children were likely in hypoactive delirium secondary to hypoventilation.

Like the vignette in labor and delivery, the rigidity of classical logic can artificially create tension, corrupt communication, and impair the extension of medical care for the benefit of patients.  

**Data, statistics, and probability**

A premature infant is a state of nonlinear interactions within each developing organ, between developing organs, and within the environment. Collected and analyzed data creates a body of knowledge for medical evaluation and management. However, numerous nonlinear interactions generate a flux of contradictory information and conflicting data making necessary information inconsistent. Reliance on statistics and probability (for example, evidence-based medicine) is not wrong. We must, though, acknowledge the insight shared by Bob Bea (64) (personal communication):

“The key problem in statistics is the validity of the data that has been gathered.”

“The key problem in probability is the potential for changes in conditions in the future that invalidate the data that has been gathered during the past.”

“The ‘tails of distributions’ generally are controlled by ‘rare events’ = ‘outliers.’ If the concerns for ‘reliability’ are primarily concerned with the _rare events_ (for example, commercial aviation and nuclear power generation), then the focus will be on the distribution tails. If the concerns are primarily concerned with _frequently occurring events_, then the central portions of the distributions are of most interest.”

Thus, the problem for the Neonatologist: application of statistics and probability to contradictory and inconsistent information as a _particular_ infant moves from one state of nonlinear interactions to another. Using classical logic to deduce conclusions by inference, reasoning rather than observation lessens our ability to make desirable worlds actual. We lose grasp of the situation.

“**Using classical logic to deduce conclusions by inference, reasoning rather than observation lessens our ability to make desirable worlds actual. We lose grasp of the situation.**”

**Conclusion**

How do we use the information? The author (DvS) gave a lecture on traffic safety for a state office. The audience came from public safety and healthcare. The author elected to teach ‘how to think’ using his public safety experience, combat decision methods, and the Affective Domain of Learning, an approach that had engendered criticism from healthcare and EMS administrators. Two senior police detectives approached after the lecture to say it was the first lecture describing and explaining how they think. The title of the lecture? “Where is Prometheus?”

**References:**

8. Weick KE. Organizing for transient reliability: The production of dynamic non-events. Journal of contingencies and crisis...


van Stralen D, Mercer TA. Pandemic COVID-19, the High-Reliability Organization (HRO), and the Ecology of Fear. Neonatology Today. 2020;15(12):129-38. doi: 10.51362/neo-


van Stralen D, Mercer TA. High-Reliability Organizing (HRO), and the Ecology of Fear. Neonatology Today. 2020;15(9):114-7. doi: 10.51362/neo-

van Stralen D, Inozu B, Byrum S. High Reliability for a Highly Reliability Organization (HRO), and the Ecology of Fear. Neonatology Today. 2020;15(12):129-38. doi: 10.51362/neo-

van Stralen D, Mercer TA. Comment on "A Tactical Medicine After-action Report of the San Bernardino Terrorist Incident". West J Emerg Med. 2018;19(2):287-93. Epub 2018/03/22. doi: 10.5811/westjem.2017.10.31374. PubMed PMID: 29560056; PubMed Central PMCID: PMCPMC5851501 are required to disclose all affiliations, funding sources and financial or management relationships that could be perceived as potential sources of bias. No author has professional or financial relationships with any companies that are relevant to study. There are no conflicts of interest or sources of funding to declare.

van Stralen D, McKay SD, Inaba K, Hartwig M, Mercer TA. Comment on "A Tactical Medicine After-action Report of the San Bernardino Terrorist Incident". West J Emerg Med. 2018;19(5):825-6. Epub 2018/09/12. doi: 10.5811/westjem.2018.6.39216. PubMed PMID: 30202494; PubMed Central PMCID: PMCPMC6123096 are required to disclose all affiliations, funding sources and financial or management relationships that could be perceived as potential sources of bias. No author has professional or financial relationships with any companies that are relevant to study. There are no conflicts of interest or sources of funding to declare.

van Stralen D, Inozu B, Byrum S. High Reliability for a Highly Reliability Organization (HRO), and the Ecology of Fear. Neonatology Today. 2020;15(12):129-38. doi: 10.51362/neo-


Szakolczai A. Liminality and experience: Structuring transitory situations and transformative events. International Po-


44. Online Etymology Dictionary.


47. McGill VJ. Concerning the laws of contradiction and excluded middle. Philosophy of Science. 1939;6(2):196-211.


63. van Straalen D, Westmoreland T. Management of a Mechanical Ventilator Using Patient Calm as an Endpoint. Special Operations Medical Association Scientific Assembly (SOMSA); December 8-11, 2014; Tampa, Florida: Special Operations Medical Association (SOMA); 2014.

64. Prud'homme A. Bob Bea, the Master of Disaster. Men’s Journal 2013:72-5.

Disclosures: The authors have no relevant disclosures.
I was exposed to opioids.
I am not an addict.
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!
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?

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

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

Partnering for patient-centered care when it matters most.

nann.org nationalperinatal.org

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.

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

Survey Says: RSV

Respiratory Syncytial Virus, or RSV, is a dangerous virus that can lead to:
- Hospitalization
- Lifelong health complications
- Death for infants and young children

According to a national survey, Specialty Health Care Providers say:
- They treat RSV as a priority, “often” or “always” evaluating their patients
- RSV is the ”most serious and dangerous” illness for children under four
- Barriers to access and denial from insurance companies limit patients’ ability to get preventive RSV treatment

But Parents are Unprepared:
- Only 46% knew “a lot” about RSV
- Only 27% considered themselves “very well” prepared to prevent RSV

RSV Education & Awareness Can Help
After parents learned more about RSV, they were:
- 61% “More concerned” about their child contracting the disease
- 67% Likely to ask their doctor about RSV

Learn more about RSV at www.infantsearth.org/RSV
ONCE UPON A PREEMIE
BY JENNÉ JOHNS
AUTHOR | SPEAKER | ADVOCATE

“ONE OF A KIND”
“PERFECT FOR PREEMIE FAMILIES”
“ENCOURAGING”

ONCE UPON A PREEMIE IS A BEAUTIFUL NEW WAY TO LOOK AT THE LIFE OF A PREEMIE BABY. IT EXPLORES THE PARENT AND CHILD NEONATAL INTENSIVE CARE UNIT (NICU) JOURNEY IN A UNIQUE AND UPLIFTING WAY.

SPEAKING ENGAGEMENTS
PREEMIE PARENT ALLIANCE SUMMIT
NATIONAL ASSOCIATION OF PERINATAL SOCIAL WORKERS
CONGRESSIONAL BLACK CAUCUS ANNUAL LEGISLATIVE CONFERENCE
NATIONAL MEDICAL ASSOCIATION ANNUAL CONFERENCE
HUDSON VALLEY PERINATAL PUBLIC HEALTH CONFERENCE
MATERNITY CARE COALITION ADVOCACY DAY

MEDIA APPEARANCES

HEART & SOUL

TARAJOH P. HENSON
A Glimpse into Tara Jo P. Henson’s Heart & Soul

HOLIDAY PARTIES MADE SIMPLE
THE ONCE UPON A PREEMIE STORY

AVAILABLE FOR $12.99 ON AMAZON OR ONCEUPONAPREEMIE.COM
I was exposed to opioids. I am not an addict.

Addiction is a set of behaviors associated with having a Substance Use Disorder (SUD). 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!
COMING SPRING 2021
ONCE UPON A PREEMIE ACADEMY
In Demand

SIGN UP AND GET
Academy updates.
Training news.

YES, SIGN ME UP!

EARN CME/CEU

Learn more, visit
onceuponapreemieacademy.com
New subscribers are always welcome!

NEONATOLOGY TODAY
To sign up for a free monthly subscription, just click on this box to go directly to our subscription page.

Did you know that premature and low birth weight babies have a 4x greater risk for SIDS?

At First Candle we’re educating parents, grandparents and caregivers about safer sleep to make sure all babies reach their first birthday. Learn more at firstcandle.org
Nurses: parents trust you.

You can help reduce the risk of Sudden Infant Death Syndrome (SIDS), the leading cause of death among infants between 1 month and 1 year of age. Take our free continuing education (CE) activity to stay up to date on the latest safe infant sleep recommendations. Approved for 1.5 contact hours.

Learn more about the free online activity at https://nichd.nih.gov/SafeSleepCE.

The CE activity explains safe infant sleep recommendations from the American Academy of Pediatrics and is approved by the Maryland Nurses Association, an accredited approver of the American Nurses Credentialing Center's Commission on Accreditation.
AAP updates guidance on returning to sports/activity after COVID-19

June 10, 2021


How should pediatricians evaluate patients who want to return to sports or physical activities after COVID-19 infection? Should kids wear a mask during athletic practices and games?

The updated AAP COVID-19 Interim Guidance: Return to Sports and Physical Activity addresses these questions based on the growing understanding of SARS-CoV-2 infection, increased number of fully vaccinated individuals as young as 12 years and a drop in COVID-19 cases and deaths in the U.S.

The AAP guidance on face masks is consistent with Centers for Disease Control and Prevention (CDC) guidance. A face mask may not be necessary for all sport-related activities. But for those keeping score:

- Everyone should consider wearing a mask in crowded indoor spaces such as locker rooms and shared transportation, regardless of their vaccination status.
- Athletes who are not fully vaccinated should wear face masks when on the sidelines at outdoor sports and during all group training and competition when there is sustained contact of 3 feet or less. They also should wear a mask when arriving at or departing from the playing facility and off the playing field.
- Proper use of a face mask for all indoor sports training, competition and on the sidelines is strongly recommended for those who are not fully vaccinated, except when the mask is a safety risk.
- Unless fully vaccinated, coaches, officials, spectators and volunteers should wear a mask.

"Sports performed outside are lower risk for transmission of SARS-CoV-2, and a face mask may not be necessary for all sport-related activities," according to the guidance.

Mitigation strategies such as wearing a face mask (when appropriate) can reduce transmission rates for indoor sports to as low as outdoor sports. Exceptions to mask-wearing might be appropriate when the risk of heat-related illness is increased.

Return to activity after infection

The guidance includes new information on evaluating patients for resumption of physical activity or sports after testing positive for SARS-CoV-2. Pediatricians should have patients notify them if they test positive for SARS-CoV-2 and document the infection in the medical record.

- For patients with asymptomatic or mildly symptomatic COVID-19 illness: A phone or telemedicine visit is recommended, at a minimum. Recent studies report a lower incidence of myocarditis (0.5% to 3%) from SARS-CoV-2 infection, than reported earlier in the pandemic. However, myocarditis has been reported in patients with asymptomatic or mildly symptomatic illness. Therefore, pediatricians should ask about chest pain, shortness of breath out of proportion for upper respiratory tract infection, new-onset palpitations or syncope. Any reports of these symptoms warrant an in-office visit, physical examination and consideration of EKG before clearing the patient to return to physical activity.

- For patients with moderate symptoms and no evidence of multisystem inflammatory syndrome in children (MIS-C): An in-person evaluation by the primary care pediatrician is recommended. Patients should not exercise until cleared, and the evaluation should occur after symptoms have resolved and quarantine is completed. The guidance recommends reviewing the American Heart Association 14-element screening evaluation with emphasis on cardiac symptoms, complete physical examination and EKG. Next steps depend on cardiac screening or EKG findings.

- For children with severe COVID-19 symptoms or MIS-C: AAP guidance remains unchanged. These children should forgo exercise for at least three to six months and receive cardiology clearance before resuming training or

Readers can also follow
NEONATOLOGY TODAY
via our Twitter Feed
@NEOTODAY
Further workup is not required for children who had SARS-CoV-2 infection and have returned to physical activity or sports on their own and do not have any abnormal signs or symptoms.

**Health supervision visits**

At the annual health supervision visit and preparticipation physical evaluation, pediatricians can provide guidance on gradual return to physical activity if the patient has recovered from COVID-19 and has not participated in consistent physical activity for more than a month. This includes:

- Starting at 25% of usual volume and intensity of activity and consider exercising every other day.
- Increasing volume by 10% each week until desired volume is reached.
- Increasing intensity by 10% each week until desired intensity is reached.

Finally, the AAP encourages COVID-19 vaccination for all eligible people. An athlete who is fully vaccinated can follow CDC transmission mitigation recommendations for vaccinated people.

**Resource**


Contact information for AAP headquarters

American Academy of Pediatrics
345 Park Blvd, Itasca, IL 60143

New AAP main number: 630-626-6000

Trisha Korioth, Staff Writer
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:

Christopher Rizzo, MD, FAAP, Chair, crizz624@gmail.com

Mitchell Goldstein, MD, FAAP, Immediate Past Chair, MGoldstein@llu.edu and

Jackie Burke
Sections Manager
AAP Division of Pediatric Practice
Department of Primary Care and Subspecialty Pediatrics
630.626.6759
jburke@aap.org

Dedicated to the Health of All Children

# # #

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/

CDC advises broader testing for RSV due to regional spikes

June 10, 2021

Clinicians are being advised to broaden their testing for respiratory syncytial virus (RSV) in patients with acute respiratory illness who test negative for SARS-CoV-2, following a recent spike in areas of the South.

In a health alert advisory issued today, the Centers for Disease Control and Prevention (CDC) also is reminding health care personnel, child care providers and staff of long-term care facilities to avoid reporting to work while acutely ill — even if they test negative for SARS-CoV-2.

While RSV activity remained low from May 2020 to early March 2021, the CDC has noticed an increase in RSV cases reported since late March to the National Respiratory and Enteric Virus Surveillance System (NREVSS), a laboratory-based surveillance network.

Increases have been observed in laboratory detections and in the percentages of positive detections for both antigen and polymerase chain reaction testing in parts of region 4 of the U.S. Department of Health and Human Services (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina and Tennessee) and region 6 (Arkansas, Louisiana, New Mexico, Oklahoma and Texas). Due to limited testing outside of the typical RSV season, data are limited in some jurisdictions and may be incomplete for the most recent weeks.

Since this elevated interseasonal activity is a deviation from the typical circulation patterns for RSV, it is not possible to anticipate the likely spread, peak or duration of activity, according to the CDC advisory.

Due to reduced circulation of RSV during the winter months of 2020–21, older infants and toddlers might now be at increased risk of severe RSV-associated illness since they likely have not had typical levels of exposure to RSV during the past 15 months. In infants younger than 6 months, RSV infection may result in symptoms of irritability, poor feeding, lethargy and/or apnea with or without fever. In older infants and young children, rhinorrhea and decreased appetite may appear one to three days before cough, often followed by sneezing, fever and sometimes wheezing.

There is no specific treatment for RSV infection other than symptom management.

CDC guidance includes the following recommendations:

- Clinicians and caregivers should be aware of the typical clinical presentation of RSV for different age groups.
- Clinicians should consider testing patients with a negative SARS-CoV-2 test and acute respiratory illness or the age-specific symptoms listed above for non-SARS-CoV-2 respiratory pathogens, such as RSV. Real-time reverse transcription-polymerase chain reaction is the preferred method to test for respiratory viruses.
- Clinicians should report laboratory-confirmed RSV cases and suspected clusters of severe respiratory illness to local and state health departments according to their routine reporting requirements.
- Clinicians can review weekly

Please submit your manuscript to: LomaLindaPublishingCompany@gmail.com
This holiday season
3,600 families won't be celebrating with their baby.

Help us end
Sudden Unexpected Infant Death
donate at firstcandle.org

Did you know that premature and low birth weight babies have a 4x greater risk for SIDS?

At First Candle we're educating parents, grandparents and caregivers about safer sleep to make sure all babies reach their first birthday. Learn more at firstcandle.org
updates to the NREVSS website and refer to surveillance data collected by local hospitals and health departments for information on RSV circulation trends in their area.

RSV is the most common cause of bronchiolitis and pneumonia in children under a year old. The virus leads to about 58,000 hospitalizations annually, with 100 to 500 deaths among children younger than 5 years.

Resources
1. Information from the CDC on RSV
2. Information from the AAP Red Book on RSV
3. AAP News article on surge in RSV cases in New York hospital
4. Information for parents from Healthy-Children.org on RSV

Contact information for AAP headquarters
American Academy of Pediatrics
345 Park Blvd, Itasca, IL 60143
New AAP main number: 630-626-6000
Alyson Sulaski Wyckoff, Associate Editor

Optic nerve firing may spark growth of vision-threatening childhood tumor

Tuesday, June 1, 2021

NIH-funded pre-clinical study supports key role of neural activity in brain cancers.

In a study of mice, researchers showed how the act of seeing light may trigger the formation of vision-harming tumors in young children who are born with neurofibromatosis type 1 (NF1) cancer predisposition syndrome. The research team, funded by the National Institutes of Health, focused on tumors that grow within the optic nerve, which relays visual signals from the eyes to the brain. They discovered that the neural activity which underlies these signals can both ignite and feed the tumors. Tumor growth was prevented or slowed by raising young mice in the dark or treating them with an experimental cancer drug during a critical period of cancer development.

"Brain cancers recruit the resources they need from the environment they are in," said Michelle Monje, M.D., Ph.D., associate professor of neurology at Stanford University, Palo Alto, California, and co-senior author of the study published in Nature. "To fight brain cancers, you have to know your enemies. We hope that understanding how brain tumors weaponize neural activity will ultimately help us save lives and reduce suffering for many patients and their loved ones."

The study was a joint project between Dr. Monje’s team and scientists in the laboratory of David H. Gutmann, M.D., Ph.D., the Donald O. Schnuck Family Professor and the director of the Neurofibromatosis Center at the Washington University School of Medicine in St. Louis.

In 2015, Dr. Monje’s team showed for the first time that stimulation of neural activity in mice can speed the growth of existing malignant brain tumors and that this enhancement may be controlled by the secretion of a protein called neuroligin-3. In this new study, the researchers hoped to test out these ideas during earlier stages of tumor development.

"Over the years, cancer researchers have become more and more focused on the role of the tumor microenvironment in cancer development and growth. Until recently, neuronal activity has not been considered, as most studies have focused on immune and vascular cell interactions," said Jane Fountain, Ph.D., program director at the NIH’s National Institute of Neurological Disorders and Stroke (NINDS), which par-
continuing medical education

The Continuing Education Department at PAC/LAC is pleased to consider requests to be a joint provider of your CME activity. PAC/LAC is actively involved in direct and joint-providership of multiple continuing education activities and programs and works with our partners to ensure the highest standards of content and design. PAC/LAC is the recipient of the 2018 Cultural & Linguistic Competency Award. This award recognizes a CME provider that exemplifies the goal of integrating cultural and linguistic competency into overall program and individual activities and/or a physician who provides leadership, mentorship, vision, and commitment to reducing health care disparities.

PAC/LAC is an accredited provider of continuing education by Accreditation Council for Continuing Medical Education / Institute for Medical Quality, the California Board of Registered Nursing, the California Association of Marriage and Family Therapists, the National Commission for Health Education Credentialing, and the American Association for Respiratory Care.

To inquire about Continuing Education Joint-Providership opportunities for your event please visit our website and complete the online request form.

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.

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
tially funded the study. "This study is one of the first to show a definitive role for ne-
urons in influencing tumor initiation. It’s both scary and exciting to see that controlling
neuronal activity can have such a profound influence on tumor growth."

Specifically, the researchers chose to study optic nerve gliomas in mice. Gliomas are
formed from newborn cells that usually become a type of brain cell called glia. The
tumors examined in this study are reminiscent of those found in about 15-20% of
children who are born with a genetic mutation that causes NF1. About half of these
children develop vision problems.

Dr. Gutmann helped discover the disease-causing mutation linked to NF1 and its en-
coded protein, neurofibromin, while working in a lab at the University of Michigan,
Ann Arbor, which was then led by the current NIH director, Francis S. Collins, M.D.,
Ph.D. Since then, the Gutman team’s pioneering work on NF1, and particularly
NF1-brain tumors, has greatly shaped the medical research community’s under-
stANDING of low-grade glioma formation and progression.

"Based on multiple lines of converging evidence, we knew that these optic nerve
gliomas arose from neural precursor cells. However, the tumor cells required help
from surrounding non-cancerous cells in the optic nerve to form gliomas," said Dr. Gut-
mann, who was also a senior author of this study. "While we had previously shown
that immune cells, like T-cells and microglia, provide growth factors essential for tu-
mor growth, the big question was: ‘What role did neurons and neural activity play in
optic glioma initiation and progression?’"

To address this, the researchers performed experiments on mice engineered by the
Gutmann laboratory to generate tumors that genetically resembled human
NF1-associated optic gliomas. Typically, optic nerve gliomas appear in these mice
between six to sixteen weeks of age.

Initial experiments suggested that optic nerve activity drives the formation of the
tumors. Artificially stimulating neural ac-

tivity during the critical ages of tumor de-
velopment enhanced cancer cell growth, resulting in bigger optic nerve tumors. In
contrast, raising the mice in the dark dur-
ing that same time completely prevented
new tumors from forming.

Interestingly, the exact timing of the dark period also appeared to be important. For
instance, two out of nine mice developed tumors when they were raised in the dark
beginning at twelve weeks of age.

“These results suggest there is a tempo-
rnal window during childhood development
when genetic susceptibility and visual
system activity critically intersect. If a sus-
ceptible neural precursor cell receives the
key signals at a vulnerable time, then it will
become cancerous. Otherwise no tumors
form,” said Yuan Pan, Ph.D., a post-doc-
toral fellow at Stanford and the lead author.
“We needed to understand how this hap-
pens at a molecular level.”

Further experiments supported the idea
that neuroligin-3 may be a key player in
this process. For instance, the scientists
found high levels of neuroligin-3 gene ac-
activity in both mouse and human gliomas.
Conversely, silencing the neuroligin-3
gene prevented tumors from developing in the
neurofibromatosis mice.

Traditionally, neuroligin-3 proteins are
thought to act like tie rods that physically
brace neurons together at communica-
tion points called synapses. In this study,
the researchers found that the protein
may work differently. The optic nerves of
neurofibromatosis mice raised under nor-
mal light conditions had higher levels of a
short, free-floating version of neuroligin-3
than the nerves of mice raised in the dark.

“Previously our lab showed that neural ac-

tivity causes shedding of neuroligin-3 and
that this shedding hastens malignant brain
tumor growth. Here our results suggest that
neuroligin-3 shedding is the link between
neural activity and optic nerve glioma for-
mation. Visual activity causes shedding and
sheding, in turn, transforms susceptible
cells into gliomas,” said Dr. Monje.

Finally, the researchers showed that an
experimental drug may be effective at
combating gliomas. The drug is designed
to block the activity of ADAM10, a protein
that is important for neuroligin-3 shedding.
Treating the neurofibromatosis mutant
mice with the drug during the critical period
of six to sixteen weeks after birth prevent-
ed the development of tumors. Treatment
delayed to twelve weeks did not prevent
tumor formation but reduced the growth of
the optic gliomas.

“These results show that understanding
the relationship between neural activity
tumor growth provides promising av-

enues for novel treatments of NF1-optic
gliomas,” said Jill Morris, Ph.D., program
director, NINDS.

Dr. Monje’s team is currently testing neu-
roligin-3-targeting drugs and light exposure
modifications that may in the future help
treat patients with this form of cancer.

This work was supported by grants from the NIH (NS092597, NS111132,
NS097211, CA165962, EY026877,
EY029137, CA233164); the Depart-
ment of Defense (W81XWH-15-1-0131,
W81XWH-19-1-0260); Brantley’s Project
supported by Ian’s Friends Foundation;
Gilbert Family Foundation; Robert J. Kle-
berg, Jr. and Helen C. Kleberg Founda-
tion; Cancer Research UK; Unravel Pedi-
atriac Cancer; McKenna Claire Foundation;
Kyle O’Connell Foundation; Virginia and
D. K. Ludwig Fund for Cancer Research;
Waxman Family Research Fund; Stan-
ford Maternal and Child Health Research
Institute; Stanford Bio-X Institute; Will Ir-
win Research Fund; Research to Prevent
Blindness, Inc.; Schnuck Markets Inc., and
Alex’s Lemonade Stand Foundation.

This news release describes a basic re-
search finding. Basic research increases
our understanding of human behavior and
biology, which is foundational to advancing
new and better ways to prevent, diagnose,
and treat disease. Science is an unpredict-
able and incremental process — each re-
search advance builds on past discoveries,
often in unexpected ways. Most clinical ad-

The only worldwide monthly publication exclusively serving Pediatric and Adult Cardiologists that focus on Congenital/ Structural Heart Disease (CHD), and Cardiothoracic Surgeons.

Subscribe Electronically
Free on the Home Page
www.CongenitalCardiologyToday.com
Advances would not be possible without the knowledge of fundamental basic research. To learn more about basic research at NIH, visit https://www.nih.gov/news-events/basic-research-digital-media-kit.

NINDS is the nation’s leading funder of research on the brain and nervous system. The mission of NINDS is to seek fundamental knowledge about the brain and nervous system and to use that knowledge to reduce the burden of neurological disease.

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.

NIH…Turning Discovery Into Health®

Article


Institute/Center
National Institute of Neurological Disorders and Stroke (NINDS)

Contact
Christopher G. Thomas (link sends e-mail)
301-496-5751

Scientists discover a new genetic form of ALS in children

Tuesday, June 1, 2021

NIH- and USU- led study links ALS to a fat manufacturing gene and maps out a genetic therapy

In a study of 11 medical-mystery patients, an international team of researchers led by scientists at the National Institutes of Health and the Uniformed Services University (USU) discovered a new and unique form of amyotrophic lateral sclerosis (ALS). Unlike most cases of ALS, the disease began attacking these patients during childhood, worsened more slowly than usual, and was linked to a gene, called SPTLC1, that is part of the body’s fat production system. Preliminary results suggested that genetically silencing SPTLC1 activity would be an effective strategy for combating this type of ALS.

“ALS is a paralyzing and often fatal disease that usually affects middle-aged people. We found that a genetic form of the disease can also threaten children. Our results show for the first time that ALS can be caused by changes in the way the body metabolizes lipids,” said Carsten Bönnemann, M.D., senior investigator at the NIH’s National Institute of Neurological Disorders and Stroke (NINDS) and a senior author of the study published in Nature Medicine. “We hope these results will help doctors recognize this new form
of ALS and lead to the development of treatments that will improve the lives of these children and young adults. We also hope that our results may provide new clues to understanding and treating other forms of the disease.”

Dr. Bönnemann leads a team of researchers that uses advanced genetic techniques to solve some of the most mysterious childhood neurological disorders around the world. In this study, the team discovered that 11 of these cases had ALS that was linked to variations in the DNA sequence of SPLTC1, a gene responsible for manufacturing a diverse class of fats called sphingolipids.

In addition, the team worked with scientists in labs led by Teresa M. Dunn, Ph.D., professor and chair at USU, and Thorsten Hornemann, Ph.D., at the University of Zurich in Switzerland. Together they not only found clues as to how variations in the SPLTC1 gene lead to ALS but also developed a strategy for counteracting these problems.

The study began with Claudia Digegorio, a young woman from the Apulia region of Italy. Her case had been so vexing that Pope Francis imparted an in-person blessing on her at the Vatican before she left for the United States to be examined by Dr. Bönnemann’s team at the NIH’s Clinical Center.

Like many of the other patients, Claudia needed a wheelchair to move around and a surgically implanted tracheostomy tube to help with breathing. Neurological examinations by the team revealed that she and the others had many of the hallmarks of ALS, including severely weakened or paralyzed muscles. In addition, some patients’ muscles showed signs of atrophy when examined under a microscope or with non-invasive scanners.

Nevertheless, this form of ALS appeared to be different. Most patients are diagnosed with ALS around 50 to 60 years of age. The disease then worsens so rapidly that patients typically die within three to five years of diagnosis. In contrast, initial symptoms, like toe walking and spasticity, appeared in these patients around four years of age. Moreover, by the end of the study, the patients had lived anywhere from five to 20 years longer.

“These young patients had many of the upper and lower motor neuron problems that are indicative of ALS,” said Payam Mohassel, M.D., an NIH clinical research fellow and the lead author of the study. “What made these cases unique was the early age of onset and the slower progression of symptoms. This made us wonder what was underlying this distinct form of ALS.”

The first clues came from analyzing the DNA of the patients. The researchers used next-generation genetic tools to read the patients’ exomes, the sequences of DNA that hold the instructions for making proteins. They found that the patients had conspicuous changes in the same narrow portion of the SPLTC1 gene. Four of the patients inherited these changes from a parent. Meanwhile, the other six cases appeared to be the result of what scientist call “de novo” mutations in the gene. These types of mutations can spontaneously occur as cells rapidly multiply before or shortly after conception.

Mutations in SPLTC1 are also known to cause a different neurological disorder called hereditary sensory and autonomic neuropathy type 1 (HSAN1). The SPLTC1 protein is a subunit of an enzyme, called SPT, which catalyzes the first of several reactions needed to make sphingolipids. HSAN1 mutations cause the enzyme to produce atypical and harmful versions of sphingolipids.

At first, the team thought the ALS-causing mutations they discovered may produce similar problems. However, blood tests from the patients showed no signs of the harmful sphingolipids.

“At that point, we felt like we had hit a roadblock. We could not fully understand how the mutations seen in the ALS patients did not show the abnormalities expected from what was known about SPTLC1 mutations,” said Dr. Bönnemann. “Fortunately, Dr. Dunn’s team had some ideas.”

For decades Dr. Dunn’s team had studied the role of sphingolipids in health and disease. With the help of the Dunn team, the researchers reexamined blood samples from the ALS patients and discovered that the levels of typical sphingolipids were abnormally high. This suggested that the ALS mutations enhanced SPT activity.

Similar results were seen when the researchers programmed neurons grown in petri dishes to carry the ALS-causing mutations in SPTLC1. The mutant carrying neurons produced higher levels of typical sphingolipids than control cells. This difference was enhanced when the neurons were fed the amino acid serine, a key ingredient in the SPT reaction.

Previous studies have suggested that serine supplementation may be an effective treatment for HSAN1. Based on these results, the authors of this study recommended avoiding serine supplementation when treating the ALS patients.

Next, Dr. Dunn’s team performed a series of experiments which showed that the ALS-causing mutations prevent another protein called ORMDL from inhibiting SPT activity.

“Our results suggest that these ALS patients are essentially living without a brake on SPT activity. SPT is controlled by a feedback loop. When sphingolipid levels are high then ORMDL proteins bind to and slow down SPT. The mutations these patients carry essentially short circuit this feedback loop,” said Dr. Dunn. “We thought that restoring this brake may be a good strategy for treating this type of ALS.”

To test this idea, the Bönnemann team created small interfering strands of RNA designed to turn off the mutant SPTLC1 genes found in the patients. Experiments on the patients’ skin cells showed that these RNA strands both reduced the levels of SPTLC1 gene activity and restored sphingosine levels to normal.

“These preliminary results suggest that we may be able to use a precision gene silenc-
Study suggests no association between antiseizure drugs used during pregnancy and neurodevelopmental problems in children at age 2

Monday, June 7, 2021

What

New findings published in JAMA Neurology suggest there is no difference in cognitive outcomes at age 2 among children of healthy women and children of women with epilepsy who took antiseizure medication during pregnancy. The findings are part of the large research project Maternal Outcomes and Neurodevelopmental Effects of Antiepileptic Drugs (MONEAD), which is a prospective, long-term study looking at outcomes in pregnant women with epilepsy and their children. The study was funded by the National Institute of Neurological Disorders and Stroke (NINDS), part of the National Institutes of Health.

This study reports findings from 382 children (292 children born to women with epilepsy and 90 born to healthy women) who were assessed for language development at age 2. The researchers also compared developmental scores with third trimester blood levels of antiseizure medication in these children.

Results suggest that children born to healthy women and those born to women with epilepsy do not show significant differences in language development scores at age 2. Neither was language development linked to third trimester blood levels of epilepsy medications. Most women with epilepsy in the study were taking lamotrigine and/or levetiracetam.

However, the study did find that those children born to mothers with the very highest levels of antiseizure medication in the blood during the third trimester did have somewhat lower scores on tests in the motor and general adaptive domains, which refer to skills related to self-care, such as feeding.

The children in this study will continue to be followed and will participate in additional cognitive tests through age 6. Results so far indicate that controlling epilepsy with these medications during pregnancy may be safe for babies.

Who

Adam Hartman, M.D., program director, NIH’s National Institute of Neurological Disorders and Stroke (NINDS). To arrange an interview, please contact nindspressteam@ninds.nih.gov (link sends email).

Article


This study was supported by the NINDS (NS038455 and NS050659).

NINDS is the nation’s leading funder of research on the brain and nervous system. The mission of NINDS is to seek fundamental knowledge about the brain and nervous system and to use that knowledge to reduce the burden of neurological disease.

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.

NIH…Turning Discovery Into Health®

Institute/Center

National Institute of Neurological Disorders and Stroke (NINDS)

Contact

Christopher G. Thomas (link sends e-mail)
301-496-5751

NIH…Turning Discovery Into Health®

Institute/Center

National Institute of Neurological Disorders and Stroke (NINDS)

Contact

Barbara McMakin
301-443-6245
“Even in the middle of taking this course, I could see myself changing the way that I spoke to parents. After taking this course, I am much better at emotionally supporting our NICU families.”

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
Surgeon general addresses myocarditis, pediatricians’ role in COVID-19 vaccination efforts

June 11, 2021


U.S. Surgeon General Vivek H. Murthy, M.D., M.B.A., responded to pediatricians’ questions about myocarditis and mRNA vaccines and discussed pediatricians’ role in supporting vaccine confidence at an interactive virtual COVID-19 town hall hosted by the AAP and Children’s Hospital Association Thursday.

Top of mind was news about cases of myocarditis in young people after COVID-19 mRNA (Pfizer-BioNTech and Moderna) vaccination. Members of the Food and Drug Administration’s (FDA’s) Vaccines and Related Biological Products Advisory Committee met virtually Thursday to discuss 226 cases of myocarditis or pericarditis reported in people ages 30 and younger since April 2021 and 250 more still under investigation.

Dr. Murthy said most of the cases reported to the Vaccine Adverse Event Reporting System have been mild.

“They have occurred predominantly in male adolescents and young adults up to their early 20s. … Most often, it has happened after the second dose of the vaccine and typically within several days after that second dose,” he said. Most patients have recovered with supportive care.

The overall number of cases is small compared to the millions of doses administered to adolescents, he said. “(But) anything regarding the health of children — or anyone for that matter — we want to take absolutely seriously.”

The Centers for Disease Control and Prevention (CDC) and FDA are continuing to evaluate reports to determine whether they are related to the vaccine or other causes. The CDC’s Advisory Committee on Immunization Practices will hold an emergency meeting on June 18 to discuss myocarditis cases.

“The bottom line is this: When you compare the risk of cardiac complications among adolescents who have had COVID vs. the numbers that we’re seeing here, it is very clear to us at this point in time that the benefits still outweigh the risk when it comes to vaccination,” he said.

Small practices, large quantities of vaccine

With many physicians’ offices awaiting COVID-19 vaccines, pediatricians in small practices may have concerns about managing a large quantity of vaccine doses.

Dr. Murthy said funding through the American Rescue Plan is intended to support states in managing and breaking up large quantities of doses so that physicians’ offices and other smaller locations can participate in COVID-19 vaccine rollout efforts.

He also suggested that pediatricians connect with nearby practices to break up and share the vaccine supply. But even with the best efforts, pediatricians should expect some doses will go to waste.

“I just want to say that out loud, because even if you waste some vaccine but if you’re able to vaccinate other children, we want that to happen,” he said. “Of course, our mind always goes to those who may be looking for a vaccine and can’t get it, whether...
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.

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

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
it’s in the United States or other parts of the world … We’d rather have some wastage but get people vaccinated than not have vials opened, and ultimately, we will be worse off in that case.”

Questions asked, answered
Pediatricians had an opportunity to chat with Dr. Murthy, ask questions and share personal stories. Among topics discussed:

- What pediatricians can do to make equity central and in turn, vaccinate more youths.
- How to work with schools to extend vaccination to more families.
- How to address COVID-19 myths that the vaccine is linked to infertility or changes a person’s DNA.
- How to prioritize mental health for patients and pediatricians.

Finally, Dr. Murthy urged pediatricians to continue addressing vaccine hesitancy in their communities. With new information about COVID-19 vaccines spreading as rapidly as misinformation, he said, one-on-one conversations can make a difference even when the person does not follow the pediatrician’s advice after the first conversation.

“The most powerful and important messengers in this effort to protect our country, our patients and our communities are you. … When people have a chance to talk to you, their doctors, whether they’re your patients themselves or their parents, it can make a huge difference,” he said. “You have the information. You have the relationships, which give you the trust. That’s why you have the power to help more people get vaccinated.”

Resource

Contact information for AAP headquarters
American Academy of Pediatrics
345 Park Blvd, Itasca, IL 60143
New AAP main number: 630-626-6000
Trisha Korioth, Staff Writer
A 10 year 8-month-old. Female status post sagittal and metopic craniosynostosis was seen for an initial genetic evaluation in the Craniofacial Team Clinic. Her Spanish-speaking mother provided the history through an interpreter.

She was the product of her 27-year old mother’s first pregnancy. The gestation was complicated by a maternal bicornuate uterus and vaginal spotting at ~2 months’ gestation when the pregnancy was detected. An ultrasound exam was suspicious for a subchorionic hemorrhage. Fetal movements were reduced, and the fetal position was always “transverse.” The mother denied teratogenic exposures, illnesses, and diabetes. She gained about 15 lbs in the pregnancy.

The infant was delivered at 38 weeks by scheduled C-section for breech presentation. Birth weight was 6 lb 3 oz. She was admitted to the NICU for two weeks primarily for hypoglycemia and respiratory distress. CT scan confirmed metopic and sagittal craniosynostosis at ten days of age. She was referred to the craniofacial clinic when she was 2 ½ months of age. At six months of age, cranial remodeling surgery was aborted for excessive bleeding and blood loss. Brain MRI at ten months showed mild scaphocephaly and turricephaly and was otherwise normal, without evidence of a vascular anomaly. Surgery was successfully performed at 14 months of age.

The infant was delivered at 38 weeks by scheduled C-section for breech presentation. Birth weight was 6 lb 3 oz. She was admitted to the NICU for two weeks primarily for hypoglycemia and respiratory distress. CT scan confirmed metopic and sagittal craniosynostosis at ten days of age. She was referred to the craniofacial clinic when she was 2 ½ months of age. At six months of age, cranial remodeling surgery was aborted for excessive bleeding and blood loss. Brain MRI at ten months showed mild scaphocephaly and turricephaly and was otherwise normal, without evidence of a vascular anomaly. Surgery was successfully performed at 14 months of age. Early milestones were delayed. She walked at two years of age and said her first words at 2 1/2 to 3 years of age. However, at age 10, she is doing well in the 5th grade, attending GATE (gifted and talented) classes.

The family history was non-contributory. Parental consanguinity was denied. She has one healthy 4-year old brother. Parents, who are both 37 years old, are of Hispanic ancestry from Mexico. There is no other reported family history of birth defects, developmental delay, intellectual disability, early infant deaths, or multiple miscarriages.

She was an alert, cooperative, well-spoken and nondysmorphic school-aged child with normal growth parameters on the exam. There was mild bitemporal narrowing. Her fingers were tapered, but the remainder of the exam was normal.

Assessment and counseling:

This child has multisuture craniosynostoses involving the metopic and sagittal sutures without other congenital anomalies or dysmorphic features. It is most likely that her craniosynostosis is secondary to fetal head constraint and abnormal mechanical forces related to gestation in a bicornuate uterus (Figure 1).

Uterine malformations are relatively common, affecting up to 7% of the female population and 18% of women with recurrent pregnancy loss. Approximately 1-2% of women have a significant uterine abnormality (Moh et al. 2010) that poses a 30% general risk for fetal deformation. In their case-control study from 75 participating hospitals in Spain, Martinez-Frias et al. analyzed the outcome of 38 pregnancies (32 liveborn) in women with a bicornuate uterus noting a four-fold increase in congenital anomalies compared to women without a uterine anomaly. However, their data did not reach statistical significance for any particular anomaly (except nasal hypoplasia), possibly because of the limited sample size. The mothers with a bicornuate uterus also had significantly more uterine bleeding during pregnancy (54.1% vs. 14.1%), increasing the risk for some types of vascularly-mediated anomalies (disruptions), such as limb defects.

“Intrauterine constraint causes fetal deformation by applying abnormal mechanical forces to the developing fetus, altering the shape of the trapped body parts. A fetal constraint has been implicated in the etiology of plagiocephaly, torticollis, micrognathia, limb contractures, pulmonary hypoplasia, congenital hip dislocation, talipes equinovarus, and craniosynostosis.”

Readers can also follow NEONATOLOGY TODAY via our Twitter Feed @NEOTODAY
Intrauterine constraint causes fetal deformation by applying abnormal mechanical forces to the developing fetus, altering the shape of the trapped body parts. A fetal constraint has been implicated in the etiology of plagiocephaly, torticollis, micrognathia, limb contractures, pulmonary hypoplasia, congenital hip dislocation, talipes equinovarus, and craniosynostosis.

Over 40 years ago, Graham and Smith (the same Smith who authored “Smith’s Recognizable Patterns of Human Malformation”) and various colleagues published a series of reports illustrating the relationship between fetal head constraint and metopic, coronal, and sagittal craniosynostosis. They published what may have been the first report of metopic craniosynostosis in the child of a woman with a bicornuate uterus. In the same report, they described metopic craniosynostosis in one of monozygotic triplets reared in a small mother in which the affected fetal head had been wedged between the hips of the two unaffected siblings. In 1980, Higginbottom et al. reported five infants with craniosynostosis who had evidence of intrauterine constraint, including breech presentation, primigravidity, uterine malformations, amniotic bands, and defects in fetal neuromuscular development.

In 2010, Sanchez-Lara et al. reported fetal constraint as a risk factor for some types of craniosynostosis. Specifically: plurality and nulliparity were associated with a twofold increased risk for metopic craniosynostosis. Macrosomia had almost twice the risk of developing coronal craniosynostosis. In our patient, genetic testing was not recommended. Based on her mother’s history of bicornuate uterus, the lack of a family history of craniosynostosis, the absence of other congenital anomalies or dysmorphic features, and her normal or even superior developmental outcome, the chance of a genetic etiology for her craniosynostosis would be too low to justify the cost of the testing. Note that the patient’s brother was unaffected, perhaps because he had the advantage of gestating in the somewhat larger parous bicornuate uterus.

**Practical applications:**

1. Infants born to women with uterine anomalies, such as a bicornuate uterus, may have a higher rate of congenital anomalies. Examine these infants carefully for deformations and vascularity-mediated disruptions.

2. Suspect intrauterine constraint in the etiology of craniosynostosis in the context of a breech or transverse lie, bicornuate uterus or other scenarios that restrict fetal movement, especially in a primigravida mother.

3. Fetal head constraint can cause craniosynostosis of any suture and even multiple sutures as in this child.

**Reference:**

2010 Feb;152A(2):394-400. PMID: 2010168

Disclosures: The authors have no relevant disclosures.

Subhadra (Subha) Ramanathan, M.Sc., M.S.
Licensed and Certified Genetic Counselor
Assistant Professor, Pediatrics
Loma Linda University Health
2195 Club Center Drive, Ste A
San Bernardino, CA 92408
Email: SRRamanathan@llu.edu

Robin Clark, MD
Professor, Pediatrics
Loma Linda University School of Medicine
Division of Genetics
Department of Pediatrics
Email: rclark@llu.edu

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.*

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Caucasian Babies</th>
<th>African American Babies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prematurity</td>
<td>11.6%</td>
<td>18.3%</td>
</tr>
<tr>
<td>Breastfeeding</td>
<td>58.1%</td>
<td>50.2%</td>
</tr>
<tr>
<td>Low Birth Weight</td>
<td>7.3%</td>
<td>11.8%</td>
</tr>
<tr>
<td>Siblings</td>
<td>60.1%</td>
<td>71.6%</td>
</tr>
<tr>
<td>Crowded Living Conditions</td>
<td>1%</td>
<td>3%</td>
</tr>
</tbody>
</table>

*Source: Respiratory Syncytial Virus in African Americans

AFRICAN AMERICAN BABIES bear the brunt of RSV. Yet the American Academy of Pediatrics’ restrictive new guidelines limit their access to RSV preventative treatment, increasing these babies’ risk.
Did you know that premature and low birth weight babies have a 4x greater risk for SIDS?

At First Candle we're educating parents, grandparents and caregivers about safer sleep to make sure all babies reach their first birthday. Learn more at firstcandle.org

“Even in the middle of taking this course, I could see myself changing the way that I spoke to parents. After taking this course, I am much better at emotionally supporting our NICU families.”

COURSE PARTICIPANT

Learn How Now
validated online NICU staff education
WWW.MYNICUNETWORK.ORG
Common Problems in the Newborn Nursery
An Evidence and Case-based Guide

- Provides practical, state of the art management guidance for common clinical problems in the newborn nursery
- Written by experts in the field in a clear, easy-to-use format
- Utilizes a case-based approach

This comprehensive book thoroughly addresses common clinical challenges in newborns, providing an evidence-based, step-by-step approach for their diagnosis and management. *Common Problems in the Newborn Nursery* is an easy-to-use, practical guide, covering a full range of clinical dilemmas: bacterial and viral infections, jaundice, hypoglycemia, hypotonia, nursery arrhythmia, developmental dysplasia of the hips, newborn feeding, cardiac problems, late preterm infants, dermatology, anemia, birth injuries, ocular issues, and hearing assessments in the newborn.

Written by experts in their fields, each chapter begins with a clinical case presentation, followed by a discussion of potential treatment and management decisions and various differential diagnosis. Correct responses will then be explained and supported by evidence-based literature, teaching readers how to make decisions concerning diagnosis encountered on a daily basis.

While this guide is directed towards health care providers such as pediatricians, primary care physicians, and nurse practitioners who treat newborns, this book will also serve as a useful resource for anyone interested in working with this vulnerable patient population, from nursing and medical students, to nurses and residents in pediatrics or family practice.

**ORDER NOW!**

Price: $109.99
Common Problems in Newborn Nursery

Please send me ________ copies

**YOU WILL BE SENT A SECURE LINK FOR YOUR CREDIT CARD INFORMATION**

Please email orders to: Holly.Klokis@springer.com

**FREE SHIPPING IN THE U.S.**

Please note that sales tax will be added into your final invoice. Outside the US and Canada add $7.00 for first book, $5.00 for each additional book. All orders are processed upon publication of title.
Purchases of this engaging true story provide disadvantaged middle school students, risking academic failure, the opportunity to attain their best personal and academic potential.

Purchasing options include a limited quantity of signed and numbered books specifically to support the SEA Program, an ebook, soft and hardcover versions, and the option to donate one or more books to support organizations supporting young children.

You can provide both reading entertainment for younger children, and make a difference in the lives of the disadvantaged middle schoolers we support.

Sales support our nonprofit charity's SEA Program. You can make a difference for these children!

Emily's Gift - Click Here to Buy

Direct SEA Support - Click Here

The Emily Shane Foundation is a 501(c)3 nonprofit charity. 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 fund the SEA Program, which make a difference in the lives of the students we serve.

For more information, please visit emilyshane.org.
Black Maternal Health Crisis Captures White House Attention

Susan Hepworth

The National Coalition for Infant Health advocates for:

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

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.

America’s maternal mortality rates are among the highest in the developed world. It is a crisis of epic proportions. Moreover, like many other crises, not all Americans are equitably affected.

Black mothers are three to four (1) times more likely to experience a pregnancy-related death than white women — regardless of their income or education level. The grievous statistic has caught the attention of the White House, which recently announced initial actions (2) to address the Black maternal health crisis.

“Black mothers are three to four (1) times more likely to experience a pregnancy-related death than white women — regardless of their income or education level. The grievous statistic has caught the attention of the White House, which recently announced initial actions (2) to address the Black maternal health crisis.”
The plan focuses on strengthening health equity by creating pregnancy medical home programs and expanding rural maternity care. These actions, among others, may help address gaps in care that stem from long-standing societal and health system factors. Black women are more likely to experience barriers to quality care, studies (1) show, and can face racial discrimination. In one national study, (3) 21% of Black mothers reported that hospital staff treated them poorly due to their race, ethnicity, or cultural background.

The White House’s plan also includes an investment in implicit bias training for health care providers. The approach guides providers to adjust their thinking patterns in a way that can reduce discriminatory behaviors.

Such a shift in thought and behavior can improve outcomes and save lives. The Centers for Disease Control and Prevention suggested that at least 60% (4) of Black maternal deaths could have been prevented by better knowledge of warning signs among patients and providers, among other factors.

Addressing racial disparities can also lower costs to the health care system. Researchers posited that eliminating racial disparities could generate $114 to $214 (5) million per year in Medicaid cost savings from just 14 southern states.

Black women have suffered higher rates of maternal mortality for long enough. President Biden’s actions and proclamation (6) are a critical acknowledgment of the Black maternal health crisis and a commitment to better protecting what is most at stake: the lives and long-term health of Black Americans.

References:
5. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4039287/

Disclosure: The author has no relevant disclosures.

Jennifer Heidi Goldstein Zadok
April 14, 1966 - June 4, 2021
May her memory be a blessing to those who knew her.
The Preemie Parent's Survival Guide to the NICU

By

little man's Nicole Conn
&
PreemieWorld.com's Deb Discenza

with

Medical Editor Alan R. Spitzer, M.D.

HOW TO MAINTAIN YOUR SANITY & CREATE A NEW NORMAL

second edition
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. 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.
National Perinatal Association

PERINATAL SUBSTANCE USE

nationalperinatal.org/position
www.nationalperinatal.org/Substance_Use

We know that there are barriers that keep pregnant people from accessing care.

We believe that perinatal providers have a duty to help remove those barriers.

Educate. Advocate. Integrate.

The only worldwide monthly publication exclusively serving Pediatric and Adult Cardiologists that focus on Congenital/Structural Heart Disease (CHD), and Cardiothoracic Surgeons.

Subscribe Electronically Free on the Home Page

www.CongenitalCardiologyToday.com

CDH International

A global initiative to stop Congenital Diaphragmatic Hernia

NEONATOLOGY TODAY www.NeonatologyToday.net June 2021
“The definitive work in genetic evaluation of newborns”
- Judith G. Hall

GENETIC CONSULTATIONS in the NEWBORN

Robin D. Clark | Cynthia J. Curry

- A streamlined diagnostic manual for neonatologists, clinical geneticists, and pediatricians - any clinician who cares for newborns
- Organized by symptom and system, enriched with more than 250 photography and clinical pearls derived from authors’ decades of clinical practice
- Includes “Syndromes You Should Know” appendix, distilling the most frequently encountered syndromes and chromosomal abnormalities in newborns
- OMIM numbers for each condition situate authors’ practical guidance in the broader genetics literature, connecting readers to the most up-to-date references

Comprising of more than 60 chapters organized by system and symptom, Genetic Consultations in the Newborn facilitates fast, expert navigation from recognition to management in syndromes that manifest during the newborn period. Richly illustrated and packed with pearls of practical wisdom from the authors’ decades of practice, it empowers readers to recognize the outward signs and symptoms crucial for an effective diagnosis.

Order now by clicking here.
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%).
Clinical Pearl: The COVID-19 Pandemic and Breast Milk in the NICU and Obstetrics and Newborn Unit at the University of Chicago

Amy Meyer, RN, BSN, CLC, Christina Billy, MSN, Melissa Benesh, MSN, Poj Lysouvakon, MD, Joseph R Hageman, MD

“The COVID-19 pandemic has had multiple effects on the care of pregnant patients and their infants prenatally, in labor and delivery, postpartum, well newborn and neonatal intensive care units (NICU) (1). One of these effects that we have noted in the Comer NICU is breastfeeding rates which are the lowest they have ever been.”

The COVID-19 pandemic has had multiple effects on the care of pregnant patients and their infants prenatally, in labor and delivery, postpartum, well newborn and neonatal intensive care units (NICU) (1). One of these effects that we have noted in the Comer NICU is breastfeeding rates which are the lowest they have ever been. Furthermore, while nationally, breastfeeding rates have taken a 17% dip because of COVID, ours have dipped 20% (Amy Meyer, personal communication, June 9, 2021). The University of Chicago Medicine is a Baby-Friendly designated facility. As a Baby-Friendly hospital, we have instituted standardized workflows and practice guidelines and fostered a culture of breastfeeding positivity that is well documented and recognized by Baby-Friendly USA. Of note, our consistent, team-based implementation of these standards at all levels of care has led to our continued maintenance of Baby-Friendly standards in the well newborn unit. Our breastfeeding initiation rates still consistently meet the 80% goal set by Baby-Friendly USA despite the pandemic (personal communication, M Benesh, June 9, 2021).

New workflows created in the early part of the pandemic did not adequately address the needs of breastfeeding parents. Resource reallocation due to COVID, rescheduled appointments, and virtual clinic appointments may have led to decreased breastfeeding education. In addition, the pandemic had significantly decreased the amount of time from admission to delivery to discharge home. This shortened length of stay in the hospital; adaptation of, adjustments to, and time to familiarize ourselves with these new COVID-related workflows; and frequent staff shortages due to COVID infection or exposure have impacted our breastfeeding initiatives. As a result, our ability to assess the birthing parent’s breastfeeding needs, supply breast pumps in the immediate postpartum period, and provide adequate support, education, and lactation services were negatively impacted. In the postpartum and well newborn units, we have addressed these challenges and mitigated the negative impacts on breastfeeding initiation. For those patients who were unable or unwilling to initiate breastfeeding or breast pumping, the downstream result is decreased breastfeeding rates in those newborns who had to be transferred to the NICU. In addition, there have been challenges in providing follow-up lactation consultations post-hospital discharge, especially home lactation visits.

“For those patients who were unable or unwilling to initiate breastfeeding or breast pumping, the downstream result is decreased breastfeeding rates in those newborns who had to be transferred to the NICU. In addition, there have been challenges in providing follow-up lactation consultations post-hospital discharge, especially home lactation visits.”

Some of the barriers and fears which have been discussed in the Medela White Paper leading to COVID-related stress include the following: (1) giving birth without the support of a partner, (2) fear of infection, (3) reduced access to support for maternal health and breastfeeding, (4) confusing changes in breastfeeding and birth planning recommendations, (5) physical distancing and containment measures, (6) financial concerns due to loss of income during lockdowns (3). These stressors then make early breastfeeding and pumping more challenging for new mothers.

This passage is the conclusion paragraph from the Medela ‘Preserving Breastfeeding in the Age of COVID’ White paper (3):

- “It is clear that the COVID-19 pandemic has had a marked impact on maternity and breastfeeding practices.
- As the pandemic progressed, our understanding of the decreased risk of transmitting infection from mothers to their infants via breast milk has been confirmed (4).
- Evidence also showed the protective value of human milk against the virus, with neutralizing antibodies being detected in milk from previously infected women (5-8).
- It is therefore largely recognized that breastfeeding should be encouraged and supported even in women infected with COVID-19. Healthcare professionals can provide invaluable guidance and support to help mothers breastfeed successfully, despite the challenges posed by the pandemic and infection control measures.
- During the mother’s hospital stay, mothers and babies should be kept together and supported to initiate lactation appropriately.
Given the shortened length of maternal stay in COVID-19 times, it is imperative that community-based support and hospital-grade pump technology are prescribed as appropriate and become indications in clinical guidelines (3).

References:

Disclosures: The authors have no conflicts to disclose.

NT
It is hard to be a Neonatologist who took the path through Pediatrics first, and not use a Dr. Seuss quote from time-to-time. If your unit is anything like ours where you work, I imagine you feel as if you are bursting at the seams. As the population grows, so do our patient volumes. I often quote the number 10% as being the number of patients we see out of all deliveries each year in our units. When I am asked why our numbers are so high, I counter that the answer is simple. For every extra 100 births, we get 10 admissions. It is easy though, to get lost in the chaos of managing a unit in such busy times, and not take a moment to look back and see how far we have come. What did life look like 30 years ago or 25 years ago? In Winnipeg, we are preparing to make a big move into a beautiful new facility in 2018. This will see us unify three units into one, which is no easy task but will mean a capacity of 60 beds compared to the 55 operational beds we have at the moment.

In 2017, we were routinely resuscitating infants as young as 23 weeks, and now with weights under 500g at times. Whereas in the past, anyone under 1000g was considered quite high risk, now the anticipated survival for a...
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).

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!
New subscribers are always welcome!

**NEONATOLOGY TODAY**

To sign up for free monthly subscription, just click on this box to go directly to our subscription page.

---

**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

**Update: CORONAVIRUS COVID-19**

According to data published in The Lancet

Pregnancy and the risk of VERTICAL TRANSMISSION LOW

www.nationalperinatal.org

---

**Time is precious, just like your patients.**
Why Pregnant and Nursing Women Need Clear Guidance on THE NET BENEFITS OF EATING FISH

2 to 3 servings per week of properly cooked fish can provide health benefits for pregnant women and babies alike:

- Iron
- Omega 3 fatty acids

Earlier Milestones for Babies

But mixed messages from the media and regulatory agencies cause pregnant women to sacrifice those benefits by eating less fish than recommended.

GET THE FACTS ON FISH CONSUMPTION FOR PREGNANT WOMEN, INFANTS, AND NURSING MOMS.
Letters to the Editor

Follow up to The Importance of Specialized Nursing Care for NICU Patients and Families

“As you will recall, the impetus for this article was the response, from a group of California Neonatal Clinical Nurse Specialists, about a new draft that was put out by the California Children’s Services (CCS) outlining a significant change in the specifications related to the role of the CNS in the Neonatal Intensive Care Unit (NICU).”

Dear Dr. Goldstein:

This is in response to the article published back in March titled “Neonatal Clinical Nurse Specialist: The Importance of Specialized Nursing Care for NICU Patients and Families.”

As you will recall, the impetus for this article was the response, from a group of California Neonatal Clinical Nurse Specialists, about a new draft that was put out by the California Children’s Services (CCS) outlining a significant change in the specifications related to the role of the CNS in the Neonatal Intensive Care Unit (NICU).

The exposure we received in the March publication of Neonatology Today was an enormous help in bringing to light the significant problems with the misunderstanding of the CNS role in the Neonatal Intensive Care Unit. This publication also provided some much-needed clarification on the differences in Advanced Practice Registered Nursing roles, Clinical Nurse Specialist, Neonatal Nurse Practitioner, and Nurse Educator role as it pertains to fulfilling their individual scope of practice in the NICU. I recently had the opportunity to share our plight with a group of CNSs from across the nation, and when I shared with them the publication in Neonatology Today, it gave them a sense of pride and renewed strength, reminding them that there are still ways to have our voices heard. Many CNS’s struggle with administrative and other healthcare professionals not understanding the CNS’s full scope of practice as an Advanced Practice Registered Nurse (APRN), and the lack of understanding doesn’t stop at that level; it trails all the way up to the state levels and varies greatly across the nation.

I wanted to take this time to write you and thank you for the support in publicizing this article on behalf of all Clinical Nurse Specialists. In doing so, this has helped not only our cause in the NICU but has ignited a fire and renewed passion in helping the campaign to resolve the inconsistency in the scope of practice for the Clinical Nurse Specialist in the Advance Practice Arena in all areas across the nation. Lastly, I want to share with the readers that since the submission of this letter directly to CCS, they have taken into consideration our concerns and listened to our argument regarding the changes they wanted to make. CCS instead has decided to keep the role of the CNS intact as it was originally stated in the CCS regulations, which defines the Neonatal CNS as being the best suited to manage the complex health care needs for the Neonatal Intensive Care Unit. We are grateful for their consideration and discernment in seeing the value that the CNS brings to this very special and fragile patient population and to the entire NICU healthcare team.

“We are grateful for their consideration and discernment in seeing the value that the CNS brings to this very special and fragile patient population and to the entire NICU healthcare team.”

Thank you for your support,

Nancy Simmons, MSN, CNS-NICU, RNC

Dear Ms. Simmons,

Thank you very much for your kind words. It is reassuring to know that the Clinical Nurse Specialist role will be kept intact in the NICU here in California according to the original CCS regulations. As you are well aware, this challenge to the traditional nursing infrastructure would have made it very difficult, if not improbable, to assure uniform quality of care across the NICUs in California. The complex health care needs supported by the role provide the backbone for advanced practice nursing in this venue.

Indeed, this issue is present nationwide and is not confined to the NICU. However, support for the CNS role and advanced practice is requisite for compliance with increasing complex protocols and best practice guidelines. More importantly, this role has supported various quality improvement initiatives statewide and is a significant impetus to CPQCC and the success of this collaborative. Any dilution of this role would be counterintuitive and potentially disrupt care pathways by removing the architect of best practice and continuous quality improvement in the NICU.

Neonatology Today is pleased that this “inconsistency in the scope of practice” has been taken seriously by CCS and that the CNS role will continue to provide the necessary support for our most at-risk neonates.

“Neonatology Today is pleased that this “inconsistency in the scope of practice” has been taken seriously by CCS and that the CNS role will continue to provide the necessary support for our most at-risk neonates.”
We believe that we must provide a platform, not only for research, opinion editorials, and original research but in publicizing concerns that affect our practice and our patients directly. Although the scope of this decision only pertains to California NICUs, we hope that through our subscriber base, knowledge of the need for this role may inspire other regions both in the United States and abroad and other care areas to investigate the need for a CNS’s full scope of practice as an APRN in provisioning quality of care and quality improvement metrics.

Sincerely,

Mitchell Goldstein, MD
Editor in Chief

Loma Linda Publishing Company
A Delaware “not for profit” 501(c) 3 Corporation.
c/o Mitchell Goldstein, MD
11175 Campus Street, Suite #11121
Loma Linda, CA 92354
Tel: +1 (302) 313-9984
LomaLindaPublishingCompany@gmail.com
© 2006-2021 by Neonatology Today ISSN: 1932-7137 (online)
Published monthly.
All rights reserved.
www.NeonatologyToday.net
Twitter: www.Twitter.com/NeoToday

Neonatology Today welcomes your editorial commentary on previously published manuscripts, news items, and other academic material relevant to the fields of Neonatology and Perinatology.

Please address your response in the form of a letter. For further formatting questions and submissions, please contact Mitchell Goldstein, MD at LomaLindaPublishingCompany@gmail.com.

Erratum (Neonatology Today May 2021)

Neonatology Today is not aware of any erratum affecting the May, 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.
Loma Linda Publishing Company supports the Academic True Open Model (ATOM)

Journals listed support the following principles:

1. Free subscriptions (electronic or paper) to all.
2. Peer review of all submitted manuscripts
3. Timely review of manuscripts
4. Timely response to letters to the editor
5. Listing and correction of erratum
6. Appropriate disclosure of any related conflicts of interest in published manuscripts
7. No charge for submission of manuscripts
8. No charge for review of manuscripts
9. No charge for processing of artwork, color, layout, or length of manuscript
10. No charge for publication of manuscript in electronic or digital form.
11. A commitment to the ethical treatment of humans and animals in research.
12. Documentation of informed consent where indicated.

Any journal that supports the ATOM principles can be listed here, along with their logo and a link back to their site, free of charge. Please contact Loma Linda Publishing Company at LomaLindaPublishingCompany@gmail.com for additional details.
Las nuevas mamás necesitan acceso a la detección y tratamiento para la depresión posparto

1 DE CADÁ 7 MADRES AFORTA LA DEPRESIÓN POSPARTO, experimentando

Llanto incontrolable
Sueño interrumpido
Ansiedad
Displamientos en los patrones de alimentación
Ideas de hacerse daño a sí misma o al bebé
Distanciamiento de amigos y familiares

1 in 3 preterm infants will require support services at school

DE CADA 7 MADRES AFRONTA LA DEPRESIÓN POSPARTO, experimentando

LA DEPRESIÓN POSTPARTO NO TRATADA PUEDE AFECTAR:

La salud de la madre
La capacidad para cuidar de un bebé y sus hermanos

PARA AYUDAR A LAS MADRES A ENFRENTE LA DEPRESIÓN POSPARTO

LOS ENCARGADOS DE FORMULAR POLÍTICAS PUEDEN:
• Financiar los esfuerzos de despistaje y diagnóstico
• 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
• Conectar a las mamás con una organización de apoyo

Sin embargo, sólo el 15% recibe tratamiento

El sueño, la alimentación y el comportamiento del bebé a medida que crece


Visit CDC.gov to find contact information for your state’s early intervention program.
Upcoming Medical Meetings

44th Annual Conference on Neonatal Perinatal Medicine
June 17 - 21, 2021
AAP District VIII Section on Neonatal-Perinatal Medicine
https://nm2020.district8sonpm.org/

American Academy of Pediatrics National Conference and Exhibition
October 8-12, 2021
Philadelphia, PA
https://aaapexperience.org/

Hot Topics in Neonatology®
Gaylord National
National Harbor, MD
December 6-8, 2021
http://www.hottopicsinneonatology.org/

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
Feb 23-25, 2022
San Diego, CA
www.neoconference.com

Specialty Review in Neonatology
Feb 21-26, 2022
San Diego, CA
www.specialtyreview.com

For up to date Meeting Information, visit NeonatologyToday.net and click on the events tab.
Nursing Opportunities

Many Strengths. One Mission.

Great Nurses. Great Medicine.

Neonatal Nurse Practitioner

- Collaborative work environment
- Care of high acuity NICU patients
- State of the art technology
- 24/7 coverage provided by NNP team and Fellows

Who We Are

With over 900 beds in four hospitals, we operate some of the largest clinical programs in the nation. We also offer the only Level I Regional Trauma Center and Children’s Hospital in the Inland Empire servicing the largest county in the US. We lead in many areas of excellence; pediatrics, cardiac services, cancer treatment and research, mental health, chemical dependency, and other essential clinical disciplines. All this adds up to endless possibilities for our patients and for you.

The Neonatal Intensive Care Unit (NICU) at Loma Linda University Children’s Hospital is committed to providing high-quality, family-centered care with our highly skilled, multi-disciplinary neonatal team. Our unit has 84 licensed beds for the most critically ill infants and a new Tiny Baby Program focusing on improving survival and outcomes of extremely low birth weight infants (<1000g at birth). As one of the only level 3 tertiary centers in Southern California, we are equipped to provide the highest level of care for the most complex disorders. We have subspecialists in all medical and surgical areas that are available at all times and are supported by hospital staff with technical, laboratory, and service expertise.

At Loma Linda University Health, we combine the healing power of faith with the practices of modern medicine. We consist of a University, a Medical Center with four hospitals, and a Physicians Group. These resources have helped us become one of the best health systems in the nation.

Contact Us

Please visit our website http://careers.llu.edu or contact Jeannine Sharkey, Director of Advanced Practice Services at jsharkey@llu.edu or (909) 558-4486.
We Can Help You Recruit from 1,045 NICUs in the USA & Canada

Your Recruitment Advertising Includes:

- Full color Recruitment Ad in the issue(s)
- Your recruitment listing in the e-mail blast for the issue(s) with a hot link
- 3-Step Special Recruitment Opportunity Website Section on three (3) areas of the website
- We can create your recruitment ad at no extra charge!

For more information, contact:
Andrea Schwartz Goodman
+1 (302) 313-9984 or andrea.schwartzgoodman@neonatologytoday.net
Neonatology Today's Policy on Animal and Human Research

Neonatology Today's policies ensure the protection and responsible use of animals and humans in all research articles under consideration. Authors are encouraged to follow the guidelines developed by the National Centre for the Replacement, Refinement & Reduction of Animals in Research (NC3Rs), International Committee of Medical Journal Editors, and the Guide for the Care and Use of Laboratory Animals and U.S. Public Health Service's Policy on Humane Care and Use of Laboratory Animals (PHS Policy). Authors are expected to demonstrate to their institutional review board or suitable proxy that ethical standards are met. If there is doubt whether research conducted was in accordance with ethical standards, then there must be verification that the institutional review board approved the uncertain aspects. Research not following these policies on participating animal and human subjects may be rejected. Researchers have a moral obligation towards the humane treatment of animals and ethical considerations for humans participating in research and are expected to consider their welfare when designing studies.

https://www.nc3rs.org.uk/arrive-guidelines
http://www.icmje.org

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. Jif 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.

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. Is Art Imitating Life or Life Imitating Art? Our Bird for this month is provided by Yasmine Razi, OSMIII who provides us with "A Peacock."

Herbert Vasquez, MD,
Associate Neonatologist, Queen of the Valley Campus
Emanate Health, West Covina, CA
VasquezH1@gmail.com

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/quad, 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

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.

Copyright © 2020 NICU Parent Network