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Fresh Outlook to Understanding Maternal Stress in NICUs

Chantal Lau, PhD

The increased survival of preterm infants in neonatal intensive care units (NICUs) over the last decades has heightened our awareness of the stress encountered by their mothers. Unfortunately, no well-defined intervention protocols are yet available to assist these parents during such unfortunate times (1-7). This likely ensues from our limited understanding of the challenges these mothers face in tandem with the concern over their child(ren) 's fragility, particularly their temperament and/or hardships in their personal life (8). Indeed, perception of stressfulness is not only a result of a recipient's traits, e.g., resilience, coping abilities (9) but also of their environment. These elements together determine the response intensity of an individual to a particular prolonged stressful situation.

"This brief aims to share with neonatal/perinatal practitioners the greater in-depth understanding we recently gained regarding the complex "assortment" of stressors that mothers face simultaneously during their infant's NICU hospitalization (10). As mothers are not the patients, it is understandable that NICU providers do not necessarily know how best to support them. "

This brief aims to share with neonatal/perinatal practitioners the greater in-depth understanding we recently gained regarding the complex "assortment" of stressors that mothers face simultaneously during their infant's NICU hospitalization (10). As mothers are not the patients, it is understandable that NICU providers do not necessarily know how best to support them. However, the latter's concerns over their well-being should not be undervalued as the integrity of a mother-infant dyad is crucial for her infant's proper development and growth (s). The customary concerns expressed by NICU staff, e.g., physicians, nurses, lactation consultants, are primarily directed towards maternal depression and anxiety, e.g., reasons for infrequent visits and/or breastfeeding/pumping. However, our recent study highlights the complexity of how the *interactions* of all the stressors facing mothers at the same time may be the actual culprits that prevent us from offering these parents better support during their baby(ies)' NICU hospitalization. A brief description of our study (10) is presented herein to propose a more rational reason as to why mothers' attitudes do not always meet our expectations.

In nature, ecologists have long recognized how the multitude of stressors simultaneously impacting an organism within its natural ecosystem could lead to uncertain developmental or behavioral outcomes. The latter is not only a result of the impact of the individual stressors but rather of the complex multitude of potential synergistic/antagonistic interactions occurring among them. Consequently, foretelling any conceivable outcome(s) becomes difficult (11-13). Animals respond in a similar manner to their environment. Although it is common to study the individual effects of stressors in animals, their combined effects have not received the attention they deserve (13). Based on the similarities existing between organisms under stress in our natural world and our NICU mothers, it was deemed of value to examine whether the Multiple-Stressor modeling approach well recognized in Ecology may assist in the development of similar maternal mediational models during their infants' NICU hospitalization. With the ability to identify maternal traits by their NICU experiences through self-reported psychological tests, it was hypothesized that the Multiple-Stressor theoretical framework might allow for the development of similar mediational models of maternal stress. If achievable, neonatal care providers would gain a better "grasp" of the varied stressors most impactful to these parents' respective attributes and socioeconomic environment.

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In this recent study, 30 mothers of infants born between 24- and 29-week gestation were recruited. Table 1 shows the self-reported psychological tests used to evaluate subjects' characteristics and stress responses to the NICU. Two focused on personal characteristics/traits, i.e., the magnitude of a responder's emotional responses to stress [Affect Intensity Measure (AIM)] and his/her truthfulness when responding to self-reported testing [Social Desirability Scale (CM)]. Five tests monitored their stress responses to anxiety (BSI-Anx), coping skills under stressful situations (CISS), postpartum depression (EDPS), perceived social support (MSPSS), and parental stress scale in the NICU (PSS:NICU). Table 2 presents subjects' responses by ethnicity/race. Self-reported testing was conducted at two weeks postpartum once their infants were deemed clinically stable. One-way ANOVA and post hoc Fisher LSD analyses were used to compare subjects' characteristics and stress responses between ethnic/racial groups. Significant differences between groups were only observed between

Table 1 - Self-reported Traits & Stress Responses

Traits	To evaluate
Affect Intensity Measure (**AIM**) {Larsen, 1987 #9877}	• trait characterizing an individual's magnitude of emotional response (the higher the score, the greater the emotional response)
Crowne-Marlowe Social Desirability Scale (**CM**) {Crowne, 1960 #7929}	• trait characterizing an individual's - inclination to be viewed favorably by others - truthfulness of responses (the lower the score, the more truthful the response)
Stress Responses	
Anxiety (Brief Symptom Inventory) (**BSI-Anx**) {Derogatis, #12552}	• anxiety
Coping Inventory for stressful Situations (**CISS**) {Endler, 1990 #12557}	• coping skill response via: - avoidance-oriented behaviors - emotion-oriented behaviors - task-oriented behaviors (the higher the score, the greater the stress)
Edinburgh Postnatal Depression Scale (**EPDS**) {Cox, 1987 #7745}	• postpartum depression (the higher the score, the greater the depression
Multidimensional Scale of Perceived Social Suppport (**MSPSS**) {Zimet, 1988 #8208}	• perceived social support (the higher the score, the greater the perceived social support)
Parental Stress Scale:NICU (**PSS:NICU**) {Miles, 1993 #3737}	• perceived stress in the NICU from: - sights & sounds in NICU (S&S) - baby's looks/behaviors (Looks) - parental role alteration (Parent) - staff communication (Staff) (the higher the scores, the more stressful these factors)

education, income, and subjects' social desirability trait. No significant difference was noted between ethnicity/race in maternal responses to self-reported tests that monitored anxiety, coping skills through the use of avoidance-, emotion-, and/or task-oriented behaviors, depression, perceived social support or lack thereof, and PSS:NICU stress.

Insofar as our interest was to identify maternal characteristics and stressors that may be implicated in the maternal self-reported stress responses monitored (Table 2), multiple regression analyses were first conducted to identify maternal attributes significantly associated ($p \leq 0.05$) with individual stress outcomes for all mothers. Following this, the Multiple-Stressor approach was evaluated using the "Best Subset Regression" analysis (www.minitab.com). This statistical method compares "best-fitting models" as determined by ranking all the subsets of significant maternal attributes or predictors identified in order of highest to lowest adjusted R^2 values (https://support.minitab.com/en-us/minitab-express/1/help-and-how-to/modeling-statistics/regression/how-to/best-subsets/before-you-start/overview/). Our study focused only on the four factors that *best* contributed, i.e., highest p-values, to each of the ten stress outcomes monitored (Table 3). The latter shows how mothers' responses to the varied mediational stress models were associated with different combinations of maternal attributes that had differing positive (synergistic) or negative (antagonistic) correlations depending on the stress outcomes monitored [NB: not all of the four factors identified within each model necessarily were of statistical significance ($p \leq 0.05$)].

"In brief, our recent study (10) validated the applicability of the Multiple-Stressor framework to clinical studies, offering a means to appreciate better the intricate struggle confronting NICU mothers."

In support of the Multiple-Stressor theoretical framework, these data show how changes in a specific maternal attribute can lead to a series of "chain reactions" impacting other stress outcomes through interactions between them. For instance, at a first

Table 2. Maternal Characteristics, Traits, & Stress Responses by Ethnicity/Race

Maternal Characteristics/Traits				
	Caucasian	**African-American**	**Hispanic**	**p****
Number	13	8	9	
Maternal age	31.6 ± 6.5*	26.8 ± 6.6	26.4 ± 6.8	0.128
Education	6.6 ± 1.4 [a]	6.2 ± 1.5 [b]	4.4 ± 1.6 [a,b]	**0.001**
Income	3.3 ± 0.6 [a,b]	2.0 ± 0.8 [a]	1.9 ± 1.0 [b]	**<0.001**
Infant's gestational age (wks)	27.8 ± 1.5	26.5 ± 1.4	26.4 ± 2.0	0.131
Infant's birth weight (g)	1044 ± 233	821 ± 145	970 ± 210	0.070
Maternal health[#]	1.3 ± 1.5	1.4 ± 0.5	0.8 ± 0.4	0.520
Affect Intensity Measure (AIM)	3.6 ± 0.4	3.8 ± 0.6	3.9 ± 0.5	0.465
Social Desirability Scale (CM)	16.5 ± 5.8 [a b]	26.4 ± 4.2 [a]	22.3 ± 4.2 [b]	**0.001**
Self-Reported Stress Responses				
Anxiety (BSI-Anx)	57.3 ± 12.3	52.9 ± 8.4	48.9 ± 11.5	0.297
Coping Skills (CISS) - Use of Task-oriented behavior	49.7 ±1 5.1	56.0 ± 8.6	45.0 ± 10.8	0.273
- Use of Emotion-oriented behavior	48.0 ± 9.4	47.4 ± 11.1	48.5 ± 12.2	0.980
- Use of Avoidance-oriented behavior	46.5 ± 11.4 [a]	59.4 ± 12.5 [a]	47.8 ± 10.8	0.060
Depression (EPDS)	10.9 ± 4.7	11.6 ± 6.2	13.5 ± 5.5	0.546
Perceived Social Support (MSPSS)	6.5 ± 0.5	5.5 ± 1.3	6.2 ± 0.9	0.084
Parental Stress Scale (PSS:NICU) - NICU Sight & Sound	3.1 ± 0.7	2.5 ± 1.2	2.3 ± 1.3	0.268
- Baby's Looks	3.4 ± 0.7	2.9 ± 1.2	3.3 ± 1.1	0.479
- Parenting Role	4.3 ± 0.9	4.1 ± 1.1	3.9 ± 1.2	0.736
- Staff Communication	2.2 ± 1.0	1.5 ± 0.6	1.7 ± 0.9	0.252

* Mean ± SD ** 1 way ANOVA [a,b] post hoc Fisher LSD: p<0.05 between symbols

[#] Number of postpartum visits to a healthcare provider

Codes	1	2	3	4	5	6	7	8
Education	< 6th grade	6th	8th	10th	12th	14th	16th	<16th
Income	<$10,000	$10,000-49,999	$50,000-99,999	≥ $100,000				

Table 3. Mediational models of the 4 factors contributing *best* to each Stress Outcome

Stress Outcomes	Combined 4 factors/predictors contributing *best* to each Stress Outcomes			
Anxiety (BSI-Anx)	Income (+)[#] (**<0.001**)[§]	CISS-Task (-)[#] (**0.001**)	CISS-Avoidance(+) (**0.004**)	AIM (-) (**0.021**)
CISS - Task-oriented	Education (+) (**0.002**)	BSI-Anx (-) (**0.002**)	MSPSS (+) (**0.010**)	CISS-Avoidance (+) (**0.026**)
- Emotion-oriented	EPDS (+) (**0.001**)	CM (-) (**0.024**)	Looks (-) (0.062)	AIM (+) (0.369)
- Avoidance-oriented	Income (-) (**<0.001**)	AIM (+) (**<0.001**)	CISS-Task (+) (**<0.001**)	BSI-Anx (+) (**0.004**)
Depression (EPDS)	Parent Role Alteration (+) (**<0.001**)	CISS-Emotion (+) (**0.001**)	Race (**0.002**)	MSPSS (-) (**0.006**)
MSPSS	CM (-) (**<0.001**)	CISS-Emotion (-) (**0.008**)	CISS-Task (+) (**0.032**)	AIM (+) (0.092)
PSS:NICU - Sights & Sounds	Baby's Looks (+) (**0.012**)	CM (-) (**0.020**)	Education (+) (**0.028**)	AIM (+) (**0.049**)
- Baby's Looks	Parental Role Alteration (+) (**<0.001**)	Income (+) (**0.006**)	Race (**0.008**)	CISS-Emotion (-) (0.121)
- Parental Role Alteration	Baby's Looks (+) (**<0.001**)	Race (**0.002**)	EPDS (+) (**0.003**)	BSI-Anx (-) (0.386)
- Staff Communication	EPDS (+) (**0.020**)	Income (+) (0.075)	CISS-Emotion (-) (0.088)	Sights &Sounds (+) (0.197)

[#] (+) positive and (-) negative correlation with Stress Outcomes

[§] p value for individual factor/predictor within each mediational model (significance at p≤0.05)

level, Depression can be impacted by Parental Role Alteration (PSS:NICU), CISS-Emotion, and MSPSS [Table 3]. At a secondary level, Parental Role Alteration, in turn, would lead to an altered Parental Perception of Baby's looks (PSS:NICU) while CISS-Emotion and MSPSS affect responders' truthfulness (CM) in their response to their self-reported tests. At a third level, MSPSS may additionally affect the respondents' CISS-Task.

"In conclusion, our observations support the use of the Multiple-Stressor mediational modeling in human studies. This novel approach offers a more comprehensive understanding of the complex psychosocial environment NICU mothers face than currently available."

In brief, our recent study (10) validated the applicability of the Multiple-Stressor framework to clinical studies, offering a means to appreciate better the intricate struggle confronting NICU mothers. It illustrates how such an analytical approach can assist in identifying not only the maternal attributes at risk but, importantly, their interactive "networking" pathways in affecting overall maternal well-being. With a clearer understanding of the impact that maternal attributes can have on differing stress outcomes, it is advanced that such an approach can facilitate the development of more efficient and integrated intervention protocols to assist NICU mothers. However, caution is raised towards the truthfulness of subjects' responses to self-reported tests, as we have already observed in earlier studies (8,14).

In summary, the following observations are advanced: 1. the different interactions existing between maternal characteristics and their self-reported stress responses validate the use of the Multiple-Stressor framework for human studies; 2. the ability to identify the most stressful outcomes early on in babies' NICU stay will "facilitate early targeted guidance and social support to help mothers develop more constructive parenting …and positive mutualistic parenting routine for themselves and their babies" (8); 3. identification of the synergistic or antagonistic impact of these attributes onto individual stress outcomes would facilitate psychosocial therapists in offering more focused and relevant approach(es) to better support these mothers; 4. the "chain reaction/networking" pathways taken by individual attributes may better guide therapeutic approaches; 5. this approach can help identify the impacts that factors unique to each parent, e.g., education, income, race, AIM, can have on maternal stress outcomes.

In conclusion, our observations support the use of the Multiple-Stressor mediational modeling in human studies. This novel approach offers a more comprehensive understanding of the complex psychosocial environment NICU mothers face than currently available.

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Target fortification at the Wake Forest Baptist Health NICU

The Miris HMA™ was cleared by FDA in the end of December 2018. Soon after the company received a request from the Wake Forest Baptist Health NICU and they subsequently became the first NICU in US with the FDA cleared version of the Miris HMA™. Over a year down the road we checked in with Doctor Amit Chandel, Assistant Professor of Pediatrics, to hear how the Miris HMA™ has improved the nutritional care of their smallest babies.

With Dr Chandel

"This approach of fortification is very precise and has growing evidence about improving growth. It gives us an objective way to fortify human milk instead of just guessing with standard and adjustable fortification techniques."

How did you come to hear about the Miris HMA™?

I had always wondered that with so much advancement in science and tests moving from labs to bedside, that there would be something available to analyze the components of breast milk, so that we could really know what nutrition we are giving to our most vulnerable preterm newborns. Infant nutrition is one of my core interests. Our Neonatology Chief Dr Shenberger was aware that there is a breast milk analyzer by Miris which is used in NICUs in Europe and that it had recently been approved by US-FDA. I was immediately drawn to this and we purchased the milk analyzer in the ensuing months for our NICU.

We were using the standard and adjustable techniques for fortification of human milk in our NICU, both these approaches either under or over shoot the optimal nutritional needs for the infant. So, we were very excited to hear about Miris HMA which could help these infants by analyzing the maternal milk and giving us the information about the macronutrient composition of mom's milk.

What did you find when you started analyzing mother's milk in your NICU?

Research has shown variation in maternal milk composition with dietary intake, gestational age, corrected gestational age of the infant in the same mother and large variation between mothers. When we started analyzing maternal milk in our NICU, we found similar variation in maternal milk macronutrient composition which was very fascinating.

What has been the benefits of the analysis?

We are currently analyzing the milk of mothers who had babies born less than 31 weeks gestational age. We wanted to focus on the babies who are the most vulnerable and we can get at least 4 weeks of analysis and target fortification. Our target fortification program has been running for 9 months now and, despite our numbers being small, we are definitely seeing a positive trend towards better weight gain and linear growth in babies receiving target fortified milk. An additional benefit that is hard to quantify is that mothers feel very satisfied providing their milk for analysis knowing that it would help their little ones grow better.

What does the target fortification process look like in your NICU? Who does what?

Our team consists of lactation consultant, NICU nutritionists, milk technicians and myself. We currently analyze two times per week. Our lactation consultant provides information regarding milk analysis to eligible mothers during her lactation consultation and provides mothers with the milk collection kit. When mothers return milk for analysis, it is analyzed by our lactation consultant. The report generated by the HMA is reviewed by the NICU nutritionists and macronutrient components are put into an automated excel based calculator, which tells us how much protein needs to be added to the maternal milk. This information is relayed by the nutritionists to the milk technicians, who will finally prepare the milk to specification and forward the target fortified milk to the nurse who is caring for the individual baby.

How do you manage billing of the analysis as it does not have a CPT code?

We currently have not been billing the analysis, but this is something that we are thinking about for the future.

Clinicians, not analyzing in their NICU, often asks us if mothers react negatively to the analysis of their milk, that they would get the impression that there is concerns regarding the content of their milk. What is your experience, how have you informed mothers of the purpose of the analysis and what have their reaction been?

I think it is a genuine concern which cannot be brushed away. We discussed this question within our team when we were implementing the milk analysis in our NICU. To address this concern, we developed a standard way for communicating the benefits of analyzing and emphasized that it is being used to optimize maternal milk to the needs of the growing preterm infant. So far, our experience has been really good, and mothers feel very empowered and satisfied that they are giving the milk for analysis and upon analysis if any optimization is required it is provided to their infants.

One year in, what would your advice be to a NICU considering implementing human milk analysis and target fortification in their NICU?

Optimal Nutrition is one of the cornerstones for good growth and development of these vulnerable preterm infants who are predisposed to growth failure because of being born preterm and various other comorbidities associated with prematurity, like chronic lung disease. With macronutrient variation in human milk being a known fact, human milk analysis provides a quick way of analyzing these variations and targeted fortification a tool to overcome them. This approach of fortification is very precise and has growing evidence about improving growth. It gives us an objective way to fortify human milk instead of just guessing with standard and adjustable fortification techniques. I think this is going to be adopted in more and more NICUs in coming time.

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Disaster Series: Understanding Disasters – Classifications and infrastructure

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

Abstract

A disaster is an environmental disruption of medical care, a victim generator that disrupts the ability to treat multiple patients. We classify to understand and make sense of the world, but a disaster has flux, uncertainty, and ambiguity, bedeviling our ability to classify. Structures in the abstract are more amenable to classification and give a sense of order. This 'top-down' perspective, however, is outside the flux of events. Within the flux of events, a 'bottom-up' perspective, the operator is personally at risk, and changing contexts necessitates updating less reliable information. In classifying, we lose details due to irrelevance, but what is irrelevant now may become relevant later. Different communities working in the disaster space may or may not cooperate. 'Boundary objects' are ambiguous yet constant objects shared by adjacent domains, contributing to cooperation even when the communities do not understand each other. Infrastructure as human behavior reaches beyond the single event. We can identify and use boundary objects for the rapid development of communication when disaster brings diverse organizations together.

"A disaster is an environmental disruption of medical care, a victim generator that disrupts the ability to treat multiple patients (1). This functional and ecological definition of disasters helps us understand the flux of continuous and discontinuous change from the event and during the response."

Introduction:

A disaster is an *environmental disruption* of medical care, a *victim generator* that disrupts the *ability to treat* multiple patients (1). This functional and ecological definition of disasters helps us understand the flux of continuous and discontinuous change from the event and during the response. We have a natural drive to understand and identify patterns. We are trained to predict and respond to those predictions. Our concepts become standards to give us direction, anchor care, and define an error. These are classifications. Classifications may have less utility in the complexity of neonatal care in an austere, hazardous environment. We must guard against too much abstracting to fit our contextual situation into abstract concepts and classifications. We lose information and gain vulnerability (2).

The NICU becomes exposed to environmental threats that are physical, social, and behavioral. Death can come from any or a combination of the three threats. Physicians normally focus on physiological threats (inadequate tissue oxygen delivery) but now are exposed to physical threats and become more responsible for behavioral threats. Because death can occur due to the disaster, the *potential for fatalities* can function as a 'boundary object' for communication (discussed later in this article).

- Physical threats from uncontrolled energy
- Social threats from outside groups impeding care (3)
- Behavioral threats from situational cognitive distortions due to stress, fear, or threat (4-6)

Our goal becomes survivability, the prevention of deaths that result from post-disaster events. Survivability also includes pre-disaster actions such as planning, training, and structural design, but for our purposes, we discuss the actions the Neonatologist can take to reduce fatalities once the sequence of events has commenced.

With a disaster, the environment becomes an open system, and the NICU interacts with other, often nonmedical, systems such as FEMA, EMS, the fire department, and the air traffic control system. These organizations have their infrastructures and standards of information. We share information, but information across disciplines can be misunderstood. Because the information has entropy, it can become corrupted by its transmission to others (7).

Classification of disasters, such as earthquakes or hurricanes, has administrative, legal, and academic purposes (8, 9). In medical care, a disaster explains the uncontrolled addition of pathology and constraints on providing care. In the *Neonatology Today: Disaster Series,* we will present High Reliability *Organizing* to use routine operations as the disaster response toward High-Reliability *Operations*.

Survivability

The infant with survivable pathology may die from environmental exposure or the lack of access to necessary care. The environment can act as an independent contributor to mortality, comorbidity that we must treat. The disaster environment can interfere with the logistics of bringing medical supplies or specialists to the infant or with the evacuation of the infant to a higher level of care. This spatio-temporal mismatch of physiological demands and medical care is common to all disasters and, when combined with the boundary object of potential fatality, can drive effective communication.

Characteristics of Disasters

A disaster has flux, and how the observer or participant experiences that flux influences information and communication. The Lagrangian flow specification is in contradistinction to the Eulerian specification from a fixed point of reference outside the flow of events (10). These influence practical descriptions of what to expect, such as the nature of the increase in demand, the appear-

ance of novel demands, and the decrease in resource availability.

Table 1: Eulerian and Lagrangian Specifications (11)

Eulerian, quantitative	Langrangian, qualitative
Decontextualized	Contextual
External, fixed point Focus on the specific location	Within flow Focus on the individual moving parcel
Flow	Trajectory
Multiple, fixed positions	Continuous measure with position and pressure
Rate of change of system	Individual parcels

A disaster has a topological orientation based on relations, contiguity, and relative position rather than actual metric measurements that would indicate an absolute position. In a topology, elements maintain continuity of connectedness despite deformations. The focus is on how the elements are connected, for example, the closeness of connection or overlapping connection (12). Topology replaces precise characterizations with a topological differentiable state that represents possible variable states.

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 (13, 14). Note that in a topological network, the strength of relations between nodes has a greater influence than the distance between nodes as in a Euclidean network. Topological networks are invariant, meaning that if the network is deformed, the relations do not change, and the formula remains true. Graph representations of network topologies include line, ring, mesh, star, tree, bus, and the fully connected mesh topology. The Incident Command System is a tree network topology.

"Topological networks are invariant, meaning that if the network is deformed, the relations do not change, and the formula remains true. Graph representations of network topologies include line, ring, mesh, star, tree, bus, and the fully connected mesh topology. The Incident Command System is a tree network topology."

Uncertainty and Ambiguity

We classify to understand, but a disaster has flux, uncertainty, and ambiguity, all bedeviling our classification ability. The system may appear linear over small time intervals, but our lack of information on system behavior leads to unpredictability. Concepts are discrete. Interruptions in a process can break the causal chain of classical logic and rationality. Continuous perceptions do not match discrete concepts. Our grasp of events challenges the accuracy of our concepts with the consequence of misidentification and misunderstanding (15).

When we have linearity and discrete concepts, our approach can be more like a *well-structured problem*, clearly delineated, amenable to algorithms, and well-accepted goals (16). Problem-solving becomes puzzle-solving where knowable information fits together to produce the right answer. We search for puzzle pieces. We solve the problem by finding the right puzzle pieces and placing them in the right spot (17).

> "We persuaded ourselves that we had conceived of virtually all possible scenarios and, by having observed a wide range of the pieces of the scenario, that we could effectively extrapolate a behavior that was underway or being planned. This was the puzzle approach we used in an attempt to understand the cold war world. What kept us from clearly seeing was a lack of healthy respect for the principle of uncertainty. Taking uncertainty into account—*approaching a problem as a mystery and not as a puzzle*— is at the heart of full-spectrum analysis."
>
> Adrian Wolfberg (17)

Uncertainty, ambiguity, and flux create an *ill-structured problem*, a problem with no boundaries. The lack of concise boundaries interferes with classifying data and information and prevents clean assignment to a protocol or algorithm. We do not know what we can do or even what will work. We must learn as we act. Because we access our continual experience through discrete concepts, we find ourselves improvising solutions. The whole thing becomes a mystery; we do not know what a clue could be, where the clues are, or how they fit together. Mystery solving becomes a search for clues to the mystery (17). The use of mystery-solving over puzzle-solving developed as a military strategy to analyze the full spectrum of information.

To Colonel John Boyd (18), a US Air Force tactician, the analysis differentiated concepts and created classifications, a trait particularly useful during disruptions or for complex situations. He then combined analysis, a destructive cognitive force, synthesis, a constructive cognitive force, to generate new classifications.

The inclusion of uncertainty increases the importance of contextual information while abstractions become dangerous (2). Uncertainty does, however, widen our operational environment making available a fuller spectrum of analysis and the pursuit of weak but salient signals.

"Concepts are how we access reality and produce mental representations of the world. We then classify and categorize to make sense of the world and to make predictions. Structures in the abstract are more amenable to classification and more tractable to this sense of order (19)."

Classifications and Standards

Concepts are how we access reality and produce mental representations of the world. We then classify and categorize to make sense of the world and to make predictions. Structures in the abstract are more amenable to classification and more tractable to this sense of order (19). This is how we segment the world through its spatial and temporal relations. We classify things as part of the

production of knowledge and, with classification, comes standards for the rules to classify and produce textual or material objects (8).

We classify plans, organization, hierarchy, actions, errors, types of disasters, and so forth. How we classify, create order, use abstract terms, and set priorities will influence how we think and act during a disaster. Through our classification method, we can unintentionally shift HRO from high-reliability operations to high-reliability logistics or, worse, serve as an existing, less flexible hierarchy and structure.

The reference frame for emergencies and disasters is generally created by people far from the disaster (20). From a distance, discussions for planning and classification may readily move away from contextual details toward a secondary practice world of management and logistics. The planners then become spectators (2, 21) with assumptions of linear Newtonian physics in a Euclidean world. The sense of order makes spectators receptive to the decontextualized Eulerian perspective.

In the academic and business literature, this gives a 'top-down' perspective outside the flux of events, the Eulerian perspective at a fixed point. The benefit is qualitative and more precise information. Within the flux of events, a 'bottom-up' perspective with the Lagrangian view, the operator is personally at risk, and changing contexts necessitates updating less reliable information. Rather than algorithms that fit a specific situation, accuracy becomes the platform for decision-making.

A disaster brings together these two systems with different order and responses to the environment – 'bottom-up' public safety classifying by function and consequences while 'top-down' medicine classifies based on etiology or treatment. Classification by risk, cause, situation, or outcome is standard in healthcare. Classification by capability and intervention, the order of public safety, is less common.

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Standards and Error

With standards come rules and the expectation of meeting those standards. Jens Rasmussen and Kim Vicente (22, 23) studied how perceptions influenced performance, leading them to create a framework of categories – the *skills, rules, knowledge (SRK) framework.* Rule-based behavior is found in routines from a stored rule or procedure, and *signs* indicate the action. James Reason (24) adapted this framework for categories of error management with the concept of rule-based error, which is highly contextual and more indicated for puzzle-solving strategies. Rule-based errors come from 'information sensitive' uncertainties due to imperfections of the rule or model used by the organization.

In the flux of a disaster, we would use a knowledge-based framework for causal functioning and reasoning. *Symbols* represent the abstract thought used to describe what we have never before, or not yet, encountered. Errors occur from uncertainties that are "inherent or natural uncertainties that are fundamentally information insensitive" (Bob Bea, 8/8/2007, personal communication). Knowledge-based errors are difficult to identify because the use of imperfect information and causal functioning is not known. In addition, abstracting in a highly contextual environment loses information, increasing vulnerability (2).

An organization with a rule-error focus may force the expert to accept concepts and follow the rules. The expert then performs poorly, at a lower level than the novice (25-29). We also risk surprises when we must use the best-fitting frame (30). Dynamic conjunctions of facts have different relations than we expected, or events may abruptly change trajectory. Fewer expectations create fewer surprises and earlier engagement.

Reducing the perception of error through certitude decreases the ability to forecast events. Such experts are the 'confident poor predictors' who know one thing, and they know it well. They will extend their one theory to many domains with great confidence. Following Occam's razor, they believe that their parsimony of having one theory overrides the numerous theories other people use. They do not entertain the idea that other views may be correct. When they are wrong, they argue about the event's implications and focus on justifying their decision (31).

On the other side are the 'super forecasters who know many things but to a far lesser degree. They use a point-counterpoint style of thinking that sustains doubt while reducing excessive enthusiasm. They understand that opposing and contradictory forces yield stability, a feature that confounds prediction. Superforecasters diligently pursue information, update their information, and revise their conclusions as more information becomes available (31).

In a disaster environment, error through action generates information and corrects heuristic bias. Action causes responses, creating 'Shannon Information' by converting uncertainty to certainty (7). The action in these circumstances is not a single action but a series of actions with motor cognition that corrects throughout the activity. This approach creates information from 'error,' but it also increases the order of the system (32).

The Sensemaking of Classifications

In classifying, we lose details due to irrelevance, but what is irrelevant now may become relevant later. We may combine nuanced, relevant details with more obvious but less relevant details, losing information we may later need. This is less of a problem for most medical diagnoses and treatments, particularly if we can make the diagnosis as specific as possible—the more specific the diagnosis, the safer and more effective the treatment.

In public safety, on the other hand, knowing the situation's specifics has limited meaning because engagement can uncover new circumstances, and entropy creates new threats, bringing dramatic change to the situation. Details or outliers may represent the covert compensated state or herald catastrophic failure. Public safety seeks discrepant details before they can disrupt operations. A moving situation has contextual attributes that cannot be arrested solely for classification. Nor can outliers be dismissed as random, independent events. "Details without context is micromanagement," Karl Weick (personal communication).

In a disaster, we work with only partially known elements or information that cannot be separated from irrelevant information (33). Quantitative measures, hierarchy, metrics as points and lines, or discrete representations do not work in the topological, commonsense space (30). Rather than categories classified by metrics, common sense organizes knowledge in topological forms connected for their value to solve problems and support the social

organization during a disaster (34).

Sensemaking during a novel, evolving event in the VUCA-2T environment is dangerous. The disaster-naïve individual makes sense of the situation by fitting events into familiar classifications and categories. All categories are learned or come from previous experience. Classification is to place the event into a static state, one of arrest that is unlikely to be timely and accurately updated, unchangeable due to the plausibility of the category, or to reduce complexity. Such categories become irrelevant as the environment changes, making later actions more troublesome (2). The leader remaining within context can create a possible adaptive solution, or the leader may lose context, precluding a life-saving solution (2). Those who appear to know best will be spectators studying the outcome.

"Neonatal hypothermia, unrelated to a cause of a disaster, became a direct threat during disasters caused by a tropical cyclone, an earthquake, and a hospital fire (35, 36). Life-threatening vibration during isolette movement was a threat to the neonate during a controlled evacuation due to bomb removal (35)."

Classification by cause of the disaster can occur from "I have seen this before." But not now and not in *this* environment (2). Neonatal hypothermia, unrelated to a cause of a disaster, became a direct threat during disasters caused by a tropical cyclone, an earthquake, and a hospital fire (35, 36). Life-threatening vibration during isolette movement was a threat to the neonate during a controlled evacuation due to bomb removal (35).

Reframing – Classify for Meaning

The characterization of the disaster environment as VUCA-2T generates classifications for the threat to life, degree, and proximity of threats, stabilization, movement, leadership, and safety. Classifications can organize sensemaking to form relations that engage abstractions with circumstance and thought, creating a situation comprehensible for action and driving enactment (2, 37). Recognition of VUCA-2T as a liminal zone informs the Neonatologist's observations of staff behaviors and performance, supporting those new to a significant crisis. These classifications develop the sense of agency and give meaning to the actions taken by the staff. This processing is not a benign task. Karl Weick described the abrupt loss of meaning and framework that contributed to the tragic deaths of thirteen smokejumpers in the Mann Gulch Fire. The collapsed sensemaking had deadly consequences (38).

Whether private, organizational, or academic, classification systems are lost in the liminal zone where events disrupt meaning and structure. The events of the disaster also constrain the ability to gain information for accurate sensemaking. The authors' experience (DvS, TAM) and the military leadership in extremis studies show that rapid, reciprocal sensemaking and sense giving between leaders and subordinates develops effective and accurate sensemaking with distributed cognition (39, 40). Classifications are created in much the same way that actions are improvised.

An environmental emergency *in extremis* makes visible an individual's private classifications for meaning, the methods they use to frame their experience, and the framework they operate within. *In extremis* describes a situation where the leader and followers personally could die, or they have the perception that death could be imminent (40). [This differs from the nautical term *in extremis,* where both vessels must maneuver to avoid a collision. Normally, one vessel must maneuver following the rules of the road, and the other vessel is required by the law to maintain course and speed until that vessel is *in extremis.* This is by international rules of the road in maritime law.] How the individual classifies or frames and gives meaning to events and actions has serious ramifications (38). During the event, a leader can influence a person's perceptions of meaningfulness and sensemaking by framing and reframing, altering the perceived meaning of events (10, 40, 41).

Reframing develops new, pragmatic classifications that give meaning to perceptions and develop a functional framework. Modeling coping strategies, the leader *in extremis* reframes events toward a sense of controllability and focuses on the person's capabilities (5, 39).

Reframing the physical care given to the neonate as meaningful actions in the face of disaster makes the beneficial consequences of the individual's actions visible. The close contact with the neonate, or any person becoming overwhelmed, has a positive impact developing and reinforcing prosocial behaviors, giving the feeling of serving a higher purpose (41). These assist leaders in maintaining motivation and finding meaning in their experiences (10, 39, 40, 42). The ability to make meaning of traumatic and stressful experiences, death awareness, and mortality salience, promotes a positive growth state, resilience and mitigates post-trauma stress (42-44).

"The ecological approach we describe above incorporates into classification systems environmental entropy with the biotic and abiotic factors of an open ecological system. Jens Rasmussen and Kim Vicente (22, 23) also used an ecological approach to study human performance in the workplace. They viewed the workplace as an ecosystem of perceptions of signs, signals, and symbols at the interface of the working environment that can affect behaviors through skills, rules, and knowledge, respectively. "

The ecological approach we describe above incorporates into classification systems environmental entropy with the biotic and abiotic factors of an open ecological system. Jens Rasmussen and Kim Vicente (22, 23) also used an ecological approach to study human performance in the workplace. They viewed the workplace as an ecosystem of perceptions of signs, signals, and symbols at the interface of the working environment that can affect behaviors through skills, rules, and knowledge, respectively. Perceptions within a framework for performance formed categories of the *skills, rules, knowledge (SRK) framework.* Rule-based schemata form the basis for standardization through checklists,

which can both help and hurt during disaster response and stabilization.

James Reason (24) adapted the skills-rules-knowledge (SRK) framework for categories of error management. We urge caution for organizations relying on the SRK error framework and the swiss cheese model for error classification and management. Errors from these categories come from 'information sensitive' uncertainties due to imperfections of the model used by the organization. In an open system with entropy, such as a disaster, uncertainties are "inherent or natural uncertainties that are fundamentally information insensitive" (Bob Bea, 8/8/2007, personal communication). Identification of errors in unstable environments has great value for identifying the boundaries of knowledge and performance (10, 45, 46).

"The categories in Euclidean space are more sharply defined and linked, while the topological space is more open and overlapping, with some elements in residual categories. Categorizing abstractions gives cleaner organization and standardization."

Limits of Classifications

The categories in Euclidean space are more sharply defined and linked, while the topological space is more open and overlapping, with some elements in residual categories. Categorizing abstractions gives cleaner organization and standardization. "The advantage of confining attention to a definite group of abstractions is that you confine your thoughts to *clear-cut definite things*, with *clear-cut definite relations*...We all know these clear-cut trenchant intellects, immovably encased in a hard shell of abstractions. *They hold you to their abstractions by the sheer grip of personality."* Alfred North Whitehead (47).

In a field as messy as responding to a disaster, staff work with well-structured and ill-structured problems, each problem type necessitating different operations and forming different categories. Standardization, "often by administrators or regulatory agencies," limits the necessary shifting between problem types (48).

As described above, the reference frame for planners and executives can drift to that of a spectator (2, 21). Knowledge for disaster planning then becomes knowledge by description rather than "knowledge by personal acquaintance" (49). Knowledge by an acquaintance, a form of experiential empiricism, carries tacit knowledge and the awareness of contextual subtlety and nuance.

Classifications for operations and logistics will differ due to differences in tempo, as will classifications for participants and spectators based on functions and purpose. Operators intimately acquainted with the VUCA-2T environment use functional *descriptions* for accuracy and relevance (50, 51). Academicians and executives are more likely to use structural *definitions* for precision and visibility. The two groups also classify outliers and probability differently. Operators classify outliers as signs of a developing process and future events by their *possibility* or the ease of occurrence. Academicians and executives lean toward the classification of outliers as random, independent events and future events, as risk probability, the likelihood an event will occur.

Weick described the gap and possible conflict between continuous perceptions and discrete concepts that make reliability a transient achievement (52). Reconciling the gap and reducing the conflict can lean toward operations or the planners, either of whom is at risk to become spectators. The lean is arbitrary with the risk of losing details and cues while shifting to abstractions. We then change the conflict between perception and concept to another, between the concrete and abstract (2).

For Rasmussen, high-performing individuals rely more on symbols as information representing abstract thought, causal functioning, and reasoning when encountering a novel situation. This is knowledge-based behavior in the SRK Format. Evaluating performance with types of situations and the type of information used, Jens Rasmussen (22) identified rule-based behavior from routines that used a stored rule or procedure with signs from the environment to start or modify predetermined actions. This became the source for rule- and knowledge-based error management (24). Knowledge-based errors, those errors derived from abstractions and symbols, are less visible than rule-based errors.

Disaster planning, training, management, and evaluation lean heavily toward abstract classification systems and categories. Contextual details are lost due to temporal and spatial distance, risking planners becoming spectators (2, 21). Planners then rely on knowledge by description (49) and trust knowledge-based performance (22). Continuous perceptions do not readily align with discrete concepts, making reliability a transient achievement (52), seen writ large but developed in the intimacy of engagement. Between trusting the continuous perceptions of line staff, a bottom-up operational approach, planners will trust discrete concepts, a logistical approach, and visible from a distance.

"There is an error: but it is merely an accidental *error of mistaking the abstract for the concrete*. It is an example of what I will call the 'Fallacy of Misplaced Concreteness.'" Alfred North Whitehead (47).

Abstract classifications, privileged in academics and business management, are at risk for becoming mistaken for reality itself. Abstractions are constant, independent of context, and can be discussed without having had the experience. Our knowledge and insight from science do not have to be fully converted to abstract concepts. We can use our perceptions with science to understand the actual world. While concepts *represent* reality, we must not mistake them *for* reality. We must not sacrifice *operational* classification systems for conceptual tractability in planning.

Boundary Objects

Different communities working in the same space may or may not cooperate. While various domains will classify elements with different criteria, some objects are found in adjacent classifications of different groups. By inhibiting both domains, boundary objects are ambiguous yet satisfy the informational requirements for each, allowing the two domains to cooperate. (53).

'Boundary objects' are ambiguous yet constant objects shared by adjacent categories, allowing their use by several communities of practice. Boundary objects facilitate local understanding by reframing the object into a broader context of joint activity. The use of boundary objects contributes to cooperation and communication across borders, often without the need for different groups to communicate, and can help manage the tension between divergent viewpoints (8, 53).

During a disaster, boundary objects are more likely to be ill-structured problems one group has, yet the solution must come from an outside group. This has contributed to conflict and friction in disasters. Boundary objects can contribute to communication and understanding in unstandardized, unstable situations when the boundary object is transient (54).

- Self-explanation, rather than narrative, is more likely to occur one-on-one. This may contain personal or privileged information to share the meaning of the situation.
- Inclusion to create alliances brings an outside group's unique capabilities or resources by making them part of the solution.
- The compilation brings together the information necessary to create alignment with both groups.
- Structuring, crucial for competing interests, establishes order and identifies principles to coordinate activities.

Boundary objects are common and an effective measure to gain cooperation. One author (DvS) used boundary objects in several ways:

- Self-explanation when transferring care of a brain-injured long-term care patient. To personalize a severely brain-injured patient, the author demonstrates the child producing a Duchenne smile, reflecting enjoyment, if not happiness (55).
- Inclusion upon learning a recent laboratory change prevented emergency serum iron levels. The author spoke with the lab supervisor thanking him, then describing the child and the possibility of using high dose deferoxamine, which had saved a life earlier. The lab supervisor advised that there would be 30-45 minutes to warm up the analyzer and an unknown time to find a technician. Within 20 minutes, the supervisor called the author with the results. He was curious about the serum level. (It was >2,000 mcg/dL, and the child survived.)
- Compilation brought together nurses and respiratory care after the author introduced enhancing life by mechanical ventilator settings (56). During an emergency at the pediatric subacute, a serious patient-ventilator asynchrony episode caused oxygen desaturation and inadequate chest expansion. As the author walked into the room, the RCP told the nurse to give the patient a suppository. When queried the nature of a rectal suppository for ventilator management, the RCP replied that smaller infants would destabilize during a bowel movement. The nurse called the RCP, who hand ventilated while the nurse administered the suppository. This problem was resolved after increased levels of PEEP, our new "PEEP for Poop" ventilator management plan.

"Boundary objects can facilitate medical care with non-compliant patients. With a vague boundary object used by the physician and patient or parent, the discussion shifts toward the actions they have in common rather than the beliefs that keep them apart."

Boundary objects can facilitate medical care with non-compliant patients. With a vague boundary object used by the physician and patient or parent, the discussion shifts toward the actions they have in common rather than the beliefs that keep them apart.

In a disaster, the environment can kill. Death, then, is a boundary object shared by the Neonatologist, EMS, public safety agencies, and government disaster agencies. Each will see death differently. The Neonatologist extends medical care to neonates born prematurely in a 'death zone' (50, 57). EMS extends medical care into the field to engage physiological threats, preventing death that can respond to straightforward early field interventions. The fire service engages physical threats causing death and solves ill-structured problems the public cannot or will not solve themselves (William J. Corr, Captain, LAFD). The government has a legal duty to reduce premature death for the common welfare. Government disaster agencies focus on reducing death originating from the disaster itself.

In communicating the situation of the NICU, rather than describing diseases or the technological needs of a neonate, the Neonatologist can accurately and dispassionately describe what will kill the child. As coarse as this sounds, the disaster agencies are working to reduce the disaster's death toll and can more easily support the Neonatologist to find resources that prevent death. This brings a joint focus to survivability.

"As coarse as this sounds, the disaster agencies are working to reduce the disaster's death toll and can more easily support the Neonatologist to find resources that prevent death. This brings a joint focus to survivability."

Following a hurricane, a neonatology team waited for a helicopter on the hospital helipad. They intercepted a nonmedical utility helicopter delivering supplies to their hospital and requested transport of their two neonates. The neonatal team considered the helicopters as air ambulances for transporting infants.

Infrastructure of Disaster

The common idea of infrastructure is a physical 'thing,' a passive physical substrate that sits in the background of how we use the thing. For example, surface transportation infrastructure includes roadways, highways, and railways serving as a background to move material and ourselves around the country. For example, we can view transportation infrastructure as a topology of relations between access to places, support for travelers, safety, and so forth. Viewed as relations infrastructure builds a community. Each mode of transportation occurs in specific contexts with specific purposes. One person's infrastructure, however, can become another person's barrier (58).

Infrastructure is built from an existing base and does not grow *de novo.* Infrastructure, part of the human organization rather than dispassionate design, reaches beyond the single event. Though not noticed by members even though present, an organization's infrastructure is noticed by those outside the system. "You do in an emergency what you do every day."

You are not in one system or infrastructure – transport, emergency operations, and continuity of care have distinct infrastructures. Disaster infrastructure is new to the Neonatologist but well used by disaster responders, hence the importance of boundary objects. Disaster infrastructure has a language and lexicon, engages risk in dangerous contexts, provides medical care in austere conditions, and supports continuity of business operations. Behaviorally, disaster infrastructure modulates stress responses, focuses on capabilities, supports situational leadership, and engages the outlier as an early herald of a process. The accepted use of contradictions for descriptions and decisions is common. Their disaster infrastructure becomes your difficulty.

Failure to integrate into the disaster infrastructure can be deadly. The disaster is a liminal zone, and disaster operators are accustomed to working with liminal people, inexperienced or unaware of the dangers. Inflexibility in shifting from the hospital infrastructure will quickly be identified. In dangerous contexts, such individuals can bring harm to others (3, 50, 59). In this new disaster context, the loss of contextual awareness can collapse sensemaking with a poor outcome (2, 38). Integrating the NICU and hospital infrastructure into the disaster infrastructure is vital for continuing operations.

Infrastructure viewed as relations with different contexts illustrates the activity during a disaster. A disaster can have unforeseen effects by the context or bring two contexts with unexpected interactions. "The discontinuities are not between system and person, or technology and organization, but rather between contexts" (58). These discontinuities lead to disputes when disciplines use the same information differently or have different problem-solving methods.

What is not apparent in these disputes is the effect of different infrastructures. Infrastructure is embedded into a discipline's technology and social system and is learned as the individual acculturates. Infrastructure shapes and is shaped by the discipline's practice conventions, embodying standards specific to the discipline (8).

"A disaster brings together diverse infrastructures, but they are infrastructures of organizations and disciplines accustomed to collaborating. New for NICU sheltering or evacuation are the types of organizations and infrastructures they utilize."

A disaster brings together diverse infrastructures, but they are infrastructures of organizations and disciplines accustomed to collaborating. New for NICU sheltering or evacuation are the types of organizations and infrastructures they utilize. For example, air transport will be controlled by a central government agency, and FAA rules and procedures will become more visible. Ground transport services by ambulance will change from interfacility transport rules to EMS and on to disaster control by a central government agency. Boundary objects facilitate communication across disciplines and organizations while operating in a new boundary infrastructure.

To form a boundary infrastructure, a community of practice can interface with the information system shared in the disaster. The Neonatologist would identify the kinds of information objects necessary that can be useful as boundary objects. The concept of boundary infrastructure recognizes the different information objects within the diverse communities of practice that now share a disaster infrastructure (8).

While who "owns" a problem is locally determined, another organization may be the solution in a disaster, or the solution may be distributed. Boundary objects that bridge these gaps have sufficient ambiguity to connect several domains yet enough fidelity to the problem that the key points are not lost. Accuracy will have greater force. Precision can mislead or intimidate outsiders, decreasing the chance of receiving assistance.

An elected leader in the city government approached a wildland fire chief, upset about the possibly preventable fire damage to the city. The city leader wanted to know why fire crews were not positioned better to protect the city. After the leader finished, the fire chief went to the back of the fire pick-up truck, pulled up a firehose coupling, and brought it to the leader. The coupling had charred remnants of hose still attached; the rest had burned away. The chief told the leader the coupling came from the fire engine nearest the city. The crew escaped to safety, leaving behind the coupling. (personal communication, DvS)

Fitting into the Government Response

[From a discussion between one author (DvS) and Dan Kleinman, Operations Section Chief, National Incident Management Organization (retired)]

The Neonatologist has the proper focus on the care and survivability of the infants in the NICU. During a disaster, other groups and organizations that might directly support the NICU have missions that may not be congruent with those of the Neonatologist. If you know and can articulate your mission, you can then seek someone who can assist you in your mission. This is the strength of the boundary object and understanding infrastructure as relations and the formation of a boundary infrastructure due to the disaster. This gives freedom to act and choose, but remember that the disaster sets limits.

Disasters are state or local events where the federal government has a support role. If the President makes a disaster declaration, then FEMA and NIMS become involved. There are various federal agencies for support that can be tied, but they remain in support roles.

State or federal involvement is determined by a disaster declaration and the public lands involved. The county responds the quickest, followed by the state, then the federal government. There can be multiple NIMTs, but they now function without NIMO teams. There are numerous agreements between agencies.

The involvement of federal agencies comes from a disaster declaration or the disaster occurring on federal lands. For public lands, it matters whether its jurisdiction is county, state, or federal. This also determines who pays for the management team – state or federal. IMT becomes involved if there are casualties and FEMA becomes involved for supplies.

The county, state, and FEMA will bring in outside ambulances and helicopters by contract. Hospital access to these transportation assets is through pre-arranged contracts or the relevant government agency. FEMA often has an order to bring in ambulances from outside the disaster area. Helicopters have assigned missions and may not be available for hospital use.

"Error from action generates information and corrects heuristic bias because the action in these circumstances is a series of actions with motor cognition that corrects throughout the activity. This approach creates information from 'error,' but it also increases the order of the system (32)."

Conclusion

Uncertainty increases the importance of contextual information, while abstractions increase the danger (2). Uncertainty widens our operational environment making available a fuller spectrum of analysis and the pursuit of weak but salient signals. Error from action generates information and corrects heuristic bias because the action in these circumstances is a series of actions with motor cognition that corrects throughout the activity. This approach creates information from 'error,' but it also increases the order of the system (32). Classification can lead to loss of details due to irrelevance, but what is irrelevant now may become relevant later. Reframing develops new, pragmatic classifications that give meaning to perceptions while developing a functional framework. The *in extremis* leader reframes events toward a sense of controllability and brings focus on the person's capabilities (5, 39).

Different communities working in the same space may or may not cooperate. Boundary objects found in adjacent classifications of different groups can be used to develop cooperation. By inhibiting both domains, boundary objects are ambiguous yet satisfy the informational requirements for each, allowing the two domains to cooperate. (53).

We can view infrastructure as a topology of relations to build a community, keeping in mind that one person's infrastructure can become another person's barrier (58). As in routine operations, you are not in one system or infrastructure in a disaster – transport, emergency operations, and continuity of care have distinct infrastructures.

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Fellows Column: Neonatal Abstinence Syndrome: Management and Role of APRN

Rachel Fiorentino, BSN

Abstract:

Substance abuse is on the rise in the United States, and opioids have been the drug of choice. When pregnant women abuse opioids, the newborns can experience a set of symptoms known as neonatal abstinence syndrome (NAS). Screenings should be implemented with every prenatal visit to assist with a treatment program or support prior to birth. When screenings fail to assist, biological testing should be obtained to forecast withdrawal. Symptoms need to be assessed with a clinical diagnostic tool such as "Eat, Sleep, Console" and treated with non-pharmacological interventions first, and then pharmacological if unresolved. The advanced practice nurse is a key factor in coordinating this care and advancing public health policies.

Keywords: Neonatal abstinence syndrome, NAS, opioid epidemic, Eat, Sleep, Console

"It has been hypothesized that neonatal abstinence syndrome (NAS) was a part of society before the 1900s. Nevertheless, the rate of opioid-addicted pregnant women is increasing exponentially. This brings a priority to define, screen, test, assess, and treat neonates withdrawing from opioids promptly and successfully"

Neonatal Abstinence Syndrome:

The opioid epidemic has been a focus for public health, US Drug Enforcement, and health care providers for quite some time, with the first reported case in 1875 (1). It has been hypothesized that neonatal abstinence syndrome (NAS) was a part of society before the 1900s. Nevertheless, the rate of opioid-addicted pregnant women is increasing exponentially. This brings a priority to define, screen, test, assess, and treat neonates withdrawing from opioids promptly and successfully.

Definition, Incidence, Presentation, and Physical Findings:

The incidence of opioid usage during pregnancy has increased dramatically. Globally, usage has increased by 47% from 1990-2016 (2). In the United States, there has been an increase of 333% from 1999-2014(2). According to the Centers for Disease Control and Prevention (CDC), in 2016, one baby every 19 minutes was diagnosed with NAS (3). The states with the highest rates include Kentucky, New Mexico, Pennsylvania, Tennessee, Vermont, and West Virginia (3).

NAS is a collection of clinical signs and symptoms from abrupt discontinuation of opioids at birth after exposure in utero (4). The severity of symptoms varies based on length of exposure, type of drug, purity of drug, polysubstance use, and gestational age of the neonate (1). The substances can be prescribed or non-prescribed, one specific opioid or a combination of many. The most common maternal substance use is opioids such as OxyContin, fentanyl, heroin, and morphine. There is a high risk of polysubstance use with amphetamines, cocaine, cannabinoids, nicotine, alcohol, and benzodiazepines, along with opioids.

The range of clinical presentations for NAS can be divided into two categories: central nervous system and gastroenterology. The most common symptoms are "increased muscle tone, tremors when undisturbed, and exaggerated Moro reflex" (2). Other characteristics of NAS include excessive high-pitched crying, jitteriness, tremors, diarrhea, nasal stuffiness, sneezing, poor feeding, hypertonia, frequent yawning, diaphoresis, and temperature instability (4). These listed symptoms can continue to create additional complications that will also need to be managed. Examples include diarrhea leading to severe skin breakdown or poor feeding leading to poor weight gain and failure to thrive. While NAS is self-limiting, it can last from weeks to six months (5).

The most severe and rarely reported presentation of NAS is seizures (1). It is estimated that between 2-11% of NAS infants may have seizures (6). However, it is difficult to distinguish from observable seizure-like activity versus epileptic seizures demonstrated on electroencephalogram (EEG). A seizure-like activity might indicate benign neonatal sleep myoclonus (BNSM) self-limiting and not requiring treatment (6).

The onset of symptoms depends on the type of drug exposure in utero. Short half-life opioids such as heroin may have infants withdrawing within 24 hours (2). While long-acting opioids, such as buprenorphine and methadone, could take up to three days. There have been reports of opioid withdraw not occurring until 30 days of life. These time frames for clinical presentations can be more problematic with additional polysubstance use. Withdraw from benzodiazepines or barbiturates can take up to seven to 21 days to onset symptoms (2).

Disease Etiology and Pathogenesis:

Opioids cross through the placenta easily because of their fat-loving or lipophilic properties (4). These lipophilic properties allow opioids to cross the blood-brain barrier and accumulate in fetal brains (4). Animal studies have shown a cascading effect on neurotransmitters, opioid receptors, locus coeruleus, and various intracellular elements with neonatal withdraw of an opioid at the time of birth (1). When the fetus is exposed to opioids, the receptors in the locus coeruleus increase intracellular cyclic adenosine monophosphate (cAMP), causing hyperactivity. When the opioids are withdrawn, the over-activation of cAMP causes an increase in norepinephrine release. With an overabundance of norepinephrine, the "flight-or-fight" response is on overdrive, causing central nervous system irritability and gastrointestinal dysfunction (1).

Levels of neurotransmitters begin to fluctuate, increasing central nervous system irritability (1). Dopamine and serotonin levels de-

crease, which alters sleep, appetite, and stress. The accumulation of all these attributes, in addition to an immature nervous system, hinders the newborn's state control, sensory processing, and motor control (1).

"Management of NAS begins with screening. Most, if not all, obstetricians ask routine questions regarding prenatal drug usage. This screening can open the door for women to seek treatment programs while pregnant. Unfortunately, reliability of answers, fear of judgment, and a tendency for other high-risk behaviors may not reveal the information needed until the symptoms are witnessed."

Management:

Management of NAS begins with screening. Most, if not all, obstetricians ask routine questions regarding prenatal drug usage. This screening can open the door for women to seek treatment programs while pregnant. Unfortunately, reliability of answers, fear of judgment, and a tendency for other high-risk behaviors may not reveal the information needed until the symptoms are witnessed. When that does become the case, caregivers need to know high-risk maternal signs for biological testing. These signs may include no prenatal care, sexually transmitted diseases, premature labor, and abruptio placentae (4). Hospitals should have policies regarding when to perform biological testing to avoid biases while still protecting the neonate.

Several types of biological testing can be done, each with pros and cons. Maternal and infant urine testing is quick and less expensive than other testing (2). However, there is a high probability of false negatives depending on the last use of the drug(s), dosage, and cumulative in-utero exposure. Meconium testing is more sensitive and can detect exposure from 20 weeks gestation to birth. Meconium testing requires strict protocols on handling and cannot be contaminated with urine, water, or alcohol. False positives can occur with amphetamines. Neither urine nor meconium can identify synthetic opioids, such as fentanyl, without it being specified. Cord blood and hair can detect drug use in utero but can be costly and require specialized experts. Many facilities will use urine with meconium verification (2).

In attempts to manage NAS, many models of care have been developed. These models strive to care for the infant as best as possible with as little pharmacological intervention as needed with the shortest length of stay (5). These models include an assessment tool to determine when treatment should be escalated to pharmacological interventions. The most recent assessment tool is Eat, Sleep, Console (ESC) (5). The guidelines are as follows: eat an appropriate amount daily, sleep undisturbed for at least one hour, and be consoled within 10 minutes (7). ESC navigates towards functional criteria of the newborn as opposed to responses to treatment (7).

When pharmacological intervention is needed, morphine is the most used first-line medication (2). According to Grossman & Berkwitt (2019), 90% of pharmacologically treated infants received morphine. Clonidine or phenobarbital is the most used second-line medication intervention. There are many studies to determine which medication has the best outcome for neonates, but there is currently no consensus (1).

Outcomes:

Whether non-pharmacologic or pharmacologic interventions are used, one key aspect continues to provide the best outcomes for the neonate. That is maternal involvement (5). Maternal bonding, attachment, breastfeeding, and skin-to-skin contact provide the infant with the best outcomes while mitigating NAS. However, maternal mental health should be acknowledged and supported to empower the mother to care for her child (5).

Studies of long-term outcomes of NAS are limited and lack precision causation (1). For example, children with NAS may have poorer school performance than their peers; but is that from low socio-economic factors, lack of parental involvement, or opioid use in utero? A New York study suggested children with NAS had a mortality rate four times greater but is that from high-risk behaviors associated with parental addiction or withdrawing from opioids as an infant? There is still more to be discovered about the long-term outcomes of NAS (1).

"An advanced practice nurse (APN) can affect NAS and the opioid epidemic in three different ways. One, ensure correct care of the neonate. Two, publish findings or remain current on research. And three, help facilitate change policies as it relates to legislation. Care for the infant will always be the first and foremost implication for an APN."

Implications for Advanced Practice Nursing:

An advanced practice nurse (APN) can affect NAS and the opioid epidemic in three different ways. One, ensure correct care of the neonate. Two, publish findings or remain current on research. And three, help facilitate change policies as it relates to legislation. Care for the infant will always be the first and foremost implication for an APN. This process includes utilizing assessment tools, optimizing non-pharmacological care, and implementing medications when warranted. The APN should also educate and support staff. It can be difficult for staff nurses to remain non-judgmental when caring for an infant with a high-pitched cry that requires constant holding. APN's need to consult other resources such as social workers to ensure holistic care. This treatment, when possible, should include the mother. The APN should educate the impor-

tance of parental presence in a non-judgmental manner, facilitate a non-punitive environment, and encourage strength-based behaviors.

An APN needs to stay up to date on NAS research. This includes continuing education courses, seminars, conferences, and specialty associations. When the opportunity presents itself, the APN should publish findings based on their research.

The last implication for the APN is to help move policy changes forward. This includes legislating the community's needs, interrupting the stigma of addiction, and ensuring safe care for the mother-infant dyad. APN's need to humanize opioid-addicted mothers to increase awareness and confirm progress in public health policies.

"Clear consensus regarding hospital policies and symptom relief would help many caregivers. In the meantime, help is needed by all to humanize addiction and gain control over the opioid epidemic."

Conclusion:

There is still much work to be done regarding infants experiencing NAS. However, defining, screening, testing, assessing, and treating is still a top priority for any provider. As new research is discovered, APN's will need to adjust accordingly for the benefit of the newborn. Clear consensus regarding hospital policies and symptom relief would help many caregivers. In the meantime, help is needed by all to humanize addiction and gain control over the opioid epidemic.

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Briefly Legal: Failure to Safely Deliver Timely and A Botched Resuscitation Lead to Adverse Outcome

Maureen E. Sims, M.D., Barry Schifrin, M.D,

Case Presentation

The patient was a 29-year-old primigravida presented at 40 weeks' gestation who presented for elective induction of labor. Her prenatal course had been uncomplicated. External monitoring was done and initially showed a Category I pattern. Artificial rupture of membranes (AROM) produced clear fluid 14 hours prior to delivery. After several more hours of labor, excessive uterine activity was noted, followed by multiple deep variable decelerations with the eventual rise in baseline and loss of variability (a Cat II tracing). When active pushing began, late decelerations appeared with a nadir to the 70s. Pitocin was discontinued intermittently. Despite the evolution of the FHR pattern, the obstetrician decided to allow the patient to pursue operative vaginal delivery- assisted by vacuum.

"When active pushing began, late decelerations appeared with a nadir to the 70s. Pitocin was discontinued intermittently. Despite the evolution of the FHR pattern, the obstetrician decided to allow the patient to pursue operative vaginal delivery- assisted by vacuum."

The duration of the 2nd stage of labor was 2 h 28 min. Some descent was noted from a 2+ to a 3+ station with the vacuum. However, after 17 minutes, two separate pulls were made with the vacuum, decelerations were noted, and delivery by vacuum was abandoned. A knee-chest position with resuscitative efforts was initiated. Eventually, a decision was made to perform a stat cesarean section. While the operating room was being prepared, the fetus crowned. The vacuum was reapplied, which resulted in the delivery of the head, but shoulder dystocia was immediately encountered. With assistance, the patient was placed into McRoberts position, and suprapubic pressure was applied to disengage the right anterior shoulder from behind the pubic symphysis. When that initiative failed, a Woods maneuver was performed during which a (terminal) fetal bradycardia ensued. The shoulder dystocia lasted about 2 minutes. At delivery, the lifeless baby had a tight nuchal cord. The baby was placed on the mother's chest. Cord arterial pH was 6.76, pC02 was 107 mmHg, p02 was 8.7 and base excess was -28.2 (lactate 18.7 mmol/L); cord venous pH was 7.09, pC02 was 49 mmHg, p02 was 51 and base excess was -17.3 (lactate 12.67 mmol/L). After 22 minutes of resuscitation, a heart rate (HR) was detected.

A labor and delivery nurse began positive pressure ventilation (PPV) via mask and called a code blue. Ten minutes later, a nurse anesthetist arrived and intubated the infant with a 3.0 ETT to a depth of 10 cm and gave 0.4 mg epinephrine via the ETT. PPV continued via the ETT. At 15 minutes, the emergency room physician arrived and placed a 20 gauge angiocatheter directly into an umbilical vessel and gave a bolus of NS followed by 1 mg of atropine, 2 meq of bicarbonate, and two additional doses of epinephrine. On four occasions, the nurses failed to place a peripheral intravenous (PIV) line. At 27 minutes, an arterial gas drawn from the right radial artery had a pH of <6.89, a PC02 of *91* mmHg, a p02 of123 mmHg, and a base excess of-17.9 (lactate>20 mmol/L). At an hour of life, the baby's arterial blood gas showed a pH of 7.18, a pC02 of 20.8, a p02 of 46, and a base excess of-18.8 (lac >20 mmol/L). The point of care glucose was <40mgdL (a more specific value was not documented). The HR was 163 beats per minute (bpm), and the blood pressure (BP) was 79/54 with a mean of 58 mmHg. Fifty percent dextrose was ordered by the emergency room physician to be administered through the catheter still inserted into an umbilical vessel at a rate of 5 ml/h. Given the considerable forewarning, the plaintiff neonatologist was critical of the lack of a skilled resuscitation team ***present before or immediately after birth, the lack of timely intubation, wrong size endotracheal tube (ETT), wrong insertion depth, lack of placement of an umbilical venous catheter (UVC), lack of epinephrine administration via the UVC, and lack of appropriate documentation of the resuscitation. Placement of an angiocatheter into an (unidentified) umbilical vessel was reckless, as well as the administration of 50% dextrose.***

One and a half hours after delivery, the transport team arrived and noted that the baby was unresponsive, had no spontaneous movements, had generalized hypotonia and a prominent swelling in the occiput. The physician placed an umbilical venous catheter (UVC) but could not successfully place an umbilical arterial catheter (UAC). The venous gas had a pH of 7.19, a PC02 of 21.9 mmHg, a p02 of 55 mmHg, and a base excess of -18.8. The infant was on the ventilator with moderate pressures and 30% inspired oxygen. Passive cooling was done, and the baby was transported, during which the BP was 52/19 with a mean of 25 mmHg.

"At the receiving hospital, the baby received therapeutic hypothermia (TH) because of his hypoxic-ischemic encephalopathy. His course was complicated by disseminated intravascular coagulopathy (DIC) and seizures. The magnetic resonance imaging (MRI) at eight days showed cortical and deep gray matter necrosis, restricted diffusion in the splenium of the corpus callosum."

At the receiving hospital, the baby received therapeutic hypothermia (TH) because of his hypoxic-ischemic encephalopathy. His course was complicated by disseminated intravascular coagulopathy (DIC) and seizures. The magnetic resonance imaging (MRI) at eight days showed cortical and deep gray matter necrosis, restricted diffusion in the splenium of the corpus callosum. There were also supra and infratentorial subdural hemorrhages

and parieto-occipital cephalohematoma. She was discharged at two months. Blood cultures were negative. On follow-up, she is developmentally delayed, has cerebral palsy, is cognitively impaired, and has seizures.

The obstetrician and hospital were sued and settled.

Plaintiff allegations against obstetrician:

1. Failure to properly evaluate and safeguard the well-being of the fetus.
2. Failure to timely appreciate the diminished feasibility of safe vaginal delivery
3. Failure to use proper technique during vacuum-assisted delivery
4. Failure to do a cesarean section timely
5. Failure to anticipate shoulder dystocia and obtain assistance

Defense response:

1. Standard of care for delivery was met.
2. Should dystocia was not predicable

Plaintiff allegations against the hospital

1. Failure to have a policy on attendance for high-risk deliveries
2. Failure to have a skilled resuscitation team present before delivery

   category II tracings and vacuum assist required the resuscitation team presence
3. Failure to have individuals with knowledge and skills to resuscitate a newborn

   intubation was not timely, ETT size and depth were incorrect

   the umbilical venous line was not placed, and epinephrine was not administered

   placement of angiocatheter into the umbilical vessel was dangerous

   administration of 50% dextrose was dangerous
4. The hospital should not be delivering babies if they are not capable of safeguarding the fetus before and immediately after delivery

Defense response:

It is a small rural hospital and cannot be expected to have personnel and equipment; We do the best we can under the circumstances

"Prevention of fetal asphyxia is preferable to managing the newborn who has suffered a hypoxic-ischemic insult during birth. Modern obstetrics aims to determine the feasibility of safe vaginal delivery, recognize, from an evaluation of the FHR pattern, a compromised fetus before irreversible organ damage occurs, and moderate any deterioration."

Discussion:

Prevention of fetal asphyxia is preferable to managing the newborn who has suffered a hypoxic-ischemic insult during birth. Modern obstetrics aims to determine the feasibility of safe vaginal delivery, recognize, from an evaluation of the FHR pattern, a compromised fetus before irreversible organ damage occurs, and moderate any deterioration. Failing that, to rescue the fetus from its hostile environment, the key to surveillance is to avoid the need to rescue urgently. The key to resuscitation is to restore adequate oxygenation and perfusion of vital organs, particularly the brain. The Neonatal Resuscitation Program helps individuals learn the cognitive, technical, and teamwork skills to resuscitate and stabilize newborns.

"Almost all neonates born in sub-optimal conditions can be anticipated with careful evaluation of prenatal and intrapartum records. A review of the last hours or minutes of the fetal electronic heart patterns is useful to understand the fetal condition prior to birth."

Almost all neonates born in sub-optimal conditions can be anticipated with careful evaluation of prenatal and intrapartum records. A review of the last hours or minutes of the fetal electronic heart patterns is useful to understand the fetal condition prior to birth. There should be very few surprises at the time of delivery, but having a skilled team even when the unexpected occurs just before delivery should be managed proficiently. Being prepared is the first and most important step in delivering effective neonatal resuscitation. In the United States, 10% of all newborns need intervention, 5% of term newborns receive PPV, 2% of term newborns are intubated, and 1% require extensive resuscitative measures. **Hospitals should not deliver babies if personnel with the knowledge and skills cannot be *immediately* available to resuscitate a neonate.** Knowledge of the risk factors will help the personnel be prepared well in advance. The following risk factors increase the likelihood of neonatal resuscitation:

- Maternal

  diabetes, hypertension, advanced or very young maternal age, multiple gestations, lack of prenatal care, substance abuse
- Fetal

  prematurity, post dates, intrauterine growth restriction, macrosomia, multiple gestations, significant fetal anomalies, malformations or anomalies, arrhythmias, hydrops
- Antepartum

  oligohydramnios, polyhydramnios, placental or cord abnormalities, premature or prolonged rupture of membranes
- Intrapartum

  emergency cesarean delivery, forceps or vacuum-assisted delivery, breech, transverse or other abnormal presentation, category II or III fetal heart rate pattern, excessive uterine activity (tachysystole), maternal general anesthesia, maternal magnesium therapy, placental abruption, intrapartum bleeding, chorioamnionitis, opioids administered

to mother within 4 hours of delivery, shoulder dystocia, meconium-stained amniotic fluid, prolapsed umbilical cord, maternal boluses containing glucose, precipitous delivery.

"Communication between the obstetrician and the labor and delivery staff with the neonatal resuscitation team is vital. Inquiry of the umbilical cord blood gases values and timely repeated gases after the baby is born is critical in those cases where samples are sent for evaluation. If the hospital does not provide therapeutic hypothermia, then an arrangement with a local facility that does offer the procedure must be in place, with the understanding of the timeliness of early transfer."

Communication between the obstetrician and the labor and delivery staff with the neonatal resuscitation team is vital. Inquiry of the umbilical cord blood gases values and timely repeated gases after the baby is born is critical in those cases where samples are sent for evaluation. If the hospital does not provide therapeutic hypothermia, then an arrangement with a local facility that does offer the procedure must be in place, with the understanding of the timeliness of early transfer. Each resuscitation team member needs to show curiosity and initiative in understanding the fetal history and being prepared for unexpected situations. Thorough knowledge of NRP with frequent drills helps carry out a seamless resuscitation of these vulnerable infants.

Suggested reading:

American Academy of Pediatrics. Textbook of Neonatal Resuscitation, 8th ed, Weiner GM (Ed), American Academy of Pediatrics, 2021.

Disclosures: The authors have indicated no conflicts of interest.

NT

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

KEEPING MOTHERS + INFANTS TOGETHER

Means balancing the risks of...

- HORIZONTAL INFECTION
- SEPARATION AND TRAUMA

EVIDENCE

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

PARTNERSHIP

What is the best for this unique dyad?

SHARED DECISION-MAKING

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

TRAUMA-INFORMED

Both parents and providers are confronting significant...

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Gravens By Design: 13th International Newborn Brain Conference Headlines the Newborn Brain Society's Educational Program for 2022

Robert D. White, MD

"Beginning at the turn of the 21st century, the International Newborn Brain Conference has sought to address this deficit. Held alternately between sites in the US and Europe, the conference utilizes a format of plenary, workshop, and research abstracts to present current management and promising future approaches for topics of greatest interest."

Since the advent of neonatology, newborn brain care has remained in the shadows of more immediate and addressable problems of the high-risk infant, such as respiratory care, nutritional support, and infectious disease prevention and management. To a large extent, this was because - except for IVH – we could easily overlook its importance, even though long-term neurological complications were and continue to be one of the major adverse outcomes of neonatal illness.

Beginning at the turn of the 21st century, the International Newborn Brain Conference has sought to address this deficit. Held alternately between sites in the US and Europe, the conference utilizes a format of plenary, workshop, and research abstracts to present current management and promising future approaches for topics of greatest interest.

The 2022 meeting of this conference will be held February 10-12 in Clearwater Beach, Florida, with an international faculty and participants and will offer both in-person and virtual options. Plenary sessions include presentations on

- Sleep and the Developing Brain
- Neuroprotection of the Developing Brain
- Parents' perspectives of HIE
- Care during hypothermia
- Post-hemorrhagic ventricular dilatation management
- Seizure management
- Gaps in Research and QI in Neurocritical Care
- Management of Mild HIE
- Biomarkers of HIE Severity
- Neuroimaging in the Newborn
- Parent communication in the neurocritical care unit
- Neuroplasticity and early intervention

A record number of 141 abstracts were submitted to the conference this year, so there will be an abundance of frontline research presented. Further information about the conference, including registration details, can be found at https://www.mcascientificevents.eu/inbc/

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The conference is now presented under the auspices of the Newborn Brain Society (NBS). Founded in 2019, the NBS has grown rapidly and has over 1000 members from more than 60 countries, including neonatologists, pediatric neurologists, nurses, parents, and other health professionals. Its primary purpose is education; to this end, the annual conference is the capstone but many other offerings, including weekly webinars, are available to members. The NBS collaborates with other scientific organizations from around the world to facilitate multicenter research and QI projects. Membership information for the Newborn Brain Society, along with additional details about their mission and offerings, can be found at https://newbornbrainsociety.org/

Disclosure: The author has no conflicts of interest

NT

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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

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 assistant.
- Call 211 for FREE delivery services.

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

SELF ISOLATION

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

6 FT

Practice social distancing

KITCHEN

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

TRACK COVID-19 NEAR YOU BY VISITING COVIDNEARYOU.ORG

#STOPTHESPREAD

MIORA

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Brought to by Miora in partnership with United2Care

COVID-19

DETENER LA PROPAGACIÓN EN CASA

Qué hacer cuando usted o un ser querido está infectado.

CONSEJOS DE HIGIENE

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

OJOS
Use equipo de protección para los ojos (lentes)

MANOS
SIEMPRE lávate las manos

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

BAÑO

- Desinfecte TODO.
- Limpiar 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.

AISLAMIENTO

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

6 FT

Practica el distanciamiento social

COCINA

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

SIGUIR COVID-19 VISTAR COVIDNEARYOU.ORG

#STOPTHESPREAD

MIORA

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Traído por Miora en asociación con United2Care

Ways to Manage Covid 19 @ Home

Household

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

Stop the Spread at HOME

MIORA

Sick

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

Maneras de manajer COVID-19 en casa

Hogar

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

Detén la propagacion en casa

MIORA

Enfermo

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

PROTECT YOUR FAMILY FROM

RESPIRATORY VIRUSES

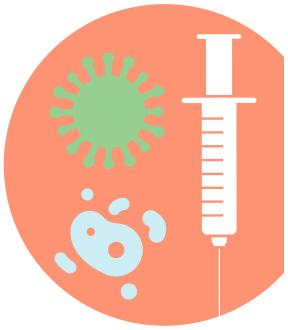
flu coronavirus pertussis RSV

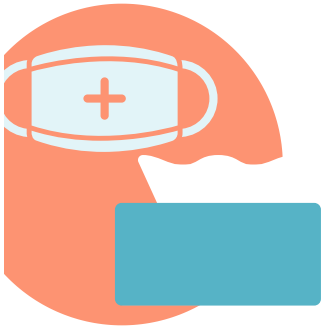
WASH YOUR HANDS

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

GET VACCINATED

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





COVER COUGHS AND SNEEZES.

Sneeze and cough into your elbow.

USE A HAND SANITIZER THAT IS 60%+ ALCOHOL.

STAY AWAY FROM SICK PEOPLE

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

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

KEEPING MOTHERS + INFANTS TOGETHER

Means balancing...

Risk of horizontal infection

Risks of separation and trauma

EVIDENCE

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NT Behind the Scenes: Breastsleeping the Anthropological Science: A spotlight on Dr. James McKenna

Kimberly Hillyer, DNP, NNP-BC, James McKenna, PhD

The following is an amended transcript of Dr. Kimberly Hillyer and Dr. James McKenna for Neonatology Today Media. Click this link to enjoy the direct viewing of the interview and stay to the end for a special drawing.

Introduction:

Thank you for joining us on today's broadcast of Neonatology Today. I'm Dr. Kimberly Hillyer, a Nurse Practitioner at Loma Linda University Hospital, and today we have joining with us, Dr. James McKenna.

Dr. James McKenna is a biological anthropologist who pioneered the first behavioral and electrophysiological studies between mothers and infants sleeping together and apart, and through 30 years of research, Dr. McKenna has become a leading expert looking at multiple topics and issues of sleep development and breastfeeding Dr. McKenna has directed the mother-baby behavioral sleep laboratory at the University of Notre Dame for 22 years and has received numerous accolades. He has published over 130 articles and chapters regarding mothers and babies sleep development, SIDS, and breast sleeping a term that he developed. His work in electrophysiological and behavioral studies with breastfeeding was referenced six times in the American Academy of Pediatrics policies. He is the author of seven books including his new book Safe Infant Sleep: Expert Answers to Your Co-sleeping Questions.

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Dr. Hillyer: Thank you for joining us today, Dr. McKenna. How are you doing?

Dr. McKenna: Great, thanks for having me, Kimberly.

Dr. Hillyer: No problem. I was very excited to be able to speak to you today because this is something as a mother of two that was really interesting to me, especially when it came to your concept of breast sleeping, which I had never heard of. Can you tell me a little bit of how you came up with that term?

Dr. McKenna: You want the true story?

Dr. Hillyer: I do!

Dr. McKenna: All right, you're gonna have it. I think about these issues a lot…what I'm about to tell you probably won't go too, unexpectedly. I was preparing to give a lecture to 2000, pretty much all women in the Australian Breastfeeding Association. The night before, and like all of us that give talks, you know, as making sure you know last minute before I went to bed looking at all the issues I wanted to address. That night, I had this interesting dream, and someone asked me in the dream… what would I be speaking about and in the dream, I said, "Oh, I'm going to be talking about Breastsleeping," and I immediately heard this voice come out of the back of my brain and said, "Breastsleeping." Yeah, that sounds really good. You gotta wake up and write that down and see what people think tomorrow morning.

" Honestly, it sounds strange, but that's exactly what happened. I said to them my first slide was "Breastsleeping." I said, what do you think about this as really showing the integrated nature of what we've been trying to explain. How sleeping with your baby is just really not a separable issue to the ways in which babies are fed."

Honestly, it sounds strange, but that's exactly what happened. I said to them my first slide was "Breastsleeping." I said, what do you think about this as really showing the integrated nature of what we've been trying to explain. How sleeping with your baby is just really not a separable issue to the ways in which babies are fed. The idea that obviously, irrefutable fact that breastfeeding wasn't the centerpiece of human development and particularly in the very, very early ages of an infant's life sleep and breastfeeding maternal sleep and breastfeeding infant sleep and breastfeeding hormonal cycles physiology. They're all integrated into a singular system, and I was particularly happy to make that mistake. You know, and rather than saying... Oh, I'm looking at breastfeeding in the context of co-sleeping. I came out in that dream with Breastsleeping, but it really is what is reflected in my research. That these variables that most of us separate out maternal sleep or infant sleep. How many breastfeeding sessions? What constitutes

appropriate hormonal responses for mothers and babies and sleep time and all the issues we study? All of them are integrated; each one has relationship to those other variables that we'll be talking about.

Dr. Hillyer: I see, and so you really developed something that really separated out what the medical field has been struggling with when it comes to co-sleeping and how that relates to things like room sharing and bed-sharing, so now you threw in the mix breastsleeping.

Dr. McKenna: Right, I was trying to well, of course, when I really thought about it the next day and I got such a positive reaction. I was thinking about it also in the sense that it doesn't really have any baggage people hear. They go well it's breastsleeping, and I say, "Oh, that's bed-sharing in the context of breastfeeding," which sets up a whole very different dimension of assessing benefits and risks. Because breastfeeding so changes alone without even looking where the baby or the mother is sleeping, it changes the whole physiology of the infant. Obviously, it changes the reproductive cycles and status of the woman as well. So that breastsleeping again as sort of a singular word reflects this integrated…biocultural interdependent functional system, that really is what is the universal pattern of the infant's biological expectations. If one starts with that knowledge rather than trying to think of, well where should a baby sleep or what's normal sleep etc. To first address the issues of who is the infant, who is the human infant from a, strictly speaking, biological point of view. What will come out probably later, as well, as our babies are distinct and that they're neurologically the least mature primate of all with only twenty-five percent of its brain volume. This suggests immediately that immediate parental investment of an extreme nature will be required…and in so far as that's true.

"This intimacy of relatively speaking, almost continuous contact is part of the biology that evolved -- The expectations of all the undeveloped immature systems of the human input, not just the brain, but digestion and heart rate sleep cycles and hormonal status. The development of digestion itself, and that's a very hard concept for western scientists who are used to pulling everything apart first to put it all together. "

This intimacy of relatively speaking, almost continuous contact is part of the biology that evolved -- The expectations of all the undeveloped immature systems of the human input, not just the brain, but digestion and heart rate sleep cycles and hormonal status. The development of digestion itself, and that's a very hard concept for western scientists who are used to pulling everything apart first to put it all together. To say, oh, by the way, you can't understand too much about a baby's eyesight visual range, what it can hear, how it's going to respond without looking at the micro-environment within which the baby evolved. That is the mother, the only environment to which the baby is adapted. Every baby in the world, regardless of culture, you put that baby on the mother's ventrum, and every baby in the world responds in exactly the same way. Increased thermal regulation, breathing is affected, heart rate has affected, blood pressures affected, hormonal status is affected, the actual pattern of breastfeeding is affected. So, you have all together kind of a universal human for a very brief period of time. That's what I've been studying for the first, actually the time period babies are most vulnerable to Sudden Infant Death Syndrome to see whether those clinical variables that are sort of addressed by solitary, usually bottle-feeding babies. How do those critical variables of breathing rates and apnea distributions, how are those issues affected when you put the babies in the environment within which the baby's sleep and architecture and breathing? All of those clinically important factors evolve, therein you get and derive what truly does amount to human infant normal sleep.

"How do those critical variables of breathing rates and apnea distributions, how are those issues affected when you put the babies in the environment within which the baby's sleep and architecture and breathing? All of those clinically important factors evolve, therein you get and derive what truly does amount to human infant normal sleep."

Dr. Hillyer: It's interesting that you saw all that because, for the most part, neonatology has been looking at the thermal regulation of infants and how that has helped with growth in terms of them being in the Neonatal Intensive Care. So, it amazes me that we haven't yet put that together and especially in the policy for the American Academy of Pediatrics.

Dr. McKenna: There are some complex issues here, so of course, to a certain extent and depending on how premature infant is we're really working in, if I may unchartered territories in the sense that the baby is being born in a context, now that it is possible for that baby through artificial interventions to live. So, what I mean by unchartered territories is never before during the evolution of human infancy. If a baby was born at 24 weeks or 28 weeks, would there ever have a chance of the baby living? So, to a certain extent, I understand why sometimes we are tending to sort of distance those premature babies from somewhat could be thought of as really being relevant under normal gestational ages -- Things that are really important to the neonate, an infant that's had a full term. That said, what's interesting coming out of neonatology has been some of the greatest representations of the importance of looking at babies as reflecting a contiguous life with what it was sensitive to within the womb. In fact, some of my colleagues have suggested [to] Julie Rutherford, one of them that actually the breast becomes the new umbilical cord. Indeed, that's a really important point because it brings the baby to the mother. You're always guaranteed if the baby is breastfeeding, that mom's

going to be very close, and indeed that permits and sets up a continuation of the regulatory mechanisms that were intrinsic to the intra-utero baby. In fact, Ashley Montague many years ago captured that concept by calling human infants extero-gestates, meaning they finish their gestation after the womb compared with other mammals. Indeed, it's true we are the only primate that can't cling, for example, to the mother's ventrum because the motor neurons are not developed.

Thus, infant carrying behavior turned out to be an extremely important selective pressure on evolving human mothers. Really, it's fascinating. I obviously wouldn't have time to go into all the human adaptations that are actually explained by the vulnerability and the prolonged vulnerability of the human infant, how societies and adults and everyone in the groups had to adjust and did behaviors to make it possible for such energetically expensive little creatures to survive. So, we evolved empathy. You could fall in love with anybody's baby and be willing to help them. You do, and we do, so it had bipedalism. Actually, if you want to take it one step back, upright posture changed the architecture of the woman's pelvis because it was so utterly beneficial, freeing the hands to do other things to make tools manipulate the environment alongside the emergent large, relatively large brain. It really permitted or necessitated a group response in the emergence of empathy of caring. So much about what others think and having a theory of mind where we know what people are likely thinking given those circumstances. We care about it, and that's unusual. We think that the origin of empathy, the ability to give your life for the sake of a perfect stranger in many ways, is the result of our need to bond with not just babies and those who are biologically related, but with others in our group in very significant ways. That care of infants, although that's true for many mammal species this collective generalized response to babies, but in the evolution of human emotional structures literally the capacity to treat other human beings that are non-related to you as being related is, in fact, a central part of our adaptation. It's generosity and giving up for the sake of the other it extends out, but it was originally because we were giving birth to these little babies that the only way they could be born safely given that the brain size was going to get so large was to roll back the immaturity of the brain relative to how large it would become. As an adult, so babies are born ever increasingly in our evolution earlier and earlier in terms of its ultimate neurological maturity birth.

"We care about it, and that's unusual. We think that the origin of empathy, the ability to give your life for the sake of a perfect stranger in many ways, is the result of our need to bond with not just babies and those who are biologically related, but with others in our group in very significant ways. "

Dr. Hillyer: And with this group empathy that you were talking about, how does that relate to other family members, whether it's fathers or grandparents participating in the engagement of sleep with infants?

Dr. McKenna: You probably, well maybe you know that generally speaking that most cultures in the world as individuals in it never sleep alone in general. Obviously, part of that is that most people around the world do not have the choice of multiple bedrooms, so on and so forth, even where there are possibilities of other beds. Many cultures, in fact, never let babies sleep alone, and when they get larger, other babies come along; grandmas and grandpas are really important in the sense of caregiving patterns and always have been throughout our evolution. When there's an effect in anthropology, there's the grandmother hypothesis and why women and men live so long post-menopausally for women. After reproductive age, it's to contribute to their relatives and friends' babies to help take care of them.

Dr. Hillyer: That's very interesting, I never have put those two things together. Very, very neat aspect, and you said that you had seen this happen with your anthropological studies in different cultures.

"Many cultures, in fact, never let babies sleep alone, and when they get larger, other babies come along; grandmas and grandpas are really important in the sense of caregiving patterns and always have been throughout our evolution. When there's an effect in anthropology, there's the grandmother"

Dr. McKenna: Yes. I can tell you as a kind of a biological anthropologist, but also trained in the other subfields, cultural anthropology, linguistic anthropology, archaeology. You all have to, as an anthropologist, develop knowledge and skills to relate your particular subspecialty. Like mine is human evolutionary processes in relationship to our contemporary species... Most cultures around the world, they hear that there's any part of the world, but they put their babies somewhere that they are not think [ing]; this is a form of child abuse and neglect. In our parlance of today's and kind of unthinkable because of the biology, that's what's so interesting. Culture can change any way it wants practically with social values and ever-increasing ideologies and thinking this is the right thing to do. The genes, in this case, particularly the genes of the infant, have remained constant through time pretty much constant through time in terms of this neurological maturity what that requires to buffer them in terms of the external world. It's done through complete and utter social interdependence and the complete dependence on the baby through a very long period of the child's life. You know, for the first third of a child's life, a human being's life, they are in some way or another dependent on caregivers for their survival and well-being; it's very unusual.

Dr. Hillyer: Do you think that that's maybe one of the reasons that the Academy of Pediatrics then opened up their policy -- to say that room-sharing was something that was definitely appropriate

for infants up to the first year of life?

Dr. McKenna: Right, oh of course, and all our studies originally, but now other people have joined in, it's just undeniable. What kinds of physiological changes are happening to babies when they're sleeping in the context for which they were designed. Lighter sleep, not deep sleep, which gives babies benefits of terminating apneas for the appropriate form of sleep, deep sleep. You don't want babies sleeping too long, too hard, too soon, and that's what solitary sleep and particularly bottle-feeding solitary sleep promotes. For the babies, about ten percent of which are more neurologically even less mature with some deficiency, you don't want to push them into an environment for which the most difficult form of sleep to terminate apneas is characteristic. That is the form of sleep that puts them alone, and of course, you complicate that even further by putting them on their bellies. That even promotes deeper sleep and gets some babies in trouble, in terms of turning face down, and their muscles aren't strong enough to turn away from. What's interesting too, isn't I didn't say anything about dads in this picture thus far, but what we've recently found out, particularly through the work of Dr. Lee Getler at Notre Dame, who's been focusing as much on the changes in male reproductive physiology and reproductive stages. As for the most part, historically, we've concentrated on women's reproductive stages through time, and what he's been able to document is, in fact, physiology that changes with his reproductive status. Birth mating patterns, where testosterone is high and oxytocin is low.

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Partnering with a woman in whatever form that takes. Where testosterone goes down significantly when men have their first child, that testosterone, which is sort of associated with risk-taking and competition, etc., risk-taking goes down. When that "T" goes down, and oxytocin goes up. When they have, like I mentioned, their first child, then this is so fascinating too, which we've been able to document. Also, by using data from our sleep lab where dads were there too. The longer the dad spends in physical contact with his baby, his testosterone adjusts to that, too, and also goes down significantly while prolactin and oxytocin go up. Now you might think that, of course, men think that's not good. You know, testosterone is always associated with western concepts of masculinity...having big muscles, and obviously, it plays a role in that behavior or that physiology for men, but what it always does, it puts men and their moods in more stable and nurturing kinds of context. If manliness rather than thinking about big muscles is associated with how successful his children are, how long they survive, and whether they survive then. Then being masculine would, in fact, not relate to how strong you are or how you meet western cultural motifs of the beautiful man, but how that man is able to care for his infant emotionally and invest in that baby because it's all about that, that's important for these energetically unbelievably expensive babies actually whose energy requirements exceed any one individual's ability to provide it, that's the key.

We know that now that babies are born not just because of the obstetrical dilemma, where those babies have to get out before their brain or head cranium gets too large to prevent the baby from successfully passing through the birth canal. We also now realize in recent research that what's happening is the trigger for birth occurs also when the mother's ability to provide the trajectory of brain growth that she has already provided is exceeded. When that energy level then stops the growth of the brain, then it's time for the baby to be born such that the external contact and breast milk continue as an incredibly critical part of it, but so does the enrichment of that social external environment to the baby. That's going to affect inter-neuronal growth, interconnections between the brain, and that ability to continue the trajectory of growth that was occurring in the uterus, but which at some point, the need for you know what is it twenty-five percent of the energy that's put into the brain on a daily basis; that huge amount of energy no longer can be provided to the baby by the mother's body. So, I am just pointing out that fathers are really important, and they too have a hormonal paternal evolutionary history that explains, yet again, what we know babies actually need, which was never asked when in the 30s and 40s or even at the turn of the century. You know, I hate to say it, and not to pick on any one race group in particular, but when white MDs, who probably never changed a diaper, by the way, started assessing how best babies should be cared for. None of those individuals had ever studied babies. There were no observational studies, no empirical physiological studies looking at the human infant. Who are they, how does the biology work, what are their brain growth patterns relative to other species, and this comparative basis not just with other animal species? Real-life history but also comparisons with what people do with babies around the world. And sure enough, when you look, they're all they would never dream of not sleeping with their babies. So that has to count for telling part of the story, too. In addition, to the studies that we have conducted that really look at the role that the physiological regulatory effect of contact plays in changing almost every variable with respect to the physiological experiences.

"There were no observational studies, no empirical physiological studies looking at the human infant. Who are they, how does the biology work, what are their brain growth patterns relative to other species, and this comparative basis not just with other animal species?"

Dr. Hillyer: Now, I feel like Neonatal Intensive Care Units around the nation has started to really take heed to what you're saying and really implement and encourage skin-to-skin contact right away with both the mother and fathers and even other support

people. Is there anything else that you could see us doing in order to bridge this concept a little bit more for home?

"Let me start with what we have a lot of data on. Which is starting with the premise that every human infant, regardless of culture, their body is designed to work in relationship to sensory exchanges with the caregiver. Every culture, and as I mentioned, I think earlier you put any baby from any culture on its mother's ventrum. Its heart rate changes, its blood pressure changes, its cortisol levels change, its breathing patterns, its distribution of apnea has changed, its growth rate changes."

Dr. McKenna: Let me start with what we have a lot of data on. Which is starting with the premise that every human infant, regardless of culture, their body is designed to work in relationship to sensory exchanges with the caregiver. Every culture, and as I mentioned, I think earlier you put any baby from any culture on its mother's ventrum. Its heart rate changes, its blood pressure changes, its cortisol levels change, its breathing patterns, its distribution of apnea has changed, its growth rate changes. Tiffany Field showed years ago that you give a massage and a baby a lot of contact physical contact, and it puts on she found 47 percent more daily weight gain every day. No one could believe it until they went out and did studies, and sure enough, boy, you give babies more contact, and whoever they are, they grow faster and more, more assuredly. So we know that, and we've known for many years, it came out of neonatology. Dr. Martinez and Reyes, if you wouldn't probably remember, because you're too young, I suspect, in the 70s, they were the first to send these little premature babies parked in the chests of their mothers because they had no more room for them in their hospitals. I believe it was Quito Ecuador, I believe I could be wrong on that, but they thought these four little prematures were not going to live. It turned out that putting these babies parked in their mother's ventrums between their breasts -- those babies had a higher survival rate than the babies that were staying in the incubators in the hospitals, and it was them that wrote this paper up and introduced this whole notion of either skin-to-skin care, kangaroo care as it came to be called. Now in the contemporary context, just a couple of years ago,

Bounty with a group of colleagues did a meta-analysis, meaning she collected as many studies of the outcomes of premature babies and the care that they received in the hospital; to see what their survival rates were, the percentages of babies returning to the hospital, sepsis, hypoglycemia, oxygen saturation levels, and all that. What has been improved hundreds, thousands of times over is that now, not only are these babies growing faster. They have less stress, less cortisol, but their survival rates, at least according to Bounty's average from all the studies, which is 37 percent less infant mortality rate of premature babies that have received skin-to-skin contact or kangaroo care as it's been called. That is, the important thing also in terms of adding to that is it's not a female body thing necessarily; it is a body thing for the infants. The dads can do this kangaroo care and get the baby's heart rate more stable, blood pressure down, less crying, a more light stable sleep with less apneas. So, the baby is again it's mimicking as much as possible that uterine environment. So originally, I just wanted to give credit to these Pediatricians specializing in neonatology that they might have learned it inadvertently, but they were the ones that made it well known around the world. The Karolinska Institute in Sweden and many centers of real infancy, neonatal, and premature studies emerged have now hundreds of studies documenting how critical this is even during that premature period. Now it's true that prematurity does make depending on the age and degree, and as opposed to the gestational age of specifically each baby too, but babies are more fragile. They don't have the capacity to engage in reflexive activities that a full-term neonate does to suffocation or a potential for suffocation. Believe me, there's only been one study that I know of on normal newborn infants to look at their reactions to having their nasal passages blocked in one form or another.

I always hesitate to tell this because it sounds like such a terrible study to do, that would never be institutionally approved...but that said, it wouldn't be, but they took newborns, and they put cellophane over the newborn space, and that was one of the things, and then the researchers put cotton up the baby's noses. The reaction of these newborns that aren't supposed to be able to do this was dramatic. In one case, it took two individual nurses to keep the baby stable from its head backing, it's arching, it's batting at the stimulus...the description is remarkable.

You definitely get the picture that for that normal little baby, that baby is not just a little protoplasmic blob waiting to have its nose or its mouth suffocated...they were like fighters.

Now that's your normal healthy baby, and premature babies, of course, would not be able to give that kind of really reflective genetic-based response to this you, know blockage. That said, the baby still, as his in evidence, they need the contact, they need the contact, but for some babies, it probably is not wise to put them, depending yet again on the age and maybe the physicians or Neonatologist's assessment of the relative strength of this baby. It's not an easy thing to say that they should be close sleeping or bed-sharing with their caregiver because they are more fragile. So that's that is a problematic for the issue of breastsleeping, etc., but of course as, as I know that the field is doing ever-increasingly they're really attempting not to make assumptions about what these prematures can do or not do, insofar as particularly getting in some form or another, breast milk, which of course would be absolutely ideal even for premature infants. So, neonatology per se opened our eyes; if now, if we could only appreciate what does this actually mean still from the newborn, these babies are contact seekers. They are designed to; they're designed to live and to feel things, not cognitively evaluation and judging, so they're not making any judges, they're not culturally socialized yet. They are as close to their genes as they'll ever get, and the genes are finding the most direct expression in whatever environment they're going to be found in.

If we really look at the responses babies give to whatever caregiv-

ing practices we administer to them, we get a very, very good clue as to what's in their best interests. Babies aren't plotting and planning and making agendas. They don't have any wants, they don't want anything, but they need things, and the need is very honest, fundamental, and biological. I can guarantee you that there isn't even an infant, not to mention preemies, which are different categories. There isn't an infant, that if they could talk, would say, "oh yes, I really think this idea of separation at four months, just yeah, it's really cool, you know, yeah put me in there I want my own bed." I think it's one of the crimes we commit about babies is inadvertent; however, so we tend to assume from a cultural, social basis, oh yeah, that should be good for babies. Teach them a little independence for five months, the little rascals, you know, I heard this put like that in a newspaper article. The little rascals, those little four-month-olds, they know what they're doing, and I could have screamed, you know. Those babies don't have an agenda. They are giving you an honest assessment of what's in their best interest.

"That's why I am, I dare say, I am absolutely opposed to any kind of sleep training. I feel it's an absolute form of cruelty. I know parents don't mean it in that way, but let's face it if an objective alien came down and looked at what this puts babies through. It is unfortunate that oftentimes it's portrayed as an important developmental landmark to self-soothe."

That's why I am, I dare say, I am absolutely opposed to any kind of sleep training. I feel it's an absolute form of cruelty. I know parents don't mean it in that way, but let's face it if an objective alien came down and looked at what this puts babies through. It is unfortunate that oftentimes it's portrayed as an important developmental landmark to self-soothe. That's a complete social construction, and so is the alleged need for early sleep consolidation. I can assure you that babies do not benefit from anything other than what their own body metabolism, body shape, their weight, their growth patterns is normal and good for them. Babies all over the world will self-soothe in their own time and place. Tom Anders who came up with the observation that if you look at babies in the video, by video cameras, crib sleeping baby, solitary sleeping baby. He named two types. They were the signalers, that the minute they woke up looking around, "Hey, where is everybody," you know, "Hey, this isn't, I don't feel right." Then there were the self-soothers that would look around for a while and go back to sleep. Now what's happened is we've come to think of the "good baby syndrome." "Oh, is your baby sleeping through the night?" You know it's one of the second questions asked, after, "what is your baby sex?" "Is your baby sleeping through the night?" As if this is good for the babies. It's not good for the babies, especially sleeping through the night and alone. That's in a completely social-cultural category of its own, this whole constructed concept of self-soothing, which Tom Anders never intended to be a developmental step or something that the good babies do. Then there's all the rest of those, you know, kind of bad babies. You don't want to mention it. No, it's a culturally constructed phenomenon. I hear these things being said by these pop-up sleep clinics that are fueling this run…Your baby's going to miss out on some important social skills unless they get this; that's just not true. I just want to make that sure to make sure people really know that. Now what parents might feel they need to do within bounds or so, but ideally, there's no need to do it, etc. So anyway, I got a little bit off the track, but what would you like to ask?

"Hearing the work that you do makes me then wonder, how can medicine take a step back in understanding multiple different cultures -- not just looking at just western cultures reactions, but looking at multiple different cultures in order to incorporate a better policy moving forward."

Dr. Hillyer: No, no, no, this is great. You know being, able to understand how cultures and different cultures work and how it has influenced the way medicine has made policies is extremely important. Hearing the work that you do makes me then wonder, how can medicine take a step back in understanding multiple different cultures -- not just looking at just western cultures reactions, but looking at multiple different cultures in order to incorporate a better policy moving forward.

Dr. McKenna: So, I don't chide our culture for thing; we do pretty darn good here, we're a good group, we're a good culture. In this sense, I believe we have gone over and overstep boundaries and thinking that this whole western innovation supposedly a baby sleeping alone and how great it is for them it never was substantiated on any empirical grounds whatsoever. Here is where we could have early on very much benefit before jumping to making universal claims about how great it is, in the baby's best interest to be separate. How great it is for the parents and that lady's life will be good, and the baby will be great. To jump to the conclusion that not only is it the best thing to do, but it's too bad those other cultures don't get on board. We need to import this "pseudo-scientific," and it is "pseudo-science" because it isn't that scientifically based and factual that babies benefit by being separated from their caregivers. No, that's never going to be shown or proven because it isn't true. Originally, it isn't even necessarily Kim that you get validation for these things. From looking at which is important where do babies sleep around the world, hands down, they are all in whatever diverse form it takes, and there is many diverse forms as there are people cultures doing it. But nonetheless, the important ingredient is access to the sensory signals that mothers and babies would give or the caregiver the ability to respond to the sensory signals. The heat, the sounds, the smells, the movement, etc. That is, it's critical, but I came to this from watching monkeys originally and studying the parenting ecology; what is it that determines forms of contact prolonged restrictive permissive in non-human primate societies. I studied the North Indian

language, so I was very familiar with the way environmental factors shape the specific ways babies are cared for. Now when you think about primates, you can get a huge idea about where babies belong by simply realizing that there isn't a non-human primate around that doesn't spend prolonged periods in unbroken physical contact with its mother's body. Chimpanzees which are the higher primate, gorillas, and orangutan, take the higher apes; all of them really prolonged associations between the infants. Then the children of those parents and it isn't just a nice social idea here. It's developmentally based. What are those children capable of? What are those babies capable of? The chimpanzee infant doesn't even break contact at all with its mothers for about four to five months.

We have a baby born that neurologically speaking is about twenty to twenty-five percent less neurologically developed than a chimpanzee, which can cling to its mother's center right away, so I was familiar though I didn't do those studies myself in the '80s. All of a sudden, we got away from Harry Harlow's work. Do you remember the two kinds of monkeys? The surrogate … that had the bottle available to it and had a steel rim mother with a bottle sticking through, and the other place was no bottle, but a terry cloth soft fake mother wrapped around. The monkeys all preferred not the bottle, and the milk. [They] preferred the secure soft, warm cozy terry cloth mother. It was a huge breakthrough because it was extremely consistent previous to that Freud had argued that one of the drive theories is the satiation of the baby's stomach and that attachment came along with the baby feeling, "oh, that's so nice." Even at the monkey level, it was determined by Harry Harlow's studies in the '50s and would never replicate them because they were pretty cruel to the monkey baby, but he showed that even there that it's something else that monkeys need. They need that social support, that feeling of emotional protection by contact rather than being the factor that brings babies to fall in love with and attach with their mothers, so we were alerted to that. Then in the '80s and early '90s, all the monkeys and apes were studied in laboratories. Most of them not there were field studies, too, don't get me wrong, but in the lab to find out what was underlying the contact if you separate a monkey or a baby right at birth what physiologically happens to the ape.

"Much more hydrocortisol production, heart rate changes, fluid in the lungs developed in many of the monkeys. They lost their appetites. Their sleep was all interrupted. They had oxygenation drops. In other words, even at the level of monkeys' three-hour separations, three-day separations didn't just reflect a social loss. It reflected underlying physiology. "

With a monkey, even if you're trying to keep it and yourself as a human caregiver, what happens to the baby? How about three months? At three months, you take it away from this mother. What about six months? Well, all these studies done on at least 30 - 35 different primate species showed immediate physiological consequences to hormonal levels. Much more hydrocortisol production, heart rate changes, fluid in the lungs developed in many of the monkeys. They lost their appetites. Their sleep was all interrupted. They had oxygenation drops. In other words, even at the level of monkeys' three-hour separations, three-day separations didn't just reflect a social loss. It reflected underlying physiology. That's what was dependent on that social relationship for undeveloped primates as they are not even yet to get to the human the social and the physical can't be separated; they're one and the same. In other words, there's a physiological regulatory effect that comes with this nice social idea, and it's not a nice social idea alone. As Harlow showed kind of dramatically, that the monkeys that had their mothers taken away were never normal, ever again. They needed to be looked at, be taken care of. So even the monkeys that were on the terry cloth, monkeys that only stooped over to get a little milk when they were starving…only did so for about twenty minutes or a half an hour during the day. That was possible for them to do it they wanted to stay on their terry cloth emotionally soft caregiver. So, I'm just trying to make the point that already in the '90s, when I started realizing there could be a possibility between this western unique, western tragedy of babies to healthy baby suddenly dying in the night and crib, that there could be a connection with this dismantling of what was an incredibly intact important biocultural system. We took away breast milk and breastfeeding, which made possible the ability to supplement bottles and thus to put babies somewhere else. Which we did, we separated them, put them in little rooms, and finally even to promote deeper sleep; yet more, we put babies on their tummies because they arouse less frequently. They sleep longer, and they sleep longer in a deeper stage of sleep. So, three major components each of what we dismantled from cultural information and values, each of those is a risk factor independently for Sudden Infant Death Syndrome; not breastfeeding putting babies prone for sleep, and putting babies in cribs by themselves. Now you mentioned room sharing, I get perturbed by this concept. I'm very happy; finally, the American Academy of Pediatrics recommended and actually knows now that babies need to be in proximity to their caregivers, but what I don't like is this kind of euphemism you might call, calling it room sharing. It is not the inert walls of the room that are being shared with, that babies that's keeping them alive. It's what's going on in that room between the mother and the father and that baby. I can guarantee that it's the vigilance, it's the checking, it's the touching, it's the responding to noises or lack therein of noises of the baby.

A baby that sleeps in a room by itself has a fifty percent greater chance of dying. Imagine that fifty percent, really, a chance alone before you go anywhere on that issue. Yet what is so terrible for my 35 years or so of studying this is that we're caught in this terrible situation. You know, like when cartoon characters run off a cliff and their feet are running around, they don't know that there's nothing underneath them. Then finally, they fall. Well, I think that's what this can be used to describe, where we are at. The animals or the cartoon characters spinning is this notion that sleeping with your baby or bed-sharing is a pathology. It's not a pathology; it's an adaptation. What they're confusing it with is how the practice is practiced, which is very different. Let me give you an example of what I mean by that, the baby sleeping in a crib face down or prone who dies through the night, the diagnosis would be SIDS it would be considered. The solution would be to teach safe crib when your babies are on their backs, take out the fluffy material.

Now we know to bring that crib in and put it next to the bed. So, let's think about the baby dying prone in a bed-sharing environment, where the double standard exists. So even if the mother says, "I really wasn't near the baby," the baby died, the cause of the death would be said to be bed-sharing. The solution would be to eradicate bed-sharing; in other words, the baby was sleeping prone, which is singularly one of the highest SIDS rates there is. Yet what has happened in this discourse on that sharing, and it isn't discourse, that's the problem. It should have always been an actual conversation about the clinical characteristics of each parent's situation. What they think, what they know, what they feel, and that's what I've been arguing for years. Not that everyone needs to jump in bed with their babies, no, but never argue that I don't actually even advocate this out, but kind of application of bed-sharing for all. No, I'm advocating for informed choice. Using actual, well-rounded scientific information, and that is what I am disappointed that the American Academy of Pediatrics refuses to consider and change.

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What's happening is its kind of like an underground up, bottom-up revolution. We get anywhere from one and a half to two million mothers right now while sleeping with their babies and breastsleeping, breastfeeding their babies. Once that breastfeeding genie was out of the bottle, that changed everything in terms of where babies were going to end up because of the way the system works. I mean, it just doesn't make sense; some others do in part because they're worried they might suffocate their baby. The very ones that probably would never suffocate their babies, but nonetheless, they put them in another room. It's pretty inconvenient to get out of bed and to go get your baby, and you've already upset the baby; they're already crying to signal you, which makes it harder to resettle the baby. So, in our studies, we've looked at mothers and babies sleeping in the same bed, sleeping apart. Over three nights, we looked at both mother and baby physiologically. Full physiological montage, oxygen, heart rates, body temperatures, sleep architecture brain waves from the mother and the baby. We had routine bed-sharers who, one night of the three, would do the opposite sleep apart. We measured them both apart; as we did, we took routine solitary sleepers, but with one commonality with the bed-sharers, they were exclusively breastfeeding. So, all our mothers were breastfeeding but just putting their babies somewhere else. The routine solitary sleeping moms would, the first night, do what they did at home, sleep separately in different rooms. Keep in mind we're monitoring their brain waves, body temperatures, heart rates, and everything. We got a good pattern of what the babies looked like, they were very different than the breastfeeding baby sleeping in bed, but I'll get to that in a minute. Then for those solitary sleeping couples the next night, we drew to see if they'd do an experiment which for them would be to sleep in the same bed or they did the same thing they did the night before, which was to sleep in their normal home situation which was in separate rooms and the third night we did the opposite of whatever they did the second night which was for the routine solitary sleepers the dead chair oh no I'm sorry for the third night gave two nights randomly to the normal night and the third night would be the opposite of what the group would normally do. We got what's called a between and within-group design, which is the best kind of cross-sectional physiological study you can do. We found that when exclusively breastfeeding all our babies were, keep that in mind when those babies were in the bed that sharing environment, they all moved physiologically and behaviorally in exactly the same way. When the baby separated the routine, bed-sharing babies didn't sleep with their mothers, they never went down very far in their numbers of arousals and things like that, but their patterns of all these clinical variables began to match that of the routinely solitary sleeping breastfeeding babies…In other words, bed-sharing acutely changes what happens to the baby right away. Solitary sleeping exactly; it changes quite acutely what happens in the bed. Now always our are breastfeeding babies whether they were sleeping alone in a room next door or in the bed. They always breastfed more, significantly more, but not as much more when they were in bed. Our solid usually solitary sleeping breastfeeding babies when they were in bed, all their numbers went way up, the number of breastfeeds per session. So, we knew that those were real, real important kinds of mechanisms of change that are defined by where the baby is sleeping.

"They always breastfed more, significantly more, but not as much more when they were in bed. Our solid usually solitary sleeping breastfeeding babies when they were in bed, all their numbers went way up, the number of breastfeeds per session. So, we knew that those were real, real important kinds of mechanisms of change that are defined by where the baby is sleeping."

Dr. Hillyer: So, I think that one of the things that was really solidified after the initial "Back to Sleep" campaign that the AAP and other agencies put in place is that they did see a dramatic decline with SIDS and then it sort of settled in. Now with the fact that we are trying to implement and have more breast milk use, breastfeeding, and in addition, with the idea of the room-sharing. Do you think that breastsleeping is going to be at odds anymore with the future of sleep guidelines? Because to me, it sounds like although behind in the times as far as the policy. It is starting to catch up with what you're actually seeing and studying?

Dr. McKenna: Yeah, it's ecology itself actually playing out, honestly. That's the power of, dare I say -- these are all scientists I'll be speaking to here; it's evolutionary-based. I didn't begin my research on sociocultural ideas about babies; they were from this cross-cultural, this cross-species. The separation studies of monkeys and apes that really gave me, in this case, the clue that wow, I think we need to really look at what would be from a species-wide perspective of normal sleep. So, what I'm just trying to point out is that, yes, I believe and I'm very hopeful that this term breastsleeping without a lot of baggage associated it, is defined by the absence of all known hazardous factors that could be associated with bed-sharing. You know the baby always on its back, of course, you know a stiff mattress, is centered, nobody in the bed desensitized by drugs or alcohol, no maternal smoking. That any baby experience this is huge. In fact, I always say that, and I'm really disappointed that the AAP hasn't put above everything else a smokeless gestation as being the very first way you can have safe infant sleep. Smokeless gestation, secondly breastfeeding, and thirdly avoiding the prone sleep. Altogether avoiding other children in the bed, having removed all the spaces between headboards and mattresses, or pushing the mattress against the wall. Not knowing parents that it's migrating away and the babies caught in that space or at an end table where there's a space between the bed. That what's interesting is some of those dangers actually go away in the bed-sharing environment because the baby is so absolutely focused on the mother they just don't move around.

"One of the ways in which the solitary bed-sharing baby gets into trouble is either the mothers place the babies on the pillow, which is a kind of a dangerous sleep environment, but also the babies move around in the bed more. Whereas the breastsleeping baby is just fixated, literally under the mother's arm looking right at chest level with the mother's body and doesn't want to go anywhere else. "

One of the ways in which the solitary bed-sharing baby gets into trouble is either the mothers place the babies on the pillow, which is a kind of a dangerous sleep environment, but also the babies move around in the bed more. Whereas the breastsleeping baby is just fixated, literally under the mother's arm looking right at chest level with the mother's body and doesn't want to go anywhere else. Not only that, but universally no mothers had to be told to put their babies on their backs because they're all breastfeeding, and the only way you can get a baby to breastfeed is to let it move to the breast and away from the breast on the back. You can't feed a baby very well, sleeping prone, and let it trying to get to the breast. So, yes, I think, and I'm very hopeful that we move from this monolithic, and it's really an unbelievably long beginning point of thinking no matter what one that mothers can't protect their babies when they are informed. That's one of the difficult factors that I think is holding up the AAP from agreeing that mothers can responsibly sleep with their babies even in an urban cultural environment where there are such things as mattresses and headboards and those kinds of things. But, I think that we're getting there, but I still hear the two major people; I won't mention names on the committee, still saying without any qualifications, "bed-sharing is dangerous, bed-sharing is dangerous, bed-sharing is dangerous." It was interesting before we got to those recommendations in 2005 that was when the actual recommendation was never the bed-sharing. It was interesting.

"They had a description of all the safety factors for the solitary sleeping baby and the same things they were saying about bed-sharing, you could exactly say about solitary crib sleeping."

They had a description of all the safety factors for the solitary sleeping baby and the same things they were saying about bed-sharing, you could exactly say about solitary crib sleeping. I didn't ever point it out to them, but every single one of the factors of what happens with bed-sharing was saying risk factors when babies were except for the overlaying of the mother, but it was a nonconscious cultural ideology that they didn't realize. If you begin with the premise, a priori, that no matter what it is, whatever form it takes, bed-sharing is dangerous, you're never going to get to the point where you're really trying to, you're starting off at the wrong point. It's not that it's inherently dangerous; it can't be because that's how babies have lived, but it can be made inherently dangerous, and that's a huge difference. That is what they have been very disappointingly, not able to actually begin with listen this is a proven time-honored cross-species valid and intra-species valid, important beginning point for babies affecting neural biological growth and development. Affecting the development of the immune system, itself I mean, now that deals with breastfeeding too, but breastsleeping does include. It's defined by breastfeeding in the context of a hazardous bed-sharing environment, but again I think that the mothers and babies are defining what they're doing. Now we have to bridge what the small 9 to 12, the 15 person com-

mittee, now keep in mind; most people don't know this; millions of mothers around the world millions and millions are being affected by what a very small insular handpicked group is thinking. No discipline differences, people that represent really different lines of evidence like anthropologists. I have to keep saying it because psychologists now are actually looking at these issues from this perspective. So, it's changing…I could tell you names, but a very big group now is beginning to understand these beginning points as having been erroneous.

> ***"The problem for me has been in my career is that I'm fighting two paradigms at the same time, the SIDS research paradigm and the pediatric sleep paradigm, and both are suffering from false beginning points that cultural assumptions have been used as the basis of making recommendations."***

The problem for me has been in my career is that I'm fighting two paradigms at the same time, the SIDS research paradigm and the pediatric sleep paradigm, and both are suffering from false beginning points that cultural assumptions have been used as the basis of making recommendations. A big epidemiological studies for SIDS that…asked more carefully the important questions about bed-sharing. I'm convinced now that I've seen other studies that show how parents with such negative rhetoric about bad sharing are not telling pediatricians that they really do sleep with their babies. It's a complex question that to answer actually, Kim, because suppose you have a crib and you put your baby in your crib in the beginning of the night, and some researcher that you have a feeling wants you not to be bed-sharing you say, "oh yes, my baby sleeps in the crib," but what they're not saying is the baby is relocated. You know, at first feed and goes into the bed, which is a very normative pattern and unless you want to believe that in the middle of the night, the baby started levitating out of the crib and floated down the hall and dropped into the parents' bed, which I doubt. So, it's a hard question to answer, but a lot of parents don't even know that they really do bed-share. I mean, in a sense, they know where the baby's supposed to be, and they think it's just kind of a little exception. You know what I mean, so it's fudged, and that data sometimes is very close as to whether or not the bed-sharing and the epidemiological study proves to be a factor. Now smoking in bed-sharing is 20 - 30 times greater risk. So, you really see how individual risk factors can play out obviously in the safety of bed-sharing. That's why it's not an easy concept to really work with, but we see that the breastfeeding and the breast milk through multiple studies now are changing everything. If it can't go on that, the American Academy of Pediatrics is continuing it is going to be considered a fraudulent form of science. That people know now there are very different ways to be looking at this issue. Important legitimate scientists in legitimate science is being presented in all the best journals. It's all there, and it has to be considered, and I'm hopeful in the next set of recommendations that the committee changes that the people that have these other perspectives. It's not meaning that they're superior to the physicians that are making these decisions, but I've become convinced that it isn't good enough. What I mean by that it's not that the people aren't good enough, but the information and the lines of science they have access to for this question needs to be very integrated. In important and substantive ways and that in a sense, I guess, I'm arguing that just as my field alone would not be enough, or psychology alone would not be enough, medically trained knowledge would not be enough, right.

Dr. Hillyer: I think what you said there is definitely key, and it gives me hope seeing that they had already used, I think, five articles that you have been a part of in the current guidelines and policies and utilized one of your books. So, with this new book, ***"The Safe Infant Sleep: Expert Answers to Your Co-Sleeping Questions."*** What would be the one thing that you would want them to highlight moving forward as they create this next policy?

Dr. McKenna: It's something; actually, I've been arguing since 1996 or even before that they make a distinction from the act of bed-sharing itself and the conditions and circumstances by which it occurs. Stop focusing only on the outcome, which is, of course critical, it's the bottom line. How the outcome becomes the outcome and that there are millions, as we speak millions of mothers that are going uneducated to the very safest form of breast-sleeping even because they are afraid to mention it because of pediatric pediatricians responding negatively -- Lactation support, who I admire remarkably around the world, women [are] giving generously of their time to help mothers everywhere. It's incredibly impressive Kimberly, I have been humbled by these women thousands, tens of thousands of them. Their voice has been, you know, silenced; their jobs have been threatened if they even mention the word…co-sleeping. You have people making these laws that don't know anything about the subject. They think they do. They say, "oh my gosh, four babies just died last week from co-sleeping." Well, that's tragic, but how did those babies die? That's important to include in the disciplines. Then we eliminate those factors that actually explain the debt, just like we have done with crib sleeping because it isn't going away. That is what I am hoping, and other people need to be members of that, heretofore very insular group and paradigm that's actually being used.

Dr. Hillyer: Well, I want to thank you for lending your voice to this broadcast and educating our viewers a little bit more on this aspect. I really do look forward to seeing this movement not only in neonatology but through the Academy of Pediatrics with the continued work that you have been doing, and I really appreciate your time today.

Dr. McKenna: Kim, thanks so much for allowing me, giving me the privilege of speaking to your colleagues. I really am very thankful and appreciative.

Dr. Hillyer: No problem and I want to thank everyone for joining us today; and Dr. McKenna's book is "Safe Infant Sleep: Expert Answers to your Co-sleeping Questions." Thank you, from Neonatology Today.

Dr. McKenna: Thank you.

Disclosure: *The authors have no disclosures.*

NT

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

Title: NT News Anchor and Editor

Title: Neonatal Nurse Practitioner & News Anchor, Editor for Neonatology Today

Organization: Loma Linda University Health Children's Hospital

Neonatology Today in partnership with Loma Linda University Publishing Company.

Bio: Kimberly Hillyer, RN LNC, NNP-BC DNP, completed her Master's degree specializing as a Neonatal Nurse Practitioner in 2006 and completed her Doctorate of Nursing Practice (DNP) at Loma Linda University in 2017. She became an Assistant Clinical Professor and the Neonatal Nurse Practitioner Coordinator at Loma Linda University. Her interest in the law led her to attain certification as a Legal Nurse Consultant at Kaplan University.

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 Author: Professor James J. McKenna

Professor James J. McKenna is recognized as the world's leading authority on mother-infant cosleeping in relationship to breastfeeding and SIDS. In recognition of his work in 2009 he was admitted as a Fellow into the select body of the American Association for the Advancement of Science, the world's most prestigious scientific society. That same year and in recognition of his extensive work with television, radio, and print media he received from the American Anthropological Association the "2008 Anthropology In The Media Award" one of the top three awards presented to anthropologists by the association in recognition of his distinguished work in educating the public to the importance of anthropological concepts.

He received his undergraduate degree in anthropology from the University of California, Berkeley in 1970, his Master's Degree from San Diego State University in 1972, and his Ph.D. in biological anthropology from the University of Oregon, Eugene, in 1975.

After teaching anthropology at the University of California, Berkeley as a Visiting Assistant Professor for two years, he accepted a tenure track position (in anthropology) at Pomona College in Claremont, California, where he was awarded an Endowed Chair and received numerous teaching awards, and remained an active member of the faculty for twenty years. Professor McKenna was recruited by the University of Notre Dame in 1997, and since then has won every teaching prize he has been eligible for including most recently, the College of Arts and Letters' highest teaching award, the Sheedy Award, in 2008.

Initially Professor McKenna specialized in studying the social behavior of monkeys and apes but following the birth of his son in 1978 he began to apply the principles of human behavioral evolution to the understanding of human infancy. At the University of California, Irvine School of Medicine, Department of Neurology his research team pioneered the first studies of the physiology and behavior of mothers and infant sleeping together and apart, using physiological and behavioral recording devices.

Professor McKenna has published over 139 refereed scientific articles in diverse medical and anthropological journals on co-sleeping, breastfeeding, evolutionary medicine and SIDS, and both here and abroad. He also

regularly gives lectures on over 20 specialized topics relating to cosleeping and breastfeeding especially to pediatric medical professionals and parents. Here in the United States he remains a primary spokesperson to the media on issues pertaining to infant-parental sleeping arrangements, nighttime breastfeeding and SIDS prevention.

He has also published two monographs on SIDS and infant sleep, and co-edited two books: Evolutionary Medicine (published by Oxford in 1999) and Evolutionary Medicine And Health: New Perspectives, also with Oxford University Press. His first trade book for parents was published in 2008 entitled: Sleeping With Your Baby: A Parents Guide To Co-sleeping, and was recently translated and made available in Spanish and Dutch, as well as other languages.

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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Addressing Health and Racial Equity in Neonatal Care

Valencia Walker, MD
Nationwide Children's Hospital

Jenné Johns, MPH
Once Upon A Preemie Academy

MON, NOV. 22, 1 - 2 PM EST

Addressing Structural Racism and the Impact on Neonatal Care and Health Disparities

Tamorah Lewis, MD
Children's Mercy Hospital

Jenné Johns, MPH
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Jonathan R. Swanson, MD, MSc

Associate Professor of Pediatrics
University of Virginia
Children's Hospital
Charlottesville, VA

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

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August 9, 1996 - April 3, 2010

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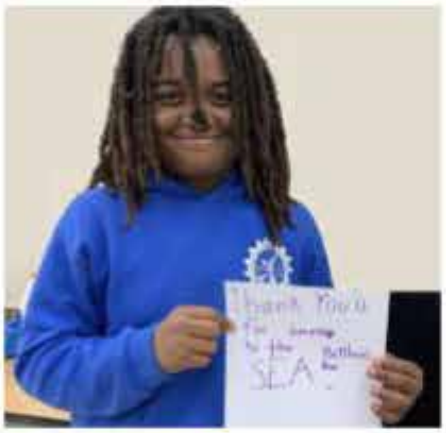

1 session	$15
1 week	$30
1 month	$120
1 semester	$540
1 year	$1,080
Middle School	$3,240

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

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

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

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

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

fu-sheng.chou@neonatologytoday.net

Medicolegal Forum: The Apgar Score

Gilbert I. Martin, MD

The Apgar score has continued to emerge as an important parameter in the medical-legal arena. That is, it is often used to prognosticate future neurological compromise and blame it on inappropriate obstetrical and/or neonatal care. The following poem, written in 1989, remains pertinent today. For the first five individuals who submit a letter to the editor regarding the Apgar Poem, I will send that person an Apgar Stamp from my own personal collection.

"For the first five individuals who submit a letter to the editor regarding the Apgar Poem, I will send that person an Apgar Stamp from my own personal collection."

Virginia Apgar, in '53,
was practicing anesthesiology.
She said to colleagues with great frustration,
"The newborn babe needs observation.
Correct assessment with more attention,
leads to appropriate intervention.
If we pick numbers that seem to jive,
can this predict who will survive?"
A scale devised that very year
was clinically oriented and did seem fair.
Heart rate, reflex irritability, and muscle tone
were numbered singly, each one alone.
Respiratory effort and color too,
Hence, the score—but what to do?
Measured at minutes, one, five, and ten,
Instructed what to do and when---
Problems arose with such a roar,
Who should assign this "Apgar Score"?
The obstetrician called numbers high,
for perfect babies would not die.
The pediatrician, not wanting blame,
called numbers low—this was a shame.
This left the task to the poor nurse,
who often found the job a curse.
Five clinical signs made up the score,
but in reality, there were several more.
The obstetricians yelled and booed,
wailing that they'd soon be sued.
Pediatricians countered, "Don't be afraid,
Asphyxia's a term that soon will fade."
And then some babies born premature
could not be measured with the score.
Cord pH, gestational age
Made the number a poor gauge.
Faulty recall, postdated noting
had the lawyers really gloating.
Potential help for this condition
mimics Olympics competition:
Skaters, gymnasts, and divers, too,
are all assigned a score by few.
A special team of five or more
could redefine the Apgar score.
In-house, on-call for deliveries,

their Apgar scores would surely please.

A 3, 4, or 7.1,

hold up your cards—we've just begun.

Three and one-half million births a year,

Who will fund a cost so dear?

Perhaps the answer is soporific,

as we attempt to be scientific.

Encourage closer observation,

adapt a score without inflation.

Modify existing terms—

We've opened up a can of worms.

THE PERINATE

Disclosure: There are no reported conflicts.

NT

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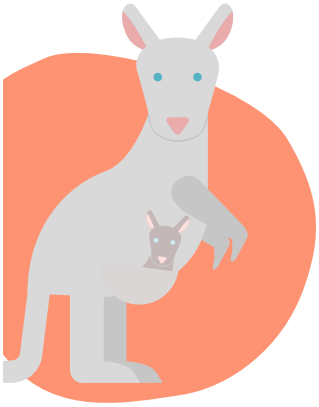

GET INFORMED ABOUT THE RISKS + BENEFITS

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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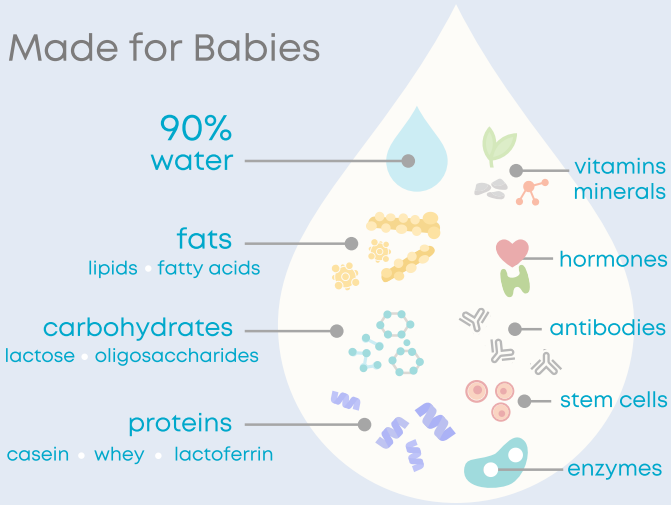

Breast Milk is Living Tissue

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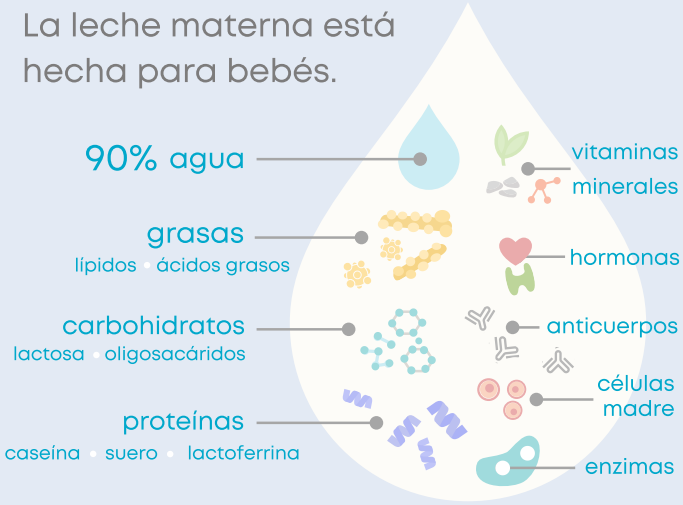
La composición de la LECHE MATERNA

200+ componentes

La leche materna está hecha para bebés.



La leche materna es tejido vivo.

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The Village Son

A Life's Journey

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

Houchang D. Modanlou

Peer Reviewed

Interpreting Umbilical Cord Blood Gases: Section 7: Fetal Circulatory Failure, Part II

Jeffrey Pomerance, MD, MPH

"On the day of admission, the mother presented at the hospital because of spontaneous rupture of membranes with the escape of clear fluid confirmed by examination. Although the mother reported normal fetal movement, the FHR tracing revealed a baseline of 160 bpm with minimal variability and absent accelerations."

Case 20: Chronic Fetal Heart Failure: Unknown Etiology

The mother was a 34-year-old, A+, antibody negative, gravida 2, para 1, aborta 0, with an intrauterine pregnancy at 39 6/7 weeks gestation. Approximately two weeks before admission, the mother reported decreased fetal movement. An NST was reactive, demonstrating a baseline FHR of 135 bpm with accelerations to 155-165 bpm. On the day of admission, the mother presented at the hospital because of spontaneous rupture of membranes with the escape of clear fluid confirmed by examination. Although the mother reported normal fetal movement, the FHR tracing revealed a baseline of 160 bpm with minimal variability and absent accelerations. Excessive uterine activity was present with five to six contractions in eight minutes. Intermittently, the tracing revealed a pattern of smooth oscillations (sinusoidal pattern). At approximately 15 minutes prior to delivery, the FHR fell slowly to 50-60 bpm, and an emergent cesarean section was called with prompt delivery under general anesthesia. Upon entering the uterine cavity, the amniotic fluid was dark and blood-stained. Upon delivery of the infant, the placenta was found free-floating in the uterine cavity. The 3970-gram infant's Apgar scores were 0, 0, 0, 1, 3, and 5 at one, five, 10, 15, 19, and 35 minutes, respectively.

Cord blood gas results were as follows:

	Umbilical Vein	Umbilical Artery
pH	7.24	6.91
Pco_2 (mmHg) *(kPa)*	54 *7.20*	105 *14.00*
Po_2 (mmHg) *(kPa)*	39 *5.20*	9 *1.20*
BD* (mmol/L)	4	12

*BD_{ecf} (CSLI)

The hematocrit was 52% (approximately the same at follow-up). Extensive resuscitation included suctioning, intubation, ventilation with 100% oxygen, chest compressions, five doses of epinephrine via ETT, two doses of sodium bicarbonate, and 40 mL of normal saline through a peripheral IV. At age 35 minutes, the still flaccid infant began gasping.

"Extensive resuscitation included suctioning, intubation, ventilation with 100% oxygen, chest compressions, five doses of epinephrine via ETT, two doses of sodium bicarbonate, and 40 mL of normal saline through a peripheral IV. At age 35 minutes, the still flaccid infant began gasping."

An ABG at age 48 minutes revealed the following results:

	Infant's ABG
pH	6.86
Pco_2 (mmHg) *(kPa)*	102 *13.60*
Po_2 (mmHg) *(kPa)*	105 *14.00*
BD (mmol/L)	15

The placenta weighed 760 g and showed mild acute chorioamnionitis and a small area of old infarct (1.1 cm in greatest diameter). No blood clot or other indicator of placental abruption was deduced from inspection of the maternal surface of the placenta.

The infant continued to be flaccid and had no spontaneous movements; pupils were fixed at 2 mm. ETT suctioning resulted in dark, old blood. Because of poor ventilation, lung lavage was performed twice and resulted in improved chest movement. The abdomen appeared "round and hydropic."

Seizures began prior to three hours of age and were treated with phenobarbital. The newborn's base deficit normalized after eight hours of age. The initial corrected WBC count at two to three hours of age was 19,400/mm^3 with 4% bands, 44% neutrophils, and 165 NRBCs/100 WBCs). NRBCs were approximately 32,000/mm^3 (19,400/100 x 165). The infant developed evidence of DIC and hepatic and renal dysfunction. An EEG showed a burst suppression pattern. A CT of the head at approximately 19 hours of age was normal. An MRI and MRA of the head at about age 24 hours demonstrated a question of diffusion abnormalities bilaterally in the ventral lateral thalami and the subcortical white matter. At age four days, an MRI of the brain demonstrated restricted diffusion in the lateral basal ganglia regions. At age four years, this child carried diagnoses of dystonia, spastic quadriparesis, and developmental delay.

Interpretation

The umbilical cord venous blood sample demonstrates a mild respiratory acidosis and a borderline high Po_2, a finding associated with cord occlusion, chronic fetal heart failure (see Case 19), and a normal base deficit. The venous pH is borderline low. The umbil-

ical cord arterial blood gas sample demonstrates severe respiratory and mild to moderate metabolic acidosis. The umbilical veno-arterial blood gas differences are quite widened, suggesting either cord compression (common) or fetal heart failure (rare). However, the findings during labor suggest placental abruption – excessive spontaneous uterine activity, bloody amniotic fluid upon entry into the uterus (it was clear initially), and the free-floating placenta encountered immediately after delivery of the infant. In the face of uteroplacental insufficiency induced by placental abruption, one would expect to see approximately equal derangements of both umbilical venous and arterial blood gas samples (see Case 8), clearly dissimilar from the values that are present in this case. Initially, I thought these cord gas results must have belonged to a different newborn, an occurrence that is always possible but very unlikely, and the last bastion for unexplainable cord blood gas results.

The diagnosis of abruption is a clinical one, and the absence of fresh clots behind the placenta at the time of delivery does not exclude acute abruption. (1) With chronic placental abruption, one would expect confirmation from pathological examination of the placenta. Further, the amniotic fluid was clear when the membranes ruptured. Therefore, it seems likely that acute placental abruption began sometime after the onset of labor (or was the initiator of labor) and became complete around the time of delivery.

"On admission, a maternal report of "normal" fetal movement seems improbable given the FHR pattern of decreased variability and absent accelerations. Often mothers feel "chided" when their perception of decreased fetal movement appears to be in error. This may result in a future reluctance to report any decrease in fetal movement."

On admission, a maternal report of "normal" fetal movement seems improbable given the FHR pattern of decreased variability and absent accelerations. Often mothers feel "chided" when their perception of decreased fetal movement appears to be in error. This may result in a future reluctance to report any decrease in fetal movement. When the mother was reassured after testing, no explanation was offered as to the cause of her perceived change in fetal behavior. No ultrasound examination was performed to evaluate the amount of amniotic fluid.

Placental pathology showed mild acute chorioamnionitis; however, chorioamnionitis with or without funisitis does not appear to influence cord pH or base deficit.

The upper limit of normal NRBC shortly after birth is approximately 1000/mm^3. (2) The extremely elevated NRBC count of 32,000/mm^3 suggests fetal hypoxemia over at least days rather than hours. Other potential explanations exist for the very large differences between the umbilical venous and arterial samples. However, all of the other potential explanations involve cord occlusion of one sort or another. Chronic cord occlusion with a slowly tightening knot in the umbilical cord provides a possible explanation; however, no knot was found, and variable decelerations were absent. Similarly, the explanation of occult cord prolapse seems improbable due to the absence of both variable decelerations or a finding of any unusual cord location at the time of the emergency cesarean delivery. An occult cord is frequently missed at the time of emergent cesarean section. The major reasons arguing against these mechanisms of fetal embarrassment include the smoking gun in this case, the hydropic appearing neonatal abdomen, a classic sign of fetal heart failure. (3) It is hard to ignore this finding. Regardless of the cause, fetal heart failure was present prior to the onset of labor. Furthermore, there was an intermittent FHR sinusoidal pattern during labor. This instance is the third fetus I am aware of in whom a sinusoidal FHR pattern was observed in the absence of fetal anemia and the presence of fetal heart failure. Perhaps it is fetal heart failure rather than severe fetal anemia that is the prime cause of a fetal sinusoidal heart rate pattern.

In summary, although there was clinical evidence of placental abruption, this development likely did not play a major role during labor and delivery. Instead, chronic fetal heart failure of undetermined etiology was responsible for the terminal events and the extremely disparate umbilical cord blood gas results. The mechanism by which umbilical cord blood gases become widely disparate when the fetus has heart failure is explained in the previous case.

Even though the apparent cause of the initial Apgar score of zero was chronic fetal heart failure, if this had not been present, a complete placental abruption would likely have been catastrophic all by itself.

Key Points

- Combined venous and arterial umbilical cord blood gases often provide a different and improved view of the pathophysiology of fetal compromise.
- A fetal sinusoidal heart rate pattern may be primarily associated with fetal heart failure rather than only severe fetal anemia.

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3. *Ojala TH, Hornberger LK. Fetal heart failure. Front Biosci (Schol Ed) 2010;2:891-906.*

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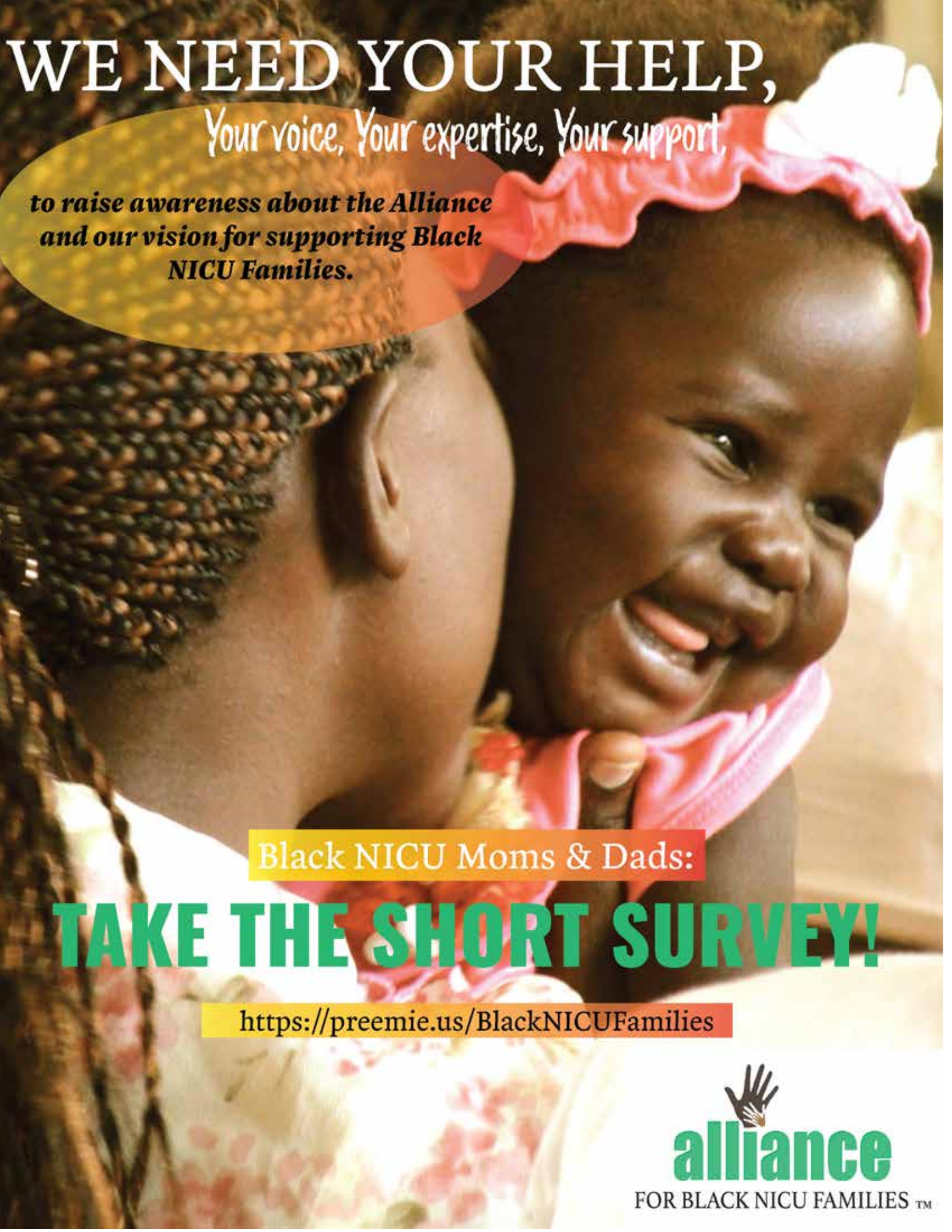
WE NEED YOUR HELP,
Your voice, Your expertise, Your support,
to raise awareness about the Alliance and our vision for supporting Black NICU Families.
Black NICU Moms & Dads:
TAKE THE SHORT SURVEY!
https://preemie.us/BlackNICUFamilies
alliance
FOR BLACK NICU FAMILIES ™

Peer Reviewed

The Current Legislative Landscape for Maternal and Infant Health and Why It Matters

Alison Jacobson

first candle

Saving babies. Supporting families.

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

Abstract:

Background: About 3,500 infants die annually within their first year of life from Sudden Unexplained Infant Death (SUID) and its subset Sudden Infants Death Syndrome (SIDS), making it the single leading cause of infant mortality in the U.S. Evidence indicates adherence to infant Safe Sleep Guidelines developed by the American Academy of Pediatrics (AAP) reduces these mortality rates. Still, since an initial decline following the 1994 guidelines introduction, SIDS rates have leveled, and SUID rates have increased. In addition, SUID rates per 100,000 live births are twice as high among Black and Native American infants than white. The AAP last updated the guidelines in 2016 and is scheduled to issue the next updated guidelines in late 2021.

Objective: To examine perceptions of the AAP guidelines held by parents and health care providers as they relate to guidelines comprehension and compliance, and to share this information with the AAP 2021 guidelines task force.

Methods: First Candle commissioned a qualitative research study in 2020, consisting of three online focus groups in three different states to identify perceptions and potential barriers to guidelines adoption by family members and providers, the outcomes of which were shared with the AAP for review as its guidelines task force develops the updated version to be released in 2021.

Results: Regarding how the AAP guidelines were viewed, there were responses across geographic and sociocultural variation regarding varying levels of general comprehension and trust in them, depending on the resource and acceptance of the language used. Additional factors were the emotional and practical realities of parenting, cultural and family traditions, and the belief that parental volition in decision-making is important.

Conclusion: Evidence-based protocols regarding infant safe sleep practices and their impact on reducing infant mortality rates may have proven value. Still, professional caregivers and family members feel that more cultural context and personal relevance are needed in presentation and communication if families are to trust and consider them for adoption and compliance.

Keywords:

infant mortality, infant safe sleep, implicit bias, Sudden Unexplained Infant Death (SUID).

Definition of terms:

Qualitative research: Information gathered first-hand regarding individual feelings, opinions, and perceptions, through focus group questions and discussion. The information is not quantified.

Purposive: qualitative research conducted with a sampling whose characteristics indicate it will likely have knowledgeable responses to the topics to be introduced.

Infant Safe Sleep Guidelines: the evidence-based recommendations developed by the American Academy of Pediatrics Task Force, to reduce the risk of Sudden Unexplained Infant Death, including Sudden Infant Death Syndrome and Accidental Suffocation and Strangulation in Bed (ASSB). The current revision in use was released in 2016.

Implicit bias: bias that can occur automatically, without conscious thought.

"The final content of the Biden Administration's Build Back Better Act is currently being worked out in budget reconciliations in Congress, and at stake are several initiatives that could affect maternal health – and, therefore, infant health."

The final content of the Biden Administration's Build Back Better Act is currently being worked out in budget reconciliations in Congress, and at stake are several initiatives that could affect maternal health – and, therefore, infant health.

- The plan includes provisions to increase and diversify the perinatal workforce, including education and anti-bias training for healthcare providers.
- It also calls for improvements in data collection to better understand the causes of maternal mortality and complications from birth and investments in community-based organizations.
- It proposes making the American Rescue Plan's health insurance premium reductions permanent for women who buy it on their own, an annual savings of $600.
- In addition, those covered by Medicaid and CHIP would receive a full year of postpartum coverage, regardless of which state they live in. The bill would require all states to extend full-benefit Medicaid and CHIP postpartum coverage to one year by redefining the postpartum period from 60 days after pregnancy to 12 months.

Several of the maternal health-related investment proposals were advanced by the Black Maternal Health Momnibus, (1) a package of bills created in the U.S. House of Representatives to drive multi-agency efforts to improve maternal health, particularly among racial and ethnic minority groups, and which continues to be advocated for during the reconciliation process.

A state version, the California Momnibus Act, was signed into law in October 2021 by Governor Newsom and includes Medi-Cal coverage for doulas, extending Medi-Cal eligibility for postpartum people, providing easier access to CalWORKs for pregnant people, and establishing a guaranteed income pilot program that prioritizes pregnant Californians with low incomes.

These proposed investments matter for several reasons. Maternal mortality rates in the U.S. are among the highest in the developed world and especially high among Black and Native American women (2), regardless of income or education levels. Being aware of maternal and infant health, including access to healthcare throughout the pregnancy and breastfeeding, is an important component of the infant safe sleep practices advised by the American Academy of Pediatricians, which form a basis of the educational outreach First Candle has been undertaking for more than 30 years. Healthy mothers, healthy pregnancies, and healthy babies can contribute to decreased risk for Sudden Unexpected Infant Death (SUID), which remains the leading cause of death in children between one month and one year of age.

"In addition to potentially boosting GDP and the job market, the administration believes increasing women's labor force participation is critical to supporting working families, including the over 4 in 10 mothers, mostly women of color, who are the sole or primary wage earners in their families."

The proposed act also examines the economic universe women operate in and its impacts on their health and wellbeing. One of these areas is to increase compensation for childcare and home care workers. Roughly 90 percent of care workers are women, and nearly half of childcare workers are women of color. (3) On average, childcare workers make 23 percent below workers who do not work in that profession. (4) The proposed plan would ensure childcare and preschool teachers are paid at least $15 an hour and comparable to kindergarten teachers if they possess similar credentials.

In addition to potentially boosting GDP and the job market, the administration believes increasing women's labor force participation is critical to supporting working families, including the over 4 in 10 mothers, mostly women of color, who are the sole or primary wage earners in their families.

Unfortunately, National Paid Family and Medical Leave is at risk of being cut from the budget. Today, one in three Americans – estimated at 113 million -- lack access to a single day of paid leave to care for themselves or their loved ones. This population is overwhelmingly women, communities of color, and low-wage working families. And one in four women goes back to work two weeks after giving birth. The ability for mothers to recuperate postpartum and remain home to care for their baby is critical to the health and wellbeing of both mother and child. At the time of this writing, members of Congress are still negotiating the budget package.

They must hear from all of us to make sure they pass a national paid family and medical leave program.

Regardless of the final decisions made in the Build Back Better plan, the relevant issues it raises and hopes to address are the result of efforts by those at the local, state, national, and organizational levels who are aware of the link between family health, maternal health, and infant health, and how day-to-day living and systemic practices that weaken access to health care can contribute to health disparities. Their importance will not go away after the plan is finalized, and whatever issues remain unaddressed should continue to be fought for.

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

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About First Candle

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

Neonatologist Opportunity
Davenport, Iowa

Looking to make a change? We have the total package…

The Department of Pediatrics at the University of Illinois College of Medicine and OSF Healthcare are partnering with Genesis Medical Center-Davenport and currently seeking a board certified Neonatologist. Genesis Medical Center-Davenport is a Level II nursery with roughly 1,700 deliveries/year. An excellent benefits package is available including vacations, sick time, malpractice coverage, CME, health and life insurance and retirement plan.

Genesis Medical Center-Davenport is a licensed 502 bed facility, which offers a wide range of inpatient and outpatient medical services. Specifically, the NICU is a 20 bed unit, which consists of ten private rooms and three open bays. The NICU functions as a Level II intensive care nursery. The NICU is equipped to stabilize and manage neonates with acute and chronic illness. It is equipped with emergency and resuscitative equipment including:

- Cardiac and apnea monitors with capabilities for trending/monitoring pulse oximetry
- Non-invasive and invasive blood pressure monitoring
- Oxygen therapy (ventilators, CPAP, bag/mask, high flow nasal cannula, RAM cannula and nasal cannula)
- Warmer units
- Isolettes
- Neonatal instruments for insertion of UAC/UVC lines, PICC lines and chest tubes

The Quad Cities (made up of 5 cities, including Davenport Iowa), representing roughly 400,000 people, is the largest metropolitan area on the Mississippi River between Minneapolis and St. Louis. It is three hours west of Chicago and two and a half hours east of Des Moines, Iowa. The area has recently been ranked as a "best place to live" and is known for safe neighborhoods, short commute times and a reasonable cost of living. The community is fortunate to have excellent schools (in the Quad Cities and surrounding areas), the Niabi Zoo, museums, fine arts, a local festival scene, minor league baseball and hockey, and many seasonal outdoor activities. The John Deere Classic, PGA Tour event, and the Bix 7 road race bring in people from all over the world every summer. The Quad Cities International airport located in Moline, IL connects our community to almost a dozen other cities in the US.

Please contact or send CV to:
Stacey E. Morin, OSF HealthCare Physician Recruitment
Ph: (309) 683-8354
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Web: www.osfhealthcare.org

OSF HealthCare Children's Hospital of Illinois

GENESIS

Neonatal Nurse Practitioner Opportunity

Davenport, Iowa

Looking to make a change? We have the total package…

The Department of Pediatrics at the University of Illinois College of Medicine and OSF Healthcare are partnering with Genesis Medical Center-Davenport to provide neonatology coverage in Davenport, Iowa. Genesis Medical Center-Davenport is a Level II nursery with roughly 1,700 deliveries/year. An excellent benefits package is available including vacations, sick time, malpractice coverage, CME, health and life insurance and retirement plan.

Reporting to the Medical Director of the Neonatal Intensive Care Unit, and according to professional nursing standards of care, performs a variety of advanced nursing diagnostic and therapeutic procedures for the high risk neonates in the critical care setting at Genesis Healthcare—Davenport (Davenport, IA). Demonstrates the knowledge and skills necessary to provide patient care that is appropriate to the ages of the patients served.

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GENESIS

Symposiums. Conferences. Congresses……

Kelly Welton, BA, RRT-NPS

"Call them what you want; this all-encompassing environment of learning is slowly making a comeback post-pandemic. Most of us are done with 'attending' a conference from our couch and 'seeing' old friends from former workplaces in a chatbox."

Call them what you want; this all-encompassing environment of learning is slowly making a comeback post-pandemic. Most of us are done with 'attending' a conference from our couch and 'seeing' old friends from former workplaces in a chatbox. Those responsible for education have done their best to recreate the real thing in an online format, but the truth is: We do not take care of our patients via tabs and chat boxes, iPads, and downloaded slides. We run on our two feet, use both hands, and wish we had an extra set of both. Patient care is still a hands-on business, no matter how much tech they throw at us.

The first run of Academy of Neonatal Care's 3-day seminar was a hybrid of sorts. A couple of lectures, then some time at a station or two to practice what they just saw. A couple more lectures, then more time at the hands-on stations. A review of the day's learnings, with opportunities for the students to ask questions and ensure confidence in their answers to the day's quiz. However, we noticed something about the students. While in process with hands-on stations, it was time to reconvene for the next lecture. Nevertheless, everyone at the five tables appeared engaged, asked questions, and squeezed in (masked and distanced) to watch their fellow students practice securing a 2.5 ET tube or setting up an oscillator circuit.

As an educator, to interrupt engaged learning should be a crime punishable by something.

The team agreed, keep going with the hands-on skills practice. The lecture could be watched later. Online access to the 'missed' modules was granted to the attendees. All attendees agreed that the opportunity to practice live and make mistakes (runaway PEEP on a flow inflating bag/ loose tape jobs/ wrong nasal CPAP device size) in a safe environment was superior to sitting through a lecture.

At the debriefing, it was necessary to decide how to best fit in all of the content and keep it to 3 days. Move more content online? That would preclude them from asking questions as needed. Even in a live 'Zoom' type meeting, students can ask questions via a chatbox, but they are anonymous and isolated. Hence, the "Tri-brid" model is born: Some basic prerequisites, to be completed online, then the live three days with extended hands-on time, and follow up online lectures, the number of which is dictated by the students' required practice time.

I cannot wait for the days to return of getting up, getting dressed, putting on our best face, and mingling with fellow RT's: talking to reps and playing with their ventilators and ABG kits.

Online is a necessity for busy professionals who may not have time to travel the day before and the day after a conference, on top of being absent for 2 or 3 days. But the additional learning by asking questions in a group gathered around a new ventilator or new procedure is enhanced by fellow RTs asking questions we may not have thought of asking or by showing us 'their' way of setting up a circuit or system that works better than 'our way.'

"Until those days return, we must do our best to continue to educate in the best manner we can, continually polling our learners so that we can get the combination right."

Until those days return, we must do our best to continue to educate in the best manner we can, continually polling our learners so that we can get the combination right.

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

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Project New Born Distinguished Chair in Neonatology
University of Miami Miller School of Medicine
Medical Director, Newborn Services, Jackson Health System

On behalf of the Department of Pediatrics at the University of Miami Miller School of Medicine (UMMSOM), Jackson Health System (JHS), and Holtz Children's Hospital, CareerPhysician, LLC, the national leader in academic pediatric leadership recruitment, has initiated an international search to identify a transformational leader to serve as the next UMMSOM Chief of the Division of Neonatology, and Medical Director of Newborn Services for JHS.

- The incoming Chief will have the opportunity to continue the renowned legacy of the program and the responsibility of establishing and implementing a strategic plan that will guide the division into the future. Eligible applicants shall be at the academic rank of Associate Professor or Professor, board-certified in Neonatology, and hold or be eligible for an unrestricted medical license in the state of Florida.

Opportunity Highlights:

- Dr. Eduardo Bancalari, an international thought leader in Neonatology who has led the division for the past 45-years, has initiated a succession plan and will be stepping down with the naming, transition, and onboarding of his successor. Given the scale and scope of the program and its strong national and international reputation, we believe this opening to be among the premier leadership opportunities currently available in Neonatology.
- The Division has grown to 26 faculty, in addition to administrative and research team members, as well as well as a prestigious and well-respected neonatal fellowship program.
- The incoming leader will also serve as Director of Project: New Born, a nonprofit philanthropic organization supported by the Jackson Foundation.
- JHS hospitals have approximately 7,000 deliveries annually, with the division providing full-time coverage in the Newborn Special Care Center at Holtz Children's Hospital and in two neonatal units at Jackson North and Jackson South hospitals. Division faculty also provide educational support to developing clinical programs in Haiti, the Dominican Republic, and throughout Latin America.
- With 126 beds, the Newborn Special Care Center is one of 11 Regional Perinatal Intensive Care Centers designated by the State of Florida, and is the only Level 4 birthing hospital in Miami-Dade County, a community of 2.8 million people. Of the NICU's 126 beds, 66 are Level IV ICU stations and 60 are Level II/III stations.
- As the only academic Neonatology program in the South Florida region, the division's basic and translational science research interests are comprehensive, with long standing intra and extramural funding.
- As part of the Total Rewards benefits package, University of Miami faculty, staff, and their eligible dependents can receive tuition remission for undergraduate and most graduate degree programs.
- Miami is known as the top ranked healthiest city in the United States, where you will enjoy no state taxes, weather that is never cold, endless recreational pursuits, and world-class amenities!

For more details about this opportunity, or if you would like to recommend an individual(s) who exemplifies the qualities we are seeking in a candidate, please contact Marcel Barbey at marcel@careerphysician.com, or at 817-707-9034. All interactions will remain confidential, and no inquiries will be made without the consent of the applicant.

The University of Miami is an AA/EOE/ADA employer that seeks applicants who add to our culture of diversity and inclusion.

COPING WITH COVID-19

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

Provide culturally-informed and respectful care.

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

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

myNICUnetwork.org

and

National Perinatal Association
NICU Parent Network

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

TOP 10

RECOMMENDATIONS FOR THE PSYCHOSOCIAL SUPPORT OF NICU PARENTS

SUPPORT 4 NICU PARENTS

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

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

1 PROMOTE PARTICIPATION

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

Welcome!

2 LEAD IN DEVELOPMENTAL CARE

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

3 FACILITATE PEER SUPPORT

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

4 ADDRESS MENTAL HEALTH

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

5 SCREEN EARLY AND OFTEN

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

6 OFFER PALLIATIVE & BEREAVEMENT CARE

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

7 PLAN FOR THE TRANSITION HOME

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

8 FOLLOW UP

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

9 SUPPORT NICU CARE GIVERS

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

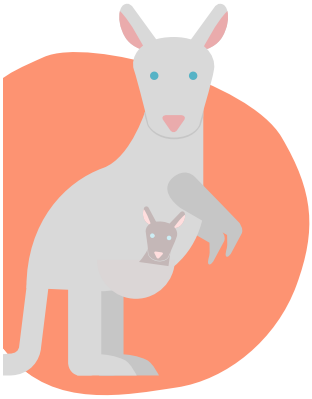
10 HELP US HEAL

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

SUPPORT4NICUPARENTS.ORG

SUPPORTING KANGAROO CARE

SKIN-TO-SKIN CARE DURING COVID-19



GET INFORMED ABOUT THE RISKS + BENEFITS

work with your medical team to create a plan

GET CLEAN

WASH YOUR HANDS, ARMS, and CHEST

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

PUT ON FRESH CLOTHES

change into a clean gown or shirt.

IF COVID-19 + WEAR A MASK

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

National Perinatal Association

nicuparentnetwork.org

NPN NICU PARENT NETWORK

nationalperinatal.org/skin-to-skin

ONCE UPON A PREEMIE ACADEMY

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Raising Global Awareness of RSV

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

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

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

RSV GOLD

A Global Mortality Database for Children with RSV Infection

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

2021 Hand to Hold NICU Community Conference: A Synopsis

Kelli Kelley

Hand to Hold
2021 NICU Community Conference
NICU PARENTS • NICU PROFESSIONALS
NOV 3 - 5 2021

"Hand to Hold welcomed more than 1,700 attendees to the first-ever virtual conference for NICU parents and NICU professionals in early November. Attendees from 39 states, 14 countries, and Puerto Rico spent three days learning, growing, and being inspired by sessions focused on family-centered care, moving panel discussions, and inspirational speakers, both in English and Spanish."

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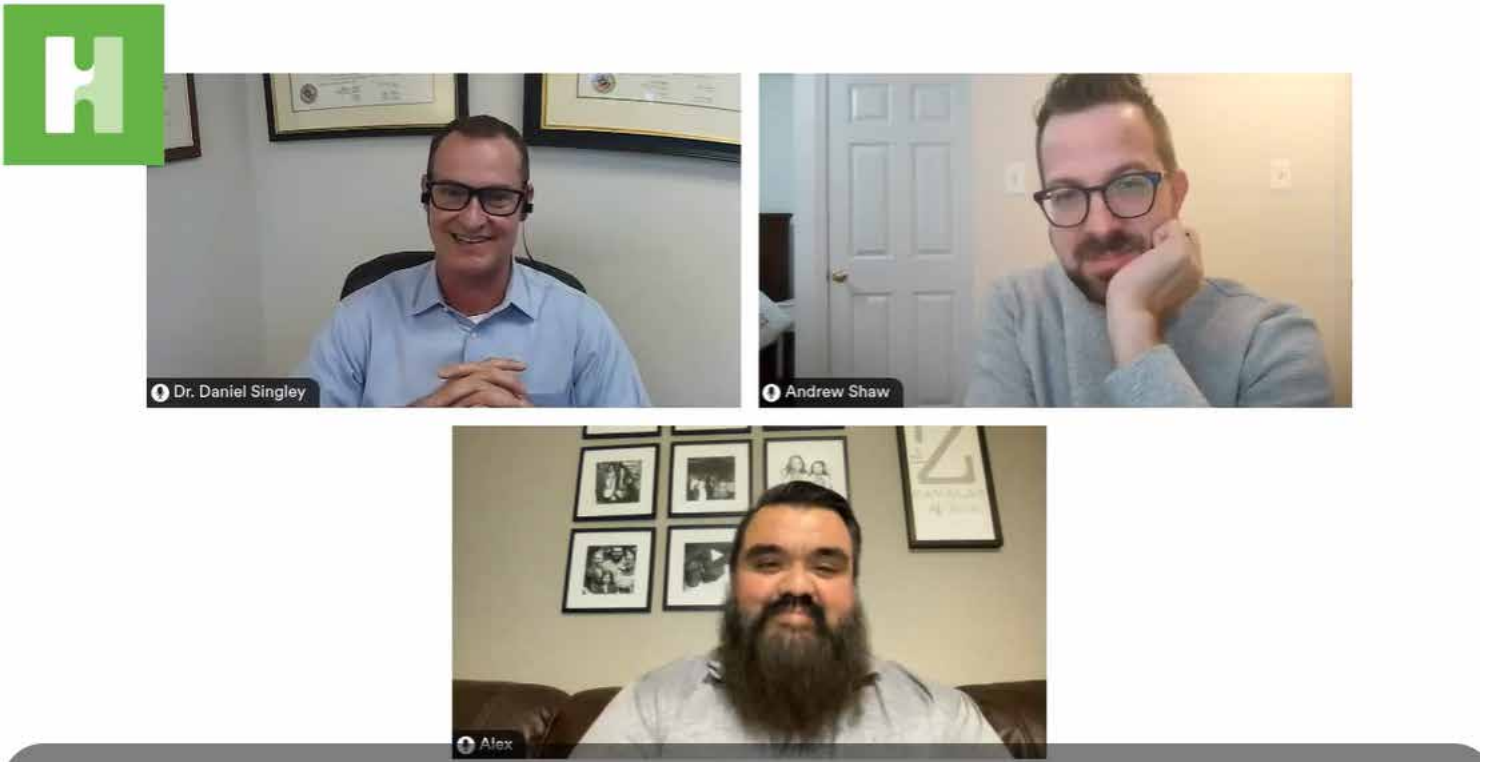
On Wednesday, November 3, the conference kicked off with an outstanding keynote by Susan David, Ph.D., award-winning Harvard Medical School psychologist and author of Emotional Agility: Get Unstuck, Embrace Change, and Thrive in Work and Life. In her inspiring and humorous session, Susan shared the powerful strategies of emotional agility and how to lead with curiosity, courage, and insight in the face of challenges.

From there, NICU parents and professionals split into their individual tracks, including a track for Spanish-speaking families ready to learn and engage. NICU professionals learned from Marni Panas about the effectiveness of timely, meaningful, and honest communication between NICU providers and parents. Meanwhile, NICU parents learned how to integrate therapy into everyday activities, attended a parent panel about advocating for their child in and out of the NICU, and got tips on how to help siblings feel empowered and included.

On Thursday, NICU professionals kicked off the day with Dr. Anthony Orsini sharing his research and proven communication techniques that physicians and parents can utilize to help navigate difficult conversations with NICU parents. Other sessions included feeding and nutrition from Dr. Christina Valentine, followed by an amazing session by Dr. Richard Shaw about the psychological issues affecting parents of premature infants. The day finished with "Self Care Isn't Selfish: Practical Options for NICU Nurses."



Picture 1. Dad Panel

Picture 2. Susan David Screenshot

For parents, day two of the conference started with the incredible Michele Rosenthal, in part two of her three-part series, "Your Life After Trauma," (part one was released as a pre-conference webinar, and part three of the series is to be announced), followed by a discussion on milestones for the first three years of a baby's life. Thursday afternoon brought a heartfelt panel discussion with parents who have endured a loss, and an engaging session about self-care from KC Davis, licensed professional therapist, author, and speaker behind the mental health platform Struggle Care.

Picture 3. Marni Panas Session

Day three invited NICU professionals to explore the power of story in a joint session with Mary Coughlin, founder of Caring Essentials Collaborative, LLC, and NICU nurse and NICU mom April Castaldi sharing her painful birth story. Next, NICU professionals learned about NICU discharge and transition planning, followed by Health Disparities and Cultural Competence in the NICU.

On day three, NICU parents started with a presentation about feeding and nutrition, followed by a panel of NICU dads discussing involving fathers in the process of supporting new parents during and after the NICU experience. Parents ended the day with an inspiring talk from author and motivational speaker Mindy Henderson, who showed us that, while our challenges may look different, the tools and strategies we use to navigate them are universal.

"Recordings for most sessions are available to registered conference attendees on the conference platform until December 5, 2021, and CEUs are available for all sessions in the NICU Professionals track. Hand to Hold plans to release the sessions on our YouTube channel in December, with select NICU professional sessions also released as episodes on the NICU Heroes podcast in the coming months."

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It was an honor to host so many parents and professionals for three inspiring days. We are looking forward to another amazing event in 2022!

Disclosures: There are no relevant disclosures identified.

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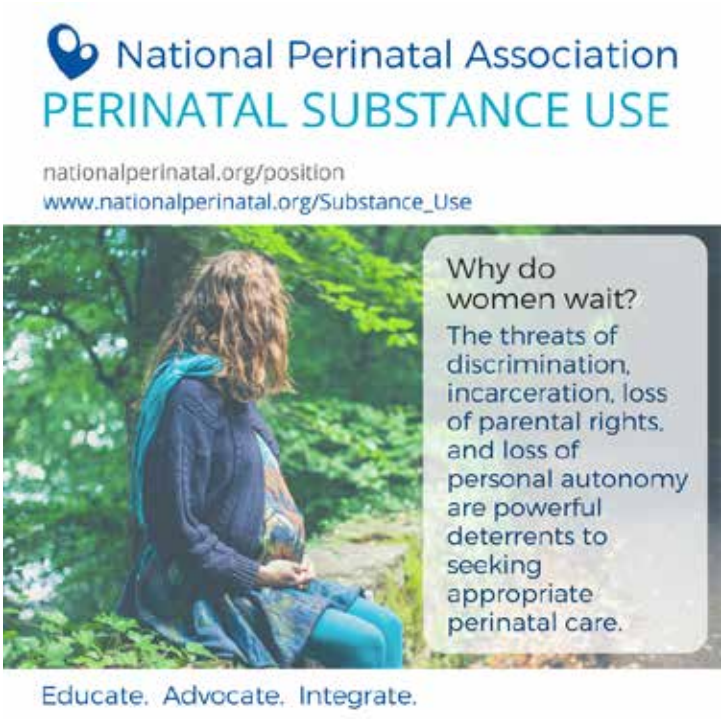
The Survey says RSV



Post-Natal Steroids: Old Dogs with New Tricks (But They Can Still Bite)

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.

"I started my full-time career in the NICU in January 1990. "Prems" were mechanically ventilated in the mid-'60s, but there had been no substantial changes in terms of conventional ventilation since that time.

I started my full-time career in the NICU in January 1990. "Prems" were mechanically ventilated in the mid-'60s, but there had been no substantial changes in terms of conventional ventilation since that time. Continuous mandatory ventilation (CMV, also known as intermittent mandatory ventilation (IMV)) was the norm, and patient-triggered breaths were just showing up. Assist Control mode (A/C) was on the horizon, and high-frequency oscillation (HFO) and high-frequency jet ventilation (HFJV) were rarely used, if available, and then for rescue only.

Shortly thereafter, a new drug came onto the scene that quickly garnered a reputation for being seemingly miraculous. That drug was dexamethasone. It allowed us to successfully extubate babies with rather bad lung disease or drastically decrease their FiO_2 requirements. Given the comparatively archaic ventilation and "Peepaphobia" of that time, one can imagine how many of those babies there were. Soon dexamethasone was being dispensed by the barrel. Everyone rejoiced at this wonderful breakthrough in neonatology. That celebration was, shall we say, premature.

Despite having an anti-inflammatory: corticosteroid (cortisol) ratio of 30:1,(1) corticosteroid effects such as catabolism, hyperglycemia, hypertension, and spontaneous intestinal perforation, and hypertrophic cardiomyopathy (2) were seen at the doses given at that time. These effects were (and are) transient and, except for intestinal perforation, relatively benign compared to the prospect of prolonged mechanical ventilation (MV) and possible pulmonary failure.

It was not until later, when these babies were seen at follow-up that concerns were raised regarding more serious, long-term adverse effects. Head circumferences were smaller than controls, and neurological exams were more likely to be abnormal. There was also an *apparent* increase in the incidence of cerebral palsy (CP) (2). A definitive link to CP is difficult to determine as premature infants are already at higher risk, and many other interventions may also be contributory. CP diagnosis was also made prior to age 5 when the diagnosis is less certain than at age 8-9. A single study extended follow-up to age 8-9 and found no significant difference in the rate of CP with steroid use (2). These contradictory findings may be, at least in part, patient-specific. A meta-regression of dexamethasone trials found that outcomes differ with severity of illness; those with an estimated risk of CLD of <35% are at greater risk of death or CP given dexamethasone, whereas those whose risk of CLD is >65% are at reduced risk (3). (How risk was determined is unknown; however, this reference is one tool used (4)).

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Infection is another possible adverse effect of steroid use, but, as with CP, separating out sepsis causation is difficult due to the severely compromised premature immune system (2). Here again, while metanalysis found no increase in sepsis among babies receiving dexamethasone, a crossover study found more nosocomial infections in the dexamethasone group (3).

Early vs. late administration:

A trial of 248 infants given dexamethasone or placebo within three days of life found that while there was an initial decrease in venti-

lation requirements in the treatment group, this was not evident at seven days. More concerning is that there was also no difference in the rate of CLD or survival between the treatment and control groups. The authors concluded that early administration was ill-advised (2).

Another Cochrane review of late steroid administration (defined as >7 days of life) found mortality decreased at 28 weeks post-conceptual age (PCA) but not at 36 weeks, but CLD was reduced at both 28 and 36 weeks PCA, as was the need for mechanical ventilation. The same side effects were reported (2).

It is important to note that many of the studies on dexamethasone used higher doses than are currently used and for much longer; a "short course" was considered 4-6 weeks. It stands to reason that higher doses are given for a longer time will increase systemic and side effects. Enter the "DART" protocol.

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The DART protocol uses a low-dose tapering strategy starting at 0.075 mg/kg every 12 hours (q12h) for three days. This dose is reduced to 0.05 mg/kg q12h for three days, then to 0.025 mg/kg q12h for two days, and finally to 0.01 mg/kg q12h for two days. This protocol gives ten days of dexamethasone treatment, much shorter than the previously common practice. A high dose protocol begins with a dose of 0.25 mg/kg q12h followed by 0.15, 0.1, 0.05 respectively each for three days, followed by a dose of 0.025 mg/kg q12h for six days prior to discontinuation of treatment (3). As expected, higher dosing is associated with greater systemic and adverse effects.

Data on steroid administration at 28 days of life up to 36 weeks PCA is not as plentiful. One retrospective study compared the use of dexamethasone, hydrocortisone, and methylprednisolone in this cohort. It found that dexamethasone facilitated extubations at seven days of treatment, but no difference in the incidence of CLD was found in any of the groups (5).

Beyond 36 weeks PCA, only one study has looked at prednisolone and found that respiratory support requirements decreased significantly after one week of treatment. Beyond one week, no further improvement and an increase in side effects, particularly failure to grow, were observed (5).

Alternate administration methods:

Since the lungs are the intended target for decreasing inflammation and systemic effects are largely responsible for adverse/side effects, it makes sense to target the lungs directly. Here, hopes of decreasing systemic effects have thus far not been realized. A trial of 78 infants given dexamethasone either intravenously or via inhalation found similar results between the groups (although the response to IV administration was faster) but found no significant differences in system/adverse effects (6).

Nebulized budesonide has been used in the NICU, mostly on infants receiving non-invasive respiratory support, and is very commonly used this way in the unit in which I practice. The viscosity of the drug (and that it is a suspension rather than a solution) makes nebulization difficult, but diluting the dose with normal saline to increase total volume increases effective deposition (7). In intubated neonates, the small endotracheal tube (ETT) diameter may further decrease the amount of drug delivered. Vibrating mesh nebulizers (i.e., Aerogen®) may be superior to jet nebulizers, delivering approximately 37% more budesonide in one bench study (7); a head-to-head study comparison is needed. Electrostatic charge on the ETT itself may lead to more drug depositing on the walls of the tube. Using a metered-dose inhaler and spacer device may also increase deposition, and giving one or two puffs "extra" may help negate electrostatic attraction (8). A study done in our unit using beclomethasone in a metered-dose inhaler and spacer administered to intubated infants failed to achieve a primary outcome in any group, but there was a significant reduction in FiO_2 at the highest dose given (9). Although a higher dose may have decreased electrostatic charge and improved effective delivery (and improved results), this was not done.

Recently some clinicians have been administering a mixture of budesonide and surfactant intratracheally. Reviewing several studies (although limited in number) reveals a significant decrease in CLD in the treatment group. However, differences exist between the study cohorts, particularly birth weight and study design (10,11). Different surfactant formulations were also used that are not consistently identified.

"Reviewing several studies (although limited in number) reveals a significant decrease in CLD in the treatment group. However, differences exist between the study cohorts, particularly birth weight and study design (10,11). Different surfactant formulations were also used that are not consistently identified."

The typical dose of budesonide when administered with surfactant is 0.25mg/kg. There is compelling evidence that this dosage is much higher than needed. An escalating dose trial of calfactant plus budesonide administered intratracheally found similar pulmonary results at all doses, including at 1/10th the 0.25mg/kg dose. Furthermore, metabolomic analysis of blood found budesonide levels at all doses, linearly increasing as doses increased, along with systemic effects. Tracheal aspirates were analyzed for inflammatory markers, and further analysis showed improvement only if inflammatory markers were present. This result suggests that this approach is practical only if inflammation exists and that much lower doses of budesonide are effective and reduce systemic ef-

fects/adverse effects (12). Further research is clearly indicated.

Choice of Steroid:

Dexamethasone, hydrocortisone, and prednisolone/methylprednisolone are the most commonly used steroids in current use. Dexamethasone is between 25-50 times more potent than hydrocortisone and is long-lasting with a biological half-life between 36-72 hours. Hydrocortisone is short-acting with a biological half-life of 8-12 hours. Methylprednisolone's biological half-life is between 12-36 hours and is five times more potent than hydrocortisone (13). Betamethasone is very similar to dexamethasone, and there is evidence to suggest its effectiveness is equivalent to dexamethasone with fewer side effects, although it is more expensive and less available than dexamethasone (14).

Most studies have involved either dexamethasone or hydrocortisone. Recently hydrocortisone has gained favour amongst clinicians treating micro-premature infants. Adrenal insufficiency is common in extremely premature infants and may exacerbate their susceptibility to inflammation. It is, therefore, reasonable to expect supplementation with hydrocortisone would be of benefit. Recent trials have indeed shown a positive effect. The largest of the studies found a beneficial effect only in babies with prenatal exposure to inflammation. Although early (18-22 months corrected age) follow-up in 3 of the 4 studies reviewed found no adverse neurodevelopmental effects evident in the treatment groups (15). More recently, the "PREMILOC" showed early hydrocortisone significantly improved survival at 36 weeks PCA with no evidence of neurological adverse effects; in the 24-25-week gestational age (GA) cohort, neurological outcomes were better in the treatment group. This result is particularly encouraging since prophylactic indomethacin is most likely to benefit these babies, but its concomitant use with steroids is contraindicated (5).

"That post-natal steroids have a place in the NICU is incontrovertible. As with all therapies, it is vital to choose which babies receive them wisely. Changes in dosing and dosing regimens have increased the safety profile of dexamethasone, but adverse effects remain a concern, particularly neurodevelopmental outcomes."

Conclusion:

That post-natal steroids have a place in the NICU is incontrovertible. As with all therapies, it is vital to choose which babies receive them wisely. Changes in dosing and dosing regimens have increased the safety profile of dexamethasone, but adverse effects remain a concern, particularly neurodevelopmental outcomes. Current evidence discourages both early treatment and high doses and suggests dexamethasone benefits infants at high risk of CLD.

As we resuscitate more micro-premature infants under 24 weeks GA, we will inevitably see an increase in those with CLD and a concurrent increase in steroid use. Concerns remain regarding neurodevelopmental sequelae, and only long-term follow-up of these babies can establish the validity of those concerns. Since CLD in and of itself bodes poorly for neurodevelopmental outcomes, we may be faced with choosing the lesser of two evils. Choose well.

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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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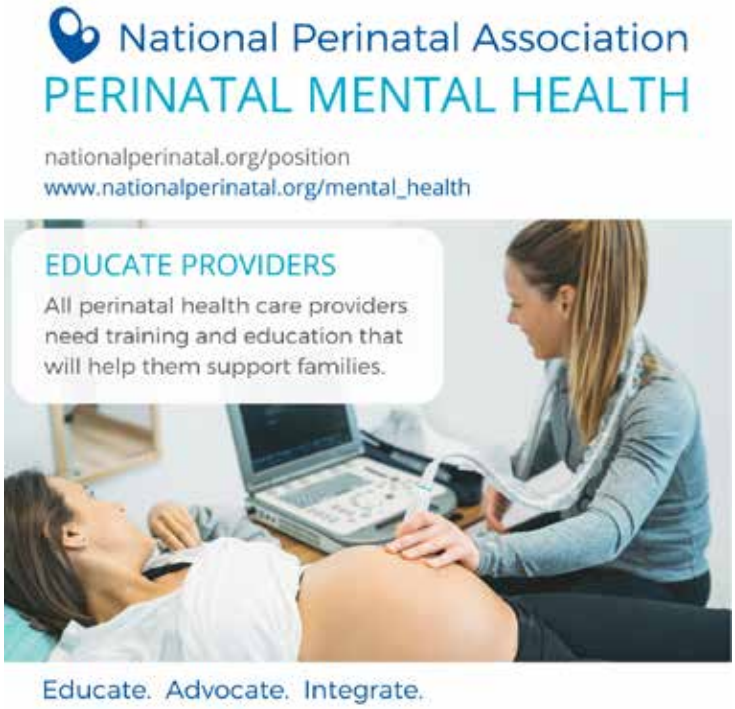

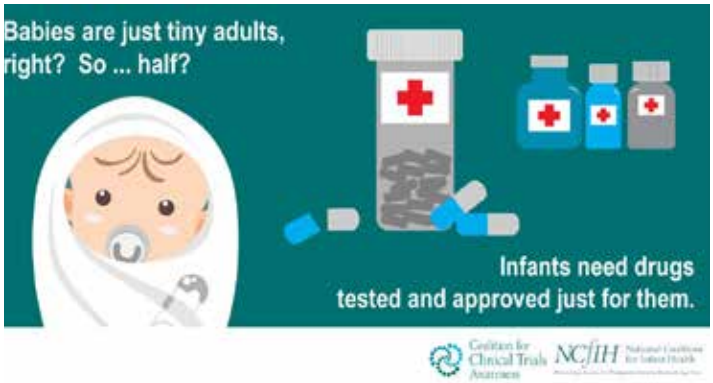

1 Educate Yourself
Did you know that more than half of the babies admitted to NICUs were not born prematurely? See our fact sheets.

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

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

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

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

This project is a collaboration between

Project Sweet Peas + National Perinatal Association

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

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

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

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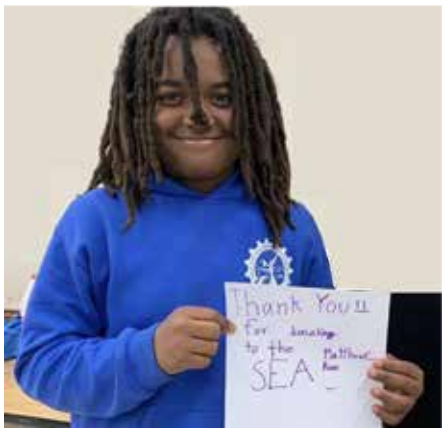
The average cost for the program to provide a mentor/ tutor for one child is listed below.



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

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

NICU Policy Shifts During Uncertain Times

Pamela A. Geller, PhD, Andrea L. Nelson, PhD, Shannon G. Hanson, PhD, MPH, Leah B. Sodowick, BA, Hisham Nsier, BS, Miller Shivers, PhD, Chavis A. Patterson, PhD, Melissa Maye, PhD

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

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

National Perinatal Association

Educate. Advocate. Integrate.

Since the onset of the COVID19 pandemic in the United States in March 2020, neonatal intensive care units (NICUs) across the country have enacted a range of internal policies to protect infants, their families, and staff from contracting COVID19 . (1) Even within single institutions, hospital policy has shifted over the course of the pandemic based on community infection rates, location of national hotspots, vaccination availability/rates, and perceived risk. Unfortunately, while necessary to promote safety in the face of uncertainty, such policies affect delivery of family-centered care as well as parent-infant bonding. News reports as well as recent publications have indicated that these policies have resulted in limited parent visitation (e.g., length of visit, number of providers at bedside) and restrictive infant-parent interaction (e.g., limited holding and caretaking, mask over face blocking infant's view of face). (2-5) These reports are corroborated by global survey and the experiences of members of the National Network of NICU Psychologists (NNNP) working in settings throughout the country. (6) Increased parent-infant separation and restricted parent-infant interactions at the bedside may have immediate negative consequences on parent mental health and short-and-long-term-effects on infant development. (7)

"Since the onset of the COVID19 pandemic in the United States in March 2020, neonatal intensive care units (NICUs) across the country have enacted a range of internal policies to protect infants, their families, and staff from contracting COVID19 . (1)"

" It is likely that COVID19 policies restricting parent visitation to the NICU and interaction at the bedside have exacerbated the negative mental health implications already associated with a NICU hospitalization. (2,9)"

NICU parents already report higher rates of anxiety and depression in the post-partum period relative to other subgroups of new parents. (8) It is likely that COVID19 policies restricting parent visitation to the NICU and interaction at the bedside have exacerbated the negative mental health implications already associated with a NICU hospitalization. (2,9) For example, some COVID19 NICU policies have resulted in limited access to mental health services, religious support services, and social support from parents of other infants hospitalized in the same NICU during the same time period. Parents have also likely limited their contact with family, friends and other potential support providers outside of the hospital due to public health recommendations to protect their infant and the spread of COVID19.

NICU infants demonstrate higher prevalence rates of neurodevelopmental delays and disabilities than other infants. (10) While a number of factors likely contribute to these outcomes, researchers have begun to question whether the aversive NICU environment contributes to the increased prevalence of language delays and cognitive disorders among NICU graduates due to limited social interaction and limited exposure to stimuli. (11) Current research supports this hypothesis; recent studies have found that NICU infants who have more social interactions demonstrate significantly higher scores on neurodevelopmental tests even at 24-to-36-months. (12-13) Reduced quantity, and quality, of parental interaction during a critical period of development has likely been even further reduced due to shifts in COVID19 NICU policies. In particular, changes in NICU parent visitation policies have influenced the frequency and duration of

parental visits, while policies relevant to parent-infant interaction have reduced, or at times even eliminated, the potential for skin-to-skin contact and exposure to the human face due to masks blocking facial features and expressions. Moreover, maternal and paternal mental health conditions repeatedly have been found to be associated with adverse childhood and adolescent cognitive, language, and socioemotional outcomes. (14-15) These negative neurodevelopmental outcomes may be even more apparent for infants hospitalized in NICUs during the COVID19 pandemic as a result of limited interactions during their hospitalization and the impact of parental mental health on long-term development and adaptive functioning.

"Ultimately, a large national multi-site, longitudinal, cohort study is necessary to fully understand the impact of COVID19 NICU policies on parental mental health and the combined impact of COVID19 NICU policies and parental mental health on child neurodevelopmental and socio-emotional outcomes."

Ultimately, a large national multi-site, longitudinal, cohort study is necessary to fully understand the impact of COVID19 NICU policies on parental mental health and the combined impact of COVID19 NICU policies and parental mental health on child neurodevelopmental and socio-emotional outcomes. At this time, even the short-term impact of parent mental health consequences during COVID19, above what is typically seen in a NICU setting, is not fully understood given the continuation and shifting of restrictions. While prevention of COVID19 infection is the primary goal, it is unclear what, if any, data are informing decision-making around policy shifts. Data are necessary not only to conceptualize the problem but also to inform policy decisions moving forward.

As an initial step, members of the NNNP Research Committee have initiated a national survey of parents who have had a child hospitalized in a level III or level IV NICU since April 2020. Funded through the Henry Ford Health System (HFHS) Proposal Development Fund (Principal Investigators, M. Maye & P. Geller), the first aim of the study is to understand the scope, stability, variability, and drivers (e.g., local COVID19 prevalence rates) of NICU policies that parents of a NICU infant experienced/are experiencing during the ongoing COVID19 pandemic. A second aim is to explore the short-term impact of these NICU policies on parental mental health. Specifically, we are actively collecting data from 450 parents that explores the scope and stability of the COVID19 visitation and parent interaction policies in place during their infant's hospitalization. The survey also explores any variability that may have occurred during the infant's hospitalization (e.g., increasing restrictions, lax implementation, loosening of restrictions). Our measure collects basic socio-demographic (e.g., race, insurance type, parent education) and NICU hospitalization information (e.g., date of admittance, date of discharge). Parent mental health data (i.e., anxiety, depression, stress, sleep) are collected using well-validated self-report instruments.

"Our measure collects basic socio-demographic (e.g., race, insurance type, parent education) and NICU hospitalization information (e.g., date of admittance, date of discharge). Parent mental health data (i.e., anxiety, depression, stress, sleep) are collected using well-validated self-report instruments."

Can you help us connect with parents who had a child in the NICU during COVID19?

During this active phase of recruitment, we are looking for parents to take a 15-minute anonymous survey to help us learn more about COVID19 NICU parent visitation/interaction policies and their impact on parent mental health. Participation is voluntary and all participants who choose to complete the survey will be compensated for their time. The project has been approved by the Institutional Review Boards of HFHS and Drexel University and permits recruitment of NICU parents through relevant listservs and social media. If you have the capacity to connect with NICU parents, we would value your assistance with recruitment efforts. Please contact study personnel at mmaye1@hfhs.org for more information.

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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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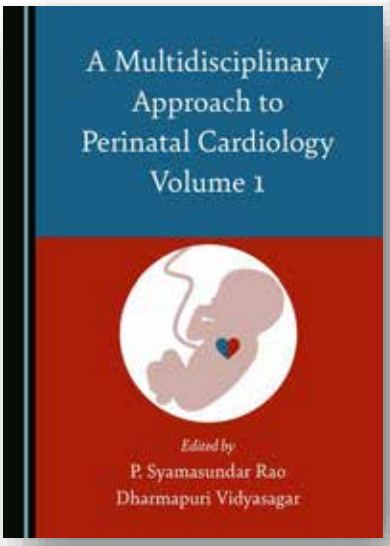
A Multidisciplinary Approach to Perinatal Cardiology *Volume 1*

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.

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National Perinatal Association + NICU Parent Network

Online L&D Staff Education Program

Caring for Pregnant Patients & Their Families:

Providing Psychosocial Support During Pregnancy, Labor and Delivery

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pac-lac

About the Program

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

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

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

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

Program Objectives

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

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

PROGRAM CONTENT

COMMUNICATION SKILLS CEUs offered: 1

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

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

PERINATAL MOOD AND ANXIETY DISORDERS CEUs offered: 1

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

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

PROVIDING ANTEPARTUM SUPPORT CEUs offered: 1

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

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

PROVIDING INTRAPARTUM SUPPORT CEUs offered: 1

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

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

PROVIDING POSTPARTUM SUPPORT CEUs offered: 1

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

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

SUPPORTING STAFF AS THEY SUPPORT FAMILIES CEUs offered: 1

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

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

Cost

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

Contact help@myperinatalnetwork.org to learn more.

Faculty

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

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

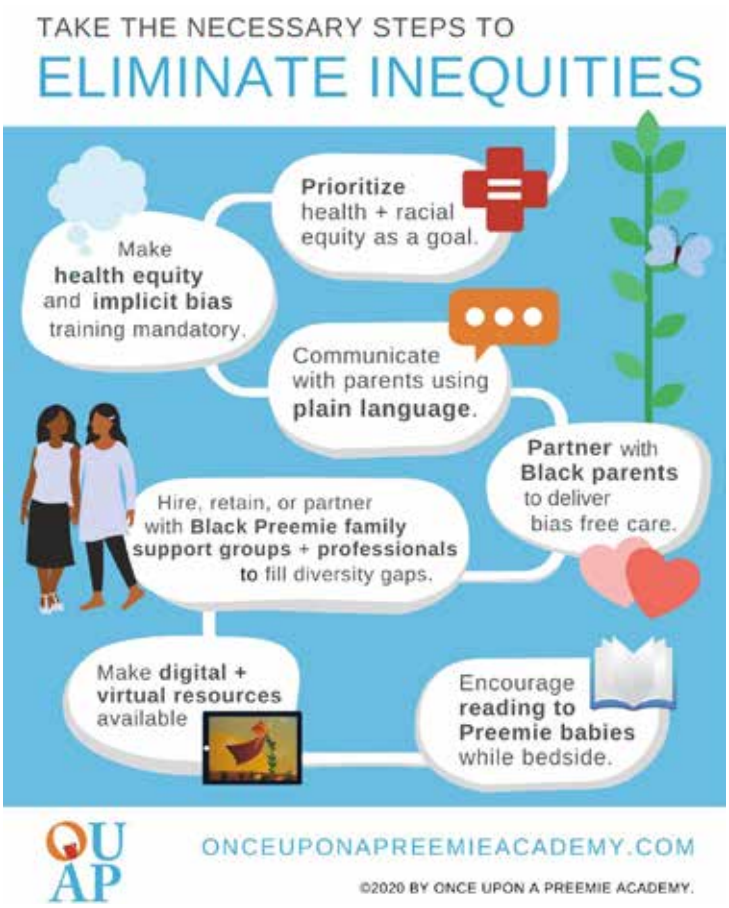
CANCELLATIONS AND REFUNDS

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

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

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

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



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

KEEPING MOTHERS + INFANTS TOGETHER

Means balancing the risks of...

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

EVIDENCE

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

PARTNERSHIP

What is the best for this unique dyad?

SHARED DECISION-MAKING

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

TRAUMA-INFORMED

Both parents and providers are confronting significant...

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

LONGITUDINAL DATA

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

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

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

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Pregnant Women Urged to Get COVID-19 Vaccine

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.

"A federal health advisory from the Centers for Disease Control and Prevention follows the release of new data showing a 70% increased risk of death from COVID-19 during pregnancy. Unvaccinated pregnant women also have a higher risk of early delivery or stillbirth."

Public health officials are urging pregnant and breastfeeding moms to get the COVID-19 vaccine – and soon.

A federal health advisory from the Centers for Disease Control and Prevention follows the release of new data showing a 70% increased risk of death from COVID-19 during pregnancy. Unvaccinated pregnant women also have a higher risk of early delivery or stillbirth.

Pregnancy and Vaccine Safety

As part of their campaign to encourage pregnant women to get inoculated, Federal health officials are highlighting the safety and efficacy of the vaccine. As the health advisory notes, the vaccine does not increase the risk of miscarriage or birth defects or affect fertility.

The COVID-19 vaccine is recommended for pregnant women, recently pregnant, breastfeeding, or trying to get pregnant. Professional medical organizations have endorsed these recommendations, including the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine.

COVID-19 Among Pregnant Women

Despite the benefits to mothers and their unborn babies, only 31% of pregnant women are vaccinated against COVID-19. Being unvaccinated leaves expectant moms vulnerable to contracting COVID-19, while pregnancy makes them more likely to experience severe symptoms and require intensive-level care.

"Thus far, approximately 97% of pregnant women hospitalized with COVID-19 were unvaccinated. Moreover, in August, 22 pregnant women died of COVID-19, making it the single highest month for COVID-related pregnancy deaths since the pandemic began."

Thus far, approximately 97% of pregnant women hospitalized with COVID-19 were unvaccinated. Moreover, in August, 22 pregnant women died of COVID-19, making it the single highest month for COVID-related pregnancy deaths since the pandemic began.

In contrast, getting vaccinated protects both expectant moms and her baby. Getting vaccinated is the single most effective way to prevent serious illnesses, death, and adverse pregnancy outcomes from the coronavirus.

A Precaution Not to be Overlooked

Women who are planning to get pregnant take many steps to prepare. Likewise, expectant moms pay extra attention to their health and safety for the sake of their babies.

Getting vaccinated against COVID-19 is one precaution they should not overlook. The sooner, the better, say the experts.

References:

https://emergency.cdc.gov/han/2021/han00453.asp

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

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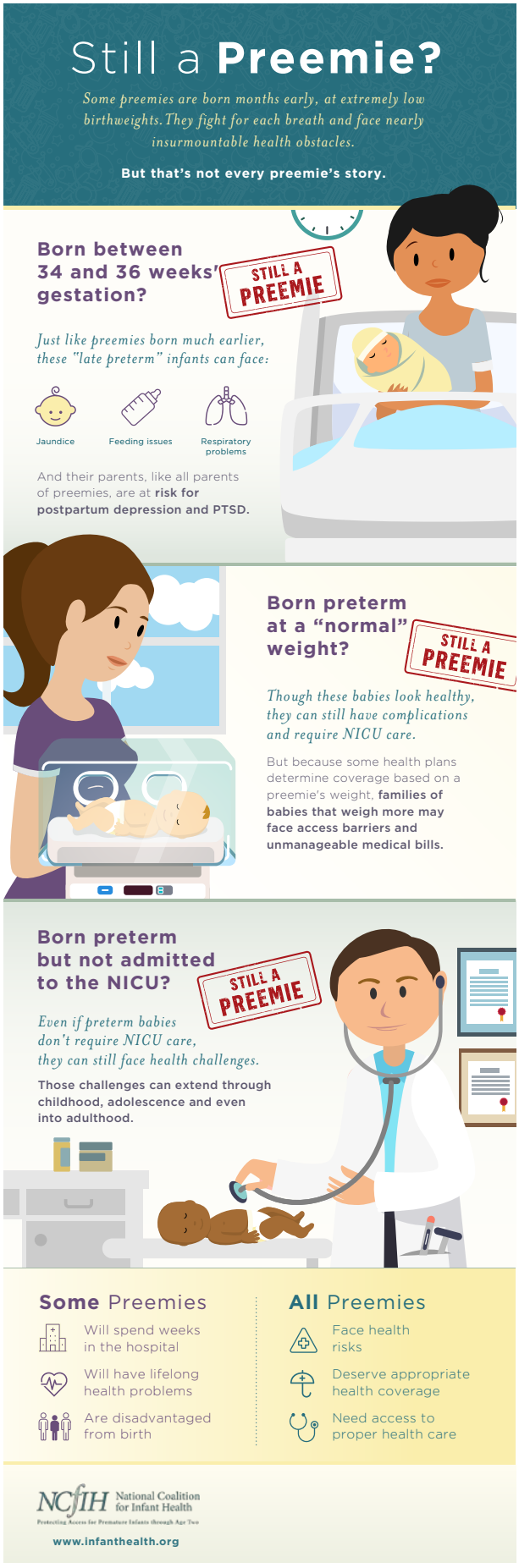

Keeping Your Baby Safe

during the COVID-19 pandemic

How to protect your little one from germs and viruses

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

Here's what you can do...

Wash Your Hands

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

Limit Contact with Others

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

Provide Protective Immunity

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

Take Care of Yourself

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

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

WARNING

Never Put a Mask on Your Baby

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

If you are positive for COVID-19

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

We can help protect each other.

Learn more

www.nationalperinatal.org/COVID-19

National Perinatal Association

The Gap Baby: An RSV Story

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

The National Coalition for Infant Health advocates for:

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

www.infanthealth.org

I CAN Digitally Involved (I CANDI): Giving Tuesday

Amy Ohmer

"November is often a time for many to gather and practice gratitude through creating positive acts of service within our homes while preparing for the holidays or through our pediatric medical and research work as we reflect upon personal ways to better support children and families within the pediatric medical and research community."

This month's I CANDI reflects the spirit of GIVING TUESDAY.

November is often a time for many to gather and practice gratitude through creating positive acts of service within our homes while preparing for the holidays or through our pediatric medical and research work as we reflect upon personal ways to better support children and families within the pediatric medical and research community. To continue fostering our commitment to all children, many of whom live with rare, chronic, and complicated medical conditions, we need your help.

On November 30th, you are invited to support the International Children's Advisory Network, Inc. (iCAN) through sponsorship or volunteering during GIVING TUESDAY.

Since our inception in 2014, iCAN has been intentional with ensuring that children could share their voices to help create the best path within pediatric clinical trials, research, medicine, science, and innovation.

What do we do with our funding?

iCAN creates projects for children to share their voice through creative channels such as the "Invisible Condition" series - a documentary created by a teen from KIDS CHOC-Rady to spotlight medical conditions that are often misconstrued within society. This ongoing series collaborates with iCAN kids from around the world who want to make a difference.

This month, iCAN will release a beautiful "I CAN" book designed to inspire children (and families and doctors) on what they can accomplish in the world. Written and illustrated by children ages 8-18 from around the world, it shares insight into overcoming challenges and reaching full potentials. Watch for more to come at www.icanresearch.org on how you can order your own copy to keep or to give as an inspiring present this holiday season.

iCAN has developed a two-part guide to how doctors can better reach kids and families through social media, created using focus group content from 35 children, ages 14-18 years old from KIDS Kansas City and KIDS Illinois - Walter Payton High School. This project will be completed by the second week of November and freely available to doctors, researchers, and other pediatric stakeholders.

iCAN has partnered with pharmaceutical organizations. Most recently, iCAN and the KIDS Illinois Chapter at the Ann & Robert Lurie Children's Hospital presented five diverse youth members' experiences about their participation within pediatric clinical research trials.

iCAN annually provides scholarships and travel stipends to children (and their families) to attend the highly acclaimed "iCAN Summit." This event brings together children worldwide to share their own experiences of clinical trial participation, patient care, and more… to stakeholders within the medical community. Our goal is to ensure that ALL children from EVERYWHERE have the ability to share their voices, and we do this through sponsorship of iCAN. Donors can even highlight a chapter for adoption to help ensure that we reach youth from the farthest corners of the world to attend the iCAN Summit.

"In 2022, for the second week of July, iCAN and their KIDS France Chapter will be hosting the 8th Annual iCAN Summit, June 11th - June 15th, 2022, in Lyon, France. Looking ahead to 2022, iCAN is busy creating the Summit 2022 agenda."

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During Giving Tuesday, iCAN will be seeking sponsorship for our kids to attend the iCAN Summit and continue supporting the pediatric voice by including children in research, science, innovation, and medicine/medi-

Join the
International Children's Advisory Network, Inc. (iCAN)

GIVING TUESDAY

November 30th, 2021

We give for the kids.

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iCAN
International Children's Advisory Network

The International Children's Advisory Network Inc., (iCAN) is a tax exempt organization as described in Section 501(c)3 of the Internal Revenue Code

2022 SUMMIT

iCAN
International Children's Advisory Network

SAVE THE DATE

July 13th through July 17th, 2022

To be held in-person at the University of Lyon, Franc

Hosted by iCAN KIDS France

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cal device development. To help us by sponsoring a youth member, please email Amy Ohmer, Director, amyohmer@icanresearch.org. All donations support iCAN, a tax-exempt organization as described in Section 501(c)3 of the Internal Revenue Code. All donations are welcome and appreciated. https://www.icanresearch.org/sponsoring

"Do you have an iCAN chapter at your hospital? There is no cost to create a chapter or for a child to participate, as iCAN is supported through sponsoring partnerships. Starting a chapter is free and easy, as iCAN helps each group get started and up and running."

Do you have an iCAN chapter at your hospital? There is no cost to create a chapter or for a child to participate, as iCAN is supported through sponsoring partnerships. Starting a chapter is free and easy, as iCAN helps each group get started and up and running. If you would like to start a chapter, often, the best place to start is through your hospital's ChildLife center. We are happy to meet with your ChildLife team to help share how iCAN is making a difference in patients' lives around the world. To set up a meeting, please contact us by email at info@icanresearch.org or visit www.icanresearch.org. If any interested kids are not involved in an iCAN chapter but would still like to participate, iCAN offers a Virtual Chapter to accommodate any child, anywhere in the world. All children are welcome and are encouraged to join us!

#iCANMakeADifference #iCAN #iCANBeDigitallyInvolved #iCAN-2022Summit

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

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Respiratory Syncytial Virus is a

Really Serious Virus

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

Coughing that gets worse and worse

Breathing that causes their ribcage to "cave-in"

Rapid breathing and wheezing

Bluish skin, lips, or fingertips

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

Call your doctor and meet them at the hospital.

If you baby isn't breathing call 911.

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

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

National Perinatal Association

www.nationalperinatal.org/rsv

PROTECT YOUR FAMILY FROM

RESPIRATORY VIRUSES

flu coronavirus pertussis RSV

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often with soap and warm water.

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

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

USE AN ALCOHOL-BASED HAND SANITIZER.

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

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Peer Reviewed

Disaster Series: The Use of Information for Wildland Fire and the NICU: Combined Evacuation and Sheltering

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

Abstract

Wildland fire threatens the hospital, evacuation routes, and even the use of vehicles. Smoke-filled air endangers the neonate inside the NICU or ambulance, while poor visibility can ground helicopters. The wildland fire environment is continuously changing from fire behavior determined by topography, fuel characteristics, and wind. This creates a fire environment of poor air quality and road closures or congestion—the decision to evacuate or shelter changes, sometimes by the hour. Therefore, NICUs planned simultaneously to evacuate and shelter. This review revealed two different systems for decisions and coordination of evacuation depending on governmental support. Regardless, NICU staff were the ones making specific decisions and preparations for evacuation or sheltering.

"Wildland fire threatens the hospital, evacuation routes, and even vehicles, whether air or ground. Smoke-filled air endangers the neonate inside the NICU or riding in an ambulance. Rural hospitals several hours from a receiving hospital have but a few local ambulances available for evacuation."

Introduction

Wildland fire threatens the hospital, evacuation routes, and even vehicles, whether air or ground. Smoke-filled air endangers the neonate inside the NICU or riding in an ambulance. Rural hospitals several hours from a receiving hospital have but a few local ambulances available for evacuation. Poor visibility from smoke prevents helicopters from flying. Government agencies protect life and property, allocating limited resources to save a city from fire, and may requisition helicopters or ambulances, preventing their use by the NICU (1, 2). An approaching fire means the Neonatologist must simultaneously prepare to evacuate the NICU *and* shelter in place. Rapid evacuation of the NICU is labor-intensive over hours (1, 2). To shelter in place, the NICU brings in extra staff and stockpiles supplies.

Of course, it is prudent to prepare to evacuate from an oncoming fire. Until you step outside and realize the infant will travel in an ambulance for several hours, much through smoke, and there are only two ambulances in town with insufficient neonatal-trained staff to accompany the infants. Sheltering does make sense – keep the neonates as a group with an intense concentration of neonatal specialists in nursing, pharmacy, and respiratory care with an ample stock of supplies and extra equipment – until soot comes through the ventilation system, the roads close from fire, and returning staff are caught in the fire.

"These are the situations when preparations to evacuate inform the decision to shelter, and preparations to shelter inform the decision to evacuate. In the episodes described below, Neonatologists and administrators consistently prepared to evacuate and shelter at the same time."

These are the situations when preparations to evacuate inform the decision to shelter, and preparations to shelter inform the decision to evacuate. In the episodes described below, Neonatologists and administrators consistently prepared to evacuate and shelter at the same time. Fires change direction and speed in minutes. You can be safe one moment and endangered the next. The decision to evacuate is a constant decision continuously incorporating changing information. In a sense, preparing for wildland fire, simultaneous evacuation and sheltering, is to prepare to fail. The organization not prepared to fail will fail.

We reviewed published accounts containing first-person experiences (3-5). From these articles, we extracted and collated the actions and words of participants. Rather than listing models and tools that the participants stated they had used, we describe *how* they used the models and tools. This follows James P. Spradley's description of culture – *how* people use social knowledge to interpret the world (6).

How people use social knowledge is *how* they enact future states (7), critical processes for the event that abruptly collapses our sensemaking (8). Looking at the actions described in this paper as an outsider can facilitate the "I wouldn't have done that" response. This is not hindsight but rather a thoughtful discourse to reach a useful, effective conclusion. What that approach lacks is one of the necessary High-Reliability Organizing (HRO) values identified by two of the authors (DvS, TAM) as required to make HRO operational (9), empathy – "That could be me."

In the *Neonatology Today: Disaster Series,* we present High-Reliability *Organizing* (HRO) as a means to understand decisions

better and prepare for evacuation or sheltering in place due to an approaching wildland fire. In the setting of wildland fire, the HRO's response moves toward High-Reliability *Operations*.

> ***"Wildland fire, irrespective of the type of vegetation, is demanding to manage, the resources complex to coordinate, and the consequences catastrophic for wildland firefighters and the public."***

The Wildland Fire Environment

There are two types of firefighters: structure firefighters and wildland firefighters. While the lay community uses the terms wildfire, forest fire, or brushfire, the professional term is 'wildland fire.' Regardless of whether grass, brush or the forest is on fire, the grim results are destroyed homes and fatalities. Wildland fire, irrespective of the type of vegetation, is demanding to manage, the resources complex to coordinate, and the consequences catastrophic for wildland firefighters and the public.

The Incident Command System came about from the challenge of rapidly coordinating 95,000 professional firefighters from 500 separate departments and agencies throughout California in 1970. During thirteen days in Southern California, 773 wildland fires destroyed 722 homes and killed sixteen people (10). The loss of fourteen wildland firefighters in the 1994 South Canyon Fire (11) led to the incorporation of Lessons Learned through establishing the national Wildland Fire Lessons Learned Center's (WFLLC), Tucson, AZ in 2002. Later, with consultation from Karl Weick and Kathleen Sutcliffe, the WFLLC incorporated HRO into wildland fire management (12).

Wildland fires increasingly affect hospitals due to the increase in Wildland-Urban Interface, a consequence of the growth of communities into and within forested areas. The severity and threat of approaching wildland fire come from smoke, highway access, and the risk of the hospital catching fire. Winds, humidity, and vegetation drive these risks. It appears prudent to evacuate from a distance, except that evacuation places a load on staffing and transport resources and is time-consuming.

Fire Behavior

Fire behavior describes the movement and intensity of wildland fire and is determined by various elements, including topography, fuel characteristics, and wind (13). Familiarity with fire behavior, combined with information about the fire's proximity, winds, road closures, and air quality outside and inside the facility, are necessary for safe and effective decisions regarding evacuation versus shelter in place.

Fire danger ratings assess the potential for wildland occurrence, spread, and difficulty to suppress (14). The greatest contributions to fire danger are wind speed and moisture content of vegetation (fuel). Temperature and relative humidity determine fuel moisture content.

Topography describes the hospital's elevation, nearby slopes, and their orientation, the direction nearby slopes face. South-facing slopes are hotter and drier than north-facing slopes. In valley bottoms, nocturnal air temperatures are coolest and humidity highest (14).

Fuel characteristics influence the intensity of the fire, with fires burning in grass, shrubs, and tree branches having less intensity than crown fires burning through the tops of trees.

Winds aid fire spread by causing flames to lean closer to unburnt fuel, supplying oxygen, and carrying away moist air (14), influencing a fire's direction and increasing its intensity. Local residents will be familiar with local winds and 'critical' winds, which are regional scale (*synoptic*) winds. Although this seems pedantic, appreciating these differences explains the uncertainty of an approaching fire's path and the great speed the approaching fire can sustain.

Critical winds dominate the fire environment (15):

- *Downslope winds* follow air pressure gradients down a geographic slope. Examples are the Chinook Winds off the eastern Rocky Mountains and California's Santa Ana Winds from a high-pressure centered over Utah's central plateau region.
- Downslope winds become hotter, drier, and faster from acceleration between mountain ranges and through passes.
- *Frontal winds* follow the pressure gradient between weather fronts in the mountains and Great Plains of the US.
- *On the leeward sides of mountains, Foehn winds* become dry and hot after moisture is lost, rising over the mountain range then re-warmed as the winds move downslope.

The characteristics of regional scale (synoptic) winds explain their danger, why they are considered critical winds. Synoptic scale winds have horizontal lengths over 600 miles (1000 km), seasonal occurrences, low humidity, and expected, sustained wind speeds (>30 mph, easily exceeding 40 mph for Santa Ana winds). In a few hours, these winds can dry vegetation to the level of high fire hazards.

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Humidity, relative humidity, and temperature influence fire danger through their effect on the moisture content of fuels (14).

The Fire Environment

Proximity and velocity of fire. As the fire approached, residents evacuated their homes, increasing road congestion (4). The approaching fire led neonatologists and hospital administrators to prepare for evacuation while more closely evaluating whether to shelter in place (3-5).

Winds, as threats to transportation, became a consideration for evacuation of one NICU. For another NICU in the same fire, the wind changed the direction of the fire (5).

Road closures. Fires can easily jump interstate highways, and the radiant heat from burning trees can threaten the occupants of vehicles. Evacuating residents will congest smaller rural roads. Road closures and congestion interfered with the ability of re-

called healthcare providers to return to the facility (4) or evacuate facilities (5).

Air quality. Smoke and air quality have been identified as a significant problem for the NICU (16). "Smoke-filled air entered the ED's and hospital ventilation systems and triggered bronchospasms in some staff members. Many hospitals treated employees for smoke-related illnesses" (4). "Despite air scrubbers in place, air quality was poor, and minimizing the amount of soot and debris inside the facility was difficult" (3). "You could see smoke in the hospital, and it was hazy outside" (5). The thickness of the smoke-darkened skies and decreased visibility, grounding aviation resources (4).

Information from the environment is necessary for safe and effective decisions to evacuate or shelter in place. The strongest influences mentioned in the narratives were the fire's proximity, the severity of winds, road closures, and the air quality outside and inside the facility (3-5).

"Information from the environment is necessary for safe and effective decisions to evacuate or shelter in place. The strongest influences mentioned in the narratives were the fire's proximity, the severity of winds, road closures, and the air quality outside and inside the facility (3-5)."

Evacuate and/or Shelter

These three wildland fires revealed two different systems for decisions and coordination of evacuation depending on governmental support. Regardless of regional or government plans, the healthcare providers in the facility were the ones making specific decisions and preparations for evacuation or sheltering.

Two facilities are in the same county, San Diego, CA, where the county Office of Disaster Preparedness coordinates evacuation, including transportation vehicles and receiving hospitals (3, 4). These operations included close consultation between the affected hospital and the county, including the type and level of care necessary for the patient.

The two NICUs, without government coordination, decided with their hospital incident command and leadership. Part of a regional healthcare system, one hospital initiated an internal emergency that rapidly progressed to their system-wide incident command. The other NICU in the Level 1 Evacuation Zone prepared to evacuate with discussion among their hospital leadership. Neither hospital administration had experience with an operation of this magnitude. The Neonatologists smoothed the process through their personal relations with the receiving Neonatologists. Though not easy, it was effective (5). The other NICU was part of a healthcare system with a larger medical center and a regional medical center.

Discharge Patients

Physicians and staff responded to assist either by being recalled or arriving voluntarily. Physicians began patient discharge for those who could be released and to work toward the evacuation of the other patients (3-5). One NICU discharged infants to parents in the morning after evacuation (5).

NICU Evacuation (5)

Encroaching fires made the area of the hospital a Level 1 evacuation zone; the Neonatologists prepare to move patients. Neonatal nurses prepared bags of necessary supplies for each infant:

> Stethoscope, bulb suction, blood pressure cuff, thermometer, diapers, wipes, PPE, emergency code med sheet, formula, breast milk, feeding tube, IV pumps, supplies for ordered labs, daily progress note, face sheet with parent contact information and other supplies as needed.

That evening, concern about winds led the medical staff to decide for evacuation to area hospitals. The 14 neonates would be among the first evacuated as "red" status, that is, patients who could not be moved by wheelchair. The neonatologists immediately began to arrange transports to avoid an emergent Level 2 evacuation of the babies. Without regional coordination, the Neonatologist described the patient to a potential receiving neonatologist and requested acceptance. Personal relationships with area neonatologists smoothed the process with the neonates distributed evenly among area NICUs based on family's location. Transfers of eleven infants would start that night, with three infants discharged in the morning.

"Personal relationships with area neonatologists smoothed the process with the neonates distributed evenly among area NICUs based on family's location. Transfers of eleven infants would start that night, with three infants discharged in the morning."

After arranging placement, the Neonatologists coordinated specialized ambulance transport teams. The first baby was evacuated at 2140h, and the last baby left at 0410h. The three infants were discharged to their parents. The wind changed, but air quality in the NICU was still poor, with smoke visible in the hospital.

The area hospitals had access to a shared electronic medical record (EMR).

With the evacuation under relatively controlled conditions, eleven infants were transferred over 6 ½ hours, coordinated with specialized and skilled transport teams.

Evacuation with Maternity Patients (3)

One hospital without a NICU evacuated babies from the nursery as ambulatory mother-baby dyads.

On the first day of a nearby fire with Santa Ana winds gusting to 80 mph, the county opened the Emergency Operation Center (EOC). With the fires spreading, the EOC notified the hospital to initiate its Incident Command Center. The hospital administrators planned for evacuation with approaching fire, exposure to debris, and poor air quality. About 2200h, disaster equipment was readied, patient records copied, and off-duty physicians arrived to discharge patients.

By 0300h the following day, the EOC advised hospital administrators they could only give a two-hour window to evacuate. Residents began arriving at the hospital seeking a haven for themselves, their families, and their pets. With poor environmental air

quality, the hospital air scrubbers became inadequate – smoke, soot, and debris entered the facility creating poor air *within* the hospital. By 0800h, with the possibility of the fire breaching hospital grounds, the hospital administrators decided to evacuate the hospital.

"The county EOC directed staging for transportation with ambulances staged at a local fire station and school buses staged in a nearby parking lot. Ambulatory patients evacuated by bus, egressing through the front entrance of the hospital."

The county EOC directed staging for transportation with ambulances staged at a local fire station and school buses staged in a nearby parking lot. Ambulatory patients evacuated by bus, egressing through the front entrance of the hospital. A manager of the medical, surgical, and telemetry units directed the process. Each bus transported five patients escorted by one certified nursing assistant and one RN and any needed medical supplies, oxygen tanks, and emesis basins. Family members could accompany patients and assist in calming their anxiety. Ambulatory patients included postpartum mother and baby combos.

Patients needing a gurney or wheelchair were evacuated by ambulance through the ED coordinated by a paramedic supervisor and ED manager. One ambulance could transport two patients, one gurney patient in the back and one wheelchair patient in front

Evacuate then Sheltered (5)

At 1100h, a manager's spouse calls her about the fires. In the incident command meeting, she becomes the Emergency Preparedness Manager. A Neonatologist hearing of the proximity of the fire arrives to assist. The hospital declared an internal emergency at 1251h, which quickly expanded to a system-wide incident command for the three hospitals. Two and a half hours later comes the call for all available providers to return to the hospital.

The NICU team begins planning for the evacuation of 16 neonates. Without regional coordination, Neonatologists begin calling NICUs, the nearest 2.5h away. The NICU team creates an evacuation list for the respiratory support, equipment, and staff each infant will need for transport. Bedside nurses create supply bags for each neonate for monitoring, routine care, emergency treatment, documents, and other supplies as needed.

Fires close roads to the north and south. The evacuation of residents congests the open roads—poor visibility from smoke grounds air transport. The ICU is isolated from the rest of the state. They will have about an hour's notice to evacuate. The babies cannot be transported one at a time. Neonatologists and NICU staff, therefore, create their own extemporaneous triage system.

Pink neonates (6 infants) are the most acute receiving the highest level of support and will be evacuated by ambulance with two neonates per ambulance. Two staff members will travel in the ambulance. Because the main NICU is on the ground floor, the neonates can be directly taken to the ambulance.
Yellow neonates (2 infants) are intermediate and will be evacuated by bus or private car with the driver (driver, not a team member). Accompanying staff will be a nurse and respiratory therapist or Neonatologist. From the main NICU, they can also be moved directly to the transport vehicle.

Green neonates (8 infants) are the feeder growers, babies without other medical concerns. Their evacuation can be staffed by a nurse and respiratory therapist or Neonatologist using a bus or private car (driver, not a team member). Because they are on the second floor, they will be carried down the stairway.

The day-shift staff has been held over to work with the night-shift staff. The three neonatologists on service are in-house, with four others on standby. The standby neonatologists are ready to evacuate with cars and car seats.

The winds shifted away from the hospital; the fire department contained the fire. The NICU did not evacuate.

Prepare to Evacuate then Sheltered (4)

The wildland fire started in the area. Two days later, it became more extensive, threatening two larger hospitals with NICUs. The county EOC opened, 0530h.

The next day, 0700h, a nurse calls. She reports she is unable to work because her house is threatened and her family is endangered. At 0800h, another nurse on duty calls, her house is "in the line of fire." She is sent home. At 0900h hospital, administrators initiate "Disaster Standby" to activate additional resources. At 0915h, the Emergency Care Center (ECC) Director activates a full disaster response. All hospital staff are in full preparation for the approaching fire.

At 1200h, hospital administrators learn the fire is continuing to move toward the hospital and could "jump the freeway." Central Supply delivers oxygen masks, nebulizers, and O_2 tanks to the ED. Pharmacy stands by with additional pulmonary medications.

At 1300h, hospital administrators decide to prepare evacuation. The NICUs for both hospitals would evacuate neonates to the USNS Mercy, the Military Sealift Command hospital ship based in San Diego. The Mercy is about 10 miles from the fire. The NICUs will pool their efforts, using evacuated staff to escort neonates and ensure all NICU patients will be transferred as a group.

At 2000h, the winds change direction, moving the fire into the mountains. Firefighters sufficiently contain the fire; there is no evacuation. Staff, however, remain ready to evacuate.

The alert continued until the next day.

The Decision to Evacuate

The decision to prepare for evacuation or to shelter consumes staff time and resources. It is not a light decision. Communication with government public safety services and receiving NICUs occupies the attention of senior managers and administrators and phone lines and radio frequencies. Equipment and supplies for each neonate will be gathered by other staff while others will prepare medical records for transfer. To shelter involves engineering services to assess the strength of the physical structure and reliability of power and water.

The increasing proximity of the fire drove the decision for the four facilities. One NICU planned for evacuation while awaiting sufficient information on whether to evacuate or shelter. Another NICU in the Level 1 Evacuation Zone initially evaluated neonate evacuation to a major city (5). A third hospital conferred with the county and city officials regarding methods for safe evacuation and the limits on resources due to the size of the fire. They would have a two-hour window to move their patients (3). The fourth hospital decided to prepare for evacuation (4).

While the decision to evacuate was uniformly influenced by the proximity and behavior of the fire, one facility specifically stated internal air quality contributed to their decision to evacuate (3). All described the negative effects of environmental and internal air quality on the care for infants (3-5).

In one county, the county emergency operations center provided the hospitals with a list of accepting hospitals, number of patients that can be accepted, and level of care available (3). If there were limited space at receiving NICUs, medical staff at one facility discussed opening a Level II NICU in a safe area (5). One facility categorized neonates as "unable to use wheelchair transport," moving them into the group to be evacuated first (5).

Call for Receiving Facilities

Neonatologists for the two NICUs in the same fire and without regional coordination called other NICUs to determine bed availability. One of the NICUs later sheltered while the other evacuated (5). In another wildland fire, the Neonatologist believed that calling the operation center rather than directly contacting the NICUs would have improved regional coordination and prevented overlapping requests (16). The two California hospitals described above deferred to the county EOC. Managers had predetermined bed locations and the number and types of patients transferred to each hospital (3).

In previous fires, this communication was lacking, with at least one instance of babies arriving at the receiving hospital without notification or acceptance (16).

"Evacuation consumes staff and hours of time, while sheltering exposes the infants to grave risk. One NICU was faced with evacuating infants through smoke and dangerous air quality for a 2 ½ hour drive over congested roads that may abruptly close due to fire activity."

Evacuation

Evacuation consumes staff and hours of time, while sheltering exposes the infants to grave risk. One NICU was faced with evacuating infants through smoke and dangerous air quality for a 2 ½ hour drive over congested roads that may abruptly close due to fire activity. They were without aviation resources. The circumstances had significant contributions to their decision to shelter in the hospital (5). Another facility had decided to move ahead with evacuation but changed to sheltering seven hours later with fire containment (4). Even then, the staff remains ready to evacuate.

Because the decision to shelter came after the decision to evacuate, the sheltering NICUs were poised to evacuate rapidly.

Transportation

Sleds modified for infants and capable of containing a ventilator have been used to evacuate infants, including descending stairways. Aprons have been used, but one hospital did not find they worked well (16).

NICUs evacuating infants have relied on ambulances, buses, and private cars using bassinets or car seats for all three modes when possible. The use of cars could free ambulances to evacuate sicker infants (16). Without regional coordination, administrators at a rural NICU coordinated specialized transport teams for the NICU. The first baby left in the late evening, and the last baby evacuated in the early morning – eleven babies in 6 ½ hours.

NICUs that had wildland fire exposure but did not evacuate had planned to use general ambulances for transport. Two in the survey would use neonatal transport teams. There would also be planned reliance on helicopter transport (16).

Bassinets rather than open cribs for ambulance transport could prevent infants from sliding around, though it did not happen during a fire evacuation. The ability to support oxygen administration would also be helpful (16).

The county EOC coordinated transport for a larger hospital, but healthcare providers and administrators were responsible for gathering and preparing the patients. The EOC staged ambulances at a fire station and school buses in a nearby parking lot. A paramedic supervisor and ED manager coordinated ambulance transport through the ED while a medical unit manager coordinated bus transport through the hospital's front entrance. Postpartum mothers with their babies traveled on buses (3).

"Medical care is accustomed to 'well-defined problems.' The problems in a disaster are not only ill-defined; they are embedded in the environment with the free exchange of energy. Emergency plans presuppose effective courses of action."

Two facilities were prepared for transport then sheltered. The distant, rural NICU retained day-shift staff, and the three Neonatologists on service came to the NICU for transport preparation and sheltering if necessary. The Neonatologists and nursing staff organized into eight teams with two patients per team for a 2 ½ hour road trip by ambulance, bus, or car (5). A driver that is not a team member would drive any private car. The NICU on the ground floor provided had direct outside access to the transport vehicle. Feeder growers on the second floor could be carried downstairs to the awaiting vehicle.

Staffing and Equipment

Staffing

Often, there is minimal staffing during the wildfire, and staff may not reach the hospital (4, 16). In a small, rural hospital, the day-shift staff continued to work, collaborating with the night-shift staff. The three Neonatologists on service remained in the NICU, while four other Neonatologists were available on standby (5). In a larger hospital, off-duty physicians arrived to begin discharging patients then joined with on-duty staff and physicians to evacuate patients (3).

On-duty staff at a larger hospital began calling off-duty staff, many of whom were unaware of the threat to the hospital. Those with families or homes imperiled by fire were conflicted with leaving family and home to return to work. Staff could not always reach the hospital in other wildland fires due to road closures (16). Fires change direction and speed in minutes; you can be safe with an escape route one moment, then cut off and endangered the next minute.

During a wildland fire event, one receiving NICU streamlined the vetting of NICU staff. Not every NICU was able to do so (16).

Supplies and Equipment

All facilities prepared a supply of current medications and necessary equipment for transport. Some neonatal staff obtained as

many supplies as possible in preparation for an impending evacuation, one hospital specifically collecting formula bottles and nipples. Small emergency backpacks were discussed for emergencies with formula, wipes, diapers, and feeding tubes (16).

One facility described this extemporaneous process in some detail: A team of a clinical practice advisor, Neonatologist, and transport team nurse prepared an evacuation list of patient names, respiratory support, and equipment needs. Nurses then prepared transport bags of the necessary supplies for each baby. Important was the necessity of an isolette rather than a crib for transport. Staff members would transport patients using an isolette (5).

Documentation

In a series of wildland fires, infant identification became a concern by some of the hospitals. Besides ensuring the presence of an ID band on the infant, some suggested placing stickers on the infant's abdomen (16).

One NICU relied on an electronic medical record (EMR) shared by area hospitals (5). Two hospitals began copying medical records, keeping them on the nursing units though limited time caused some incomplete records (3, 4). Copying has delayed transfer in some cases (16). In other wildland fires, the receiving hospital did not have sufficient medical record documentation, or there was the incompatibility of the EMR (16).

Problems Encountered

For healthcare, a disaster is an *environmental disruption* of medical care that disrupts the *ability to treat multiple patients*. This is a functional, ecological definition (17). Environmental problems are not isolated but are embedded into each other – damaged structure, toxic air, cold temperatures, moving from one problem places the neonate into another.

Road conditions. Congestion from evacuating residents, fire burn over, and visibility impaired used of roads (3-5).

Smoke. Visibility from the smoke impaired recall of staff, surface transport of patients, and air operations. Hospital ventilation systems could not maintain clean air (3-5), with some hospitals using internal respiratory treatment stations (4).

Regional coordination. Neonatologists contacted receiving NICUs, and administrators coordinated transportation for the neonates. They did not have regional government coordination (5).

Equipment. It is not feasible to pack a bag at the moment for every patient (5).

Medical records. Some patients evacuated with incomplete records due to the limited preparation time (3).

Increasing staff. Staff requested more information as they balanced work, the safety of their family, a threat to their home, and the ability to travel on the roads to the hospital. Some were trapped in their neighborhoods. Some staff were called home to help the family. The fire trapped one nurse evacuating her family, resulting in a fatality and severe burns.

Communication. The hospital administration and NICU staff lacked a clear communication structure. Medical directors and physicians were not included in hospital incident command meetings. Medical staff leadership decided on evacuation while nursing leadership decided on shelter. The contradictory conclusions were communicated to their respective staff, creating confusion and exacerbating the tension of an intense situation (5). In a different wildland fire, neonates arrived at the receiving NICU without a call from the evacuating NICU asking for permission or providing a warning. Internet and phone call issues did not help. One participant had to text an intermediary to communicate (16).

Furthermore, the delegation of responsibilities was problematic. One participant said if they could have changed one thing, it would be to have a clear command structure in the unit (1, 16).

Disaster Infrastructure

A disaster brings together diverse infrastructures, but they are infrastructures of organizations and disciplines accustomed to collaborating (18). Viewed as relations, infrastructure builds a community. New for NICU sheltering or evacuation are the types of organizations and infrastructures they utilize. For example, air transport will be controlled by a central government agency, and FAA rules and procedures will become more visible. *Boundary objects* facilitate communication across disciplines and organizations while operating in a new boundary infrastructure (18).

"You are not in one system or infrastructure – transport, emergency operations, and continuity of care have distinct infrastructures. Disaster infrastructure is new to the Neonatologist but well understood by disaster responders, hence the importance of boundary objects. There is a specific language and lexicon for risk within dangerous contexts that differ from medical care and business operations for disaster response."

You are not in one system or infrastructure – transport, emergency operations, and continuity of care have distinct infrastructures. Disaster infrastructure is new to the Neonatologist but well understood by disaster responders, hence the importance of boundary objects. There is a specific language and lexicon for risk within dangerous contexts that differ from medical care and business operations for disaster response. There is a similar difference between stress versus capability, leadership, and what a leader does. The outlier is probably the most significant difference, whether an early herald or a random event. One person's infrastructure, however, can become another person's barrier (19).

Lessons Learned

The *Lesson Learned process* is a formal process that provides realistic, actionable recommendations that cause an organization to improve from the knowledge acquired after an adverse experience. It reduces or eliminates the potential for failures and mishaps or reinforces a positive result. Analytical processes discover what happened and why it happened. By identifying the root causes and remedial or corrective actions, experiences are transformed into best practices and lessons. Expert consultation from subject matter experts (SME) helps the organization understand the collected data to create informed recommendations (20).

The Lesson Learned must connect to measurable changes in behavior. The organization must take deliberate corrective actions from the Lesson Learned to enhance performance (20). Lessons Learned can prepare the organization for the next disaster or improve routine operations to support operations during the next disaster.

Generally, a review of the published Lessons Learned reveals observations without analysis, nor do we find identified correctional actions or effective operations that should be reproduced.

"All NICUs responded by improvising effective plans that fit situations in flux. Surveys of NICUs with experience with wildland fire also reflected the lack of significant gaps in response (16). Common traits identified in the above experiences and from other surveys were flexibility, adaptability, and remaining calm (16),"

The Lessons Learned

All NICUs responded by improvising effective plans that fit situations in flux. Surveys of NICUs with experience with wildland fire also reflected the lack of significant gaps in response (16). Common traits identified in the above experiences and from other surveys were flexibility, adaptability, and remaining calm (16), traits necessary for decision making during emergencies (21, 22).

Smoke and poor air quality. Evacuation plans should include fire hazards, exposure to debris, and poor air quality (3). Despite 'air scrubbers' in place, air quality within the hospitals was poor with soot and debris (3, 4). Healthcare providers within the hospital were affected, and some experienced bronchospasm (4).

Evacuation. Identify methods to mobilize additional staffing, develop transportation options, and identify receiving hospitals (4). Evacuation time of 12 hours gave a calm, controlled process. In an emergent evacuation, specialized ambulance transport teams would have been used rather than accompanying neonatologists or bedside nurses (5). Medicating patients prior to transfer reduces difficulties in equipment (4) and medication administration by EMS personnel.

Impaired patient hand-off for the adult receiving hospital resulted when patients were transported with minimal medical information. Nurses counteracted this problem by nurse initiated RN-to-RN phone reports (3).

Communication. Prepare a script for on-duty staff to explain the crisis, reasons for the recall, and their responsibilities (3, 4). Improve the communication structure and include physicians in hospital incident command meetings. Inefficiencies and disconnections in communication interfered with the development of evacuation plans and preparation to evacuate (3, 5). Staff did not have clear guidance on when and where to report for duty or clarify their role and responsibility during a disaster (3).

Information. Keep everyone informed promptly. A stressful and intense situation with contradictory information from leaders becomes a major problem and source of confusion. "The realization that knowledge is power against panic" (5).

Incident command system. Develop an incident command communication workflow specific for NICU that connects to the hospital incident command (5, 23).

Social worker. Incorporate the NICU social worker into the disaster response rather than a social worker from an unfamiliar unit. The social worker, trusted and familiar to families, assists staff during the crisis (5).

Staff as victims. Identify methods to mobilize additional staffing. Staff, concerned about their families and homes, requested information necessary to return to work (4). Assist staff in developing family evacuation plans to decrease their worry (5). To return to, or stay at, work creates an untenable position between duty to protect patients and duty to protect (4).

Hospital as a haven. Residents arrived at the hospital with families and pets (3).

Next Time

Before the next fire season, develop a NICU-specific evacuation policy with procedures, have a quick triage method, and create easy-to-use checklists and supply lists**.** Conduct simulations for preparation or think through general scenarios for a framework to operate in a disaster (5).

The hospitals responded quickly to adapt medical care, prepare to evacuate, and identify personal conflicts for the caregivers (4).

All participants urge the use of drills for disaster preparation.

Comment

Disasters are the extension of routine operations – the NICU on the move into a dangerous environment, with trust in the emergency operations.

If healthcare providers are seriously affected in the hospital, consider the effect of air quality on the babies in the well-baby nursery and NICU. Also, consider that evacuation will expose neonates to smokey conditions, possibly for over an hour.

Staff as victims, the uninterrupted professional experience of disruption and loss while working continuously for 24-48 hours (5, 16) drains a person, compounded when the fire as personally experienced.

Healthcare providers and hospital workers may have at home young children, teenagers, or disabled dependents. To stay at the hospital would endanger their family members. Staff may need to remain at home or return home (4). Staff, supported by colleagues and hospital administration, returned to their homes and children during the Panorama Fire (CA) on Nov. 24, 1980.

Under even mild stress, we lose our prefrontal cortex abilities (24). Adolescents are the most susceptible. Their loss of PFC function is greater as they revert to an earlier childhood state while adults generally revert to middle adolescence.

In a wildland fire, staff may lose their homes or the life of a loved one. Staff told of colleagues who lost their homes to fire (16). Traveling during a disaster can become deadly. One nurse, evacuating with her family, was caught in the fire. Her daughter died, and another daughter suffered severe burns (4). Returning to duty immediately after the Northridge Earthquake, an LAPD officer died as he drove his motorcycle off a sheared-off freeway (25).

Evacuation. Physician orders are canceled when leaving hospital grounds. Paramedics operate under the medical control of their provider or a government agency. Nurses cannot administer medications unless the ambulance service employs them. RCPs and PAs do not exist in EMS law. They are considered civilians.

Triage system. Improvisation is effective. One NICU created its own system for evacuation priority, relying on their knowledge of the infants. This is similar to an improvised approach when paramedics triaged during a response to a terrorist shooting. Without the 'proper' colored triage tarps, they used salvage covers (the same material as a triage tarp but uncolored), placing the patients

on the proper tarp, recognized by the treating and transporting paramedics. They did not use the sanctioned patient triage method (the START system) because it "becomes a mindless algorithm that can potentially under-triage and/or fail you and your patient." The use of the START system slowed triage and did not properly triage patients. It was quickly abandoned (26).

- Bedside nurses created supply bags for each neonate
- NICU extemporaneously created: "Pink, yellow, green."
- At the terrorist shooting, the truck company did not have the "appropriate" colored triage tarps. Firefighters used salvage covers, and all paramedics recognized the proper tarp. Even placing more urgent cases on one side of urgent compared to the other.
- After the school shooting, all teachers who evacuated went to the edge of the asphalt, which is their plan, then spontaneously walked their students to the back gate to the street.

Maternity ward. Treat all expectant mothers and infants as neonates. That is, treat the maternity nursery as a NICU.

"Fire behavior drives the NICU to simultaneously plan for evacuation and sheltering, with evacuation compromised by road conditions and visibility, while sheltering is compromised by air quality within the hospital and NICU. Regardless of regional or government plans, the NICU staff make specific decisions and preparations for evacuation or sheltering. "

Conclusion

Wildland fire can compromise evacuation routes and the use of vehicles, whether air or ground. Smoke-filled air endangers the neonate inside the NICU or riding in an ambulance. Rural hospitals several hours from a receiving hospital have but a few local ambulances available for evacuation. Poor visibility from smoke prevents helicopters from flying. Fire behavior drives the NICU to simultaneously plan for evacuation and sheltering, with evacuation compromised by road conditions and visibility, while sheltering is compromised by air quality within the hospital and NICU. Regardless of regional or government plans, the NICU staff make specific decisions and preparations for evacuation or sheltering. Personal relationships with area neonatologists helped obtain placement of neonates. Neonatologists and NICU staff extemporaneously created an effective, common-sense triage system.

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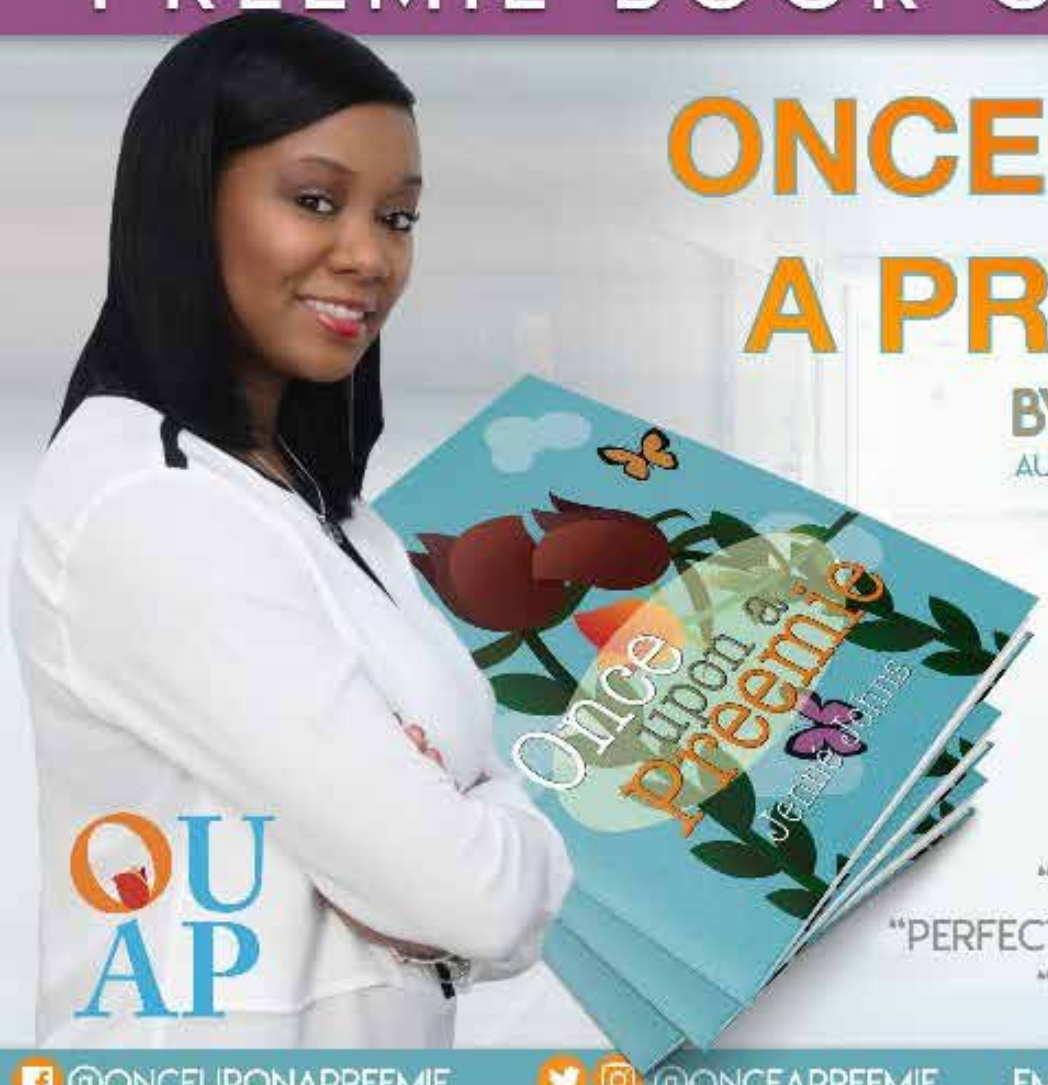

ONCE UPON A PREEMIE

BY JENNÉ JOHNS

AUTHOR | SPEAKER | ADVOCATE

QUAP

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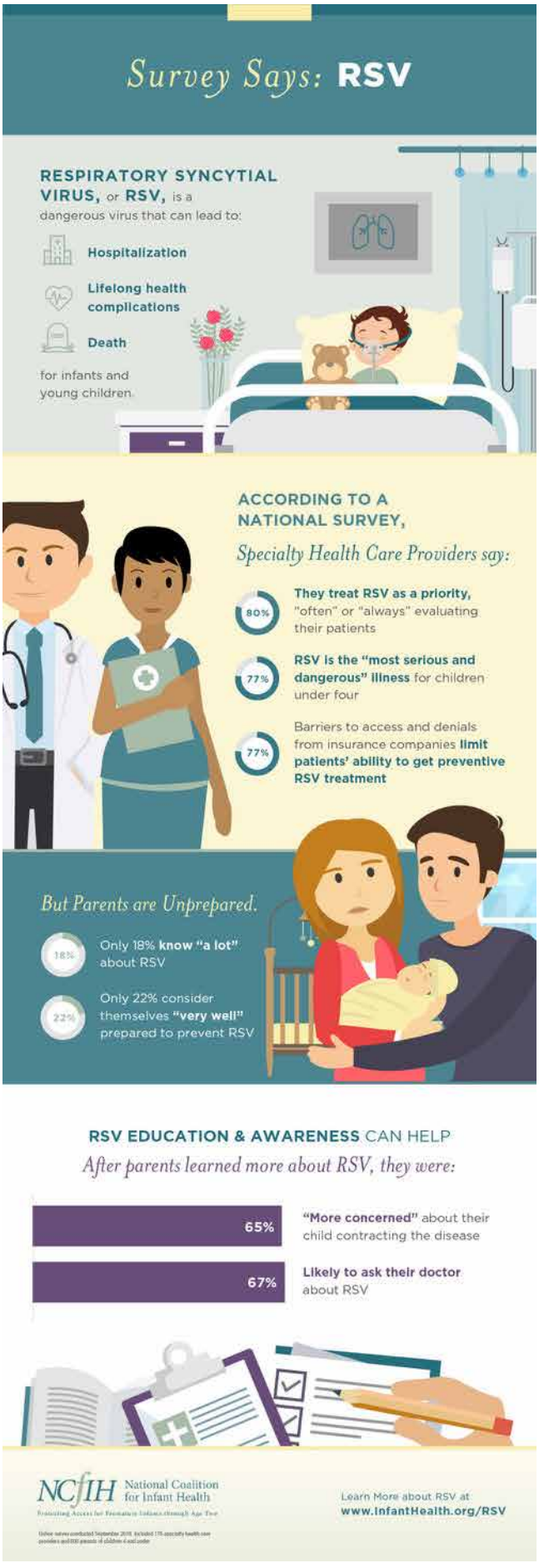

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Compiled and Reviewed by David Vasconcellos, MS IV

CDC Recommends Pediatric COVID-19 Vaccine for Children 5 to 11 Years

For Immediate Release: Tuesday, November 2, 2021
Contact: Media Relations
(404) 639-3286

Today, CDC Director Rochelle P. Walensky, M.D., M.P.H., endorsed the CDC Advisory Committee on Immunization Practices' (ACIP) recommendation that children 5 to 11 years old be vaccinated against COVID-19 with the Pfizer-BioNTech pediatric vaccine. CDC now expands vaccine recommendations to about 28 million children in the United States in this age group and allows providers to begin vaccinating them as soon as possible.

COVID-19 cases in children can result in hospitalizations, deaths, MIS-C (inflammatory syndromes) and long-term complications, such as "long COVID," in which symptoms can linger for months. The spread of the Delta variant resulted in a surge of COVID-19 cases in children throughout the summer. During a 6-week period in late June to mid-August, COVID-19 hospitalizations among children and adolescents increased fivefold. Vaccination, along with other preventative measures, can protect children from COVID-19 using the safe and effective vaccines already recommended for use in adolescents and adults in the United States. Similar to what was seen in adult vaccine trials, vaccination was nearly 91 percent effective in preventing COVID-19 among children aged 5-11 years. In clinical trials, vaccine side effects were mild, self-limiting, and similar to those seen in adults and with other vaccines recommended for children. The most common side effect was a sore arm.

COVID-19 vaccines have undergone – and will continue to undergo – the most intensive safety monitoring in U.S. history. Vaccinating children will help protect them from getting COVID-19 and therefore reducing their risk of severe disease, hospitalizations, or developing long-term COVID-19 complications. Getting your children vaccinated can help protect them against COVID-19, as well as reduce disruptions to in-person learning and activities by helping curb community transmission.

Distribution of pediatric vaccinations across the country started this week, with plans to scale up to full capacity starting the week of November 8th. Vaccines will be available at thousands of pediatric healthcare provider offices, pharmacies, Federally Qualified Health Centers, and more.

The following is attributable to Dr. Walensky:

"Together, with science leading the charge, we have taken another important step forward in our nation's fight against the virus that causes COVID-19. We know millions of parents are eager to get their children vaccinated and with this decision, we now have recommended that about 28 million children receive a COVID-19 vaccine. As a mom, I encourage parents with questions to talk to their pediatrician, school nurse or local pharmacist to learn more about the vaccine and the importance of getting their children vaccinated."

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CDC works 24/7 protecting America's health, safety and security. Whether disease start at home or abroad, are curable or preventable, chronic or acute, or from human activity or deliberate attack, CDC responds to America's most pressing health threats. CDC is headquartered in Atlanta and has experts located throughout the United States and the world.

Page last reviewed: November 2, 2021

Content source: Centers for Disease Control and Prevention

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

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

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

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- Network with other pediatricians, pharmacists, and other health care providers to be stronger advocates for children.
- Invitation for special programming by the Section at the AAP's National Conference.
- Access to and ability to submit research abstracts related to advancing child health through innovations in pediatric drugs, devices, research, clinical trials and information technology; abstracts are published in Pediatrics.

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

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

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

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

Children, Adults Equally Vulnerable to Coronavirus Infection, But Children Less Likely to Become Sick

Study shows relatively high rate of household transmission when at least one member is infected.

1-Nov-2021 8:35 AM EDT, by University of Utah Health

Newswise — New research addresses the misconception that children are less susceptible to infection with the new coronavirus. According to a recent report in *JAMA Pediatrics*, children and adults have similar risks of becoming infected with SARS-CoV-2, but a much larger proportion of infected children do not show symptoms of COVID-19. When one household member is infected, there is a 52% chance they will transmit it to at least one other person with whom they live.

The findings are based on the Coronavirus Household Evaluation and Respiratory Testing (C-HEaRT) study led by the Centers for Disease Control and Prevention (CDC) in collaboration with investigators at University of Utah Health, Columbia University, Marshfield Virology Laboratory, and Abt Associates.

"Often, it seemed like children weren't sick because they didn't have any symptoms," says Christina Porucznik, Ph.D., professor of public health at U of U Health, who led investigation of 189 families in Utah. "But some were actually infected, and they could still spread COVID-19."

Early in the pandemic, reports indicated that children accounted for the minority of COVID-19 cases. However, the observation was not able to distinguish between two scenarios. One was that children were less susceptible to infection. Another was that reported case rates in children were artificially low because they did not show symptoms, and therefore were not tested.

To better understand infection dynamics, the C-HEaRT study followed 310 households with one or more children aged 0 to 17 years in Utah and New York City. More than 1,236 study participants submitted samples for weekly molecular testing (PCR) for SARS-CoV-2 infections and completed weekly questionnaires about symptoms. On average, each person was observed for 17 weeks, and the report included a total of 21,465 person-weeks of surveillance time. The results were from September 2020 through April 2021, before the Delta variant emerged in the U.S.

The study showed that:

- Children and adults 18 years and older had similar rates of infection.
- Children in different age groups (birth to 4 years; 5 to 11 years; 12 to 17 years) also had similar rates of infection. Infection rates in each group were between 4.4 to 6.3/1,000 person-weeks.
- About half of the cases in children were symptomatic, compared with 88% of adult cases.
- In households with one or more infected individuals, the overall average household infection risk was 52%.
- The mean household infection risk was 40% in Utah and 80% in New York City.

More research will need to be done to investigate whether differences in housing density, the timing of emergence of the Delta variant, or other factors contributed to differences in household transmission rates in Utah and New York. Additionally, infection rates and household infection risk may be higher in the general population since study participants could be more likely to carry out COVID-19 prevention behaviors.

This study's results highlight that many infections in children go undetected, underscoring the need for surveillance testing and for children to continue public health safety measures to protect the people around them, Porucznik says. "We know that until kids can be vaccinated, it's still important for them to wear masks when they're in groups and to keep them apart," she says. "And most of all, when they are sick, keep them home."

# # #

The study published as "Incidence Rates, Household Infection Risk, and Clinical Characteristics of SARS-CoV-2 Infection Among Children and Adults in Utah and New York City, New York" and was funded by the U.S. Centers for Disease Control and Prevention.

Additional co-authors from U of U Health include Joseph Stanford, M.D., professor of family and preventive medicine, and Emily Hacker, a graduate student in public health.

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University of Utah Health provides leading-edge and compassionate care for a referral area that encompasses Idaho, Wyoming, Montana, and much of Nevada. A hub for health sciences research and education in the region, U of U Health has a $428 million research enterprise and trains the majority of Utah's physicians and health care providers at its Colleges of Health, Nursing, and Pharmacy and Schools of Dentistry and Medicine. With more than 20,000 employees, the system includes 12 community clinics and five hospitals. U of U Health is recognized nationally as a transformative health care system and regionally a provider of world-class care.

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NT

From mask battles to vaccine conversations, pediatricians share local concerns

Alyson Sulaski Wyckoff, Associate Editor

November 01, 2021

With a surge in COVID-19 cases and increased demand for testing and education, weary pediatricians are dealing with a host of pandemic-related challenges.

In some states — like South Carolina, Tennessee and Arizona — governors have tried to prohibit or reverse mask mandates. The AAP and its state chapters are providing legal assistance to help members educate school boards and residents about public health mitigation measures.

Below, four AAP members describe their efforts to communicate science-based vaccine information and deal with community public health policies.

In the middle of mask wars

When Tracie Newman, M.D., M.P.H., FAAP, was elected to her school board in Fargo, N.D., families seemed to embrace a new physician-member as the pandemic took hold. She advocated for a return to in-person learning with universal masking in the K-12 school district of more than 11,000 students.

The overall approach was working, Dr. Newman said. The AAP North Dakota Chapter even honored her with the 2020 Special Achievement Award for School Health Advocacy and Leadership.

Over time, however, a vocal group of parents resisted masking and used school board meetings to vent their opposition.

Forty to 50 unmasked parents showed up at meetings to rail against the policies. Sometimes, hundreds would gather in the lobby. That prompted Dr. Newman, who also serves as the county health officer, to begin entering meetings through the back door.

As the exchanges became more heated, parents accused her of taking kickbacks from mask manufacturers and "Big Pharma" and also questioned her data.

"I don't believe public health should ever be political," Dr. Newman said, "but it seemed like masks got singled out as this 'overreach' of our authority."

When parents challenged Dr. Newman's integrity as a physician, she called it the ugliest stage. "That part has been very personal and very hard."

On the plus side, she said most of the teachers and staff — along with the patient families in her practice — are supportive.

While a recall campaign to remove Dr. Newman and several others on the board failed, she knows the criticism will continue.

Dr. Newman remains undaunted: "Our role as pediatricians is to do our best … to advise our communities," she said.

Other pediatricians said school mask mandates, in conjunction with additional infection control measures, have helped to limit transmission in their areas.

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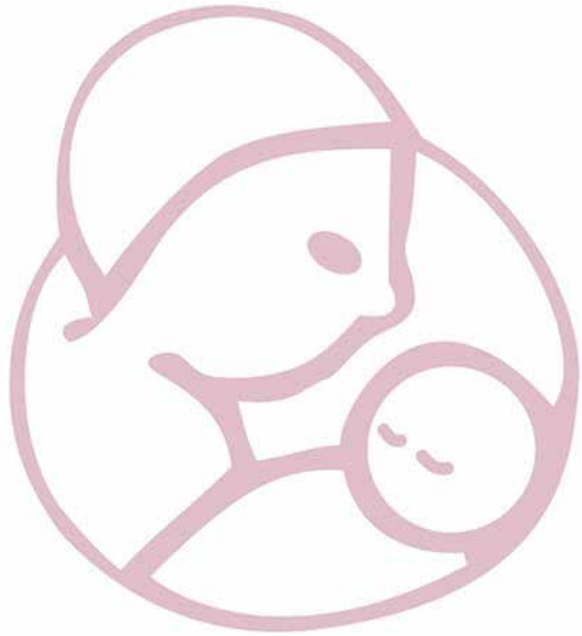

PAC/LAC's core values for improving maternal and child health have remained constant for over 30 years – a promise to lead, advocate and consult with others.

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

Advocacy

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

Consultation

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

Courtesy of John Gaudet, M.D., FAAP

In Hattiesburg, Miss., John Gaudet, M.D., FAAP, is grateful for mask mandates but said one need not travel far to find districts without such policies.

"There's still community spread, and I believe that what goes on in the school is reflective of your community spread," Dr. Gaudet said. "So if the adults aren't wearing them and they're not doing proper mitigation techniques, you're going to see circulation of the virus in the schools — and we're still seeing it in the school setting."

Coping with caseloads

In the central Oregon city of Bend, John Peoples, M.D., FAAP, believes his area is about at the peak of the delta variant, but it has been tough.

"It's pushed our hospital locally right to the brink of capacity," he said, with August and September being the worst months.

He hesitates to read too much into state vaccination statistics, noting that COVID is local. A state could have a high overall vaccination rate, he said, but rampant spread in pockets of the unvaccinated.

Where Dr. Gaudet practices in Mississippi, the delta variant also may have peaked in late September/early October.

In spring 2020, most of his patients tested negative for the virus. When the delta wave hit, it was like flipping a switch, with so many positive results. "…what really got me was, in my little group, my three-man group, we had two MIS-C cases plus another one that was never proven to be COVID but had all the features," Dr. Gaudet said.

Mississippi also has seen an uptick in cases in pregnant women and maternal deaths, prompting him to recommend COVID vaccines to both pregnant women and postpartum mothers.

In her part of Texas, Austin pediatrician Kimberly Avila Edwards, M.D., FAAP, said overall numbers were starting to drop in the last two weeks of September.

"… we've definitely seen decreasing cases of COVID within our hospital systems, so that need (for testing and care) is subsiding a bit," said Dr. Avila Edwards, director of advocacy and external affairs for Ascension Texas and associate chair for advocacy in the pediatrics department at Dell Medical School.

Vaccine conversations

Dr. Avila Edwards also practices at Children's Health Express, a mobile clinic where most patients are under- or uninsured, and there is a high migrant population. She makes it standard practice to ask if eligible family members got the vaccine. If not, she directs them to where they can be vaccinated together.

"It's been such a great opportunity to share that information," she said.

Her experience, however, is poles apart from pediatricians who find themselves frequently addressing vaccine hesitancy.

"Because we're seeing a high migrant population, it's a very different conversation," she said. "Many of them can't wait to get the vaccine. They've been in communities from other countries that haven't had the luxury of all the vaccines we've had, whether it's varicella or HepA. And so a lot of times, there's eagerness that I know is not replicated in some of my private community colleagues' offices."

Dr. Peoples is among those who are trying to combat vaccine hesitancy. He said he emphasizes scientific data as the trusted voice for his families.

Dr. Gaudet takes a bimodal approach, starting with facts and figures and ending with an appeal to the heart and parental instincts.

"I'll ay something like: 'It's a terrible illness and even though kids do well, they are still miserable. They're less likely to go in the hospital and less likely to get severely ill, but that doesn't mean they don't get very ill. This is an opportunity to protect your child. And if they're going to suffer, if they get sick from it, knowing all along that this could have been preventable, it would be a hard thing to take.'"

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NT

Indoor Air Pollution Is a Major Culprit in Preterm Births

Tara Haelle

October 26, 2021

(Scientists have long known that exposure to air pollution during pregnancy increases risks for preterm birthor low birth weight. New findings suggest that pollution ex-

posures are higher in low- and middle-income countries and especially from indoor sources.

In 2019, for example, about half the world's population breathed household air pollution from cooking fires. In addition, 92% of the global population lived in areas in which the air quality did not meet World Health Organization recommendations.

For this latest report, published in PLOS Medicine, researchers analyzed data from 124 studies on air pollution, birth weight, and preterm birth. They wanted to be sure distinguish exposures to indoor air pollution, which often is overlooked. (A preterm birth is defined as before 37 weeks of pregnancy; low birth weight is about 5.5 pounds, or less than 2,500 grams).

Most of the studies they assessed came from the United States, Europe, and Australia, with a scattering of findings from India, China, South America, and sub-Saharan Africa. The researchers specifically included reports from Africa and Asia because indoor fire cooking is more common in these regions.

About a third of the air pollution causing preterm birth came from the outside air, so that most of it was from indoor air pollution, largely in low-income countries.

The results showed that air pollution accounted for 16% of all babies born with a low birth weight and 36% of preterm births. The findings imply that one out of every three preterm births could be prevented if air pollution exposure during pregnancy could be eliminated. The study authors estimate that about 5.9 million preterm births worldwide in 2019 could instead have been delivered at term if air pollution were kept to levels associated with minimum risk.

In sub-Saharan African countries, for example, more than half of all preterm births (52.5%) were attributable to air pollution exposure. Keeping air pollution at the minimum risk level could reduce both preterm births and incidence of low birth weight by 78% in this region, the study authors estimate.

Low birth weight and preterm birth increase the risk of death before age 1 and can have additional lifelong consequences. These infants have a greater likelihood of intellectual and developmental disabilities and of other disabilities, such as vision, lung, or hearing problems. Asthma, digestion difficulties, and infections are also more common in those born preterm.

Source

PLOS Medicine: "Ambient and household PM2.5 pollution and adverse perinatal outcomes: A meta-regression and analysis of attributable global burden for 204 countries and territories."

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NT

Neonate Rewarming Tied to Increased Electrographic Seizure Risk, Poor 2-Year Outcomes

By Lisa Rapaport

November 05, 2021

(Reuters Health) - Neonates with hypoxic ischemic encephalopathy who are treated with hypothermia have an increased risk of seizures during rewarming, and those seizures are associated with greater death and disability at 2 years, a new study suggests.

Researchers examined data on 120 newborns at a mean gestational age of 39 weeks who were randomized to receive either 72 hours (n=66) or 120 hours (n=54) of cooling as an intervention for hypoxic ischemic encephalopathy. The primary endpoint was electrographic evidence of seizures during the 12 hours prior to rewarming compared with the first 12 hours of rewarming.

Compared with the 12 hours prior to rewarming, infants had significantly greater seizure risk during the first 12 hours of treatment for both 72-hour rewarming (odds ratio 2.7) and 120-hour rewarming (OR 3.2).

At ages 18-22 months, the infants who experienced seizures during rewarming had a significantly higher risk of mortality or severe disability (OR 1.7) in adjusted analysis that accounted for baseline clinical encephalopathy and seizures as well as treatment center.

"The presence of higher odds of seizures during rewarming that are associated with death and disability at two years is a new and important finding," said lead study author Dr. Lina Chalak, a professor of pediatrics and psychiatry and director of the Neonatal Neurological Intensive Care and Fetal and Neonatal Neurology Fellowship Program at the University of Texas Southwestern Medical Center in Dallas.

"The underlying mechanisms are likely related to impaired auto-regulation with hemodynamic mismatch between oxygen delivery and metabolic demands during rewarming which precipitates seizures," Dr. Chalak said by email.

These results suggest that there's a significantly elevated risk of seizures during the rewarming period, most of which typically go unnoticed if not monitored with EEG or amplitude compressed EEG, Dr. Chalak added.

For infants randomized to a 72-hour rewarming period, 27% experienced seizures during the first 12 hours of rewarming, compared with 14% in the 12 hours prior to initiation of rewarming.

For infants randomized to a 120-hour rewarming period, 21% experienced seizures during the first 12 hours of rewarming, compared with 10% in the 12 hours prior to treatment initiation.

These outcomes add to the evidence that faster rewarming may carry more risks for infants, the study team concludes in JAMA Neurology.

One limitation of the study is that the researchers didn't use continuous EEG monitoring, which is the gold standard for detecting electrographic seizures, the authors note. The researchers also lacked hemodynamic assessments to confirm any underlying mechanisms for seizures such as a mismatch in oxygen delivery and consumption, they point out.

However, the results underscore the importance of monitoring these infants for seizures, Dr. Chalak said.

"This study is telling us that there's an untapped opportunity to improve care for these babies during rewarming by recommending EEG monitoring a standard part of the rewarming protocol," Dr. Chalak said. "Monitoring during both cooling and rewarming can help protect these young patients' brains from further insults while they heal."

SOURCE: https://bit.ly/3mHLH4U JAMA Neurology, online October 18, 2021.

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NT

NIH to study long-term effects of COVID-19 in pregnancy

Effort will follow up to 1,500 pregnant patients with COVID-19 and their offspring for four years.

Tuesday, November 2, 2021

What

The National Institutes of Health will support a four-year follow-up study on the potential long-term effects of COVID-19 on women infected with SARS-CoV-2 during pregnancy. The study will also follow their offspring for any potential long-term effects.

The effort is part of NIH's Researching COVID to Enhance Recovery (RECOVER) Initiative(link is external), which aims to understand why some individuals who have had COVID-19 don't fully recover or develop symptoms after recovery. Known as post-acute sequelae of SARS-CoV-2

infection (PASC), or more commonly as Long COVID, these conditions affect all ages. Long-term effects include fatigue, shortness of breath, difficulty concentrating, sleep disorders, fevers, anxiety and depression.

The current study will enroll some participants from an earlier study by the Maternal-Fetal Medicine Units (MFMU) Network, a 36-site research collaboration supported by NIH's *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD). Participants will be recruited from roughly 4,100 patients with asymptomatic and symptomatic SARS-CoV-2 infection during pregnancy who gave birth at MFMU Network hospitals. The research teams will assess patient symptoms periodically during the four-year period and evaluate their offspring for neurologic symptoms and cardiovascular conditions.

Researchers led by Torri Metz, M.D., of the University of Utah School of Medicine, will seek to understand what proportion of patients with COVID-19 in pregnancy are at risk for Long COVID, whether the severity of COVID-19 in pregnancy influences the likelihood of developing Long COVID, and how the proportion of patients who develop PASC after COVID-19 in pregnancy compares to that of non-pregnant women who develop PASC. Researchers hope the study findings will inform efforts to reduce the risk of Long COVID after pregnancy and to treat its symptoms.

Who

Monica Longo, M.D., project scientist, NICHD Maternal-Fetal Medicine Units Network, is available for comment.

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

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

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NT

Universal masking, immunization top 2 strategies for safe in-person school: AAP

Alyson Sulaski Wyckoff, Associate Editor

November 02, 2021

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

Schools need to take a multipronged, layered approach to reduce the risk of COVID-19 transmission among students, teachers and staff so that in-person learning is safe and possible. As part of that approach, universal masking and immunizations are the most important risk mitigation strategies.

These recommendations are included in the AAP's updated *COVID-19 Guidance for Safe Schools and Promotion of In-Person Learning*. The interim guidance is designed to help support communities, local education and public health leaders, and pediatricians who collaborate with schools.

"All local, state and federal policy considerations for school COVID-19 plans should start with a goal of keeping students safe, physically present and emotionally supported in school," the guidance states.

Maximizing protections

Besides masking and vaccination, layers of protection include physical distancing, ventilation when resources are available, screening, testing, handwashing, staying home and getting tested when sick, contact tracing, isolation and quarantining.

"There must be a continued focus on keeping students safe particularly because not all students have had the opportunity or are eligible to be vaccinated against COVID-19 at this time," the guidance states.

Included in the updated guidance are new and expanded sections on school ventilation systems, COVID testing, oral health and evidence for universal masking. The use of plastic dividers or desk shields in the classroom no longer is recommended and, in some cases, can be detrimental for infection control.

There is continued emphasis on supporting the behavioral/mental health of students and staff. Schools are fundamental to child and adolescent development and can play a critical role in addressing racial and social inequity. The guidance discusses the impact school closures have had on racial and ethnic groups and populations facing inequities.

Key principles

Schools should consider following these key principles to mitigate risk during the pandemic:

- All eligible individuals should receive the COVID-19 vaccine. Schools can play a key role in supporting their jurisdictions' immunization efforts.
- All students older than 2 years and all school staff should wear face masks at school (unless medical or developmental conditions prohibit use), regardless of vaccination status.
- Adequate and timely COVID-19 testing resources must be available and accessible to limit spread and help symptomatic students who do not have COVID-19 return in a timely way. Testing should not be considered a primary form of prevention and should not be the only mitigation strategy.
- Schools should work closely with

public health agencies to develop quarantine and isolation protocols that limit time away from school based on current scientific data.

- School nurses and school health personnel should not be the default to provide school-based COVID-19 testing or contract tracing.
- Strategies should be revised and adapted depending on the level of viral transmission and test positivity rate throughout the community and schools.
- Policies should be reviewed regularly.
- Attendance should be monitored and support provided for those at higher risk of absenteeism.
- School districts must be in close communication and share COVID-19-related policies with state and/or local public health authorities, school nurses, local pediatric practitioners and other medical experts.
- Policies should be communicated in languages other than English, when needed.
- Ongoing federal, state and local funding should be provided to all schools so mitigation and safety measures can be provided, with the goal of keeping students safe, physically present and emotionally supported.

Importance of indoor mask-wearing

The AAP recommends masking for the following reasons:

- Masks have proven effective in reducing transmission of the virus from infected individuals.
- Because a significant portion of the student population is not yet vaccinated, masks help protect unvaccinated students from COVID-19 and reduce transmission.
- As monitoring or enforcing mask policies can be difficult, universal masking is the most effective strategy to create consistent messages and compliance without the burden of needing to monitor vaccination status.
- There may be low vaccination uptake within the surrounding school community.
- Variants that spread more easily may emerge.
- Fully vaccinated individuals can become infected and transmit the virus; therefore, universal masking is needed to protect unvaccinated and otherwise vulnerable community members.
- An added benefit of universal masking is protection of students and staff against other respiratory illnesses that would take time away from school.

Special considerations

The guidance also covers issues of school attendance and absenteeism; students with disabilities or chronic illnesses; adult staff and educators; onsite school-based health services; and the importance of getting caught up on other immunizations — especially influenza — and screenings. Also covered are food and housing insecurity, the digital divide and organized activities.

Evidence to support safe return to classrooms continues to evolve, and the AAP regularly reviews and updates its guidance.

Resources

- Information for parents from HealthyChildren.org on safe schools during the COVID-19 pandemic
- Information from the CDC on schools and child care programs
- AAP policy statement "COVID-19 Vaccines in Children and Adolescents"

Contact information for AAP headquarters

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New AAP main number: 630-626-6000

NT

Keeping Your Baby Safe

during the COVID-19 pandemic

How to protect your little one from germs and viruses

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

Here's what you can do...

Wash Your Hands

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

Limit Contact with Others

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

Provide Protective Immunity

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

Take Care of Yourself

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

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

WARNING

Never Put a Mask on Your Baby

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

If you are positive for COVID-19

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

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

National Perinatal Association

PROTECT YOUR FAMILY FROM RESPIRATORY VIRUSES

flu coronavirus pertussis RSV

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often with soap and warm water.

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

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

USE AN ALCOHOL-BASED HAND SANITIZER.

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

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Peer Reviewed

Genetics Corner: A Newborn with a Disorder of Sex Development Caused by 45,X/46,X,idic(Y) Mosaicism

Robin Dawn Clark, MD

Summary:

An infant with ambiguous genitalia was born at 37 weeks 6 days gestation by repeat C-section to a 37-year old G4P4 mother with well-controlled gestational diabetes (class A2). The mother had a cell-free fetal DNA screening test that was positive for an increased risk for Monosomy X. An offer of amniocentesis was declined. The parents were expecting a female infant based on genital anatomy on fetal ultrasound (US) examinations. Family history was noncontributory. Apgar scores were 8^{1} and 8^{5}. Birth weight was 2.51 kg (3^{rd} %ile, Z=-1.87), birth length was 46 cm (2.01%ile, Z=-2.05), head circumference was 32 cm (2.63 %, i.e., Z=-1.94). Placental weight was 286.9 grams, smaller than expected for the gestational age: ($<3^{rd}$ %ile for males at 37 weeks gestation). (1)

"The mother had a cell-free fetal DNA screening test that was positive for an increased risk for Monosomy X. An offer of amniocentesis was declined. The parents were expecting a female infant based on genital anatomy on fetal ultrasound (US) examinations."

Physical exam revealed a small nondysmorphic infant with ambiguous incompletely virilized external genitalia. A phallic structure with prepuce, measured >1.5 cm in length, was present with proximal hypospadias. Gonads were palpable bilaterally in a well-rugated, deeply pigmented bifid scrotum. There was no pedal or hand edema or neck webbing.

The pelvic US showed a normal-appearing bladder and no unusual masses or other structures that suggested a uterus, ovary, or testis within the pelvis. The US of the kidneys was normal. The US of the groin revealed "a probable right testicle within the right inguinal canal/scrotum and an ill-defined, heterogeneous ovoid structure in the left inguinal/scrotal region with a questionable peripheral follicle that may represent an ovotestis or dysplastic ovary or testis." Endocrine studies ruled out the salt-wasting type of congenital adrenal hyperplasia. Testosterone, luteinizing hormone, and 17-hydroxypregnenolone were normal.

Chromosome analysis in 30 metaphase cells showed a 45,X chromosome complement, and parents were informed that their child had a likely diagnosis of 45,X/46,XY mosaicism, and male sex assignment was recommended. They understood that further studies were in progress to identify Y-bearing cells. Chromosome microarray was consistent with monosomy X: arr(X)x1. Fluorescence in situ hybridization (FISH) studies with probes for X and SRY (Yp11.3) were ordered, but results did not return until after the child was discharged. FISH studies revealed an isodicentric Y chromosome in 2 of 20 metaphases: ish dic(Y)(SRY++)[2/20]. "The isodicentric Y chromosome hybridized with two copies of *SRY* on each of the attached Y short arms. Thus each isochromosome had two copies of the *SRY* gene. In 18 of 20 selected metaphases, there was a single X chromosome." Parents were informed of these results by phone.

The child returned at a month of age with his family for outpatient counseling regarding his diagnosis. His parents had accepted a male sex assignment for him. Although his weight had improved slightly (4^{th} %ile, Z= -1.77), his height had not ($<1^{st}$ %ile, Z= -2.88). Repeat chromosome analysis from genital skin and testicular biopsy of both gonads was recommended in conjunction with his hypospadias repair, which is planned when he reaches an appropriate weight. He was referred for an endocrinology evaluation for short stature. An echocardiogram was ordered.

Discussion:

This child has a disorder of sex development (DSD) caused by sex chromosome mosaicism, which is categorized as a sex chromosome DSD (2). Sex chromosome

DSDs include Turner syndrome, Klinefelter syndrome, and 45,X/46,XY gonadal dysgenesis. Our patient is mosaic for 2 cell lines: 45,X in the majority of lymphocytes and a small percentage of cells with a structurally abnormal isodicentric Y chromosome (idicY), consisting of 2 copies of the Y short arm separated by two centromeres, and, presumably, a small amount of the Y long arm between them. An isodicentric chromosome can be unstable during cell division if both centromeres are active during cell division. When two centromeres are pulled toward opposite poles of the dividing cell, an idicY can be pulled apart, resulting in monosomy X in the surviving daughter cell. This is the likely mechanism for the monosomy X cell line in this patient. A structurally abnormal Y chromosome is not infrequent in children with 45,X/46,XY mosaicism. The percent of 45,X cells in lymphocytes does not correlate with the genital/gonadal phenotype, and indeed the percentage of 45,X, and 46,X,idicY cells varies with the tissue type.

Both of these problems, the structurally abnormal Y chromosome and the 45,X cell line, contributed to this child's phenotype in different ways. Mosaicism causes tissue-specific differences in the chromosome complement. The presence of 45,X cells in the gonadal ridge in early embryonic development seems to have diluted the effect of the idic Y cells that express the testis determining factor, SRY. *SRY* (**S**ex determining **R**egion on the **Y** chromosome), a gene on the distal short arm of the Y chromosome (Figure 1), is a key factor that initiates early differentiation of the bipotential gonad by directing support cells to become Sertoli cells in a testis rather than granulosa cells in an ovary. In this patient, the idicY has two copies of *SRY,* but this cell type, it seems, may not have been in the majority in the gonadal ridge.

We expected that our patient might be infertile as an adult. Azoospermia factor regions a, b, and c (AZFa, AZFb, AZFc), located on the Y q arm, are required for normal sperm production and are often deleted in men with 45,X/46,XY mosaicism who present with infertility. An idicY, with two copies of the p arm and loss of the Y q arm material, increases the chance of azoospermia later in life. Indeed, idicY is a common finding among azoospermic men. (3)

There is a well-described ascertainment bias in reports of 45,X/46,XY mosaicism. Over ninety percent of prenatally diagnosed cases have a normal male phenotype, (4) whereas postnatally diagnosed cases are highly variable and present with a wide spectrum of genital/gonadal phenotypes. This is also the case for individuals with 45,X/46,X,idic(Y). In their review of 32 prenatally diagnosed patients with an isodicentric Y chromosome, Yang and Hao (5) report six prenatally diagnosed patients with mosaic 45,X/46,idic(Y) and review the literature to describe 27 others. In their series, most individuals (84%) were phenotypically normal males (27/32), 10% were phenotypic females (3/32), and the rest had ambiguous genitalia (2/32). The breakpoint on the Y chromosome did not correlate with the genital phenotype. Although most prenatally detected isodicentric Y chromosomes had similar breakpoints (Yq11.2 or Yp11.3), the breakpoints had no direct correlation with the phenotype at birth.

"Males with 45,X/46,XY mosaicism should not be referred to as having "male Turner's syndrome" since Turner syndrome is generally regarded as a disorder described in females. Nevertheless, they can share similar features with females who have Turner syndrome. In their review, because of the range of problems present, Debo and colleagues advocate for multidisciplinary and specialized care for males with 45,X/46,XY mosaicism. (6) "

Males with 45,X/46,XY mosaicism should not be referred to as having "male Turner's syndrome" since Turner syndrome is generally regarded as a disorder described in females. Nevertheless, they can share similar features with females who have Turner syndrome. In their review, because of the range of problems present, Debo and colleagues advocate for multidisciplinary and specialized care for males with 45,X/46,XY mosaicism. (6) Short stature is a common finding, which justifies chromosome analysis in all boys with short stature, the recommended diagnostic test for all short girls. Small size at birth is not universal, and some children do not exhibit short stature until after age 2. Short stature has a similar cause in girls with Turner syndrome and in males with 45,X/46,XY mosaicism. Both have a heterozygous loss of *SHOX* (**S**hort stature **HO**meobo**X**) in the 45,X cell line. This gene, which participates in chondrocyte proliferation and differentiation, is located in the PAR1 region

of both the X and Y chromosome short arms, and two functioning copies are required for normal growth in both males and females. Growth hormone treatment may be beneficial for short stature in this group, especially when treatment is initiated early with appropriate dosing. (7) Cardiac anomalies, primarily left-sided lesions such as bicuspid aortic valve or coarctation of the aorta, are found in about 1/3 of patients and are equally common in males with 45,X/46,XY mosaicism, and in females with Turner syndrome. Similar rates of renal anomalies are also seen in both groups. Importantly, there is a risk for gonadoblastoma in phenotypic males and females with mosaicism for a Y-bearing cell line. The risk for gonadoblastoma is higher in individuals with intraabdominal streak gonads and ambiguous genitalia. Because of the potential benefits of endogenous testosterone production and preservation of fertility, scrotal gonads are often preserved when possible and monitored for neoplastic changes with ultrasound and testicular biopsy.

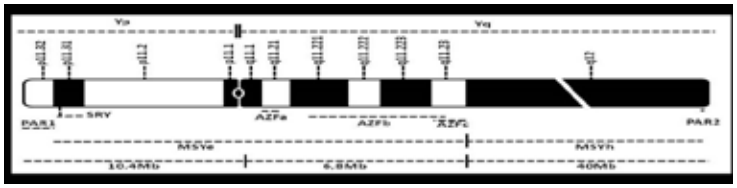

Figure 1 (adapted from Figure 1, Signore et al. 2019) (8)

The Y chromosome consists of a short arm, Yp, and a long arm Yq, separated by a centromere. The dark areas represent bands that appear after Giemsa staining. Two **p**seudo**a**utosomal **r**egions, PAR1 and PAR2, located at distal Yp and Y q respectively, bind to counterparts on the distal ends of the X chromosome. Unlike other sex-linked genes that are subject to X-inactivation, PAR1 and PAR2 are expressed from both the X and the Y chromosomes. SRY (Sex-determining Region on Y) at Yp11.31 is a key factor in developing the testis from the primordial gonad early in embryonic life. Azoospermia factors a, b, and c (AZFa, AZFb, AZFc) are located in the long arm of the Y.

" Because of the potential benefits of endogenous testosterone production and preservation of fertility, scrotal gonads are often preserved when possible and monitored for neoplastic changes with ultrasound and testicular biopsy."

Practical applications:

1. Recognize that a child with a 45,X chromosome complement with ambiguous genitalia is likely to have a Y-bearing cell line. Utilize fluorescence in situ hybridization (FISH) with probes for X and Y chromosome regions, esp *SRY*, to establish the presence of a Y chromosome that contains *SRY*. Note that the chromosome microarray in this child did not detect the idicY because it was present at a low level of mosaicism.
2. Do not refer to males with 45,X/46,XY mosaicism as having "male Turner syndrome" since that diagnosis is understood to refer to females.
3. Anticipate that males with 45,X/46,XY mosaicism may have short stature and benefit from early growth hormone treatment.
4. Recognize that individuals with 45,X/46,XY mosaicism are at risk for gonadoblastoma, left-sided cardiac defects, renal anomalies, and other features that can be seen in Turner syndrome. Refer to a multidisciplinary center for specialized care if possible.
5. Recognize that there is an increased risk for infertility in adulthood posed by deletion of the long arm of the Y chromosome.

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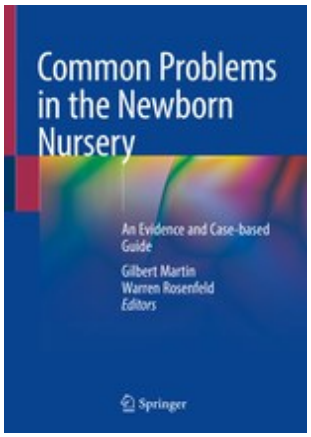

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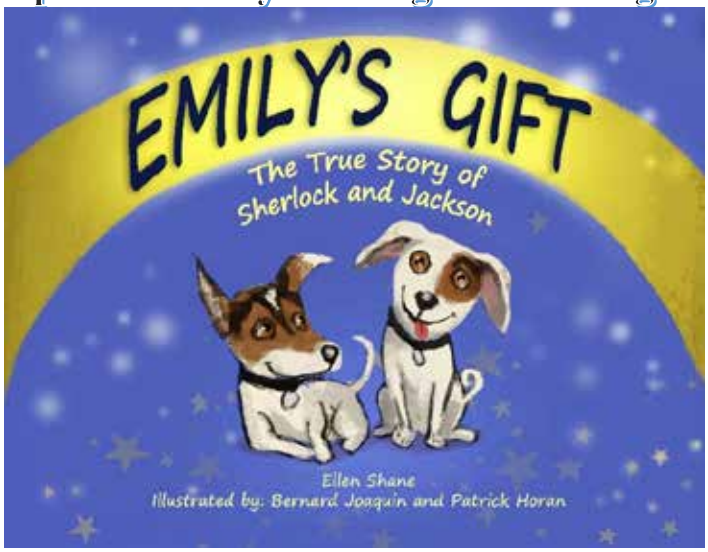

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VIRTUAL

2021

Infant Health

Policy Summit

NCfIH National Coalition for Infant Health

Protecting Access for Premature Infants through Age Two

IfPA Institute for Patient Access

AfPA Alliance for Patient Access

Overview

The sixth annual Infant Health Policy Summit welcomed health care providers, parents, policymakers, advocates, and other stakeholders to explore how policy solutions can improve the health and lives of infants and their families.

This year's event, held virtually, examined issues such as:

- The value of safety and innovation for neonates
- Respiratory syncytial virus and compounding disparities
- Perspectives from the Asian, Black, Hispanic, and LGBTQ communities
- The long-term effects of separating mothers and babies during COVID-19
- Nutrition and safety in a growing human donor milk market
- Newborns and rare diseases

Ashley Randolph, a Black mother of three premature babies, president of GLO Preemies, and co-founder of the Alliance for Black NICU Families, delivered opening remarks. She called for a reexamination of policies that shape infant care and highlighted what advocates can do to make policies stronger, better, and fairer.

"My baby and I did not always get the information, the respect, or the care that we needed," she recalled of her time in the NICU. "Navigating the NICU after you've just come through the enormous stress of premature birth, that's difficult for any parent," Randolph reflected, "but it's especially hard when you're met with preconceptions, stereotypes, or judgment from the very system that's meant to help you."

Ashley Randolph

"The challenges I faced were an opportunity to do something more."

Randolph called on advocates to keep working "today, tomorrow, and every day until all infants have the access and the care they deserve."

The summit, which included a series of panel discussions, individual stories, and interviews, was convened by the National Coalition for Infant Health and co-hosted by the Institute for Patient Access and Alliance for Patient Access.

Keynote Address

U.S. Rep. Nanette Diaz Barragán

Member of Congress

For much of the 20th century, stigma has persisted around mental illness generally, with maternal mental health neglected almost entirely. U.S. Rep. Nanette Diaz Barragán wants to see that trend reversed.

The congresswoman used her keynote address to emphasize the importance of repairing prevention and care networks for new moms. Rep. Barragán recently introduced the TRIUMPH for New Moms Act of 2021, a bipartisan bill to create a taskforce across agencies, medical societies, and nonprofit organizations with expertise in maternal or mental health. The taskforce would be chaired by the assistant secretary of the Department of Health and Human Services.

It is critical to reduce disparities faced by moms of color, support policy on maternal mental health, and improve federal, state, tribal, and community partnerships focused on maternal mental health, the congresswoman emphasized. She also highlighted the need to create supportive environments for new moms returning to work.

Rep. Barragán envisions the taskforce coordinating programs, closing gaps, formulating recommendations, identifying appropriate programs and finding federal resources to support new mothers. The taskforce would also develop a national strategy for maternal mental health and issue recommendations at all levels of government while regularly updating the report to create an ongoing, up-to-date national strategy.

The congresswoman described seeing the lack of federal coordination and strategy every day. Suicide and overdose are the leading cause of death for new mothers, she noted, adding that untreated mental health disorders damage mother-child bonding, most prevalently in communities of color.

> ***"One in five women, and three of five women of color, will suffer from a maternal mental health condition."***

Rep. Barragán underscored the need for advocacy, explaining that "public sentiment moves the needle." She told summit attendees that members of Congress need to hear from the "boots on the ground" — reminding them that nothing is as powerful as a personal story.

Innovating for Infants

This year's summit highlighted an urgent need for policies that promote the development of devices and medications created specifically for infants — and for hospital systems to implement these policies.

Mitchell Goldstein, MD

National Coalition for Infant Health

Dr. Goldstein provided an example to illustrate the urgency of needed devices and medications for infants. Early in his career, Dr. Goldstein recalled, he had an infant patient whose oxygen levels were being monitored with an adult oximeter, which didn't work correctly for such small patients. Dr. Goldstein fortunately had access to a trial device developed specifically for infants. With this tool, he could tell that the infant was showing steady improvement.

"This was the first point," Dr. Goldstein reflected, "where I realized how important it was…that we have technology that is specifically designed for the population — in this case, neonates. And this technology for this baby at this time made all the difference."

Patricia Bondurant, DNP

University of Kentucky HealthCare

Patricia Bondurant echoed concerns about the scarcity of well-tested, safe and effective medical devices for infants. With the variety of health concerns facing NICU babies, this population is extremely vulnerable to infection. She stressed that more precise measures and dosing are needed, as are tools that address the constantly changing weight and maturation of babies as their stay extends.

Bondurant is leading the way with private-public partnerships to merge life science and digital companies with physical sciences and computer sciences to bring breakthroughs to the NICU. She emphasized the importance of bringing innovators and collaborators "committed to ensuring that all children have access to the right devices to deliver safe care," as well as the need to work with clinicians to improve existing tools.

Viewpoints

A series of individual perspectives shed light on how different communities experience parenthood and infant health issues.

Wakako Minamoto Eklund, DNP

Pediatrix Medical Group of TN, Northeastern University

Wakako Minamoto Eklund, reflecting on the experiences of the Asiancommunity, has found that major language barriers can create a difficult environment for multi-ethnic families. She has seen poor interpretation unnecessarily add to families' strife.

Eklund laid out several policies and tools that could reduce language issues. Those included boosting training so that translation services could guarantee a quality interpreter with proper training to facilitate conversations about medical issues. Eklund also recommended developing go-to resources for translators with a common language and medical terms. A better understanding of non-verbal cues and changes is also important since patients may sometimes refrain from asking questions or chatting with providers when language barriers exist. Training providers in nonverbal communication such as smiling, pointing, universal signs, and gestures, Eklund noted, could also improve medical interactions for the family.

Curry Bordelon, DNP, MBA

University of Alabama at Birmingham School of Nursing

Curry Bordelon has run into issues of bias in all areas of his life as a gay man, father, and same-sex partner. While in the NICU, hefound that the medical providers assumed they were "waiting on mom." Preconceptions about what makes up a family are pervasive,Bordelon said, from the NICU to school forms to pediatric visits.

Many LGBTQ patients and families fear providers disengaging from patients different from them or whom they aren't sure how to approach, Bordelon noted. His mission is to teach students and colleagues about conscious and unconscious bias, helping them see that families come in all colors, shapes, and sizes.

Liliana T. Miramontes, BSN

Perinatal Nurse

It's time to "make sure the workforce is as diverse as patients," said Liliana Miramontes. As a Hispanic, she has experienced bias herself — both as an experienced medical professional and patient. Patients may assume she is uneducated, Miramontes explained. They don't want to believe or credit her knowledge, and sometimes they want to talk to the doctor so that the doctor can repeat everything she's already said.

Whether it's having English as a second language or coming from a different educational background, Hispanic people can have different experiences in the world of pregnancy and infant health. Miramontes explained that it is important to educate patients so they can be their own advocates. She is working on getting informationto patients and helping them understand how America's health care system works and the process for labor and delivery. More resources in more languages and more locations, Miramontes noted, would help empower patients and reduce anxiety.

Gigi Khonyongwa-Fernandez, BSc

Certified Professional Coach

Gigi Khonyongwa-Fernandez has experienced her share of bias — as a preemie mom who spent six months in the NICU, a Black woman, and a healthcare provider. She reflects that the experiences stemmed from both conscious and unconscious bias. She was often overlooked as a medical professional, even assumed to be housekeeping staff in one encounter.

She said that fighting assumptions and having to disprove stereotypes can have an impact on both families and babies. In many cases, there is an immediate assumption that a Black family must be incapable of preparing for a child. She explained that providers "actively try to fit you or, shall I say, force you" into a box. This can cause unnecessary trauma and stress, and it also exerts energy on ignorant assumptions rather than focusing on the child. Distrust creates an uncomfortable environment.

When asked how providers can ensure every single baby and familyreceive optimal care, she said they must keep the conversation going. "We have to get comfortable with being uncomfortable," Khonyongwa-Fernandez emphasized.

Respiratory Syncytial Virus

As yet another RSV season sets in, policymakers must improve access to health care for underserved communities and ensure more comprehensive coverage for treatment.

Megan Jones

Iowa General Assembly, The Jones Family

The mom of four kids, Representative Jones, recalled the challenges and heartache of seeing her infant son hospitalized with RSV. An ER visit led to an ambulance ride that "I will never forget," Rep. Jones explained, which ultimately landed the family at an Iowa children's hospital. While her son survived, Rep. Jones, says the experience hasmade her family vigilant about RSV precautions.

She urged legislators and advocates to raise awareness about the disease and lack of resources for infant health care in underserved and rural areas.

National Coalition for Infant Health

Suzanne Staebler explained that while RSV cases initially dropped amid the masking and sanitizing of the pandemic, a delayed RSV season started much sooner this year. Pediatric beds in many hospitals are full of RSV or COVID cases, she noted.

She noted that it is hard to watch infants struggle from a provider's perspective because RSV can be prevented. "Prophylactic treatment forRSV has been available since the late 1990s," Staebler explained, butrestrictive dosing and coverage by insurance companies means that "many at-risk infants are denied treatment."

Martha A. Dawson, DNP

National Black Nurses Association

Martha A. Dawson outlined RSV's comparatively high impact on the Black and brown communities. She explained that faith-based organizations could be a catalyst for awareness, pointing to similar efforts for adult diseases such as diabetes, stroke, and heart disease.

Whether it's prayer services, women's retreats, or baby showers, Dawson explained, faith communities can have a role in raising awareness about RSV. The health care community is wide, and concern doesn't — and shouldn't — stop at the hospital.

COVID-19 Mother & Baby Separation

Even during a pandemic, separating mothers from their newborn infants can have severe consequences, both short and long-term.

Marisa DeMis

Patient Advocate

When Marisa DeMis' newborn was diagnosed with a congenital heart defect, she faced unanticipated challenges in the NICU. COVID restrictions prevented immediate family members fromcoming to the hospital. Though DeMis' husband was allowed to visit, DeMis found herself thinking about how postpartum depression and PTSD could have affected her — and could affect other women who were isolated in the hospital after giving birth.

She now strives to educate and advocate so that other families can avoid similar barriers.

Ruth Davidge, RN

Neonatal Nurses Association of Southern Africa

Ruth Davidge relayed related challenges in South Africa. While national policy supports zero separation for full-term babies, sick and small babies are separated from COVID-positive mothers for at least two weeks. In private hospitals, many NICUs are closed to all "visiting" mothers and fathers.

Davidge alluded to studies reporting that "kangaroo care," even with mothers positive for COVID, outweighs the risks of the illness and reduces mortality in low-weight babies. "The mother's presence is essential and not a 'nice to have,'" she concluded.

Johanna Kostenzer, PhD

European Foundation for the Care of Newborn Infants

Dr. Kostenzer has spearheaded bi-weekly calls with parent advocacy organizations globally to learn about emerging issues and the impact of COVID-19 restrictions on infants and families. These conversations allowed her to ask questions of different fields relating to the family side of care — issues with depression, breastfeeding, skin-to-skin contact, mental health changes, and communication.

Among 2,100 parents in 65 countries, 20% experienced separation of parents and infants, demonstrating that the experience was not just anecdotal. Based on these findings, Dr. Kostenzer calls for a zero-separation policy. She said policymakers must provide inclusive and family-centered care, pandemic or not.

Antibodies & Rare Diseases

Antibodies are tricky. While some can help health issues, others can cause or worsen them for pregnant women and their developing babies.

Kenneth J. Moise, Jr., M.D.

Dell Children's Hospital

Dr. Moise explained that antibodies often pass through the placenta into the developing baby — but some can cross and attack. This leads to conditions such as hemolytic disease of the fetus and newborn and congenital heart block. Certain antibodies are commonly tested in pregnancy, but some are rare and not routinely tested.

Unfortunately, treatments for these diseases are few and can take a toll on an expectant mother. Treatment for hemolytic disease of the fetus and newborn, for example, involves multiple blood transfusions throughout the pregnancy. Dr. Moise emphasized a need for innovation to treat these rare diseases and allow patients to have better outcomes in their overall health.

"Science could have a big impact," he emphasized.

Suzanne E. Shores, CNM, FNP, MSN

UPMC Magee Women's Hospital

Suzanne Shores stressed that maternal vaccines convey exposure to infants, which provides antibodies to fight illness. In utero, antibodies pass from mom into baby and provide some protection for common diseases.

In other cases, antibodies produced by the mother's body can cause complications. Signs and symptoms of abnormality are seen in screening tests and later pregnancy can show up in ultrasounds as atypical development. Given widespread shortages of advanced health care providers, advanced practice nurses and midwives can play a critical role, especially in rural areas, for risk assessment, assisting in detecting disease, and offering preventive care.

It's a collaborative effort, Shores noted, among caregivers, specialists, and the family.

Donor Human Milk

Human milk can offer a variety of lifesaving benefits, but how can policymakers ensurethat donor human milk is safe for infants who need it?

Martha A. Dawson, DNP

National Black Nurses Association

Martha Dawson explained that there is no standard for testing and screening human donor breast milk. Practitioners have requested that the FDA clarify plans for safety regulations. "Our nurse leaders really became acutely aware of the different methods for the screening and testing of human milk," she said, as well as a "lack of consistency and best practices in the industry."

Human donor milk is a tool for the most vulnerable patients, and infant mortality from complications of prematurity can be lessened with the benefit of human milk. But without clearer guidance from the FDA, Dawson explained, donor milk could be "an accident waiting to happen."

"We must be proactive to protect infants," Dawson urged attendees.

Prolacta Bioscience

As the chief operating officer of a company that offers a full line of human milk and human milk-based products for the nation's NICUs, Scott Eaker offered insight on the issue. The "growth of the human milk industry," he explained, "is absolutely a net positive, requiring… a huge increase in the amount of milk collected and processed."

While human donor milk is a lifeline for mothers who cannot produce enough breastmilk on their own or whose infants require more calories, the market also introduces questions of safety and quality. Eaker reiterated that the FDA needs to address breastmilk as a "novel product" for regulation. It's also essential that families know the hallmarks of quality and safety of the supply, from donor selection and donor testing to milk testing. Eaker said that the FDA should step up oversight and inspections, which can be encouraged through interest and calls from policymakers.

Audience Overview

TOTAL ATTENDEES
386

PAGE VIEWS
801

ATTENDEE BREAKDOWN

NCfIH National Coalition for Infant Health

Protecting Access for Premature Infants through Age Two

IfPA Institute for Patient Access

AfPA Alliance for Patient Access

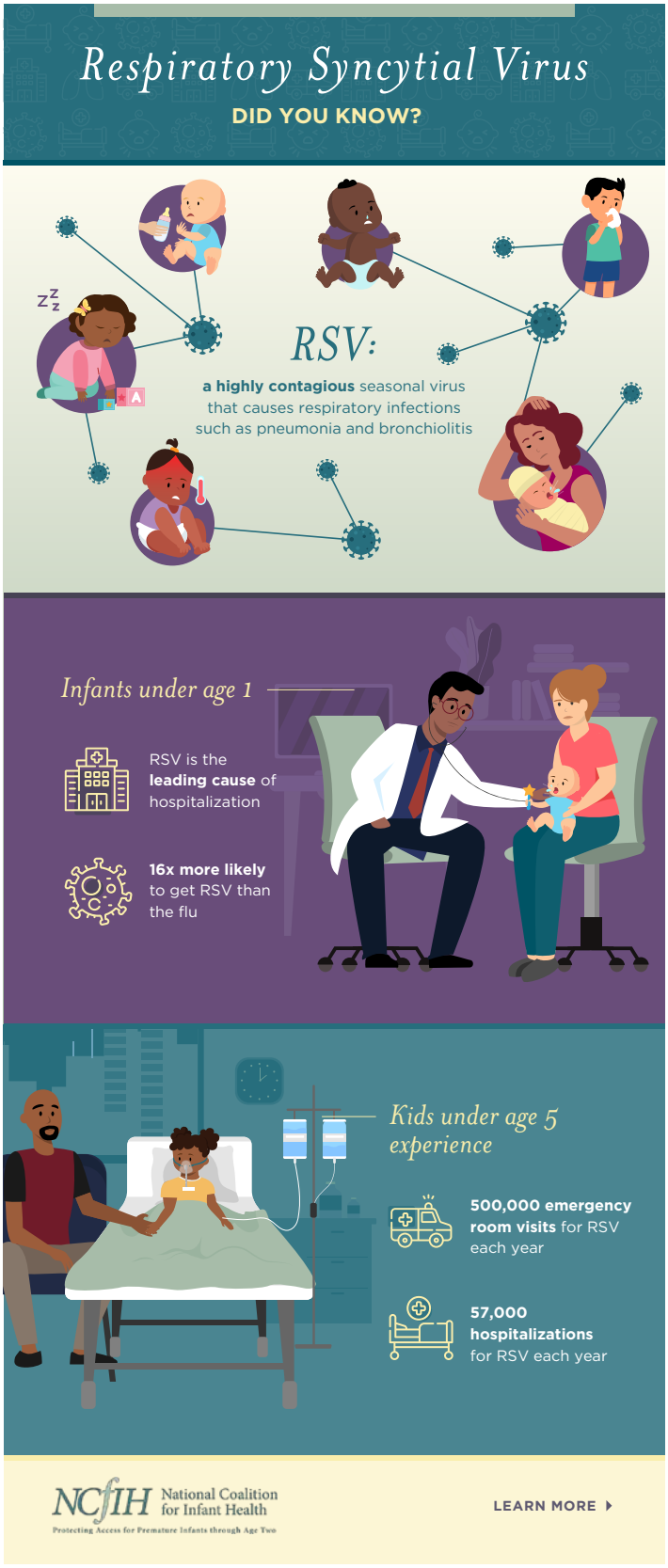
National Coalition for Infant Health Values (SANE)

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

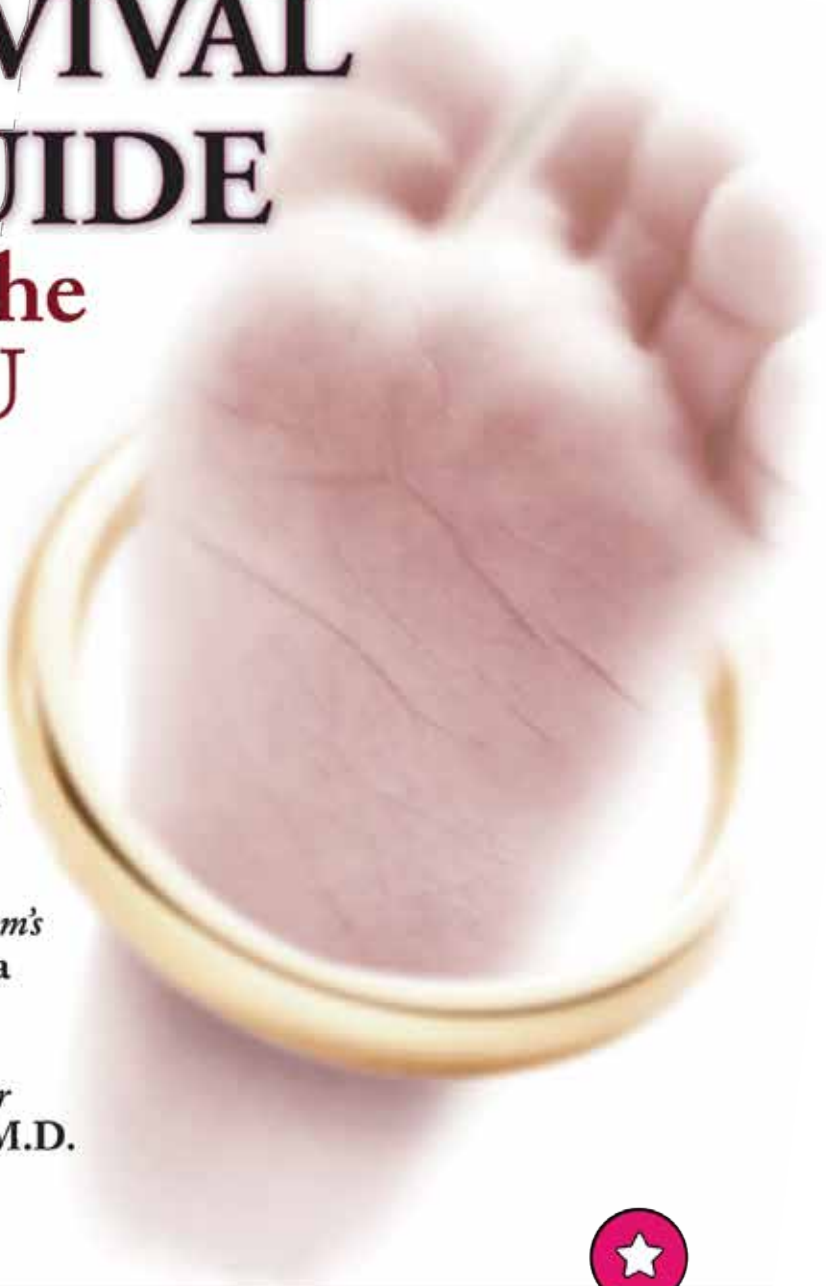
Access. Budget-driven health care policies should not preclude premature infants' access to preventative or necessary therapies.

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.



The Preemie Parent's SURVIVAL GUIDE to the NICU



By

little man's
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&

PreemieWorld.com's
Deb Discenza

with

Medical Editor
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HOW TO MAINTAIN YOUR SANITY & CREATE A NEW NORMAL

second edition

The Signs & Symptoms of RSV

RESPIRATORY SYNCYTIAL VIRUS

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- Cough
- Runny Nose
- Struggling to Breathe *(breastbone sinks inward when breathing)*
- Difficulty Eating
- Lethargy
- Wheezing

RESPIRATORY SYNCYTIAL VIRUS
is a highly contagious seasonal virus that can lead to hospitalization for some babies and young children.

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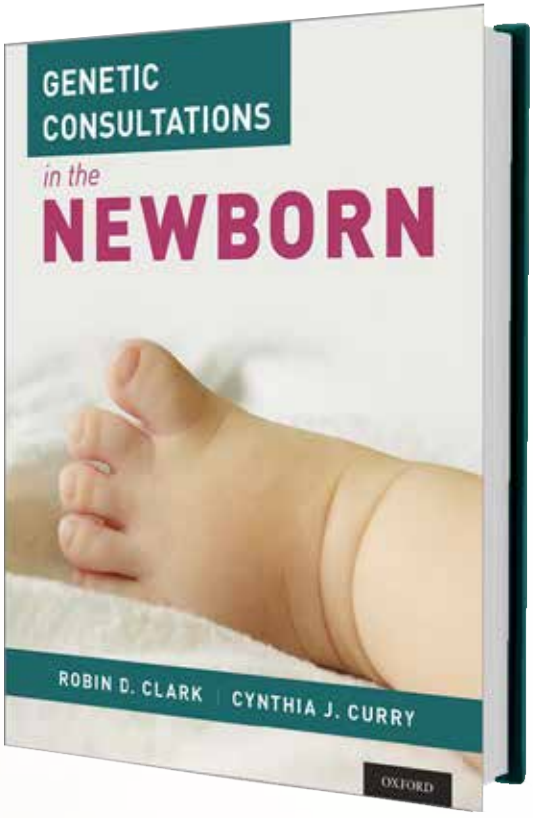

Robin D. Clark | Cynthia J. Curry

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Order now by clicking here.

OXFORD

RSV AWARENESS:
A National Poll of Parents & Health Care Providers

Respiratory syncytial virus, or RSV, is far from the common cold. It can lead to hospitalization, lifelong health complications or even death for infants and young children. **In fact, it is the leading cause of hospitalization in children younger than one.**

Yet a national poll of parents and specialty health care providers reveals a startling divide in attitudes toward the virus. While both groups acknowledge RSV as a significant concern, the two populations vary widely in their reported ability to meet RSV's threat head-on. Health care providers vigilantly monitor for the virus, which they report seeing regularly in their practices. Parents, however, feel unequipped to protect their young children.

Meanwhile, specialty health care providers overwhelmingly report that health plan rules and insurance denials block vulnerable infants' access to preventive RSV treatment. Such barriers can put unprepared parents at a double disadvantage. The survey does suggest, however, that education can embolden parents to seek more information about RSV and take steps to protect their children.

KEY FINDINGS

Preparedness

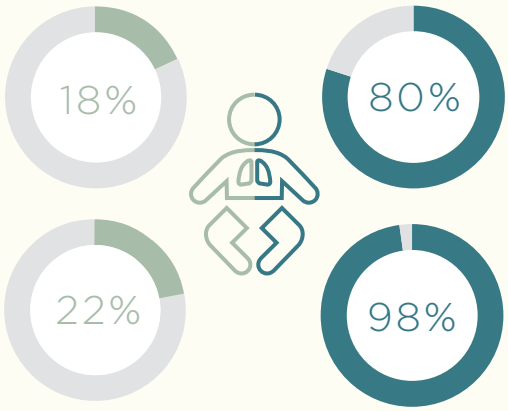
Parents of children age four and under report that understanding of RSV is lacking. That leaves them less than fully prepared to prevent their young children from catching the virus.

Specialty health care providers reiterated these concerns; 70% agreed that parents of their patients have a low awareness of RSV. Meanwhile, specialty health care providers themselves actively monitor for RSV. They reported that:

PARENTS

Only 18% said parents know "a lot" about RSV, reflecting an awareness level that's roughly half that of the flu

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



SPECIALTY HEALTH CARE PROVIDERS

They treat RSV as a priority, "often" or "always" evaluating their patients (80% doctors; 78% nurses)

During RSV season, they are especially vigilant about monitoring patients for symptoms or risk factors for RSV (98%).

Peer Reviewed

Clinical Pearl: Case Report: Congenital Syphilis and Cytomegalovirus Infection in a Mother with Substance Use Disorder: Case-Based Review

Yessenia Castro-Caballero, MD, Harshil Matta , MD, Joseph Hageman, MD

Abstract:

The incidence of congenital syphilis in the United States is rising. No prenatal care or lack of early detection may be a cause for the rise in this serious yet preventable and treatable disease. Here we review a case, that through physical findings, sparked an index of suspicion to promptly test and treat for congenital syphilis as well as congenital CMV.

"Congenital syphilis is an infectious disease caused by the spirochete treponema palladium. The infant acquires it in utero prior to birth. This mode is the most common form of transmission. Early diagnosis and detection of congenital syphilis is key to preventing further sequela."

Introduction:

Congenital syphilis is an infectious disease caused by the spirochete treponema palladium. The infant acquires it in utero prior to birth. This mode is the most common form of transmission. Early diagnosis and detection of congenital syphilis is key to preventing further sequela. Making the diagnosis can be difficult as the presentation can be vague and nonspecific at birth. Even symptomatic infants can be challenging to diagnose due to the subtle nature of the symptoms or atypical presentations. Recognizing congenital syphilis and becoming familiar with its presentation is essential to early diagnosis and initiation of treatment. Congenital syphilis is on the rise in the United States, and recent data suggest a surge in incidence. Here we report a case of congenital syphilis in a newborn infant.

Case Presentation:

A newborn female infant was born to a woman of advanced maternal age, at term gestation, 35-year-old G5P3023 at 39 2/7 weeks gestational age via cesarean -section. Mother had very poor prenatal care with few visits prior to arriving at labor and delivery. The mother reported multiple drug use with cocaine, heroin, and alcohol throughout the pregnancy. The mother admits to snorting heroine 2 hours prior to arrival at labor and delivery. She was taking prenatal vitamins during pregnancy and had no other significant past medical history. Prenatal labs include blood type O positive, antibody negative, GBS unknown, RPR unknown pending, rubella unknown pending, HIV negative, COVID-19 negative at delivery.

A female infant was born via cesarean section with meconium-stained fluid at rupture. The infant was brought to a warmer, cleaned, stimulated, and suctioned. The infant was noted to be coughing up thick meconium. Initial lung examination displayed course lung sounds. The infant was deep suctioned, and CPAP 5L and FiO_2 21% were initiated as subcostal retractions were present. Oxygen saturation at this point was 77%, FIO2 was increased to 30%, and the infant was transferred to the nursery where she was weaned to 2 LPM nasal cannula (NC). Chest x-rays revealed findings consistent with retained fetal lung fluid or transient tachypnea of the newborn (TTN). Apgars were 8 and 9 at one and five minutes of age.

On examination, infant weight was 3560 grams, head circumference 34.5 cm, length 48.5 cm. The infant was vigorous but in mild respiratory distress. A cardiac exam revealed a systolic 3/6 murmur present at LUSB and LLSB. The tone was normal. However, the infant displayed intermittent tremors of the upper and lower extremities. Skin exam revealed firm purple nodules on the right forehead, left eyelid, chin, and left foot. Petechiae were present on the chest and lower legs. Infant oxygen saturations were stable on 2 LPM NC, 30% oxygen. Initial complete blood count (CBC) had a platelet count of 25,000; repeat platelet count was 21,000. At this time infant was transferred for TORCH workup, platelet transfusion, septicemia diagnostic workup. The infant was started on intravenous Ampicillin and Gentamicin.

Assessment: The diagnosis was established with the rest of the TORCH diagnostic workup.

Clinical Course:

The patient received one platelet transfusion with the subsequent platelet count recovery to 100,000 on postnatal life 13. The patient was weaned off oxygen in two days. The patient developed neonatal abstinence syndrome managed with non-pharmacologic care along with three doses of PRN morphine. Maternal laboratory studies included r FTA antibody reactive, RPR Reflex QT +TPPA reactive, and RPR titer 1:4. Infant treponemal antibody resulted positive with RPR 1:2., the maternal titer and mother were not treated given a serum quantitative nontreponemal serologic titer equal to or less than fourfold; however, the infant was diagnosed as possible congenital syphilis, and IV penicillin was started. CSF studies were obtained. CSF VDRL was negative. CSF meningitis panel for bacteria, viruses, and yeast was negative. CSF count: total RBCs 380, WBCs 12 with Seg % 22, L % 46. Infant quantitative CMV of urine >6.30, which was positive for Cytomegalovirus infection. Treatment with valganciclovir was initiated and continued for six months. Blood, urine, and CSF culture had no growth. Long bone X-rays showed no periostitis, destructive lesions, or other evidence of syphilis. Head ultrasound showed no brain parenchymal abnormality or calcifications and no evidence of germinal matrix hemorrhage. An ophthalmologic exam showed no signs of CMV retinitis. The patient finished a 10-day course of IV penicillin. The patient did well throughout the hospital stay and was discharged home in healthy condition on day of life 25. Follow-up visits included RPR monitoring. At three months, RPR was 1:4, at four months follow-up RPR reactive at 1:1, and 6-month follow-up non-reactive. Physical examination, feeding, and growth review displayed a thriving infant progressing toward full recovery.

Discussion:

Congenital syphilis is on the rise in the United States, and recent data suggest a surge in incidence. CDC reported a four-fold increase in cases of congenital syphilis from 2013 to 2018 in the United States, going from 362 to 1306 cases. In 2018 the rate of congenital syphilis was 33.1 per 100,000 births, a tremendous surge from 2014 where the case rate was 11.6 per 100,000 births. Congenital syphilis can result in catastrophic sequela of spontaneous abortion, intrauterine growth restriction (IUGR), stillbirth, prematurity, hydrops fetalis, and death in newborn infants.

Congenital syphilis is categorized broken into early and late. In early congenital syphilis, the most common findings are hepatomegaly, jaundice, snuffles, rash, skeletal abnormalities, fever, sepsis. Approximately 60-90 percent of infants are asymptomatic at birth. Symptomatic infants may further present with anemia, thrombocytopenia, and respiratory complications. Manifestations of late congenital syphilis include saddle nose deformity, frontal bossing, Hutchinson's triad, anterior bowing of shins.

Testing for congenital syphilis involves RPR testing and treponemal tests. The most common manifestation of early congenital syphilis is the rash. The index of suspicion should be raised when the rash is combined with poor prenatal care, thrombocytopenia, respiratory complications, and failure to thrive. In our patient, the initial presentation included rash, respiratory compromise, and thrombocytopenia combined with high-risk maternal behavior and poor prenatal care. RPR titers and treponemal testing pointed toward congenital syphilis in our patient with prompt treatment of penicillin initiated.

"Our developed nation is not immune to congenital syphilis, and it is more important now to recognize, diagnose and treat congenital syphilis as early as possible to prevent catastrophic sequelae. Physicians should be aware of the sometimes vague presentation of early congenital syphilis and display a high index of suspicion when evaluating infants in the newborn period. "

Conclusion:

The cases of congenital syphilis in the United States are rising, with a four-fold increase from 2013 to 2018. Currently, cases sit at 33.1 per 100,000 births. Our developed nation is not immune to congenital syphilis, and it is more important now to recognize, diagnose and treat congenital syphilis as early as possible to prevent catastrophic sequelae. Physicians should be aware of the sometimes vague presentation of early congenital syphilis and display a high index of suspicion when evaluating infants in the newborn period.

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1. *Kwak J, Lamprecht C. A review of the guidelines for the evaluation and treatment of congenital syphilis. Pediatric Annals 2015; 44(5): e108-e114.*
2. *Davis NL, King CC, Kourtis AP. Cytomegalovirus infection in pregnancy. Birth Defects Research 2017; 109: 336-346.*
3. *Penner, J et al. Stop, thing SCORTCH: rethinking the traditional "TORC*

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Clinical Pearls are published monthly.

Submission guidelines for "Clinical Pearls":

1250 word limit not including references or title page.

May begin with a brief case summary or example.

Summarize the pearl for emphasis.

No more than 7 references.

Please send your submissions to:

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OPIOIDS and NAS

When reporting on mothers, babies, and substance use

LANGUAGE MATTERS

I am not an addict.

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

I was exposed to opioids.

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

NAS is a temporary and treatable condition.

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

My mother may have a SUD.

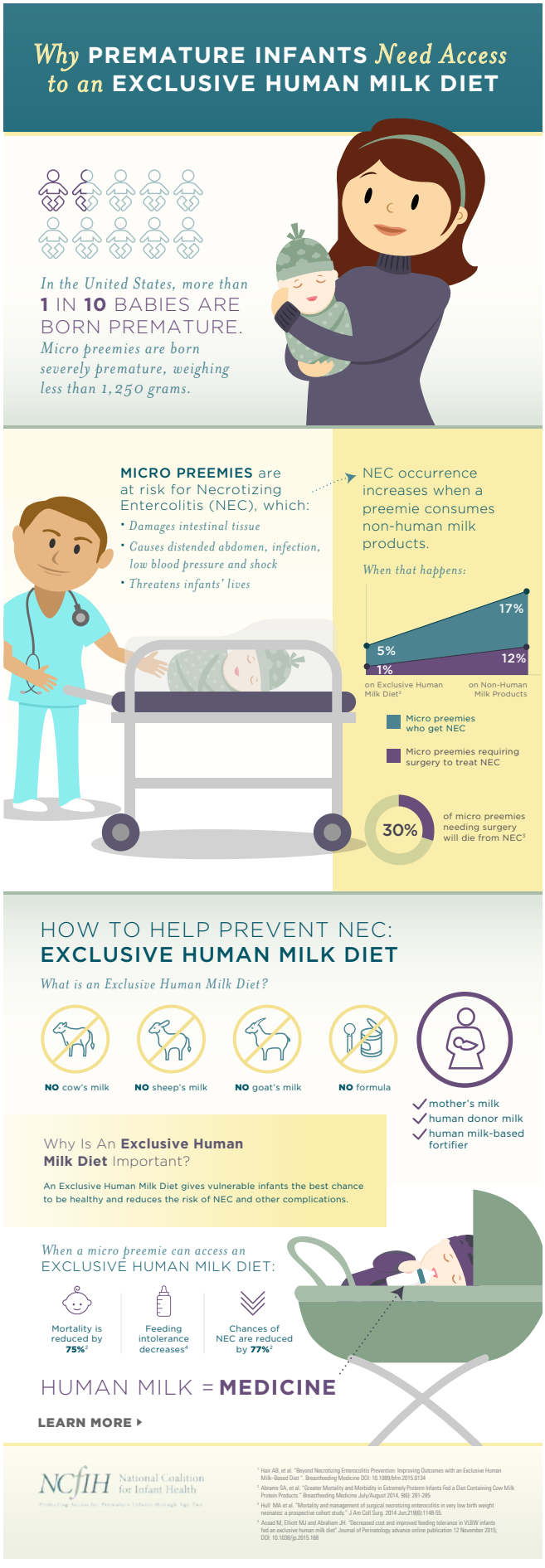
She might be receiving Medication-Assisted Treatment (MAT). My NAS may be a side effect of her appropriate medical care. It is not evidence of abuse or mistreatment.

My potential is limitless.

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

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

National Perinatal Association



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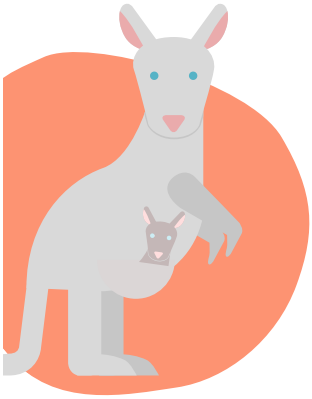
SKIN-TO-SKIN CARE DURING COVID-19



GET INFORMED ABOUT THE RISKS + BENEFITS

work with your medical team to create a plan

GET CLEAN

WASH YOUR HANDS, ARMS, and CHEST

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

PUT ON FRESH CLOTHES

change into a clean gown or shirt.

IF COVID-19 + WEAR A MASK

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

National Perinatal Association

nicuparentnetwork.org

NPN NICU PARENT NETWORK

nationalperinatal.org/skin-to-skin

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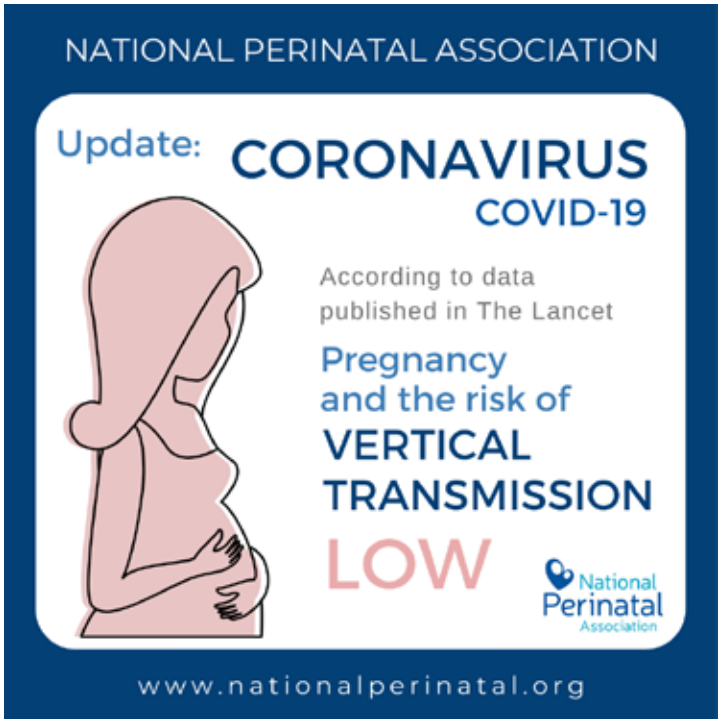


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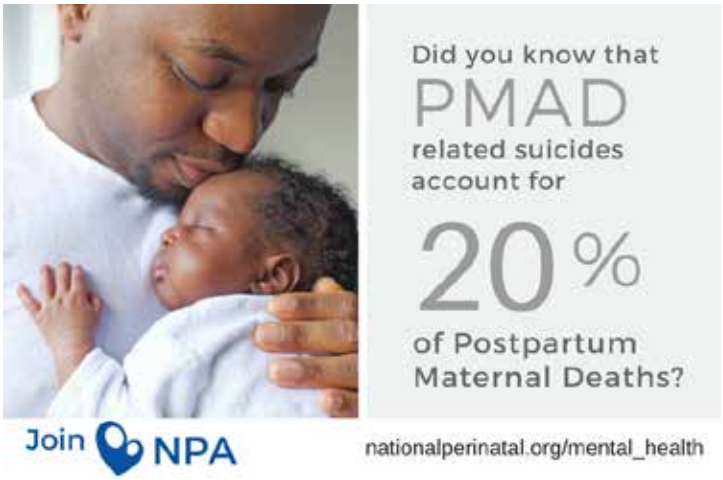
Did you know that
PMAD
related suicides
account for
20%
of Postpartum
Maternal Deaths?
Join NPA
nationalperinatal.org/mental_health


Support the
Open Letter
Breastfeeding
Innovations
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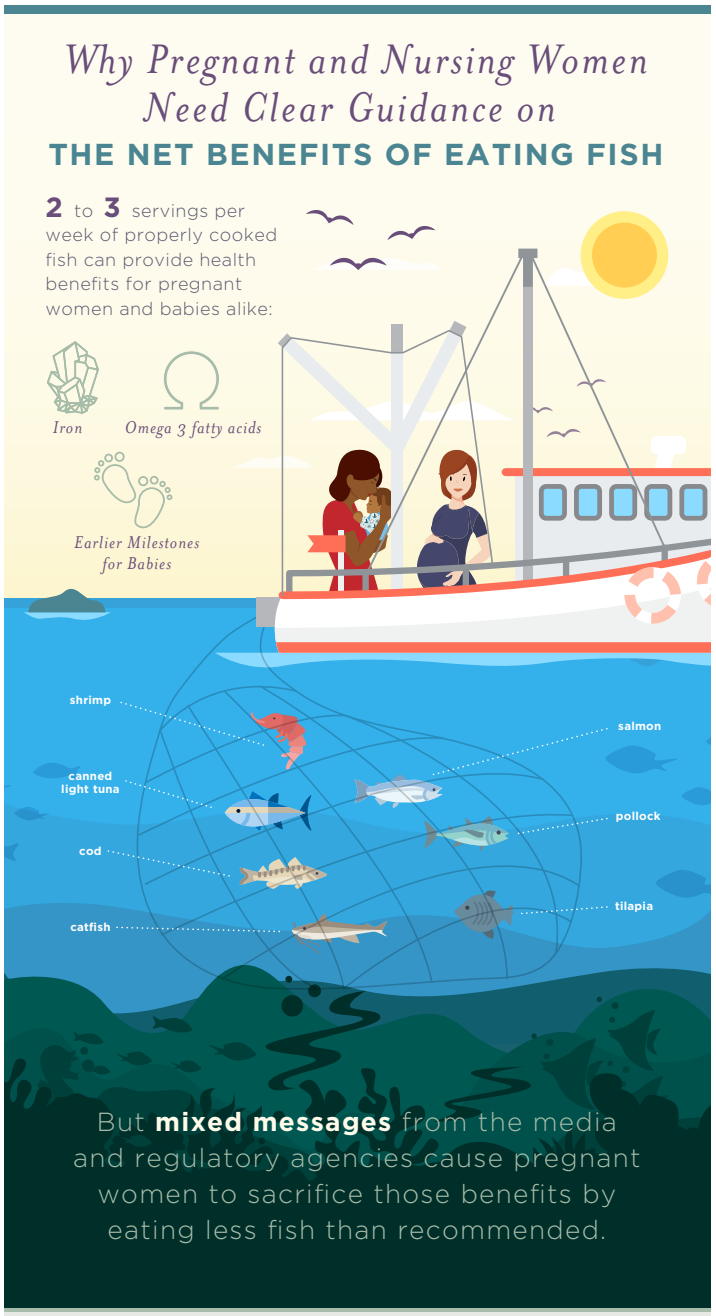
Why Pregnant and Nursing Women
Need Clear Guidance on
THE NET BENEFITS OF EATING FISH
2 to 3 servings per
week of properly cooked
fish can provide health
benefits for pregnant
women and babies alike:
Iron
Omega 3 fatty acids
Earlier Milestones
for Babies
shrimp
salmon
canned
light tuna
pollock
cod
tilapia
catfish
But mixed messages from the media
and regulatory agencies cause pregnant
women to sacrifice those benefits by
eating less fish than recommended.


GET THE FACTS
ON FISH CONSUMPTION
FOR PREGNANT
WOMEN, INFANTS,
AND NURSING MOMS.
NCfIH National Coalition
for Infant Health
LEARN MORE

Letters to the Editor

Why is the infant placed on a High-Frequency Oscillatory Ventilation (HFOV) set primarily at a bias flow (BF) of 20 LPM?

Letter to the Editor

As a respiratory therapist in the NICU with over 15 years of experience, there are many questions asked of me regarding HFOV. When calibrating a Sensormedics 3100-A HFOV, it states to set the BF at 20 LPM for proper calibration, as noted on the ventilator manual and the quick guide. (1) BF is typically the first parameter set by the clinician because it is part of the oscillator peruse calibration. If the BF is set too low, it may result in increased P_aCO_2 secondary to inadequate circuit washout. (2) If the BF is set too high, it may inhibit CO_2 elimination.

On the contrary, an increased bias gas flow will increase airway pressure, thus improving oxygenation. (3) Also available within the quick guide, it gives the different bias flows that a practitioner may select based on the potential age range (preterm, near-term, small child, and large child). There is even guidance to use the lowest bias flow needed to achieve the desired settings. An interesting study by Turner et al. looked at how bias flow showed no influence in ventilation in pediatric lung models looking at 10,20,30, and 40 LPM bias flows. (4) When they used linear regression analysis, it showed no statistically significant change in PaCO2 when controlling for power and amplitude. As mentioned by the manufacturer, only the minimum bias flow to deliver the ventilatory pressures is needed. Is there any evidence of how different bias flows could generate more or less driving pressures? In a quick literature review, there appears a rationale for using different BF rates for achieving these pressures, but what are the consequences?

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3. *Stawicki SP, Goyal M, Sarani B. High-frequency oscillatory ventilation (HFOV) and airway pressure release ventilation (APRV): a practical guide. J Intensive Care Med 2009;24(4):215-229.*
4. *Turner DA, Adams DF, Gentile MA, Williford L, Quick GA, Smith PB, et al. Bias flow does not affect ventilation during high-frequency oscillatory ventilation in a pediatric animal model of acute lung injury. Pediatr Crit Care Med 2012;13(2):e108-112.*

Corresponding Author

Fabian Lora MSRC, RCP, RRT-NPS, C-NPT, C-ELBW

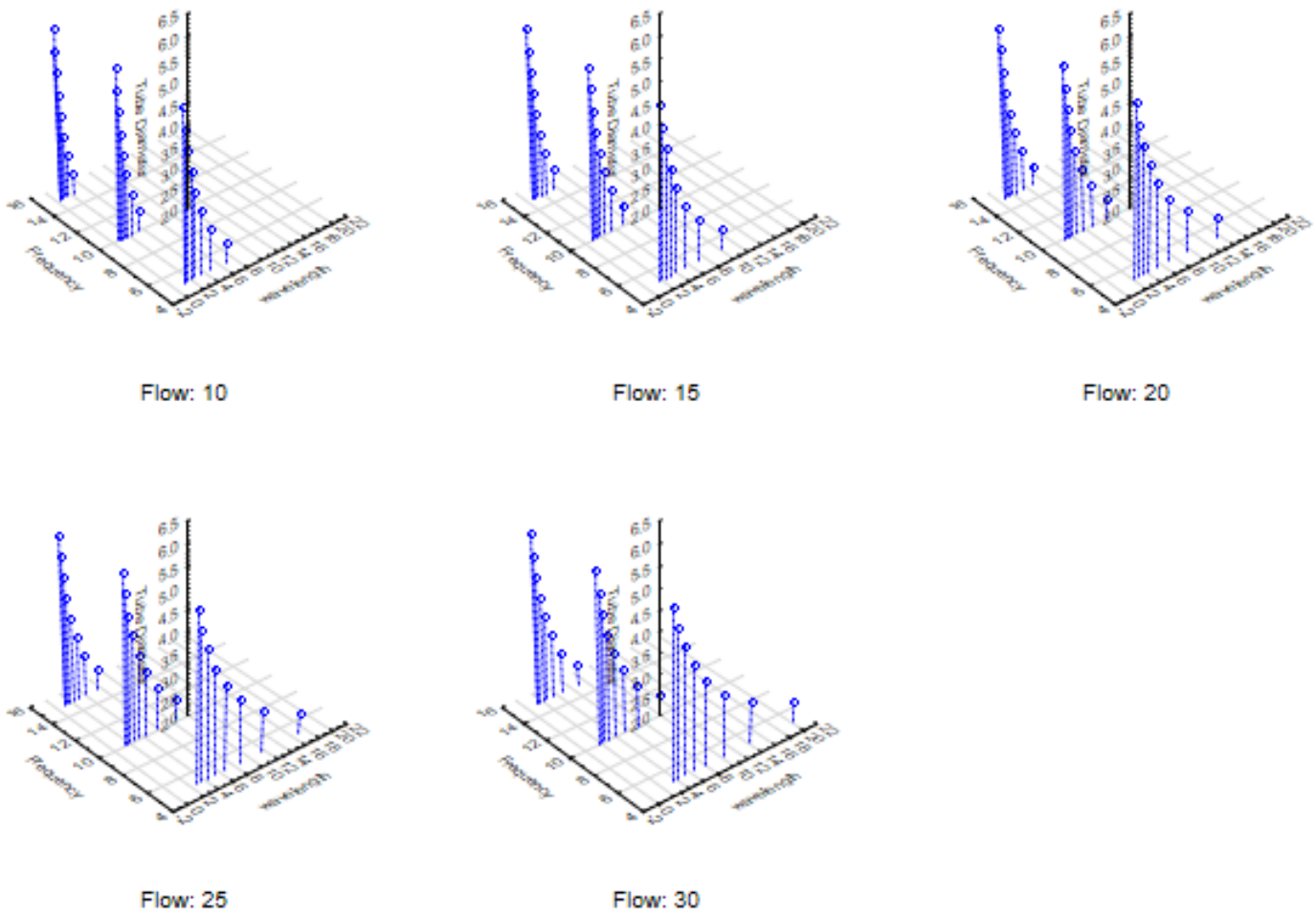
Loma Linda University Children's Hospital, Loma Linda, CA

Dear Mr. Lora,

The effect of using higher flows on the oscillator than that which is necessary can produce significant flow and pressure issues that may ultimately contribute to lung disease. The flow issues are challenging to explain because one must look at the second derivative with respect to time to get to a number that describes not the acceleration but the change in acceleration, particularly at the inflection points where negative flow changes to the positive flow and vice versa. The analogy of a car moving along the highway at a gradually increasing velocity under constant acceleration and then slamming headlong into a brick wall is similar to what can happen with an oscillator provided with the excess flow. Excess flow is analogous to excess speed. The higher the speed that the car hits the wall, the more damage.

A more straightforward way of approaching this issue is using wavelength. Longer wavelengths are associated with better propagation across distance. The classic example is a tidal wave. It promulgates over many hundreds or thousands of miles before causing damage on some distant shore. Wavelengths can also be calculated from ventilation circuitry. Using parameters from the Endrotracheal tube dimensions, frequency, and theoretical bias flow, we presented data regarding this phenomenon this Fall at the 2021 American Academy of Pediatrics NCE.

Simulated oscillator settings were used for this model (SensorMedic 3100-A, Vyaire Medical, Inc., Yorba Linda, CA). Bias flows of 10 LPM, 15 LPM, 20 LPM, 25 LPM, and 30 LPM were analyzed for endotracheal tube sizes 2.5 mm, 3.0 mm, 3.5 mm., 4.0 mm, 4.5 mm, 5.0 mm, 5.5 mm, and 6.0 mm at frequencies of 5 Hz, 10 Hz, and 15 Hz. The flow velocity used in this calculation is: $v = Q / (\pi \cdot (ø / 2)^2)$, where $v = Q / A$, $A = \pi \cdot r^2$, and $r = ø / 2$. Q = Volume flow rate, v = Flow velocity, A = Cross-sectional area, r = Radius, and ø = Diameter. Wavelength (λ) was calculated using the rela-



tionship λ=v/f, where f represents the oscillator frequency.

For this analysis, it was assumed that there were uniform flow conditions within the entire cross-sectional area of the endotracheal tube, without any loss of speed due to friction or shear at the inner aspect of the ETT wall or the presence of water vapor in the circuit.

Graphically, the result can be represented as above.

Comparing the wavelength above propagated with a flow of 10 lpm to 30 lpm across all frequencies demonstrates this situation. Smaller tubes are more dramatically affected by lower oscillator frequency and higher flow – these same smaller tubes are used for our most at-risk preterm infants.

Although theoretical, it would seem logical to use the lowest flows necessary to achieve the desired ventilation. 20 LPM is probably not necessary with smaller babies and correspondingly small endotracheal tube size.

References:

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

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Erratum (Neonatology Today October 2021

Neonatology Today is not aware of any erratum affecting the October, 2021 edition.

Corrections can be sent directly to LomaLindaPublishingCompany@gmail.com*. The most recent edition of Neonatology Today including any previously identified erratum may be downloaded from* www.neonatologytoday.net.

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Mitchell Goldstein, MD, MBA, CML

Editor in Chief

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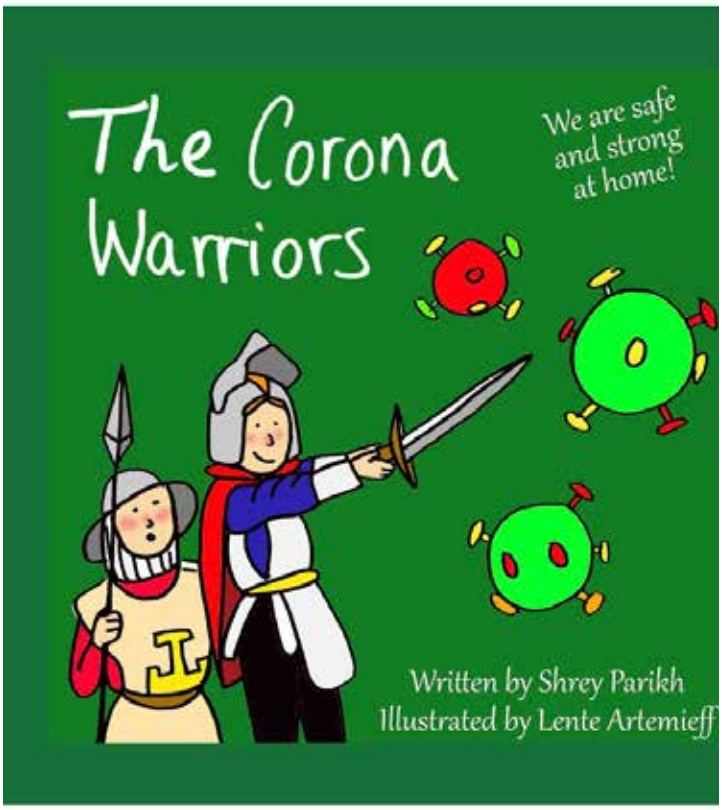

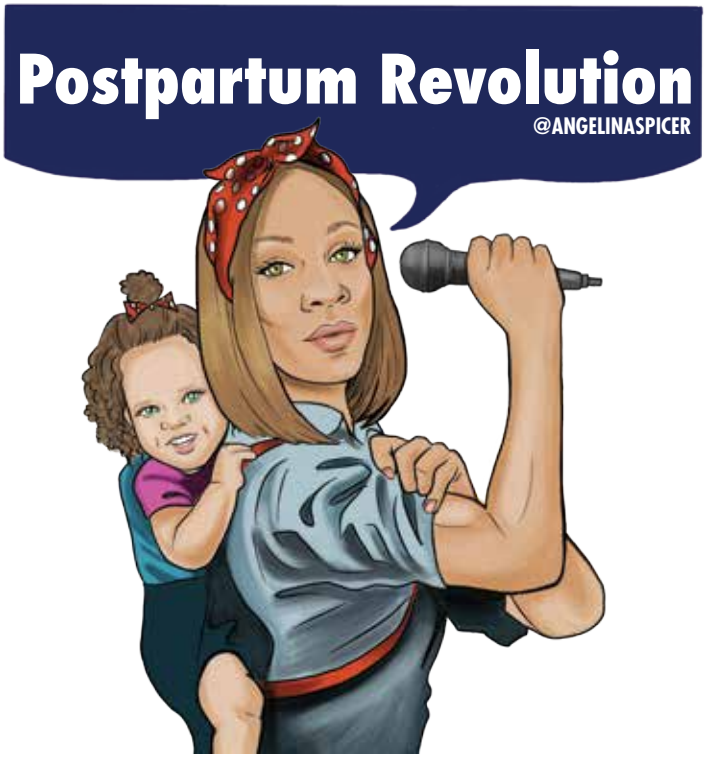

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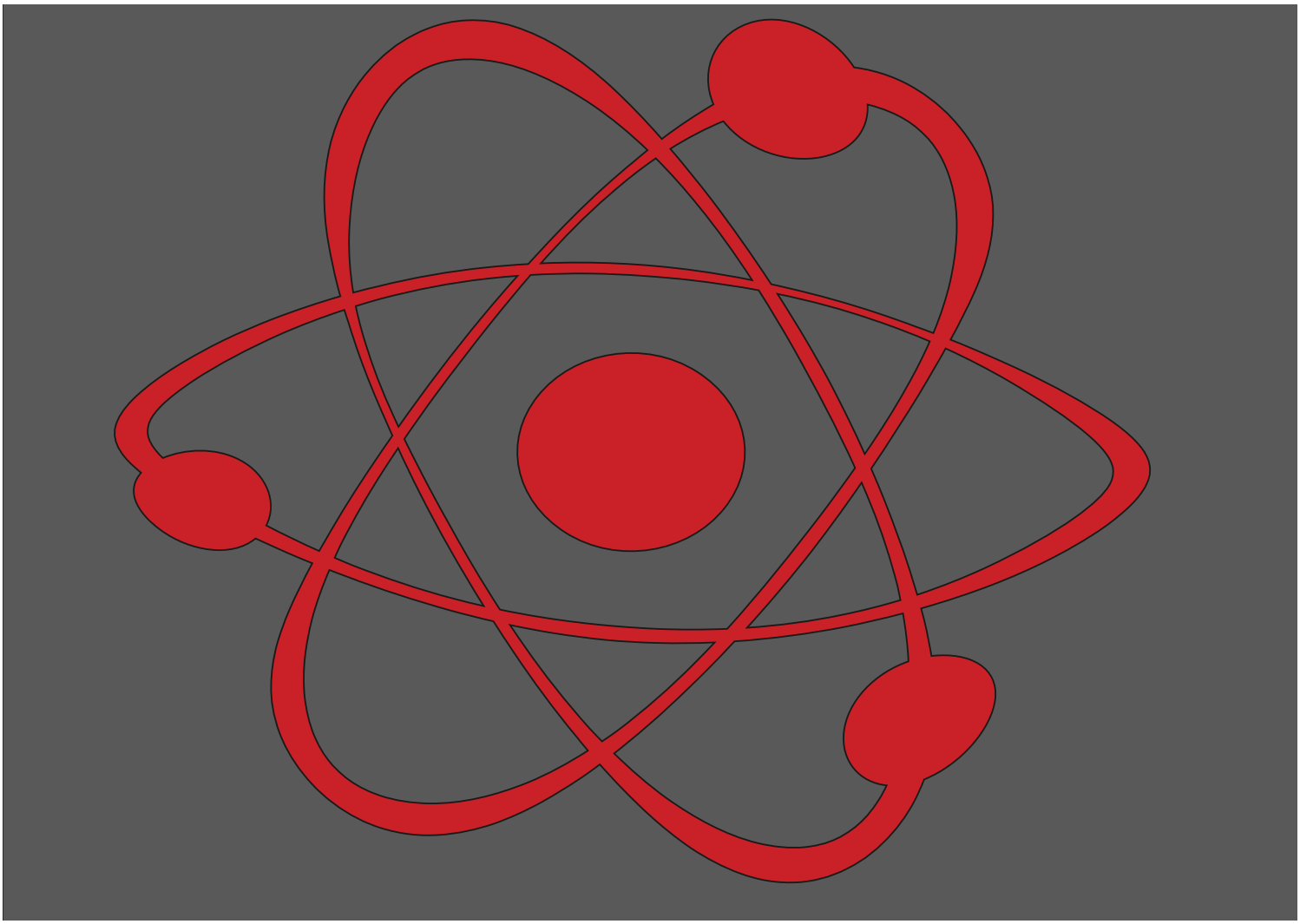

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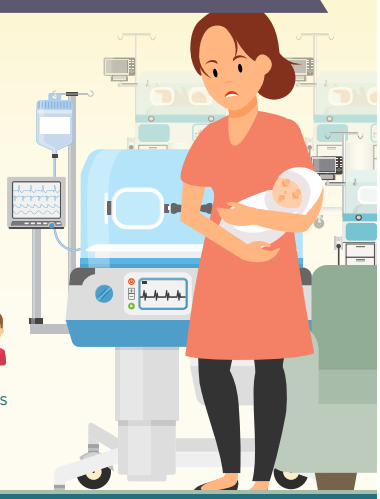
Will your **PRETERM INFANT** *need* **EARLY INTERVENTION** *services?*

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



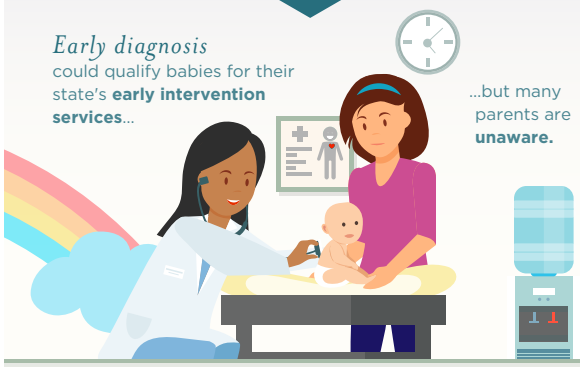
Early intervention can help preterm infants:

- 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 POSPARTO**

1 DE CADA **7** MADRES AFRONTA LA DEPRESIÓN POSPARTO, *experimentando*

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

Sin embargo, sólo el 15% recibe tratamiento[1]

LA DEPRESIÓN POSTPARTO **NO TRATADA** PUEDE AFECTAR:

- *La salud de la madre*
- *El sueño, la alimentación y el comportamiento del bebé a medida que crece*[2]
- *La capacidad para cuidar de un bebé y sus hermanos*

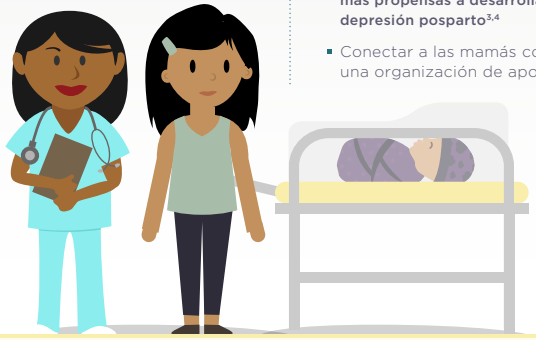
PARA AYUDAR **A LAS MADRES A ENFRENTAR LA DEPRESIÓN POSPARTO**

LOS ENCARGADOS DE FORMULAR POLÍTICAS PUEDEN:

- Financiar los esfuerzos de despistaje y diagnostico
- Proteger el acceso al tratamiento

LOS HOSPITALES PUEDEN:

- Capacitar a los profesionales de la salud para proporcionar apoyo psicosocial a las familias... **Especialmente aquellas con bebés prematuros, que son 40% más propensas a desarrollar depresión posparto**[3,4]
- Conectar a las mamás con una organización de apoyo



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[1] American Psychological Association. Accesible en: http://www.apa.org/pi/women/resources/reports/postpartum-depression.aspx

[2] National Institute of Mental Health. Accesible en: https://www.nimh.nih.gov/health/publications/postpartum-depression-facts/index.shtml

[3] Journal of Perinatology (2015) 35, 529–536; doi:10.1038/jp.2015.147.

[4] Prevalence and risk factors for postpartum depression among women with preterm and low-birth-weight infants: a systematic review. Vigod SN, Villegas L, Dennis CL, Ross LE BJOG. 2010 Apr; 117(5):540-50.

CALL FOR
POSTER SUBMISSIONS

2022

Perinatology at the Intersection of Health Equity and Social Justice

NPA's 42nd ANNUAL INTERDISCIPLINARY CONFERENCE

DATES May 2 - 4

SEEKING POSTER ABSTRACTS

- Innovative Models of Care
- Applied or Basic Research
- Public Policies or Local Initiatives

STUDENT RESEARCHERS ARE ENCOURAGED TO SUBMIT.

VENUE Hyatt Regency Aurora-Denver

www.NPAconference.org

National Perinatal Association

Upcoming Medical Meetings

Once Upon A Preemie Academy Live Training:
Going Deeper In Health and Racial Equity in the NICU- Part 2
November 22, 2021; 1-2PM EST
Register Here:
www.onceuponapreemieacademy.com

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

2022 NeoPREP®
An Intensive Review and Update of Neonatal-Perinatal Medicine
January 22-26, 2022
San Antonio, Texas
https://shop.aap.org/live-activities/

35th Annual Gravens Conference on the Environment of Care for High Risk Infants
Transformational Change: Making if Happen in the NICU
March 9-12, 2022
Sheraton Sand Key
Clearwater Beach, Fl
Abstract call:
https://neonatologytoday.org/Gravens/Abstract/

38th Annual Advances in Therapeutics and Technology: Critical Care of Neonates, Children, 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/

NEO: The Conference for Neonatology
March 2-4, 2022
San Diego, CA
www.neoconference.com

Specialty Review in Neonatology
March 1-6, 2022
San Diego, CA
www.specialtyreview.com

2022 National Perinatal Association Perinatology at the Intersection of Health Equity and Social Justice
Hyatt Regency Aurora-Denver
Denver, CO
May 2-4, 2022
www.NPAconference.org

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

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

Academy of Neonatal Care Winter Course and Workshop

Thursday, Friday, and Saturday January 27, 28, 29

Valley Presbyterian Hospital

15107 Vanowen Street, Van Nuys 91405

~~7 CEU's Per Day Available~~ 0900-1700 Daily

SESSION 1

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

SESSION 2

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

SESSION 3

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

Academy of Neonatal Care

AcademyofNeonatalCare.org/register

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

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ONCE UPON A PREEMIE ACADEMY

2021

HEALTH AND RACIAL EQUITY IN THE NICU

TRAINING

MON, NOV. 22, 1 - 2 PM EST

Addressing Structural Racism and the Impact on Neonatal Care and Health Disparities

+ Defining and dismantling racism and what it looks like in the NICU
+ Patient-Centered Care Opportunities to support Black NICU Families
+ Personal journey and experiences with structural racism in the NICU

Tamorah Lewis, MD
Neonatologist and Researcher
Children's Mercy Hospital

Jenné Johns, MPH
Micropreemie Mom and Founder
Once Upon A Preemie Academy

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Physicians: This activity has been approved for *AMA PRA* Category 1 Credit(s)™
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.
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GREAT MEDICINE.

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Neonatal Nurse Practitioner

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- Care of high acuity NICU patients
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- 24/7 coverage provided by NNP team and Fellows

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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.

Contact Us

Please visit our website **http://careers.llu.edu** or contact Jeannine Sharkey, Director of Advanced Practice Services at jsharkey@llu.edu or (909) 558-4486.

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https://www.nc3rs.org.uk/arrive-guidelines

http://www.icmje.org

https://olaw.nih.gov/policies-laws/phs-policy.htm

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Neonatology and the Arts

This section focuses on artistic work which is by those with an interest in Neonatology and Perinatology. The topics may be varied, but preference will be given to those works that focus on topics that are related to the fields of Neonatology, Pediatrics, and Perinatology. Contributions may include drawings, paintings, sketches, and other digital renderings. Photographs and video shorts may also be submitted. In order for the work to be considered, you must have the consent of any person whose photograph appears in the submission.

Works that have been published in another format are eligible for consideration as long as the contributor either owns the copyright or has secured copyright release prior to submission.

Logos and trademarks will usually not qualify for publication.

This month we continue to feature artistic works created by our readers on one page as well as photographs of birds on another. This month's original artwork is "T-Tom" provided by Kineta Lim, RRT, NPS. Our bird of the month is "Hummingbird in Flight" contributed by Herbert Vasquez, MD.

Herbert Vasquez, MD,
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Emanate Health, West Covina, CA
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NT

Manuscript Submission: Instructions to Authors

1. Manuscripts are solicited by members of the Editorial Board or may be submitted by readers or other interested parties. Neonatology Today welcomes the submission of all academic manuscripts including randomized control trials, case reports, guidelines, best practice analysis, QI/QA, conference abstracts, and other important works. All content is subject to peer review.

2. All material should be emailed to: LomaLindaPublishingCompany@gmail.com in a Microsoft Word, Open Office, or XML format for the textual material and separate files (tif, eps, jpg, gif, ai, psd, or pdf) for each figure. Preferred formats are ai, psd, or pdf. tif and jpg images should have sufficient resolution so as not to have visible pixilation for the intended dimension. In general, if acceptable for publication, submissions will be published within 3 months.

3. There is no charge for submission, publication (regardless of number of graphics and charts), use of color, or length. Published content will be freely available after publication. There is no charge for your manuscript to be published. NT does maintain a copyright of your published manuscript.

4. The title page should contain a brief title and full names of all authors, their professional degrees, their institutional affiliations, and any conflict of interest relevant to the manuscript. The principal author should be identified as the first author. Contact information for the principal author including phone number, fax number, e-mail address, and mailing address should be included.

5. A brief biographical sketch (very short paragraph) of the principal author including current position and academic titles as well as fellowship status in professional societies should be included. A picture of the principal (corresponding) author and supporting authors should be submitted if available.

6. An abstract may be submitted.

7. The main text of the article should be written in formal style using correct English. The length may be up to 10,000 words. Abbreviations which are commonplace in neonatology or in the lay literature may be used.

8. References should be included in standard "NLM" format (APA 7th may also be used). Bibliography Software should be used to facilitate formatting and to ensure that the correct formatting and abbreviations are used for references.

9. Figures should be submitted separately as individual separate electronic files. Numbered figure captions should be included in the main file after the references. Captions should be brief.

10. Only manuscripts that have not been published previously will be considered for publication except under special circumstances. Prior publication must be disclosed on submission. Published articles become the property of the Neonatology Today and may not be published, copied or reproduced elsewhere without permission from Neonatology Today.

11. NT recommends reading Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals from ICMJE prior to submission if there is any question regarding the appropriateness of a manuscript. NT follows Principles of Transparency and Best Practice in Scholarly Publishing(a joint statement by COPE, DOAJ, WAME, and OASPA). Published articles become the property of the Neonatology Today and may not be published, copied or reproduced elsewhere without permission from Neonatology Today.

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NEONATOLOGY TODAY is interested in publishing manuscripts from Neonatologists, Fellows, NNPs and those involved in caring for neonates on case studies, research results, hospital news, meeting announcements, and other pertinent topics.

Please submit your manuscript to: LomaLindaPublishingCompany@gmail.com

NICU Baby's Bill of Rights

1- The Right to Advocacy
My parents know me well. They are my voice and my best advocates. They need to be knowledgeable about my progress, medical records, and prognosis, so they celebrate my achievements and support me when things get challenging.

2- The Right to My Parents' Care
In order to meet my unique needs, my parents need to learn about my developmental needs. Be patient with them and teach them well. Make sure hospital policies and protocols, including visiting hours and rounding, are as inclusive as possible.

3- The Right to Bond with My Family
Bonding is crucial for my sleep and neuroprotection. Encourage my parents to practice skin-to-skin contact as soon as and as often as possible and to read, sing, and talk to me each time they visit.

4- The Right to Neuroprotective Care
Protect me from things that startle, stress, or overwhelm me and my brain. Support things that calm me. Ensure I get as much sleep as possible. My brain is developing for the first time and faster than it ever will again. The way I am cared for today will help my brain when I grow up. Connect me with my parents for the best opportunities to help my brain develop.

5- The Right to be Nourished
Encourage my parents to feed me at the breast or by bottle, whichever way works for us both. Also, let my parents know that donor milk may be an option for me.

6- The Right to Personhood
Address me by my name when possible, communicate with me before touching me, and if I or one of my siblings pass away while in the NICU, continue referring to us as multiples (twin/triplets/quads, and more). It is important to acknowledge our lives.

7- The Right to Confident and Competent Care Giving
The NICU may be a traumatic place for my parents. Ensure that they receive tender loving care, information, education, and as many resources as possible to help educate them about my unique needs, development, diagnoses, and more.

8- The Right to Family-Centered Care
Help me feel that I am a part of my own family. Teach my parents, grandparents, and siblings how to read my cues, how to care for me, and how to meet my needs. Encourage them to participate in or perform my daily care activities, such as bathing and diaper changes.

9- The Right to Healthy and Supported Parents
My parents may be experiencing a range of new and challenging emotions. Be patient, listen to them, and lend your support. Share information with my parents about resources such as peer-to-peer support programs, support groups, and counseling, which can help reduce PMAD, PPD, PTSD, anxiety and depression, and more.

10- The Right to Inclusion and Belonging
Celebrate my family's diversity and mine; including our religion, race, and culture. Ensure that my parents, grandparents, and siblings feel accepted and welcomed in the NICU, and respected and valued in all forms of engagement and communication.

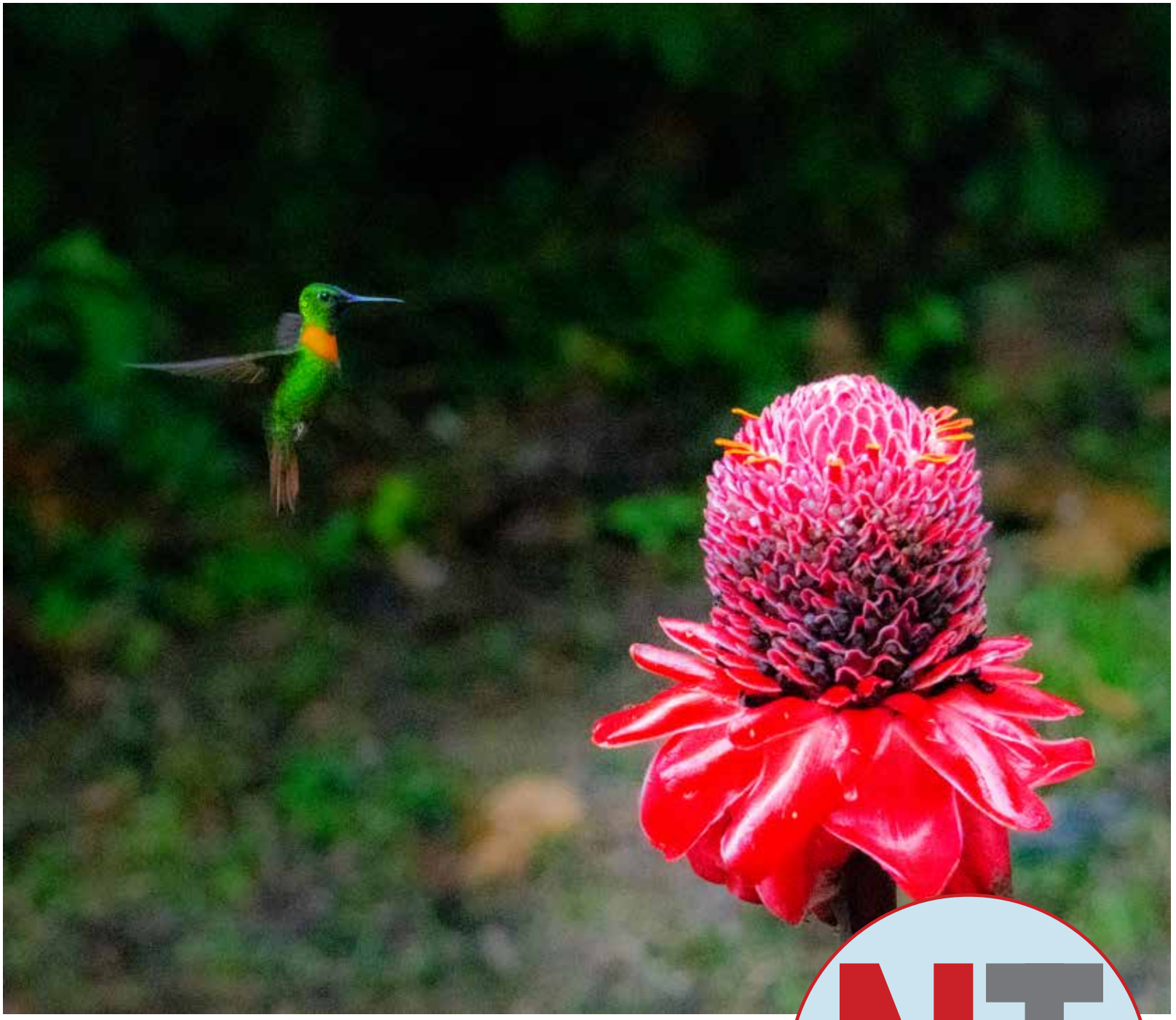
Presented by:

NPN
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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