

NEONATOLOGY TODAY

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



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Bilateral Pulmonary Aplasia Diagnosed at Delivery

Elisa Zhang, MD, Alexandra Iacob, MD, Yona Nicolau, MD

Introduction:

Pulmonary aplasia is defined as the absence of lung parenchyma in the presence of bronchial buds, whereas pulmonary agenesis is defined by the absence of lung parenchyma, bronchus, and pulmonary vasculature. (1) Bilateral pulmonary aplasia or agenesis is a rare and lethal condition. Several cases associated with bilateral pulmonary agenesis have been previously reported, (1-5) most detected prenatally on advanced imaging but can be missed by routine prenatal ultrasounds (US). (1) Here, we report an unusual case of a term neonate found to have bilateral pulmonary aplasia postnatally, despite weekly ultrasounds starting at 26 weeks gestation and fetal MRI.

“Here, we report an unusual case of a term neonate found to have bilateral pulmonary aplasia postnatally, despite weekly ultrasounds starting at 26 weeks gestation and fetal MRI.”

Case Report:

A 29-year-old primigravida had prenatal US scans at 19 and 20 weeks, indicating bilateral hydronephrosis, heterotaxy, cardiomegaly, and VSD. At 25 weeks, her US noted dextrocardia with an abnormal four-chamber view, subtle cranial lemon shape, pulmonary hypoplasia, hyperextension of the neck, small orbits, and pericardial effusion. Pregnancy was complicated by obesity (BMI 34) and severe polyhydramnios. Maternal prenatal labs were unremarkable. Amniotic fluid microarray was negative. A fetal MRI obtained at 31 weeks gestation showed polyhydramnios, dextrocardia, structurally normal heart, normal lung size, left-sided stomach, and hyperextension of the fetal neck, as seen in Figure 1. However, imaging was limited by increased amniotic fluid and significant fetal motion. Due to the numerous anomalies, the

“However, imaging was limited by increased amniotic fluid and significant fetal motion. Due to the numerous anomalies, the mother underwent weekly US scans starting at 26 weeks until delivery. They revealed a persistently hyperextended fetal neck.”

mother underwent weekly US scans starting at 26 weeks until delivery. They revealed a persistently hyperextended fetal neck. Due to concerns for airway patency, the infant was delivered at 38 weeks via Cesarean in coordination with Pediatric Anesthesia and Pediatric ENT. Physical exam revealed normal head and neck position, normal neck mobility, good respiratory effort, grimacing, but the absence of audible cry. The rest of the physical exam was otherwise unremarkable. Neonatal resuscitation guidelines were followed. Bag-mask ventilation was initiated due to bradycardia, cyanosis, and the development of retractions.

Minimal chest rise was observed despite adequate peak inspiratory pressures. Laryngoscopy performed by Pediatric ENT via rigid bronchoscope showed normal-appearing larynx with a normal epiglottis, arytenoids, and vocal cords, but the subglottis appeared collapsed entirely. Distal trachea and mainstem bronchi bilaterally could be opened briefly with significant positive pressure. The endotracheal tube was inserted, but there was no color change on capnography. Despite aggressive ventilation efforts, the baby remained hypoxic and bradycardic. The endotracheal tube was removed, and bronchoscopy was used to visualize the distal airway. The trachea was completely collapsed with the bronchoscope stenting open the proximal trachea. Notably, there was a complete loss of structure and no identifiable cartilaginous rings in the trachea or bronchi. An emergent tracheostomy was performed; tube position was confirmed via a bronchoscope. Ventilation continued with high pressures via tracheostomy with no response. At 35 minutes of life, parents agreed with discontinuation of life support. An autopsy was performed, which revealed:

1. Normal length and body weight
2. Normocephalic head but poorly calcified calvarium—6cm circular regions of ossification over bilateral parietal lobes but otherwise unmineralized
3. Extremely large and connected fontanelles
4. Grossly and histologically unremarkable fetal brain
5. Normally facies, palmar creases, extremities, digits
6. Bilateral pulmonary aplasia: tracheal tube bifurcated 3cm below the larynx; both distal segments ended in a blind pouch (Figure 2). Microscopic sections of the blind-ending right bronchus revealed cartilage plates, bronchial glands, and respiratory epithelium with no sign of alveolar structure development
7. Absent tracheal cartilage rings

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8. Intact and normally-positioned diaphragm
9. Levocardia with severe cardiomegaly, right ventricular hypertrophy, interventricular septal hypertrophy, enlarged patent foramen ovale, and large patent ductus arteriosus
10. Enlarged pulmonary trunk with no pulmonary arteries and no pulmonary venous return
11. Normal gastrointestinal tract
12. Thymus and liver weight each at 84-95th percentile
13. Accessory spleen
14. Combined kidney weight at 5-16th percentile, left kidney pelviectasis
15. Normal male genitalia

“To our knowledge, this is the first case of bilateral pulmonary aplasia described to be associated with massive polyhydramnios, congenital absence of tracheal rings, persistent hyperextension of the neck on prenatal ultrasound, and poorly calcified calvarium.”



Figure 1. Fetal MRI depicting neck hyperextension.

Discussion:

This case of bilateral pulmonary aplasia associated with primary tracheobronchomalacia due to congenital absence of tracheal cartilage rings was undetected on prenatal ultrasounds as well as fetal MRI. To our knowledge, this is the first case of bilateral pulmonary aplasia described to be associated with massive polyhydramnios, congenital absence of tracheal rings, persistent hyperextension of the neck on prenatal ultrasound, and poorly calcified calvarium. Many similar cases in the literature were first detected via elevated diaphragm on prenatal ultrasound. (3-4) Our case was not detected prenatally, possibly due to the enlarged thymus filling the thoracic cavity or the lack of diaphragmatic elevation. Given the unknown etiology of our case, we explore the embryologic, molecular, and syndromic pathways that could offer an explanation.

Tracheal and pulmonary embryology begins during the third gestational week. (2) Pulmonary agenesis arises from the failure of lung bud formation. This process is critically dependent on the local expression of Fgf10 in the foregut mesoderm, which activates signaling in tracheal and respiratory progenitor cells. (6) Studies have shown that Fgf10-null mice die at birth and have multiple defects; lungs do not form, but tracheal development occurs. (6) There is increasing evidence in mice studies that Fgf10 expression is regulated by vitamin A-derivative retinoic acid (RA) signaling at the onset of lung development. (7) Vitamin A deficiency, genetic disruption of the RA pathway, or the presence of RA inhibitors have been associated with multiple developmental abnormalities, including lung agenesis in mice studies. Interestingly, tracheal cartilage development, which occurs at ten weeks, also relies on signaling by a variety of molecules, including RA. (6) Thus, vitamin A deficiencies or disruption of RA signaling may be a unifying cause for the findings seen in this patient with bilateral pulmonary aplasia and congenital absence of tracheal rings.

“Several syndromes, associations, and chromosomal anomalies have also been associated with pulmonary hypoplasia or agenesis. (5) Our patient’s karyotype and microarray were normal. However, the remaining dysmorphism—poorly calcified skull and lack of tracheal cartilage—do not describe a known syndrome.”

Several syndromes, associations, and chromosomal anomalies have also been associated with pulmonary hypoplasia or agenesis. (5) Our patient’s karyotype and microarray were normal. However, the remaining dysmorphism—poorly calcified skull and lack of tracheal cartilage—do not describe a known syndrome. Spear syndrome, PDAC syndrome (pulmonary hypoplasia/agenesis, diaphragmatic hernia/eventration, anophthalmia/micropthalmia, and cardiac defect), PMD syndrome (pulmonary agenesis, micropthalmia, and diaphragmatic defect), Meckel syndrome, Hydroletharus syndrome, Ellis-van Creveld syndrome, Opitz G/



Figure 2. Autopsy depicting trachea opened posteriorly and two probes showing the blind-ended lobar bronchi.

BBB syndrome, Smith-Lemli-Opitz syndrome, C syndrome, Fryn syndrome, Goldenhar syndrome, VACTERL, and Tracheal Agenesis Association are all conditions which can involve pulmonary hypoplasia/aplasia. However, these syndromes have characteristic musculoskeletal and multi-organ anomalies not present in this patient. Finally, viral infections, genetic factors, and folic acid may also be implicated in pulmonary anomalies. (3)

Bilateral pulmonary aplasia is associated with the absence of main pulmonary artery branches and pulmonary veins because pulmonary vasculature development depends on pulmonary mesenchyme stimulation to grow. (1,3) Thus, the suspicion for bilateral pulmonary aplasia or agenesis increases if color Doppler of pulmonary vasculature is absent, and several cases have been confirmed in utero with this test. (3) Pulmonary vasculature anomalies were not noted prenatally in this patient but confirmed on autopsy.

The cause of the patient's poorly-calcified calvarium and large

fontanelles is unclear. Joints and marrow were noted to be grossly normal. X-rays were not done to assess ossification. The differential for large fontanelles includes hypophosphatemia and hypothyroidism. Trisomies, osteogenesis imperfecta, congenital rubella or syphilis, and cleidocranial dysplasia (5) are also possible but less likely given the karyotyping results, prenatal labs, and autopsy results.

Intriguingly, there is a temporal overlap of when this patient's major anomalies likely developed in utero. An interesting unifying etiology to consider would be a disruptive event in-utero around 7-10 weeks gestation, at which time the parietal bones should start to ossify(10), and the visceral lung pleura and tracheal cartilage should start to develop. Fgf10, the molecule necessary for lung development in mice, has also been implicated in skeletal disorders, (8) leading to the possibility that abnormal Fgf10 signaling may have a yet unknown role in both the pulmonary genesis and skull ossification.

The cause of the fetus' hyperextended neck also remains unclear. In a retrospective study of six fetuses with polyhydramnios and head hyperextension on prenatal ultrasound, five had neurologic malformations such as anencephaly or craniorachischisis. (9) This was not the case for our patient. The persistent in-utero hyperextended neck resolved by delivery and with no apparent structural cause could suggest an abnormal joint laxity. A connective tissue etiology may be another unifying explanation for this patient's pathology given the poorly-ossified skull, lack of tracheal rings, and constellation of the persistently hyperextended neck in utero.

Conclusion:

Our case illustrates bilateral pulmonary aplasia diagnosed at birth with prenatal findings of persistent neck hyperextension and massive polyhydramnios. Prenatal diagnosis of bilateral pulmonary aplasia was missed despite several ultrasounds and fetal MRI, likely due to lack of previously described associated findings—elevated diaphragm, enlarged thymus—as well as visual limitations due to polyhydramnios. Given the link between vitamin A-derivative RA signaling, lung bud formation, and tracheal cartilage development, maternal vitamin A deficiency or disruption of the RA signaling pathway should be considered when presented with isolated, non-syndromic pulmonary aplasia and congenital absence of tracheal rings. Additionally, the absence of the main pulmonary artery and vein branches on prenatal imaging or absent color Doppler of these structures should also raise suspicion for this fatal condition. Given our patient's course, persistent fetal neck hyperextension with polyhydramnios could represent a new association in future prenatal diagnosis of bilateral pulmonary aplasia.

“Given our patient's course, persistent fetal neck hyperextension with polyhydramnios could represent a new association in future prenatal diagnosis of bilateral pulmonary aplasia.”

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Keeping Your Baby Safe

during the COVID-19 pandemic

How to protect your little one from germs and viruses

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

Here's what you can do...

Wash Your Hands

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



Limit Contact with Others

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



Provide Protective Immunity

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



Take Care of Yourself

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



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

WARNING

Never Put a Mask on Your Baby

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



If you are positive for COVID-19

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



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NT Behind the Scenes: Jade Kearney, Co-founder, and CEO of She Matters

Kimberly Hillyer, DNP, NNP-BC



The following is an amended transcript for Neonatology Today Media of Dr. Kimberly Hillyer and Jade Kearney, Co-founder, and CEO of She Matters. She Matters is a digital health platform designed to provide Black mamas who experience postpartum anxiety or depression with community, culturally relevant resources, and culturally competent therapists. Click this link to go directly to our YouTube channel. Hit the subscribe and notification button to enjoy the direct viewing of the interview when it is available.

subscribe and notification button to enjoy the direct viewing of the interview when it is available.

“The following is an amended transcript of the Q&A with Dr. Kimberly Hillyer and Jade Kearney, Co-founder, and CEO of She Matters for Neonatology Today Media. Subscribe to our YouTube channel: Neonatology Today Media. Hit the notification button to see the premiere spotlight and the full interview.”

Introduction

Thank you for joining us on today’s broadcast. I’m Dr. Kimberly Hillyer, a Nurse Practitioner and the Media Correspondent for Neonatology Today. This segment features Jade Kearney.

Jade Kearney is the Co-founder and CEO of **She Matters** (<https://www.shematters.health>). She Matters is a digital health platform designed to provide help to Black mothers who are experiencing postpartum anxiety and/or depression. Her platform provides culturally relevant resources for the community and connects mothers seeking help with culturally competent therapists.

Thank you for joining us today, Jade. How are you doing?

Jade Kearney: I’m great. Thank you so much for having me. I am happy to be here.

Dr. Hillyer: Thank you very much, and thank you for the work that

you are doing. Your platform is **She Matters**. It is a company that you Co-founded and are the CEO of. Can you tell me about this platform and what you do?

“She Matters is designed to support Black women who experience postpartum anxiety or depression through community, culturally competent therapists, healthcare professionals, and culturally competent resources.”

Jade Kearney: Oh sure. She Matters is designed to support Black women who experience postpartum anxiety or depression through community, culturally competent therapists, healthcare professionals, and culturally competent resources. So, what we do is we find a therapist and train them in cultural competency, specifically Black mothers. We match Black mothers with those therapists and healthcare providers. We also provide community through the She Matters App, where Black moms can talk about their experiences in postpartum because a lot of women don’t understand what they are experiencing until after they have experienced it. Because of cultural stigma, we make sure that there is a community element to our platform.

Dr. Hillyer: What inspired you to start a platform for Black women experiencing postpartum anxiety and depression?

Jade Kearney: I suffered from postpartum anxiety in the form of OCD and intrusive thoughts. It was really a lonely, lonely experience. I am now eleven months postpartum with my second daughter, but I had postpartum anxiety and depression with my first, and I remember feeling just like no one was paying attention to me. I was sinking. I was going to work. I was taking care of my daughter. I really felt terrible mentally. I felt like I was losing myself. I felt like I could not really connect with my daughter from a place of happiness, so I was overbearing with her. I could not enjoy being a mom, and every time I tried to speak to my family or my community about it, the response was, “You will get over it,” “Keep moving,” “You have to go to work.” When I tried to talk to healthcare professionals about it, antidepressants were thrown at me, and it was like, you will be okay, but nobody would listen; no one was listening. So, I decided that I would start She Matters because I didn’t want any other Black mother to feel the way that I felt especially considering all the things that we deal with dur-

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ing pregnancy, whether Pre-Eclampsia, hemorrhaging, and all the statistics that go around with just having a Black child, right. So now, in the postpartum period, I'm also suffering. I thought it was over during pregnancy, but I didn't realize it began the moment I left the hospital like suffering and loneliness, really.

Dr. Hillyer: Now, usually, the standard of practice in the healthcare field in the OBGYN field is to do the Edinburg scale for screening for postpartum depression. Is this screening equal for all?

Jade Kearney: No, we're actually working on changing the Edinburg scale so that it's culturally competent. I am not Afro-Latina; I'm Black American, but if I was, I've had women come to us that were Afro-Latina and say to us, "What does it mean to say I still feel like things are getting on top of me mean?", that can actually be literal like things are actually getting on top of me. This was created over 40 years ago, and times have changed. It is not culturally competent. It is like a standardized test; it's not one size fits all when it comes to explaining your mental state. We are working diligently to change this and put out a new scale by the end of the year.

Dr. Hillyer: What are some of the questions you think will be highlighted to help change and make the Edinburg scale more culturally competent?

Jade Kearney: I think questions around when it says "sometimes," "all the time." We need to say, "have you felt anxious in the last week" just have people felt anxious, one question "yes" or "no." The question, "I have things getting on top of me," have you felt overwhelmed. What is overwhelmed? Write in a response. What does overwhelm mean for you? Have you cried uncontrollably for the past three days, give some actual context to these questions because the current scale is up in the air, right? It's says the past 7 days, but it doesn't highlight that in the questions. It says that at the top of the scale, in the past 7 days. Then the questions do not say, in the past 7 days, and the questions are just asking you for right now. So, we need a scale that talks about how you felt in the past week. Have you thought about suicide in the past week? Have you felt like you are a harm to you or your child? are you scared right now? These are like common questions.

Dr. Hillyer: What really stood out for me was that you said you felt you weren't being listened to. The first reaction was to prescribe medication. Even as you talk about the adjustment of the Edinburg scale, I hear how it's really important to sit down with the mothers and find context within the questions being asked.

"That's why we believe in culturally competent healthcare professionals because if you're not building a relationship with your healthcare professionals, you need a different healthcare professional, you need a different doctor, you need a different pediatrician because the person should have the time to sit with you and go over this scale."

Jade Kearney: Yeah, and that all goes back to your provider. That's why we believe in culturally competent healthcare professionals because if you're not building a relationship with your healthcare professionals, you need a different healthcare professional, you need a different doctor, you need a different pediatrician because the person should have the time to sit with you and go over this scale. Hey, I noticed that you're struggling to answer this. Is there something I can help you with, or do you need clarity around these questions? I mean, it's that simple, but the healthcare industry makes it that difficult, and honestly, a lot of people, a lot of Black mothers that we talk to said that they didn't remember getting the scale or they got it, and no one ever said anything to them about it. So, there was no follow-up, and just culturally as Black folks, we know mental illness is stigmatized. It's a huge cultural stigma, so if you say to us, medication, medication for mental illness is automatically a turnoff. No, you didn't talk to me, I don't know why you are giving me this, I don't know if I can trust you, I don't know if I can trust this medication, I don't know if I'm going to feel like myself, I don't know if it's going to control me or change me. As a healthcare provider, you need to be culturally competent.

Dr. Hillyer: So, context is everything.

Jade Kearney: Context is everything. As much as we like to say that we're all one people and in a lot of respects we are but there are cultural differences around vocabulary colloquialism. So, "I feel like things are getting on top of me" is nothing that I would ever say in my community. It just doesn't speak to everyone, it doesn't speak to South-East Asian women, but specifically, it doesn't speak to Black women. I want to say this, I'm a Black woman, so She Matters starts with Black women, but we also started with Black women because Black women had the highest incidence of death during postpartum. So that's why we start with Black women, and that's why I'm speaking specifically about Black women in this context. It is just not something culturally that we would say. I don't think people of color in general say, "sometimes," "always," "never." It's very confusing stuff. I think it's confusing for any woman, but when you get down to people of color and specifically Black people, it is not how we converse with each other. When doing challenges, this is not the language that we use, not the vocabulary that we use. It's important that healthcare providers understand that and are able to use the language in that and in context when speaking with Black women, right Black mothers.

Dr. Hillyer: Why do you think it is or that it appears that women of color, Black women suffer in silence?

Jade Kearney: Well, I think that it is two folds, right. One is because of cultural stigma, and some people say, are you giving the healthcare system a pass? No culturally, mental illness is not something that we discussed. It's not!. We have this strong woman's syndrome. This ideal that we're supposed to live up to is that we're supposed to handle everything. We're supposed to

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suffer; we're supposed to suffer with class. That's what we like to say. Black women are held to the standard of she suffered so well through that. No! So, we're living up to the standard of I went through all these challenges and "I did it alone" or "I did it." I made it all the way here through all of this. That's not healthy, right.

Then the healthcare industry has historically been vicious to Black women. Starting from the father of gynecology, who would practice on slave women without any anesthesia operations without any anesthesia, right. Down in the '80s and early '90s on the east side of Harlem, they were sterilizing Black and Latina women who were going there for birth control. We can take it around the globe and go to South Africa, where they were giving Bondi beer in cartons with tremendous alcohol; it was sterilized Black women. I mean, this is something that's done to Black women around the world, but it's done with precision in the United States. So, there's an earned distrust that we have for the medical system, and they need to earn our trust back. So, our cultural competency certification is one way, it is a step because we know that we can't change maternal health care, but we can improve.

"Then the healthcare industry has historically been vicious to Black women. Starting from the father of gynecology, who would practice on slave women without any anesthesia operations without any anesthesia, right. Down in the '80s and early '90s on the east side of Harlem, they were sterilizing Black and Latina women who were going there for birth control."

Dr. Hillyer: I remember learning about precisely the history that Black Americans went through in the United States within the healthcare industry. I don't think that the average healthcare provider understands that part of our history. Or goes through a cultural competency on the deep generationally rooted pain and mistrust that Blacks have within America. Let alone your everyday person. So, our society may not even see America's history as a barrier, but obviously, you pinpointed a huge issue when it comes to the historical and generational mistrust. What are some of the other cultural obstacles that may take part in this?

Jade Kearney: I think other cultural barriers are what our mothers see. I'll take quotes from some of the women in our community. "I was tired of not being heard, so I started to just do self-care at home," which is terrible because there's screening that needs to be done to guarantee that you're healthy. If you're hemorrhaging, there's no way, if you're not a medical professional, that you know how much you should be bleeding. So, there's this thing of like I'm on my own because they don't know what I need because they don't understand me. So, we're also improving communication because there's a language that's spoken and in healthcare that sometimes we don't speak and vice versa, right. So, yes, we're all speaking English, but if you're not communicating with me on an empathetic level, then I immediately tune you out because I don't

feel safe. Everything in healthcare has to do with safety, right. This is my life. This is my child's life.

I need to feel safe with you, so I can be honest with you. There's also this barrier to mental health with Black women. I don't want to tell you that I had thoughts of hurting my kid because I'm afraid that you're going to take my child. If you look at the incidents for Black women's children are taken for mental illness, it's greater than white women. I mean, we can go down the line schizophrenia, depression, and anxiety; our kids are taking at higher instances than white children. You have to be a healthcare provider who is learned in our culture. You understand the conversation. I want to help you. It's safe here unless you are a harm to yourself, your child we're not going to take your child. We just want to help you. But that takes caring. That takes understanding who you're working with. That takes building a relationship with the person you're giving care to. Outside of an emergency room situation, like in an emergency, you're trying, I understand that emergency room doctors are trying to figure out the same. Right like this emergency, I'm trying to help you even then in order to fix you in an emergency, you have to speak the language of the person, or you won't know what's wrong.

Dr. Hillyer: That is correct. So, do you think there is a correlation between the racial disparities in pregnancy-related mortalities and Black women's mental health during and after pregnancy?

"Absolutely, I think the stress of being a Black mother is enough to create any type of morbidities because we live in a country where systemic racism is a part of our healthcare system our education system. So, who's already stressed there, so I wonder if I'm going to come out alive after I have my child. I wonder if the doctor is going to treat me with dignity and respect."

Jade Kearney: Absolutely, I think the stress of being a Black mother is enough to create any type of morbidities because we live in a country where systemic racism is a part of our healthcare system our education system. So, who's already stressed there, so I wonder if I'm going to come out alive after I have my child. I wonder if the doctor is going to treat me with dignity and respect. Hence, the Dignity and Respect Act in California. I wonder if I'm going to have a premature Black child with a low birth rate because we have higher instances of that. It's stress from inception, and that's all mental health. Across the board, postpartum anxiety and depression went up, whether you are Black, White, Asian, or Other. So, for us, it went up four times, Pre-Eclampsia and hemorrhaging went up four times the rate which is already horrific. We're in an epidemic right now with mental illnesses definitely as a part of it because if you cannot trust the people who are supposed to help you when you're suffering. What are your options? What happens if you're in pain and you cannot go to the doctor to get help? What happens if you are having thoughts that you don't under-

stand? I mean, everyone knows that mental illness left untreated equates to a greater instance of mental illness. Depression that's left untreated gets worse, anxiety that's left untreated gets worse. If there's no reciprocal communication between the healthcare industry and Black women, it will continue to get worse.

“That is absolutely true. You know, one of the things that I think about and am grateful for is that you have a celebrity like Serena Williams, really bringing attention to what it is like for us Black women not being heard during these times. She almost died after giving birth to her first child Alexis Olympia.”

Dr. Hillyer: That is absolutely true. You know, one of the things that I think about and am grateful for is that you have a celebrity like Serena Williams, really bringing attention to what it is like for us Black women not being heard during these times. She almost died after giving birth to her first child Alexis Olympia. When I think about the celebrities I can recall talking about postpartum depression, I remember Celine Dion, [and] Gwyneth Paltrow.

Jade Kearney: Brook Shields

Dr. Hillyer: Brook Shields, yes. Maybe even Princess Diana, but it feels like the only woman of color I remember speaking out is Chrissy Teigen. Then it makes me think that our voices just aren't really being heard even at that level. You believe that you have all the money, and yet you still have that fear or stigma.

Jade Kearney: I agree. I think the fear is people because we have to keep up this, “I am strong.” I think the exterior appearing to be strong like this role that we take on is really because it is a defense mechanism because it is the default to being a Black woman trying to navigate the healthcare system. You encounter so much rejection, you encounter so many no's, it's almost like you don't feel human. It's like when your kids ask, “why does this kid get this, and I don't get this.” Why is she being heard, and I'm not being heard. So, after a while, you stop screaming because no one's hearing you. Nobody's hearing you. I don't care if I'm Beyonce, Serena Williams, if you're not hearing me and if when I do say something, it falls on deaf ears. That's the biggest thing when we do scream when we do say we need help, and we do say we're not strong enough. People ignore us because people are comfortable with Black women suffering. I say this all the time. It is comfortable when we say she's supposed to suffer, and that's also culturally. People are comfortable with us saying, “I'm tired,” “I'm stressed,” “I need help.” Well, not I need help because you never say it. But I'm tired, I'm stressed, it's hard. Okay, that's the role that you play. Historically, we suffer right here in this place. So, no one is alarmed because it's just the status quo, and we've taken that on as a community to say, “okay, it's okay,” but it's not okay. It's not. It's really not okay. Look at the instance of suicide, look at the girl just jump out of the window,

Dr. Hillyer: Chelsi Smith, Miss USA.

Jade Kearney: Miss USA, who just jumped out of the window in the city. She was suffering from depression. We're hearing more stories like that of Black women committing suicide because if you scream, if you speak up if you're hollering, no one hears you. So why?

You have to change that, especially from others. If you're a mom and you have a child, and you're suffering from mental illness, it is a known fact that it will affect your child. So, in order to improve stigmas of mental health in the community, it starts with Black mothers. In order to improve maternal morbidity, it starts with mental health because that's how you get mothers to go to that six-week visit. Black women are 40% less likely to go to the six-week visit because they're interacting with doctors on that first visit isn't positive. So, if the first time wasn't positive, why would I go again? Why would I go for a follow-up with you? That's all mental; that has nothing to do with your physical body. It has everything to do with the relationship that was built or destroyed. That instance when you have that baby and postpartum when you go to your pediatrician. That place is pivotal at decreasing Black maternal morbidity.

Dr. Hillyer: Your website offers tools that can help Black women breakdown the cultural stigma and the medical neglect that we have associated with mental illness. Can you tell me about some of those tools that She Matters provides?

Jade Kearney: Well, we have events. So, for instance. We had an event this past Thursday where we had a doctor come on. It's called Black women and postpartum anxiety and depression. We talked about it and we talked about signs of postpartum anxiety and depression and why we may be more likely to not speak about it. Then we just allow women to express themselves and be heard, and we validate their feelings. I always say I always felt like my suffering. The suffering that I experienced postpartum is the path for someone else's healing. When you talk about what you've experienced, it opens the door for someone else to not experience that same thing or to identify what you experienced and get help. So, hopefully, through our blog and through our events and through our guests' speakers, our doctors, our psychiatrists, women find a voice and speak up for themselves. We can offer tools to ask your practitioner if you're feeling like they're not hearing you. You know, our insurance is the same as other people's insurance, so it's all the same price. This thing you see me, it cost the same as anyone else so you're supposed to serve me. So, I feel like I'm not being served, I have to be an advocate for myself. We offer some of those questions that you can ask your practitioner if you feel like you're not being heard because you can't let people off the hook for not doing their job.

“The suffering that I experienced postpartum is the path for someone else's healing. When you talk about what you've experienced, it opens the door for someone else to not experience that same thing or to identify what you experienced and get help.”

Dr. Hillyer: You absolutely cannot. I know some women may want to try and connect with a Black physician. This could be a great tool, but that may not be the solution. Especially when Black women physicians only make up 3% of healthcare, so that cannot be the only answer. What are your thoughts regarding that?

Jade Kearney: I feel like we are 12% of the population. Black female doctors are less than 3%. All doctors should be culturally competent because all doctors take my insurance. So, all of you should be able to serve me when I walk into the office. This is not 1950; this is not segregation; every doctor should be able to serve every person. I don't just want a Black doctor. My OBGYN is a Jewish man. So, I want a good doctor if she's Black, well oh great, if she's Asian, Okay. I want you to be great at what you do. I want you to help me. Like I said, I mentioned earlier, there are some other great people doing the work. In HUED (<https://huedco.com/>), these companies find Black practitioners, and they pair them with Black people, in general, looking for health care services. That's amazing. We want everyone to be able to serve Black women, period.

“In HUED (<https://huedco.com/>), these companies find Black practitioners, and they pair them with Black people, in general, looking for health care services. That's amazing. We want everyone to be able to serve Black women, period.”

Dr. Hillyer: Absolutely, and I think that hits it right on the nail, period! So, what steps does your organization take to create these culturally competent therapists and these resources?

Jade Kearney: Well, we created a culturally competent certification. It's a 12-week program that goes through the nuances of Black women in this country. We go through details about culture, we go through some of those case studies, we have guest speakers come on from Yale psychiatry, and we just talk about the Black female experience. Once you go through that 12-week process, you meet with Black mothers; we think the best practice is practice, so working with Black women. Then you graduate from the program. It's 12-weeks of someone's life to have some empathy. The learning management system we use has a culturally-bias quiz, so when you get on the platform as a practitioner, you can actually watch your journey. We all have biases so let's put that out there. Everyone has biases, but we all can improve. As a practitioner, I think the job of a physician is extremely difficult and stressful, and so does seeing your progress through this journey is also great for the mental health through the practitioner. We make sure that there's that give and take relationship, but the certification was created by me and psychiatrists out of Yale in Columbia. I have a background in diversity inclusion from Georgetown.

Dr. Hillyer: Fantastic, and anyone or provider can go directly to your website to sign up for these classes?

Jade Kearney: Yes, they can just go to the culturally competent tab and sign up, and then we will let you know when the next class starts.

Dr. Hillyer: All the things you have already talked about sound like your program is already working on reducing some of the racial disparities that we have seen with postpartum depression and the screening tool that you're hoping to adjust. Is there anything else you want us to know about specifically your platform and the steps you are doing to help decrease these racial disparities?

Jade Kearney: Well, our culturally competent certification is specifically for Black mothers, right, specifically for Black women. There are no other certifications specifically for Black women. There are racial bias certifications, there are birthing with dignity certifications, but it's general; it's for people of color. This is for Black women; there's no confusion. This is if you work and you interact with Black women in the healthcare space. This is something that you should definitely take advantage of because it's pointed. You know it's for us because of the statistics around maternal morbidity. We have to be pointed; we can't go around it. It's not for everyone. It's for Black women, and I think that's important.

Dr. Hillyer: So that is just one of the tools that people can find on your website. What are some of the other things that you hope your platform will be able to accomplish?

Jade Kearney: Well, we have our app, which is in Beta, and that will be available at the end of March.

Dr. Hillyer: Honestly, as I listen to your journey, I hear you talk about the things that you are providing.

I provide care in the Neonatal Intensive Care Unit, but you have me seeing the importance of the NICU. Even if we don't consider ourselves providing direct healthcare to Black mothers. We often view ourselves as technically the providers of the baby. However, if you really want to be a part of a holistic care family-centered care. It sounds like it shouldn't just be the OBGYN but any provider touching bases with the families during this time. The NICU, after all, produces considerable stress.

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Jade Kearney: Oh my God, so huge with my second baby she was hypoglycemic, and we were in the NICU for a week. I don't want to say the wrong statistic, but Black women are more likely to have their babies in NICU. I came in contact with many Black women and some who had multiple kids, and then they were working, and their babies were NICU. It was just stressful, and so when you leave, you're postpartum, the first doctor you interact with is the pediatrician. That's the first person who gives you the Edinburgh scale. So, it has to be this centered care around the mom coming from the OBGYN, the general practitioner, the pediatrician because every doctor has their pulse on whether or not this mom is okay. It's the relationship, so one isn't able to pick it up the other one should, based on their relationship. I think the NICU is an amazing place to connect with the mom because that's a place where she's vulnerable, where she can hear you because

she's there for her baby. I was there, I was a mess when I was in the NICU and the nurses that were there, thank God. I had both my daughters in Morristown because, in New York, I'm 12 times more likely to die, so I went across the bridge in New Jersey to have both my girls. Morristown Hospital wonderful staff, my baby was very well taken care of, and the women heard me, and I felt seen. After going to the doctor's office here in New York, where I did not. So, I'm very thankful for the staff there.

Dr. Hillyer: I'm glad you had a good experience with the NICU staff. I know that there has been an extensive discussion over the last couple of years, with more individuals in the healthcare field having to understand their bias and what it means to be culturally competent. Trying to really understand how systemic racism has developed the healthcare system. I remember reading an article, "Speaking Up to Address Racism and Health Inequity," in *Advances in Neonatal Care* and seeing its responses on the Neonatal Association of Neonatal Nurses Facebook page. However, often there is resistance when people think about systemic racism. The seemingly overwhelming response on NANN's Facebook was, "We wouldn't show any racism towards babies." So, it is interesting to hear you talk about how each of the providers of Black mothers, especially those of us in the NICU when the mothers are the most vulnerable, need to have our hand on the pulse.

"I'm being judged, but it's not a matter of being judged because subconscious cultural bias is something that is we're all a part of because we all live in systemic racism here. So, it could be subconscious, it could be something you're completely not aware of, but it's definitely something you should look into. It's definitely something that you should look at and say, "I am" or "I am not," let me figure that out. Let me look into this, and that takes not being defensive."

Jade Kearney: Yeah, because they're the first to interact with us. Look, nobody wants to do this hard-working being a physician and feel like, oh, I'm being judged, but it's not a matter of being judged because subconscious cultural bias is something that is we're all a part of because we all live in systemic racism here. So, it could be subconscious, it could be something you're completely not aware of, but it's definitely something you should look into. It's definitely something that you should look at and say, "I am" or "I am not," let me figure that out. Let me look into this, and that takes not being defensive. No one is judging the physician; everyone is just saying we all have the ability to improve. This is one step to improve because obviously there's a problem. It's not made-up Black women; we are dying more than anyone. Black women are more likely to have their kids be in the NICU. Black women have

higher incidents of postpartum hemorrhage, Pre-Eclampsia. All of the things are bad. It's not just by chance something else is going on, and it has to do with communication, and it has to do with systemic racism. It goes past socioeconomic status, and it's like I'm at the point, I don't know, I don't want to hear it anymore like really there's the problem to say that there's not would mean you're in complete denial.

Dr. Hillyer: Today's focus has been about Black women, but honestly, this affects more than just Black women. What is your perspective on that and on how it affects family members or even the generational effect?

Jade Kearney: I think that it affects everyone in the community. If you mean, do you mean more than Black women like race-wise, or do you mean people in the Black community or both?

Dr. Hillyer: Yes, I am talking about both.

"We're part of the equation and every facet, so everyone should care. Black women dying is an American problem; it's not just the Black problem."

Jade Kearney: I think race-wise, it affects everyone because Black women are not only in Black communities. Black women are part of this society, so Black women are suffering. Then can any of us really say that the healthcare system is great, or can anyone ever really stay that America takes care of its women or takes care of his mothers because we're part of the equation. We're part of the equation and every facet, so everyone should care. Black women dying is an American problem; it's not just the Black problem.

Dr. Hillyer: As you point out, it is an American problem. So, we have talked about what Black women can do; how they can connect with you, how you can connect them with a culturally competent therapist and providers. Then you talked about how the healthcare system can work on creating culturally competent providers and different things that we can do individually. So, can you tell me how the community can affect State policies to achieve a broader national scale?

Jade Kearney: I think that communities have to demand respect and advocate for themselves. Individually we have to advocate for ourselves but also the family members, the husbands, the partners, the grandmothers. We have to start to advocate for ourselves and stop suffering in silence. Use our voices because when we use our voices, people listen; we just saw that with George Floyd; we saw that in the last 2 years. It's important that we speak up, and I think that this place where Black women are less likely to speak up because there's some level of this is what I'm supposed to go through and it's not what we're supposed to go through we don't have to suffer, nor are we supposed to suffer. So, the more that we as a culture, we understand that you can be a mom and you can have some type of peace, and you deserve to have that peace, and you are you're worthy of having that peace. I think that also changes things, and I think that is generational. You know culturally the suffering, the challenges that we've been through. I mean, we're not that far removed from the plantation, so I mean when you think five grandmothers back, suffering was just a part

of life. So, it's hard to change that thinking and pain and suffering. Also was down to a molecular level, so we all have some work to do as a culture with mental healthcare. So, we can change the narrative for our daughters and their daughters, and so we can demand happiness.

Dr. Hillyer: Thank you for shining a light on this topic. What is your platform currently doing?

Jade Kearney: Thank you, so thank you for caring about this topic and reaching out, and just being willing to offer a platform. We currently have 6,000 women who signed up in 2 weeks, so we are asking all healthcare providers to sign up to serve the community that really wants change. So, the platform opened on January 7th, and 6,000 women signed up, so if you are an OBGYN, if you are a pediatrician, if you are a psychiatrist, psychologist, or social worker, please go to our site and sign up for the certification. Even if you just want information, we want you guys in our community. We want women to know who you are so they can get services from you. Especially if you feel that you're culturally competent or would like to become a culturally competent healthcare provider. We get about 40 women a day who comes to us for help from mental health, all the way through general practitioners. So please sign up for it if you would like to help in any way. Just go ahead and sign up on the site. We appreciate it.

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Dr. Hillyer: Is there any way we can help support your platform and the policies you are working on?

Jade Kearney: I would say you can donate through She Matters. When you donate, a Black mommy gets therapy. So, if you choose \$25, \$50, \$100, a Black woman automatically gets therapy, and we do not turn Black mothers away. So, I think the best thing to do is share this with a Black mom because she may be surfing in silence. Or, if you would like to donate, you can donate to make sure Black mommy gets therapy.

Dr. Hillyer: Well, your platform truly is helping us change that narrative. I want to thank you for lending your voice to this crucial subject. I want everyone to know about you, about **She Matters**, and what you do.

To our audience, I want to thank you for joining us on this segment of Neonatology Today. We really want to make sure that we don't just help healthcare providers but the vulnerable communities. To continue to work on assisting Black women in feeling



comfortable about mental health and in bringing attention to the morbidities and mortality rates of Black women during pregnancy. Let us make a path forward in change.

Thank you again, Jade, for joining us and sharing your website and app **She Matters** (<https://www.shematters.health>).

Disclosure: , Jade Kearney is the Co-Founder and CEO of She Matters

NT



About the Author: Kimberly Hillyer, DNP, NNP-BC:



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As a Neonatal Nurse Practitioner, she has worked for Loma Linda University Health Children's Hospital (LLUH CH) for twenty years. During that time, she has mentored and precepted other Neonatal Nurse Practitioners while actively engaging in multiple hospital committees. She was also the Neonatal Nurse Practitioners Student Coordinator for LLU CH. A secret passion for informatics has led her to become an EPIC Department Deputy for the Neonatal Intensive Care at LLUH CH.

She is a reviewer for Neonatology Today and has recently joined the Editorial Board as the News Anchor.

About the Interviewee: Jade Kearney, MA, MA



Jade Kearney is the Co-Founder and CEO of She Matters, a digital health platform designed to improve mental health for Black women through community, culturally competent therapists and culturally relevant resources. Jade is the author of "Lean: A Guide to Black Entrepreneurship" and the creator of "Black Girl's Tech Day". She has a background in diversity and inclusion and a Master's degree in Digital Media Design from NYU. As a Black female founder and mother, her goal is to inspire other women of color to experience their power through entrepreneurship.

Operational Logics and Inference During [1/f or f -1] Noise Events: High-Reliability Operations (HRO)

Daved van Stralen, MD, FAAP, Sean D. McKay, Element Rescue, LLC, Thomas A. Mercer, RAdm, USN (Retired)

Abstract:

To prepare for and operate in stochastic environments, we study and even master academic models. The environmental stochastic Noise separates the world of practice from scientific theory. Oscillating and fluctuating processes create frequencies of power, the color of Noise, and unpredictability. These environments also contain the determinants of stress, putting individuals at risk of the peculiar Logic of Stress and the ecology of fear. We effectively engage these environments by logic, a logic of practice shared by those who crossed the threshold with us - not classical logic, however. Modal logics conform to changing events and support flexible thinking. Paraconsistent logics support inferences from contradictions. In topology, the central concept is continuity and how the elements preserve a notion of nearness by a continuous function. They maintain connectedness during deformation without tearing apart to create a new boundary.

“We hear these phrases, resignations to the futility of cherished, though undependable, plans. Then why make such futile plans? As stated by La Porte, we must act. But act into what?”

Introduction

We “must act when we cannot foresee consequences; we must plan when we cannot know; we must organize when we cannot control,” Todd R. La Porte (1).

“No plan survives the first shot.” “No plan survives the first contact with the enemy.” “Every plan is a good one until the first shot is fired.” We hear these phrases, resignations to the futility of cherished, though undependable, plans. Then why make such futile plans? As stated by La Porte, *we must act*. But act into what? “The fog of war”? Another phrase like the weather – talked about yet not acted upon. The fog of war is the uncertainty and confusion of any red noise forcing function – the system, through individuals, must respond even when “we cannot know...we cannot control.”

We *can* project thought into the stochastic environment. We *can* act into uncertainty. We can operate in that fog by generating new information through logically acting and inferring new information. By appreciating the limits of classical logic, we can identify logic to

our actions, the logic of practice.

To prepare for and operate in stochastic environments, we study and even master academic models. Logic is how we can reliably use these models with available information to make useful, valid inferences. However, information in these environments is imperfect and in flux, opening a gap between practice and theory. Using scientific models to predict what would happen when entering these environments can kill inaccurate models (2).

“Everything around us, and within us, from the micro to macro, has oscillating behaviors. These oscillations may become synchronous, aggregating into waveforms that can develop into collective behavior (3). Feedback or an external force can readily desynchronize the oscillations and waves into aperiodic fluctuations, the variable, random, stochastic ‘noise’ forming our environment.”

Everything around us, and within us, from the micro to macro, has oscillating behaviors. These oscillations may become synchronous, aggregating into waveforms that can develop into collective behavior (3). Feedback or an external force can readily desynchronize the oscillations and waves into aperiodic fluctuations, the variable, random, stochastic ‘noise’ forming our environment. This is the actual, ‘real’ world, the world studied by scientists, academicians, and management scholars, whether in the field or the laboratory. The Gaussian distribution disintegrates from these noisy fluctuations, impairing correlations between the environment and laboratory or office.

When we separate and remove signals (cycles with predictability that have meaning) from Noise (the residual variability that causes unpredictability), we can distinguish environmental stochastic noise patterns from their probability distributions and the influence by various frequencies – white brown, pink, and red Noise.

We develop concepts, models, and theories to understand and predict aggregating, collective behavior that has been influenced by environmental stochastic Noise. Classical logic underlies the development of scientific theories (4). Scientific rationality provides the framework of organizational and management theories (5). Classical logic and scientific rationality are founded on deductive reasoning (facts guarantee the conclusion), statements either true or false (bivalence), and discrete entities having distinct properties (law of the excluded middle). Environmental stochastic Noise separates the world of practice from scientific theory. It separates the formal knowledge produced by management scholars from the applied knowledge needed by practitioners.

The Color of Noise and Predictability

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Oscillating and fluctuating processes create frequencies of power. In some environments, the spectrum has an equal distribution of all frequencies with constraints on the power. This is a 'white noise environment' with a frequency value f^0 , named after the white Noise in acoustical systems. The frequencies and power can all be random as in Brownian motion; hence, 'brown noise environments' with frequency value f^2 . The frequencies of these two environments are related through the calculus integral function discussed below. Half the integral of white Noise is pink Noise with frequency value f^{-1} with characteristic 'flickers' of power. Environments with low-frequency (or long-period) cycles are a 'red noise environment' having frequency values around that of pink Noise. We will discuss how this affects logic and the inferences we can make.

“Without the dominance of any frequency, events are random and independent of past events (6, 7). This does not mean that surprises will not occur. Novel properties can emerge from the stochastic resonance that creates environmental Noise (8).”

White Noise has a flat spectrum uniformly spread across all frequencies ($1/f^0$, a constant). Without the dominance of any frequency, events are random and independent of past events (6, 7). This does not mean that surprises will not occur. Novel properties can emerge from the stochastic resonance that creates environmental Noise (8).

White Noise has the characteristic that the values will converge by summing the low frequencies at random (integration by the calculus of the power). If we sum the *high* frequencies at random, the values will *diverge*. When we sum all random frequencies over longer time intervals, the values will converge to an average or *mean value*. The instantaneous value, however, will be undefined (9).

White noise frequencies, $1/f^0$ (a constant), therefore generate a normal distribution with zero mean, constant variance, and is uncorrelated in time (in a time sequence, the value at time t is random and independent of the value at time s). 'Gaussian' white Noise has a normal distribution of mean 0 and standard deviation 1. This makes possible statistical analysis and probability calculation and the development of reliable models and theories.

'Brown' Noise (after Brownian motion) is random Noise generated by keeping a running or cumulative sum of power differences in increments, constantly adding up the power. This summing up makes brown Noise the calculus *integral* of white Noise and white Noise; therefore, the calculus *differential* of brown Noise. Since the flat spectrum of white Noise is $1/f^0$, then brown Noise has a spectrum of $1/f^2$.

When summed (integrated) toward *zero frequency* and over longer timescales, the value *diverges* from its initial value. Summing frequencies that approach *infinity* gives *converging* values. Combining all the frequencies as for white Noise (which converges to a mean value, described above), the diverging low frequencies and converging high frequencies results in *no mean value*. Brown noise, therefore, generates a random distribution rather than a Gaussian distribution. Over time, this random walk function wan-

ders farther away.

Pink Noise (also called fractal, flicker, $1/f$, or f^{-1} noise) is half the integral of white Noise. Pink Noise is the power function half-way between white Noise's predictability and the randomness of brown Noise. We can observe 'flickers' of power (abrupt increases in magnitude) (9, 10) at 'half' the integral of white noise processes. Flicker noise sums (calculus integration) *diverge toward zero or infinite frequencies*. Without a long-term mean or defined value at an instantaneous time, pink Noise does not form a Gaussian curve. Because these divergences are logarithmic, extending time intervals in a time series may not capture the flicker (9). Rare events are more severe and sudden in the pink noise environment, as forcing functions (7), forming a power distribution.

[The name flicker noise came from John B. Johnson's initial measurements of the white noise spectrum. He measured an unexplained flicker at low frequencies halfway between white and brown Noise (10).]

Red Noise is dominated by low-frequency (or long-period) cycles producing an increased probability of long runs of above or below average conditions. Low-frequency events (reddened spectrum) have an inordinate influence on a system because prolonged decay continues dissipating energy and environmental disruption (11, 12).

Red and pink Noise develop from autocorrelation, the feedback when the past influences the present or a system interacts with other systems. Red and pink Noise have zero mean, increasing variance, and are autocorrelated in time by feedback. As power distributions, the non-Gaussian nature of red and pink noise distributions impairs our ability to use classical logic, rigid models, and strict concepts.

“Whenever a system results from its past, there is feedback or correlation between past and present. Feedback from the system onto the system is autocorrelation and shifts a system from white Noise and the Gaussian distribution to red or pink Noise and power distribution.”

Whenever a system results from its past, there is feedback or correlation between past and present. Feedback from the system onto the system is autocorrelation and shifts a system from white Noise and the Gaussian distribution to red or pink Noise and power distribution. It is forcing functions to become ubiquitous, not entirely random except by timing. The forcing function emerges from known processes within normal variation, differing from only as a matter of time scale and magnitude.

As described above, low-frequency events are forcing functions that the system must respond to. While possibly counterintuitive, this also describes human behavior – our past experiences influence our current behavior, and we constantly interact with those around us. ALL human behaviors are autocorrelated. ANY system with *human behavior is a red noise environment that will generate forcing functions into the system*.

We may have a hard time accepting that random environmental Noise has the power to force the system to respond. This is espe-

cially true when the human behaviors are *internal* to the system: leaders, supervisors, and line staff. We believe that everything that happens must have a cause(s) that can be identified, and for that, we can prepare. Stochastic resonance brings things to our notice, things we would not usually detect (8). Environmental stochastic Noise brings things together for interactions we would not normally expect. Stochastic Noise, then, generates the unexpected from the expected.

“Feedback processes generate stochastic resonance that creates the red noise environment with the loss of Gaussian distributions. However, precise, tight coupled scientific theories, models, and concepts do not necessarily provide the necessary accuracy for deadly contexts (2, 13).”

Feedback processes generate stochastic resonance that creates the red noise environment with the loss of Gaussian distributions. However, precise, tight coupled scientific theories, models, and concepts do not necessarily provide the necessary accuracy for deadly contexts (2, 13). Red Noise creates the dangerous gap that forms between theory and practice (5, 14), discrete concepts and continuous perceptions (15, 16), and the academician and operator (13, 17). Engagement of feedback and stochastic resonance in the red noise environment distinguishes operations from logistics.

Environmental stochastic Noise challenges our knowledge, undermines our experience, and refutes closely held beliefs, models, and theories. In the red noise environment, we have a logic of practice that differs from the laboratory or office – one that paradoxically applies to the well-controlled lab or office environment and for red Noise forcing functions and abrupt pink noise catastrophes. We use inductive reasoning and heuristics (18), loop decision making (19), and practical common-sense problem solving (20). In this paper, we discuss modal, paraconsistent, and topological logics.

The Logic of Stress

We must rapidly infer new information when the environment is in flux. All disturbances of various sizes are red Noise forcing functions and abrupt pink noise catastrophes, normal environmental variations experienced at different time scales (7). The properties that emerge are likely novel to individuals unfamiliar with the event, introducing a greater level of uncertainty. Trajectories become unpredictable and seemingly uncontrollable.

Stress interferes with making logical inferences. Novelty, uncertainty, unpredictability, and uncontrollability are the determinants of stress responses (21, 22). Uncontrollability alone causes minor stress to impair the brain’s executive functions (23), restricting abstract thought and suppressing action. Abstract words generate thinking while concrete, active words facilitate action (24). It is action, though, coupled with the perception that forms *motor cognition*, allowing us to adjust our actions to changing situations (25). The effect of *intentional* motor activity on thought as motor cognition may explain why intentional movement can break the grip of cortisol on abstract thinking.

This is the paradox of stress: inhibited abstract thinking with con-

crete motor cognition. We can recall our actions but not the logical inferences or conscious intentions that supported those actions. Conscious intention occurs *after* preparatory brain activity in the frontal and parietal brain areas (26), and intention in motor cognition is not complete until the motor function ends (26).

Logical inferences during stress events make sense to the operator at the time yet appear illogical to spectators and are often difficult to explain later. The authors have commonly observed concrete thinking that the individual later explained as actually being more complex abstract thought. More serious is the effect of fear reactions and threat reflexes while making logical inferences.

Interpretation of the stressor as a threat brings forward the conscious yet subjective *fear reactions* and subcortical, objective *threat reflexes* (27, 28). Separating the emotional and motor components of stress, fear, and threat elucidates the effect of stress on logical inferences in the VUCA-2T environment [see Table 1] caused by forcing functions. Because even showing fear impairs performance, those operating in dangerous contexts suppress the showing of fear reactions (personal experience and observation of the authors; (29-31). They also modulate threat reflexes because of the effect on cognition and performance (32).

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

Table 1. VUCA-2T (33)

Fear Reactions

We maintain distance for safety. An encroaching threat elicits the fear reaction to increasing distance by moving to a place of psychological or physical safety (34) and, if that fails, fighting to escape (35). The distant threat increases activity in the ventromedial prefrontal cortex (vmPFC), the brain structure necessary for decision-making in uncertain, risky, ambiguous, or context-dependent conditions (36). The vmPFC incorporates contextual factors into decision-making. The subjective representation of threat, and the degree to which it is felt, is processed in the phylogenetically older midbrain structure, the periaqueductal gray (PAG) nucleus. The PAG coordinates behaviors essential to survival controls, such as fast reflexive behaviors (e.g., fight, flight, or freeze) (37, 38).

This movement from contextual decision-making under uncertainty in the vmPFC to reflexive decision-making from the PAG makes the fight or flight of the *fear reactions* appear to be the same as the fight or flight from *threat reflexes*. What it describes, though, is the functional flow of response to a developing danger: apprehension leads to avoidance (flight), then becomes engagement (self-defensive fight). Fear reactions (PAG) develop from distance-based assessments as a functional approach, while *threat reflexes* (amygdala) come from active danger.

It becomes clear why those who work in dangerous contexts will suppress the subjective feeling of fear. The logical inferences that one would describe making during conscious, subjective fear responses develop deeper within the brain than conscious thought. Fear-flight causes people to avoid the threat in some way. Fear-

fight poses a more significant problem as the individual will focus on self-preservation by defensive protection or taking offensive protection through prompt aggressive attacks to stop the spread of the problem.

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Defensive protection keeps the threat at a distance. The person will not go near the threat or its source, whether it is abstract such as concepts or specific information or concrete such as the leader, an administrator, or a colleague. Distance interferes with forming accurate descriptions, correlations, or causations. Individuals, instead, rely on rationalizations and abstractions (for example, clichés and metaphors) to support and explain judgments, interpretations, and actions. The individual is less helpful to protect others since the person becomes focused primarily to reduce risk to themselves. Deflection, excuses, justifications, and prophylactic self-blame are standard methods (39).

The limited accuracy of observation and inferences directed toward self-preservation follow idiosyncratic rules specific to an individual. Others will learn these methods through modeling as they appear prudent and rational at the moment. As a method for logical inference, they are more likely to lead to failure to engage the situation, failure by not acting. We enact our operations restraints and may enact our fear. Failure from not acting is invisible and becomes part of the organization's knowledge (40), forming the invisible ecology of fear (41).

Threat Reflexes

Threat reflexes are subcortical actions due to *attack*, the *imminence of a threat*. We cannot control the threat reflexes as a reaction, but we can inhibit sustained threat reflexes and control consequent behaviors (32). Threat reflexes initiate behaviors for survival and adaptation to adverse or hostile environments. Perceptions of threat trigger reflexes that operate below the level of consciousness (42). Threat reflexes do not generate information by logical inference but will intrude into cognitive efforts to infer new information.

The fight is manifested by anger, including the instrumental use of anger for gain unrelated to the threat. The flight takes the form of avoidance and distraction. Freeze as attentive freeze supports observation. The body is tense and poised to act; the mind is watchful, collecting information. Attentive freeze is associated with faster subsequent cue-signaled responses (43).

Emotional memory rapidly initiates a behavior from a trigger event through the amygdala (44, 45). Emotional memory contributes to the logical inference that can be effective from an experienced veteran but destructive when associated with a traumatizing event at a subcortical level.

While mentoring military or public safety professionals regarding post-traumatic stress, one author (DvS) would describe their

sudden anxiety during a medical emergency (but not where the individual is exposed to danger). When they walk into a patient's room, their brain identifies objects by past, present, and future. The vase with flowers: who gave it, how did it get there, and why in that spot; is the vase interfering with activity; what can happen to the vase, will it fall, what can the vase be used for (as a weapon, for protection). Rather than fighting these images from the compression of time as past-present-future meant survival in a dangerous context, the individual can gain insight into the situation and the patient.

Fear as Faulty Inference

As with fear responses, logical inference from threat reactions is more likely a justification for behavior rather than the inference for new information. The resulting, unrecognized concrete thinking restricts if not intrudes into, the abstract, decontextualized processes of classical logic.

What confounds the translation of classical logic into reddened noise environments is the necessity to generate the information that is needed as the situation changes, cognitive impairments from maladaptive stress responses, the autocorrelation of time sequences (feedback), multiple valences developing from oscillations, fluctuations, and indications for when and how to act. The logic of practice translates to experience in dangerous contexts for routine operations. With the logic of practice, we need not see everything as a danger.

The Logic of Practice

We engage and enact in uncertain or ambiguous situations, not by decision theory, not by rationality, and not by sensemaking. It is, by logic, a logic of practice shared by those who crossed the threshold with us.

Academicians study the logic of practice from outside the flux and trajectory of events. Cognition and behaviors become normalized without the necessary access to inner mental states that may have been impaired by stress and threat. What is missed is stress and threat manifested as contingently linked behaviors (5, 17, 46). Detached observation and identification of abstract properties, necessary for scientific objectivity, conceal the situational reasoning and intent of the operator (5, 47, 48). Individuals' internal logic of operations becomes unrecognized and inaccessible (49).

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Within the NICU, the environment can become unpredictable from time compression and abrupt changes in structure. The Neonatologist must work with imperfect information in flux—the internal logic of events changes. Threats impair the mind, which, if unmodulated, can quickly become unrecognized and even normalized (32).

Karl Weick (50) described how these “cosmology episodes” collapse sensemaking and leadership. This occurred even with seasoned wildland firefighters during the 1949 Mann Gulch Fire when they mistook a large fire for an ordinary fire; then, they were overtaken by a firestorm. Such abrupt breaches in the environment

involve the entire group or organization. In structured, predictable environments, what is rational and logical becomes harmful during a cosmology episode. Actions or events may appear irrational solely because we do not recognize the system's internal logic. We likely continue using classical, scientific logic even as the system's internal logic changes.

Boyd's response (51) to a disruption of observed reality parallels Weick's sensemaking perspective that operators create what they focus on through repeated cycles. For Weick's sensemaking, the operator distinguishes cues within an ambiguous event to use for enactment toward a resolution that restores the disrupted activity (52, 53).

This illustrates three problems with scientific rationality (5):

- Underestimating the meaningful totality into which practitioners are immersed,
- Ignoring situational uniqueness characteristic of the tasks practitioners do, and
- Abstracting away from time as experienced by practitioners.

Modal Logic

When the Neonatologist enters the room, staff and family see the individual *designated* as the Neonatologist. In logic systems, if that specific Neonatologist can be interchanged with any Neonatologist, we are only seeking a Neonatologist, then "Neonatologist" is considered an *extension*. Logic systems that only consider *the designation of things* are extensional. Mathematics is an *extensional* logic system.

To the people in the room, "Neonatologist" has different *meanings*. For example, the same Neonatologist could be a teacher, the attending Neonatologist, or a supervisor. Meanings are truth values independent of the form, as the different meanings of "Neonatologist." Meanings are called *intentions*, and logical systems that deal with meanings are *intensional* logics. Meaning is the form, or mode, of a thing. Thus, a *modal logic* evaluates the mode or qualification of truth: the different ways things are true.

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Extension refers to the truth value entirely deriving from its form. For example, "Neonatologist" refers to the same attributes of all actors acting as "Neonatologist." These are extensional logics, and the *substitutivity principle* is valid, which is invalid *intensional* logics because the truth values are determined by something other than its form.

"Neonatologist" is interchangeable in classical logic, measured only as a quantity. Modal logics allow qualifications for "Neona-

tologist" such as "necessarily" and "possibly." In the 20th Century, modal logics developed to work with time, knowledge, belief, belief revision, and moral obligation (54).

These other logics allow values we need if we are to understand the VUCA-2T (Table 1, above) environments, the indeterminate problem (i.e., time compression, uncertainty, and threat), and ill-structured or embedded problem [references]. In informal logic,

1. multiple adaptive answers are possible;
2. many-valued and partially valued logics are used;
3. more than one truth, and partially true values all exist; and
4. the universe is *not* knowable.

We present modal and inconsistent logics as systems that benefit high reliability-seeking operations. Rational thought and preserving truth through logical operations may provide the best security in dangerous circumstances. However, mild uncontrollable stress impairs cognition and flexible thinking (23), corrupting rational thought while imperfect information in actively changing states corrupts classical logic operations. In addition, classical logic tells us what things are, the ontology, and not what we can or should do. Modal logics conform to changing events and support flexible thinking. Paraconsistent logics support inferences from contradictions.

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The limits to scientific logic can be addressed by the modal logics: the different ways, or modes, that things are true. We must learn how to use these logics to infer reliable information from imperfect information, understand our changing beliefs in a dynamic world with uncertain information, appreciate how time changes the truths and information we work with, and comprehend how situations create different, but logical, duties and obligations.

The rigid restraints of classical logic impair usage for uncertainty and inconsistency, particularly the law of the excluded middle. We can evaluate a premise by its appearance or form, or we can use partial operators. That is, we limit the action of the operator. Modal logic classifies propositions as *contingently* true or false and allows claims about what is necessary, possible, contingent, essential, and accidental. Modal logic is the logic of "modalities," *modes* (means) of truth, by using a variety of operators dependent on the domain of the logic (55) (Table 2).

Logic	Domain	Operators
Modal	Qualify the truth of a judgment	“necessarily,” “possibly”
Epistemic	Knowledge and belief	“it is known that” “x knows that” “x believes that”
Doxastic	Belief revision (add information) Updating (world has changed)	“x holds after contraction / revision / expansion”
Deontic	Moral expression, duty	“ought to be” “obligatory,” “permitted,” “forbidden.”
Temporal	Future, past Linear & branching-time	“it will be / it was” “it will be / it will always be”
Paraconsistent	Partial truth	“necessarily” rendered as “pragmatic validity.” “possibility” rendered as “pragmatic truth.”

Table 2. Modal Logics

Epistemic logic (Greek *episteme*, knowledge; the *certainty* of sentences) concerns the justification and rationality of knowledge and belief. Epistemic models help us understand how operators perceive the actual world. The person may have belief as conviction, that everything they believe is true, or they may only believe what is objectively true, that is, a belief independent of their subjectivity. There are small but conceptually important differences between these two frames of view. (Epistemology has two aspects: the definition of knowledge and its logical inferences. The two logical inferences are epistemic knowledge logic and doxastic belief logic.)

Knowledge of the situation depends on the frame of reference (17, 56): the subjective internal, the perfect (objective) external, and the imperfect external points of view.

The subjective internal view

The person involved in the situation builds from a mental model representing how the world is perceived. This model must include the beliefs of others and the beliefs that others have about the person, however wrong they are. Therefore, these beliefs could be wrong, and the envisaged models could be wrong. The individual maintains this level of self-awareness during a crisis.

The perfect (objective) external view

The person is an omniscient, uninvolved observer with perfect knowledge of the situation and has access to the minds of the people involved. The models are envisaged as true to reality. This is the presumptive view of planners and can be found in executives, administrators, and managers.

The imperfect external view.

The person is outside of the situation but does not have perfect knowledge. Any models envisaged could be wrong. This view drives the search for information and initiates HRO.

During the complexity of events, we assume that our actions have a very narrow effect and that most things will not change. The assumption of “no change,” similar to inertia, is called “causal inertia” in artificial intelligence and forms the “Frame Problem” (57). What makes this a problem are the variables that don’t appear to

be involved with the action but are partially relevant or contingent information that can influence events. The Frame Problem formalizes this inertial reasoning (58).

“*Dynamic epistemic logic*” is a logical framework dealing with knowledge and information change and planning for partial observability and non-determinism (56, 59). These events can change the real properties of the actual world. It describes knowledge and how actions change knowledge (epistemic) and facts (ontic) (59). While dynamic epistemic logic provides a logical framework to reason about the outcomes of a series of actions, this reasoning will always be situational. Thus, it has a focus on situations involving multiple agents/actors and how their knowledge changes when the situation changes. Each agent will generate a set of possible worlds that are compatible with an agent’s knowledge and those that are not. This can be limiting as inexperienced agents comment, such as “How common is this?” “It can’t be done, it’s not possible” “What will *they* do?” “How can *they* help?”

Modal operators for shared knowledge include:

- *General knowledge* – everybody in the group knows
- *Common knowledge* – everybody knows, and everybody knows that everybody knows
- *Distributed knowledge* – if participants pooled their knowledge, they would know what holds true, knowledge becomes *distributed*

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The visibility of information is difficult in dynamic events because facts are not accessible, or they change. In dynamic epistemic logic, *public announcements* present information to everyone without factual changes occurring. Actions are *fully observable (public)*, *partially observable*, or *non-observable*. Observability can be private or by the group. Operators may know *something* has happened but not precisely what.

The PICU interfacility transport program expanded rapidly in the first three years. Referral emergency departments, unfamiliar with the process, insisted on rapid departure for critically ill or injured children. The author (DvS) advised the team to operate in similar conditions to how the fire rescue ambulance operated. Family, friends, or bystanders of all socio-economic groups were confused about the need for on-scene medical treatment. Methods of intimidation included voice, stance, and threats, including the display of weapons. Fire medics would kneel by the patient while facing the more vigorous bystander to maintain strict neutrality on the scene and decelerate the aggression. All actions were clearly shown, if not mildly exaggerated, and thought processes and actions were clearly “described” to the other medic. The author suggested such an approach and the PICU mantra to “never criticize.” He explained that the ED staff would ob-

serve and listen from a distance. Their action would reassure and educate staff and demonstrate there would be no delay in transport. Within weeks, ED staff began walking by the patient and would stop and watch. After a few months, ED staff began asking questions. At six months, the transport supervisor began receiving service compliments. The transport teams used epistemic logic to overcome the partial observability problem and reduce uncertainty.

Partial observability contributes to uncertainty. For the single operator, uncertainty also comes from incomplete knowledge of initial conditions and indeterminate course of events. With multiple operators, the acts of other operators give rise to additional uncertainty.

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In the subjective internal view, the operator will not know the state of the actual world when the plan is initiated, but the operator will know the state of the world once the plan is executed. Whereas conventional planning assumes or disregards belief and knowledge of the operators, dynamic epistemic logic incorporates belief and knowledge of multiple operators into the logic system. Planning for operators' knowledge (and iterated knowledge) allows for more complex planning domains than plans that are concerned with simple facts about the world (60).

Part of this richness comes from the epistemic logical branching of plans. Plans cannot guarantee to achieve goals in all contingencies, and branching increases the power of the plan. Branching models can represent how the operator perceives the actual event, whose own epistemic model contains knowledge and ignorance. The branching of planning trees can expand by adding nodes or contracts as nodes are solved (59).

Forcing functions that emerge from normal processes are likely to be first noticed by those sensitive to the subtle appearance of the function or when the least experienced person begins to feel the effects. Epistemic models help us understand how individuals perceive an unexpected actual world in flux. HRO leaders appreciate the limitations of their imperfect external view, which then drives their search for information and efforts to generate new information. Reliance on branching plans that can expand by adding or contracting nodes increases their effectiveness during a forcing function's flux.

Doxastic logic (Greek *Doxa*, “belief”), a form of epistemic logic, concerns the logic of belief of participants. Doxastic logic provides reasons about belief rather than knowledge. The difference is that a belief is probably, though not necessarily, true. When we are not

careful, we may collapse knowledge and belief into the same system as conviction in epistemic logic. Our beliefs become refractory to disconfirming evidence and contribute to motivated reasoning. In the worst case, such logic strengthens cognitive dissonance. Doxastic operators capture belief change, as “belief revisions” or “belief updates,” when they receive conflicting information or encounter a discrepancy or disruption.

- A *belief update* refers to accounting for a change in the situation and acquiring new, more reliable information; this requires us to change our inaccurate old beliefs to more accurate, new ones.
- *Belief revision* occurs when we identify the old information as less reliable and use new, more reliable information to revise our older beliefs; we keep the new belief as close as possible to the old belief while accepting the newer, more accurate information.

Forcing functions in the reddened noise environment increases the gap between our place in the actual world and the models and theories we customarily use. We may have to act before acquiring information at the abrupt presentation of a pink noise catastrophe. Collecting more information simply increases the variance of our knowledge about the situation. Belief and attitudes become our primary operational methods. We rely on belief when we operate in an environment in flux and imperfect information. One response is to hold close to certain beliefs, *motivated reasoning* (61). The individual then scrutinizes information that conflicts with those beliefs and too readily accepts data that supports the belief. Because of our epistemic imperfect external view, we do not have access to the individual's beliefs and must infer their interpretation of new, conflicting information.

Belief updating and revision can help in these situations. We find updating and revision useful when those with authority have created a steep authority gradient that impairs information flow. Also, more timid individuals are more willing to speak up if they are “updating” information.

Deontic logic (Greek *Deon*, “that which is binding,” “duty,” “ought”) guarantees the conditional obligations to act. It provides reasons about duty or obligation and drives action from states. Every proposition exists in one of three mutually exclusive states in this logic: necessary, contingent, or impossible. Things that are possible are either necessary or contingent. Things that are not necessary are either contingent or impossible (62).

Classical logic is static. Because something “is” does not mean it drives an action—that is, we “must” or “ought to” act on the information. This is the *is-ought* quandary of logic; its static nature does not connect a premise to action. “Deontic logic,” however, takes us from “is” to “ought to”—that is, if an event occurs, then an action may be either *obligated* or *not permitted*. Deontic logic is

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the logic of norms or accepted standards.

Spectators may comment on an individual's choice of actions or question efforts that place a person in danger while helping others. This makes sense for those operating in the white noise environment with a Gaussian distribution. We collect sufficient information to support action from a pre-selected set of actions. In a reddened environment, collecting more information clouds our selections, stress responses impair our cognition, and fear reactions lead to ineffective actions no matter how internally logical they seem.

We can identify “tipping points” when we will or can act by discussing our duty and what we ought to do, adjusting for time and the flux of events, can identify “tipping points” when we will or can act. These discussions occur outside the static structure of most logic systems.

Temporal logic reasons how time qualifies statements and propositions with two basic operators, future and past. The asymmetry of time describes how the past is fixed, yet the future is branching and open to influence and change. A deterministic view of time requires the use of linear time for the future (63).

In terms of logic, time is discrete, occurring as intervals, or time is continuous, flowing onward as instants. Scientifically, we assume continuous instants for scientific logic, computer programs, processes, protocols, and algorithms. For categorization and data collection, we take time sequences as discrete intervals. However, any real-world operation, scientific or otherwise, has a duration that occurs within intervals. These intervals can overlap or be embedded within other events, run parallel with other independent or interdependent events, jump to other events, or depend on the initiation or completion of different events. (Intervals are used in artificial intelligence and computer science.)

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Logic can also be modified for concepts of time. For example, X is true at all times, while Y is true only sometimes. While the past is fixed and already determined, logical processes can account for the branching of time in the future. “Temporal logic” addresses problems of causality and mechanism, continuous change, planning actions, concurrent or discontinuous events, and the persistence of a fact rather than the truth of a fact.

Temporal logic is vital for any logic system operating in red or pink noise environments. The time-series changes from white Noise to red or pink Noise. White Noise has discrete time intervals inde-

pendent of the next interval in the series. A time sequence builds on the previous time interval, a type of feedback. The events at any one time will correlate with events in its past, the definition of autocorrelation, and the development of stochastic resonance.

Stochastic interactions between different environmental noise frequencies create stochastic outcomes in the unpredictable development of sepsis or retinopathy of prematurity. Branching time in temporal logic creates the necessity for the branching plans found in epistemic logic. In the logic of practice, we simultaneously act to increase the probability of the preferred end state while also reducing the probability of the unwanted end state. This often leads to simultaneous plans to act on both outcomes.

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Paraconsistent and Paracomplete Logic Systems

Forcing functions and catastrophes from red or pink noise release energy from the environment into our well-designed systems. Information entropy corrupts information. The give and take of interacting systems, increasing feedback, rapid oscillating processes, the forcing functions' frequency, and the Gaussian distributions' loss disintegrate the utility of inferences from classical logic. Events of lesser time scales and smaller magnitudes do the same. We will experience contradictions and the need to infer across quantitative and qualitative data collected from heterogeneous systems in a multitude of states.

Rejection of inconsistencies and contradictions creates risk in dangerous contexts (13). Describing reliance on laboratory research to support Mount Everest climbing expeditions, Vanessa Heggie (2) wrote, “Predicting what would happen to the first human beings to climb that high was, therefore, a matter of life or death – here inaccurate models could kill. Consequently, high-altitude respiratory physiology has prioritized not the laboratory, but the field.”

“The reflection that apparent contradictions are everywhere around us and that treating them as anomalies may not be the best way to go” (64). We easily collect contradictory data, accumulate inconsistent information, and find the increasing information also increases the variance (7, 65, 66). We invalidate and change our conclusions and derived solutions processes not permitted in monotonic classical logic (67, 68). “Handling contradictory data is one of the most complex and important problems in reasoning under uncertainty” (66). These are the paraconsistent logics. Formalized modes of *nonmonotonic reasoning* give “rules of conjecture” rather than “rules of inference.” Conclusions appropriate in one set of assumptions can be disconfirmed by the addition of new assumptions (69).

Reddened noise environments give us partial (incomplete) and excessive (contradictory) information. “A logic is called paraconsistent if it ‘tolerates contradictions’ and paracomplete if it does not ‘enforce completeness/exhaustiveness’” (70). Paraconsistent and paracomplete logics meet the needs for rapidly changing, conflicting information and adjusting solutions. This is the opera-

tor, working contextually “bottom-up” from within the trajectory, inside events, feeling the pressure of elements. Thus, paraconsistent logics do not have the “principle of explosion.” If we accept a contradiction in classical logic, then everything follows – the explosion. Paraconsistent logics allow us to make logical inferences with contradictions. Paracomplete logics do not have the “law of excluded middle” (either the proposition is true or false), allowing the use of gradations and shared qualities.

Paraconsistent and paracomplete logic systems allow us to work with partial truths, called initially ‘pragmatic truth,’ connecting it with the pragmatism of William James, John Dewey, and Charles Sanders Pierce. Operators for truth value (Table 2, above) are renderings of modal “necessarily” and “possibility” as “pragmatic validity” and “pragmatic truth,” respectively. We can differentiate between acceptance and belief, with acceptance defined as the belief that the theory is partially true and belief defined as the correspondence to the truth. If we assume “acceptance,” we can act *as if it were true* for further elaboration, development, and investigation (71).

“Contributing to a bias toward classical, monotonic logic is the frame of reference common to planners, executives, administrators, and managers. From their external, fixed reference point, they observe the flow of events and identify rates of change, but it is a decontextualized view.”

Contributing to a bias toward classical, monotonic logic is the frame of reference common to planners, executives, administrators, and managers. From their external, fixed reference point, they observe the flow of events and identify rates of change, but it is a decontextualized view. This is the spectator, top-down, outside the events, free from the direct influence of events, and able to differentiate concepts through observation. Classical logic more readily infers solutions from the more static, aggregated information.

Paraconsistent and paracomplete logic systems can support our navigation through this environment if we maintain guarded respect for the limits of classical logic (4). ‘Para’ was initially referred to as ‘quasi’ or ‘similar to’ but now seems accepted as a different meaning, ‘beyond’ (72). Classical logic avoids paradoxes and explosion into triviality by restricting sets with the law of excluded middle. Weakening classifications by weakening the excluded middle allows more detailed distinctions and nuanced inferences. We can weaken the logic system for the possibility of non-trivial inconsistency (73). Paraconsistency logic weakens formulations of logical inference with limitations to the choice of variables (71).

Paraconsistent Logics

Logic System	Non-contradiction	Logic Explosion	Excluded Middle	Usage	Truth Values
Paraconsistent	Not applicable	None	Possible	Contradictory data	Over-define (restrictive)
Paracomplete	Applicable	Possible	None	Incomplete data	Unknown

Table 3. Paraconsistent, Paracomplete Logics

Consistent logic systems (*consistency*) contain no contradictions (The Law of Noncontradiction) and contain at least one situation when all formulas are valid. *Inconsistency*, the acceptance of contradictions, permits a formal system to derive every statement, rendering such a logic system meaningless or trivial. Logic terms for this are *explosion*, anything that can follow from a contradiction, and *triviality* because it has little importance since any proposition can be inferred.

An explosion is a problem of accepting contradictions, a false proposition implies any proposition, and any proposition implies a true proposition.

Paraconsistent logics are consequence relations that are not explosive. They do not allow any contradiction in a controlled way, treating inconsistencies as informative (72). Paraconsistency permits us to use inconsistent beliefs and enter inconsistency ethically. For example, medical specialists will develop their findings from their knowledge and experience using the same information and relying on the same logic system. They may reach different, inconsistent diagnoses.

Paracomplete Logic

When we probe back, seeking greater accuracy and identifying subtlety, we find differences between our continuous perceptions and discrete concepts (16). Because we change concepts to fit our observations, our observations of reality are incomplete.

“When we probe back, seeking greater accuracy and identifying subtlety, we find differences between our continuous perceptions and discrete concepts (16).”

Gödel proved a system’s consistency could not be demonstrated within the system. To determine the consistency, we must use another system beyond the system where we are operating (51). William Harvey (74) observed, “the best fertilizer for medicine is the progress of other and quite different sciences.”

In complete logic systems, every property or statement (true or false) can be derived from *within* the system. Systems, however, cannot be complete. For example, from Kurt Gödel’s The Second Incompleteness Theorem (75), through arithmetic itself, the consistency of arithmetic cannot be proved. Because of incompleteness (76):

- an element cannot be completely classified
- incomplete or partial information
- the excluded middle is not enforced

Paraconsistent and paracomplete logics differ by the application of non-contradiction and the excluded middle (77, 78) (Table 3).

- Paraconsistent logics – non-contradiction *does not* apply. Therefore, the explosion does not hold, while the excluded middle *does* apply.
- Paracomplete logics – non-contradiction *does* apply,

while excluded middle *does not* apply.

Belief Revision.

People have inconsistent beliefs. The most consequential sources of inconsistencies are motivated reasoning and cognitive dissonance. Paraconsistent logic drives inquiry to correlate and revise belief to the context instead of motivated reasoning and cognitive dissonance. We cannot eliminate all inconsistencies (72).

Sectioning Data Base.

People create consistent subsets in their “belief database,” then remove the sections they feel are inconsistent or have lower degrees of acceptability. There is a risk of losing information. (65).

Many-Valued Logics.

Classical logic allows truth values of “true” or “false.” Paraconsistent logics can aggregate conflicting information by adding a third, “indeterminate,” or using a four-value logic with “both” or “neither.” Modal logic can incorporate multiple values. Rather than value as a function, values can operate as relations; the proposition relates to true, false, or neither (72).

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Discussive (or discursive) logic

A form of deference to expertise, each person shares information they possess, true according to the individual even if inconsistent with that of others. During the discourse, the whole of the assertions become consistent (72).

Adaptive, Nonmonotonic Logics.

The inferences from these logics change as information becomes available and premises expand the external dynamic. The internal dynamic describes withdrawing the inference rule should we encounter a contradiction (72).

Relevant Logics / Topology.

The conclusion must be relevant or connected to the premises (72). In topology, a boundary can make the premise inconsistent depending on its relation to other elements (79). On the other hand, contextual isolation of premises from “failure of the object of understanding to cohere with readily available unitary context” (80). If from simplicity, then complexification by developing information may bring understanding.

Topology

Network topology is a discrete, object-oriented model that involves objects, nodes, edges, and connections. The topology leads to network system properties such as connectivity, directedness, closeness, betweenness, degree, characteristic path length, small worlds, and giant components (81, 82). In topology, the central concept is continuity and how the elements preserve a

notion of nearness by a continuous function. They maintain connectedness during deformation without tearing apart to create a new boundary. Topology replaces precise characterizations with a topological differentiable state representing possible variable states and possible worlds (83, 84). The topological space of connection and relation does not localize an object in the Euclidean space of points and measures.

Note that in a topological network, the strength of relations between nodes has a more significant influence than the distance between nodes as in a Euclidean network. Graph representations of network topologies include line, ring, mesh, star, tree, bus, and the fully connected mesh topology.

Logic as a topology

‘Category theory’ is a certain way physicists use categories. A category has ‘objects’ or ‘forms’ representing things and ‘morphisms’ representing ways to go between things. In logic, objects are propositions, and morphisms are logical proofs. The morphism of proof accomplishes the connection between two forms as propositions (hypothesis and conclusion). Topological categories (forms) are ‘manifolds,’ Their morphisms are ‘cobordisms,’ the evolution passing to the continuum (73, 85).

In this sense, logic acts as a topology in a topological space.

Topology as a logic

Topology does not have a point and fixed (relative or comparative) distance metric as in Euclidean geometry. Instead, a single binary operator can compare distances between sets and a unary operator that distinguishes between limits (maximum and minimum; least, necessarily the least, not necessarily the least) of those distances (86) (Table 4). Sets can be open or closed or between the two. An open set is like a table chart without the frame lines. When we cut and paste, we are not aware of the contents of each cell. A closed set has the lines. We can consider these sets as possible worlds.

“A person’s connections to experiences, facts, and people significant in their lives may be deformed but never torn. They will operate and self-organize as a topology. The organization that plans based on rigid Euclidean structures will fail when individuals self-organize in a topological space with stronger topological connections.”

We can view human relations as a topological space for logical inference during a forcing function. As a social system, two actors are *adjacent* if they can interact immediately, even if by influence alone. The set of all adjacent actors is the neighborhood of the event. A person’s connections to experiences, facts, and people significant in their lives may be deformed but never torn. They will operate and self-organize as a topology. The organization that plans based on rigid Euclidean structures will fail when individuals self-organize in a topological space with stronger topological connections.

Homeomorphism in topology is a continuous mapping or function that preserves the topological shape. Lines between two points

do not intersect but represent possible worlds that change continuously. The horizontal axis interprets the modal operator while the vertical axis forms a possible world. Modal logics support reasoning and inference for relative distances as relative with limits rather than the metrics of Euclidean space. The homeomorphism of knowledge can become deformed by a forcing function but not torn.

Measure	Operator
Homeomorphism	Interior, border, frontier
Value	Maximum/minimum value of uncertainty There exists x such that x is the least There exists x such that x is necessarily the least
Distance function	“no greater than.” “Closer” “not closer.”

Table 4. Topology Operators

The logic of the Color of Noise

Stochastic resonance, forcing functions, and catastrophe create the environment from white, red, and pink Noise. A ‘cosmology’ event collapses our sensemaking and classical logic fails. We cannot rely on models that are unproven in these environments.

Colored noise environments are autocorrelated segments in time series that can branch. Oscillations between demands and capabilities create bivalence, even multi-valences. Fluctuations and change create new premises and the consequent necessity to change or find new solutions, possibly with the same premises. Static, classical logic gives us a solution, but not whether we have an obligation to act toward that solution. Some logics correlate to

“When a frequency becomes autocorrelated by segments, it develops stochastic resonance. Time segments are no longer independent but can change the environment or branch into different possible worlds. Human behavior is always autocorrelated. Deductive processes and classical logic do not permit changing a solution or deduction once it is reached.”

these demands from stochastic resonance and the color of Noise.
Time Series.

When a frequency becomes autocorrelated by segments, it develops stochastic resonance. Time segments are no longer independent but can change the environment or branch into different possible worlds. Human behavior is always autocorrelated. Deductive processes and classical logic do not permit changing a solution or deduction once it is reached. Temporal logic gives inferences when time becomes a factor in the environment, such as branching-time or the need to update or revise the premises we are using.

Oscillating Processes.

Even the most straightforward environmental process oscillates between resources and constraints. Within a forcing function, actions can rapidly shift from helping to hurting and back again, a bit riskier than assuming one can ‘titrate to effect.’ Information can be true or false or could become neither unknown nor contingent.

Fluctuation.

“Handling contradictory data is one of the most complex and important problems in reasoning under uncertainty” (66). Paraconsistent logics allow contradiction without any solution, thus treating inconsistencies as informative. Paraconsistent logics allow us to work with entities undergoing continuous change; there is no need to assume “A” or “not-A.” Nonmonotonic logics allow us to change our solutions as events evolve.

Duty to act

The moral duty to act and engage in threat comes from deontic logic. Public safety organizations must act in situations that civilians can avoid. Deontic logic provides inference rules for the obligation to act and when we must not act.

Conclusion

Reddened Noise brings forcing functions and crises. Classical logic does not serve us well with the consequent uncertainty and unpredictability. Our logic of practice can be idiosyncratic or derive from the logic of stress. Modal logics, the different ways things can be true, support inference in these situations and can drive action. Paraconsistent logic supports the revision of solutions as we develop new information. Paraconsistent logics also support inference in an environment of flux, contradictions, and inconsistencies. Topological logics reveal how we work with elements that have more significant influence than their physical absence suggests.

You solve these problems by entering their environment. It is *environmental* stochastic Noise, and you become part of that environment; you become the stochastic Noise around the problem to influence it as any noise would. Our connections to experiences, facts, and people may be deformed, but they are never torn.

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Fellows Column: Serial Direct Bilirubin Measurement in the Management of Neonatal Hyperbilirubinemia: A System Error

Michelle Benjamin, MD, Michael L. Phillips, MD, Shabih Manzar, MD

Case Presentation:

A female infant was born at term via vaginal delivery. The infant was transferred to the newborn nursery. Bilirubin collected at 12 hours of life was 10 mg/dL. The mother's blood group was A positive, and the baby was AB positive with Coombs positive. Phototherapy was started based on the clinical pathway/guideline nomogram. (1) Serial bilirubin levels were followed, and phototherapy was discontinued once the level was below the threshold for treatment. The infant was discharged home with a follow-up in 48 hours.

System and Process Error:

During the case audit, a system error was detected. In addition to the serial indirect bilirubin, we noted that 11 specimens of direct (conjugated) bilirubin were obtained during the treatment (Table 1, Figure 1). Applying the five whys principle (2), we found measuring of the direct bilirubin as an ongoing practice in the nursery established by the retired physician (1st why - the on-call intern ordered it because the day intern ordered it, 2nd why - the day intern ordered it because the senior resident ordered it, 3rd why - the senior resident ordered it because the nurse practitioner (NP) ordered it, 4th why - the NP ordered it because she observed the retiring physician ordering it).

Heuristics and Biases:

In daily life, we encounter cognitive bias and heuristics in decision-making. (3) These biases could take the form of anchoring bias (tendency to adjust toward the first piece of information), availability bias (tendency by which a person evaluates the prob-

ability of events by the ease with which relevant instances come to mind), and confirmation bias (tendency to search for, to interpret, to favor, and to recall information that confirms or supports one's prior personal beliefs). (4) These factors could have played a role among the trainee interns and residents to keep ordering serum direct bilirubin levels without questioning the value in managing hyperbilirubinemia.

“These factors could have played a role among the trainee interns and residents to keep ordering serum direct bilirubin levels without questioning the value in managing hyperbilirubinemia.”

Bound by Investigation:

The plausible reasons for obtaining direct (conjugated) bilirubin in a newborn infant are to diagnose biliary atresia and prevent bronze baby syndrome (BBS) if prolonged phototherapy is provided. (5,6) Although BBS is a potential complication of using phototherapy with direct bilirubinemia, phototherapy-induced bronzing is a self-limited process. It should not prevent the use of phototherapy for hyperbilirubinemia in infants with elevated levels of conjugated bilirubin, as suggested by Le and Reese. (5) A recent study of 124 385 infants using conjugated bilirubin identified seven infants with biliary atresia with a sensitivity of 100% and a specificity of 99.9%. However, the authors concluded that research is needed in larger populations to precisely estimate this screening approach's diagnostic yield and cost-effectiveness. (6)

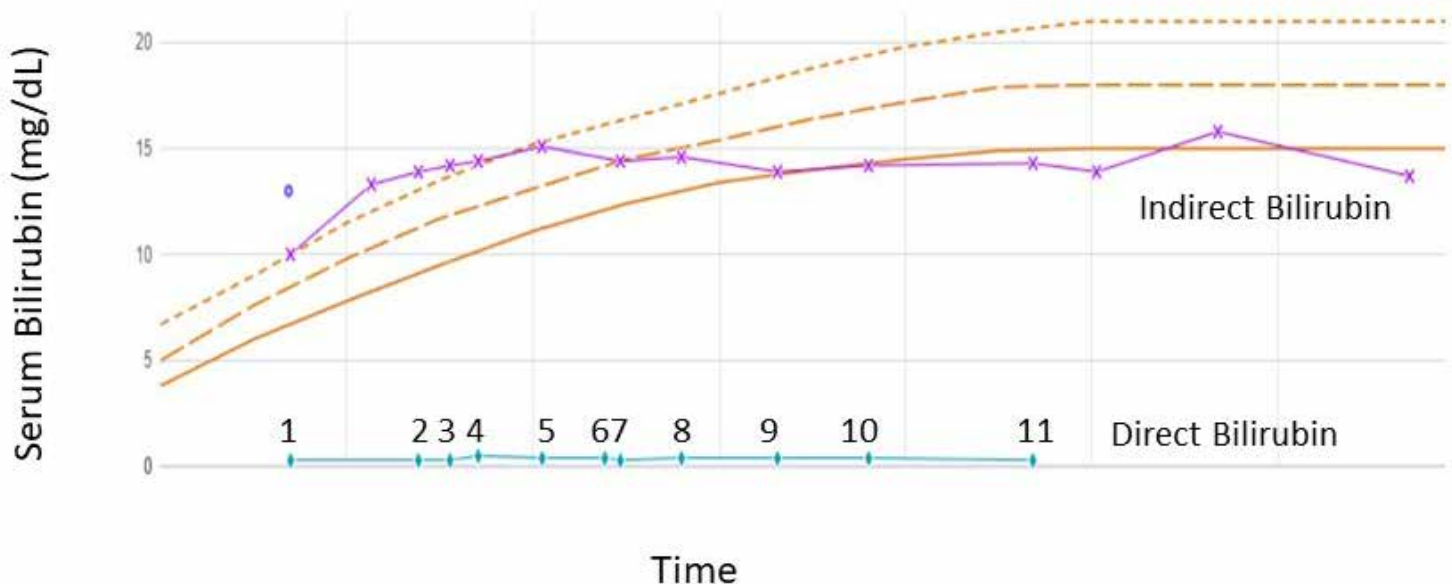


Figure 1 Graph showing serial serum bilirubin levels

Date	Time	Bilirubin
Day 2	05:30	0.3
Day 2	21:59	0.3
Day 3	02:03	0.3
Day 3	05:41	0.5
Day 3	13:55	0.4
Day 3	22:00	0.4
Day 4	02:05	0.3
Day 4	07:53	0.4
Day 4	20:15	0.4
Day 5	08:00	0.4
Day 6	05:10	0.3

Table 1: Serial Direct Bilirubin Level (mg/dl)

Choose Wisely Initiative:

The process error noted was viewed as low-value care (we did not conduct any survey to look at the national practice). The pediatric residents in training need to be cognizant of the laboratory tests and treatment. Choosing Wisely Top Five for newborn medicine highlights five tests and treatments that cannot be adequately justified based on efficacy, safety, or cost. (7) These include (1) avoiding routine use of antireflux medications for the treatment of symptomatic gastroesophageal reflux disease or treatment of apnea and desaturation in preterm infants, (2) avoiding a routine continuation of antibiotic therapy beyond 48 hours for initially asymptomatic infants without evidence of bacterial infection, (3) avoiding the routine use of pneumograms for pre-discharge assessment of ongoing and/or prolonged apnea of prematurity, (4) avoiding routine daily chest radiographs without an indication for intubated infants, and (5) avoid routine screening term-equivalent or discharge brain MRIs in preterm infants. Measurement of serial conjugated bilirubin could be another one.

Extra Cost:

The extra cost for the direct bilirubin was \$77 (11 specimens drawn). Our institution charges \$7 for measurement of direct bilirubin (<https://www.ochsnersuhs.org/patients-visitors/billing-financial-services/billing-estimates>). McClean et al. (8) had shown cost savings and reduced painful heel sticks using transcutaneous bilirubinometry at the community level.

“This case serves as an important reminder that a careful approach to the blood draws should be followed in neonates. Although it is important to rule out cholestasis in neonates receiving phototherapy, it is crucial to remember the key tenet of doing no harm. The unnecessary, extensive workup and burden of painful procedures create a cascade effect.”

Lessons Learned:

This case serves as an important reminder that a careful approach to the blood draws should be followed in neonates. Although it is important to rule out cholestasis in neonates receiving phototherapy, it is crucial to remember the key tenet of doing no harm. The unnecessary, extensive workup and burden of painful procedures create a cascade effect.

Additionally, residents in training need to be mindful of this cascade to avoid anchoring and pursuing unnecessary workups. The initiative should be taken to decrease laboratory testing in neonates. Klunk et al. (9) analyzed the problem of laboratory investigation among neonates, and by applying the Pareto principle, they found bilirubin to be the third most common laboratory investigation. They suggested adherence to guidelines and compliance as major factors in reducing the laboratory investigation.

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Briefly Legal: An Avoidable Fetal/Neonatal Death

Maureen E. Sims, MD, Barry Schifrin, MD

A 24-year-old G2P1 patient presented for induction of labor at 39 1/7 weeks gestation. She had an uneventful course with a normal result to a glucose challenge at 28 weeks gestation. At 30 weeks gestation, she was hospitalized for ulcerative colitis and treated with steroids. She had a negative Group B streptococcus culture at 36 weeks gestation. Three days prior to admission, a non-stress test NST was interpreted as reactive (normal). On the biophysical profile, the fetus was active, but the amniotic fluid volume was moderately increased (polyhydramnios). An anatomical evaluation of the fetus revealed no apparent abnormalities. The mother reported normal fetal movements up to the time of admission.

“Three days prior to admission, a non-stress test NST was interpreted as reactive (normal). On the biophysical profile, the fetus was active, but the amniotic fluid volume was moderately increased (polyhydramnios).”

The patient had normal vital signs on admission, and the FHR pattern was reassuring (Category I). The induction was initiated with Intravenous Pitocin, and an epidural was provided early in labor for pain relief. With the onset of pushing in the 2nd stage of labor, the initially normal FHR tracing deteriorated with the appearance of several deep decelerations associated with frequent contractions and maternal pushing. Membranes were ruptured at this time with the egress of abundant, meconium-stained fluid. The 2nd stage lasted just over one hour. Relentless pushing coincided with frequent contractions and a deteriorating fetal heart rate pattern, including severe, prolonged variable decelerations with overshoot, rising baseline heart rate, and absent variability. Just prior to delivery, again in association with frequent contractions and relentless pushing, there was a prolonged deceleration lasting over 10 minutes with the nadir of 60 bpm. The monitor was disconnected several minutes prior to the spontaneous vaginal delivery.

At delivery, the 3351-gram female infant was lifeless – with a 1-minute Apgar score of 0. The arterial cord blood gas had a pH of 7.1, pCO₂ 69 mmHg, pO₂ 24.7 mmHg, and a base deficit (BD) of 9.8. The venous cord blood gas analysis revealed a pH of 7.34, pCO₂ 37 mmHg, pO₂ 50 mmHg, and a base deficit of 5. (Note the wide difference between the arterial and venous values.) The infant was brought to the radiant warmer, where she was dried, stimulated, and given continuous positive airway pressure (CPAP) by the labor and delivery nurse. No member of the neonatal resuscitation team was present at the delivery. After 1-2 minutes, the nurse began positive pressure ventilation (PPV). At 2 1/2 minutes,

the HR was noted to be 63 bpm, the inspired oxygen level was increased from 30% to 100%, and the resuscitation team was finally paged. The oxygen saturation (SaO₂) levels were recorded from the pulse oximeter were noted to be 100% after the inspired oxygen was increased, but then shortly dropped to 88%. At 5 minutes after the birth, the resuscitation team arrived. At 6 minutes, the HR was 153 bpm. At 7 minutes, the HR was 80, and the O₂ saturation was 68%. At 7 minutes, an intubation attempt was made, unsuccessfully. At 11 minutes, the infant was finally intubated. At 14 minutes, the HR was 71 bpm, and the SaO₂ was 72%. HRs were determined by auscultation and pulse oximeter (documentation by nurses in the chart). A nasogastric tube was placed at 15 minutes.

At 18 minutes, the neonatologist began chest compressions, having determined that the pulse oximeter was not reliably determining the HR. He observed that the only time a HR was found was when a nurse was holding it in place. Several doses of epinephrine were given through the endotracheal tube (ETT) every 3-5 minutes. The HR recorded from 18 to 25 minutes ranged from 78-151 bpm, and the O₂ saturation ranged between 50 and 89%. At 25 minutes, an umbilical venous catheter was placed and could be flushed, but no blood could be drawn back. Resuscitation was stopped at 30 minutes, at which point the baby was pronounced dead.

“The following day the neonatologist annotated the chart to “provide clarification” of the events surrounding the resuscitation of the newborn. He averred that no HR or pulses were noted by any physician on examination at any point after delivery.”

The following day the neonatologist annotated the chart to “provide clarification” of the events surrounding the resuscitation of the newborn. He averred that no HR or pulses were noted by any physician on examination at any point after delivery. Further, he stated that the wording in the chart “minutes of life” should have actually stated “minutes after birth,” because the baby was not alive at birth; she never had a HR, respiratory effort, movement, or tone, and the death should be considered a fetal demise, not a neonatal death. The Apgar scores were changed and re-assigned after death as 0 at 1, 5, 10, 15, 20, and 25 minutes after birth.

On postmortem examination, the baby was without dysmorphism and appropriately grown with a birthweight of 3351-grams, the length was 50.8 cm, and the head circumference was 32 cm. Meconium was found in some of the alveolar spaces suggesting aspiration. The placental examination revealed a 459-gram placenta and 45 cm umbilical cord.

Plaintiff Allegations:

The resuscitation was below the standard of care

Despite the presence of meconium in the amniotic fluid and the profound deceleration, the resuscitation team was not present before delivery.

The resuscitation team did not arrive until 5 minutes after birth

The resuscitation process was egregiously below the standard of care; it failed to comply with Neonatal Resuscitation Guidelines.

After the fact assessment, the neonatologist's late entry was self-serving to avoid accountability for a mismanaged neonatal resuscitation.

Defense Allegations:

The baby was stillborn, and nothing could be done to save her, even if the resuscitation process had followed the NRP.

After many months of discovery, the case was dropped.

“In the 2016 American Academy of Pediatrics and American Heart Association Neonatal Resuscitation (NRP) Guidelines (7th edition) stated that if one cannot determine the HR by physical examination and the baby is not vigorous, it is necessary to connect a pulse oximetry sensor or electronic cardiac (ECG) monitor lead and evaluate the HR.”

Discussion:

In the 2016 American Academy of Pediatrics and American Heart Association Neonatal Resuscitation (NRP) Guidelines (7th edition) stated that if one cannot determine the HR by physical examination and the baby is not vigorous, it is necessary to connect a pulse oximetry sensor or electronic cardiac (ECG) monitor lead and evaluate the HR. The Guidelines caution that pulse oximetry may not function if the baby's HR is low or if the baby has poor perfusion. In these situations, monitoring the HR with ECG becomes the preferred method. In unusual circumstances, an ECG monitor may show an electrical signal, although the heart is not pumping, a condition referred to as pulseless electrical activity (PEA). This condition should be treated the same as an absent HR (asystole). The 8th edition of the NRP (2021) continues to make this same recommendation for using a pulse oximetry sensor or ECG to assess HR and adds another option to include a handheld Doppler ultrasound or digital stethoscope. A combination of these modalities- auscultation, palpation, pulse oximetry, ECG, and perhaps the newer modalities will give the best assessment when a patient presents as described. In the above case, it seems likely that the baby would have responded favorably had timely and effective PPV been instituted. Even more probably, had proper and timely intrauterine resuscitation been forthcoming, the problems of neonatal resuscitation would have been avoided.

Pertinently, the obstetrical care provided by the physicians and

the nurses, the real culprits, were not sued. It is important to consider that on admission; the fetus was demonstrably normal with a reassuring FHR pattern, normal growth, somewhat increased amniotic fluid volume, and normal anatomy (confirmed by ultrasound and subsequently at autopsy). With the onset of the 2nd stage of labor, the FHR tracing deteriorated, predictably, in relationship to the frequent contractions, compulsive pushing (pushing not modified as a response to the deteriorating FHR pattern) to the point of a profound hypoxic-ischemic event. The cause of the decelerations was likely umbilical cord compression given the modest BD and the wide differences in the umbilical artery and the vein values. (Pomerance)¹ These severe changes in the FHR, co-associated with maternal pushing, demanded reduction of the Pitocin, perhaps even tocolysis, and restraining the pushing with contractions. With reasonable medical probability, such maneuvers, applied in a timely fashion, would have restored fetal homeostasis and permitted vaginal delivery of a non-asphyxiated, healthy newborn.

Without the benefit of intrapartum resuscitation, these events also gave ample warning of the likely difficulties encountered in the neonate, requiring the timely availability of personnel capable of resuscitation of the severely compromised newborn.

“Without the benefit of intrapartum resuscitation, these events also gave ample warning of the likely difficulties encountered in the neonate, requiring the timely availability of personnel capable of resuscitation of the severely compromised newborn.”

Suggested Reading

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- + Solutions for Addressing Inequities and Implicit Bias In the NICU
- + Black NICU Mother's Mental and Emotional Health
- + Black Premie Parents as Partners in Premie Care

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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.

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- + Gain actionable tools to drive health and racial equity solutions in your organization!

SHARED DECISION-MAKING PROTECTS MOTHERS + INFANTS

DURING COVID-19

KEEPING MOTHERS + INFANTS TOGETHER

Means balancing
the risks of...

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



EVIDENCE

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

PARTNERSHIP

What is the best
for this unique dyad?

SHARED DECISION-MAKING

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



TRAUMA-INFORMED

Both parents and providers
are confronting significant...

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

LONGITUDINAL DATA

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

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



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

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when it matters most.

nann.org nationalperinatal.org



National
Association of
Neonatal
Nurses



National
Perinatal
Association

Gravens By Design: The International Newborn Brain Conference

Robert White, MD

“Advances in understanding and treating various problems in high-risk neonates have followed different trajectories depending on the organ system being studied. Improvements in respiratory care were the most dramatic changes seen in neonatology’s early days and continue today at a more gradual pace.”

Advances in understanding and treating various problems in high-risk neonates have followed different trajectories depending on the organ system being studied. Improvements in respiratory care were the most dramatic changes seen in neonatology’s early days and continue today at a more gradual pace. The same is true of our understanding of sepsis, nutrition, and jaundice. The newborn brain remained largely a “black box” in the early days of neonatology. Still, the pace of advances has steadily increased as both our understanding and our ability to intervene have broadened. Whereas one could stay up to date on neurodevelopmental and neurocritical care with targeted sessions at general neonatology conferences in the past that is no longer the case; an annual conference focused on brain care is essential to keep up with new developments and controversies.

The International Newborn Brain Conference was created to meet this need, bringing researchers and clinicians together to promote rapid dissemination of the most important developments in care and to provide a forum for the most pressing clinical dilemmas. The 13th iteration of this meeting was held virtually February 9-12, 2022, and welcomed a record number of almost 400 participants from more than 70 countries. Abstract submissions also doubled the previous record, illustrating how rapidly the science in this area is advancing. These abstracts will be published in an upcoming issue of the Journal of Neonatal-Perinatal Medicine.

The challenges of treating infants with hypoxic-ischemic encephalopathy (HIE) received considerable attention. Dr. Alistair Gunn reviewed recent studies that showed that our current practice of cooling at 33.5o C for 72 hours remains the proper strategy for moderate or severe HIE; using shorter or longer courses, higher or lower temperatures, or a longer time for the rewarming phase did not improve outcomes. He also reviewed the status of a number of other adjunctive treatments, including recombinant erythropoietin and melatonin, concluding that none have shown sufficient promise yet for clinical adoption. “Therapeutic creep” in the use of hypothermia for infants with mild HIE was also explored in depth at this meeting. There is still insufficient evidence on which to affirm or reject its value, and the conduct of a randomized trial has

proven to be difficult. Counseling families, already a challenge in babies with HIE, is especially difficult in this setting.

Many other topics in neurocritical and neurodevelopmental care were covered during this meeting, including updates on the management of seizures and posthemorrhagic hydrocephalus, new evidence on the importance of sleep hygiene in the newborn, and a review on the various forms of brain monitoring, including continuous EEG, near-infrared spectroscopy, functional MRI, and biochemical markers.

“Next year’s International Newborn Brain Conference will be held in Clearwater Beach, Florida, from February 8-11. More information will appear on the Newborn Brain Society’s website newbornbrainsociety.org, where you can also learn about membership in the NBS.”

Next year’s International Newborn Brain Conference will be held in Clearwater Beach, Florida, from February 8-11. More information will appear on the Newborn Brain Society’s website newborn-brainsociety.org, where you can also learn about membership in the NBS. Member benefits include weekly CME webinars on research and clinical aspects of brain care in the newborn infant.

Disclosure: The author has no conflicts of interest

NT

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INFANT AND FAMILY-CENTERED DEVELOPMENTAL CARE (IFCDC)

STANDARDS AND SAMPLE RECOMMENDATIONS FOR INFANTS IN THE INTENSIVE CARE UNIT

SYSTEMS THINKING IN COMPLEX ADAPTIVE SYSTEMS



- Are the baby and family central to the mission, values, environment, practice & care delivery of IFDCD in the unit?
- Are the parents of each baby fully integrated into the team and treated as essential partners in decision-making and care of the infant?
- What are the strategies and measurements used to improve and sustain IFDCD in the unit?

POSITIONING & TOUCH FOR THE NEWBORN

- Are the positioning plans therapeutic and individualized, given the care needs and development of the baby?
- Are the positioning and touch guidelines continually reviewed by the team, including the parents, and adapted to meet the changing comfort needs of the baby?



SLEEP AND AROUSAL INTERVENTIONS FOR THE NEWBORN



- Can the team confidently describe the "voice" or behavioral communication of the baby?
- Are the baby's unique patterns of rest, sleep, and activity documented by the team and protected in the plan of care?

SKIN-TO-SKIN CONTACT WITH INTIMATE FAMILY MEMBERS

- Is the practice of skin-to-skin contact supported and adjusted to the comfort needs of each baby, parent, & family member?
- Are the parents & family members supported to interact with the baby to calm, soothe, & connect?



REDUCING AND MANAGING PAIN AND STRESS IN NEWBORNS AND FAMILIES



- Are parents supported to be present and interactive during stressful procedures to provide non-pharmacologic comfort measures for the baby?
- Are there sufficient specialty professionals to support the wellbeing of the team, including parents, families, and staff? Examples include mental health, social, cultural, & spiritual specialists.

MANAGEMENT OF FEEDING, EATING AND NUTRITION DELIVERY

- Are the desires of the m/other central to the feeding plan? Is this consistently reflected in documentation with input of the m/other?
- Does the feeding management plan demonstrate a feeding & nutrition continuum from in-hospital care through the transition to home & home care?

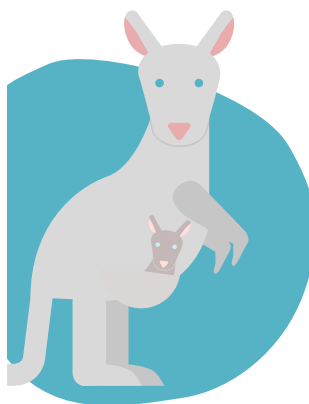


WANT TO KNOW MORE ABOUT THE STANDARDS AND RECOMMENDATIONS? VISIT: [HTTPS://NICUDESIGN.ND.EDU/NICU-CARE-STANDARDS/](https://nicudesign.nd.edu/nicu-care-standards/)

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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



nicuparentnetwork.org
nationalperinatal.org/skin-to-skin



The Mount Sinai Light and Health Research Center (LHRC) in collaboration with the National Lighting Bureau (NLB) are putting on a series of virtual monthly interviews with experts in light and health fields. The series aims to bring together attendees of vast backgrounds in lighting, clinical, academic, and novices alike to promote conversations centered around specialized topics.

A new kind of lullaby

Robust light/dark pattern for babies



Sofia Axelrod, PhD

Sleep Research Associate

Young Laboratory of Genetics at The Rockefeller University

In the next installment of the series, Dr. Sofia Axelrod will share her experience of how becoming a mom has led her to become an expert on getting babies to sleep. Learn about how light plays a role in the home and what parents should be aware of during the day and night.

Join in for the live Q&A following the interview.



28 March 2022



12 pm ET

[View our calendar](#)

[Register](#)

Interested in sponsoring this topic? Contact Randy Reid at randy@nlb.org

COVID-19

STOP THE SPREAD AT HOME

What to do when you or a loved one is infected.

HYGIENE TIPS

- MOUTH**
 - Wear a face mask or face shield.
 - If in car, wear mask & put windows down.
 - NO cloth face masks for children younger than 2yrs.
 - Avoid kissing.
- EYES**
 - Wear protective eye gear (glasses)
- HANDS**
 - ALWAYS wash your hands down.
- CLOTHING**
 - Wear a jacket when dealing with infected.
 - DO NOT share clothing, sheets, or pillows.

BATHROOM

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

PROTECT

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

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

COVID-19

DETENER LA PROPAGACION EN CASA

Qué hacer cuando usted o un ser querido está infectado.

CONSEJOS DE HIGIENE

- BOCA**
 - Use una mascarilla o careta.
 - Si está en el automóvil, use una máscara y baje las ventanas.
 - NO mascarillas de tela para niños menores de 2 años.
 - Evitar besos.
- OJOS**
 - Use equipo de protección para los ojos (lentes)
- MANOS**
 - SIEMPRE lávate las manos
- ROPA**
 - Use una chaqueta cuando se trata de infectados.
 - NO comparta ropa, sábanas o almohadas.

BAÑO

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

PROTEGER

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

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

SELF ISOLATION

- Sick should be separate from household.
- Room with window preferred.
- Aerate room 3x day.
- Create a room divider with sheet.
- Keep water and sanitation liquids near room.
- Don't cuddle with pets.
- Use SEPARATE utensils.
- Clean utensils separately.
- If sick avoid the kitchen.

KITCHEN

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



Miora logo and social media links (Facebook, Twitter, Instagram, LinkedIn). Includes text: "Brought to by Miora in partnership with United2Care" and a QR code.

AISLAMIENTO

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

COCINA

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



Miora logo and social media links (Facebook, Twitter, Instagram, LinkedIn). Includes text: "Traído por Miora en asociación con United2Care" and a QR code.

Ways to Manage Covid 19 @ Home

Household

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

Sick

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

Stop the Spread at HOME Miora



Maneras de manejar COVID-19 en casa

Hogar

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

Enfermo

- Aíslase permaneciendo en una habitación separada con baño separado. No vayas a espacios compartidos
- Si no se puede aislarse crea un separador de ambiente con una sábana.
- Ventile la habitación con aire fresco por lo menos 3 veces al día.
- Mantenga agua y productos de saneamiento en la habitación.
- Mantenga una bolsa de basura en la habitación.
- Proteja a las mascotas, no las abraza.
- Notifique a todos los contactos de los últimos 10 días.
- No espere! Si se siente peor llame a su médico.

Detén la propagacion en CASA Miora



WEAR A MASK

PROTECT PARENTS + BABIES

COVID-19

When we all wear masks...

We protect parents and babies.



USA UNA MASCARILLA

PROTEGER A LOS PADRES Y BEBÉS

COVID-19

Cuando todos usamos mascarillas ...

Protegemos a los padres y los bebés.





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Charlottesville, VA

Featured Conference: Agenda for the Virtual 38th Annual Advances in Therapeutics and Technology: Critical Care of Neonates, Children, and Adults

Donald Null, MD, Mitchell Goldstein, MD, Arun Pramanick, MD

38th Annual Conference
Advances in Therapeutics and Technology: Critical Care of Neonates, Children, and Adults
The Cliff Lodge and Spa in Snowbird, UT

TUESDAY, MARCH 29, 2022

Time	Title	Speaker
3:00 - 5:00 pm	Pre-registration <i>Primrose B Lobby</i>	
Abstract Presentations: Moderated by Arun Pramanik, MD		
5:00 pm	Opening Remarks	Arun Pramanik, MD Professor of Pediatrics, Louisiana State University School of Medicine
5:30 pm	Abstract Presentation <i>Mesenchymal Stromal Cell Extracellular Vesicles Improve Respiratory System Outcomes in Mechanically Ventilated Preterm Lambs</i>	A. Rebentisch University of Utah
5:45 pm	Abstract Presentation <i>Mesenchymal Stromal Cell Extracellular Vesicles Improve Alveolar Formation in Mechanically Ventilated Preterm Lambs</i>	Emily Major University of Utah
6:00 pm	Special Lecture <i>LISA Versus Insure: LISA is no Longer a Fashion- It is Here to Stay</i>	Rangasamy Ramanathan Professor of Pediatrics (Clinical Scholar) Director of Neonatology Pediatrics
7:00 pm	Conclusion	

38th Annual Conference
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The Cliff Lodge and Spa in Snowbird, UT

WEDNESDAY, MARCH 30, 2022
MORNING SESSION

Time	Title	Speaker
7:00 - 8:00 am	Continental Breakfast Vendors: Primrose A Registration: Primrose B Lobby	
Presentations: Moderated by Stephen Derdak, DO		
8:00 am	Abstract Presentation <i>Trends in Outpatient Palivizumab Use and Rates of RSV Related Hospitalization in Very Preterm (born at <29 wGA) Infants: 2003-2020</i>	Elizabeth R Packnett, MPH IBM Watson Health, Cambridge, MA
8:20 am	Special Lecture <i>Respiratory Syncytial Virus in COVID-19 Pandemic an Update</i>	Mitchell Goldstein, MD Director, Neonatal ECMO Professor of Pediatrics, Division of Neonatology, Loma Linda University Children's Hospital
9:10 am	Special Lecture <i>Postnatal Corticosteroids to Prevent and Treat Chronic Lung Disease Following Preterm Birth (Updated AAP's COFN Policy)</i>	Dr. Arun Pramanik Professor of Pediatrics LSU Health Shreveport, LA
10:10 am	Break	
10:40 am	Abstract Presentation <i>Benefits and Pitfalls During Design and Use of Pneumotachograph for Monitoring of Mechanical Ventilation</i>	Ladislav Bis Department of Biomedical Technology Czech Technical University in Prague Czech Republic
11:00am	Ultrasound Workshop High-Frequency Nasal Ventilation Workshop	Donald Null MD, Professor of Pediatrics Director NICU and Neonatal Transport UC Davis Children's Hospital
12:05 pm	Special Lecture <i>Discover the Magic of Point of Care Ultrasound A Focus on Hocus Pocus</i>	Yoginder Singh, MD Loma Linda University Children's Hospital
1:00 - 4:00 pm	Break Academy of Neonatal Care	

***Agenda is subject to change without notice.**

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WEDNESDAY, MARCH 30, 2022

EVENING SESSION

Time	Title	Speaker
4:00 - 5:00 pm	Light Refreshments/Vendors <i>Primrose A</i>	
Presentations: Moderated by Donald Null, MD		
5:00 pm	Abstract Presentation <i>Humidified High Flow Nasal Cannula and its Effect on Total Water Delivery</i>	Mitchell Goldstein MD Professor of Pediatrics Loma Linda University Children's Hospital
5:15 pm	Special Lecture <i>Pediatric Digital Technology and Addressing Health Disparities and Bias in Children.</i>	Colleen Kraft MD Past President of American Academy of Pediatrics
6:05 pm	Special Lecture <i>Robert DeLemos Memorial Lecture</i> <i>How do we Provide the Best Patient Care in the NICU</i>	Donald Null MD, Professor of Pediatrics Director NICU and Neonatal Transport UC Davis Children's Hospital
7:05 pm	Break	

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THURSDAY, MARCH 31, 2022

MORNING SESSION

Time	Title	Speaker
7:00 - 8:00 am	Continental Breakfast/Vendors <i>Primrose A</i>	
Presentations: Moderated by Mitchell Goldstein, MD		
8:00 am	Special Lecture <i>Congenital Heart Disease and Rapid Genome Sequencing</i>	Nathaly Sweeney, MD Assistant Clinical Professor, Pediatrics School Vc-health Sciences
9:00 am	Special Lecture <i>Update on Closure of the PDA in Extremely Low Birth Weight Patients with a Plug</i>	Frank Ing, MD Professor of Pediatrics Chief Pediatric Cardiology UC Davis Children's Hospital
10:00 am	Break <i>Refreshments/Vendors: Primrose A</i>	
10:35 am	Workshop #1 <i>Ventilators</i>	
11:15 am	Workshop #2 <i>Ventilators</i>	
12:05 pm	Break	
1:00 - 4:00 pm	Academy of Neonatal Care	

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The Cliff Lodge and Spa in Snowbird, UT

THURSDAY, MARCH 31, 2022

EVENING SESSION

Time	Title	Speaker
4:00 - 5:00 pm	Light Refreshments/Vendors <i>Primrose A</i>	
Presentations: Moderated by Donald Null, MD		
5:00 pm	Special Lecture ECMO Considerations in Pregnant Patients	Stephen Derdak DO
6:00 pm	Special Lecture <i>Update on Fetal Surgery</i>	Dr. Shinjiro Hirose MD Chief Division Pediatric Surgery Medical Director Pediatric Trauma Professor of Surgery Vice-Chair Dept. of Surgery UC Davis
7:00 pm	Break	

***Agenda is subject to change without notice.**

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The Cliff Lodge and Spa in Snowbird, UT

FRIDAY, April 1, 2022

MORNING SESSION

Time		Speaker
7:00 - 8:00 am	Continental Breakfast/Vendors <i>Primrose A</i>	
Presentations: Moderated by Stephen Derdak, DO		
8:00 am	Abstract Presentation <i>Novel Application of Neonatal point-of-care Ultrasound: Ultrasound-guided less Invasive Surfactant Administration</i>	Amy Yeh MD, MPH Assistant Professor of Pediatrics Director of Neonatal-Perinatal Medicine Fellowship Education Division of Neonatology, LAC+USC Medical Center
8:20 am	Abstract Presentation <i>Mitigation of Water Condensation and High Flow Nasal Cannula, Dew Point Significance</i>	Mitchell Goldstein MD
8:35 am	Special Lecture <i>Use of Heliox in Neonates with Diaphragmatic Hernia</i> <i>Use of Mechanical Ventilation for Diaphragmatic Hernia</i>	Jose Honold, MD Chief Neonatology, Medical Director NICU Rady Children's Hospital, San Diego, CA Bradley Yoder, MD Chief Neonatology Professor of Pediatrics of Utah
9:35 am	Break <i>Refreshments/Vendors: Primrose A</i>	
10:05 am	Abstract Presentation CoroVent an Emergency ventilator designed and used for treatment of patients with respiratory failure during Covid- 19 pandemic in the Czech Republic	Simon Walzel Department of Biomedical Technology Czech Technical University in Prague Czech Republic
10:25 am	Abstract Presentation Research of gas exchange of a victim with avalanche snow	Karel Roubik, PhD Faculty of Biomedical Engineering Czech Technical University in Prague, Czech Republic
10:45 am	Abstract Presentation Influence of Oxygenation on Neurodegeneration following Traumatic Brain Injury in a Swine Model	Brendan Beely, RRT The Geneva Foundation, San Antonio TX
11:05 am	Special Lecture Fluid Resuscitation in the Critically Ill Pediatric and Adult Population	Steve Conrad, MD
12:00 pm	Break	

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1:00 - 4:00 pm	Academy of Neonatal Care	
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***Agenda is subject to change without notice.**

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The Cliff Lodge and Spa in Snowbird, UT

FRIDAY, APRIL 1, 2022

EVENING SESSION

Time	Title	Speaker
4:00 - 5:00 pm	Light Refreshments/Vendors <i>Primrose A</i>	
Presentations: Moderated by Arun Pramanik, MD		
5:00- 7:00 pm	Special Session ECLS and Critical Care	Chairs: Andriy Batchinsky, MD Teryn Roberts, PhD
	Special Lectures <i>Hemolysis Issues During ECMO</i> <i>Anatomy of Anticoagulation in Blood- Polymer Interfaces: Implications for Medical Device Development</i> <i>Development of Microfluidic Oxygenators</i> <i>ECLS During COVID are We Changing Practice</i>	Timothy Maul, CCP, FPP, PhD Teryn Roberts, PhD J. Borenstein, PhD Andriy Batchinsky, MD
7:00 pm	HFVP How it Compares in the COVID Pandemic	G Sarduci Roma Italy
7:10 pm	Closing	

***Agenda is subject to change without notice.**

38th Annual Conference
Advances in Therapeutics and Technology: Critical Care of Neonates, Children, and Adults
The Cliff Lodge and Spa in Snowbird, UT

SATURDAY, April 2, 2022

MORNING SESSION

Time	Title	Speaker
7:00 - 8:00 am	Continental Breakfast/Vendors <i>Primrose A</i>	
Presentations: Moderated by Mitchell Goldstein, MD		
8:00 am	Abstract Presentation	Abstract Presenter
8:30 am		
9:30 am	Special Lecture <i>Antibiotic Stewardship: The Good, The Bad and the Ugly</i>	Donald Null, MD
10:35 am	Break <i>Primrose A</i>	
11:00 am	Conference Summary and Closing Remarks	Donald Null, MD
11:15 am	<i>Thank you!</i>	

***Agenda is subject to change without notice.**

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The Gap Baby: An RSV Story



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Health Equity Column: Addressing Social Disparities in Perinatal and Neonatal Care

Jenné Johns, MPH, Margaret Parker, MD, MPH



In this month's Health Equity Column, I've interviewed Dr. Margaret Parker, Associate Professor of Pediatrics and Director of Newborn Research at Boston Medical Center. Dr. Parker offers her personal and professional experiences with supporting Black and Brown women during the prenatal and neonatal periods. She also pushes the healthcare community to place social and cultural realities of receiving

healthcare for multicultural families. As you read this column, I encourage you to reflect on your social, racial, and ethnic solutions to driving disparities down in perinatal and neonatal care within your respective institutions.

"As you read this column, I encourage you to reflect on your social, racial, and ethnic solutions to driving disparities down in perinatal and neonatal care within your respective institutions."

What is your definition of health equity?

It means that everybody has the potential to reach their optimal health regardless of their social status or their social advantage.

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

One of my first priorities is to make sure that people recognize that social disparities in perinatal care delivery occur. It's not just that the health outcomes differ by social factors. It's that the actual care we deliver varies by these social factors. It's important for providers to understand this and acknowledge it. A key way that that needs to happen is that we need to track our health outcomes in our care and process measures about how we deliver care. These need to be tracked by social factors and that does not currently happen very much. For example, we need to be tracking our delivery methods by language and insurance status and by race and ethnicity. To me, a really important component is to make sure that we're tracking these measures and that people recognize the value of that.

Another priority is making sure that people recognize that, in order to address disparities and perinatal care delivery, we need to have both standardized and non-standardized approaches. For the standardized approaches, we need to make sure that the evidence-based practices that we know can change health outcomes are being delivered uniformly regardless of someone's social status. For example, in breastfeeding, which is an area that I do a lot in, we need to make sure that all mothers have access to the

right kinds of breast pumps that can help them maximally make milk. There are some things that really do need to be standardized across different social strata, which are currently not. I think the second tier of that is that there do have to be non-standardized, culturally appropriate, and tailored approaches to socially disadvantaged groups. I'll again use the breastfeeding example. Not only do women that are of low-income need to have the same kind of breast pump as someone who is of high income, but they may also need additional support with child care, food, and transportation. They might need a more tailored approach that fits the cultural needs of that group. I think that that's another really important factor for addressing social disparities in perinatal care delivery. Number one is acknowledgment, and number two is that to address it, we have to acknowledge we need both standardized approaches that occur equally among groups and non-standardized, culturally tailored approaches.

"There are a few things that have to happen. One is leadership buy-in and modeling behaviors by our leaders that this is true and apparent and addressing it openly. I think the second is really trying to bring family voices to the table when we're making decisions about our improvement processes. That is so crucial, and it's so basic, yet it's so hard for people to do. It just doesn't happen that much, and that's an area we really need to change."

Third is the importance of recognizing the implicit and explicit biases that occur within the healthcare system. We are increasingly having studies showing this, and it has been great to see that an increasing amount of people are embracing this topic and acknowledging that it's true. I think that to address this. There are a few things that have to happen. One is leadership buy-in and modeling behaviors by our leaders that this is true and apparent and addressing it openly. I think the second is really trying to bring family voices to the table when we're making decisions about our

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improvement processes. That is so crucial, and it's so basic, yet it's so hard for people to do. It just doesn't happen that much, and that's an area we really need to change.

“My dad traveled internationally, so I had some experiences very young visiting countries with significant amounts of poverty. I think the combo of those two things made me very focused on the importance of improving experiences for this population and the social justice aspects of it. I think I always had some interest there.”

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

From a personal perspective, I've always been very drawn to socially disadvantaged populations. This is probably stemming from my mom, who was a school principal and then the head of special education in low-income school districts in the East Bay in California, where I grew up. I heard a lot of stories from her growing up. My dad traveled internationally, so I had some experiences very young visiting countries with significant amounts of poverty. I think the combo of those two things made me very focused on the importance of improving experiences for this population and the social justice aspects of it. I think I always had some interest there. I went to med school in the Bronx, and then I was a resident at Oakland Children's, so those experiences also just made me very aware of the adverse social determinants of health that impacted the way that health outcomes occurred in these populations.

In terms of neonatology, I remember that as a resident at Oakland Children's, I was doing my NICU rotation, and I kept seeing all these black women with preeclampsia giving birth to growth-restricted babies. These mothers also had obesity, and I learned that because of the mothers' conditions at birth and what they experienced during pregnancy, that these kids have all these adverse health trajectories in their future. I found this really unfair, and I was also so drawn to this time period. I learned how all the things that happen during pregnancy and in the NICU have such important consequences for future life. I became very drawn to this time period and was intrigued by the Developmental Origins of Health and Disease Hypothesis, more broadly. Those experiences together solidified my choice to go into neonatology because I felt like this was such an opportune time to potentially change the life trajectory for these babies.

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

First and foremost, we have to be tracking our outcome and process measures by social factors. It's currently not done very much, and if it is done, it's done by race and ethnicity only. But that is just a social construct and only hits the tip of the iceberg. Embedded under racial and ethnic disparities are so many other

social factors. We need to have metrics that track these things, so we know how to improve.

“We also really need to improve the pipeline of healthcare providers that are underrepresented minorities themselves because that shared experience and background that patients feel when they see that their providers look like them is so critical and gives them so much more trust in the system.”

The second call to action is making a very concerted effort when we do develop improvements and interventions that we ensure that in the appropriate circumstances that equal distribution of these interventions are occurring. When there is a need to provide a culturally tailored approach, we must ensure that happens, that that's acknowledged, and that there's prospective planning for that.

Lastly is the call for action for us to recognize and address implicit bias in our interactions with families in the NICU from a leadership level and making sure that the family voices are coming to the table with decision making about improvement. This means including non-English speaking families, for example, and going farther than the ways we currently do things. We also really need to improve the pipeline of healthcare providers that are underrepresented minorities themselves because that shared experience and background that patients feel when they see that their providers look like them is so critical and gives them so much more trust in the system.

“I encourage people to keep up the hard work. I am constantly inspired by my colleagues across the US and in my own local environment and I just hope that folks feel like they can make a difference, because they can. Every single interaction you have with somebody is important.”

Final Remarks

These issues aren't new. This has been going on for decades and decades, and many of them are rooted in historical events in the US, and there are lots of political groups in this as well. I continue to be inspired by the work people are doing and the change that I do see, and I think it's an uphill battle that we have to all go in on together. I encourage people to keep up the hard work. I am constantly inspired by my colleagues across the US and in my own local environment and I just hope that folks feel

like they can make a difference, because they can. Every single interaction you have with somebody is important. We're not going to change things overnight, and this has been an ongoing long stretch. People should just remember that every little interaction and step that we have to move forward is really important on this long trajectory of work that we have ahead.

I've seen more enthusiasm in the perinatal space for health equity and care delivery in the last one to two years after COVID and George Floyd's death than I've ever seen in my career, even though I've been doing this for a long time. That is really exciting for me to see and I'm very enthusiastic for what the future is going to bring. Obviously it will be hard but I hope that this momentum continues.

Disclosure: *The authors have no disclosures.*

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Jenné Johns, MPH is President of Once Upon A Premie, Founder of Once Upon A Premie Academy, mother of a micropreemie, author, speaker, advocate, and national senior health equity leader. Once Upon A Premie is a non-profit organization with a two-part mission: 1.) to donate Once Upon A Premie 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 Premie 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.

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Organization: Boston University School of Medicine

Bio: Dr. Parker is an Associate Professor of Pediatrics and Director of Newborn Research at Boston Medical Center (BMC), Boston University School of Medicine. Dr. Parker is a neonatal health services researcher and holds several federal and foundation grants in social disparities in preterm birth outcomes; she has a particular interest in safe sleep and breastfeeding. Dr. Parker is also an expert in multi-site implementation science and is the Co-Chair of the Neonatal Quality Improvement Collaborative of Massachusetts and an Improvement Advisor from the Institute of Healthcare Improvement. She has led multi-site NICU quality improvements focused on breastfeeding and family engagement. Dr. Parker applies a health equity lens to her local and multi-site quality improvement projects and is a member of the American Academy of Pediatrics Committee of Fetus and Newborn.

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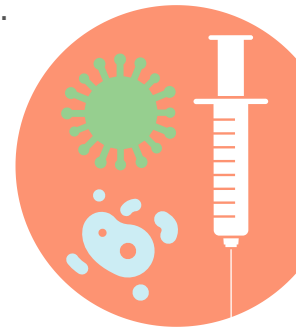


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Interpreting Umbilical Cord Blood Gases: Section 7: Fetal Circulatory Failure, Part IV Case 22: Acute Fetal Hemorrhage with Reperfusion Acidosis

Jeffrey Pomerance, MD, MPH

“Resuscitation included intubation, bag/tube ventilation with 100% oxygen, chest compressions, ETT epinephrine, UVC epinephrine, and sodium bicarbonate. The infant was pale, poorly perfused, and weighed 3580 g. The placenta was not examined.”

The mother was a 22-year-old, gravida 1, para 0, aborta 0, with an intrauterine pregnancy at 37 4/7 weeks gestation. She had moderate contractions, and her cervix progressed to seven cm dilated, completely effaced, and with the vertex at zero station with late decelerations on the fetal monitor. In conjunction with a small amount of vaginal bleeding, deep late decelerations ensued, resulting in an emergency cesarean section 20 minutes later. Apgar scores were 0, 0, 0, 0, and 1 at one, five, 10, 15, and 18 minutes, respectively.

Cord blood gas results were as follows:

	Umbilical Vein	Umbilical Artery
pH	7.16	7.11
Pco ₂ (mmHg) (kPa)	70 9.33	75 10.00
Po ₂ (mmHg) (kPa)	13 1.73	10 1.33
BD _{ecf} (mmol/L) (CSLI)	4	6

Resuscitation included intubation, bag/tube ventilation with 100% oxygen, chest compressions, ETT epinephrine, UVC epinephrine, and sodium bicarbonate. The infant was pale, poorly perfused, and weighed 3580 g. The placenta was not examined.

Although an umbilical venous catheter was in place, blood could not be drawn freely, and neither a blood gas nor a hematocrit was obtained.

After 60 mL of 5% dextrose in ½ normal saline (D5/½NS) and 35

mL Plasmanate were infused, an arterial blood gas was drawn from the infant.

Results at approximately age 50 minutes were as follows:

	Infant's ABG
pH	6.91
Pco ₂ (mmHg) (kPa)	80 10.67
Po ₂ (mmHg) (kPa)	16 2.13
BD _{ecf} (mmol/L)	17
BD _b (Hgb 5.7) (CSLI)	16

The hematocrit from this sample was 17% (Hgb ~ 5.7). After transfusion with 45 mL of PRBCs from an uncrossmatched unit, the hematocrit was 30% (Hgb ~ 10).

Results from the second follow-up arterial blood gas at approximately two hours of age were:

	Infant's ABG
pH	7.28
Pco ₂ (mmHg) (kPa)	20 2.67
Po ₂ (mmHg) (kPa)	84 11.20
BD _{ecf} (mmol/L)	17
BD _b (Hgb 10.0) (CSLI)	16

A WBC count obtained within the first hour of life did not show an elevated NRBC count. A maternal Kleihauer-Betke test performed several hours later was negative. Three days later, a head ultrasound demonstrated severe bilateral cortical necrosis with no evidence of intracranial hemorrhage. After a detailed discussion with the parents, an agreement was reached to discontinue ventilatory support. The infant died shortly thereafter.

Interpretation

The umbilical venous blood gas sample has moderate respiratory acidosis, while the umbilical arterial blood gas sample has

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only mild. Both umbilical venous and arterial blood samples have normal base deficits. Initially, however, the infant is clinically dead. It is not possible for the umbilical arterial blood gas obtained to reflect the situation at the fetal tissue level accurately. At the time of birth, the infant had no discernable heart rate and therefore had no blood pressure. Blood had not been entering the umbilical arteries from the fetus for an undetermined period prior to birth. Therefore, umbilical arterial blood stopped reflecting fetal status when fetal blood pressure fell below the critical pressure necessary for perfusion of the umbilical arteries and other fetal vessels.

During rapid acute blood loss, blood flows preferentially to the area of least resistance, the site of hemorrhage. Under these circumstances, tissue hypoxia is reflected poorly in any fetal vessel as blood is no longer flowing to nor returning from the fetal tissues. Blood drawn from an individual in the process of rapid exsanguination will have normal or near-normal blood gas values.

The fetus has one important advantage in this situation over a child or adult – the placenta will transfer, at least briefly, some replacement fluid to the fetus across the placenta from the mother. Normally, maternal RBCs are not transferred across the placenta.

“The fetus has one important advantage in this situation over a child or adult – the placenta will transfer, at least briefly, some replacement fluid to the fetus across the placenta from the mother. Normally, maternal RBCs are not transferred across the placenta.”

Neonatal blood volume was reconstituted initially with D5W/1/2NS and Plasmanate, a total of 95 mL. This accounts for the initial hematocrit being as low as 17%, as much of this infant's total blood volume had been reconstituted. Shortly thereafter, the blood volume was further reconstituted with 45 mL of PRBCs. The restored circulation enabled the sequestered tissue lactic acid to enter the bloodstream – *reperfusion acidosis*. In the face of a depressed newborn whose clinical condition has been improving, logic suggests that a follow-up base deficit would be similar or improved. When it has deteriorated significantly, suspect reperfusion acidosis. A number of other cases presented in this text have similar findings.

The respiratory acidosis in the umbilical venous gas is not explained by acute fetal hemorrhage, as this gas reflects primarily the uteroplacental unit, not fetal integrity. Likely, the respiratory acidosis was secondary to a brief terminal event associated with anesthesia and delivery, as there was not yet any metabolic acidosis (expected base deficit of 6).

Unfortunately, the placenta was neither examined in the delivery room nor by the pathology department. Nonetheless, a ruptured vasa previa seems to be the most likely cause of the clinical and laboratory information. The fetus has had a large recent blood loss. A negative Kleihauer-Betke test on the mother rules out significant fetal-maternal hemorrhage. The absence of an elevated NRBC count in the infant excludes more chronic hemolysis or blood loss. The head ultrasound examination three days after birth did not demonstrate hemorrhage. What is described as a “small amount” of vaginal bleeding can amount to a large hemorrhage for the fetus if the blood is fetal in origin.

During marked fetal hypovolemia and consequent cardiac standstill, circulation to the brain ceased and resulted in necrosis.

At term, the fetal-placental unit has a blood volume of approximately 125 mL/kg of newborn weight. (1,2) Using the birth weight of 3580 g and 125 mL/kg to calculate the total fetal-placental blood volume results in approximately 448 mL ($3.58 \times 125 = 448$). The lower end of the range for hematocrit in full-term infants is approximately 42%, although the upper end may be as high as 65%. (3) More than half of the calculated fetal-placental blood volume would have to be lost for the hematocrit to have dropped to 17%. A “small amount” of vaginal bleeding could easily amount to more than 100 mL, inconsequential to the mother but potentially catastrophic to the fetus. Likely, additional blood was lost and unobserved during preparation for emergency cesarean delivery.

BD_{ef} does not take hemoglobin into account, while BD_{b} does. However, substituting either 5.7 gm/dL hemoglobin (Hct 17%/3 = 5.7 gm/dL) in the first followup blood gas or 10 gm/dL hemoglobin (Hct 30%/3 = 10 gm/dL) in the second followup blood gas, makes very little difference in the BD_{b} s. Only when Hgb is truly extreme, do significant differences occur.

Much has been made about the value of an Apt test in differentiating fetal from maternal blood. This test was designed to differentiate maternal from fetal blood in emesis or stools of newborn infants, but has also been applied to vaginal bleeding. However, if vaginal bleeding is due to loss of fetal blood, long before the results of an Apt test return from the laboratory, the fetus will have exsanguinated. Bedside testing, if available, might provide information in a timelier manner. Usually, electronic fetal monitoring provides the timeliest information as it will quickly reflect major fetal hemorrhage.

“Many infants with severe asphyxia have poor circulation at the time of birth. Blood does not circulate freely to the fetal tissues. It is not until a good heart rate, and at least a reasonable blood pressure is restored that oxygen is brought to the tissues in sufficient quantity to restore normal metabolism at the tissue level. As normalizing circulation and metabolism are restored to the newborn's tissues, lactic acid is cleared into the central circulation.”

Many infants with severe asphyxia have poor circulation at the time of birth. Blood does not circulate freely to the fetal tissues. It is not until a good heart rate, and at least a reasonable blood pressure is restored that oxygen is brought to the tissues in sufficient quantity to restore normal metabolism at the tissue level. As normalizing circulation and metabolism are restored to the newborn's tissues, lactic acid is cleared into the central circulation. Depending on when a follow-up blood gas is obtained from the infant, the worsening metabolic acidosis may not be documented. If the first follow-up blood gas from the infant is not drawn soon enough, the documentation of worsening metabolic acidosis may be missed entirely.

The second follow-up blood gas obtained approximately 70 minutes after the first follow-up blood gas had the same base deficit as the first. In the absence of significant base deficit improvement, fetal heart failure should be seriously considered. It would not be unexpected for this infant to have heart failure following such catastrophic events. One could have considered a partial exchange transfusion with PRBCs rather than a straight transfusion. Obtaining a central venous pressure prior to transfusing the PRBCs might have been instructive.

Finally, how long should resuscitation continue without a heart rate? In 2011, the American Academy of Pediatrics stated in their Textbook of Neonatal Resuscitation, (4) "If you can confirm that no heart rate has been detectable for at least 10 minutes, discontinuation of resuscitation efforts may be appropriate. Current data indicate that, after 10 minutes of asystole, newborns are very unlikely to survive, and the rare survivors will have a severe disability. The decision to continue resuscitation efforts beyond 10 minutes with no heart rate should take into consideration factors such as the presumed etiology of the arrest, the gestational age of the baby, the presence or absence of complications, the potential role of therapeutic hypothermia, and parents' previously expressed feelings about the acceptable risk of morbidity."

"The "right" thing to do is still unclear or at least challenging to carry out. It is difficult to terminate resuscitation as early as 10 minutes following delivery because of perceived or actual psychological pressure to continue. This pressure comes from the obstetrical team that just completed an emergency cesarean delivery, from the parents' frequent desire for the resuscitators to continue to try for a more extended period, and/or from the internal emotional pressure of members of the resuscitation team."

Largely, this last statement is based on an instructive article published in 1991 by Jain et al. (5) Of 58 infants whose Apgar scores were 0 for 10 minutes or more following delivery and who eventually had a heartbeat, only one survived to go home from the hospital; that one survivor developed cerebral palsy. A 2009 article by Laptook et al. (6) reported 25 infants whose Apgar scores were zero 10 minutes after birth and had total body cooling. Six of these infants (24%) survived and were normal or had only a mild disability. A 2020 article by Zhang, Friedman, and Strand (7) from a chart review of 49,876 infants born between 2010 and 2017 whose ten-minute Apgar score was 0 or 1, 172 were identified. "Of these, 133 did not receive resuscitation and died while receiving comfort care. Of the 39 resuscitated newborns, 15 (38%) achieved a return of spontaneous circulation at an average of 20 minutes. Thirty-two of these newborns died (82%) within 24 hours. The average time of the return of circulation for survivors was 17.8 minutes. Death or severe neurologic disability at 15-24 months of age was present in 92% (36-39) of resuscitated infants." The "right" thing to do is still unclear or at least challenging to carry out. It is difficult to terminate resuscitation as early as 10 minutes

following delivery because of perceived or actual psychological pressure to continue. This pressure comes from the obstetrical team that just completed an emergency cesarean delivery, from the parents' frequent desire for the resuscitators to continue to try for a more extended period, and/or from the internal emotional pressure of members of the resuscitation team. During the resuscitation, there is no time to have a considered discussion.

Key Points:

- During rapid acute blood loss, blood circulates preferentially to the area of least resistance, the point of blood loss, and poorly to the tissues.
- Umbilical artery samples will not accurately reflect fetal tissue status during acute fetal hemorrhage.
- In the face of a depressed newborn whose clinical condition is improving, a follow-up neonatal blood gas would be expected to have an improved base deficit from the umbilical artery sample. When it has deteriorated, suspect reperfusion acidosis.
- It is only following reperfusion that the full extent of metabolic acidosis at the tissue level becomes apparent.

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Medical Legal Forum: Send the Courts the Bill

Gilbert I. Martin, MD

The NICU, unusually busy,
As I started making rounds.
It seemed a little different,
There were no incessant sounds.

The beeps, the whoosh, the pings were gone,
The staff, not in a rush.
Now there was a finite silence,
A strange-like type of hush.

What is happening, I said to Sandy,
Charge nurse for this day.
Why so quiet, plug things in,
We need to start our day

Dr. M, she blurted fast,
It's not all up to me,
A new term has arisen,
It's called "LIABILITY."

Our premiums have been raised too high,
To cover increased costs,
And left us bagging these little tykes,
The battle now seems lost

You bag potatoes, I replied,
We ventilate the kids.
Go back to our government,
We need some reasonable bids.

I cannot use these monitors,
And plug them in their sockets,
Until compensation becomes reasonable,
What happened to "deep pockets"?

The Neos believe the court's unjust,
The Barrister, augments a fee.
A little used principle, is inserted,
A rationalized contingency.

I apologize for rambling on,
You might think my retort "short",
I'm tired and simply frustrated,
Who will change, "The Tort"?

OK, here's the solution, I whispered,
Will you close the door?
Plug in all the instruments,
We'll simply self-insure.

Common sense will soon return,
No longer a bitter pill.
Bring back the beeps, the whoosh, the pings
And "send the courts the bill."

Disclosure: There are no reported conflicts.

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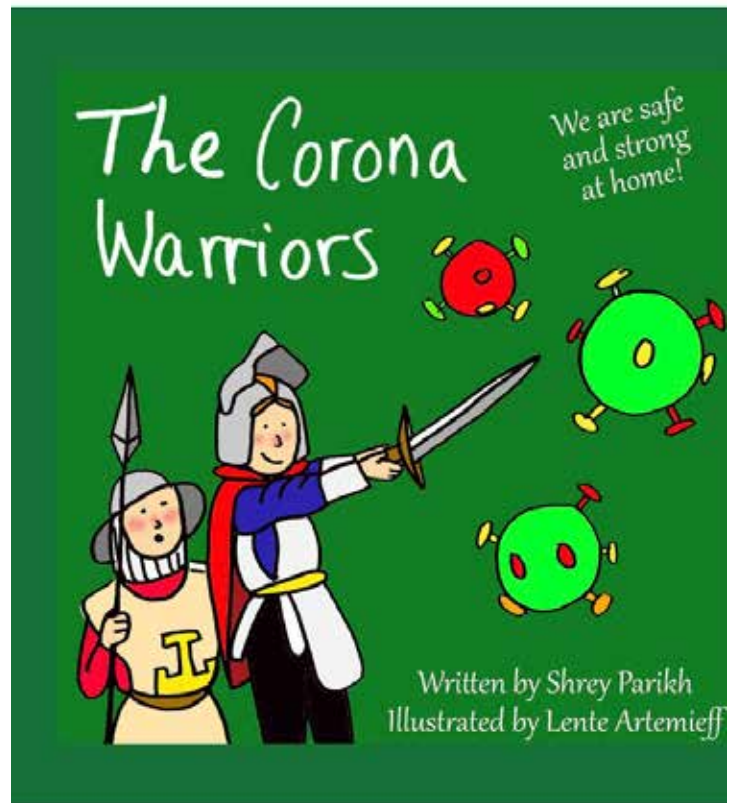


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Disclaimer:

This column does not give specific legal advice, but rather is intended to provide general information on medicolegal issues. As always, it is important to recognize that laws vary state-to-state and legal decisions are dependent on the particular facts at hand. It is important to consult a qualified attorney for legal issues affecting your practice.



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You Can Never Go Back.... Or Can You?

Kelly Welton, BA, RRT-NPS

In a previous articant (that's a cross between an article and a rant. Or should it be called a 'ranticle'?) Anyway, I discussed the concept of about half the country's RTs and RNs taking one step right, so to speak, i.e., leaving one job to take another, which left a vacancy that then had to be filled, and so on. This got very expensive for hospitals, but the need was there thanks to Covid. And, RT's finally got some recognition. Now that the Omicron variant has been reduced to being a mere respiratory nuisance for most people, rather than discuss masks or the need for more boosters, let's talk about what's going on with RT contract work and the possibility of returning to one's 'home hospital.'

"I ran an informal poll on an RT page on Facebook, asking: "If Covid contracts go away, how many of you will return to your home hospital versus continue with contract work? And, if the Covid contract money dries up, what will you do?" I was truly surprised at the responses."

I ran an informal poll on an RT page on Facebook, asking: "If Covid contracts go away, how many of you will return to your home hospital versus continue with contract work? And, if the Covid contract money dries up, what will you do?" I was truly surprised at the responses:

Out of 295 responses total, 246 (83%) said they would continue to travel and work on contract.

"Out of 295 responses total, 246 (83%) said they would continue to travel and work on contract."

Twenty-four said they would work PRN/registry and wait for a decent contract.

Eight said they would go back to school, while 14 said they would take a break over the summer. Two had no idea what they would do, and only ONE said they would return to their home hospital. Whaaaat? Why?

The comments were telling. "Even without Covid bonuses, travel pay is better than regular hospital pay." "Administration never changes, so I'll travel until I find a place I really like." And many were warned by their home hospital that if they left to take a contract, they would not be welcomed back. A seasoned, experienced therapist who has already previously oriented to hospital X, and you won't hire them back? They just got two years of practicing their craft in a hospital where they might have learned a thing or two and become a more versatile, well-rounded RT, and you don't want them? Wow...

I interviewed one of the RTs who had left their job to take a Covid contract. This was a seasoned NICU RT who left a busy NICU to work in adult care.

Me: Were you unhappy at your home hospital?

Her: No, but the pay was terrible. Along came an opportunity to get ahead with bills, put some funds into retirement, and pay off my car. It made sense.

Me: You worked 36 hours at your home base hospital and 60+ hours in the adult ICU. Did it still work out for more money?

Her: Oh yes.

Me: If you wanted to return to your NICU, could you go back?

Her: It would be.....difficult. Not just for the pay cut, but.... It would be difficult to go back.

Me: In what way?

Her: I just feel like my current contract hospital values me more.

Me: That's.... horrible. Your first contract ended after 13 weeks, then what happened?

Her: My second 2nd contract was not covid related, just NICU, but the pay was still almost twice what I was earning at my home hospital.

Me: Are you worried about what you will do when Covid contracts are no longer?

Her: I'm still getting offers, 2 or 3 a week, not for Covid but for ICU and NICU, and the regular pay is still twice as much as home base. An additional lure of contract work is the \$1000 a week stipend paid if the traveler drives > 60 miles each way to work. Essentially, if Homebase offered me full-time, the pay would not be worth it. I would just wait and get another contract.

By the looks of things on Facebook, there are still contracts to be had. Lots of them. So, what prevents every RT everywhere from jumping ship again, since contract pays better every time, and contracts don't seem to be drying up even though Covid appears to be settling down? Several factors:

Many RTs who stayed at Homebase are married, have kids, or have other family obligations.

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Many of the vacant positions were filled by new grads since new grads generally don't work registry.

The sum of what has been created is this: RT managers can't hire straight away, as the pay is too low for experienced RTs.

Managers have to hire new grads to orient and train them. And, what education is in place for recent grads since RT Educator positions are still few and far between?

She is now the only traveler at her current hospital and got the job due to her NICU experience. The adult ICU had plenty of home staff.

I asked her if she had any predictions for the coming Fall season, and several salient points emerged: One, NICU is not seasonal work for RT compared to adults. A NICU may be slow but still needs an experienced RT there, no matter the level of NICU. And, it would be a good idea for RTs to learn NICU now and get higher pay and more opportunities and potential job security.

“A NICU may be slow but still needs an experienced RT there, no matter the level of NICU. And, it would be a good idea for RTs to learn NICU now and get higher pay and more opportunities and potential job security.”

Let's hope more RTs get trained this summer to work in specialty areas such as NICU. And pray that Fall 2022 is Covid-free.

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

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



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.

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August 9, 1996 - April 3, 2010



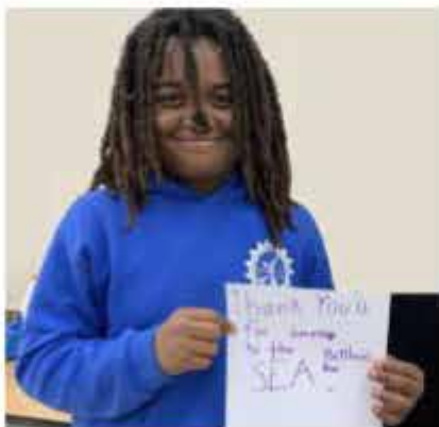
Each year, the Emily Shane Foundation SEA(Successful Educational Achievement) Program provides academic and mentoring support to over 100 disadvantaged middle school students who risk failure and have no other recourse. We have served over 700 children across Los Angeles since our inception in the spring 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.**

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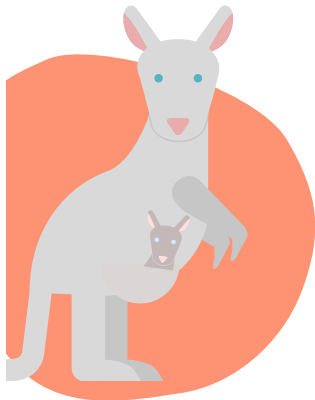
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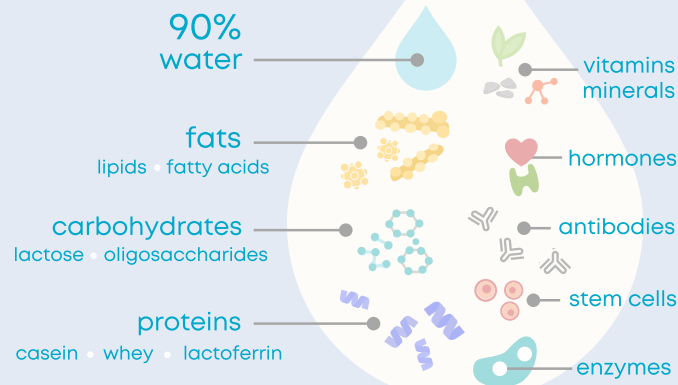
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Let's Talk About Light and Health – Out of the Womb: Lighting up the NICU

Robert White, MD, Randy Reid, MBA, Allison Thayer, MS

“ This is the second in our series: Let's Talk About Light and Health, and today's discussion is entitled: Out of the womb, Lighting up the NICU.”

Randy Reid: Hi, I'm Randy Reid, Executive Director of the National Lighting Bureau and I am joined today by Dr. Robert White, Director of the Regional Newborn Program at Beacon Children's Hospital in South Bend, Indiana. This is the second in our series: *Let's Talk About Light and Health*, and today's discussion is entitled: *Out of the womb, Lighting up the NICU*. Dr. White, welcome.

Randy Reid: Give us a little on your background and how you came to be the Director of the Regional Newborn Program back in 1981.

Dr. White: I grew up in this area and went to school at Notre Dame, then went out to Johns Hopkins for all of my medical training. When I was done with that and ready to get a job as a neonatologist, it was early on in the course of neonatology, so a lot of places were just getting started. One of those was the hospital here in South Bend, so very close to my hometown, and they were looking for a neonatologist to start their program, so it was a great opportunity. I made one request of them; I was really interested in the environment of care in the NICU. I thought it was pretty awful in the NICUs I had trained in and been in and so one of the things I asked for as a term of coming was that they'd be willing to build a world-class NICU. And they agreed. So I was happy to come, and within five years, we had built a NICU that was much different than the ones typical for that time, and we did have people come from all over the world to take a look at it. That built an interest in that topic of neonatology for me and for the rest of my career. The construction was completed in 1986, and it lasted us until 2017. We are now in a new unit which is the second world-class unit we have built, but we were in that one for 31 years.

Randy Reid: Can you tell us a little bit about how NICUs have changed from the work that you've done?

Dr. White: When I first started out in neonatology, NICUs were big open wards that had many babies (10 or 15 babies) in each room. They were brightly lit, usually didn't have windows, they were very noisy, very crowded. Family participation was very restricted. When I first started, families could come in for 15 minutes a day, and they could touch their baby, maybe, and that was it. They couldn't hold them or have any other interaction with them. So it was if you can imagine what the worst possible

environment would be for the care of a newborn baby who's going through this really important stage of development, this is the worst possible environment that we could have put them in. From that, we have come a long way and we'll talk a little bit more, I think, about how we got here. Now we're much more interested in making sure families have as much time with their babies as possible, and the design of our NICUs has been driven a lot by that consideration.

Randy Reid: Speaking of which, I have five-year-old grand twins, and they were born a month early, three and a half pounds each, and they lived their first month in the NICU. Even as a grandparent, I got to go in and see them, so I do think they have come a long way. But I will tell you; there was a lot of light there that I noticed. For me seeing the wires, the tubes, the noise, it just broke my heart and I just said, 'these kids will never be normal.' And they're happy, healthy five-year-old girls and all worked well so we have a huge amount of respect for the NICU and for the people for the work that you guys do.

Randy Reid: We learned a little bit last month in our series about circadian rhythms. Can you tell us specifically about circadian rhythms for babies?

“ It's fascinating in part because the baby's cycle is offset from the mother's cycle a little bit, and many pregnant women will tell you this, in the third trimester, that just when they're ready to shut down for the day and rest the baby becomes very active. I think the reason for this, which is just my hypothesis, that the mother's metabolic capability is trying to manage things for two organisms at that point, one of which is growing rapidly.”

Dr. White: It's really fascinating because babies develop a circadian rhythm in utero. They get the signaling for that from their mother so both through substances that cross the placenta as well as the mother's own activity. It's fascinating in part because the baby's cycle is offset from the mother's cycle a little bit, and many pregnant women will tell you this, in the third trimester, that just when they're ready to shut down for the day and rest the baby becomes very active. I think the reason for this, which is just my

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hypothesis, that the mother's metabolic capability is trying to manage things for two organisms at that point, one of which is growing rapidly. So, although the baby is small, they still have major metabolic requirements. If the mother is active during the day but the baby becomes more active when the mother is quiet, that doesn't put quite as much demand on the mother's circulation and oxygen delivery and metabolic requirements that would otherwise have the mother and baby in conflict. In any case, that rhythm is well established by the time the baby is born and even by the beginning of the third trimester, where some of the kids end up coming into our NICUs.

Randy Reid: Tell me a little bit about the importance of time-stamped breast milk.

“After a baby is born, then they have to get their circadian cues somewhere else. Typically, that's going to be from the environment, and light/daylight is a component of that. It was discovered, probably 30 years ago now, that another cue that a baby has for circadian rhythms is through the mother's breast milk.”

Dr. White: After a baby is born, then they have to get their circadian cues somewhere else. Typically, that's going to be from the environment, and light/daylight is a component of that. It was discovered, probably 30 years ago now, that another cue that a baby has for circadian rhythms is through the mother's breast milk. This was discovered in maternal milk in babies born at term, and it showed a very clear distinction in the presence of certain hormones as well as minerals, calcium, and phosphorus, for example, in the breast milk. We repeated that study in premature newborns, which Mariana [Figueiro], your guest last month, was one of the people who really helped us do that research and showed that that same phenomenon is true even when moms deliver prematurely. If that's intended to be a circadian signal for babies, it's just as important in premature babies as in full terms, we hypothesized. So we give milk to babies according to the time of day in which the mom pumped it. Our moms pump their milk put little stickers on it to indicate whether it was pumped during the day or the night. We then give it to babies at that same time of day or night, within a 12-hour range, so that we can give them those circadian signals. The circadian system is really fascinating because it's not just the pineal gland that is taking care of melatonin for us. It's been shown in babies and even more so in older folks that many other organs have an independent circadian rhythm that is probably meant to be tuned with the brain and the primary circadian rhythm. But all these other organs have this independent cycling as well. There's much more we need to learn about circadian rhythms, but it's not really just as simple as your melatonin going up and down.

Randy Reid: That's fascinating, and I will tell you, I don't think what you have just described is very well known. My daughter had a baby a year and a half ago, and she pumped quite a bit, and to my knowledge, she had never heard of this.

Dr. White: I think we are one of the few units in the world that do this because it does take a little more effort, and our publication

is the only one in the literature so far. So as much as people are inundated with research studies, it's probably pretty easy to miss, but I feel confident that as we understand more and more, it will become something that is typical for people to do because it's not that hard it is a little bit of an effort, but we can do that.

Randy Reid: Right, just give people the information and let them make their decision.

Randy Reid: Let's get to the lighting of the NICU because how difficult is it to light a room that's got to have 24/7 applications for the staff, yet you're trying to get babies to tune their circadian rhythm. How does that work?

Dr. White: So we have multiple considerations; the babies themselves are maturing so we have some kids who are 24 weeks gestation and other kids who are full term. Their needs may be different. Certainly, the stresses that bright lighting could put on them will be different at those stages. We also have staff who are in those rooms and have their own circadian needs, and that's different for the day shift nurses who might need some bright lighting to help them stay alert and to continue to trigger their circadian cycle properly, compared to night nurses who we don't want to give those bright lights to and suppress their circadian cycles so they can't sleep the next day when they get home and they get all out of sync. And then we have the families who are in there who have their own needs as well. Trying to get the lighting right for all of those populations is a challenge, and obviously, one big component of that is to make it flexible.

“To start with the baby's space, we don't want any bright light directly in the baby's eyes, so it's all indirect lighting, and that is accomplished using multiple luminaires that give us some flexibility to turn on and off as we need.”

To start with the baby's space, we don't want any bright light directly in the baby's eyes, so it's all indirect lighting, and that is accomplished using multiple luminaires that give us some flexibility to turn on and off as we need. We have a procedure light, for example, so if we're starting an IV or putting in a catheter, we can use that procedure light just on the limb that we're working with, without getting it in the baby's eyes. We have this ambient lighting at the bedside, and then we have lighting in other parts of the room. Some of it is just for fun. For example, we have LED lighting that parents can change the color of so that when it's Notre Dame football game day, they can make the lighting over the sink (which is where this LED is) they can make that green.

Randy Reid: Who has control over that, by the way? Who can control the color temperature or the color?

Dr. White: Either the family or the nurses can do it. For valentine's day, we had a lot of red, and that's sort of whimsical more than anything, but it does give you that sense that we want there to be some individual control and make this as much like home as we can, not too clinical.

Dr. White: There's even UV lighting (I know we're going to talk about that in a little bit) over the sinks, UV-A lighting that will help keep our surfaces as clean as possible

Randy Reid: You're one of the first to participate in research using UV-A to disinfect the NICU spaces. How is that working?

Dr. White: We did the trial with Mark Rea and Mariana [Figueiro] and our colleagues at GE and showed that even though we are the cleanest place in the hospital (our hospital does surveillance and monitors surface contamination of many units throughout the hospital) and we always come out best so we do a really good job of that, but we still have contamination. Nosocomial infection is a really serious problem for pre-term babies, so we wanted additional ways of keeping our environment as clean as possible. When Mark approached us about this trial using UV-A, we were very happy to participate. We showed using controlled situations. We installed the lights in multiple rooms and then had days when

"We showed using controlled situations. We installed the lights in multiple rooms and then had days when they were on and periods of time when they were off. We did many cultures and other infection control measurements to demonstrate that during the days that the UV-A light was in use, the bacterial contamination of these surfaces was significantly lower."

they were on and periods of time when they were off. We did many cultures and other infection control measurements to demonstrate that during the days that the UV-A light was in use, the bacterial contamination of these surfaces was significantly lower. Since completing that study, we have purchased several lights in several of our rooms plus our breast milk preparation area, which is an area we want to keep really clean, and our IV preparation area also have these UV-A lights installed. The beauty of UV-A is that it is in continuous use. When our cleaning folks come around and clean the counters and the sink two or three times a day, they're clean at that moment, but the moment someone comes to wash their hands, that sink is contaminated. Or if something is laid down on the counter, it becomes contaminated immediately after and doesn't get cleaned with chemicals again until 8 or 12 hours later. The UV-A, however, is always there, so it keeps the bacterial colonization down continuously in a way that we could never accomplish with either chemical cleaners or with UV-C.



Dr. White: This is the original layout of our NICU. You're looking at it from the outside, obviously, and we want it to be a little whimsical, use a lot of colors, make sure that people from the moment they approached us knew that this was going to be a little different than the typical hospital setting they were used to.



Dr. White: This is the floor plan of our NICU. You'll see the central area is an atrium (and I think you'll see pictures of that later). This was a really unique aspect of this NICU. I think we are the only one in the world that has this feature. Our previous NICU had skylights, so it raised the ceiling and brought daylight into the NICU all day long. It was really unique in that respect as well, and this atrium is just expanding on this concept. I can tell you that just for me having been here day in and day out, walking out from our workspace into that atrium on a sunny day just brightens my spirits and makes everything about the day a little bit better. I think that's true for families as well who walk out of their baby's room in a situation that might be very difficult to see some sunlight to see a little bit of the outside world is a piece of what we hope we can offer families instead of completely enclosing them in this hyper-intense environment.



Dr. White: This is our entry area, and you can see through the front door into that atrium, so that's what greets people as they walk in. Not a bunch of lights and alarms, not a bunch of signs. We want a place for the kids to be distracted, so they're not at the bedside distracting their parents from the care of their baby. It is intended to be a place for the entire family.



Dr. White: This balcony area is much nicer now. This is when we first moved in. The nurses have really done a wonderful job of embracing this concept and have done a lot of planting. It's still covered at the moment, but in the Spring, there'll be all sorts of flowering bulbs and lilac trees, and dogwoods blooming on our balcony. So again, for families who maybe don't want to leave the hospital to go outside, they can just come here for a few minutes, a few steps away from their baby's room, and have lunch and decompress.



Dr. White: These are two views of the atrium, but this atrium, of course, goes all around the center of the NICU, so there's plenty of spaces for folks to meet and have casual conversations. You'll notice the floor is carpeted. That's unusual in a hospital setting, but it keeps the noise down dramatically, and it does set a very different tone again for the kind of place this is. It's not meant to

look very sterile and clinical, but rather look a little bit closer to home for most people.



Here's the patient room, and you will see the infant space to the right that does have a lot of monitors. I can tell you, though, that those do not have audio alarms for the most part. There's a couple that we weren't able to get on to our electronic system that still do alarm, like the ventilator just to the right of the mom's head. We don't have a way of integrating those alarms into our system, but all the other alarms come through the nurse's cell phones as a vibration that alerts them to the fact that the baby might be in alarm condition. But none of those alarms sound at the bedside. You'll see some space for families towards the back; there's a desk and then these sliding glass doors that go into the parent space, which has a sofa bed, it has a bathroom, it has a refrigerator, and outlets so they can plug in and work if they need to. So it really is a space where families can make it their home away from home. At Christmas, they're often decorated. You see on that green wall on the left-hand side some mementos that are on a string that this mom has placed for her baby, but the families can really personalize the space, especially if they're going to be there for many weeks.



Dr. White: A less cluttered view of the patient space so you get a better idea of the lighting. From behind those sliding glass doors, that's daylight coming in through the window. You see the procedure light directly over the incubator, but there are no other direct lights that the baby would be exposed to. When we use that [procedure light], we can focus it away from the baby's eyes as well. Then the headwalls on either side you see some lighting that goes up onto the wall above and below it. There's some canned lighting in the ceiling that's away from the bedside that provides lighting over other spaces where people would be wanting more direct lighting. We do have vinyl flooring in the rooms, not carpet, but these rooms are still very quiet. The major source of noise that we really had to address was the heating and ventilation system. Our engineers did a great job with that so that these rooms are much,

much quieter than the typical NICU and even quieter than lots of people's living rooms at home.



Dr. White: This is what we call our “couple care” rooms. In this case, the mother is still a patient. This is right after she has delivered so she can be a patient right there in the room with the baby. That is a very unusual feature. It is one that I think will become the standard in the future so that we're not separating mothers and babies at a time when the baby is critically ill and the mother is scared to death. She can be right there. A few moms choose not to, and that's okay, but most moms want to be there. It's very helpful for us too that instead of seeing a baby and then going across the hospital to the maternity ward to give a report to the mother, she's right there, she knows what's going on, we can have a conversation and tell her what our game plan is. This setting is one that we were the first intensive care nursery in the country to provide, but there are a number of other units that have now opened or are in the process of being designed that will incorporate this concept.



Dr. White: This is just outside the patient rooms. One of the things we learned from families (as we included them in our planning for this NICU) was that they wanted bright colors. Our nurses, when they went through the first pass of the design with the architects, chose pastels and muted colors, but the family said “no, we'd rather a place that was bright.” That not only tells you what's important about the colors, but what's important about the lighting. We don't need to keep the lighting dim and low-key, some might say. Lighting that's fairly bright is good for people for their alertness, for their circadian rhythms, and for their general overall psychological well-being.

Randy Reid: At night, say three in the morning, is it the same light level?

Dr. White: No, so in the patient room the light is much lower, in the nurses' station the light is much lower, and in the hallways, these

overhead lights (the ones that are just above the doors of the patient rooms), and the one that's over the nurses work area those lights are all off at night.



Dr. White: Here's another photo that demonstrates our attempt. At the end of the hallway, we still have a conference room, but if you're walking down this hallway, you can still see through (this is actually where I'm sitting right now, so the window behind me is the same window at the front of this photo). That hallway isn't blocked off, even though there's a conference room where you can still get daylight.



Dr. White: One more photo again demonstrating a hallway. In this case, it's into the atrium. The trees and leaves that you see there are the graphics on the atrium wall, and then the window at the far end is actually a patient room with mirror glass. So the families can look out those windows into the atrium, but we can't see into their room, so they get daylight and privacy at the same time.

Randy Reid: Can you tell our audience a little bit about the changes that you have seen in the NICU, not just locally but nationally, and how you have achieved these?

“After we built this new unit back in 1986 and had a lot of people coming to look at it, one of the things that was clear was that the codes that were written for hospital construction at the time were actually getting in the way of better design of NICUs.”

Dr. White: After we built this new unit back in 1986 and had a lot of people coming to look at it, one of the things that was clear was that the codes that were written for hospital construction at the time were actually getting in the way of better design of NICUs. Our idea was that we would put together a consensus committee that would help design/write new codes for NICU design. We came to be this committee back in the early 90s. It incorporated nurses, therapists, doctors, architects, and experts from industry, including Mark Rea for lighting, for example, into a consensus committee that looked at all the requirements for NICU design and decided what the minimum standard should be based on evidence that was available. We had these strong criteria (it had to be evidence-based) if we were going to change what the recommendations were, and it had to be a consensus. We defined consensus as everybody in the group minus one. We didn't want something that was just a majority vote if there was a fair amount of uncertainty if this was really the right way to go. We wanted everyone to be convinced that the evidence pointed in favor of this change, but we didn't want to leave it in a situation where one person who wasn't quite sure, really didn't think that was the right thing, could stymie the whole progress that the committee thought we should move forward with. That "consensus minus one" was the way we worked the committee, and it's worked extremely well. We have had nine iterations now of this. The facilities guideline institute, which writes the standards for hospital construction and is the default for most state code organizations, has adapted these into their guidelines as well. For example, when we first started, you weren't allowed to put windows in newborn ICUs. The thought was that if you put a baby next to a window, there would be excessive heat loss to the outside, and that would be dangerous to the baby. Well, we realized and showed in our unit, for example, with skylights, that there were ways to do this without having the baby next to the window. You could still have a window and not put the baby next to it.

Randy Reid: The guideline institute, they've adopted that now, is that correct?

"Even though the baby may not need the window, the family and the staff benefit from it. We did this on many other levels; how the head wall was designed, how much space there was, what the support for families would be within these rooms."

Dr. White: That's right. In fact, we're moving towards the point where we're *requiring* windows because we want families in the room with the baby, and they need the windows. Even though the baby may not need the window, the family and the staff benefit from it. We did this on many other levels; how the head wall was designed, how much space there was, what the support for families would be within these rooms. That whole process has gone over the last 30 years to help facilitate a really dramatic change. More dramatic in the NICU than anywhere else in the hospital, from where we used to be to where we are now. We used to be kind of the most unpleasant place to be, to now, I think this is the most uplifting, bright place to be. We need that because, in an adult ICU or a pediatric ICU, a kid might be there for a couple to three days, and then they're better and go out to the ward or go home. In the newborn ICU, babies are here for weeks or months through a very crucial stage of their development, and the families are going through a very crucial stage as well. This may be their

first baby, this may be a new relationship for them, and this is all happening under very stressful conditions. So it's more important maybe than any other place in the hospital to get it right and make sure that people have the proper medical support. The recommended standards do go into all of that for sure, but we want them to have the other supports the hospitals should be providing that may not be which medication or which IV the baby's getting but are still very important to their success, survival, and long-term development.

Randy Reid: From everything you said, it sure tells me that you're doing it right. I am glad to see that the research and what you've learned isn't staying in South Bend, that it is being adopted by the facilities guidelines and going nationwide and I assume even worldwide, correct?

Dr. White: Yes, and the amount of research that's coming out to help drive these changes is really dramatic, and again I think more in the NICU than any other place in the hospital we have lots of research on how the environment affects our patients. That's continuing, and Mark [Rea] and Mariana [Figueiro] have been a big part of that. I mentioned a couple of studies that we participated in with them. Mariana helped us with a study on breast milk, Mark helped us with the study on UV lighting, and we've done several other studies in conjunction with that team. That kind of research is happening more in the NICU than any other place in the hospital, and so we can make these changes based on evidence not just based on somebody's opinion.

Randy Reid: Dr. White, thank you for this, and we will now open the floor for questions. We want to thank our sponsor GE Current, a Daintree Company, for making today's session possible we could not produce these segments if it weren't for the generosity of our sponsors.

Attendee 1: Thank you for a great presentation and for the amazing work that you're doing all of you both at the NICU and the lighting folks. I wonder if you could talk a little bit about what difference these measures or changes in the environment, and particularly focusing on lighting, what difference have they made in the in the outcomes in whatever you consider those to be? Obviously, the one important set would be on the development and thriving of the infants, but anything that you've looked at would be of interest.

"Sure, the first study that was done on this question, to the best of my knowledge, was in the 1980s in England. Back then, everyone had really brightly lit NICUs 24 hours a day."

Dr. White: Sure, the first study that was done on this question, to the best of my knowledge, was in the 1980s in England. Back then, everyone had really brightly lit NICUs 24 hours a day. They decided to try just in their step-down areas (these are the kids that are no longer critically ill but are still too small to go home so they're pretty stable babies), and they decided to divide those up into two groups; one where the lights stayed on 24/7 and the other where they turned them off at night. They asked mothers to keep a journal once the kids went home, and (to maybe oversimplify the results) the journal showed that the mothers liked the babies who had been cared for in the room that was dark at night a lot better at six months of age than those mothers who were caring for babies that had stayed in the room that was continuously lit. I'm going to guess that that was because those babies slept better and were

easier to get to bed at night, that their circadian rhythm was better established. What we know for sure, objectively, was that those babies weighed about a pound more than their counterparts who were in the control group. We did the next study in South Bend, looking at infants in the early, critical care stage of their illness, and showed better neurological function at the discharge of those who were in the room with cycled lighting compared to those who were in the room that was continuous lit. Once we realized that continuous bright lighting was a bad idea, we went the other direction, and the theory was, well, in utero, babies have continuous dim lighting. So that's how we'll keep the NICU, and those randomized trials were done as well and still showed the babies that were in a circadian lighted environment did better than either continuous bright or continuous dim lighting. They looked at various outcome measures. Weight gain was one of them, and length of stay in the hospital was another. The important thing to note about the continuous dim lighting is that while that is what the babies get in utero, in utero, they still have those other circadian stimuli from the mother that I mentioned. Whereas once they're delivered, they lose the circadian stimuli from the mother, and then we're not giving them any from the environment as well. So those are the studies that have been done, and the outcomes (weight gain and length of stay) have been the primary ones more recently.

“Once we realized that continuous bright lighting was a bad idea, we went the other direction, and the theory was, well, in utero, babies have continuous dim lighting. So that's how we'll keep the NICU, and those randomized trials were done as well and still showed the babies that were in a circadian lighted environment did better than either continuous bright or continuous dim lighting.”

Allison Thayer: The next question “When the babies are born prematurely, is it best to start the environmental entrainment learning from the time they are born or is it preferred to wait until the time they are normally born?”

Dr. White: Much of the research has been done from the time of birth or within a few days after. Those kids, if they had stayed in utero, would be getting circadian signals from the mother throughout that third trimester of pregnancy. So biologically, it does not make sense to me that we would wait and not give them our alternative signals that the mother can no longer transmit to them, that we would wait to give them our signals until they're full term. That's the way the studies have been done. So that “environmental entrainment learning,” as you put it, is best done from the time they entered the newborn ICU. The first two or three days for kids who are really critically ill, we may keep the room pretty dark for those kids, and there are still places who aren't quite convinced about this, so they keep the room dark a lot longer, but I think the evidence is good that it can be started shortly after birth.

Allison Thayer: Next question we have: “Have the new design choices shortened the length of stay, and similarly has there been a noticeable positive impact on the staff?”

Dr. White: Some studies for babies did show a shortened length of stay. There have been fewer studies on the positive impact on staff in the newborn ICU, but elsewhere in the hospital, those studies have been done and have shown that there is a positive impact on staff. Mark [Rea] and Mariana [Figueiro] are in a better position to comment on that because they've done so much of that research, but the answer is ‘yes’ for both of those.

Allison Thayer: The next one that I have is: “What is the biggest challenge you face while trying to define lighting configurations and specifications for the NICU units?”

Dr. White: Inertia. People don't like to change. People who make up reasons why they're continuing to do the things they did even though there was no good reason to do it in the first place, they've decided that, well, this is how we've always done it, so you have to give us really good evidence before we're going to change. Actually, there were some reasons. For example, we had NICUs bright all the time very early on because that's the only way we could tell if a kid was pink or blue. Now, we have saturation monitors, so we don't need that anymore. Then as I said, a number of places think we should keep it dark because that's the way it is in utero even though there are other biological differences more important than that. But I think this inertia about ‘you've got to present us a whole lot more data to change’ than we have to support our current practice. So that's human nature.

Allison Thayer: Can you think of ways to make people less averse to these changes? Is it, like you said, the research but also the education of it as well and getting people more on board to ask for these changes?

Dr. White: Yeah, I think just as Mark and Mariana's team are really not only strongly committed to research but strongly committed to education and getting the word out. We do a lot of good research that a lot of people don't know about because they don't read all those journals. So finding other ways to get the message out is really important, and just like this series, I think that's how we can have a lot more impact than just publishing an article.

Attendee 2: Well, I just want to compliment you, Allison, as you had this idea, and I do think it's a very powerful way to get to know people like Dr. White. The question I have (and I should know the answer): the eye development (and this is the route to the biological clock) and so when the question was asked “should you wait till full term” and we agreed that that's not the right answer, but there must be a point at which it doesn't matter what the environment has because the eyes haven't developed well enough yet to send signals to the biological clock. Can you give us a sense of when that happens to the best of your knowledge because I'm not sure I know, and there must be a gap, or maybe there isn't a gap but maybe you could comment on that?

“The auditory cortex, for example, develops much earlier than the visual cortex. This sensitivity to light and dark is developed sooner than the visual capability that we associate with seeing faces and making out images. That's a later developing skill for babies.”

Dr. White: This research was done by the primary author is Scott Rivkees, and Scott worked with premature baboons and showed that the retinal hypothalamic tract was intact by early in the third-trimester equivalent for those baboons. That's what you have to have. The eyes have to be able to receive the light signal and then transmit it to the pineal gland, and that happens through the retinal hypothalamic tract. That's how we know that almost all of the kids that (we have a few kids before the third trimester, but nearly all of them are in the third trimester at the beginning or into the middle of the third trimester) and their retinal hypothalamic tracts are intact. You also asked about 'is it the same for the visual system?' The retina is not very well developed at the beginning of the third trimester, and the visual cortex in the brain is not very well developed either. The auditory cortex, for example, develops much earlier than the visual cortex. This sensitivity to light and dark is developed sooner than the visual capability that we associate with seeing faces and making out images. That's a later developing skill for babies.

Allison Thayer: The next question we have: "What is the science behind light being used to enhance and treat the bilirubin measures." And can you also mention what is that for our audience members who may not know all these different terms?

" The discovery that light could cause photoisomerization of the bilirubin molecule was made many years ago, at least 50 years ago, by a nun in a catholic hospital who noticed that the babies who were next to a window had less jaundice than the babies who are more inboard in the room. "

Dr. White: The discovery that light could cause photoisomerization of the bilirubin molecule was made many years ago, at least 50 years ago, by a nun in a catholic hospital who noticed that the babies who were next to a window had less jaundice than the babies who are more inboard in the room. From that observation, a lot of research was done that showed that the normal isomeric form of the bilirubin molecule has to be conjugated in the liver. It has to have another chemical added to it in the liver before it can be removed from the body. Exposure to light causes this other isomeric form which can then be excreted without going through that process in the liver, so when the baby's liver is immature or diseased, phototherapy can help the baby get rid of bilirubin that they could not otherwise do. That's a standard practice in treating jaundice in newborns. It turns out there's a very specific area in the spectrum in the blue/green part of the spectrum that is most effective in doing this.

Allison Thayer: And that is for light on the skin, is that correct? Versus light through the eye?

Dr. White: Correct, we actually put a blindfold on the baby when we do that so that we're not exposing them to a bright light to the eye.

Allison Thayer: Along those lines, "How much light do babies receive in the womb?"

Dr. White: That's fascinating too. It's more than you might imagine. We don't have a really good way of measuring that, and it probably is insignificant in terms of these things that we're talking

about because, for example, we don't know if the baby's eyes our eyelids are open or closed. We presume they're closed a good part of the time, so even measuring what's present with a probe in the amniotic fluid doesn't tell you how much is actually getting through to the baby's retina. It's probably not enough to be clinically significant.

Allison Thayer: Similarly, we have another question about light through the eyes: "Are there any concerns about exposing light to the eyes of the infants that would either advance or delay the development of the eyes of infants? Is the *lack of light* unwanted at some point during the development, and is the *presence of light* unwanted at some point in the infant's eye?"

Dr. White: There was concern about that when we started turning the lights off, we thought maybe by doing so we would protect babies from one of the problems that premature babies get, which is retinopathy of prematurity. That's caused by excessive oxygen exposure, and so the retina gets more oxygen than it is supposed to get in utero; that causes constriction of the arteries in the retina, and then the retina doesn't develop as well as it should, it develops scar tissue, and that can actually cause blindness. Stevie Wonder, the singer, for example, was born prematurely and was blind because of being exposed to excessive oxygen long before we knew that it could do that. We knew about oxygen, and then people wondered maybe light can do this too, maybe excessive light can cause damage to the retina and some of these kids who are getting blind from retinopathy premature it's not just the oxygen but it's the bright lights in the NICU. As it turned out, turning the lights down and protecting babies from bright lights in any case, even if you have some lighting in the room like we do, none of it's a direct light to the baby's eyes. That did not change in the randomized control trials. It did not change the incidence of retinopathy prematurity. Within limits (nobody's tried shining bright lights in the kids' eyes all the time, and maybe that would be damaging, but), at the levels that we're talking about to give a circadian stimulus, it does not cause any damage or advance the development of the retina.

Allison Thayer: That's very interesting, and with the next question kind of fitting in: "Could the babies then receive/be sensing light through their skin?"

Dr. White: That is a fascinating question. Not only babies but maybe all of us. There is some evidence (and I haven't reviewed this literature recently, so probably even more now) that yes, the light exposure of our skin, and there's even suggestions that certain parts of the anatomy where that's most notable that can affect the peripheral circadian rhythms that are present in our body.

Allison Thayer: I do have a question for you, Dr. White. What do you see about the future of lighting in the NICU?

" The discovery that light could cause photoisomerization of the bilirubin molecule was made many years ago, at least 50 years ago, by a nun in a catholic hospital who noticed that the babies who were next to a window had less jaundice than the babies who are more inboard in the room. "

Dr. White: You know, Randy asked me that question during the interview, and I didn't have a good answer for him. As I've thought

about it since I think where we are is we just need more research. I think there is a lot more (this last question, for example, about light on the skin). Maybe if we understood that better, we would change what our recommendations are. We'll learn more about light exposure to other parts of the body, we'll learn more about which parts of the spectrum of lighting are most important (I mentioned there was one part of the spectrum that was most important for phototherapy for jaundice), and we know there are certain parts of the spectrum that are most important for the nurses for the alerting response that they get, that we want them to have while they're at work. We'll learn more about that. We'll learn more about ultraviolet light and how it can be used in the hospital to keep our surfaces clean with UV-A and to keep our air clean with UV-C. There are a lot of exciting areas for further exploration, and hopefully, we can keep up our practice current with all of that new research. At the moment, I'm not sure which direction that we'll go.

“here are a lot of exciting areas for further exploration, and hopefully, we can keep up our practice current with all of that new research. At the moment, I'm not sure which direction that we'll go.”

Randy Reid: Well, Dr. White, I want to personally thank you, Allison, our producer, I would like to thank you, and we'd like to thank the audience. We had a very good turnout today, and about 90 stuck through to all of the questions, so Dr. White, that's a great reflection on you. Allison, you wrap up and tell us one more time about the next event.

Allison Thayer: Thank you for the great questions. We will be posting the recording of this video on our LinkedIn accounts, so if you follow us either the National Lighting Bureau or the Light and Health Research Center, we'll have it posted there and feel free to keep the conversation going if you think of any more questions put a put a comment in there, we'll keep the conversation going about lighting in the NICU.

Allison Thayer: Up next, like I mentioned for everybody who's still here that Dr. Sophia Axelrod from the Young Laboratory of Genetics at the Rockefeller University will be up next in March, and she'll be talking about more specifically lighting for babies and a light-dark pattern that we should be giving them for better sleep and for better health.

Disclosure: Mr. Reid is Executive Director of the National Lighting Bureau, the editor of the EdisonReport and the editor of designing lighting (dl) magazine.

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About the Author: Robert White, MD



Title: Medical Director, Neonatal Intensive Care

Organization: Regional Newborn Program at Beacon Children's Hospital

Dr. White has a primary interest in advancing structural and operational strategies to provide the optimal NICU environment of care for babies, families, and caregivers. He has written many papers and co-founded the Consensus Committee to Establish Recommended Standards for Newborn ICU Design, the Gravens Conference on the Physical and Developmental Environment of the Newborn, and the International Newborn Brain Conference.

About the Author: Randy Reid, MBA



Title: Executive Director

Organization: National Lighting Bureau

Along with being an Executive Director of the National Lighting Bureau, Mr. Reid is also the editor of the EdisonReport and the editor of designing lighting (dl) magazine. He is a past president of the Illuminating Engineering Society and a retired Lieutenant Colonel in the US Army Reserve.

About the Author: Allison Thayer, MS



Title: Associate Researcher

Organization: Mount Sinai Light and Health Research Center

Ms. Thayer assists in human health research, participating in efforts from proposal writing to field study applications. Using her background in architectural design, she focuses on developing design guidelines and luminaires for circadian-effective lighting solutions to implement into practice. She also plays a role in outreach education efforts for spreading the word about light's impact on circadian rhythms, which includes the development of a website to contain educational materials for individuals inside and outside the lighting industry.

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Out of the womb: Lighting up the NICU

GUEST SPEAKER



Robert White, MD

Director since 1981
Regional Newborn Program at Beacon Children's Hospital

Dr. White has a primary interest in advancing structural and operational strategies to provide the optimal NICU environment of care for babies, families, and caregivers. He has written many papers and co-founded the Consensus Committee to Establish Recommended Standards for Newborn ICU Design, the Gravens Conference on the Physical and Developmental Environment of the Newborn, and the International Newborn Brain Conference.

EPISODE HIGHLIGHTS

Q How have NICUs changed over the years?

THEN

- ⊗ Big wards (10-15 babies)
- ⊗ Go to another ward to talk with parents
- ⊗ Limited 15-minute visitation
- ⊗ Brightly lit from overhead
- ⊗ No windows
- ⊗ Noisy / crowded

NOW

- ✓ Private room for mom and baby
- ✓ Immediate communication with parents
- ✓ Parents can be with baby 24/7
- ✓ Indirect lighting
- ✓ Access to daylight
- ✓ Minimal audio alarms; alerts go to nurses cell phones

Q Do babies have circadian rhythms?

Circadian rhythms develop in utero and are well established by birth due to receiving circadian signals from the mother. After birth, the baby must adjust to new, external cues including day/night cycles provided by lighting and maternal breast milk.

Q Why should you timestamp breastmilk?

After birth, a baby's circadian cues need to be received elsewhere to establish day/night patterns. Maternal hormones such as melatonin and cortisol as well as nutrients such as protein, fat, and minerals are excreted into breast milk with a circadian cycle, suggesting that mother's milk should be given according to the time of day or night it was expressed.

Q When is the development of the eye's connection to the circadian clock?

The connection to the circadian clock is developed in the third trimester. Sensitivity to light and dark is developed sooner than the visual capability that we associate with seeing faces and making out images.

Q Can exposure to bright light at a newborn's eyes be damaging?

No, using indirect light at modest levels during the daytime does not damage the retina or interfere with normal sleep cycles.

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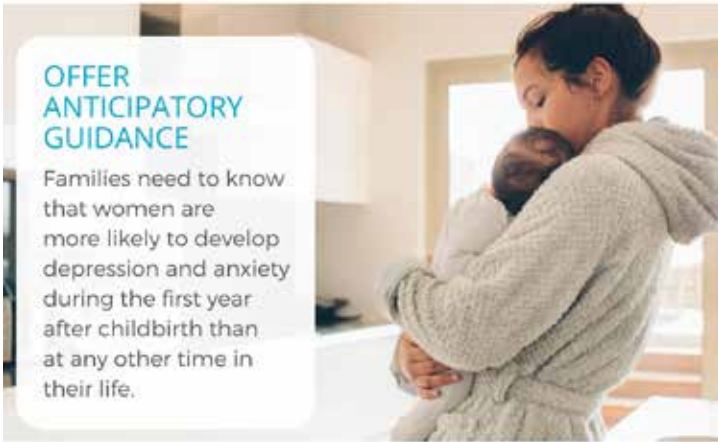
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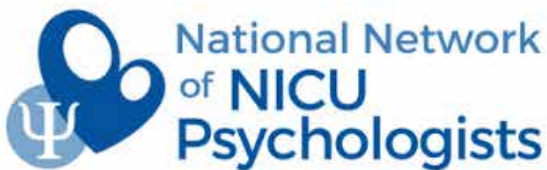


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"In the January issue of Neonatology Today, we discussed the realities surrounding family compliance with the American Academy of Pediatrics (AAP) infant safe sleep guidelines – that infants should be placed on their backs for sleep, by themselves, in a firm bed or crib with no loose bedding – and the importance of understanding what these day-to-day realities are. (1)"

In the January issue of Neonatology Today, we discussed the realities surrounding family compliance with the American Academy of Pediatrics (AAP) infant safe sleep guidelines – that infants



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

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should be placed on their backs for sleep, by themselves, in a firm bed or crib with no loose bedding – and the importance of understanding what these day-to-day realities are. (1)

A recent study by the Robert H. Lurie Children's Hospital of Chicago gives us another example of what happens in the home. A survey by the hospital's VOICES of Child Health in Chicago program, which examines issues affecting child health in Chicago, found that 58 percent of Chicago parents in the survey reported placing their infants in sleep situations known to be unsafe. The study surveyed 692 parents from all of the city's 77 neighborhoods. (2)

The unsafe conditions included putting the baby to sleep:

- in their parents' bed or that of someone else (37 percent);
- in a car seat or bouncy seat (6 percent);
- with a loose blanket (46 percent), a pillow (31 percent), a stuffed animal or toy (26 percent), a quilt or comforter (18 percent), a crib bumper (9 percent), or a wedge (3 percent).

"In addition, 17 percent placed their baby on their side or stomach (8 percent), which can increase the risk of suffocation. According to the CDC, the number of babies dying of accidental suffocation during their first year has been rising, now accounting for 28.3 percent of sleep-related infant deaths."

In addition, 17 percent placed their baby on their side or stomach (8 percent), which can increase the risk of suffocation. According to the CDC, the number of babies dying of accidental suffocation during their first year has been rising, now accounting for 28.3 percent of sleep-related infant deaths.

The VOICES survey also shows that infant sleep practices reflect cultural and socioeconomic differences.

- Latinx parents (67 percent) were most likely to use at least

one unsafe infant sleep practice, followed by Black parents (65 percent), Asian/Other-race parents (56 percent), and White parents (46 percent).

- This difference was also true for parents with a high school education or below (68 percent), with some college/technical school (58 percent), and a college degree or higher (50 percent).
- Moreover, parents with an annual household income less than the federal poverty level (FPL, set at \$26,500 for a family of four in 2021) were more likely to use unsafe infant sleep practices (72 percent), followed by those with middle income (100–399% FPL; 64 percent), and high income (400%+ FPL; 45 percent).

From our fieldwork and focus groups, we know that families may have unsafe infant safe sleep practices for reasons ranging from lack of information, lack of trust in “outside” advice, or lack of the physical materials needed to create the safest infant sleep environment.

So getting infant safe sleep information to families is critical, but just as critical is whom they are getting it from and how it is being shared. The VOICES survey reported that parents get advice from:

- Doctor or nurse (70 percent);
- Family (58 percent);
- Social media/blogs/websites (30 percent);
- Book or pamphlet (27 percent);
- Friends or neighbors (22 percent) or WIC programming (13 percent).

It is important to realize that it is not just the information – it is whether or not it is trusted. VOICES asked parents how much they trusted infant sleep information received from the sources they named. The highest level of trust lay with WIC programming (73 percent “very much”), followed by doctor or nurse (69 percent), family (50 percent), book or pamphlet (38 percent), friend or neighbor (24 percent), and social media/blogs/websites (17 percent).

“This study reinforces that there are opportunities for clinicians and nurses to reach families – including both parents as much as possible – to help them consider their infant safe sleep environment, find real-world solutions to help safeguard their baby, and link them to resources for ongoing support.”

This study reinforces that there are opportunities for clinicians and nurses to reach families – including both parents as much as possible – to help them consider their infant safe sleep environment, find real-world solutions to help safeguard their baby, and

link them to resources for ongoing support. Families want what is best for their babies, and by understanding where parents get their information and working with the health and social services agencies that families trust, health care providers can play a critical role that directly affects how parents understand and adopt infant safe sleep practices.

The high level of trust respondents placed in WIC and family also underscores the importance of community involvement in infant safe sleep messaging. We are expanding our outreach efforts by growing our Straight Talk for Infant Safe Sleep training program and piloting our Let’s Talk Safe Sleep and Breastfeeding Support Community Chats initiatives. These will have a monthly presence in community venues, bringing together new parents with nurses, doulas, lactation consultants, assistance programs such as WIC, and those experienced in the roles family members (dads, grandparents) play in infant care.

“We look forward to this chance to take what we have learned over the decades since we participated in the original National Institutes of Health Back to Sleep campaign, to reach parents on a partnership level – meeting them in the communities where they live and where they are comfortable – and helping them find the safest infant sleep solutions they can.”

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Disclosure: The author is the Director of Education and Bereavement Services for First Candle, a 501c (3) non-profit organization.

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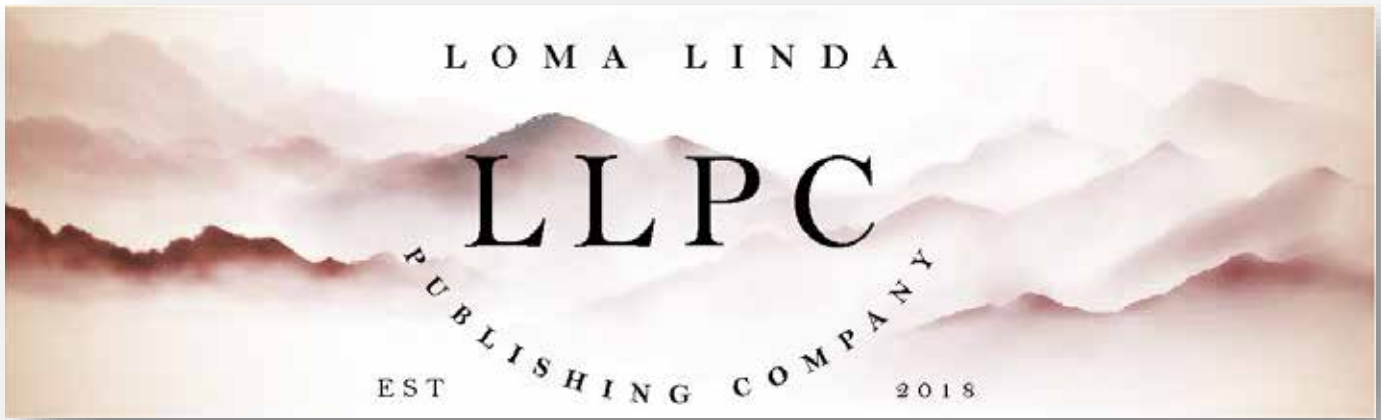
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COPING WITH COVID-19

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



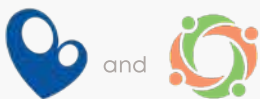
Provide culturally-informed and respectful care.

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



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

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National Perinatal Association
NICU Parent Network

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

TOP 10

RECOMMENDATIONS FOR THE PSYCHOSOCIAL SUPPORT OF NICU PARENTS



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

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

1 PROMOTE PARTICIPATION

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



2 LEAD IN DEVELOPMENTAL CARE

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



3 FACILITATE PEER SUPPORT

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



4 ADDRESS MENTAL HEALTH

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



5 SCREEN EARLY AND OFTEN

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



6 OFFER PALLIATIVE & BEREAVEMENT CARE

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

7 PLAN FOR THE TRANSITION HOME

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



8 FOLLOW UP

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

9 SUPPORT NICU CARE GIVERS

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



10 HELP US HEAL

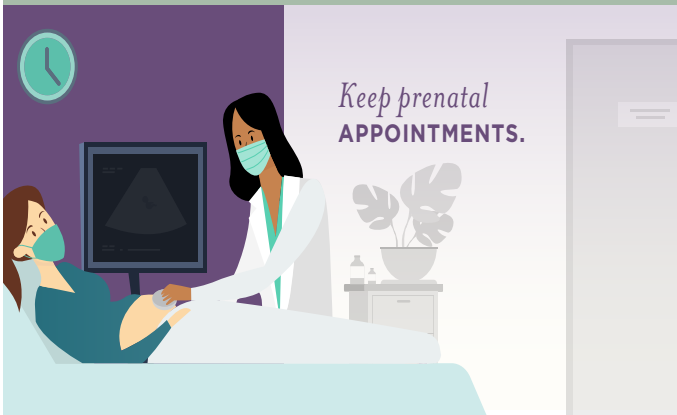
Welcome the pastoral care team into your NICU to serve families & staff.

SUPPORT4NICUPARENTS.ORG

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



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



NCJIH National Coalition for Infant Health
Protecting Access for Premature Infants through Age Two

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



nicuparentnetwork.org
nationalperinatal.org/skin-to-skin



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Once Upon A Premie Academy



+ Deidre McDaniel, MSW, LCSW
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+ Dawn Godbolt, Ph.D.
National Birth Equity Collaborative



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



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Raising Global Awareness of RSV

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

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

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



It Takes a Village. Where Are our Elders?

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.

“Throughout history, the contribution of elders to family and society has been both valued and invaluable. Both society and families have benefited from their leadership and governance, be it from cooler heads at the table, wisdom amassed over a lifetime of experience, or (sometimes unwanted!) advise on childrearing.”

Throughout history, the contribution of elders to family and society has been both valued and invaluable. Both society and families have benefited from their leadership and governance, be it from cooler heads at the table, wisdom amassed over a lifetime of experience, or (sometimes unwanted!) advise on childrearing. While marked cultural differences exist regarding the value of older members of society and their contribution, the thread is common in all cultures.

Until relatively recently, older workers have been valued and respected in the workplace. Changing demographics and employment entry requirements have resulted in a loss of appreciation for what these workers bring to the table. Were many required to re-apply for their positions today, they would not be granted an interview. (Myself included).

“Baby boomers” in the workforce, while highly skilled and adept at their jobs, are often not as formally educated as their younger colleagues. Conversely, while highly educated, younger employees lack hands-on, real-world experience. Since senior roles have

traditionally been filled by those with experience within an organization, newer, younger hires may see them as an impediment to their advancement while simultaneously considering them unqualified, at least on paper, and unable to “keep up with the times.”

Younger workers’ perceptions of older workers coincided with an all too singular focus on the bottom line. As a result, senior staff were often let go, either through early retirement incentives or restructuring that was de facto constructive dismissal, to be replaced by new hires at less pay. While this may have worked at the time, it is now a flawed strategy since growth in the labour market has outstripped the supply of workers. (1) The traditional balance sheet has no column to reflect the value (outcomes in the case of healthcare) lost during this transition. Indeed, in a profit-driven system such as the American one, poorer outcomes, while a source of consternation on “the floor,” are cause for celebration in the executive suites since they drive revenue. As long as all are playing the same game, outcome rankings remain static, even in manufacturing. For instance, a washing machine that lasted 20 years is now designed to last just over 10. Profits are up, but since reliability ratings are relative, they have not been impacted.

Healthcare is no exception to the ails facing the corporate world and may be facing more serious challenges. Staff shortages in the healthcare system predate the COVID-19 pandemic, and the pandemic has exacerbated the problem immensely. However, we cannot place the blame solely at the pandemic’s feet; the staffing crisis is multi-factorial.

“While staff burnout has and always will be an issue for healthcare workers, there has been a COVID-generated explosion in burnout. It has spurred an exodus from the field above and beyond those who have either succumbed to the disease or can no longer work. This crisis is the tip of the proverbial iceberg. (2)”

While staff burnout has and always will be an issue for healthcare workers, there has been a COVID-generated explosion in burnout. It has spurred an exodus from the field above and beyond

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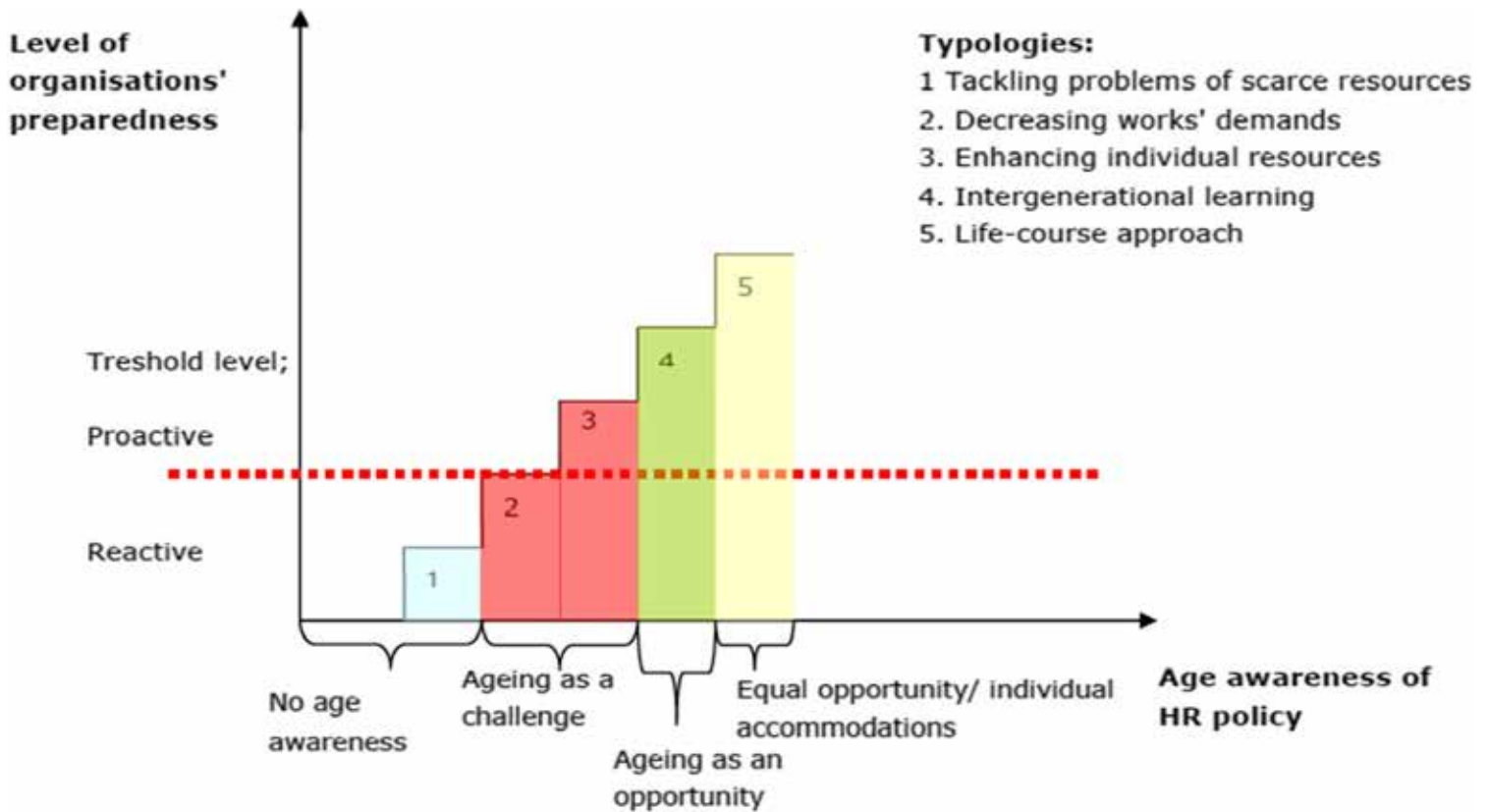


Figure 1 The typology of age management practices (10)

those who have either succumbed to the disease or can no longer work. This crisis is the tip of the proverbial iceberg. (2) The Canadian experience is reflected in the U.S. and globally. (3)

Since the 1970s, positions formerly open to high school and/or college graduates have increasingly required a university degree, and managerial positions now more often than not require a Master's. While nurses were once trained in-house at hospital-based nursing schools or community colleges, this is no longer the case. Allied health professionals are also products of a degree program more often than not. (In Canada, respiratory therapy largely remains a diploma program, although many of those entering these programs have at least partial prior degrees).

“While a degree is undeniably useful, the cost thereof may be a barrier to those wishing to enter the field of allied health. The demanding nature of healthcare work, shift and weekend work and a lack of advancement opportunities may lead those who can afford university to shun a career in healthcare. Those who do pursue a career in healthcare expect (rightfully so) a wage commensurate to their investment.”

While a degree is undeniably useful, the cost thereof may be a barrier to those wishing to enter the field of allied health. The demanding nature of healthcare work, shift and weekend work and a lack of advancement opportunities may lead those who can afford university to shun a career in healthcare. Those who do pursue a career in healthcare expect (rightfully so) a wage commensurate to their investment. Even with good wages and benefits, many leave the field after a short time when work-life balance becomes anything but balanced.

Everyone in this business knows that real learning begins on the job, especially in a field like neonatology; a few weeks rotation in a NICU in no way prepares one actually to work in one regardless of discipline. There is no substitute for an experienced clinical educator to guide new staff up the steep learning curve. The consensus amongst RTs in my workplace is that achieving a reasonable level of comfort and proficiency requires at least a full year on the job. That timeline is considerably longer if one is hired at less than full-time hours, an increasingly more common phenomenon. Call it the “summer vacation effect”: some of what is learned is forgotten between tours.

One cannot learn from errors unless they are recognised, errors that are more likely to occur without input from those who have put their time in. Unfortunately, it is not uncommon for clinical educators to have spent a relatively short time at the bedside, degree preparedness notwithstanding. Compounding matters is newer unit designs featuring single-patient rooms, which effectively have clinicians operating in isolation.

All these factors both lengthen the time required to ascend the learning curve and result in post-orientation hires assuming responsibility for their charges without the benefit of mentorship and with reduced oversight. The consequences are real. While senior

physicians' "quality of care" may not be better (4), the metrics used to measure their experience are unclear. (5) Poorer outcomes have been linked to weekend admission (when staffing levels are lower) and the number of senior attendings. (6,7)

Following a change in physical location and directorship, the unit where I practice has seen a marked increase in staffing turnover for nurses and respiratory therapists. While anecdotal, we have experienced a significant decline in outcomes across the gestational spectrum in the past year for the first time in my 33+ years of employment there. While correlation does not equal causation, this has followed a slight but steady decrease in the number of senior staff at all levels.

What is experienced? Someone once told a wise former manager of mine that they had ten years of experience. Her reply was, "Do you have ten years' experience or one year's experience ten times?" Without the continued guidance and mentorship of truly experienced clinicians, a new hire is more likely to experience the latter scenario.

Staff turnover is a fact of life. Dealing with attrition was once a simple matter of posting a job opening; however, this is no longer the case. Management must replace the "people leave" mindset with "why are people leaving and what can we do to get them to stay?"

Engagement is key and is closely tied to management and senior management. While seniority is arguably good for the patient, it is the worst metric for assessing managerial performance, (8) yet longevity is often the most common management trait, particularly at the senior level. "Suck it up buttercup" is all too often their response to grievances from younger staff since it typically reflects their own experience. This is not helpful. Many in hospital management have little former management training and may lack personality traits amenable to the task, which compounds the problem.

"Engagement is key and is closely tied to management and senior management. While seniority is arguably good for the patient, it is the worst metric for assessing managerial performance, (8) yet longevity is often the most common management trait, particularly at the senior level."

Poor engagement is highly linked to employee retention. Employees who do not feel engaged are five times more likely to leave than those who are, and management plays a key role in that engagement. (9)

Stamina, resilience, and overall energy levels naturally decrease as we age. The virtually universal adoption of 12-hour shifts and the all too common day-day-night-night schedule often do not fit the needs of older staff. Unfortunately, accommodations in scheduling and workload are often non-existent in hospitals or are offered long after burnout has set in. Failure to recognise the needs of

older workers leads to earlier retirement or reduced hours that further increase staffing shortages. The European Union is far ahead of North America (particularly the U.S.) regarding work-life balance, but the problem exists there too. (10) Hospitals must be proactive, not reactive.

Scheduling improvements can be good for older staff and can also benefit the organization by reducing overtime and absenteeism. (11)

There are many ways to increase employee engagement. Autonomy, recognition, performance incentives, and scheduling flexibility are a few. While union contracts may limit (or forbid) pay for performance, there are other ways to reward staff. For older staff, value recognition is high on the list. (12) (Although irrelevant to older staff, the most egregious shortcoming of hospitals is the availability of childcare).

Retaining older staff as long as possible benefits the entire organization. Staff shortages increase workload, decrease employee satisfaction and lead to burnout. This results in older staff leaving and younger staff becoming disengaged and leaving. This creates a vicious circle that threatens to collapse the system.

Costs associated with attrition are not trivial, but accounting systems that separate orientation budgets from staffing budgets obfuscate those costs. Systemic changes aimed at benefiting older staff can be universally beneficial. If newer hires see senior staff treated well, they may be more inclined to stay and experience higher job satisfaction. Win-win-win.

"Costs associated with attrition are not trivial, but accounting systems that separate orientation budgets from staffing budgets obfuscate those costs. Systemic changes aimed at benefiting older staff can be universally beneficial."

"To further engage employees and win their commitment through your performance management programs, consider how to treat your organization's most experienced employees. In many cases, these employees understand the intricacies of a job better than their supervisors or managers do. By virtue of long identification with your organization, they may be deeply committed to high-level goals. They use their expertise to contribute in ways that newer employees simply cannot match. But many of them also may be planning to retire soon, especially if they are from the "Baby Boomer" generation. How will you transfer their knowledge to younger workers? Design a performance management system that recognizes and rewards proactive sharing of knowledge and expertise among co-workers." (12)

In crisis, there is opportunity. One opportunity is in praise of older workers.

(Full disclosure: I have just celebrated my 65th birthday (as much as COVID would allow, i.e., not!) and am in my 34th year of a wonderful career in the NICU).

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

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 National Perinatal Association
PERINATAL SUBSTANCE USE

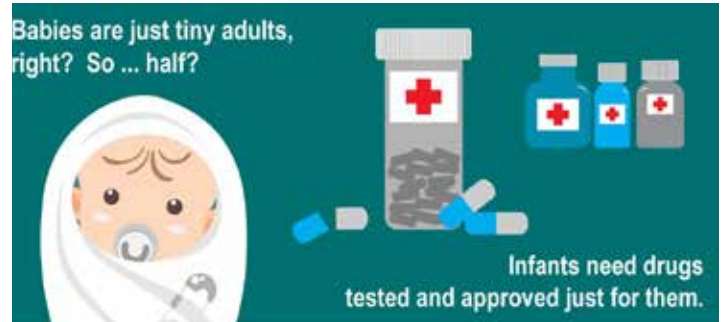
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1 week _____	\$30
1 month_____	\$120
1 semester_____	\$540
1 year_____	\$1,080
Middle School_____	\$3,240

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The Role of Parent Advocates in the NICU Community: Mike Hynan, Ph.D. and Kristy Love were honored at the 2022 Gravens Conference

Erika Goyer, BA

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.



Stan and Mavis Graven Award recipients, Kristy Love (2021) and Mike Hynan, PhD (2022)

Each year the faculty of the Gravens Conference honors a member of our neonatal community for their contributions to the field. This year they gave two awards – one for 2021 because of the difficulty convening a conference during the pandemic, and one for 2022, as we came back together in Clearwater, Florida.

The recipients of the Stan and Mavis Graven Award for Leadership in Enhancing Physical and Developmental Environments for High-Risk Infants and their Families were Kristy Love and Michael Hynan, Ph.D. Both of whom are NICU parents and have long histories of leadership and advocacy with the National Perinatal Association.

Parents as Leaders

Love and Hynan spoke of the transformational experience of having a baby in the NICU and how those experiences propelled them to advocate for change. Each has a long list of accomplishments.

After her NICU experiences, Kristy Love became a parent advocate within her unit. What was at first a volunteer role evolved into a paid position as it became apparent what her contributions meant for the well-being of both the families and staff? She went on to become more involved in the community-at-large - joining quality

improvement initiatives, developing programs that could be implemented in other units, helping to found the NICU Parent Network (a collaborative of NICU support organizations led by NICU parent professionals www.nicuparentnetwork.org), and ultimately becoming the Executive Director of the National Perinatal Association www.nationalperinatal.org. Love's family-centered focus was informed by the work of Stan Graven, who founded NPA. When she joined NPA, she found a community that shared her passion. At NPA, she met and was mentored by other parent leaders like Becky Hatfield, who founded the first NICU parent support program while at the University of Utah, and Mike Hynan, whose writing and research serves as the foundation on which the movement for mental health services for NICU families and staff has been built.

In his acceptance speech, Mike Hynan further explained the connection between Stan and Mavis Graven, NICU family advocacy, and the development of parent leaders. After his NICU stay and with the

“Each year the faculty of the Gravens Conference honors a member of our neonatal community for their contributions to the field. This year they gave two awards – one for 2021 because of the difficulty convening a conference during the pandemic, and one for 2022, as we came back together in Clearwater, Florida.”



Principles of Family-Centered Care

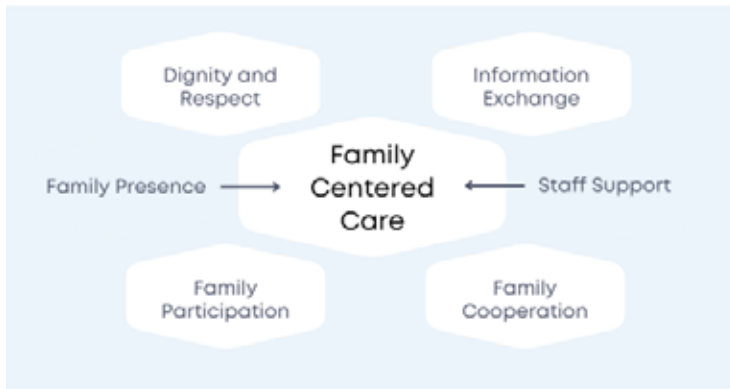


Figure 1

encouragement of his son's neonatologist, Mike got involved with the Wisconsin Association for Perinatal Care (WAPC), another organization founded by Stan Graven. The trajectory of Hyman's professional career as a clinical psychologist and professor at the University of Wisconsin – Milwaukee was set when he met people like Sheri Nance, the president of Parent Care, who spoke powerfully about how the focus of neonatology must change from "getting the baby home in the best possible shape" to "getting the family home in the best possible shape." Dr. Hyman's work demonstrates that shift in focus, whether it is the publication on NPA's Interdisciplinary Recommendations for the Psychosocial Support of NICU Parents www.nature.com/collections/vrqhjdywxv or the creation of the National Network of NICU Psychologist (NNNP), a professional organization that advocates for the role of mental health professionals in the NICU www.nationalperinatal.org/psychologists.

Parents as Partners in Advocacy

We know that babies and families have better outcomes when parents are integral to their babies' caregiving team. Similarly, we propose that our community benefits when we support and embrace parents as leaders.

The principles of family-centered care (figure 1.) - dignity and respect, information exchange, family participation, and cooperation – apply whether we are talking about caregiving or advocacy. While parents are in the NICU, they develop the skills and tools they need to advocate for their babies, for themselves, and for

Components of Family-Centered Advocacy



Figure 2

their communities. As members of the neonatal community, they are powerful agents of positive change.

We believe the essential components of **family-centered advocacy** are (figure 2):

- **Information sharing** – NICU care improves when we offer observations, share insights, and learn together.
- **Family-informed policymaking** – When policies need to be developed or changed, parent input can lead to fair, thoughtful guidance and promotes the best interests of families and staff.
- **Inclusive and equitable representation** – Our NICU leadership should look like the families we serve. We need the contributions of all parents and providers, especially those that may have been marginalized.
- **Advisory councils** – Patients and families should be represented wherever decisions are being made.
- **Quality improvement initiatives** - Safety initiatives and quality improvement efforts must account for the factors that families have become experts in during their NICU stay and after they have gone home.
- **Participant-led research** – We apply the principle of “nothing about us without us.” Rather than being the subject of studies, families need a say in how research is designed and carried out. The goal should always be to seek parent and patient input, share the research findings with families, and use the results to improve the care parents and babies receive.

The Gravens conference in March and the National Perinatal Association's conference in May are meetings where parents and providers come together and develop innovative programs and initiatives.

Kristy said, “I attended my first Gravens Conference fifteen years ago as a family advocate upon receiving her award. A nurse in my NICU attended the year before and won a free conference registration. However, due to a family conflict, she was unable to attend. So she passed the free registration on to me. I have only missed three over the last fifteen years. This is truly an honor. I explained this award to my family like this, in the perinatal community, this award is like receiving a Grammy.” She continued, “Please advocate for your family advocates to come to all Interdisciplinary conferences. Their voices need to be heard.”

We invite you to hear the parent voice and the voices of other members of our interdisciplinary community at the National Perinatal Association's 2022 conference, “Perinatology at the Intersection of Health Equity and Social Justice.” We will meet in person in Aurora, Colorado, and virtually online. www.npaconference.org There are special conference rates for parent participants. Parent researchers and scholars are encouraged to present.

Important Publications:

- Interdisciplinary Guidelines and Recommendations for NICU Discharge Preparation and Transition Planning. DOI: <https://doi.org/10.1038/s41372-022-01313-9>
- Covid-19 and the Need for Perinatal Mental Health Professionals: Now More Than Ever Before. DOI <https://doi.org/10.1038/s41372-020-0696-z>
- The Neonatal Intensive Parenting Unit: An Introduction. DOI: <https://doi.org/10.1038/jp.2017.108>
- The Transformation of the Neonatal Intensive Care Unit:

A Father's Perspective over 36Years. DOI: <http://dx.doi.org/10.1053/j.nainr.2016.09.021>

- Interdisciplinary Recommendations for the Psychosocial Support of NICU Parents. DOI: <https://doi.org/10.1038/jp.2015.141>

Organizations You Should Know:

- National Perinatal Association (NPA) www.nationalperinatal.org
- National Network of NICU Psychologists (NNNP) www.nationalperinatal.org/psychologists
- NICU Parent Network (NPN) nicuparentnetwork.org
- Wisconsin Association for Perinatal Care (WAPC) perinatal-web.org/page/history

Events:

- National Perinatal Association's 42nd annual interdisciplinary conference, "Perinatology at the Intersection of Health Equity and Social Justice" May 2-4, 2022 in Aurora, Colorado www.npaconference.org
- Save the date for the Gravens conference on the environment of care for high-risk newborns, "The Future is NOW for Babies, Families and Systems" March 8-11, 2023, in Clearwater, Florida

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.

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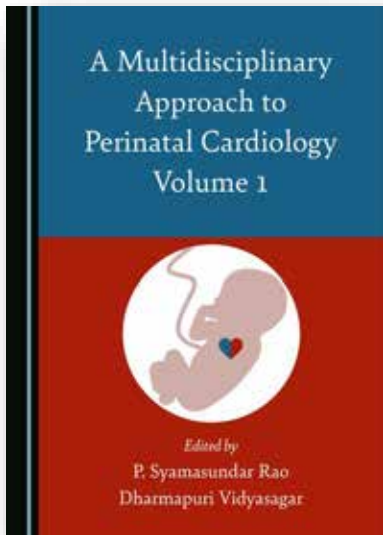


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A Multidisciplinary Approach to Perinatal Cardiology Volume 1

Edited by P. Syamasundar Rao and Dharmapuri Vidyasagar



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Book Description

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

About the Editors

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

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

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



Online L&D Staff Education Program

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

WWW.MYPERINATALNETWORK.ORG



Continuing education credits provided by



About the Program

- **WHO SHOULD TAKE THE PROGRAM?** This program is designed for both office and hospital staff in all disciplines that interact with pregnant patients and their families. A key focus is recognizing risk factors for perinatal mood and anxiety disorders, and mitigating their impact through provision of trauma-informed care.
- **WHY TAKE THE PROGRAM?** Families will benefit when staff have improved skills, through enhanced parental resilience and better mental health, and improved parent-baby bonding leading to better developmental outcomes for babies. Benefits to staff include improved skills in communicating with patients; improved teamwork, engagement and staff morale; reduced burnout, and reduced staff turnover.
- **HOW DOES THE PROGRAM ACHIEVE ITS GOALS?** Program content is representative of best practices, engaging and story-driven, resource-rich, and developed by a unique interprofessional collaboration of obstetric and neonatal professionals and patients. The program presents practical tips and an abundance of clinical information that together provide solutions to the emotional needs of expectant and new parents.
- **HOW WAS THE PROGRAM DEVELOPED?** This program was developed through collaboration among three organizations: a multidisciplinary group of professionals from the National Perinatal Association and Patient + Family Care, and parents from the NICU Parent Network. The six courses represent the different stages of pregnancy (antepartum, intrapartum, postpartum), as well as perinatal mood and anxiety disorders, communication techniques, and staff support.

Program Objectives

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

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

PROGRAM CONTENT



COMMUNICATION SKILLS CEUs offered: 1

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

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



PERINATAL MOOD AND ANXIETY DISORDERS CEUs offered: 1

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

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



PROVIDING ANTEPARTUM SUPPORT CEUs offered: 1

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

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



PROVIDING POSTPARTUM SUPPORT CEUs offered: 1

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

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



SUPPORTING STAFF AS THEY SUPPORT FAMILIES CEUs offered: 1

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

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

Cost

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

Contact help@myperinatalnetwork.org to learn more.

Faculty

Linda Baker, PsyD

Psychologist at Unstuck Therapy, LLC, Denver, CO.

Jerasimos (Jerry) Ballas, MD, MPH

Associate Clinical Professor, UCSD Health System, Maternal-Fetal Medicine, Department of Obstetrics, Gynecology and Reproductive Sciences, University of California at San Diego, San Diego, CA.

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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 Contributors:**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 Provisership 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



SHARED DECISION-MAKING PROTECTS MOTHERS + INFANTS

DURING COVID-19

KEEPING MOTHERS + INFANTS TOGETHER

Means balancing
the risks of...

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



EVIDENCE

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

PARTNERSHIP

What is the best
for this unique dyad?

SHARED DECISION-MAKING

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



TRAUMA-INFORMED

Both parents and providers
are confronting significant...

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

LONGITUDINAL DATA

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

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



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

Partnering for patient-centered care
when it matters most.

nann.org nationalperinatal.org



National
Association of
Neonatal
Nurses



Coping with COVID-19



A viral pandemic

A racial pandemic within a viral pandemic



Will mental illness be the next inevitable pandemic?

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COVID-19

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- Bonding with Your Baby
- Caregivers Need Care Too



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Caring for Babies and their Families: Providing Psychosocial Support to NICU Parents

7- Module Online Course in NICU Staff Education



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Congressional Momentum Builds for Telehealth Expansion

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.



Legislation to expand access to telehealth services is likely to pass Congress this year, but what exactly will it entail?

“Policymakers agree they need to extend the waivers that made the rapid expansion of telehealth during the pandemic possible. They remain divided, however, about the duration of those waivers.”

Policymakers agree they need to extend the waivers that made the rapid expansion of telehealth during the pandemic possible. They remain divided, however, about the duration of those waivers.

[The Telehealth Extension and Evaluation Act](#), for example, calls for only a two-year extension of all waivers. (1) This waiver would allow time for a study of telehealth service delivery that gives policymakers more information before making telehealth permanent. If this is the chosen path, maternal health advocates hope poli-

cymakers take a closer look at [expanding the scope](#) of permitted and reimbursed telehealth services. (2) Doula support, prenatal risk assessment, postpartum depression screening, and childbirth education are critical services that could be provided remotely but are not uniformly covered under current rules.

In contrast, the [Telehealth Extension Act](#) would permanently remove certain site-based and geographic restrictions that limit where patients can receive services. (3) The bill’s sponsors say there is already broad support to eliminate them. Research has found that the loosening of these restrictions during the pandemic has improved access to care and attendance at prenatal appointments, especially for an expectant mom who lives in rural communities or who needs frequent yet routine monitoring.

“Research has found that the loosening of these restrictions during the pandemic has improved access to care and attendance at prenatal appointments, especially for an expectant mom who lives in rural communities or who needs frequent yet routine monitoring.”

A Patient-Centered Approach

The bills include some other differences, but regardless of which one ends up moving forward, policymakers need to approach the issue from a patient-centered perspective. Telehealth is a valuable complement to in-person care, not a substitute for it. With this goal in mind, the ideal telehealth policy would:

- Create payment parity, so providers get paid the same whether they see patients in-person or via telehealth
- Ensure policies do not limit the ability to get in-person care
- Allow providers to see patients across state lines, which reduces patients’ travel burden
- Ensure “low-tech” audio-only visits are allowable and paid at the same rate as an appointment with an audio and video connection
- Support the infrastructure necessary to get more Americans access to the broadband internet that allows “high-tech” telehealth visits.

Expanding Access to Broadband

This last issue – addressing access to high-speed internet – has long been a problem, but the pandemic laid bare how America’s digital divide affects access to equitable health care.

[Nearly a quarter](#) of Americans still do not have high-speed internet at home, though there are movements afoot for insurers [to pay for broadband access](#). (4,5) In addition, certain state Medicaid programs are promoting the Affordable Connectivity Program to

those they serve. It provides \$30 internet subsidies for the poorest households, plus a \$100 one-time credit for a connected device.

While the Biden administration is pushing for expanded broadband connections, it is also pledged to [take a closer look](#) at the effectiveness of telehealth in serving all Americans. (6) The White House Office of Science and Technology Policy launched a series of roundtable discussions examining which pandemic-driven telehealth innovations are worth keeping and which might reinforce existing disparities in healthcare access.

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There are still many questions about the long-term role of telehealth. However, momentum for expanded telehealth services is building. If done correctly, policy changes should bode well for Americans' maternal health and postpartum care.

References:

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6. https://www.statnews.com/2022/02/03/biden-administration-telehealth-digital-health/?utm_source=STAT+Newsletters&utm_campaign=a82a238428-Daily_Recap&utm_medium=email&utm_term=0_8cab1d7961-a82a238428-150417001

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

NT

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SHARED DECISION-MAKING
PROTECTS PARENTS + BABIES COVID-19

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

CARE DELIVERY REQUIRES
PARTNERSHIP

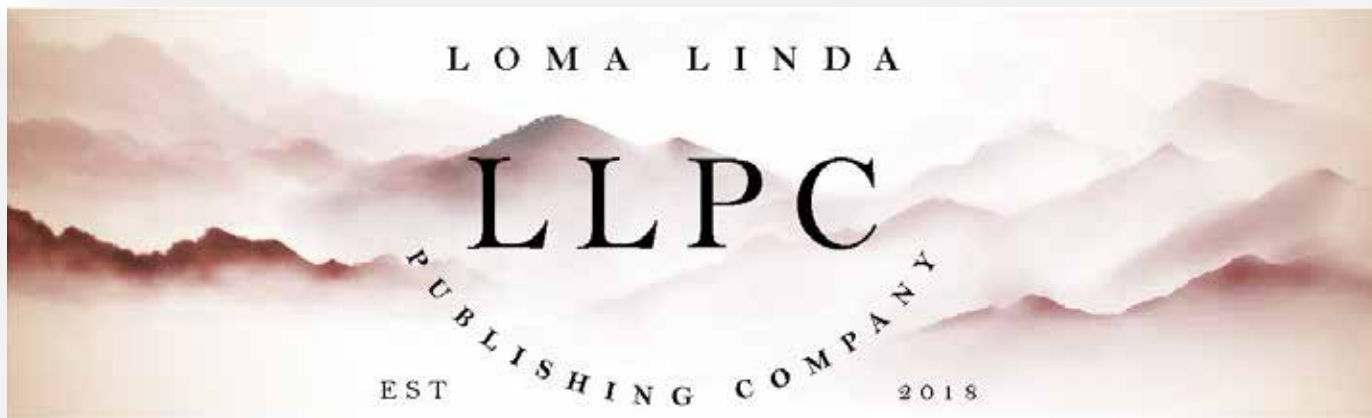
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Keeping Your Baby Safe

during the COVID-19 pandemic

How to protect your little one from germs and viruses

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

Here's what you can do...

Wash Your Hands

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



Limit Contact with Others

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



Provide Protective Immunity

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



Take Care of Yourself

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



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



WARNING

Never Put a Mask on Your Baby

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



If you are positive for COVID-19

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



We can help protect each other.

[Learn more](#)

www.nationalperinatal.org/COVID-19



The Gap Baby: An RSV Story



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



The National Coalition for Infant Health advocates for:

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

www.infanthealth.org

I CAN Digitally Involved (I CANDI): A Renewed Emphasis on Supporting the Pediatric Voice

Amy Ohmer



“February often brings forth the excitement of planning for many various annual projects. At the International Children’s Advisory Network, through the expertise of our youth members, we are delighted to be a support to many organizations around the world.”

Spring has sprung around the pediatric medical community, and with that comes a renewed emphasis on supporting the pediatric voice. At the International Children’s Advisory Network, Inc. (iCAN), through the expertise of our youth members, we are delighted to be a support to many organizations around the world with a focus on pediatric medicine, clinical research, medicine development and medical device innovation.

iCAN is focusing on a new Parent and Family Council. Starting this spring, iCAN will be including a group of parents and guardians to help with advising for the littlest patients (0-7 years old). All parents are welcome to join in to share their voices and provide insight into topics. Joining is free and can be done through either visiting www.icanresearch.org (1) or sending an email to info@icanresearch.org. To learn more, check out this page at <https://www.icanresearch.org/parents-families>. (2) Do not forget the newly launched [iCAN Young Adult Professionals group](#). (3) This special group is for our older, graduated members ages 18-25 years old. At iCAN, we understand the power of sharing experiences to help support a better community.

New iCAN Videos Alert:

- Watch the [first iCAN video of young people sharing their experiences within clinical research](#). Please click on this link at

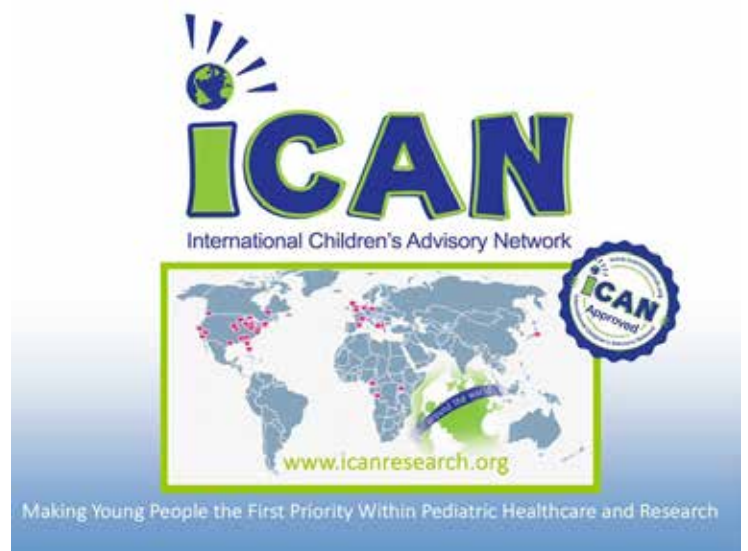
<https://youtu.be/zDUTUiOhBs4>. (4)

- Check out our [Communication Activities video](#) with the partnership by Pepperdine University at this link <https://youtu.be/U04RexXqOXE>. (5)
- Additionally, iCAN collaborated with the eYPAGNet and iCAN Chapters to create the [Top 10 Important Points to Engage Young People in Drug Development Activities](#). To view the video and share it with colleagues and other stakeholders, visit the link at <https://youtu.be/DOGnDMA-2rc>. (6)

At iCAN, we want to help you with learnings from our youth members. To do this, we have a special monthly event called “iCAN Ask the Experts” (ATE). This event focuses on youth member small group discussion on relevant topics within pediatric healthcare and research. After each session, iCAN provides a written summary of topics and a video recording of the session to ensure that information is shared to help improve the patient experience. To participate in our ATE sessions, please email us info@icanresearch.org.

iCAN is working with the Duke Clinical Research Institute (DCRI) to support a new anthology created by iCAN Youth Members to share their creative work of participating within clinical research trials. Using the prompt: “If you could go back in time to tell yourself what you know now about research, what would you say?” iCAN Youth Members will be submitting ideas using short stories, poems, illustrations, electronic art, and original photographs to be included in a book to be shared at the 2022 iCAN Summit. Everyone is welcome to participate, and the deadline is May 1st for all submitted materials. To see all of the [projects and opportunities](#) available for kids to participate in, visit this link at <https://www.icanresearch.org/open-projects>. (7)

The ‘I CAN’ Book is now available for purchase at www.icanresearch.org for \$25.00 using our special PayPal link on the home page under donations. After payment, please contact us at info@



2022 SUMMIT



SAVE THE DATE

July 13th through July 17th, 2022

To be held in-person at the University of Lyon, France
Hosted by iCAN KIDS France

Registration Opens May 15th, 2022



Sign up for for updates at
www.iCANResearch.org



2022 iCAN Summit

International Children's Advisory Network

Presented by  **jumohealth**

**July 11-15th to be held at the
University of Lyon, France**

Register Today!

www.iCANResearch.org



iCAN is not responsible or liable for any and all travel arrangements (including but not limited to flights, trains, cars, transport of any kind, accommodations, meals, reservations or other rental / vacation services acquired) by/for participants for any reason. iCAN is not responsible for any attendee medical needs. iCAN advises attendees to purchase travel insurance for the iCAN Summit.

**Join Us In-Person for 2022
Kids - Make Your Summer Count!**

- Travel to France
- Share your expert voice
- Shape the future of clinical research
- Support new pediatric innovation
- Engage with global leaders
- Make friends around the world
- Learn about careers in healthcare

icanresearch.org with your name and mailing address to receive your copy - this beautiful hard-bound book was created by iCAN Youth Members from around the world and filled with positive statements about overcoming challenges to be the best you can be. This beautiful book is fully illustrated by our KIDS Bari chapter; this beautiful book is a treasure you and your family will treasure for years to come.

SAVE THE DATE:


- iCAN's unique youth series, 'Ask the Experts', has a new session on Leadership planned for **February 19th, 2022, at 10:00 a.m. EST**. To join this fun and free event, please register at www.icanresearch.org/events. All are welcome to attend, and kids of all ages are invited to join. Additional sessions are open for registration, and we welcome all doctors, researchers, and community leaders to join us. (8)
- Calling ALL KIDS - Submit your materials to participate in the **DCRI Anthology** by May 1st, 2022, through sending a .jpeg of your art, short stories, other creative pieces to info@icanresearch.org.
- The **iCAN Summit Poster Session** submissions deadline

is June 1st, 2022. If you have research to be shared and would like to showcase your work at the 2022 iCAN Summit presented by Jumo Health from July 11th - July 15th, 2022, please send your submissions for the poster session to info@icanresearch.org no later than 6/1/2022.

- **Join iCAN on June 4th, 2022, at the New Britain Bees Baseball Game** through registering at www.icanresearch.org/events. (8) This is a fundraiser event, and you do not need to be there to participate. Donate by purchasing tickets, and iCAN will give the tickets to a local child that may not have been able to attend a game. For every \$8.00 ticket, iCAN earns \$5.00 per donation. All are welcome, and we hope to make this a very successful event. Thank you to Dr. Sharon Smith for helping us to support this effort. If you would like to donate or support iCAN, please contact Amy Ohmer at amyohmer@icanresearch.org.


The International Children's Advisory Network
and the New Britain Bees Invite You To:

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VISIT: <https://nb1.gltickets.com/nbticket/web/login/group1.php>
PASSWORD: ICAN

QUESTIONS? INTERESTED IN DONATING?
Email: info@iCANresearch.org
Website: www.iCANresearch.org

- iCAN will be hosting the **iCAN Summit from June 11th - June 15th, 2022**, in Lyon, France. To learn more about joining, please watch our [2022 Summit video](#) to understand what iCAN is all about. (9) **Registration opens on March 15th, 2022, at www.icanresearch.org**. (10) This year, the summit will emphasize rare diseases, with experts joining worldwide. Kids will be able to participate in focus group one-on-one discussions, share insight into their medical conditions and, as a week-long project, work on the development of Serious Games, an interactive approach to supporting pediatric patients. We hope to see our community as this summit marks the first travel experience for our pediatric medical community in over two years. Questions? Donations or sponsorship support is still needed! Email us at info@icanresearch.org, and we can help meet your learning needs.

[Get ready for the iCAN 2022 Summit Lyon, France!](#) (9)

- **Join iCAN and the American Academy of Pediatrics National Conference and Exhibition from October 7th - 11th, 2022**, at the Anaheim Convention Center, Anaheim, California. We cannot wait to see you at booth #2034! Look for the iCAN colors and stop by and say hello!

References:

1. <http://www.icanresearch.org/>
2. <https://www.icanresearch.org/parents-families>
3. <https://www.icanresearch.org/ican-young-adult-professionals>
4. <https://youtu.be/zDUTUiOhBs4>
5. <https://youtu.be/U04RexXqOXE>
6. <https://youtu.be/DOGnDMA-2rc>

CALLING ALL WRITERS:

If you could go back in time and tell yourself what you know now about research, what would you say?

Submit ideas to:
Amy Ohmer
amyohmer@icanresearch.org

Submit any of the following to be considered for inclusion in an iCAN/Pediatric Trials Network (PTN) published book:

- Personal essays (Maximum length: 10,000 words)
- No minimum length
- Short stories
- Poems
- Illustrations
- Electronic art
- Photographs

More details to come later!




2022

Ask the Experts
With Anthony Chang, MD

International Children's Advisory Network
www.icanresearch.org

ICAN

Hosted by:
Dr. Anthony Chang, MD

2022 Sessions Presented by iCAN and Dr. Anthony Chang:

January 15:	Kids and Covid-19
February 19:	Leadership
March 19:	Insight Into Pediatric Heart Disease
April 16::	Innovation in Pediatrics
May 21:	Advisors vs. Advocates
June 18:	What does it mean to be Rare?
July 11:	2022 iCAN Summit Week
August 20:	What Can Kids do to Help?
September 17:	Insight into Pediatric Cancer
October 15:	Specialty Careers in Medicine
November 19:	Patient Rights
December 17:	Hot Topics in Pediatrics

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7. <https://www.icanresearch.org/open-projects>
8. <http://www.icanresearch.org/events>
9. <https://youtu.be/EFzxxk0zTw3Y>
10. <http://www.icanresearch.org/>

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

NT

Readers can also follow
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Phone: (+1)734-545-2831
Email: amyohmer@icanresearch.org



Welcome to iCAN! We are so glad you are here!

Supporting the International Children's Advisory Network, Inc. (iCAN) is a unique opportunity to witness the future of international pediatric research unfold. iCAN chapters work locally in partnerships with their local children's hospitals and communities, and collaborate globally to ensure youth members age 8-18 are able to share their voice within science, medicine, research, technology, and innovation.

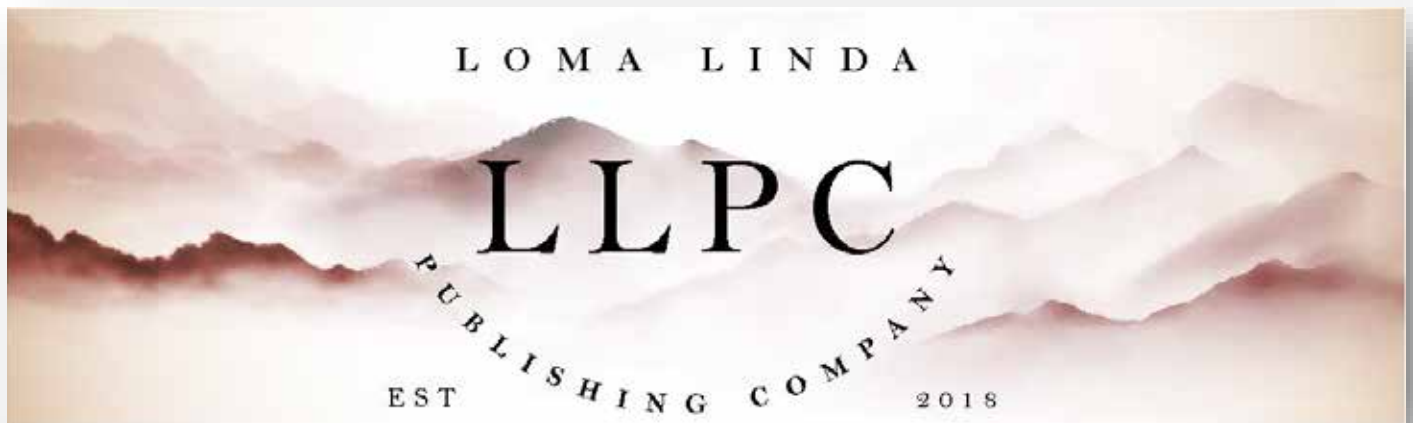
Together, iCAN makes it possible for kids (and community partners) to:



- **Connect** with similar youth advisory groups around the world
- **Share** ideas, best practices, challenges and cultures
- **Learn** from one another and capitalize on expertise
- **Collaborate** among stakeholders in research, innovation, advocacy, children and families
- **Advocate** for the health and well-being of children around the world



If you have any questions about iCAN; how to support as a sponsor, or to become involved, or to learn about our exciting projects, please visit our website at www.icanresearch.org or email info@icanresearch.org.



Respiratory Syncytial Virus is a

Really Serious Virus

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

Coughing that gets worse and worse



Breathing that causes their ribcage to "cave-in"

Rapid breathing and wheezing



Bluish skin, lips, or fingertips

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

Call your doctor and meet them at the hospital.

If your baby isn't breathing call 911.



Thick yellow, green, or grey mucus



that clogs their nose and lungs, making it hard to breathe

Fever that is higher than 101° Fahrenheit



which is especially dangerous for babies younger than 3 months

 National Perinatal Association

www.nationalperinatal.org/rsv

PROTECT YOUR FAMILY FROM RESPIRATORY VIRUSES

flu

coronavirus

pertussis

RSV



SOAP

WASH YOUR HANDS often with soap and warm water.

GET VACCINATED

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



COVER COUGHS AND SNEEZES.

Sneeze and cough into your elbow.

USE AN ALCOHOL-BASED HAND SANITIZER.



STAY AWAY FROM SICK PEOPLE

Avoid crowds. Protect vulnerable babies and children.

www.nationalperinatal.org

 National Perinatal Association

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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:

www.AcademyofNeonatalCare.org

SHARED DECISION-MAKING PROTECTS MOTHERS + INFANTS

DURING COVID-19

KEEPING MOTHERS + INFANTS TOGETHER

Means balancing the risks of...

- HORIZONTAL INFECTION
- SEPARATION AND TRAUMA



EVIDENCE

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



PARTNERSHIP

What is the best for this unique dyad?

SHARED DECISION-MAKING

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



TRAUMA-INFORMED

Both parents and providers are confronting significant...

- FEAR
- GRIEF
- UNCERTAINTY



LONGITUDINAL DATA

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

- MENTAL HEALTH
- POSTPARTUM CARE DELIVERY



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

Partnering for patient-centered care when it matters most.

nann.org nationalperinatal.org



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



Take precautions & LIMIT INTERACTIONS.

6 FT



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 >

NCFIH National Coalition for Infant Health
Protecting, Nurturing and Promoting Infants Through Age Two

NT

newly validated

Caring for Babies and their Families: Providing Psychosocial Support to NICU Parents

7- Module Online Course in NICU Staff Education



National Perinatal Association and NICU Parent Network

mynicunetwork.org

PROTECT YOUR FAMILY FROM RESPIRATORY VIRUSES

flu coronavirus

pertussis RSV



WASH YOUR HANDS
often with soap and warm water.

SOAP

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.



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HELPING CHILDREN AND FAMILIES COPE

CAREGIVERS NEED CARE TOO



National Network of NICU Psychologists

nationalperinatal.org/psychologists

Respiratory Syncytial Virus:

How you can advocate for babies this RSV season

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



Identify babies at greatest risk



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

Teach families how to protect



their babies from respiratory infections

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



Use your best clinical judgement



when prescribing RSV prophylaxis

Tell insurers what families need



and provide the supporting evidence



*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:

80% They treat RSV as a priority, "often" or "always" evaluating their patients

77% RSV is the "most serious and dangerous" illness for children under four

77% Barriers to access and denials from insurance companies limit patients' ability to get preventive RSV treatment



But Parents are Unprepared.

18% Only 18% know "a lot" about RSV

22% Only 22% consider themselves "very well" prepared to prevent RSV



RSV EDUCATION & AWARENESS CAN HELP

After parents learned more about RSV, they were:

- 65% "More concerned" about their child contracting the disease
- 67% Likely to ask their doctor about RSV



NCJIH National Coalition for Infant Health
Preventing RSV in Preterm Infants through Age Five

Learn More about RSV at www.infanthealth.org/rsv

PREEMIE BOOK ON SALE

ONCE UPON A PREEMIE

BY JENNÉ JOHNS
AUTHOR | SPEAKER | ADVOCATE



OU
AP

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

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@ONCEAPREEMIE

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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

Premie Family



heart&soul

TARAJI P. HENSON
A GLIMPSE INTO TARAJI P. HENSON'S HEART & SOUL

HOLIDAY PARTIES MADE SIMPLE
THE ONCE UPON A PREEMIE STORY



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wgts 91.9
Washington, D.C.

MAJIC
102.3 92.7
The Real Sound of the DMV

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Still a Premie?

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?

STILL A PREMIE

Just like preemies born much earlier, these "late preterm" infants can face:



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



Born preterm at a "normal" weight?

STILL A PREMIE

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.

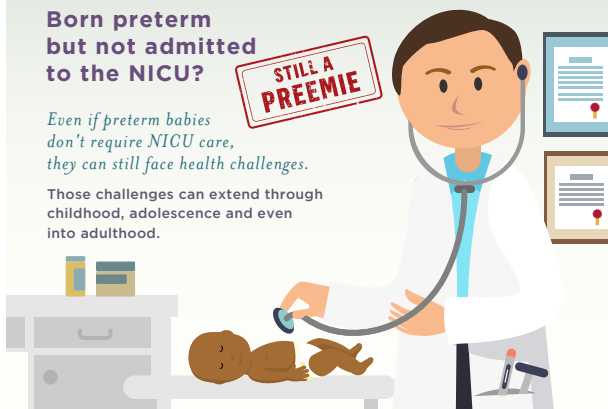


Born preterm but not admitted to the NICU?

STILL A PREMIE

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 Premies

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

All Premies

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

NCJFH National Coalition for Infant Health
Protecting Access for Premature Infants through Age Two
www.infanthealth.org

OPIOIDS and NAS

When reporting on mothers, babies, and substance use

LANGUAGE MATTERS



I am not an addict.

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



I was exposed to opioids.

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



NAS is a temporary and treatable condition.

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



My mother may have a SUD.

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

My potential is limitless.

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



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





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.



Eunice Kennedy Shriver National Institute
of Child Health and Human Development



Compiled and Reviewed by David Vasconcellos, MS IV

AAP Leaders Urge Vaccination against COVID Despite Waning Effectiveness; Provide Advice on Masking

March 2, 2022

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

AAP leaders are stressing the importance of vaccinating children against COVID-19 to protect them from severe disease, even as new studies show waning effectiveness against mild infection with the omicron variant.

"They're safe and will provide some protection," Yvonne A. Maldonado, M.D., FAAP, chair of the AAP Committee on Infectious Diseases, said of vaccines. "But we may need to provide additional doses or different levels of dosing in future vaccine formulations and ... kids may need to be more protected with masking in schools, etc."

The AAP also is providing new advice to help families decide whether to continue masking after the Centers for Disease Control and Prevention (CDC) loosened its guidance last week. In addition, the White House rolled out a new plan Wednesday to continue to protect people against COVID, prepare for new variants, prevent economic and school shutdowns, and help vaccinate the world.

Vaccine effectiveness

[Data from New York](#) that has not been peer reviewed found waning protection from the Pfizer-BioNTech vaccine against infection among children ages 5-11 years during the omicron period, dropping from 68% in mid-December 2021 to 12% in late January.

Protection against hospitalization went from 100% (95% confidence interval -189% to 100%) to 48% (95% confidence interval -12% to 75%) during that time, although wide confidence intervals limit interpretation of the results.

Protection also fell for adolescents but not as steeply as it did for younger children, according to the study. Adolescents ages 12 years and older receive higher vaccine doses than those under



12 years.

Authors concluded vaccination still should be recommended to prevent severe disease. They stressed the importance of layered protection including masks and suggested looking at alternative vaccine dosing.

In another study that was published in the CDC's [Morbidity and Mortality Weekly Report](#), researchers examined data from 10 states. For children ages 5-11, it found vaccine effectiveness of 51% against emergency department (ED) and urgent care (UC) visits in the omicron period and 74% (95% confidence interval -35% to 95%) against hospitalization in the combined delta and omicron periods. The wide confidence interval again makes interpretation difficult.

Among adolescents ages 12-15 and 16-17 years during the omicron period, effectiveness rates against ED/UC visits after two doses were 45% and 34%, respectively. In the combined delta and omicron periods, effectiveness of two doses against hospitalization was 92% for ages 12-15 years and 94% for ages 16-17 years.

Effectiveness was lower during the omicron period than during delta and lower 150 or more days after vaccination than earlier in the vaccination period. Authors found a booster shot significantly increased protection among those ages 16-17 years, and they called for all eligible children to be vaccinated and boosted.

Both studies have limitations to their data and Dr. Maldonado said more studies are needed.

Mask guidance

The data on vaccines come as the CDC loosened its [guidance on masking](#) and other mitigation measures, saying many people in communities categorized as having a low or medium community COVID level (based on cases and hospital capacity) do not need to mask in indoor public settings. Everyone in high COVID level areas should continue wearing masks.

AAP President Moira A. Szilagyi, M.D., Ph.D., FAAP, called the CDC's approach reasonable, but said masking continues to be important for children with special health care needs and those too young to be vaccinated.

The National Urea Cycle Disorders Foundation



The NUCDF is a non-profit organization dedicated to the identification, treatment and cure of urea cycle disorders. NUCDF is a nationally-recognized resource of information and education for families and healthcare professionals.

www.nucdf.org | Phone: (626) 578-0833

“We encourage each family to make a plan that works best for them, while also modeling empathy and discouraging bullying of any child who chooses to mask to protect themselves and their family even when not required to do so,” Dr. Szilagyi [said in a statement](#).

When deciding on masking, the [AAP recommends](#) families consider

- whether their child is vaccinated,
- whether their child is immunocompromised or at high risk for severe COVID-19,
- whether family members are unvaccinated or at high risk for severe disease and
- whether they live in a community with a [high level of COVID-19](#).

Based on these factors, families may choose to continue wearing masks in indoor public places even if they are not required, and that decision should be supported. Schools also should have the flexibility to reinstate masking as needed.

Layers of protection have helped keep virus transmission in schools low, according to Dr. Maldonado. While [new CDC](#)

[data show](#) an estimated 58% of children have been infected with COVID-19, she said households and communities have been the most common sources of these infections, not schools.

“We know that schools are not a major source of transmission when you use mitigation,” she said.

White House COVID plan

The White House released its latest [COVID-19 plan](#) on Wednesday to account for the changing dynamics of the pandemic. Its initiatives include:

- ensuring vaccines are widely available for children under 5 years once a vaccine is authorized;
- making more vaccines, tests and treatments available to all;
- accelerating efforts to detect, prevent and treat long COVID;
- allowing people to get tested and treated in one visit at pharmacy-based clinics and other locations;
- improving data collection on new variants;

- expediting the process of creating variant-specific vaccines and therapeutics;
- helping schools and businesses secure testing and improve ventilation to avoid shutdowns;
- working with businesses to offer paid sick leave for COVID; and
- delivering 1.2 billion vaccine doses to the world.

Congress would need to approve funding for many of the provisions in the plan.

Resources

- [CDC guidance on masking and other precautions](#)
- [AAP interim guidance on face masks](#)
- [Information for parents from HealthyChildren.org on face masks for children](#)
- [AAP COVID vaccination resources](#)
- [CDC clinical considerations for administering COVID-19 vaccines](#)

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- Trauma-Informed
- Evidence-Based

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NPN
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www.mynicunetwork.org

- [Information from HealthyChildren.org on preparing children for a COVID-19 vaccine](https://www.healthychildren.org/ohp/parenting/child_development/COVID-19_vaccine)

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

NT

Autism Screening Test for Toddlers Wins on Accuracy — Younger Diagnosis Age Means Earlier Support for Kids with Autism, Researcher Says

Today March 11, 2022

An autism diagnosis tool for toddlers proved highly accurate, creating the potential for autism to be diagnosed at a younger age, results from a community-based study suggest.

The Social Attention and Communication Surveillance-Revised (SACS-R) tool had an 83% positive predictive value (95% CI 0.77-0.87) and an estimated 99% negative predictive value (95% CI 0.01-0.02) in over 13,500 toddlers ages 12 to 24 months, according to Josephine Barbaro, PhD, of La Trobe University in Melbourne, Australia, and colleagues.

The SACS-R showed 99.6% specificity, though alone it had only “modest” sensitivity, at 62% (95% CI 0.57-0.66). Adding the SACS-Preschool (SACS-PR) test --

which follows toddlers to an older age -- increased sensitivity to 96% (95% CI 0.95-0.98), the group reported in [JAMA Network Open](#).

“Parents are often told to ‘wait and see’ when raising concerns about their child’s development. This means the average age of diagnosis [is around four to five](#), and opportunities for early support have been missed,” Barbaro said in a press release. “Putting this extremely effective tool in the hands of a trained primary health professional, so that during their routine health checks they are also screening for autism, makes a huge difference to early diagnosis.”

The SACS-R is an autism surveillance tool used in community-based samples of children ages 11 to 30 months that observes their early social-communication behaviors. The SACS-PR expands the age range of the SACS-R up to 60 months by looking at “other common markers of autism in preschool-aged children,” the researchers said.

The SACS-R has been rolled out in the state of Victoria, where La Trobe University is located, [as well as in 10 additional countries](#).

“It is important to note that the SACS-R and SACS-PR are administered by a trained professional, which is likely the reason for the high diagnostic accuracy that this paper found,” said Sandhya Iyengar, MD, MPH, of the Children’s Hospital of Philadelphia, who was not involved in the study.

“It is also best suited to longitudinal evaluation instead of one-time screening. While these may be barriers for ease of administration, the SACS-R and SACS-PR may be a very good tool for community health workers to implement in areas with otherwise limited access to medical providers in order to achieve developmental screening,” Iyengar told *MedPage Today*.

The [American Academy of Pediatrics](#) recommends developmental surveillance during primary care visits in children ages 9 to 30 months, along with autism-specific screening at 18 and 24

months. In the U.S., Iyengar said that common autism screening tools include the Modified Checklist for Autism in Toddlers, Revised With Follow-up; the Social Communication Questionnaire; and the Screening Tool for Autism in Toddlers and Young Children.

One in 50 children in this study (n=270) assessed by SACS-R were diagnosed with autism spectrum disorder (ASD). That number jumped to one in 31 children (n=439) when results from the SACS-PR test at 42 months were included, according to Barbaro and colleagues.

The study was conducted in two phases and included children from Victoria, who attended their routine maternal and child health (MCH) consultations, which is universally available to all children up to 3.5 years of age. In phase one, which ran from 2013 to 2016, 13,511 children were assessed with the SACS-R at their 12-, 18-, and 24-month MCH consultations. A total of 48% of the children included were girls. Of the 240 children in phase one who completed a university assessment, 199 were diagnosed with ASD and 41 with a developmental or language delay.

Phase two, where the sample was followed up with SACS-PR, ran from 2014 to 2018. In phase two, 8,419 children, or 62.3% of the original sample, were assessed at their 42-month MCH consultation. An additional 168 children were identified with high-likelihood of ASD with the SACS-PR.

Neither the SACS-R or SACS-PR identified any typically developing children as high likelihood.

The researchers noted that their sample was a convenience sample and acknowledged the loss to follow-up with phase two of the study. “Another potential limitation is the time and resources required for a trained professional to administer the SACS-R and SACS-PR,” the team added.

Primary Source

JAMA Network Open

Source Reference: [Barbaro J, et al “Di-](#)

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.

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[agnostic accuracy of the social attention and communication surveillance-revised with preschool tool for early autism detection in very young children” JAMA Netw Open 2022; DOI: 10.1001/jamanet-workopen.2021.46415.](#)

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NT

‘Baby-Friendly’ Steps Help Women Meet Prenatal Breastfeeding Goals

March 09, 2022

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

A first-ever study of the effect of evidence-based maternity care practices on prenatal breastfeeding intentions in women from low-income U.S. households shows that the use of “baby-friendly steps” during birth hospitalization made it possible for almost half to breastfeed exclusively for 1 month.

Analyses of national data from a longitudinal study of 1,080 women enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) revealed that 47% were able to meet their prenatal intention to breastfeed without formula or other milk for at least 30 days.

The odds of meeting prenatal breastfeeding intentions more than quadrupled when babies received only breast milk (risk ratio, 4.4; 95% confidence interval, 3.4-5.7), the study showed. Breastfeeding within 1 hour of birth was also associated with greater likelihood of breastfeeding success (RR, 1.3; 95% CI, 1.0-1.6).

The study, led by Heather C. Hamner, PhD, MS, MPH, of the National Center for Chronic Disease Prevention and Health Promotion, Atlanta, was reported online in [Pediatrics](#).

“This study confirms the relationship between experiencing maternity care practices supportive of breastfeeding and meeting one’s breastfeeding intentions, and adds evidence specifically among low-income women, who are known to be at higher risk of not breastfeeding,” the study authors wrote.

Women from low-income households often face additional barriers to meeting their breastfeeding goals, including lack of access to professional [lactation](#) services, Hamner said in an interview. “We want physicians to know how important maternity care practices supportive of breastfeeding are to helping all women achieve their breastfeeding goals. Physicians can be champions for implementation of evidence-based maternity care practices in the hospitals and practices in which they work.”

Hamner emphasized that physicians need to discuss the importance of breastfeeding with patients and their families, brief them on what to expect in the maternity care setting, and ensure women are connected to lactation resources. The American Academy of Pediatrics is working to increase physician capacity to support breastfeeding through the Physician Engagement and Training Focused on Breastfeeding [project](#).

For the study, Hamner and colleagues analyzed data from the longitudinal WIC Infant and Toddler Feeding Practices Study-2 (ITFPS-2), which assessed the impact of 6 steps from a 10-step maternity care protocol known as The Ten Steps To Successful Breastfeeding. These steps are part of the worldwide [Baby-Friendly](#)

[Hospital Initiative](#) (BFHI), which has been shown to improve rates of breastfeeding initiation, duration, and exclusivity.

After adjusting for sociodemographic and other factors, the study authors estimated risk ratios for associations between each of six maternity care practices assessed in ITFPS-2 and the success of women who reported an intention to breastfeed exclusively for 1 month. The six steps included initiation of breastfeeding within 1 hour of birth (step 4), showing moms how to breastfeed and maintain lactation (step 5), giving no food or drink other than breast milk unless medically indicated (step 6), rooming-in (step 7), breastfeeding on demand (step 8), and giving no pacifiers (step 9).

The analyses showed that only steps 4 and 6 — initiating breastfeeding at birth and giving only breast milk — remained significantly associated with meeting breastfeeding intentions. The results also revealed a dose-response relationship between the number of baby steps experienced during birth hospitalization and the likelihood of meeting breastfeeding goals, a finding in keeping with previous studies. In women who experienced all six steps, for example, 76% were breastfeeding exclusively at 1 month, compared with 16% of those who experienced zero to two steps.

Although the dose-response relationship did not appear to differ significantly by race or ethnicity, it was driven primarily by a hospital policy of providing [infant formula](#) or other supplementation, the study authors found. Notably, 44% of women reported that their infant had been fed something other than breast milk while in the hospital, and about 60% said they stopped breastfeeding earlier than intended.

“This finding reiterates the importance of limiting in-hospital formula or other supplementation of breastfed infants to only those with medical necessity,” Hamner and colleagues said.

Despite improvements in maternity care practices that promote breastfeeding, including an increase in the number of births occurring in U.S. hospitals with a baby-friendly designation, many women





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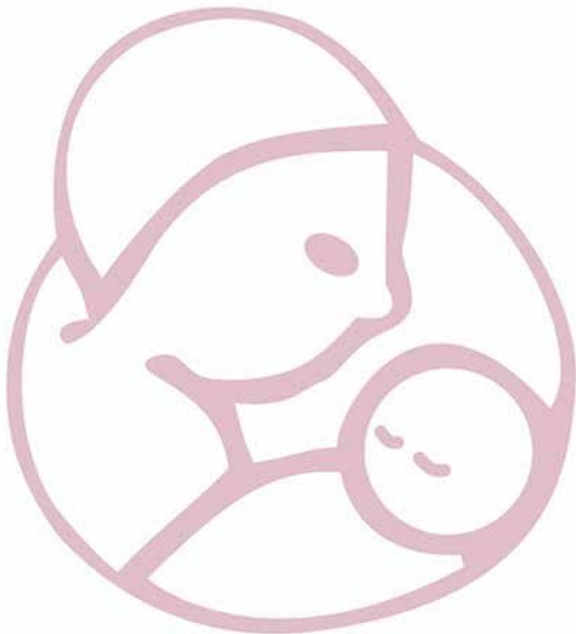
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continue to experience significant [barriers](#) to breastfeeding, the investigators pointed out. Currently, there are 592 baby-friendly [hospitals](#) in the United States, representing 28.29% of annual births.

"I think more hospitals becoming baby friendly would really help," Mary Franklin, DNP, CNM, assistant professor at Case Western Reserve University, Cleveland, said in an interview. More needs to be done to support women during birth hospitalization and after they return home, so they can continue to breastfeed for "longer than the initial 6 weeks," added Franklin, who is also director of the nurse midwifery and women's health NP program.

The AAP [recommends](#) exclusive breastfeeding for about 6 months followed by complementary food introduction and continued breastfeeding through 12 months or beyond.

Like Hamner, Franklin emphasized that physicians have an important role to play in the initiation, duration, and exclusivity of breastfeeding. This includes promoting enrichment of the pregnancy experience with prenatal education and increased support from health care providers and peers. At delivery, obstetricians can delay cord clamping to facilitate early breastfeeding. They can also support the elimination of the central nursery in hospitals so that mother and baby stay together from birth. In addition, prescriptions can be written for breast pumps, which are covered by Medicaid.

The study received no outside funding. Hamner and coauthors disclosed having no potential financial conflicts of interest. Franklin also disclosed having no financial conflicts of interest.

This story originally appeared on [MDedge.com](#), part of the Medscape Professional Network.

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NT

Pediatric Flu Deaths Rise to 10 as Virus Activity Increases

March 11, 2022

Flu activity is increasing, and two more children have died, according to [data from the Centers for Disease Control and Prevention](#) (CDC).

The additional pediatric deaths put the total at 10 this season. Overall, roughly 2.7 million people have gotten sick from the flu this season, 26,000 have been hospitalized and 1,500 have died, the CDC estimates.

The cumulative hospitalization rate of 5.5 per 100,000 people is higher than last season but lower than the four most recent pre-pandemic seasons.

About 5.8% of clinical lab specimens were positive for flu during the week ending March 5, up from 4.1% the previous week. The central and south-central parts of the country have the highest positivity rates.

About 1.6% of outpatient visits to a health care provider were due to a respiratory illness last week, which has increased from the previous week but remains below baseline. The highest rates were seen in children under 5 years.

Most of the influenza viruses detected have been influenza A(H3N2) and are genetically closely related to the vaccine virus. However, a recent CDC analysis showed flu vaccine was not effective in reducing the risk of an outpatient visit for illness caused by influenza A(H3N2) viruses. Vaccine effectiveness in preventing an outpatient visit for influenza A(H3N2) is 16%, according to [interim estimates from the CDC](#). However, the confidence inter-

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val is -16% to 39%. The CDC continues to recommend the flu vaccine for everyone 6 months and older as it can prevent severe illness from flu.

[CDC data show](#) about 52.5% of children have been vaccinated this season. Coverage is about 11 percentage points lower for Black children than White children.

The CDC also is monitoring cases of [highly pathogenic avian influenza A\(H5N1\)](#), which have been reported in wild birds in 16 states and in commercial and backyard poultry in 12 states. People are rarely infected with avian influenza. One such case was reported in the United Kingdom this year, but no human cases have been reported in the U.S.

Resources

- [Information on flu from the CDC](#)
- [CDC FAQ about the 2021-'22 flu season](#)
- [Information for parents on flu vaccine from HealthyChildren.org](#)
- [Information on flu from the AAP Red Book](#)
- [Flu vaccine locations near you](#)

Melissa Jenco, News Content Editor

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Study: SARS-CoV-2 Omicron Variant May Cause Croup

March 8, 2022

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

Researchers have found evidence the SARS-CoV-2 omicron variant may cause croup in children.

A team from Boston Children's Hospital looked at data on children treated at their institution for both COVID-19 and croup since the start of the pandemic. Children with croup have a swollen larynx and trachea and may have a barking cough and difficulty breathing.

Since the start of the pandemic, 75 children at the hospital have been diagnosed with COVID-19-associated croup, and 81% of cases occurred during the omicron period. Only one of the children tested positive

for another virus, according to "COVID-19 Associated Croup in Children," ([Brewster RCL, et al. Pediatrics. March 8, 2022](#)).

About 12% of the children were hospitalized, and they spent a median of 1.7 days in the hospital. Four children required intensive care.

Nearly all patients were treated with dexamethasone. All hospitalized patients and about one-quarter of emergency department patients also had racemic epinephrine. Hospitalized patients received a median of six dexamethasone and eight racemic epinephrine doses.

Authors said the data present "compelling evidence" that the SARS-CoV-2 omicron variant causes croup, and the croup cases may be more severe when linked to omicron than with other viruses. Omicron's tendency to strike the upper airway may help explain the connection.

"Further research is needed to characterize the underlying mechanisms of COVID-19-associated croup, differences in clinical features from other viral etiologies, and appropriate management strategies in the SARS-CoV-2 era," they wrote.

Resources

- [Information from the AAP on COVID-19](#)
- [Information for parents from HealthyChildren.org on croup](#)

Melissa Jenco, News Content Editor

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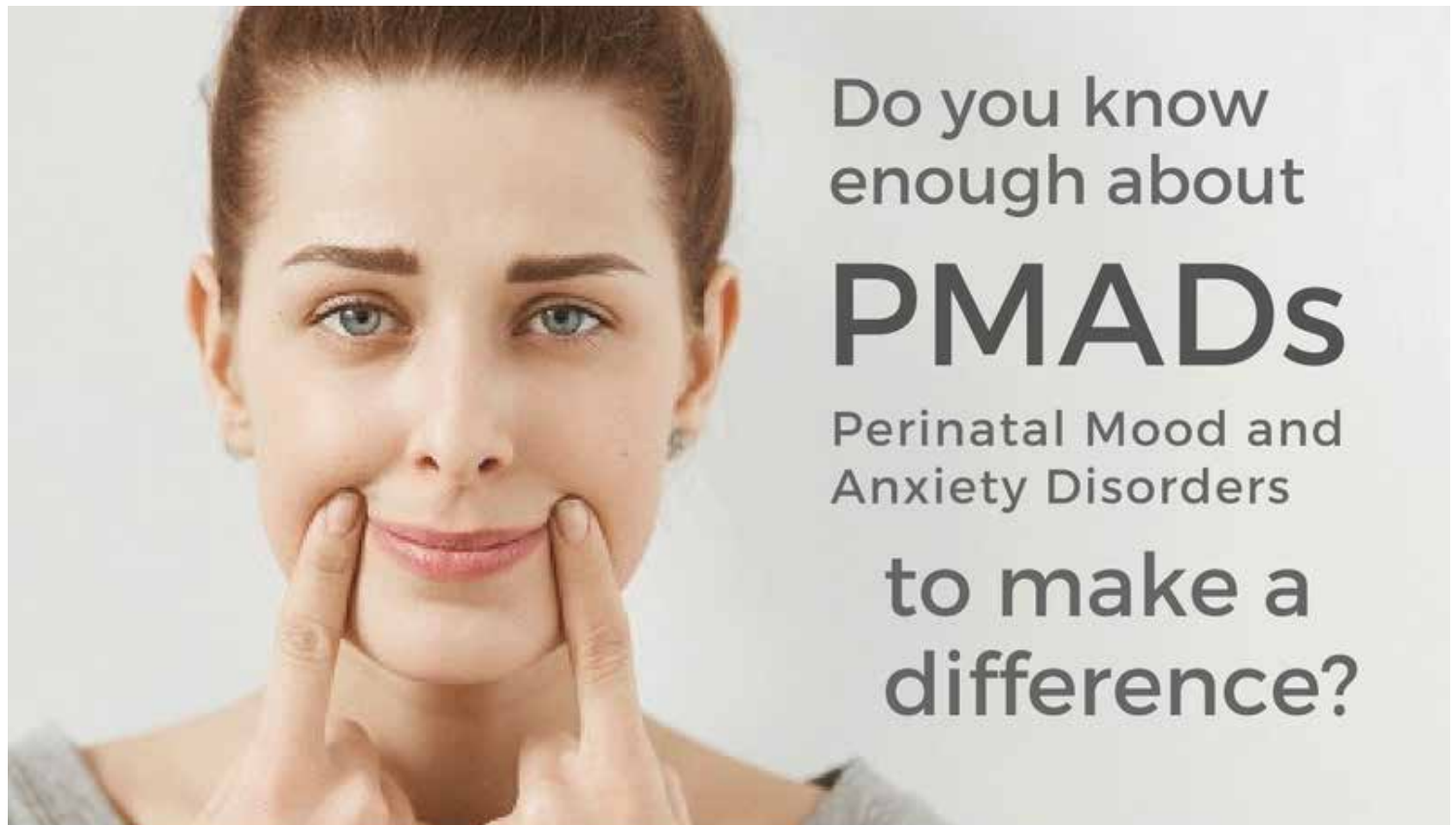
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Study: In-school COVID Spread Reduced by 72% with Universal Masking



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March 9, 2022

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

Schools with universal masking policies saw 72% less in-school spread of COVID-19 than schools where masking was optional, according to a new study.

[The AAP is advising families](#) to consider masking for their children with special health care needs and those too young to be vaccinated even though federal health officials have loosened masking recommendations for much of the country.

In the new study, researchers analyzed data from 61 K-12 school districts in nine states in the fall of 2021 when the delta variant was predominant. To be included in the study, districts had to perform contact tracing and determine whether infections were acquired in the community or in school. The data include about 1.1 million students and 157,000 school staff members.

During the study period, students and staff had 40,601 COVID-19 infections acquired from the community and 3,085 that were acquired in school, according to "School Masking Policies and Secondary SARS-CoV-2 Transmission," ([Boutzoukas AE, et al. Pediatrics. March 9, 2022](#)).

The rate of cases transmitted in schools was 3.6 times higher in schools with optional masking compared to schools with universal masking. There were about 26.4 school-acquired cases predicted for every 100 community-acquired cases in schools with optional masking compared to 7.3 school-acquired cases per 100 in schools with universal masking.

Authors said masking is a "critical mitigation effort" to help children attend school safely when community infection rates are high.

"Providing districts with the tools to monitor transmission data in real time enables schools to respond to changing national

and local policies, as well as adjust their mitigation efforts to keep in-person education as safe as possible for the remainder of the COVID-19 pandemic," they wrote.

The Centers for Disease Control and Prevention (CDC) recently [updated its mask guidance](#) to say most people in communities categorized as having a low or medium COVID community level (based on cases and hospital capacity) do not need to mask in indoor public settings including schools. Everyone in high COVID community level areas should continue wearing masks.

When deciding on masking, the [AAP recommends](#) families consider

- whether their child is vaccinated,
- whether their child is immunocompromised or at high risk for severe COVID-19,
- whether family members are unvaccinated or at high risk for severe disease and
- whether they live in a community with a [high level of COVID-19](#).

Based on these factors, families may choose to continue wearing masks in indoor public places even if they are not required, and that decision should be supported, according to the AAP. Schools also should have the flexibility to reinstate masking as needed.

Resources

- [CDC guidance on masking and other precautions](#)
- [AAP interim guidance on face masks](#)
- [Information for parents from HealthyChildren.org on face masks for children](#)
- [CDC guidance for schools during the pandemic](#)

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

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

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Oral Immunotherapy Induces Remission of Peanut Allergy in Some Young Children NIH Trial Found Experimental Therapy Also Reduced Most Children's Sensitivity to Peanut

Oral Immunotherapy Induces Remission of Peanut Allergy in Some Young Children

NIH Trial Found Experimental Therapy Also Reduced Most Children's Sensitivity to Peanut

January 20, 2022

Credit: NIAID

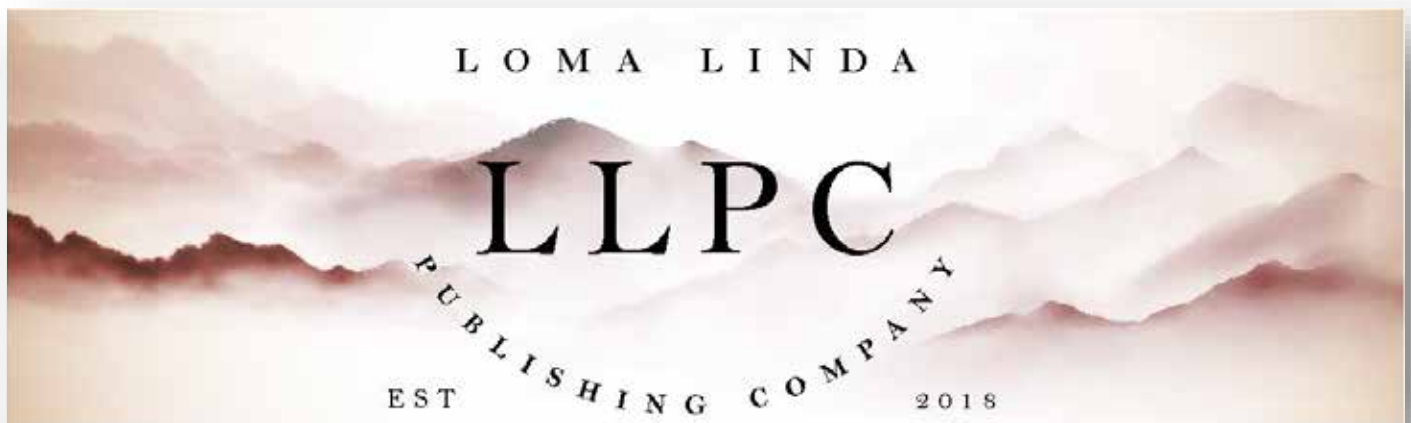
A clinical trial funded by the National Insti-

tutes of Health has found that giving peanut oral immunotherapy to highly peanut-allergic children ages 1 to 3 years safely desensitized most of them to peanut and induced remission of peanut allergy in one-fifth. The immunotherapy consisted of a daily oral dose of peanut flour for 2.5 years. Remission was defined as being able to eat 5 grams of peanut protein, equivalent to 1.5 tablespoons of peanut butter, without having an allergic reaction six months after completing immunotherapy. The youngest children and those who started the trial with lower levels of peanut-specific antibodies were most likely to achieve remission. The results of the trial, called IMPACT, were published today in the journal *The Lancet*.

"The landmark results of the IMPACT trial suggest a window of opportunity in early childhood to induce remission of peanut allergy through oral immunotherapy," said Anthony S. Fauci, M.D., director of the National Institute of Allergy and Infectious Diseases (NIAID), part of NIH. "It is our hope that these study findings will inform the development of treatment modalities that reduce the burden of peanut allergy in children." NIAID sponsored the trial and funded it through its Immune Tolerance Network.

Peanut allergy affects about 2% of children in the United States, or nearly 1.5 million individuals ages 17 years and younger. The risk of a life-threatening allergic reaction to accidentally eaten peanut is significant for these children, most of whom remain peanut-allergic for life.

When designing the study, the IMPACT trial investigators reasoned that because oral immunotherapy has the potential to change the immune system, providing peanut oral immunotherapy early in life,



when the immune system is still maturing, might modify a child's immune response to peanut. Two previous studies provided proof of concept that peanut oral immunotherapy could be given safely to very young children and have a therapeutic effect.

Nearly 150 children ages 1 to 3 years participated in the IMPACT trial at five academic medical centers in the United States. Only children who had an allergic reaction after eating half a gram of peanut protein (about 1.5 peanuts) or less were eligible to join the study. The children were assigned at random to receive either flour containing peanut protein or a placebo flour of similar appearance. The flours were mixed with foods such as applesauce or pudding to help mask their taste. No one except a site pharmacist and a site dietician knew who received peanut flour or placebo flour until all the data were gathered and study visits had ended.

During a 30-week period, the children in the treatment group ate gradually escalating daily doses of up to 2 grams of peanut protein, equivalent to about six peanuts. The children then continued to consume their daily dose of peanut or placebo flour for an additional two years.

Next, the children underwent an oral food challenge in which they received gradually increasing doses of peanut protein up to a cumulative maximum of 5 grams. They then stopped treatment and avoided peanut for six months.

Finally, the children underwent a repeat oral food challenge with 5 grams of peanut protein, equivalent to about 16 peanuts. Those who did not have an allergic reaction during the challenge were later fed 8 grams of peanut butter, equivalent to 2 tablespoons, on a different day to confirm that they could eat peanut without having an allergic reaction.

At the end of the treatment period, 71% of children who had received peanut flour were desensitized to peanut, compared to only 2% of those who had received the placebo flour. Desensitization was defined as being able to eat 5 grams of peanut protein during the first oral food challenge without having an allergic reaction. After six months of peanut avoidance following treatment, 21% of children who had received peanut flour could eat 5 grams of peanut protein during the second oral food challenge without having an allergic reaction and therefore were in remission.

By contrast, only 2% of children who had received placebo flour were in remission at that time.

The investigators found that lower levels of peanut-specific immunoglobulin E antibodies at the start of the trial and being younger predicted whether a child would achieve remission. In an analysis done after the investigators could view the study data, they found an inverse relationship between age at the start of the trial and remission, with 71% of the 1-year-olds, 35% of the 2-year-olds and 19% of the 3-year-olds experiencing remission.

Although nearly all the children who received peanut flour had at least one dose-related reaction during treatment, most reactions were mild to moderate in severity. Twenty-one children received the rescue drug epinephrine for 35 moderate reactions to peanut flour during the 2.5-year treatment period.

The Immune Tolerance Network conducted the trial under the leadership of A. Wesley Burks, M.D., and Stacie M. Jones, M.D. Dr. Burks is chief executive officer of UNC Health, dean of the UNC School of Medicine, and vice chancellor for medical

affairs at the University of North Carolina at Chapel Hill. Dr. Jones is a professor of pediatrics at the University of Arkansas for Medical Sciences and Arkansas Children's Hospital in Little Rock.

More information about the IMPACT trial is available at ClinicalTrials.gov under study identifier [NCT01867671](https://ClinicalTrials.gov/ct2/show/study/NCT01867671).

Reference: SM Jones *et al.* [Efficacy and safety of oral immunotherapy in a randomized, placebo-controlled study of 1-3-year-old children with peanut allergy: Findings from the Immune Tolerance Network IMPACT trial.](#) *The Lancet* DOI: S0140-6736(21)02390-4 (2022).

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Genetics Corner: Donohue Syndrome in a Small for Gestational Age Infant with Hyperinsulinemia

Jonathan Tam, OSM-III, Tiffany Chan, OSM-III, Herbert Vasquez, MD, Robin D. Clark, MD

Abstract:

Donohue syndrome, previously (but no longer) described as Leprechaunism, is a rare autosomal recessive trait. The primary defect in the insulin receptor causes extreme insulin resistance and failure to thrive with hyperinsulinemia, intermittent preprandial hypoglycemia, and persistent postprandial hyperglycemia. Impaired glucose metabolism causes prenatal and postnatal growth deficiency, dysmorphic facial features, visceromegaly, and lipoatrophy. A preterm male was born following an uneventful prenatal course with a birth weight of 1450 g, length of 40.5 cm, and head circumference of 32 cm. Apgar scores were 9 at one and 9 at five minutes. His postnatal course was complicated by recurrent episodes of abdominal distension and emesis with appropriate stooling, intermittent fasting hypoglycemia, and persistent postprandial hyperglycemia despite daily titrations in total parenteral nutrition. Glycemic fluctuations (20-230 mg/dl) were wide. The maximum serum insulin level was 1388 uIU/ml. With time, his dysmorphic features became more prominent. Echocardiogram identified a moderate ostium secundum atrial septal defect, mild dilation of the right ventricle, mild hypertrophy of the right ventricle, and mild pulmonary stenosis with doming. Gene testing for INSR identified two novel variants of uncertain significance.

Keywords: Donohue syndrome, Hyperinsulinemia, INSR, Preterm infant, Insulin resistance

“Donohue syndrome (DS), originally known as Leprechaunism, is an autosomal recessive disorder caused by biallelic pathogenic variants in the gene that encodes the insulin receptor, INSR, located on the short arm of chromosome 19 at 19p13.3. (1)”

Introduction:

Donohue syndrome (DS), originally known as Leprechaunism, is an autosomal recessive disorder caused by biallelic pathogenic variants in the gene that encodes the insulin receptor, *INSR*, located on the short arm of chromosome 19 at 19p13.3. (1) In this condition, loss of insulin receptor function causes severe impairments in glucose metabolism and other endocrine abnormalities

that restrict neonatal growth and development. The characteristic pattern of findings in DS is distinctive, which helps narrow the differential diagnosis. Intrauterine growth restriction (IUGR) is accompanied by hyperinsulinemia, preprandial hypoglycemia, postprandial hyperglycemia, visceromegaly, lipoatrophy, and distinctive dysmorphic coarse facial features, alveolar thickening, prominent nipples, rectal prolapse, nephrocalcinosis, and other classic features. (2) With an incidence of less than one in one million live births worldwide, only a few dozen cases of Donohue syndrome have been reported in the literature. Given the rarity of this syndrome, experience with management is limited. We present our experience of diagnosis and management of a preterm infant with DS followed from birth and discuss its unique presentations, management challenges, and future considerations.

“With an incidence of less than one in one million live births worldwide, only a few dozen cases of Donohue syndrome have been reported in the literature. Given the rarity of this syndrome, experience with management is limited. We present our experience of diagnosis and management of a preterm infant with DS followed from birth and discuss its unique presentations, management challenges, and future considerations.”

Case Summary:

A 36 week and 5-day gestation male was delivered to a G3P1 33-year-old woman. This pregnancy was complicated by an IUGR fetus and diet-controlled gestational diabetes that required an insulin drip prior to delivery. Antenatal steroid therapy was completed. The mother was Rubella immune and negative for Hepatitis B surface antigen, Venereal disease research laboratory (VDRL), Human immunodeficiency virus, Group B streptococcus, and COVID-19 at delivery. Labor progressed, and the infant was delivered by spontaneous vaginal delivery without complications. Birthweight was 1450 grams (<3rd %ile, Z-3.48), length was 40.5 cm (<3rd %ile, Z-3.09), and head circumference was 32 cm (21st %ile, Z-0.77). Assisted Apgar scores of 9 were assigned at one and five minutes. The infant was admitted to the Neonatal intensive care unit (NICU) for small size and early gestational age.

Past obstetric history was significant for previous therapeutic termination at 30 weeks gestation for IUGR, suspected skeletal dysplasia, and fetal chromosome anomaly: 45,X/46,X,idicY mosaicism. IUGR had been detected at 25 weeks gestation in that pregnancy.

“Past obstetric history was significant for previous therapeutic termination at 30 weeks gestation for IUGR, suspected skeletal dysplasia, and fetal chromosome anomaly: 45,X/46,X,idicY mosaicism. IUGR had been detected at 25 weeks gestation in that pregnancy.”

The infant was given expressed breast milk (EBM) ad lib q3 hours. He subsequently developed increased abdominal distention and was made NPO. A kidney-ureter-bladder (KUB) radiograph was unremarkable. Trophic feeds with EBM and peripheral Total Parenteral Nutrition (TPN) were restarted the following day. He had recurrent episodes of intermittent abdominal distention with KUBs demonstrating increased bowel gas without distended abdominal loops. Although glycerin enemas were highly effective in relieving distention, oral feedings were intermittent secondary to recurrent episodes of abdominal distention. His feedings were advanced when possible, with caloric density titrated to his gestational age. Preprandial hypoglycemia and postprandial hyperglycemia did not respond to daily adjustments in TPN. Glycemic fluctuations were wide: 20-230 mg/dL. The maximum serum insulin level was 1388 uIU/ml, and the C-peptide level was 135 uIU/ml. To stabilize his blood glucose levels above 70 mg/dL, he was treated with Diuril 20 mg/kg/day PO q12hr and Diazoxide at 10 mg/kg/day PO q8hr. An excrescence on the umbilical stump persisted despite silver nitrate applications. At 46 days of age, he was transferred to a regional children’s hospital for a higher level of care. An ACTH challenge test showed a normal cortisol response.

“Dysmorphic features became increasingly apparent with time. He was emaciated and hypotonic with decreased subcutaneous fat, a coarse facial appearance, upturned nose, thick alveolar ridges, soft, distended abdomen, thin extremities, large scrotum, and prolapsed rectum.”

Dysmorphic features became increasingly apparent with time. He was emaciated and hypotonic with decreased subcutaneous fat, a coarse facial appearance, upturned nose, thick alveolar ridges, soft, distended abdomen, thin extremities, large scrotum, and prolapsed rectum. Testicular ultrasound confirmed moderate bilateral

hydroceles. Abdominal ultrasound demonstrated echogenic medullary pyramids in the kidneys, suggesting early medullary nephrocalcinosis, a persistent urachus with bowel peristalsis, and grossly unremarkable urinary bladder. An echocardiogram revealed an ostium secundum atrial septal defect (5.3 mm), mild right ventricular dilation and hypertrophy, and mild pulmonary valve stenosis with doming. Following ultrasound confirmation, the omphalomesenteric remnant was surgically removed. Molecular gene testing of a panel of genes associated with hyperinsulinemia was negative. A genetics consultation was requested at 48 days of age, and the diagnosis of Donohue syndrome was made on clinical grounds.

An echocardiogram on day 79 showed progressive cardiomyopathy with moderate concentric left ventricular hypertrophy. There was no evidence of elevated pulmonary artery pressure. At 86 days of age, his weight was 2.35 kg. He required 2 LPM of nasal flow up to 30% O₂. He nipped 23% of his feedings with subcostal retractions. He had an oral diet that was lipid fortified with PE30 and expressed breast milk with MCT, Cod Liver, and beneprotein at total fluids of 160cc/kg/day. Random glucose was >200 mg/dL. He had cholestasis with elevated total and direct bilirubin. Recombinant human IGF1 (rhIGF-1) was proposed as an investigational therapy to the family. His care team includes endocrinology, nutrition, nephrology, cardiology, genetics, and palliative care.



Figure 1a. This 51-day old infant of Chinese ethnicity (4 weeks corrected) has typical features of Donohue syndrome: coarse facial features, prominent eyes, infraorbital creases, and a short upturned nose. Note darkly pigmented skin, hypertrichosis on the arms, and prominent nipples.



Figure 1b. The infant has a prominent abdomen and little subcutaneous tissue. His umbilical stump healed well after surgery.

Family history:

Both parents are of Chinese ancestry. Mother is 33, and the father is 38 years old. Both are healthy. They have a healthy 4-year-old son. They deny consanguinity.

Laboratory studies:

Gene analysis of *INSR* identified 2 novel variants: c.3792_3793dup and c.344_348delinsCCTTG. These two variants were classified as variants of uncertain significance (VUS) because they had not been previously identified as either pathogenic or benign. The first variant, located near an intron-exon boundary, is predicted to result in a frameshift in exon 21. This frameshift is predicted to introduce a premature stop codon in the last exon and result in a truncated protein. It would disrupt the original protein's last 117 amino acids (8.5%). This variant is absent from general population databases. Computational predictions for this protein change show that it is expected to occur with a higher frequency than it is observed (Expected 66.799 vs. Observed 21), which implies a deleterious effect. The second variant is predicted to cause an in-frame complex insertion/deletion in *INSR*. This variant is absent from the general population (The Broad Institute gnomAD database). Parental testing for these variants is in process to confirm biallelic variants in this child. The laboratory is reviewing clinical information on the patient and may reclassify the variants as pathogenic or likely pathogenic if they are confirmed to be biallelic.

“Donohue syndrome (DS, OMIM 24620) is a rare cause of insulin resistance in the newborn, but it has a distinctive phenotype that aids in the diagnosis. (1) DS has also been referred to as Leprechaunism, which is not the preferred name.”

Discussion:

Donohue syndrome (DS, OMIM 24620) is a rare cause of insulin resistance in the newborn, but it has a distinctive phenotype that aids in the diagnosis. (1) DS has also been referred to as Leprechaunism, which is not the preferred name. The characteristic pattern of anomalies in DS includes small size at birth with preserved head circumference, poor postnatal growth, hyperinsulinemia, preprandial hypoglycemia, postprandial hyperglycemia, coarse facial features, thick alveolar ridges, prominent nipples, rectal prolapse, nephrocalcinosis, and cardiomyopathy. This child has the classic appearance of this condition. Typically, the mothers of children with DS have gestational diabetes, as did our patient. In retrospect, the affected fetus with IUGR in this family may have been similarly affected with Donohue syndrome and a chromosome anomaly.

A milder phenotype associated with biallelic variants in *INSR* has been described as Rabson-Mendenhall syndrome (RMS). In the first year of life, it is not easy to distinguish between DS and RMS.



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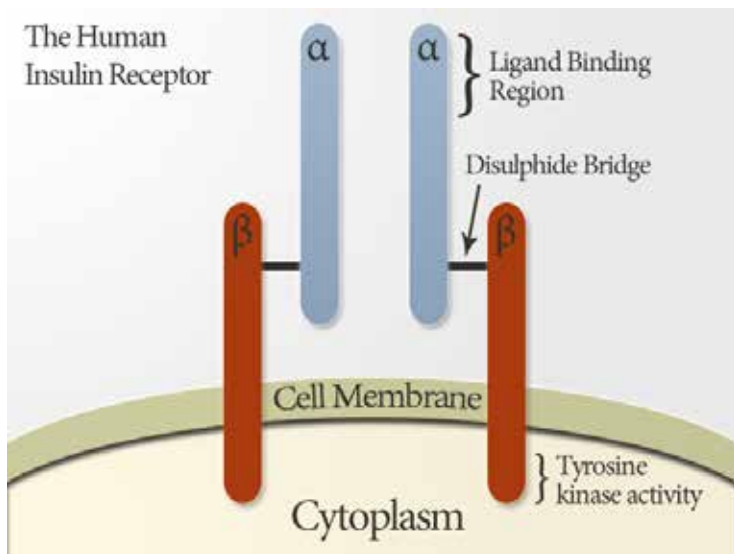


Figure 2. The tetrameric insulin receptor consists of two alpha, and two beta subunits joined by disulfide bridges. These two subunits are encoded by the same gene: *INSR*. Source for illustration: <https://vetsci.co.uk/2011/04/22/development-of-insulin-resistance/>

Children who survive beyond the first year of life with normal psychomotor development may have RMS. Heterozygous pathogenic variants in *INSR* can cause insulin-resistant diabetes mellitus with acanthosis nigricans (OMIM 610549) and autosomal dominant familial hyperinsulinemic hypoglycemia 5 (OMIM 609969), including neonatal hyperinsulinemic hypoglycemia. (2)

Donohue syndrome is life-limiting, and most affected children die by two years of age, often due to infection. Progressive cardiomyopathy, a frequent cause of death in DS, can be seen prenatally. (3,4) There is no effective treatment for insulin resistance in DS. Recombinant human IGF-1 is being studied in severe insulin resistance syndromes, but there is no standard protocol regarding its use.

Homozygous or compound heterozygous pathogenic variants cause DS in the insulin receptor gene (*INSR*; OMIM 147670) on chromosome 19p13. The insulin receptor is a tetramer of 2 alpha and two beta subunits, both coded by this single gene. Disulfide bonds join these alpha and beta subunits (Figure 2). The gene has 22 exons, of which 11 encode the alpha subunit and 11 encode the beta subunit. The alpha chains carry the insulin-binding region, while the beta chains carry the kinase domain. Defects in the alpha subunit could affect ligand binding, while defects in the beta subunit could affect membrane binding or signal transduction. This child has one variant in the first 11 exons that could affect the alpha subunit and one in the last 11 exons that could disable the beta subunit. A tetramer with two normal alpha and two normal beta subunits would be expected to represent 1/16th of the total number of insulin receptors produced. The other 15/16^{ths}

would be expected to have some combination that included at least one abnormal alpha or beta subunit.

Insulin has pleiotropic functions that extend well beyond its role in carbohydrate metabolism. Insulin receptor substrates are phosphorylated and interact with the PI3K-AKT/PKB pathway, which is responsible for most of the metabolic actions of insulin, and the Ras-MAPK pathway, which regulates the expression of some genes and cooperates with the PI3K pathway to control cell growth and differentiation. This is why the absence of a functional insulin receptor has such widespread and devastating consequences for growth and organ function. In addition to binding insulin, the insulin receptor can bind insulin-like growth factors (IGF1 and IGFII). Recombinant human IGF1 (rhIGF-1) has been shown to improve metabolic control in DS, although it may not alter the lethal outcome of DS, (5) which was the basis for offering rhIGF-1 as palliative therapy in our patient.

Practical Applications:

1. Please pay attention to uncommon features: the more rare the feature, the more discriminating it can be in narrowing the differential diagnosis. Thick alveolar ridges, prolapsed rectum, and nephrocalcinosis are rare findings in the newborn but common features in Donohue syndrome.
2. Consider a genetic etiology early in treatment when neonatal hypoglycemia does not respond to standard therapy or when dysmorphic features accompany hypoglycemia and small size. Although genetic disorders may be rare, genetic disorders are often undiagnosed in the NICU.
3. Recognize that heterozygous variants in *INSR* are more commonly encountered in patients than biallelic variants. Consider *INSR* gene analysis in infants with neonatal hypoglycemia with hyperinsulinemia even when they do not have the severe presentation of Donohue syndrome.

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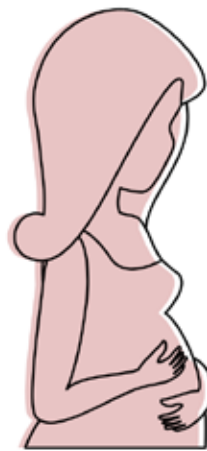
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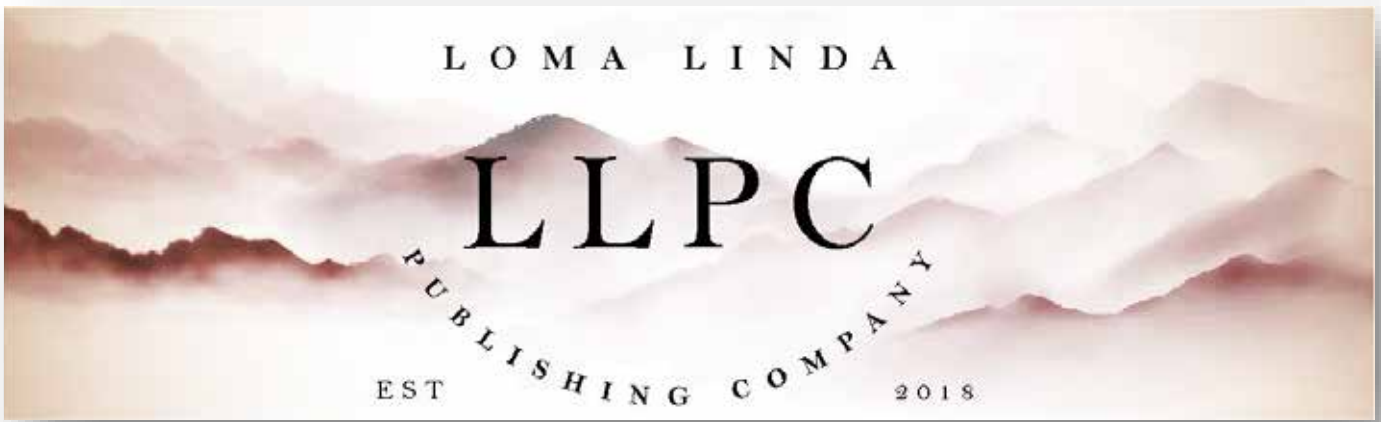


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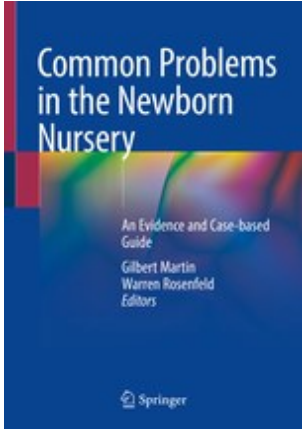


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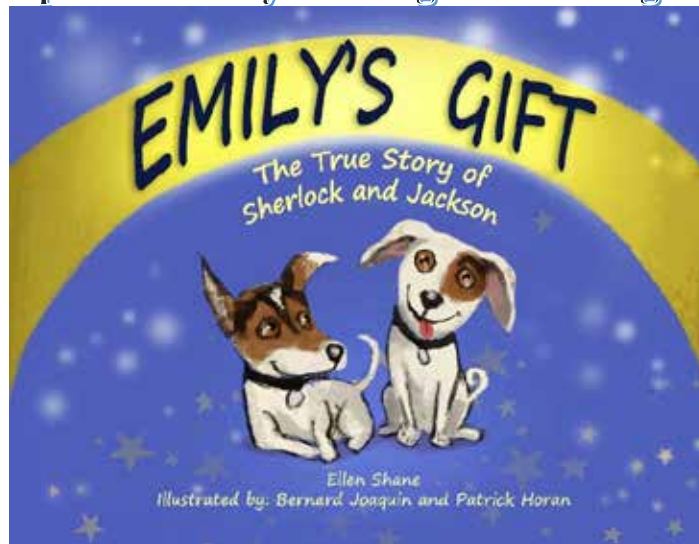
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From Mom to Baby: Antibodies and Infant Health

Susan Hepworth, Mitchell Goldstein, MD, MBA, CML



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.

Everyone knows children inherit some things from their parents: their blue eyes, their curly hair, or perhaps their love of the outdoors. Moms take [prenatal vitamins](#) and get maternal vaccines like [Tdap](#) to transfer health benefits and good antibodies to their

unborn babies. (1, 2)

However, some maternal antibodies carry risks that pregnant women should understand. Though serious dangers are rare, expectant mothers should be aware of them and prepared to discuss them with their doctors as part of their prenatal care.

“However, some maternal antibodies carry risks that pregnant women should understand. Though serious dangers are rare, expectant mothers should be aware of them and prepared to discuss them with their doctors as part of their prenatal care.”

When Mom’s Immune System Fights Baby’s Blood Cells

When a baby’s blood type is incompatible with his or her mother’s, sometimes the mom’s immune system sends antibodies to



“fight” the baby’s red blood cells. This rare condition, known as hemolytic disease of the fetus and newborn, **affects** between 3 and 80 pregnancies per 100,000, usually during the second or subsequent pregnancies. (3)

Severe symptoms, while extremely rare, once took the lives of thousands of infants every year. Medical progress has dramatically reduced that number. Hemolytic disease of the fetus and newborn is treatable today with fetal blood transfusions.

When Baby Inherits Incompatible Blood Cells from Dad

Another rare disease stemming from blood-cell incompatibility occurs when a baby inherits blood platelets from his or her father. When this happens, the mom’s immune system may respond to her baby’s unfamiliar platelets as if they were attacking her, sending harmful antibodies into the womb and giving the child fetal and neonatal alloimmune thrombocytopenia.

There is no national **screening** for either blood cell-type incompatibility condition or test to **predict** their severity. The most common indicator is a **sibling** who already has it. So doctors should closely monitor expectant mothers during subsequent pregnancies and prepare for delivery and neonatal care accordingly. (4, 5)

When Mom Has Certain Autoimmune Diseases

Sometimes harmful antibodies transferred to unborn babies have nothing to do with compatibility but result from their mothers’ immune systems. This situation is the case with congenital heart block. When a woman with an autoimmune condition like **lupus** or **Sjogren’s** syndrome gets pregnant, her body may create antibodies that attack her child’s heart as it develops in the womb. (6, 7)

Congenital heart block is **very rare**, affecting one in every 15,000-20,000 births. Thanks to ongoing advances in medical imaging technology, it is also becoming easier to diagnose. Current treatments include certain medications and the insertion of a pacemaker in the baby’s heart after the baby is born.

These conditions can happen, even if an expectant mom follows every prenatal protocol, which is why new, better and less invasive treatments are needed. The good news is that scientists are working to develop better tests and treatments – for all of these and other rare, fetal, and infant conditions.

Doctors know what to look for and test for these conditions as necessary. Women should know and ask about them to better advocate for themselves and their children.

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National Coalition for Infant Health Values (SANE)

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

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

Nutrition. Proper nutrition and full access to health care keep premature infants healthy after discharge from the NICU.

Equality. Prematurity and related vulnerabilities disproportionately impact minority and economically disadvantaged families. Restrictions on care and treatment should not worsen inherent disparities.

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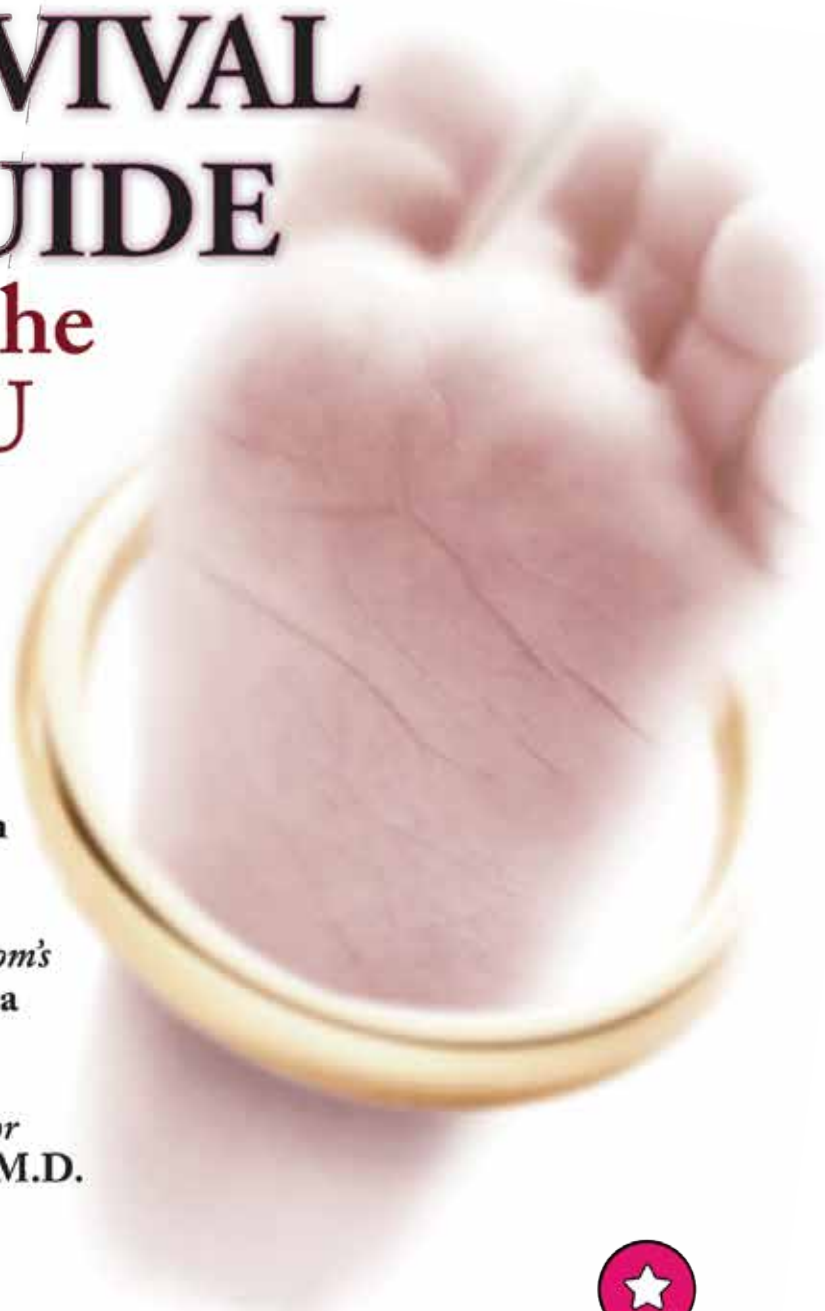
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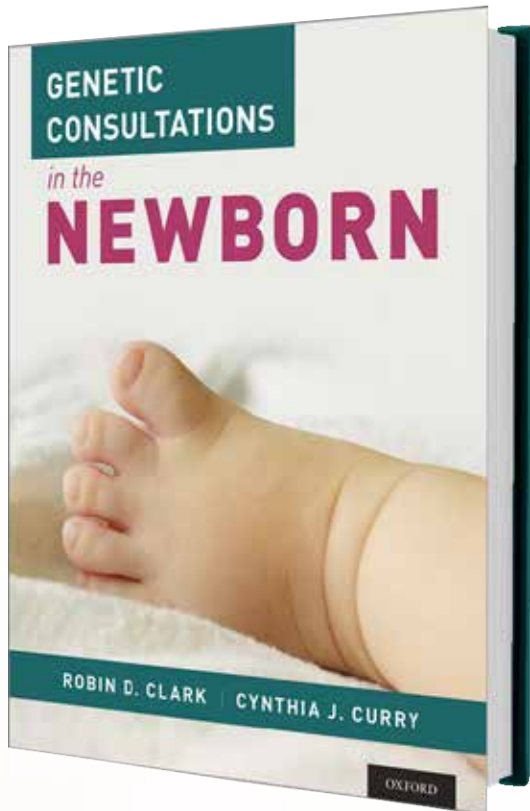


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Clinical Pearl: The Neurodevelopmental Outcomes of Infants Born During the COVID-19 Pandemic: It is Complicated!

Joseph R. Hageman, MD

I just read a well-written paper by Shuffrey and co-authors from Columbia University in New York City about a comparison of the neurodevelopmental outcomes of infants at age six months who were born at term (completed at least 37 weeks gestation) to 114 mothers exposed and 141 unexposed to SARS-CoV-2 infection exposure during their pregnancy (1). In addition, these two groups' neurodevelopmental outcomes were compared to a group of 67 term infants born at Columbia before the pandemic (1). Interestingly, the two groups of pandemic infants had statistically significantly lower scores on their Ages and Stages Questionnaire (ASQ-3) gross motor, fine motor, and personal social subdomains compared with the pre-pandemic group of infants born also born at Columbia University (1).

“Interestingly, the two groups of pandemic infants had statistically significantly lower scores on their Ages and Stages Questionnaire (ASQ-3) gross motor, fine motor, and personal social subdomains compared with the pre-pandemic group of infants born also born at Columbia University (1).”

In addition, there was no statistical difference in these subdomains in the pandemic infants, regardless of whether the mothers had SARS-CoV-2 infection or not. The pandemic infants had lower scores than those born before the pandemic, and the authors attribute these lower scores to maternal stress or maternal immune activation during the pandemic (1). Most of these pregnant mothers had asymptomatic or mild infections (110/114 mothers), and 87 of 114 mothers were infected during the second or third trimester (1). The primary analysis revealed no association between maternal SARS-CoV-2 status, timing, or severity and the infants' ASQ-3 scores (1).

The clinically relevant conclusions of this study are (1) the importance of maternal distress during the pandemic, which includes maternal immune activation defined as measured levels of inflammatory markers (e.g., IL-6) that exceed the normal range or in the high normal range and (2) the association of maternal immune

activation/stress/distress and its effect on infant development. It is not so much this intrauterine infection of the fetus in this case, but the effect of the maternal distress on the fetal neurologic system (1,2), (3) the importance of long-term neurodevelopmental follow up of these infants (1).

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Which Infants are More Vulnerable to Respiratory Syncytial Virus?

RSV is a respiratory virus with cold-like symptoms that causes 90,000 hospitalizations and 4,500 deaths per year in children 5 and younger. It's 10 times more deadly than the flu.

For premature babies with fragile immune systems and underdeveloped lungs, RSV proves especially dangerous.

But risk factors associated with RSV don't touch all infants equally.*

*Source: Respirator Syncytial Virus and African Americans

Caucasian Babies	Risk Factor	African American Babies
11.6%	Prematurity	18.3%
58.1%	Breastfeeding	50.2%
7.3%	Low Birth Weight	11.8%
60.1%	Siblings	71.6%
1%	Crowded Living Conditions	3%

! AFRICAN AMERICAN BABIES bear the brunt of RSV. Yet the American Academy of Pediatrics' restrictive new guidelines limit their access to RSV preventative treatment, increasing these babies' risk.



COVID-19

FREE for our NICU COMMUNITY

- Helping Children and Families Cope
- Bonding with Your Baby
- Caregivers Need Care Too



OPIOIDS and NAS

When reporting on mothers, babies, and substance use

LANGUAGE MATTERS



I am not an addict.

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



I was exposed to opioids.

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



NAS is a temporary and treatable condition.

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



My mother may have a SUD.

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

My potential is limitless.

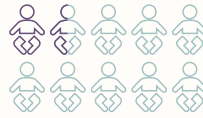
I am so much more than my NAS diagnosis. My drug exposure will not determine my long-term outcomes. But how you treat me will. When you invest in my family's health and wellbeing by supporting Medicaid and Early Childhood Education you can expect that I will do as well as any of my peers!



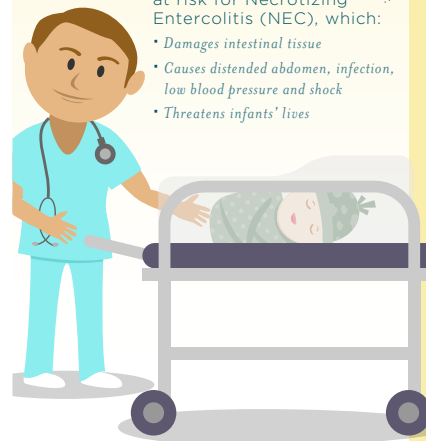
Learn more about Neonatal Abstinence Syndrome at www.nationalperinatal.org



Why PREMATURE INFANTS Need Access to an EXCLUSIVE HUMAN MILK DIET



In the United States, more than **1 IN 10 BABIES ARE BORN PREMATURE**. Micro preemies are born severely premature, weighing less than 1,250 grams.

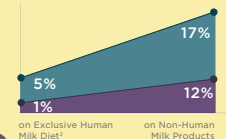


MICRO PREMIES are at risk for Necrotizing Enterocolitis (NEC), which:

- Damages intestinal tissue
- Causes distended abdomen, infection, low blood pressure and shock
- Threatens infants' lives

NEC occurrence increases when a preemie consumes non-human milk products.

When that happens:



30% of micro preemies needing surgery will die from NEC†

HOW TO HELP PREVENT NEC: EXCLUSIVE HUMAN MILK DIET

What is an Exclusive Human Milk Diet?



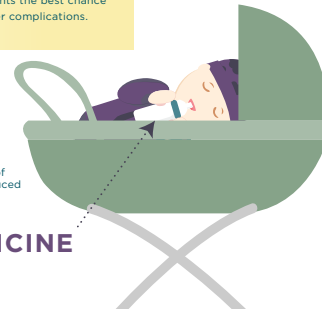
Why Is An Exclusive Human Milk Diet Important?

An Exclusive Human Milk Diet gives vulnerable infants the best chance to be healthy and reduces the risk of NEC and other complications.

- ✓ mother's milk
- ✓ human donor milk
- ✓ human milk-based fortifier

When a micro preemie can access an EXCLUSIVE HUMAN MILK DIET:

- Mortality is reduced by **75%***
- Feeding intolerance decreases*†
- Chances of NEC are reduced by **77%**‡



HUMAN MILK = MEDICINE

LEARN MORE ▶



* Hair AB, et al. "Beyond Necrotizing Enterocolitis Prevention: Improving Outcomes with an Exclusive Human Milk-Based Diet." *Breastfeeding Medicine* 2015; 10:108-116. DOI: 10.1089/bfm.2015.0124

† Abrams SA, et al. "Greater Mortality and Morbidity in Extremely Preterm Infants Fed a Diet Containing Cow Milk Protein Products." *Breastfeeding Medicine* July/August 2014; 9(6): 281-285

‡ Hall SA, et al. "Mortality and management of surgical necrotizing enterocolitis in very low birth weight neonates: a prospective cohort study." *J Am Coll Surg* 2014; Jun; 218(6): 1148-55.

§ Assad M, Elliott MJ and Abraham JH. "Decreased cost and improved feeding tolerance in VLBW infants fed an exclusive human milk diet." *Journal of Perinatology* advance online publication 12 November 2015; DOI: 10.1097/JP.2015.1169

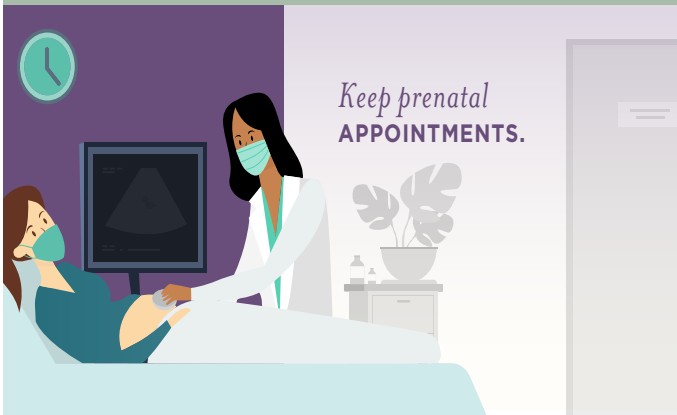
The PREGNANT MOM'S Guide To Staying SAFE DURING COVID-19



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 >

NCJIH National Coalition
for Infant Health
Protecting Access for Premature Infants through Age Two

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**

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nationalperinatal.org/skin-to-skin

NPN
NICU PARENT NETWORK

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Health and Racial in the NICU

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



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



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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.

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.

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.



Consult with specialists.



Move family education and resources online.



Provide parents lactation support.



Screen for perinatal mood and anxiety disorders (PMADs).



Facilitate shared decision-making.



Support case management.



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

myNICUnetwork.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



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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:



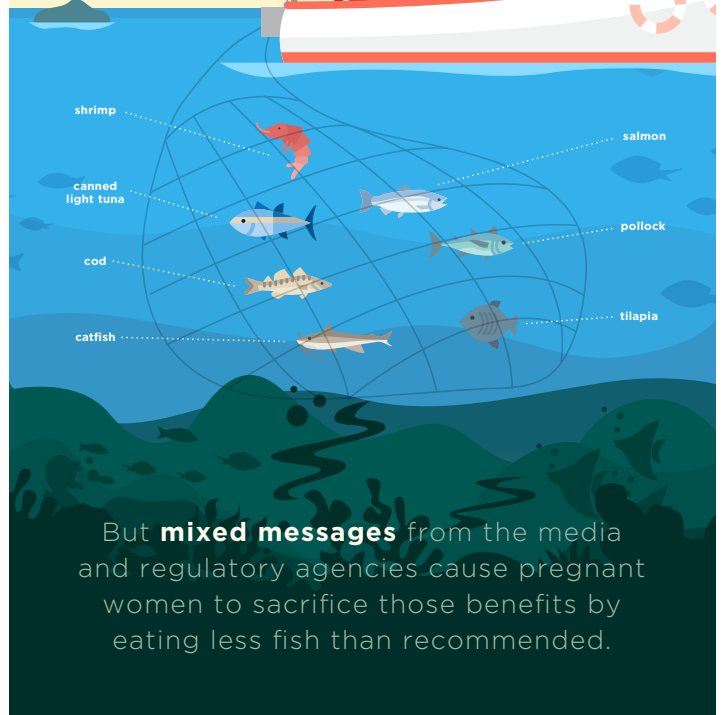
Iron



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.



Did you know that
PMAD
related suicides
account for

20%

of Postpartum
Maternal Deaths?

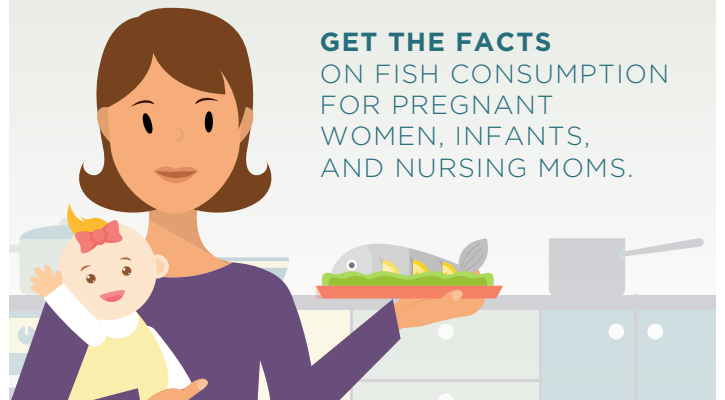
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nationalperinatal.org/mental_health

**Support the
Open Letter**



**Breastfeeding
Innovations
Team**



GET THE FACTS
ON FISH CONSUMPTION
FOR PREGNANT
WOMEN, INFANTS,
AND NURSING MOMS.

NCfIH National Coalition
for Infant Health

Protecting Access for Premature Infants through Age Two

LEARN MORE ▶

Letters to the Editor

Appeal for Ukraine and the Ukrainian and Polish Doctors Caring for over Two Million Refugees

Three weeks ago, the Western world was horrified by the calculated Russian invasion and slaughter of innocents (women, children, and men) of Ukraine. According to the UN, over 10 million Ukrainians have fled, and 1.5 million infants and children are refugees in Poland. Millions of others have escaped the on-the-ground horrors by fleeing to Moldova, Slovakia, Romania, and Hungary. The US and other NATO allies have provided military and humanitarian support to the gallant Ukrainian government for their ongoing efforts to combat this aggression. According to the UN, on March 20, 2022, over 1.5 million infants and children have arrived at the Polish border, and many are requiring medical care, proper nutrition, housing, educational services, and behavioral therapies after witnessing the horrific attacks.

Polish perinatal and neonatal medicine is highly developed with dedicated neonatologists, nurses, and others providing neonatal intensive to the 4 million infants delivered annually in this NATO country. However, the influx of refugees, including pregnant women, infants, and children within 3 weeks, has stressed their response capacity. Indeed, a Polish neonatologist serves on the Neonatology Today editorial board and, along with his colleagues, has risen to the challenges of providing quality care to the fleeing Ukrainian families with infants, children, and their families. In Poland, NICUs are concentrated in major cities with a robust transport system from smaller communities.

In this urgent time of assistance, US, Canadian, and other NICUs in Europe can provide essential support in terms of funds and equipment to support their heroic efforts. Indeed, Polish NICUs being aware that US and Canadian Neonatal care providers support their gallant efforts provides a solid moral message. The Pol-

ish Neonatal Society (<http://neonatologia.edu.pl/kontakt/>) is part of the European Association of Perinatal Medicine and the 12th Union of European Neonatal & Perinatal Societies. These NICUs need the support of US and Canadian NICUs more than ever by partnering with their NICUs, providing funding, materials, equipment, and moral support in their mission to combat the effects of the Russian war crimes against women, infants, and children.

Contacts for Polish NICUs include maria.borszewskakomnacka@gamil.com and janco@pol.med.com.pl and the Polish Neonatal Society, whose website is listed above.

On behalf of the Editorial Board of Neonatology Today,

T. Allen Merritt, MD, MHA

Professor of Pediatrics

Loma Linda University Children's Hospital

Loma Linda, CA

Dear Dr. Merritt,

The situation is dire and appears to be getting worse. We have seen images on the news of evacuated newborns from Neonatal Intensive Care Units cared for in basements and other makeshift facilities. As the number of refugees increases, the situation will increase morbidity and mortality for our most at-risk newborns.

I am aware of a number of individuals who have been trying to isolate oxygen supplies and oxygen generators for the Ukrainian people to use during these desperate times. We must remember that ongoing military operations may further endanger the delivery of healthcare, and despite our best intentions, these supplies may not ultimately benefit those most in need.

Through internal communications, I am aware that "... the Kyiv Perinatal Center recently put out a Facebook SOS for oxygen cylinders."

Translation:

This is from the Kyiv Regional Perinatal Center

SOS. Department of intensive therapy for newborns needs oxygen cylinders. Basements are not equipped properly, so we need respiratory support. Really hoping for volunteers who are actively supporting us. Need 80-100 liter cylinders. Our FB for coordination: m.me/oblroddomkyiv."

The Every Breath Counts Coalition (<https://stopppneumonia.org/>) has "contacts on the ground now in Odesa, Kyiv and further west working on oxygen deployment in partnership with the Ukraine MoH and their networks."

From my contacts at Masimo, Roy Taylor is working on an "advanced preparedness response in Ukraine and directly involved in the O2 generators being deployed by the UK government imminently."

"He needs connections to solve for the deployment end to ensure the deployment considers the end set up for neonatal departments underground (in metro) for the cities that still have access, to ensure the supply of zeolite, the protection of generators, and the infrastructure for the neonatologists. He really needs to speak directly to a leading neonatologist in Ukraine but needs additional connections."

Roy can be reached at +447501444047 -- his number best reachable by WhatsApp or messenger.

We pray for the cessation of hostilities and lasting peace during these desperate times. NT will do what we can to help set up com-



munications with those most equipped to provide solutions.



Mitchell Goldstein, MD, MBA, CML

Editor in Chief

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c/o Mitchell Goldstein, MD

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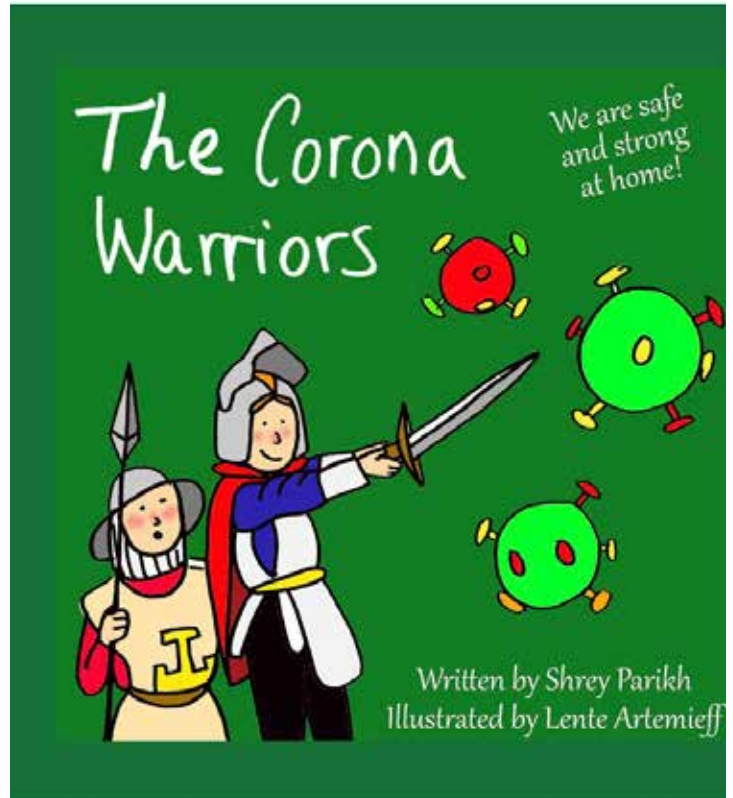
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Erratum (Neonatology Today February 2022)

Neonatology Today is not aware of any erratum affecting the February, 2022 edition.

Corrections can be sent directly to LomaLindaPublishingCompany@gmail.com. The most recent edition of Neonatology Today including any previously identified erratum may be downloaded from www.neonatologytoday.net.

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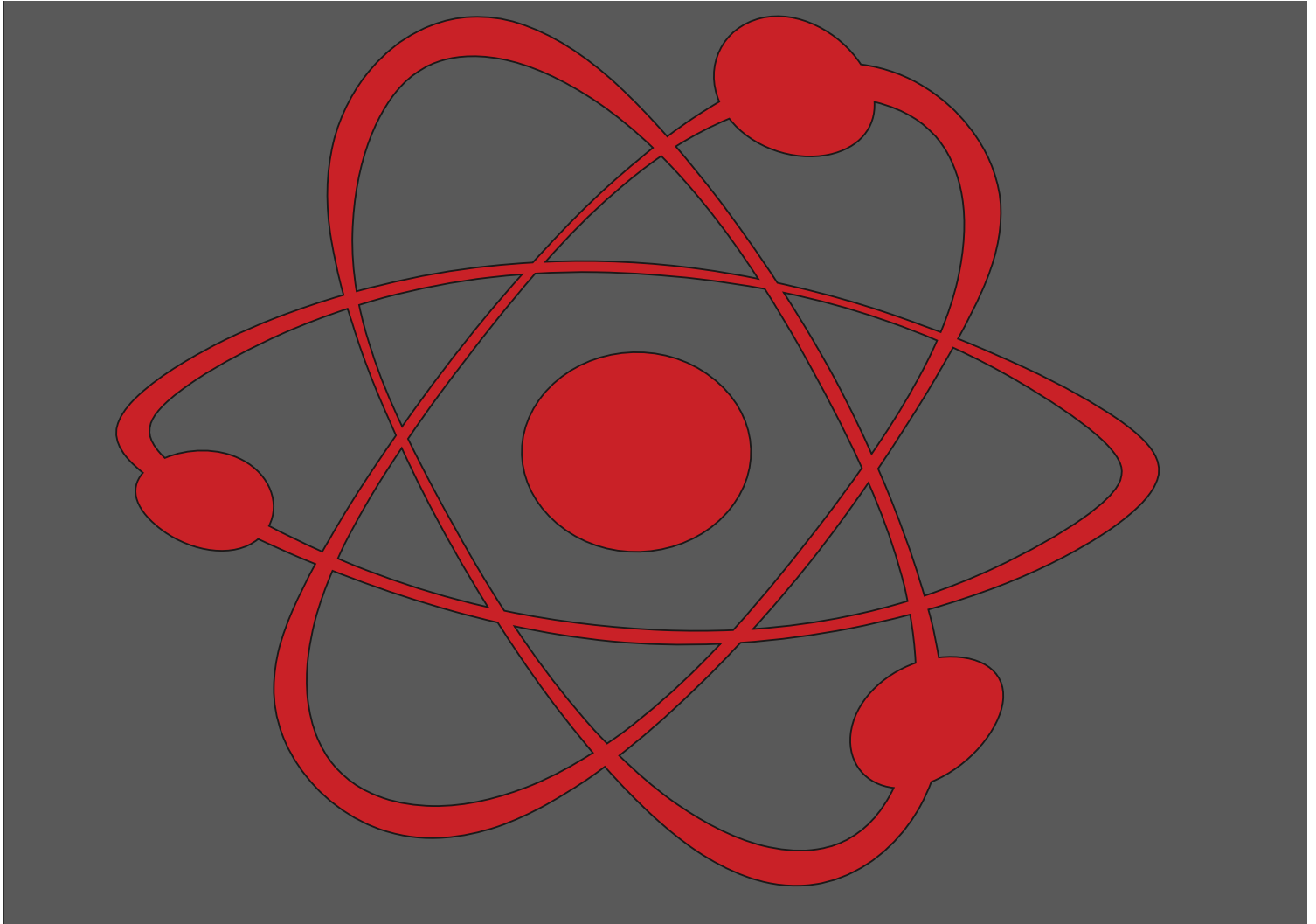
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www.99nicu.org

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Will your **PRETERM INFANT** need **EARLY INTERVENTION** services?

Preterm infants are:

2x more likely to have developmental delays

5x more likely to have learning challenges



1 in 3 preterm infants will require support services at school



Early intervention can help preterm infants:



Enhance language and communication skills



Build more effective learning techniques



Process social and emotional situations



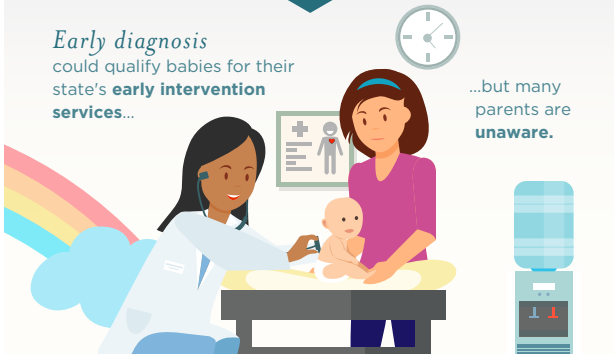
Address physical challenges



Prevent mild difficulties from developing into major problems

Early diagnosis could qualify babies for their state's **early intervention services**...

...but many parents are **unaware**.



NICU staff, nurses, pediatricians and social workers should talk with NICU families about the challenges their baby may face.

Awareness, referral & timely enrollment in early intervention programs can help **infants thrive** and grow.



NCFIH National Coalition for Infant Health
Protecting Access for Premature Infants through Age Two
www.infanthealth.org

Visit CDC.gov to find contact information for your state's early intervention program.

Las nuevas mamás necesitan acceso a la detección y tratamiento para **LA DEPRESIÓN POSTPARTO**



1 DE CADA 7 MADRES AFRONTA LA DEPRESIÓN POSTPARTO, experimentando



Sin embargo, sólo el **15%** recibe tratamiento!

LA DEPRESIÓN POSTPARTO **NO TRATADA PUEDE AFECTAR:**

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



La salud de la madre

La capacidad para cuidar de un bebé y sus hermanos

PARA AYUDAR A LAS MADRES A ENFRENTAR LA DEPRESIÓN POSTPARTO



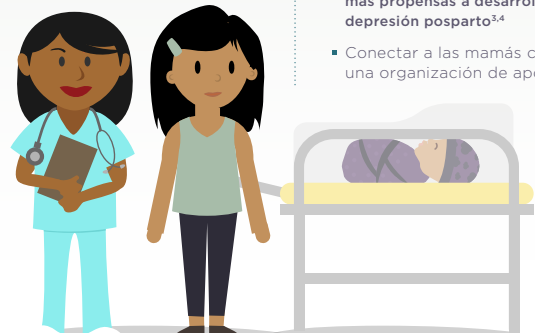
LOS ENCARGADOS DE FORMULAR POLÍTICAS PUEDEN:

- 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 postparto**^{3,4}
- Conectar a las mamás con una organización de apoyo



NCFIH National Coalition for Infant Health
Protecting Access for Premature Infants through Age Two
www.infanthealth.org

¹ American Psychological Association. Accessed on: <http://www.apa.org/women/resources/reports/postpartum-depression.aspx>

² National Institute of Mental Health. Accessed on: <http://www.nimh.nih.gov/health/publications/postpartum-depression-facts/index.shtml>

³ Journal of Perinatology (2015) 35, 529–536. doi:10.1097/JP.0000000000000147

⁴ Prevalence and risk factors for postpartum depression among women with problem and low-birth-weight infants: a systematic review. Vigod SN, Villages L, Dennis CL. *PLoS ONE* 2010 Apr; 11(7):1540-50.

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at the Intersection

of Health Equity

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- Innovative Models of Care
- Applied or Basic Research
- Public Policies or Local Initiatives

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www.NPAconference.org

 National
Perinatal
Association

Upcoming Medical Meetings

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and Adults**
March 29-April 2, 2022
Snowbird, UT
<https://paclac.org/advances-in-care-conference/>

**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/>

Pediatric Academic Society Meeting
Denver, CO
April 21-25, 2022
<https://www.pas-meeting.org/pas-2022/>

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Perinatology at the Intersection of
Health Equity and Social Justice**
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Denver, CO
May 2-4, 2022
www.NPAconference.org

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Anaheim Convention Center
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- 24/7 coverage provided by NNP team and Fellows



EOE/AAE

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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.

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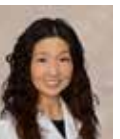
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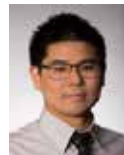
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Neonatology and the Arts

This section focuses on artistic work which is by those with an interest in Neonatology and Perinatology. The topics may be varied, but preference will be given to those works that focus on topics that are related to the fields of Neonatology, Pediatrics, and Perinatology. Contributions may include drawings, paintings, sketches, and other digital renderings. Photographs and video shorts may also be submitted. In order for the work to be considered, you must have the consent of any person whose photograph appears in the submission.

Works that have been published in another format are eligible for consideration as long as the contributor either owns the copyright or has secured copyright release prior to submission.

Logos and trademarks will usually not qualify for publication.

This month we continue to feature artistic works created by our readers on one page as well as photographs of birds on another. This month's original artwork is features Paula Whiteman, MD again with a Humming Bird in the Cat Tails. Your bird this month is an Oaxacan Wood Carving of an Owl from my collection— by Jacobo and Maria Angeles. Their gallery can be found here: <https://jacoboymariaangeles.com/?lang=en>



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Manuscript Submission: Instructions to Authors

1. Manuscripts are solicited by members of the Editorial Board or may be submitted by readers or other interested parties. Neonatology Today welcomes the submission of all academic manuscripts including randomized control trials, case reports, guidelines, best practice analysis, QI/QA, conference abstracts, and other important works. All content is subject to peer review.

2. All material should be emailed to: LomaLindaPublishingCompany@gmail.com in a Microsoft Word, Open Office, or XML format for the textual material and separate files (tif, eps, jpg, gif, ai, psd, or pdf) for each figure. Preferred formats are ai, psd, or pdf. tif and jpg images should have sufficient resolution so as not to have visible pixilation for the intended dimension. In general, if acceptable for publication, submissions will be published within 3 months.

3. There is no charge for submission, publication (regardless of number of graphics and charts), use of color, or length. Published content will be freely available after publication. There is no charge for your manuscript to be published. NT does maintain a copyright of your published manuscript.

4. The title page should contain a brief title and full names of all authors, their professional degrees, their institutional affiliations, and any conflict of interest relevant to the manuscript. The principal author should be identified as the first author. Contact information for the principal author including phone number, fax number, e-mail address, and mailing address should be included.

5. A brief biographical sketch (very short paragraph) of the principal author including current position and academic titles as well as fellowship status in professional societies should be included. A picture of the principal (corresponding) author and supporting authors should be submitted if available.

6. An abstract may be submitted.

7. The main text of the article should be written in formal style using correct English. The length may be up to 10,000 words. Abbreviations which are commonplace in neonatology or in the lay literature may be used.

8. References should be included in standard "NLM" format (APA 7th may also be used). Bibliography Software should be used to facilitate formatting and to ensure that the correct formatting and abbreviations are used for references.

9. Figures should be submitted separately as individual separate electronic files. Numbered figure captions should be included in the main file after the references. Captions should be brief.

10. Only manuscripts that have not been published previously will be considered for publication except under special circumstances. Prior publication must be disclosed on submission. Published articles become the property of the Neonatology Today and may not be published, copied or reproduced elsewhere without permission from Neonatology Today.

11. NT recommends reading Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals from ICMJE prior to submission if there is any question regarding the appropriateness of a manuscript. NT follows Principles of Transparency and Best Practice in Scholarly Publishing (a joint statement by COPE, DOAJ, WAME, and OASPA). Published articles become the property of the Neonatology Today and may not be published, copied or reproduced elsewhere without permission from Neonatology Today.

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Please submit your manuscript to: LomaLindaPublishingCompany@gmail.com



2022 Workshop on Neonatal-Perinatal Practice Strategies

March 25-27, 2022
Scottsdale, AZ



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Registration is open: Join us in Scottsdale!

The [2022 Workshop on Neonatal-Perinatal Practice Strategies](#) teaches attendees to better demonstrate effective leadership skills, resolve conflicts and motivate others in their practice setting to optimize team performance. Attendees will have networking opportunities to enhance career development. Based on evidence-based medicine, learners will recognize strategies for interpreting and integrating published research to make changes in clinical practice. Any pediatric professional caring for the fetus and newborn should attend.

Earn:

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For the latest updates and to register, visit shop.aap.org/perinatal2022.

Save \$150!
Register by February 25, 2022 for early bird rates

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Be sure to register for the Neonatal Coding Seminar!

S01: Coding Seminar (*Separate Registration Required*)

Friday, March 25, 2022

7:30AM-12:30PM

Scott Davis Duncan, MD, FAAP

This session will update the audience on changes in neonatal coding practices, using didactic presentations and clinical scenarios. There will be time for questions and discussion with audience participation.

S02: Neonatal Coding: Afternoon Deep Dive* (*Must be registered for S01 Coding Seminar*)

Friday, March 25, 2022

1:00PM-3:00PM

Scott Davis Duncan, MD, FAAP

Join the Section on NPM Coding Trainers Committee immediately after lunch for an afternoon discussion exclusively devoted to issues and concerns relevant to your practices.

**Not designated for CME credit*

Sessions Include:

- Challenged to Change: Confronting Structural Racism within the NICU Ecosystem
- Developing National Standards to Support Risk-Appropriate Neonatal Care
- Trauma Informed Clinical Care Practice: An Introduction Patient Revenue vs Patient Care
- The Credible Pediatrician Advocate
- Medical Improv for Fostering Wellness and Resilience in the Workplace (Half-Day Seminar)
- And more!

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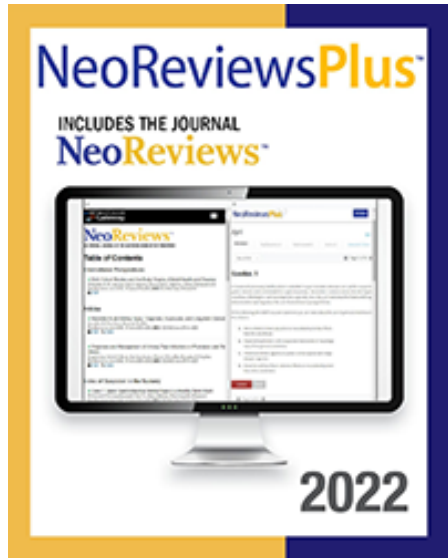
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**Limited offer good only during course registration. Does not apply to renewals or previously purchased subscriptions and cannot be combined with any other offer. Discount savings is calculated off of non-member rates. All pricing and specifications subject to change without notice.*

Due to Covid-19 restrictions, space at this course is limited. The course may fill, registration may close, and hotel room blocks may sell out, even before the early bird deadline. Register early to avoid disappointment.

The AAP cannot be responsible for expenses incurred by an individual who is not confirmed and for whom space is not available at the course. Costs incurred, such as airline and hotel penalties, are the responsibility of the individual.

COVID-19 Safety Precautions

As this course approaches, the AAP will seek guidance from local and national public health experts on implementing the necessary precautions to ensure the health and safety of all attendees, staff, and local community members.

Proof of vaccination will be required for all registrants. Instructions for providing proof will be sent to registrants soon. Adults and children older than 2 years of age are required to wear a mask in all AAP course settings.

Save \$150!
Register by February 25, 2022 for early bird rates

REGISTER



NICU BABY'S Bill of Rights

1- THE RIGHT TO ADVOCACY

My parents know me well. They are my voice and my best advocates. They need to be knowledgeable about my progress, medical records, and prognosis, so they celebrate my achievements and support me when things get challenging.

2- THE RIGHT TO MY PARENTS' CARE

In order to meet my unique needs, my parents need to learn about my developmental needs. Be patient with them and teach them well. Make sure hospital policies and protocols, including visiting hours and rounding, are as inclusive as possible.

3- THE RIGHT TO BOND WITH MY FAMILY

Bonding is crucial for my sleep and neuroprotection. Encourage my parents to practice skin-to-skin contact as soon as and as often as possible and to read, sing, and talk to me each time they visit.

4- THE RIGHT TO NEUROPROTECTIVE CARE

Protect me from things that startle, stress, or overwhelm me and my brain. Support things that calm me. Ensure I get as much sleep as possible. My brain is developing for the first time and faster than it ever will again. The way I am cared for today will help my brain when I grow up. Connect me with my parents for the best opportunities to help my brain develop.

5- THE RIGHT TO BE NOURISHED

Encourage my parents to feed me at the breast or by bottle, whichever way works for us both. Also, let my parents know that donor milk may be an option for me.

6- THE RIGHT TO PERSONHOOD

Address me by my name when possible, communicate with me before touching me, and if I or one of my siblings pass away while in the NICU, continue referring to us as multiples (twin/triplets/quads, and more). It is important to acknowledge our lives.

7- THE RIGHT TO CONFIDENT AND COMPETENT CARE GIVING

The NICU may be a traumatic place for my parents. Ensure that they receive tender loving care, information, education, and as many resources as possible to help educate them about my unique needs, development, diagnoses, and more.

8- THE RIGHT TO FAMILY-CENTERED CARE

Help me feel that I am a part of my own family. Teach my parents, grandparents, and siblings how to read my cues, how to care for me, and how to meet my needs. Encourage them to participate in or perform my daily care activities, such as bathing and diaper changes.

9- THE RIGHT TO HEALTHY AND SUPPORTED PARENTS

My parents may be experiencing a range of new and challenging emotions. Be patient, listen to them, and lend your support. Share information with my parents about resources such as peer-to-peer support programs, support groups, and counseling, which can help reduce PMAD, PPD, PTSD, anxiety and depression, and more.

10- THE RIGHT TO INCLUSION AND BELONGING

Celebrate my family's diversity and mine; including our religion, race, and culture. Ensure that my parents, grandparents, and siblings feel accepted and welcomed in the NICU, and respected and valued in all forms of engagement and communication.

Presented by:



NICU PARENT NETWORK

NICU Parent Network

Visit nicuparentnetwork.org to identify national, state, and local NICU family support programs.

* The information provided on the NICU Baby's Bill of Rights does not, and is not intended to, constitute legal or medical advice. Always consult with your NICU care team for all matters concerning the care of your baby.

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@drpaulwhiteman



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