

NEONATOLOGY TODAY

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Policy Statement of Enteral Nutrition for Preterm and Very Low Birthweight Infants

Katsumi Mizuno, Toshiaki Shimizu, Shinobu Ida, Setsuko Ito, Mikako Inokuchi, Toshihiro Ohura, Akihisa Okumura, Masanobu Kawai, Toru Kikuchi, Motochiro Sakurai, Shigetaka Sugihara, Mitsuyoshi Suzuki, Kimi-taka Takitani, Daisuke Tanaka, Sotaro Mushiake, Nobuo Yoshiike, Hiroko Kodama, Kazuo Okada, Chiharu Tsutsumi, Mitsuhiko Hara, Yoshio Hanawa, Kazue Kawakami, Hiroaki Inomata, Tatsuya Oguni, Yuko Bito, Keiichi Uchida, and Akihide Sugiyama Japan Pediatric Society, The Japanese Society of Child Health, Japan Pediatric Association, Japan Association of Pediatric Surgical Societies

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Policy Statement of Enteral Nutrition for Preterm and Very Low Birthweight Infants

Katsumi Mizuno, Toshiaki Shimizu, Shinobu Ida, Setsuko Ito, Mikako Inokuchi, Toshihiro Ohura, Akihisa Okumura, Masanobu Kawai, Toru Kikuchi, Motoichiro Sakurai, Shigetaka Sugihara, Mitsuyoshi Suzuki, Kimitaka Takitani, Daisuke Tanaka, Sotaro Mushiake, Nobuo Yoshiike, Hiroko Kodama, Kazuo Okada, Chiharu Tsutsumi, Mitsuhiko Hara, Yoshio Hanawa, Kazue Kawakami, Hiroaki Inomata, Tatsuya Oguni, Yuko Bito, Keiichi Uchida, and Akihide Sugiyama Japan Pediatric Society, The Japanese Society of Child Health, Japan Pediatric Association, Japan Association of Pediatric Surgical Societies

Abstract

1. *For preterm and very low birthweight infants, the mother's own milk is the best nutrition. Based on the latest information for mothers who give birth to preterm and very low birthweight infants, medical staff should encourage and assist mothers to pump or express and provide their own milk whenever possible.*
2. *If the supply of maternal milk is insufficient even though they receive adequate support, or the mother's own milk cannot be given to her infant for any reason, donor human milk should be used.*
3. *Donors who donate their breast milk need to meet the Guideline of the Japan Human Milk Bank Association.*
4. *Donor human milk should be provided according to the medical needs of preterm and very low birthweight infants, regardless of their family's financial status.*
5. *In the future, it will be necessary to create a system to supply an exclusive human milk-based diet (EHMD) consisting of human milk with the addition of a human milk-derived human milk fortifier to preterm and very low birthweight infants.*

Keywords: donor human milk, exclusive human milk-based diet, human milk, human milk bank.

Introduction

For preterm infants, especially for very low birthweight infants and high-risk neonates with gastrointestinal and heart disease, the first choice for enteral feeding is their mother's own milk. To be able to express the mother's own milk as early as possible, obstetrics and neonatal intensive care unit (NICU) staff should provide significant support for mothers based on scientific evidence.

Some mothers may not be able to provide enough breast milk even with sufficient support or feed it for various reasons. The European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN), and the American Academy of Pediatrics (AAP) recommend that donor human milk (1) that is pasteurized and managed by established human milk banks is provided to

the baby (1,2) in such cases. In the neonatal intensive care units (NICUs) in Japan, when the mother's own milk cannot be obtained, "donated unpasteurized breast milk" (2) that is not pasteurized is sometimes used. (Donor human milk is breast milk that has been processed in an established human milk bank and proved to be sterile by culture tests. Donated unpasteurized breast milk is breast milk provided by women other than the infant's mother that is frozen but not pasteurized. Bacterial tests are not usually conducted, and the women's condition when expressing – e.g., with or without taking cold medicine, smoking, and drinking – is also unknown.)

“In addition, while the Pediatric Society has issued a statement regarding Advocacy on Human Breast Milk traded over the Internet, even healthy infants should avoid receiving breast milk from women whose health status is unknown.(4)”

Policy statement

However, we have to consider the risks of “donated unpasteurized breast milk” because outbreaks of multidrug-resistant bacteria via breast milk have been observed. (3) In addition, while the Pediatric Society has issued a statement regarding Advocacy on Human Breast Milk traded over the Internet, even healthy infants should avoid receiving breast milk from women whose health status is unknown.(4)

Several reviews have been published indicating that donor human milk provided from established human milk banks is useful for preventing complications such as neonatal necrotizing enterocolitis (1, 5-12) in preterm infants. As a result, human milk banks have been established in countries around the world, including Asia, and systems that allow any NICU to use donor human milk if needed have been created. The Japan Human Milk Bank Association (JHMBA) was established in 2017, and the association is in the process of creating a system to provide donor human milk when infants cannot have their mothers' own milk. If mothers cannot provide enough breast milk or feed it even with appropriate support, using donor human milk provided by human milk banks is also recommended in Japan. Some mothers may be discouraged because they have to use donor human milk for their infants, and they feel that the lack of lactation is their own fault. Medical staff should pay attention to these psychological considerations for the mother and tell her that it is a "treatment" in a broad sense and that it is possible to feed their own milk after expressing successfully. While using donor human milk, support, and consideration of

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the mothers' feelings and emotions by cooperation with the staff of various occupations are needed.

In preterm and very low birthweight infants, as feeding breast milk alone leads to a lack of the nutrients needed for the growth and development of the infants, human milk fortifier is usually added. However, bovine milk-derived fortifier increases enteral feeding intolerance, (13) onset of milk allergy, (14) fatty acid calcium stone formation, (15) etc. An exclusive human milk-based diet (EHMD) is human milk with the addition of a human milk-derived human milk fortifier, and substances derived from bovine milk are not added at all. In recent years, there have been many reports on the benefits of EHMDs, and it will be necessary for Japan to create systems supplying EHMDs.

1. The mother's own milk is the best nutrition for preterm and very low birthweight infants, and NICU staff should recommend and support breastfeeding.
2. The next option, if the mother's own breast milk is not obtainable or sufficient, is donor human milk that has been pasteurized in established human milk banks.
3. In the future, it will be desirable to provide EHMD, human milk supplemented with human milk-derived human milk fortifier, to preterm and very low birthweight infants.

“Starting breastfeeding of preterm infants with the mother’s milk after birth has various advantages, such as a preventive effect on neonatal necrotizing enterocolitis, chronic lung disease, and acquired sepsis, as well as improvement of neurodevelopmental outcomes thereafter.”

Background and content of this policy statement

The best nutrition not only for preterm and very low birthweight infants but also for newborns and infants, in general, is their mothers' own milk. Starting breastfeeding of preterm infants with the mother's milk after birth has various advantages, such as a preventive effect on neonatal necrotizing enterocolitis, chronic lung disease, and acquired sepsis, as well as improvement of neurodevelopmental outcomes thereafter. It has been reported that even preterm mothers are able to enhance lactation by starting to express within several hours after delivery and expressing by using a combination of a hospital-grade electric pump and their hands. Therefore, based on current scientific knowledge, it is desirable that all NICUs provide breastfeeding support. There are some NICUs that do not feed infants anything until their mother's own milk is obtained. In that case, the problem is how long the infants have to wait before the breast milk arises as fasting may cause atrophy of the gastrointestinal mucosa and bacterial translocation in the infants. In recent years, it has been reported that there has been an improvement in short-term prognosis in very low birthweight infants by starting enteral nutrition as soon as possible after birth. Therefore, there is a tendency to start enteral nutrition within 24 h of birth. (13) In order to start enteral nutrition in a situation without the mother's own milk, we often use infant formula for low birthweight infant or “donated unpasteurized breast milk” that

is non-pasteurized milk. The formula and “donated unpasteurized breast milk” have disadvantages because the formula increases the risk of neonatal necrotizing enterocolitis, and the donated unpasteurized breast milk has the risk of viral and bacterial infection. On the other hand, donor human milk that has been appropriately managed and pasteurized in established human milk banks is considered to be generally safe because microorganisms such as viruses and bacteria are killed. (16-20)

From the above, in order to standardize the safe enteral nutrition of preterm and very low birthweight infants after birth, we would like to recommend the use of donor human milk provided by human milk banks.

When establishing enteral nutrition, we need to use human milk fortifier. It has been reported that using a human milk-derived human milk fortifier not derived from bovine milk provides various advantages, such as the earlier establishment of enteral nutrition, a shortened period of parenteral nutrition, and a reduction in the complications often seen in very premature infants (e.g., neonatal necrotizing enterocolitis, chronic lung disease, and retinopathy of prematurity), and a shortened period of hospitalization. (20,21) In the future, we will also have to create systems for supplying EHMD in Japan.

“It has been reported that using a human milk-derived human milk fortifier not derived from bovine milk provides various advantages, such as the earlier establishment of enteral nutrition, a shortened period of parenteral nutrition, and a reduction in the complications often seen in very premature infants (e.g., neonatal necrotizing enterocolitis, chronic lung disease, and retinopathy of prematurity), and a shortened period of hospitalization. (20,21)”

Human milk bank

Current status of human milk banks worldwide and the history of the establishment of the bank in Japan.

There is a movement worldwide to establish human milk banks, and more than 600 banks operate and manage donor human milk in over 50 countries. Twenty-seven non-profit human milk banks that are members of the Human Milk Banking Association of North America have already been established, and three additional banks were newly established over the past year. Human milk banks have also established in Asia (e.g., China, Korea, Taiwan, Singapore, Viet-Nam, India, and the Philippines). In Japan, the Guideline for the Establishment of a Breast Milk Bank was created as a shared research project of the Health and Labor Science Research (Next-generation Development Basic Research Project for Overcoming Children's Diseases: Study of Prevention of Mother-to-Child HTLV-1 Transmission: Cohort Study among Offspring of HTLV-1 Infected Mothers) over three years from April 2014 to March 2017. After approval by the Ethics Committee of the Showa

University Koto Toyosu Hospital in 2014, a draft of the Standard Operating Procedure was created based on the guidelines of the Human Milk Banking Association of North America – that is, the Guidelines for the Establishment and Operation of a Donor Human Milk Bank 2013. It was also created by consulting the guidelines of the European Milk Bank Association (i.e., Guidelines for the Establishment and operation of a donor human milk bank) and the National Institute for Health and Clinical Excellence (i.e., Guidelines for the Establishment and operation of human milk banks in the UK). (22-24) Based on this draft, comments from experts in the fields of food hygiene, hazard analysis and critical control points (HACCP), nutrition, and microbiology, and neonatal doctors (Director, the Japan Society of Perinatal and Neonatal Medicine) were gathered, and then the first Standard Operating Procedure was created. After revisions following discussions with research members of the Ministry of Health, Labor and Welfare (MHLW), the current Standard Operating Procedure was prepared. Then, the operation of a breast milk bank was started at Showa University Koto Toyosu Hospital, in accordance with the Standard Operating Procedure.

With that background, the Japan Human Milk Bank Association was established in May 2017. Here are descriptions of the operation of the bank:

Registration of donors

Performs medical checkups and serum screening tests (HIV, HTLV-1, HBV, HCV, syphilis), etc., and explains how to express, preserve, and deliver breast milk. In general, as the health condition of women who donate “donated unpasteurized breast milk” is unchecked, there is variability in the quality of the shared milk.

Sterilization of breast milk

There are several methods to pasteurize breast milk. As holder pasteurization at 62.5 °C for 30 min is the standard method in Europe and the USA, the Japan Human Milk Bank Association also adopted the same pasteurization conditions.

Providing donor human milk

The Japan Human Milk Bank Association provides donor human milk only to neonatal intensive care facilities. The donor human milk has a label with a batch number and expiration date. This batch number is linked to the donor.

“Whether the cost of donor milk is borne by the hospital or the infant’s family is a major issue. Society-wide action is required to make it possible for all babies who need donor human milk to receive it.”

Safety of donor human milk

Human milk is a biological product; therefore, whether from an infant’s own mother or a donor mother, there will always be concerns about contamination. Possible contaminants are infectious agents such as viruses and bacteria, and drugs they have taken. There is a risk of infection from “donated unpasteurized breast milk,” even if it is the breast milk from a woman who is negative for HIV, HTLV-1, HBV, HCV, and syphilis in screening tests for donors. Holder pasteurization has been shown to be effective in

removing infectious contaminants, and there has been no report that infections such as hepatitis or HIV have been caused by donor milk provided by a previously established breast-milk bank. (2)

Growth with human milk-derived human milk fortifier

When donor human milk is used, human milk fortifiers should be added to lead to the appropriate growth of preterm and very low birthweight infants.

Cost burden

Whether the cost of donor milk is borne by the hospital or the infant’s family is a major issue. Society-wide action is required to make it possible for all babies who need donor human milk to receive it. Feeding with donor human milk can lead high-risk children to better health. (25) Whether or not preterm and very low birthweight infants use donor human milk should be decided upon based on medical judgment, not their family’s financial status.

Future issues

Organization of human milk banks: According to the results of a questionnaire survey obtained from 168 NICUs in Japan in 2016, most facilities prioritized the provision of mother’s own milk to very low birthweight infants whose birthweight is less than 1,000 g as a method to supply calories and nutrients for one month after birth. When insufficient breast milk was obtained, they provided an infant formula for low birthweight infants. (26) The usability of donor human milk has been reported in countries where human milk banks have been established, and new human milk banks are being established every year to make donor human milk accessible. It was revealed that 75% of NICUs in Japan considered human milk banks to be necessary. (27) As mentioned above, the Japan Human Milk Bank Association was established in 2017, and NICUs using donor human milk have increased since 2018. We have to inform pediatric and neonatal care personnel about the utility of donor human milk provided by the human milk bank and establish as many human milk banks as necessary to meet domestic demand.

Standardized enteral nutrition for preterm and very low birthweight infants: As a result of meta-analysis, it has been shown that neonatal necrotizing enterocolitis is reduced by about 1/5 when standardized enteral nutrition of preterm and very low birthweight infants is used. (28) Using standardized enteral nutrition with donor human milk instead of low-birth-weight infant formula should be recommended when mothers cannot express breast milk or feed it.

Supplying EHMD: Prolacta Bioscience, Inc. In the United States, there is one company that manufactures human milk-derived human milk fortifier by using a process such as ultrafiltration from donor human milk. There are four types of fortifiers (i.e., +4, +6, +8, and +10 H2MF), and additional proteins and calories can be provided according to each infant’s condition. It allows all infants to receive optimal milk. On the other hand, it is unrealistic to purchase this at the expense of the patient’s family because of the high cost of the fortifier. However, as described above, EHMD has been shown to reduce the complications of preterm and very low birthweight infants. (20) It might reduce the effort required for respiratory circulation management, parenteral nutrition management, and fundus examination. As a result, providing EHMD to infants makes it possible to reduce medical expenses. A publication on health economics states that there is no overall loss to facilities, even if the facilities pay for the human milk-derived human milk fortifier. (29) The Canadian Premature Babies Foundation requires the Canadian government to provide EHMD for

“As a result, providing EHMD to infants makes it possible to reduce medical expenses. A publication on health economics states that there is no overall loss to facilities, even if the facilities pay for the human milk-derived human milk fortifier. (29)”

Japan’s neonatal care is of the highest quality in the world. Considering the problem of the declining birthrate in Japan, it is important for pediatricians to continue their efforts to improve the long-term prognosis for each premature infant. We must appeal to the Japanese society and the government so that EHMD can be supplied regardless of the patient’s family’s financial status.

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Fellow Column: Aphallia in a Neonate with Klinefelter's Syndrome: A Case Report

David Lawrence, MD, Carolyn Fall, MD, Christopher Day, MD

Key Words:

Aphallia
Klinefelter Syndrome
Horseshoe Kidney
Intersex
Congenital Absence of the Penis

Introduction:

Aphallia is an extremely rare congenital disorder usually recognized immediately following birth. The current estimated incidence is approximately 1 in 10-30 million births, and only about 100 cases have been reported in the literature. Given the rarity of the condition and the sizable diversity of associated genitourinary and non-genitourinary abnormalities, there is not a widely recognized standard of management of aphallia. Earlier approaches favored feminizing genitoplasty due in part to relative procedural simplicity and the prevailing philosophy that it is 'better to be incompletely female than inadequately male.' More contemporary approaches have been more often aimed at phalloplasty with the idea of surgically supporting a genetically normal male until old enough to gender self-identity. A review of the literature reveals no other reported cases of concomitant aphallia and Klinefelter syndrome, as in our patient, which complicates the selection of management.

“Given the rarity of the condition and the sizable diversity of associated genitourinary and non-genitourinary abnormalities, there is not a widely recognized standard of management of aphallia.”

Due to both the intricate psychosocial elements and the unique anatomical complexities accompanying each case of aphallia, a multidisciplinary approach between the primary Neonatologist and specialists, including urology, endocrinology, and genetics, as well as psychosocial support for the family and patient, is favored. In this case report, the unique case of a neonate with aphallia and Klinefelter Syndrome will be presented along with the approach to management.

Case Presentation:

WH presented at birth with ambiguous genitalia and no clear urethral opening. He was born to a 20-year-old G1P0 mother with unremarkable prenatal workup and who denied substance use during pregnancy. His mother presented with PPRM at 29 weeks and was admitted for observation and management. A prenatal ultrasound at 33 weeks gestation was significant for a single umbilical artery, dilated large bowel, and a small left kidney with normal right kidney and bladder. The fetal echocardiogram was within

normal limits. A C-Section was performed at 35w4d for anhydramnios and breech presentation. He cried spontaneously at birth, but required PPV and then NIMV for increased work of breathing and retractions. APGARs at 1 and 5 minutes were 8 and 8. Sex was unable to be determined at birth based on the external phenotype.

Urology was consulted immediately due to aphallia and concern for other urogenital anomalies (figure 1). Physical exam demonstrated palpable bilateral inguinal testes and an anteriorly displaced anus located at the base of the scrotal raphe without obvious urethral meatus. An abdominal and pelvic ultrasound were obtained on the day of birth and demonstrated bilateral inguinal testes and a horseshoe kidney. No Mullerian remnants were demonstrated, and there was no sign of obstructive uropathy. A spinal ultrasound showed no evidence of a tethered cord. Within the first 24 hours of life, he passed both stool and urine through the anteriorly displaced anus, suggesting likely pre sphincteric urethrorectal fistula (no visible meatus on the perineum (figure 2) per exam). Urology determined that there was no urgent need for surgical intervention.

Genetics was consulted and recommended obtaining a karyotype, chromosomal microarray, and chromosomal FISH. The karyotype was significant for sex chromosomes of XXY, consistent with Klinefelter Syndrome without noted mosaicism. Genetics also recommended an MRI of the abdomen and pelvis, which confirmed aphallia (as opposed to a concealed penis/rudimentary erectile tissue), horseshoe kidney, and bilateral inguinal testes. He also had a dilated colon, however, there was no evidence of Hirschsprung's disease on imaging, and he had normal stool output, so he was monitored clinically.

Endocrinology was also consulted to evaluate for possible coexisting conditions that may occur Klinefelter Syndrome in midline





Figure 1- Morphologically normal scrotum with congenital absence of the phallus

congenital abnormalities such as aphallia, including hypopituitarism, adrenal insufficiency, and congenital adrenal hyperplasia. The initial workup done in the hospital was not concerning for congenital endocrine disorders (Additional labwork was still pending at the time of publication.)

Nephrology was also consulted due to persistently elevated serum creatinine for age with metabolic acidosis and hyperkalemia. He was diagnosed with renal tubular acidosis due to prematurity and was started on Bicitra. The RTA resolved prior to discharge, and he was weaned off Bicitra.

He initially had poor feeding requiring an NG tube, although he eventually began to nipple all his feeds without issue.

A multidisciplinary family meeting was held prior to discharge, during which a plan for future surgical intervention and management was discussed with the parents, social workers, and specialist teams. At this meeting, the parents expressed their desire to raise him as a male, which was supported by the medical team and social worker.

Management and Outcome:

Given the rarity of aphallia and the multiple associated congenital anomalies, a multidisciplinary approach to management was

initiated early by involving multiple specialists, including urology, nephrology, endocrinology, and genetics. WH was treated for 22 days in the NICU. The diagnosis of aphallia was made using MRI, as physical exam alone was not sufficient to determine if any remnants of erectile tissue were present. Urology was to continue to manage the urogenital abnormalities associated with aphallia as an outpatient. Urology determined that, as he was able to stool and urinate without intervention, and there was no evidence of hydronephrosis, no immediate surgical intervention was required during his stay.

“Given the rarity of aphallia and the multiple associated congenital anomalies, a multidisciplinary approach to management was initiated early by involving multiple specialists, including urology, nephrology, endocrinology, and genetics.”



Figure 2: Perineum with anteriorly displaced anus with no visible urethral meatus, suggestive of a urethrorectal fistula

He will not require UTI prophylaxis as he has not had any UTI's, (although he is at increased risk) for UTI. The long-term plan for his management is to delay reconstructive surgery until he is post-pubertal to allow for physical and psychosocial development.

As his karyotype is significant for Klinefelter syndrome (XXY), he will continue to be followed by genetics and endocrinology. To determine if he has any other genetic abnormalities, a whole-exome sequencing sample was sent and is pending at the time of this case report. Klinefelter syndrome can have a significant impact on hormones, including hypogonadism. He will continue to be followed by endocrinology as he grows up to monitor for endocrine disorders.

Given the significant psychosocial impact aphallia can have on patients and their families, social work will also continue to follow

and provide resources for the family. The family was provided resources for counseling in the future.

Discussion:

Aphallia is a rare congenital anomaly, often presenting with multiple associated abnormalities requiring a multidisciplinary approach. As defined in the literature, Aphallia is the congenital absence of the penis due to the developmental failure of the genital tubercle. The etiology of aphallia is unknown, and the incidence appears to be sporadic. Given the rarity of this condition and the wide spectrum of presentation, there has yet to be posited a definitive, standardized management strategy. Based on the Skoog's anatomical classification of the site of the urethral meatus in relation to the anus, WH has pre-sphincteric aphallia, which is also associated with increased mortality and morbidity. Based upon a

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systematic review of the published literature, there are no other reports of patients with aphallia and Klinefelter syndrome. This case, therefore, presents a unique challenge, as Klinefelter syndrome is associated with multiple other abnormalities, including hypogonadism, gynecomastia, infertility, and cognitive/developmental delays. It may also suggest the implication of the sex chromosomes in the pathogenesis of aphallia, and such a case may help guide further research into the etiology of this phenomenon (just my thought, up to you guys to include or not).

Previous case studies and reviews prior to 1997 recommended early feminizing genitoplasty and raising the child as a female with female hormone replacement therapy. This was partially due to the increased difficulty of phalloplasty compared to vaginoplasty, as well as the concern for the presumed devastating psychosocial impact of being raised an aphallic male. However, follow up studies have shown that patients that underwent early feminizing genitoplasty had a high rate of gender dysphoria, most likely secondary to prenatal and early neonatal androgen imprinting prior to surgical intervention. Therefore, most surgeons and physicians recommend raising the child based upon their chromosomal sex and waiting until post-puberty for genital reconstruction surgery to allow the patient to have input on their surgical reconstruction. An endocrinologist helps manage hormone therapy in the context of pubertal changes. This patient's Klinefelter diagnosis is likely to require hormone replacement therapy due to hypogonadism; he will be followed closely by endocrinology.

“ Therefore, most surgeons and physicians recommend raising the child based upon their chromosomal sex and waiting until post-puberty for genital reconstruction surgery to allow the patient to have input on their surgical reconstruction.”

Irrespective of the patient's choice regarding genitoplasty, close follow up starting at a young age with a psychologist helps patients with aphallia navigate the significant psychosocial aspects of the condition. Klinefelter syndrome will add a layer of complexity to the already burdensome psychological impact of this condition, given it is associated with feminizing characteristics such as gynecomastia, as well as cognitive delays that may make therapy more difficult. In this case, it will be especially crucial for there to be open and active lines of communication between specialists, therapists, the patient's family, and (when he is old enough) the patient himself.

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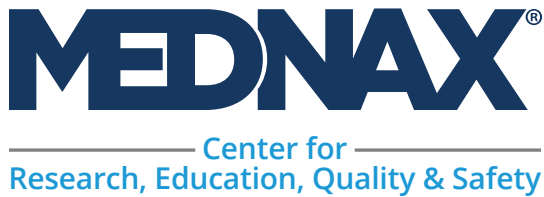


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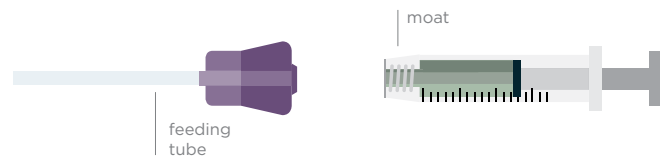


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Alison Jacobson



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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.

The week of April 11 – 17 marks the third annual Black Maternal Health Week. Founded and led by the Black Mamas Matter Alliance (BMMA), The Black Maternal Health Week is central to National Minority Health Month, created to drive health equity across the U.S. on behalf of all racial and ethnic minorities.

“The week of April 11 – 17 marks the third annual Black Maternal Health Week.”

These compelling public health campaigns are designed to deepen the national conversation about Black and minority maternal health in the U.S., which continues to be a serious issue.

As we reported in February 2020, Neonatology Today, the rate of maternal mortality is rising in the U.S., with Black women bearing an unacceptable burden. Black mothers are two to three times more likely to die from pregnancy-related causes than white women, and black babies are also at increased risk: twice as many

will die before their first birthday, compared to the rate for white babies.

We know that implicit bias -- the pervasive assumption about someone based on race, ethnicity, gender, weight, ability, age, or sexual orientation -- plays a role in this racial disparity. It's the cultural lens through which you see people, and they see you.

In health care, implicit bias can affect behavior in a maternity and infant care setting and contribute to Black maternal mortality and morbidity, high rates of infant death, and other poor health outcomes. (1) Evidence tells us implicit bias can also affect the decision-making process of health care providers in all disciplines, which can affect patient-provider relations, treatment decisions, treatment adherence, and patient health outcomes. High levels of bias can also lead to less friendly behavior toward patients and less patient satisfaction.

In the most recent Listening to Mothers national childbearing survey, 21 percent of black mothers and 19 percent of Hispanic mothers reported perceptions of poor treatment due to race, ethnicity, cultural background, or language. (2) In a study by the University of British Columbia Birth Place Lab, published in Reproductive Health, 2,700 U.S. women were surveyed. Two of the most common types of mistreatment that pregnant, laboring, and postpartum women experienced by medical professionals were being yelled at or scolded, and being ignored or refused assistance when asking for help. (3) “Our findings suggest that mistreatment is experienced more frequently by women of colour, when birth occurs in hospitals, and among those with social, economic or health challenges,” the researchers wrote.

You can't stop implicit bias by suppressing it or through good intentions. It must come from within. “The experience of being interpreted is different from the experience of being understood,” says Kimberly Seals Allers, the maternal and infant health equity strategist at Birth Without Bias at a recent symposium on implicit bias. (4) To respond to patients without bias, Seals Allers recommends:

- Learn a patient's personal history and the context that brought her to the hospital; perceive her as an individual rather than a stereotype.
- Increase opportunities for contact with individuals from different groups by expanding your network of friends and colleagues or attend events where people of other racial and ethnic groups, gender identities, sexual orientation, and other groups may be present.
- Build partnerships by framing the interaction with the pa-



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tient as one between collaborating equals, rather than between a high-status person and a low-status person.

We know, for example, that many Black families continue to advocate bed-sharing, prone sleeping, and soft sleep surfaces. A meta-synthesis of seven qualitative studies in the *Journal of Special Pediatric Nursing* found that Black mothers are less likely to follow safe sleep practices because they're more likely to believe SUIDS/SIDS is a random occurrence and not preventable. (5) The researchers determined that "nurses should work with Black mothers to understand their cultural beliefs while educating them about safe sleep practices."

"It is also critical that women have access to health care throughout the full prenatal and postnatal cycle. For that reason, First Candle also supports expanding Medicaid coverage for the 12 months following a child's birth."

At First Candle, our Straight Talk for Infant Safe Sleep Training explores unconscious bias. It works with care providers to improve communication with patients to understand better their obstacles and objections to adopting safe sleep guidelines and breastfeeding, which can significantly help reduce infant mortality rates. That's just one example of how partnership building can impact infant mortality.

It is also critical that women have access to health care throughout the full prenatal and postnatal cycle. For that reason, First Candle also supports expanding Medicaid coverage for the 12 months following a child's birth. Nearly two out of every three adult women enrolled in Medicaid are in their reproductive years. As (6) As Health Affairs reported in 2019, "4 in 10 mothers with Medicaid coverage do not access a postpartum visit and thus don't have the opportunity to receive care and support for common problems such as postpartum depression and breastfeeding challenges. Multiple barriers prevent women with Medicaid coverage from accessing postpartum care: In 19 states, Medicaid maternity coverage ends at 60 days postpartum, cutting women off from access to care during this critical period."

Improving access to health care during the first 100 days of the postpartum period is especially critical because this is when more than half of pregnancy-related deaths can occur. The burden falls disproportionately on women of color. While 12 percent of pregnancy-related deaths occur in White women after the six-week postpartum checkup, nearly 15 percent of Black women will die during this same period. Insufficient prenatal and postnatal care, unnecessary C-sections, and racial and ethnic disparities in care all play a role in contributing to these startling statistics.

In honor of Black Maternal Health Week and National Minority Health Month, we can work together to increase awareness of ra-

cial disparities in maternal and infant health care. We must prioritize increasing access to comprehensive, affordable, high-quality, and unbiased health care for Black women and infants of color as well as other underserved populations.

In April, you can support Black Maternal Health Week by sharing, liking, favoring, and retweeting BMMA content from its [tool kit](#) on maternal health and using the official hashtags #BlackMaternalHealthWeek, #BMHW20 and #BlackMamasMatter.

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In January, heaven gained a new angel - Laura Renc.

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Laura will be greatly missed.

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Still a Premie?

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

But that's not every premie's story.

Born between 34 and 36 weeks' gestation?

STILL A PREMIE

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

Jaundice Feeding issues Respiratory problems

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

Born preterm at a "normal" weight?

STILL A PREMIE

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

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

Born preterm but not admitted to the NICU?

STILL A PREMIE

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

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

Some Premies

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

All Premies

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

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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.



Ventilation and the Sub Twenty-four Week Micropremie Trying to Hit a Moving Target in the Dark

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.

Preface:

Of all the controversies over the course of my thirty-year career, the case of twenty-two-week babies and the management (or not) thereof is surely the largest. While one could write endlessly on the ethics surrounding the edge of viability and its definition, I am going to focus on challenging our assumptions about ventilation when we do "go for it."

"While one could write endlessly on the ethics surrounding the edge of viability and its definition, I am going to focus on challenging our assumptions about ventilation when we do "go for it."

This is not meant to serve as a therapeutic guide; rather, it provides food for thought and areas for future research.

Modes:

I believe I can say with certainty NICU's with the best results with the extremely premature (I will refer to them as "microprems") use a high-frequency mode as the first intention. Furthermore, the use of high-frequency jet ventilation (HFJV) is increasing and more likely to be the first intention as well.

The nature of HFJV suits tiny babies best. Issues with a fragile, tiny developing tracheobronchial tree and resulting resistance are greatly reduced. HFJV delivers its breath as a brief puff of gas, which travels more or less down the centre of the airway, much like water going down a drain, the air being at the centre of the rotating water. This allows for concurrent inspiration and expiration, and the swirling nature of the outgoing gas helps mobilise secretions. (1) As endotracheal tube size decreases, effective suctioning becomes virtually impossible. (2)

Tiny airways have very high resistance, and their compliance is high relative to the developing alveolar ducts and primitive alveoli; thus, time constants in these patients are very long. With conventional ventilation (CV), high airway resistance requires high pressures and relatively long inspiratory times (Ti) to deliver a breath. These pressures invariably result in microtears due to airway fragility, while long time constants and high Ti invariably lead to gas

trapping; there is not enough time available to both fill the lungs and exhale.

HFJV Ti of 0.02-0.034 seconds significantly mitigates gas trapping, although it can and does still occur. Because I believe gas trapping is the norm in tiny patients, I use low rates (240-300), resulting in generous inspiratory: expiratory (I:E) ratios with "the jet," as long as 1:12. A combination of physics and physiology make HFJV my first choice from the get-go.

High-frequency oscillation (HFO) is often the first mode these babies receive. On larger microprems, this can work and is certainly preferable to any form of conventional ventilation (CV). The third-generation of oscillators soon to be introduced in the U.S. offer much finer control of HFO than the first-generation thereof. I:E ratio on some machines can be increased to 1:3, and automatic adjustment of breath size gives greater flexibility to the clinician when managing amplitude and breath size. The ability to measure and adjust tidal volume (VT) will be new to American clinicians. Having used these machines in Canada for over 20 years, I can attest to their efficacy, and HFO/VG is used extensively in the unit where I work.

"While there are many advantages to HFO over CV, the nature of HFO renders it less and less efficient as patient size decreases since the HFO waveform is dampened greatly with decreasing airway diameter."

While there are many advantages to HFO over CV, the nature of HFO renders it less and less efficient as patient size decreases since the HFO waveform is dampened greatly with decreasing airway diameter. The combination of high amplitude and long time constants exacerbates the problem. Increasing I:E to 1:3 give a bit more time for exhalation, but the shortened Ti means higher amplitude must be used to deliver the same volume. Using high amplitude risks creating "choke points" as expiration is active with HFO. Raising mean airway pressure (MAP) to compensate may put undue strain on the cardiovascular system and lungs. In practice, I find decreasing frequency is very helpful; since minute volume is rate multiplied by the square of Vt, a small increase in Vt offsets the drop in frequency. One can thus now deliver more volume using a lower amplitude. HFO adjustments notwithstanding, the result is often unavoidable gas trapping.

Pressures and Volumes:

The magic mean airway pressure (MAP) number to achieve optimal sustained recruitment in practice is usually 10 cmH₂O. One unit starts its microprems on lower pressures with good results. This leads to assumption challenge number one: does the nature of 22-week gestation physiology make 10 cmH₂O too high as an initial setting? HFO requires increasing MAP as amplitude is increased to avoid airway instability and choke points. The unit in

question uses HFJV, which does not share this characteristic with HFO. As a result, perhaps initial PEEP can be decreased when HFJV is the mode of first intention.

“With new oscillators, the target Vt is usually between 1-2 ml/kg. Since airway resistance and Ti are fixed, the only option when delivering a larger Vt is increasing amplitude.”

With new oscillators, the target Vt is usually between 1-2 ml/kg. Since airway resistance and Ti are fixed, the only option when delivering a larger Vt is increasing amplitude. While decreasing frequency may help, eventually, ventilation becomes less efficient and requires amplitudes high enough to create choke points. Hence, as HFO Vt approaches that of CV Vt, I am inclined to switch to HFJV. (3) Pressure attenuation with HFJV permits using high pressures to overcome airway resistance without those pressures harming the alveolar ducts, something that clinicians need to be reminded of. There should be no “PIPaphobia” using HFJV. It is not uncommon to use jet pressures of 30 cmH₂O or more. It is also quite common to require delta-pressures of 10cmH₂O or less to maintain acceptable blood gases.

“Normal values”:

There is quite simply no frame of reference for normal laboratory values in the microprem, particularly when gestational age is below twenty-three weeks. In practice, we aim for oxygen saturation (SpO₂) of 88-92% and prefer pH no lower than 7.23 while aiming for arterial CO₂ (PaCO₂) above 40 and below 80 mmHg. In-utero arterial O₂ (PaO₂) is approximately 30mmHg while we aim for PaO₂ between 50-80mmHg in microprems and may drop that to 30-50mmHg. (4)

The physiology of the 22-week gestation infant in concert with the nature of O₂ and CO₂ diffusion characteristics makes these targets difficult to achieve safely. In the lung, CO₂ diffuses approximately 20 times more readily than O₂. (5) The microprem lung is in a primitive state of development at 22 weeks gestation, lacking surface area and a functional capillary-alveolar interface. The alveolar duct must serve as the only surface for most diffusion to take place, resulting in huge problems trying to maintain those

“normal values.” High minute volume and pressure are required to drive O₂ into the pulmonary circulation; however, this results in PaCO₂ falling rapidly, especially during initial management when the lungs are still being recruited. Low PaCO₂ is a well-known risk factor for intraventricular hemorrhage (IVH) and periventricular leukomalacia (PVL). This raises assumption challenges two and three: 2- does low PaCO₂ affect the 22-week gestation brain the same way as a more developed one, and 3- have we reached the de-facto limit of what current technology can achieve? (Have we indeed gone too far?)

Given that HFJV is ostensibly the gentlest form of invasive ventilation that we can offer microprems; should we worry less about lower than “ideal” PaCO₂ in this patient population when using this mode? How low is safe? In personal practice, these questions have haunted me because I have seen frighteningly low PaCO₂ levels. A fourth assumption challenge: are there situations in which low, stable PaCO₂ is neuroprotective? A very large patent ductus arteriosus (PDA) can flood the pre-ductal circulation and increase the risk of IVH. Could low PaCO₂ mitigate or prevent this? Indomethacin has an initial vasoconstrictive effect followed by reduced cerebral blood flow; could low PaCO₂ behave similarly? A study out of Calgary confirms the protective effect of indomethacin on IVH, but no definitive association with PDA and IVH was found. (7) There were no infants of less than 23-week gestation in the Calgary study; there is no data on the 22-week gestation infant, and they are not the same as those at 23 weeks. (Shout out to all the physiology geeks out there with animal labs!)

Low PaO₂ levels are a big problem due to the difficulty O₂ has in entering the pulmonary circulation. To achieve “normal” PaO₂ in microprems requires increasing FiO₂, PEEP, or both to facilitate diffusion. The toxic effect of O₂ on the developing infant is well known. Microprems lack antioxidant protection, and the fragile lung will only tolerate so much pressure before air leaks occur, a perfect recipe for chronic lung disease.

Conclusion:

Resuscitation of infants of less than 23 weeks gestation is a new phenomenon. There is a dearth of evidence to guide clinicians in the management of these patients; indeed, this is a de-facto experiment in progress. We have only basic science and physiology to guide us and our expectations, and from which to surmise appropriate therapy. Clinicians may have to operate outside their “comfort zone” if they are to be successful, providing success is a possibility.

References:

1. *Ti of 0.02-0.034 seconds means the vast majority of expiration is passive, and due to lung recoil.*
2. *There is no suction catheter available that will pass down a 2.0 ETT, and the high resistance of even a 6 Fr catheter limits its efficacy.*
3. *I use CV Vt of 3-4 ml/kg with microprems and rarely exceed 3 ml/kg using HFO.*
4. <https://uichildrens.org/health-library/comments-oxygen-toxicity-and-retinopathy-rop-premature-infant>
5. <https://teachmephysiology.com/respiratory-system/gas-exchange/gas-exchange/>

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6. [https://www.jpeds.com/article/S0022-3476\(13\)00118-2/abstract](https://www.jpeds.com/article/S0022-3476(13)00118-2/abstract)
7. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6817605/>

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

NT



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PRESENTATION OF INFECTION:

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Child Maltreatment of NICU Graduates: Focus on Health Disparities

JaNeen Cross, DSW, MSW, MBA

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*.



Abstract

Purpose: The purpose of this article is to highlight the maltreatment of NICU infants as a public health concern resulting from health disparities. **Description:** The article provides evidence that NICU infants are represented in the highest maltreatment group and fatal neglect group. Similarly, mothers are the highest reported group for maltreatment. This crisis is viewed through the lens of health disparities. The health disparities for the infant, mother, and health system are discussed and how these disparities increase maltreatment risks and poor outcomes. **Assessment:** Health disparity gaps need to be addressed in order to improve maltreatment and morbidity outcomes with an emphasis on maternal-infant attachment. **Conclusion:** NICU providers and child

welfare professionals need to understand the health disparities that lead to poor outcomes. Similarly, providers must address the health-related disparities for infants, maternal mental health disparities, and system gaps that leave mothers and infants vulnerable.

“Child maltreatment continues to be a public health concern [Department of Health and Human Services (DHHS) 2019] with estimated costs totaling \$80 billion (Gelles & Perlman, 2012).”

Introduction

Child maltreatment continues to be a public health concern [Department of Health and Human Services (DHHS) 2019] with estimated costs totaling \$80 billion (Gelles & Perlman, 2012). The maltreatment rate for infants (under one year of age) continues to be specifically the highest at 25.3 per 1,000 (DHHS, 2019). Also, infants under the age of one die from abuse and neglect at a rate of 21.9 per 1,000 children in that population, which is three times the death rate for children one year and over. This article views child maltreatment of newborn intensive care unit (NICU) infants as a health disparity. Attachment theory is the theoretical lens used for this discussion and represents the strongest associated theory for child maltreatment of NICU infants.

NICU graduates are at a very high risk of maltreatment post-discharge due to disrupted maternal-infant attachment, infant characteristics, medical status, and NICU environment. This article focuses solely on maternal-infant maltreatment based on

findings related to maternal perpetrators.

Background

Child welfare reports, medical, and nursing journals are examined. The population characteristics for child maltreatment, subpopulation for fatalities, and perpetrator groups are extracted. The salient factors for child maltreatment are identified related to the infant, mother, and NICU environment. In this article, neglect is defined as the failure of caregivers to provide needed, age-appropriate care, and medical care when resources are available or offered (Children's Bureau, 2019). The findings support that health disparities play a significant role in child maltreatment outcomes for NICU graduates. It should be noted that although there are no specific child maltreatment studies for NICU infants specifically, these infants are represented in the highest risk and fatality risk group, particularly African American infants.

Disparities

Healthy People 2020 define health disparities as the differences in health that are closely linked to social, economic, and environmental disadvantage (HealthyPeople.gov, 2019). A health disparity is a health outcome seen at a greater or lesser magnitude between populations. Health disparities adversely affect populations that systemically experience greater health obstacles based on race, ethnicity, religion, socioeconomic status, gender, age, mental health, cognitive, sensory, or physical disability, sexual identity, gender identity, geographic location, or other characteristics linked to discrimination and exclusion (HealthyPeople.gov, 2019). Health disparities are influenced by socioeconomic status, discrimination, biological and genetic characteristics, health behaviors, environment, and quality of care (Save the Children Foundation, 2015).

The cost of health disparities is approximately \$229 billion in direct costs and 1.24 billion dollars in indirect medical costs [Association of State and Territorial Health



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Officials (ASTHO), 2018]. Furthermore, 30% of indirect medical costs are considered excess expenditures due to health inequities experienced by African Americans, Asians, and Hispanics. Overall, children of color are over-represented in the child welfare system, given their numbers in the general population (Children's Bureau, 2017; Gourdine, Smith, & Waites, 2015).

The financial costs, however, cannot measure the disrupted lives, pain, suffering, and loss of life. According to the National Child Abuse and Neglect Data System (NCANDS), there are 674,000 victims of abuse and neglect, a rate of 9.1 victims per 1,000 children in the population (DHHS, 2019). Neglect comprises a majority (74.9%) of child maltreatment cases, followed by physical abuse (18.3%), and sexual abuse (8.6%) [DHHS, 2019]. Child fatality rates according to race are White (41.9%), African American (31.5%), and Hispanic (15.1%). The rate of African American child fatalities is 2.6 times greater than the rate of White children and 3.1 times greater than the rate of Hispanic children (DHHS, 2019). There is a public health consequence of greater magnitude experienced by African American children.

According to the Centers for Disease Control and Prevention (CDC), the preterm birthweight rates increased for the third year (CDC, 2019). Low birth weight rates are also increasing (8.2 per 1,000 births) and are within the highest rates ever reported. For children under the age of 5, mortality rates are improving while disparities and inequalities are worsening (Save the Children Foundation, 2015). In 2015, the preterm birth and low birthweight rates based on race for all births was African American 13.4%, Puerto Rican 11%, Indian-Alaska Native 10.5%, Cuban 9.3%, Mexican American 8.9%, Whites 8.9%, and American, Asian-Pacific Islander 8.6% (Childstats.gov, 2018). There are disparate preterm and low birth weight outcomes for the infant population overall, but there are higher incidences for African American infants.

The U.S. infant mortality rate continues to be relatively high, signaling less improvement despite technological advancements. In 2016, the infant mortality rate was 5.9 per 1,000 infants (Childstats.gov, 2018). The infant mortality rate is 2.4 times greater for African Americans than White infants (ASTHO, 2012). In 2014, the infant death rate per 1,000 live births was African Americans 10.9, American Indian-Alaskan Native 7.7, Puerto Rican 7.2, Whites 4.9, Mexican 4.8, and Cuban 3.9 and Asian Pacific Islander 3.7 (Childstats.gov, 2018). The burden of disease experienced by infants is clearly seen to a greater extent with African American infants.

Children who are poor and live in major cities have an extremely high risk of death (Save the Children Foundation, 2015). Systematic poverty is one of the critical indicators of disparities and poor maternal-infant health outcomes. Health disparities experienced by women and infants of color are a result of the burden of disease due to social determinants of health and in inequities experienced in larger environments (Save the Children Foundation, 2015). As African American women and infants have higher preterm birth rates and infant mortality rates, there are special implications for African American preterm, low-birthweight infants. Health disparities clearly exist in health outcomes for women and infants and to a larger and greater extent with African Americans. Ironically, these disparities can result in a NICU admission, influence the outcomes of a NICU admission, and increase the risk of maltreatment post-discharge.

Infant Health Disparities

The medical needs of NICU infants provide evidence of health disparities, particularly for minority groups. The health status of NICU infants also highlights the social determinants of health that

lead to health disparities. The risk factors for physical abuse of infants include a child being under the age of 18 months, prematurity, and twinship (Friedman et al., 2012). Similarly, Fallon, Ma, Allan, Pillhofer, Traocme, & Jud, (2013) identify positive toxicology results at birth, fetal alcohol effects (FAE), developmental delays, attachment issues, and physical-neurological impairments (i.e., physical, cognitive, development) as infant risk factors for abuse. NICU infants are often premature with low birthweights. Their medical status puts them at higher risk of developmental delays and chronic conditions resulting from premature, low birth weight status and NICU stays that require special follow-up care. In addition, there are subgroups of NICU infants (i.e., substance-exposed, special needs) who can have additional medical needs after discharge. NICU infants can have cognitive and sensory impairments, physical disability, biological or genetic characteristics that influence health disparities. Similarly, the health behaviors of mothers (i.e., alcohol, substance use) can lead to a NICU admission. Subsequently, these health disparities increase disparate outcomes for child maltreatment.

“Similarly, the health behaviors of mothers (i.e., alcohol, substance use) can lead to a NICU admission. Subsequently, these health disparities increase disparate outcomes for child maltreatment.”

In considering the fragile health status of NICU infants in the first year of life, the risks involved the NICU course, and the child welfare data, there is a greater indication and concern for maltreatment. According to the most recent maltreatment data, infants (including NICU infants) are represented in the highest maltreatment and fatality group (DHHS, 2019). As the child fatality rate is higher in African American infants, these infants require considerable attention for maltreatment risk in the NICU.

The medical needs of a NICU infant are complex. Conceptualizing child maltreatment (i.e., neglect, medical neglect, physical) is also complicated because of the complexities and difficulty required to parent and care for these very fragile infants. The risk for neglect, medical neglect, and poor outcomes are high, leaving little room for parent caretaking errors. Similarly, it may be hard to determine if harm and injury are from maltreatment or mishandling of an extremely fragile infant. In considering social determinant variables such as poverty, substance use, and domestic violence, the outcomes become more abysmal.

Maternal Health Disparities

Maternal mental health factors affect health disparity and increase the risk of child maltreatment. Parents are highly represented as perpetrators of neglect, with maternal neglect exceeding paternal neglect at 37% and 19%, respectively (Bundy-Fazioli and Delong Hamilton, 2013). In a recent report, 30% of mothers, 15% percent of fathers, and 20% of mothers and fathers together are involved in fatal child maltreatment (DHHS, 2019). More than half (54.1%) of abuse and neglect perpetrators are women; in 80% of child fatality cases, the identified perpetrators are parents (DHHS, 2019). Damashek, McDiarmid, Nelson, & Bonner (2013) identify child neglect and fatal neglect perpetrators as predominantly female and biologically related to the victim.

The risk factors in infant-related child welfare investigations include caregivers between the ages of 20 and 30, caregivers as domestic violence victims, caregivers with minimal supports, and caregivers with mental health, substance abuse, and alcohol abuse issues (Fallon et al., 2013). Additional risk factors include caregivers with histories of out of home placements as a child, cognitive impairments, and physical health concerns (Fallon et al., 2013). The cited fatal risk factors by states include substance use, financial problems, and domestic violence (DHHS, 2019). Mothers in the NICU systemically experience mental and physical health obstacles that influence health disparities. Similarly, social determinants such as substance use and domestic violence are social determinants that can exacerbate discriminatory and exclusionary practices by medical and service providers, further reinforcing health disparities and adverse child maltreatment outcomes.

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Mothers who engage in child maltreatment may be a victim of their own childhood abuse and trauma, resulting in cumulative trauma. The findings from the Adverse Childhood Experience Study (ACES) demonstrates the effects of cumulative trauma on mental and physical health (Felitti et al., 1998; Grasso et al., 2012). Adults, in the ACES study, report a childhood history that includes adverse childhood experiences and maltreatment, parental impairments, and household dysfunctions (Felitti et al., 1998; Grasso et al., 2012). The severity and progression of physical and

mental morbidity increases as the adverse experiences increase (Felitti et al., 1998; Grasso et al., 2012).

Mothers, who are often the perpetrators for abuse, may have historic trauma stemming from childhood experiences. Mothers who are involved in child maltreatment incidents can also be victims of child maltreatment themselves. Equally concerning, the children experiencing child maltreatment from these mothers develop their own ACES and are at high risk of continuing the maltreatment cycle. The ACES study provides evidence that social determinants increase mental-physical impairments, substance use, poor health outcomes, and early mortality. Mental health obstacles for NICU mothers are associated with adverse parenting outcomes and, ultimately, disparate child maltreatment outcomes.

A mother’s childhood trauma can be compounded by the stress in the NICU. Parents in the NICU experience high levels of stress while their infants are in the NICU (Tandberg, Sandro, Vardal, & Ronnestad, 2013). Also, stress-related trauma disrupts anticipating parenting norms. Parents define the NICU experience as ongoing uncertainty and lack of capacity in their parenting role (Lasiuk, Comeau, & Newburn-Cook, 2013). Stress, feelings of helplessness, absence of parenting knowledge, and negative child-interaction influence misperceptions about the infant, resulting in difficult parent-child interactions (Melnyk et al., 2005). The negative parent-child trajectories that initiate in the NICU result in poor parenting outcomes (Melnyk et al., 2005)

The stress endured by parents in the NICU causes mental health and cognitive impairments resulting in disparities in parenting outcomes. Parents experiencing a NICU admission have an increase in psychological stress have increased symptoms of intrusion and avoidance and a higher risk of post-traumatic stress disorder (PTSD) resulting from untreated stress (Jotzo & Poets, 2005). These emotional impairments of NICU parents have long-term, adverse impacts on parental self-confidence and parenting. These mental health challenges can endure well after their infants’ discharge (Jotzo & Poets, 2005).

Postpartum depression (PPD) is another mental health challenge for NICU mothers. NICU mothers are at significant risk for devel-

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oping PPD (Bergstrom, Wallin, Thomson, & Flacking, 2012). A study found that some NICU mothers experience PPD for up to 4 months post-discharge (Bergstrom, Wallin, Thomson, & Flacking, 2012). There is a correlation between maternal depression and attachment. Depression diminishes parenting skills and influences later behavioral difficulties in children (Bergstrom, Wallin, Thomson, & Flacking, 2012). Maternal depression is associated with committing physical abuse, psychological aggression, and medical neglect (Conron, Beardslee, Koenen, Buka & Gortmaker, 2009). Maternal child maltreatment perpetrators, who experienced an onset of depression, were at an increased risk of committing 2.3 more psychologically aggressive acts in a 12-month period than mothers who did not experience an onset of depression (Conron et al., 2009). There are mental health disparities experienced by NICU mothers. These mental health disparities for NICU mothers negatively impact parenting outcomes and increase child maltreatment health disparities.

“Another study found that mothers with a history of childhood abuse (i.e., emotional and physical neglect, emotional and physical abuse, sexual abuse, and severe abuse) are ambivalent in seeking professional help due to shame (Muzik et al., 2013).”

Another study found that mothers with a history of childhood abuse (i.e., emotional and physical neglect, emotional and physical abuse, sexual abuse, and severe abuse) are ambivalent in seeking professional help due to shame (Muzik et al., 2013). The postpartum period is identified as a time of increased awareness by mothers of impairments in social skills that were never learned prior to having an infant (Muzik et al., 2013). Mothers experience confusion about infant's routines, childcare needs, and acknowledged uncertainty about appropriate responses to their infant (Muzik et al., 2013). The childhood experiences of mothers undermined their parental intuition and sensitivity (Muzik et al., 2013).

Unfortunately, mothers do not receive needed support and are subject to provider bias. A study examining the attitudes of maternal neglect perpetrators discovered that mothers often have psychological challenges associated with childhood trauma, mental illness, substance abuse, and unmet support needs (Bundy et al., 2013). The study concludes that mothers were challenged with overwhelming psychosocial constraints; professional service providers often misunderstood their behaviors or observed these behaviors out of context. Even more concerning, the mothers in the study discussed voids in relationships with child welfare service providers, lack of respect, and mutual trust (Bundy et al., 2013).

Based on provider misperceptions, the necessary therapeutic, supportive relationships required for effective intervention often failed to develop. The quality of provider services and biases in the delivery of services result in disparate treatment in child maltreatment outcomes. Similarly, Gourdine, Smith, & Waites (2015) demonstrate instances in which child welfare workers were resistant or reluctant to address family needs. Their study highlights the need to evaluate and measure provider services to ensure racial equity and avoid policies and practices that have unintended

consequences for families of color. There is evidence of child maltreatment service gaps. Service gaps, discriminatory, and exclusionary practices provide evidence of the quality of care challenges that influence health disparities. Quality of care threats for a complex, high-risk population in tandem with the deprivation of needed support services for mothers, who have mental health challenges, are the health disparities that result in maltreatment outcomes.

NICU Disparities

Experiences with NICU staff can compromise bonding and attachment. One study found that NICU mothers felt restricted when caring for their infants and felt their infant's needs were not met based on workflow and assignments (Sheeran, Jones, & Rowe, 2013). NICU mothers also reported that they do not feel that they received complete, comprehensible, and consistent information about their infants. Similarly, NICU policies and procedures were perceived as restrictive, resulting in mothers feeling excluded from the decision-making process (Sheeran et al., 2013). These challenges were heightened with adolescent mothers experiencing power struggles with staff when parenting their infant. Adolescent mothers reported feeling like outsiders being constrained from providing care and parenting (i.e., bathing, feeding, holding) with the need to obtain permission from NICU nurses (Sheeran et al., 2013). This study highlights the quality of care issues experienced by mothers that influence health disparities and child maltreatment outcomes.

Since there are extreme fear, trauma, and stress associated with parenting an infant in the NICU, providers need to teach parents infant avoidance cues and how to respond to their infant appropriately (Bader, 2012). NICU and medical providers are encouraged to motivate parents to touch their infants and educate parents on how to interact with their infant in order to improve infant brain development (Bader, 2012). Auditory, Tactile, Visual, and Vestibular (ATVV) is one method that can be taught to parents. ATVV intervention is a developmentally appropriate, sensory stimulus technique that can be taught that involves a mother's voice, rocking, moderate touch/stroking, and maternal eye contact (White-Traut, 2015). It is believed that this technique improves the stressful NICU environment by mitigating noise and improving long-term neurodevelopmental outcomes for the infant (White-Traut, 2015). These practices can reduce parent's stress and increase their confidence in completing (Bader, 2012) and improve parenting interaction and parenting skills (White-Traut, 2015).

Health disparities, related to NICU provider care, disrupt bonding and attachment, increasing maltreatment risks. Approximately 66% of received child maltreatment reports are from professionals (DHHS, 2018). However, there are a lot more professionals can do to prevent child maltreatment. Equal priority is not given to infant development, bonding-attachment, and education with NICU families to improve child maltreatment outcomes. This is an important point for NICU providers and lifesaving for NICU infants. Acute medical needs take priority over bonding, attachment, and inclusionary practices. Bader (2012) identifies the role of NICU providers as expanded to include more than life-saving practices. Proprioceptive input, positive touch, and infant massage are recommended to minimize infant stress and improve parenting outcomes (Bader, 2012).

Discussion

Based on the definition of health disparities, infant maltreatment, and mortality data results, maltreatment of NICU graduates is a health disparity with increased risks for infants of color. Reducing health disparities and achieving health equity is possible based

on the literature findings and the statistical data discussed. The recommended solutions include policy, practice, and research.

It is challenging to overcome child maltreatment health disparities without awareness. Future policy direction includes increased awareness about health disparities and the heightened risk to NICU graduates. The data demonstrates that there needs to be more education on maternal-infant risk factors. This is a population in need of child maltreatment prevention and intervention efforts in pregnancy for women at increased risk for NICU admissions. Perinatal social workers need to highlight these child maltreatment health disparities for NICU infants.

Similarly, perinatal social workers must educate other NICU providers and families of the health disparities that lead to child maltreatment NICU infants. Besides, provider education needs to emphasize the equal importance of NICU policies and practices that encourage maternal-infant attachment and bonding as a health equity strategy. NICU providers need more education about how unaddressed maternal mental health needs contribute to health disparities and increase risks for child maltreatment post-discharge. Obstetrical-gynecological departments need increased awareness to improve mental health screenings for mothers at their prenatal and post-partum follow-up.

Policy goals include improving mental health support & closing gaps in child welfare services for the complex challenges of NICU mothers. Mental health support funding needs to be directed toward on-going education for mothers, families, and NICU providers. Additional resources can increase access to clinical social workers, psychologists, and home visiting support programs for ongoing education and support for post-partum mothers. In addition, mental health education and referrals can be made for mothers who continue to require mental health support post-discharge. This can help decrease child maltreatment health disparities related to mental health risks.

“NICU policies need to be reviewed and developed to elevate attachment-bonding as life-saving interventions commensurate with NICU clinical care.”

NICU policies need to be reviewed and developed to elevate attachment-bonding as life-saving interventions commensurate with NICU clinical care. The policies that need to be considered include staffing, family visitation, infant care schedules, nursing schedules, family involvement, NICU environment, attachment-bonding opportunities, parent support services, parent and staff training, and education. In detail, NICU administrators need to ensure that the appropriate staff (i.e., social workers, psychologists, peer specialists) are present and available to support the needs of NICU mothers. It is important to review NICU clinical routines and family involvement with an emphasis on equitable delivery of medical care and family attachment-bonding. In addition, policies should include post-discharge outcomes, data, and research specific to child maltreatment, bonding, and attachment outcomes.

Research Direction

There are a few research articles that examine child maltreatment outcomes for NICU graduates. One research study examined child maltreatment of infants using an attachment-based approach. This study examined child maltreatment outcomes and

breastfeeding duration (Strathearn et al., 2009). This study found that out of 7,223 infants, 10.8% (780) were reported to child protective services (Strathearn et al., 2009). A total of 7.1% (512) of infants received substantiated maltreatment incidents (Strathearn et al., 2009). Consistent with current child maltreatment statistics, this study cited more than 60% of substantiated cases involving maternal perpetrated child maltreatment (DHHS, 2019). The study concluded an inverse relationship between maltreatment and breastfeeding, where maltreatment increased as breastfeeding duration decreased. Also, children with no child maltreatment reports were more likely to be breastfed for at least four months.

Further research is needed to analyze attachment-based intervention and maltreatment outcomes for NICU infants. In addition, more research is needed to examine the correlation between health disparities and child maltreatment outcomes. The NICU experiences of mothers need further exploration. African American women and infants require special research attention based on their disproportionate outcomes and infant fatality outcomes. Similarly, more research is needed to examine the mental health status of mothers as it relates to outcomes for NICU infants.

“Child maltreatment needs to be viewed through the lens of health disparities. Health outcomes must be improved for infants and mothers with an emphasis on African Americans infants and mothers.”

Conclusion

Child maltreatment continues to be a public health concern, and risks are higher for NICU graduates. Child maltreatment needs to be viewed through the lens of health disparities. Health outcomes must be improved for infants and mothers with an emphasis on African Americans infants and mothers. Medical providers and professionals must improve child maltreatment health disparities in the NICU population. NICU mothers must be connected to mental health and ongoing support services. NICU departments must evaluate their policies and practices to reduce gaps in service, discriminatory, and exclusionary practices. Professionals must consider their role in child maltreatment outcomes and respond with preventions.

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NT

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NICU Awareness

Did You Know?

Most NICU babies have special needs that last longer than their NICU stay. Many will have special health and developmental needs that last a lifetime. But support is available.

Learn about the programs in your community. Seek out other families like yours. Then ask for help. Working together we can create a community where our children will grow and thrive.

Special Health Needs

Babies who have had a NICU stay are more likely to need specialized care after they go home. **Timely follow-up care is important.**

NICU babies have a higher risk for re-hospitalization. So every medical appointment is important. Especially during cold and flu season when these babies are especially vulnerable to respiratory infections.

Who Can Help

- pediatricians
- neonatal therapists
- pulmonologists
- neurologists
- gastroenterologists
- cardiologists
- nutritionists
- CSHCN - Programs for Children with Special Health Care Needs

Special Developmental Needs

Any NICU stay can interrupt a baby's growth and development.

Needing specialized medical care often means that they are separated from their parents and from normal nurturing.

While most NICU graduates will meet all their milestones in the expected developmental progression, it is typical for them to be delayed. This is especially true for preterm infants who are still "catching up" and should be understood to be developing at their "adjusted age."

Who Can Help

- IBCLCs and lactation consultants
- Early Childhood Interventionists
- developmental pediatricians
- occupational therapists (OTs)
- physical therapists (PTs)
- speech therapists (SLPs)
- WIC - Special Supplemental Nutrition Program for Women, Infants, and Children
- social workers and case managers

Special Educational Needs

Every child has their own unique developmental needs and **every student has their own unique and special educational needs.**

Take advantage of the services and support that can meet your child where that are and help them reach their future educational goals.

Call your local school district to request a free educational evaluation. Learn about all the available programs and support.

Who Can Help

- Preschool Program for Children with Disabilities (PPCD)
- Special Education programs under the Individuals with Disabilities Education Act (IDEA)
- educational psychologists
- speech therapists (SLPs)
- occupational therapists (OTs)
- reading specialists



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Interpreting Umbilical Cord Blood Gases: Technical Issues: Part I

Jeffrey Pomerance, MD, MPH

In order to interpret the results of umbilical cord blood gases correctly, one must have an understanding of technical problems that can mislead on occasion. It is important to recognize:

- 1) When there is internal inconsistency within a blood gas sample,
- 2) When two blood gas samples likely derive from the same vessel,
- 3) When umbilical cord blood gas samples have been mislabeled, i.e., the samples are reversed,
- 4) When contamination of a blood gas sample with an air bubble(s) has occurred, and
- 5) The need for obtaining a complete blood gas analysis versus a pH alone.

“In order to interpret the results of umbilical cord blood gases correctly, one must have an understanding of technical problems that can mislead on occasion.”

These issues are all addressed within this section or will be within Technical Issues: Part II. Although bicarbonate values are provided, they will not be discussed until the following section on uteroplacental insufficiency. Only the base deficit will be used to evaluate metabolic acidosis.

Case 1: Internal Inconsistency within a Blood Gas Sample (1st example)

The mother was a 22-year-old, gravida 1, para 0, aborta 0, with an intrauterine pregnancy at 39 0/7 weeks based on reliable dates, in active labor. (1) After six hours, her cervix was six cm dilated, completely effaced, and at minus one station. The baby had caput and molding. The mother's temperature was 37.7° C, and the fetal heart rate baseline was rising. Following full dilatation, the mother pushed for two hours without progress and ultimately underwent a primary cesarean delivery. Apgar scores were 9 and 9 at one and five minutes, respectively.

Cord blood gas results were as follows:

	Umbilical Vein	Umbilical Artery
pH	7.34	7.29
Pco ₂ (mmHg) (kPa)	38 5.07	46 6.13
Po ₂ (mmHg) (kPa)	16 2.13	14 1.87
HCO ₃ (mmol/L)	20	22
BD (mmol/L)	5	15

Interpretation

The umbilical venous pH, PCO₂, and base deficit are normal. The PO₂ is marginally low. The umbilical arterial pH, PCO₂, and PO₂ are normal. The base deficit of 15 is moderately elevated. However, the base deficit is calculated from the pH and the PCO₂ (the hemoglobin concentration also plays a role as a buffer, but unless it is unusually high or unusually low, its effect is commonly ignored). If you are familiar with the usual relationship between the pH, PCO₂, and base deficit, you will recognize that a pH of 7.29 and a PCO₂ of 46 mmHg belie any significant metabolic acidosis (you would expect a normal base deficit). In my experience, the CSLI (Clinical and Laboratory Standards Institute) equations are the most commonly used by blood gas analyzers to calculate the base deficit. Indeed, calculating the base excess/deficit using CSLI with the equation for extracellular fluid base deficit (BDefc = -(PCO₂-24.8+16.2*(pH-7.4)) reveals that the correct base excess/deficit is approximately 5 mmol/L. (2) This is the value that was calculated and reported by the blood gas analyzer. However, the handwritten base deficit presented to the clinician was 15 mmol/L, constituting an internal inconsistency. In this instance, a transcription error occurred. Fortunately, the error was appreciated before the infant received any volume replacement. One must constantly be alert for such errors, and when they are suspected, you are encouraged to calculate the base deficit from the CSLI equation.

It is of interest to note that unless the fetus is dead, fetal core temperature is always higher than maternal core temperature. If the fetus were inert, its core temperature would be identical to the mother's core temperature. Biochemically, however, the fetus is a very active organism. Many biochemical reactions have heat production as a byproduct. The fetal temperature rises until fetal heat loss to the mother equals fetal heat production. This point of equilibration occurs at about 0.5° C (0.9° F) above the mother's core temperature. (3) In this case, the maternal temperature is reported as 37.7° C, and the fetal heart rate baseline as rising. When body temperature rises above normal, oxygen consumption increases, (4) (in the adult by approximately 10% per degree centigrade). (5) Therefore, a fetus with an elevated temperature and a borderline oxygen supply may be at increased risk of hypoxia (6) compared with a fetus with a normal temperature. A febrile mother will always have a febrile fetus. As the placenta is the main method of heat transfer between fetus and mother (high blood flow resulting in efficient convection), either uteroplacental insufficiency or cord compression initially results in elevation of fetal temperature by interfering with heat loss. (7) If uteroplacental insufficiency or cord compression becomes severe enough, fetal metabolism will fail, and fetal temperature will begin to decline.

Key Points

- Base deficit (and bicarbonate) is calculated from pH and PCO₂. If both pH and PCO₂ are normal, then base deficit (and bicarbonate) must also be normal.

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- Fetal core temperature is about 0.5° C (0.9° F) higher than the maternal core temperature.
- When body temperature rises, oxygen consumption increases, a fetus with elevated temperature and borderline oxygen supply may be at increased risk of tissue hypoxia.

Case 2: Internal Inconsistency within a Blood Gas Sample (2nd example)

The mother was a 27-year-old, gravida 2, para 1, aborta 0, with an intrauterine pregnancy at 40 4/7 weeks verified by an early obstetric ultrasound examination. The mother had one previous low-transverse cesarean delivery and now desired a vaginal birth. Delivery was by emergent cesarean delivery under general anesthesia following fetal bradycardia that ranged between 60 and 90 bpm for 45 minutes. The infant was found floating freely in the abdomen due to uterine rupture. Apgar scores were 1, 3, 3, and 5 at one, five, 10, and 15 minutes, respectively.

Cord and followup blood gas results were as follows:

	Umbilical Vein	Umbilical Artery	1 st UVC	2 nd UVC
pH	6.77	6.72	6.67	6.82
Pco ₂ (mmHg) (kPa)	122 16.37	143 19.07	136 18.13	139 18.53
Po ₂ (mmHg) (kPa)	9 1.20	5 0.67	89 11.87	143 19.07
HCO ₃ (mmol/L)	17	18	15	22
BD (mmol/L)	21	21	24	26

Initial attempts at intubation were unsuccessful. The infant was ventilated by bag and mask with 100% oxygen. Chest compressions were applied briefly. The infant was successfully intubated at 15 minutes of age. An umbilical venous catheter was passed. The initial two sets of blood gas values from the infant were drawn through the umbilical venous catheter (UVC) and were obtained at approximately 26 and 41 minutes of age. Ten mEq of sodium bicarbonate was administered following the first blood gas sample and before obtaining the second blood gas sample.

Interpretation

Both umbilical cord blood gas samples demonstrate very severe respiratory and metabolic acidosis, as one would expect the following 45 minutes of severe fetal bradycardia. The first infant blood sample, taken from an umbilical venous catheter, had a reported base deficit more severe than the umbilical artery cord gas. This is not surprising. At the time of birth, the infant's heart rate was low. As the fetal cardiac output is rate sensitive, (8) likely the infant's blood pressure was compromised, resulting in diminished circulation. Lactic acid produced at the tissue level no longer is efficiently cleared into the central circulation and subsequently into the umbilical arteries. Under these circumstances, the umbilical cord arterial blood gas does not fully reflect the metabolic acidosis ongoing at the tissue level.

The initial umbilical venous catheter blood gas reveals a PO₂ of 89 mmHg. Regardless of the concentration of inspired oxygen being delivered to the infant, a central venous PO₂ of 89 mmHg is not physiologically possible except under extraordinary conditions (congenital heart disease with an anomalous venous return below the diaphragm and near the position of the umbilical venous

catheter). Contamination of the blood sample with an air bubble is similarly unlikely, as the PCO₂ would be lowered. The PCO₂ value of 136 mmHg is markedly elevated (suggesting the ETT may not have been in the trachea). Almost certainly, the umbilical venous catheter extended into the right atrium of the heart and through the foramen ovale into the left atrium. Blood returns from the lungs through the pulmonary veins into the left atrium. This easily explains the elevated PO₂, which is present in the second umbilical venous sample as well.

Both the first and second umbilical venous catheter samples report large base deficits of 24 and 26 mmol/L, respectively. Note that the second sample has a higher pH than the first (6.82 versus 6.67). Therefore, either the respiratory acidosis has improved (lower PCO₂), and/or the metabolic acidosis has improved (lower base deficit). In fact, the second sample from the UVC has both a higher PCO₂ (139 versus 136) and a worse metabolic acidosis (BD 26 versus 24) than the first UVC sample. When neither has occurred, the only conclusion possible is that an internal (computational) error has occurred. Elevating the PCO₂ by itself, i.e., increasing the respiratory acidosis, will result in a lowered pH. However, the pH has risen from 6.67 to 6.82. Therefore, we must conclude that the metabolic acidosis, as reflected by the base deficit, has become less severe. It is reported, however, that the base deficit has worsened from 24 to 26 mmol/L. This is not possible. Using the CSLI equation to calculate base excess when the pH is 6.67, and the PCO₂ is 136 results in an extracellular fluid base deficit of 21 mmol/L. Similarly, when the pH is 6.82 and the PCO₂ is 139 results in a calculated BDecf of 12 mmol/L.

“The equation used to calculate base deficit is not identical from one manufacturer of blood gas analyzer to another. When either the pH or PCO₂ is severely abnormal, it is advisable to compare the calculated base deficit with the CSLI equation.”

The CSLI equation results confirm that the metabolic acidosis in the second sample is indeed less severe than in the first sample. The equation used to calculate base deficit is not identical from one manufacturer of blood gas analyzer to another. When either the pH or PCO₂ is severely abnormal, it is advisable to compare the calculated base deficit with the CSLI equation. If it is not reasonably close to the reported result, consider trusting the CSLI equation.

Key Points

- When blood from an umbilical venous catheter appears well saturated, suspect the catheter has passed from the right atrium through the foramen ovale into the left atrium.
- Be alert to the possible miscalculation of the base deficit, especially if either the pH or PCO₂ is severely abnormal. Consider using the CSLI equation for the extracellular fluid base deficit, to calculate a value and compare it to the value reported. If it is not reasonably, consider trusting the CSLI equation result.

Case 3: Contamination with an Air Bubble

The mother was a 38-year-old, gravida 5, para 3, aborta 1, with an intrauterine pregnancy at 40 3/7 weeks in active labor. The mother had morbid obesity (272 pounds) and class A diabetes mellitus that was said to be well controlled on diet alone. Uterine contractions occurred every two to three minutes; her cervix was seven cm dilated, completely effaced, and at zero station. Previous vaginal deliveries resulted in infants weighing 3850 g (8 lbs, 8 oz), 4080 g (9 lbs, 0 oz), and 4310 g (9 lbs, 8 oz). The estimated fetal weight was 4000 g (8 lbs, 13 oz). Three days before admission, a nonstress test was reactive. The membranes ruptured spontaneously, revealing trace meconium. One hour later, the cervix was nine cm dilated, completely effaced, and at plus one station. The mother was taken to the delivery room. Thirty minutes later, she delivered an infant with Apgar scores of 7 and 9 at one and five minutes, respectively. During delivery, there was brief difficulty delivering the anterior shoulder. Birth weight was 4675 g (10 lbs, 5 oz).

Cord blood gas results were as follows:

	Umbilical Vein	Umbilical Artery
pH	7.50	7.26
Pco ₂ (mmHg)	20	50
(kPa)	2.67	6.67
Po ₂ (mmHg)	92	11
(kPa)	12.27	1.47
HCO ₃ (mmol/L)	15	22
BD (mmol/L)	4	5

Interpretation

The umbilical arterial sample is normal. In the umbilical venous sample, the pH is high, the PCO₂ low, and the PO₂ very high. Conceivably, severe maternal hyperventilation could cause fetal PCO₂ to be lowered to 20 mmHg and pH to be raised accordingly. A PO₂ of 92 mmHg, however, is not possible absent a hyperbaric chamber.

“Conceivably, severe maternal hyperventilation could cause fetal PCO₂ to be lowered to 20 mmHg and pH to be raised accordingly. A PO₂ of 92 mmHg, however, is not possible absent a hyperbaric chamber.”

In an expectant mother breathing room air, the PO₂ in the uterine vein is normally about 44 mmHg, and the PO₂ in the umbilical vein is normally about 28 mmHg. (10) If an expectant mother with normal heart and lung function were to breathe 100% oxygen, her arterial PO₂ would likely exceed 600 mmHg, and her mixed venous PO₂ would be approximately 50 mmHg. (11) The umbilical venous PO₂ will always be lower than the PO₂ of the mother’s uterine vein. The PO₂ in the intervillous space changes modestly in response to supplemental oxygen given to the mother. Only if the mother were in a hyperbaric chamber with high ambient oxygen, would it be possible for the umbilical venous PO₂ to be raised into the range of 90 mmHg, as in the blood gas results provided

above.

Normal barometric pressure averages 760 mmHg at sea level. The partial pressure of oxygen in dry air is approximately 160 mmHg (21% oxygen; 0.21 x 760). Therefore, contamination of either an umbilical venous or arterial blood sample with an air bubble will raise the PO₂. The partial pressure of carbon dioxide in air is only about 0.3 mmHg (0.041% carbon dioxide; 0.00041 x 760). (12) Therefore, contamination with an air bubble will lower the PCO₂ in the sample and consequently raise the pH. PO₂ is the most helpful indicator to alert the clinician to a sample that has been contaminated with an air bubble(s), as a substantially elevated PO₂ is almost always secondary to such contamination. Minor increases in PO₂ over the upper end of normal in umbilical cord venous samples may occur in association with slowed umbilical venous blood flow.

The effect of contamination with an air bubble may vary over a wide range. Many small air bubbles are far more effective than a single large air bubble in altering PCO₂, pH and PO₂. It is the surface area of the interface between air bubbles and the blood that is important. In the extreme, room air may be mixed with a blood sample sufficiently to drive the pH over 8.2 and the PCO₂ down to three mmHg. Many years ago, I did this using a tonometer, an instrument used historically for creating a blood gas sample with known PCO₂ and PO₂, to test the accuracy of a blood-gas analyzer. This device is extremely efficient at mixing thousands of tiny bubbles of a gas with a liquid substrate. Contamination with an air bubble does not affect the base deficit because pH rises an amount equal to the respiratory effect of the decrease in the PCO₂. Contamination with an air bubble is purely a respiratory event. Therefore, in the presence of contamination by an air bubble(s), one may rely on the accuracy of the base deficit, but not the pH, the PCO₂, or the PO₂.

The most reasonable interpretation of the umbilical blood gas values in the case presented above is the contamination of the venous sample with an air bubble. The base deficit may be relied upon as being unaffected and is normal. Fortunately, significant contamination of a blood sample with an air bubble resulting in confusing results appears to be less common than previously. Some current blood gas analyzers do not report results when air bubble contamination is detected.

Key Points

- Contamination of an umbilical cord blood gas sample with an air bubble lowers the PCO₂ (consequently raising the pH) and raises the PO₂.
- PO₂ is the most helpful indicator to alert the clinician to a sample that has been contaminated with an air bubble(s), as a substantially elevated PO₂ is almost always secondary to such contamination.
- Minor increases in PO₂ over the upper end of normal in umbilical cord venous samples may occur in association with slowed umbilical venous blood flow.
- The base deficit is not altered by contamination with an air bubble, as lowering PCO₂ is a respiratory event, not a metabolic one.
- In the presence of contamination with an air bubble(s), some blood gas analyzers report only “air bubble contamination,” rather than blood gas results, making obfuscation of the true blood gas values less likely. Also, those using older model blood gas analyzers will also encounter this problem.

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RELIABLE RESOURCES:

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Medical Provider Documentation and Its Impact on Facility Coding

Kate Peterson Stanley, MD

Historically, healthcare providers have used the medical chart to document a patient's condition and treatment plan in order to record their encounter and communicate with others. Over time, the written record morphed into evidence required for payment of services and measures of medical care quality. With the advent of the electronic medical record and advanced computer systems, provider documentation now serves multiple purposes. In addition to patient care, it is associated with reimbursement for both health providers and patient care facilities. Quality, accuracy, and consistency of documentation are now more important than ever to ensure it clarifies the care received by the patient and supports payment for the care provided. In this month's column, the role of provider documentation and ICD-10 diagnosis coding to support facility billing will be delineated. In addition, tips to assist the medical provider in capturing the complexity of a patient's condition within the medical record will be highlighted.

Many providers are unaware of what occurs behind the scenes with their medical documentation. Within the bowels of health facilities, coders translate the providers' words into medical codes, which are subsequently used for reimbursement, quality reporting, and facility benchmarking. This includes codes from the International Classification of Diseases (ICD) Code Set. This set of codes is used by the World Health Organization to classify global mortality data. Each code has seven digits that categorize diseases, medical conditions, and injuries into different groups. Currently, it is in its 10th version. In the United States, the Centers for Disease Control have adapted and modified the code set (ICD-10-CM), which is used for standardization and reimbursement of health care services. ICD-10-CM diagnoses codes are combined with medical provider billing codes (CPT codes) and sent to both government and non-government insurers for reimbursement of medical services. Many providers may not realize that these codes are also used to organize hospital cases into groups for payment of facility services. Facility services include the materials and services used to "make the magic happen" such as the lights in the hospital room, nursing care and patient monitoring equipment. Thus, the facility depends on the accuracy of medical provider documentation for facility reimbursement.

The quality of the medical record documentation matters for both care and reimbursement. Medical facility coders use the information documented by the provider to determine which ICD-10-CM codes are submitted for claims reimbursement. Providers are increasingly being asked to participate in determining the appropriate ICD-10-CM codes. Inaccurate, incomplete or inconsistent documentation of the patient's condition, complexity or abnormal findings may result in under or overpayment for hospital services. Health providers often describe conditions as opposed to using a diagnosis or ICD-10-CM code to communicate the patient's illness or injury. However, coders do not have the authority to infer diagnoses from the medical descriptions or interpret data in the medical record. However, coders may seek clarification from providers via a query. Ensuring that the complexity of the patient's condition is reflected in the record improves the quality of care by communicating patient acuity to other

providers and payers, which results in reimbursement for the extra services required to care for complex patients.

“How can the medical provider ensure they are accurately documenting the patient's condition? First, determine if the patient's diagnoses “MEAT”s criteria: if a condition is Measured, Evaluated, Assessed, or Treated, it is the clinical significance that is documented in the medical record.”

How can the medical provider ensure they are accurately documenting the patient's condition? First, determine if the patient's diagnoses “MEAT”s criteria: if a condition is Measured, Evaluated, Assessed, or Treated, it is the clinical significance that is documented in the medical record. This includes illnesses that prolong hospitalization, require additional medical resources, or impact future health care needs. Chronic conditions that affect ongoing care are also included. However, despite previous interventions, conditions that have resolved are not reported for coding purposes. Additionally, coders may not report abnormal laboratory or diagnostic results for reimbursement without an interpretation and explanation within the documentation regarding their impact on the patient's condition. The MEAT criteria can guide the provider in accurately capturing the patient's acuity and complexity.

Next, commit to a diagnosis. Providers are taught to describe what they see and hear in the medical record, but they often fail to name the condition they are treating. Coders cannot assume a diagnosis from the medical record. ICD-10-CM diagnostic coding can bridge this gap because it is a common language that is used across the health care continuum. Increasingly, providers are required to use the ICD-10-CM codes within their documentation. However, they often struggle to designate an ICD-10-CM diagnosis when faced with uncertainty. In these situations, the provider should use their best judgment based on their clinical expertise, even when final tests or study results are not available. For hospitalized patients, inpatient coders are permitted to code for diagnoses when the provider uses terms such as “borderline, probable, possible, still to be ruled out, likely, suspected, appears to be, consistent with, indicative of.” Choosing an ICD-10-CM diagnosis code to “describe” the patient may not change the provider's clinical assessment and decision-making, but it will improve communication between the provider and coder.

Finally, be specific. Based on clinical judgment, choose an ICD-10-CM diagnostic code that best describes the patient's condition. In

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situations where a diagnosis is unknown, code for the presenting symptom that resulted in the evaluation. If a patient has a clinical syndrome, the code for the syndrome is used rather than each finding. However, if a finding within the syndrome has an additional clinical implication, the significance of that finding should be clarified. For example, if a child has Trisomy 21 with atrioventricular canal and clinodactyly, atrioventricular canal adds additional complexity to the patient's care. Clinodactyly, on the other hand, is an intrinsic feature of Trisomy 21 and does not change the acuity of the patient's condition. Lastly, abbreviations result in incomplete and confusing documentation and should be avoided. ARF can mean either acute respiratory failure or acute renal failure. Coders are not allowed to determine diagnoses from abbreviations unless stated within the coding rules, or they are part of the facility's official list of abbreviations. Specific and clear documentation of the patient's illness leads to more accurate coding.

Neonatal conditions have their own set of ICD-10-CM codes known as the perinatal codes, which begin with the letter (P00-P96). These codes are used for neonatal conditions that originate in the perinatal period, which is defined as the day of birth through 28 days of life. These codes are used regardless of the patient's age as long as they apply to the patient's current condition. This includes chronic conditions such as prematurity or bronchopulmonary dysplasia if they affect the presenting encounter or treatment. Codes from other ICD-10-CM categories that provide greater specificity about a patient's condition may also be used. Congenital diagnoses are designated by the letter Q (Q00-Q99). Clarifying whether a condition occurred before or after birth can affect a facility's quality metrics which may have future implications as insurers move toward quality-based reimbursement models. Finally, documenting the birthweight and gestational age of the neonatal patient may be obvious to most neonatologists, but stating that the patient is premature in addition to other characteristics assists the facility in capturing the complexity and resources used to provide to care these tiny patients require.

The purpose of the medical provider's documentation continues to expand beyond the medical care of the patient. Ensuring that the written record accurately reflects the complexity of the patient encounter assists both provider and facility reimbursement. ICD-10-CM can be used as a common language between the provider and coders to communicate patient conditions. Using the MEAT criteria, committing to a confirmed or presumed diagnosis, and documenting in a specific and accurate manner enhances the care and communication required to provide quality care to patients. Developing a relationship with the inpatient coders at your facility can assist in better understanding the nuances ICD-10-CM coding related to specific specialties such as neonatology and improve the reimbursement for the neonatal ICU in which you work.

Patient Question:

You admit a 4 hours old 27-week 950-gram premature male infant who was transferred to your facility. He was delivered vaginally after the mother presented with fever and premature labor. On admission, the infant has respiratory failure and requires Bubble CPAP 6, FIO2 28%. The chest radiograph shows underinflated lungs and a diffuse reticular granular pattern consistent with respiratory distress syndrome. Blood culture was obtained, and antibiotics were started prior to transport because of maternal chorioamnionitis. The infant has tachycardia, and you are concerned the infant may have sepsis.

What is the correct CPT code:

- A) 99477
- B) 99468
- C) 99471



The correct code is B: 99468 – Initial inpatient neonatal critical care, per day for the E/M of a critically ill neonate, 28 days or less. This patient meets the definition of critical care secondary to respiratory failure due to RDS requiring CPAP.

99477 represents the code for initial hospital care, per day, for the E/M of the neonate, 28 days of age or less, who requires intensive observation, frequent interventions, and other intensive care services. As stated above, this patient's condition qualifies him for critical care services.

99471 represents the code for initial pediatric critical care, per day, for the E/M of a critically ill infant or young child, 29 days through 24 months of age. This is not the correct answer because the patient described above is a newborn infant.

List the ICD-10-CM codes for this patient:

- 1) Prematurity, extreme 27 weeks P07.26
- 2) Low BW, extreme, 750-999g P07.03
- 3) Respiratory Distress Syndrome (RDS) P22.0 (For the purposes of facility coding, respiratory failure is inherent in the code for RDS; therefore, Respiratory failure of the Newborn P28.5 is not used with RDS P22.0).
- 4) Infant affected by maternal chorioamnionitis P02.78
- 5) Sepsis, neonate unspecified P36.9 (although this diagnosis may be uncertain, it is the best diagnosis to describe the acuity of the patient at this time. It can be changed when more information is available).

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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
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Federal Public Health Policymaking in an Epidemic: Access to Care for Pregnant Women, Newborns, & Children

Darby O'Donnell, JD 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.



During the first full week of March 2020, Congress passed, and President Donald Trump signed into law \$8.3 billion in emergency funding to address a growing number of coronavirus (COVID-19) cases in the United States. The funding will ensure a coordinated federal and state response to minimize and treat future outbreaks.

The legislation, [Coronavirus Preparedness, and Response Supplemental Appropriations Act, 2020, Public Law No: 116-123](#) “will bolster vaccine development, research, and equipment stockpiles, as well as boost state and local health budgets,” as government officials and health workers fight to contain the outbreak. (1) More than \$400 million will be disbursed to states within the first 30 days of the bill’s enactment, with each state receiving no less than \$4 million,” according to [Politico](#). (2) Provisions of the bill also include an “Economic Support Fund” and “International Disaster Assistance.”

With any rapid response and an epidemic that has reached a global scale, one has to ask which populations stand to benefit the most from this funding, and which are likely to be left on the outskirts or underrepresented in the distribution?

Two key demographics come to mind: young children and preg-

nant women.

Is coronavirus infection less prevalent in children?

More knowledge and data is still needed about how the coronavirus is transmitted and who it impacts. However, media outlets have published reports that children may be less susceptible to the infection (or bounce back more quickly than adults once affected).

“More knowledge and data is still needed about how the coronavirus is transmitted and who it impacts. However, media outlets have published reports that children may be less susceptible to the infection (or bounce back more quickly than adults once affected).”

In late February, [Business Insider](#) described a [study](#) of nine infants in China infected with the virus between December 8, 2020, to February 6, 2020 - all under one year old. (3,4) The study acknowledged in all nine cases, and each baby had become sick after exposure to at least one infected family member, “with the infant’s infection occurring after the family members’ infection.” Of interest, none of the nine infants “required intensive care or mechanical ventilation or had any severe complications.”

This is too small a sample size of infants with the infection to predict future infant health outcomes. Policymakers have difficult decisions to make: How should they, as lawmakers react during an infectious outbreak amid an early lack of impact reports? Should research and data collection for infants and children with the virus be less of a priority for government funding and outreach?

Babies under one year old cannot put on/wear masks, as the study notes. They do not sterilize their own toys or items in their environment, or voluntarily wash their own hands, or even make their own bottles/feed themselves. They are completely reliant on a caregiver to take precautionary measures when it comes to their health and protection of their developing immune systems. So it does not make logical sense, absent scientific proof or under-

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standing; otherwise, that infants are going to be more “immune” to coronavirus.

Yet to the contrary, based on early studies of coronavirus outbreak, children are reported to have milder symptoms with the coronavirus. As the article above says, “there are two possible explanations for why so few children have gotten sick: They’ve either been less likely to be exposed in the first place, or there’s something different about how their bodies respond to the virus.”

“Still, the flu likely poses a more imminent threat to many kids worldwide than the coronavirus,” David Weber, MD, MPH, a professor of epidemiology and pediatrics at the University of North Carolina at Chapel Hill, told Business Insider.”

“Still, the flu likely poses a more imminent threat to many kids worldwide than the coronavirus,” David Weber, MD, MPH, a professor of epidemiology and pediatrics at the University of North Carolina at Chapel Hill, told Business Insider.

Policymakers should consider that perhaps symptoms of the virus in babies and children are less likely to be reported by hospitals and individuals - or articulated by a small child, who may just be feeling feverish or may be unable to verbalize their symptoms.

But, maybe caregivers and adults are taking meticulous precautions around the pediatric population to keep them safe from infection and the spread of the virus.

Either way, current data and reports do not seem comprehensive; and so final decisions on the allocation of emergency funding to pediatric populations in the U.S. should be allowed to continue to take shape as we learn more about transmission and demographic impacts of COVID-19. Arguably, it is not yet known how coronavirus will impact the pediatric population across the U.S., or how living with infected adults can increase the risk of transmission of the coronavirus to children.

Vaccine Development

Babies are just tiny adults, right? So ... half?

Infants need drugs tested and approved just for them.

Center for Clinical Trials Innovation | NCJFH National Coalition for Infant Health

Still a Premie?

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

But that’s not every preemie’s story.

Born between 34 and 36 weeks’ gestation? **STILL A PREMIE**

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

- Jaundice
- Feeding issues
- Respiratory problems

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

Born preterm at a “normal” weight? **STILL A PREMIE**

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

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

Born preterm but not admitted to the NICU? **STILL A PREMIE**

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

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

<p>Some Premies</p> <ul style="list-style-type: none"> Will spend weeks in the hospital Will have lifelong health problems Are disadvantaged from birth 	<p>All Premies</p> <ul style="list-style-type: none"> Face health risks Deserve appropriate health coverage Need access to proper health care
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NCJFH National Coalition for Infant Health
Protecting Access for Premature Infants through Age Two
www.infanthealth.org

In a related occurrence, on March 5, 2020, in the same week, as the emergency funding was working its way through Congress, [Politico](#) reported, “Scientists have been amazed at the speed with which government health agencies and vaccine makers are assembling possible coronavirus vaccines. (5) Even so, top infectious disease scientist [and Director of the National Institute of Allergy and Infectious Diseases] Anthony Fauci MD has warned — repeatedly, and with the president nearby — that it will be at least a year before a vaccine could be launched.”

“While policy and health experts applaud global developments for a COVID-19 vaccine, researchers and academics in the United States are less enthusiastic and optimistic about the possibility of the benefits of such a vaccine for pregnant women and their infants.”

While policy and health experts applaud global developments for a COVID-19 vaccine, researchers and academics in the United States are less enthusiastic and optimistic about the possibility of the benefits of such a vaccine for pregnant women and their infants.

- Ensuring there’s a vaccine that can be offered to pregnant women is critical to health equity.

[“Historically, the interests of pregnant women have not adequately featured in global responses to outbreaks and epidemics.”](#) wrote bioethics and immunization research experts, all affiliated with

John Hopkins University. (6)

Their article cautions vaccine funders and researchers that scientific responses to global health outbreaks typically ignore the interests of pregnant women, who are not tested nor included in drug trials. As a result, scientific data collected on the outcomes of administered vaccines are woefully lacking for pregnant women and the child(ren) they carry. Lack of data also thereby blocks access to the vaccine for pregnant women and their children.

To combat this incongruity, the authors recommend that data collection and health surveillance collection systems include “data relevant to maternal, obstetric, and newborn health outcomes ... to inform scientific and public health responses.”

Additional suggested policies for drug developers and investors include:

- Ensure one or more of the vaccine candidates in the pipeline will be suitable for use in pregnancy;
- Determine what types of reproductive and developmental toxicology studies will be needed prior to enrollment of pregnant women in later-stage trials;
- Large-scale efficacy trials for promising vaccines should assume that pregnant women are eligible to be enrolled unless the risks outweigh the benefits.

The aim of these recommendations is a body of evidence tailored towards pregnant women - so that they may, in turn, base their decisions and response during their pregnancy and a health crisis on the information most relevant to their current circumstances.

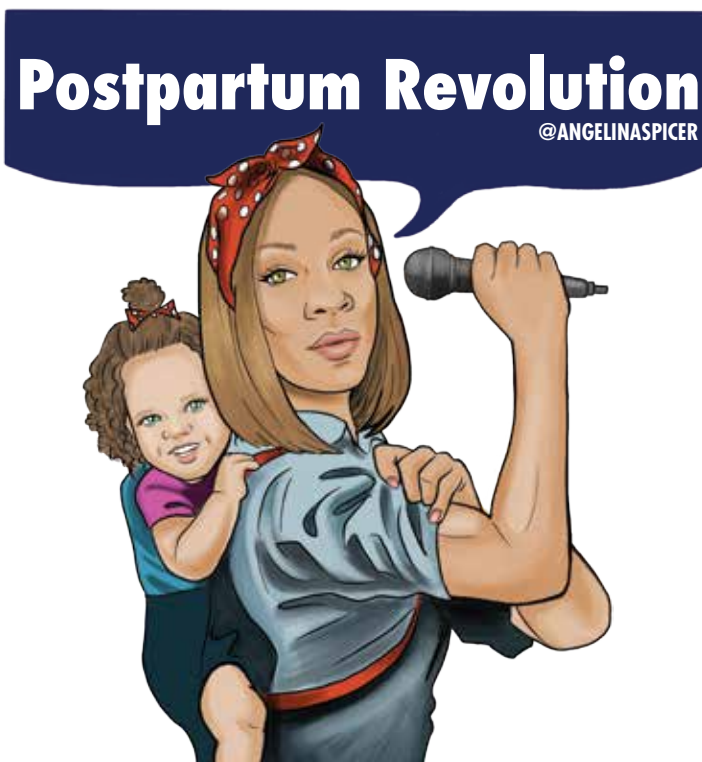
More Information

The coronavirus emergency funding bill, [Public Law No: 116-123](#), is likely the first in a series of emergency funds requested by the Administration and executed by Congress. (7) If coronavirus amounts to the broad scale of a global epidemic - as is the current narrative in the U.S. news media - more funding will be needed to address prevention, treatment, care, and cure.

Watch for where and to whom the money gets directed.

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Use your best clinical judgement



when prescribing RSV prophylaxis

Tell insurers what families need



and provide the supporting evidence



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

Survey Says: RSV

RESPIRATORY SYNCYTIAL VIRUS, or RSV, is a dangerous virus that can lead to:

- Hospitalization
- Lifelong health complications
- Death

for infants and young children



ACCORDING TO A NATIONAL SURVEY, Specialty Health Care Providers say:

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

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

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



But Parents are Unprepared.

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

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



RSV EDUCATION & AWARENESS CAN HELP

After parents learned more about RSV, they were:



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Preventing RSV in Preterm Infants through Age Five

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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!

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Neonatal Abstinence Syndrome
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Compiled and Reviewed by Mitchell Goldstein, MD Editor in Chief

Coronavirus (COVID-19) Update: FDA and CDC take action to increase access to respirators, including N95s, for health care personnel

Broad implications for the availability of these essential devices.

For Immediate Release:
March 02, 2020

Today, in a joint effort, the U.S. Food and Drug Administration and the Centers for Disease Control and Prevention took action to make more respirators, including certain N95s, available to health care personnel. Currently, the majority of respirators on the market are indicated for use in industrial settings. Today's action allows certain National Institute for Occupational Safety and Health (NIOSH) approved respirators not currently regulated by the FDA to be used in a health care setting by health care personnel during the coronavirus (COVID-19) outbreak, thereby maximizing the number of respirators available to meet the needs of the U.S. health care system.

"President Trump has made it clear that protecting the American people is his top priority, and that includes taking every necessary step to ensure America's healthcare providers have the tools they need," said HHS Secretary Alex Azar. "The FDA and CDC's action to allow a wider range of respirators to be used in healthcare settings will help those on the front lines of this outbreak and their patients, which will keep all Americans safe. We will continue pursuing every possible avenue to secure the protective gear needed for responding to the COVID-19 outbreak."

Respiratory protective devices are designed to achieve a very close facial fit and very efficient filtration of airborne particles. When properly fitted, respirators, such as N95s, can filter more airborne particles than face masks, which is important during an outbreak of a respiratory disease like COVID-19. The FDA regulates respirators intended for use in a health care setting, however, most respirators are used in construction and other industrial jobs only and are therefore not required to meet the FDA requirements for testing.

Today, the FDA granted the CDC's request for an emergency use

authorization (EUA) to allow health care personnel to use certain industrial respirators during the COVID-19 outbreak in health care settings. The FDA concluded that respirators approved by NIOSH, but not currently meeting the FDA's requirements, may be effective in preventing health care personnel from airborne exposure, including COVID-19, which can cause serious or life-threatening disease, including severe respiratory illness. Given the increased demand and supply challenges on the availability of respirators, today's EUA helps to provide alternatives that can enable more health care personnel to have access to this potentially lifesaving personal protective equipment. This action is the result of the close collaboration between the FDA and the CDC to prioritize access to needed medical products during this outbreak to support health care personnel.

"The FDA, alongside the CDC and other federal, state and local partners, have been aggressively addressing the COVID-19 outbreak," said FDA Commissioner Stephen M. Hahn, M.D. "At the FDA, we've been working diligently to mitigate any potential shortages in the supply chain, including addressing increased demand and supply challenges associated with personal protective equipment. It is imperative that we assure health care personnel on the front lines of this outbreak have sufficient supplies of respiratory protective devices. Actions like today's emergency use authorization are one of many tools the FDA can utilize during a public health emergency to respond to critical public health needs."

Of note, the agencies are not currently aware of specific widespread shortages of personal protective equipment, but there are reports of increased ordering of these products and shortages have been observed in some U.S. health care institutions. The FDA and CDC are aware that as the COVID-19 outbreak continues to expand globally, the supply chain for these devices will continue to be substantially stressed as demand exceeds available supplies. Under the circumstances of this emergency, nationwide shortages are anticipated. The FDA and CDC are taking steps to address the observed and anticipated shortages by expanding the use of respirators that are NIOSH approved, but do not currently meet FDA regulatory requirements. This action today is part of an overall HHS strategy to help optimize the availability and use of respirators for health care personnel.

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“The action taken today by CDC and the FDA will increase the availability of N95 respirators to healthcare professionals across the country and we will continue to work together with our agency partners to protect the health and safety of all Americans,” said CDC Director Robert R. Redfield, M.D. “It is important to remember the best way to prevent the spread of respiratory disease is by using everyday preventative actions. These include hand washing, using tissues to cover a cough, disinfecting frequently-touched surfaces and keeping distance from people who are coughing and sneezing. CDC does not recommend the use of masks by the general public.”

Additionally, while the EUA today can help increase the availability of certain NIOSH-approved respirators to health care personnel, this EUA does not apply to the public, who should not wear these respirators to protect against COVID-19. There is no added health benefit to the general American public to wear a respiratory protective device (such as an N95 respirator). The immediate health risk from COVID-19 is considered low. [The CDC recommends everyday preventive actions](#), such as hand washing, to help prevent the spread of respiratory diseases.

The FDA will continue to update the public on our efforts to respond to this outbreak and efforts to find solutions to help mitigate any supply chain challenges that may arise, including continuing to assess the potential impacts of this outbreak on availability of medical devices and personal protective equipment. We are committed to working with stakeholders across the

supply chain in close collaboration with public health and government partners to help enable access to critical medical products.

The FDA, an agency within the U.S. Department of Health and Human Services, protects the public health by assuring the safety, effectiveness, and security of human and veterinary drugs, vaccines and other biological products for human use, and medical devices. The agency also is responsible for the safety and security of our nation’s food supply, cosmetics, dietary supplements, products that give off electronic radiation, and for regulating tobacco products.

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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, and Sunday 11/17/2019 1020

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

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Coronavirus Update: FDA steps to ensure quality of foreign products

Guidances issued regarding FDA steps to improve the quality of foreign products.

For Immediate Release:

February 24, 2020

Statement From:

Commissioner of Food and Drugs - Food and Drug Administration

Stephen M. Hahn M.D.

Associate Commissioner for Regulatory Affairs - Office of Regulatory Affairs

Judith A. McMeekin Pharm.D.

Recently, we provided an update on FDA-wide activities we are engaged in related to the novel coronavirus outbreak: COVID-19. We continue to take a multi-pronged approach to this public health emergency, including focusing on actively facilitating efforts to diagnose, treat and prevent the disease; surveilling the medical product supply chain for potential shortages or disruptions and helping to mitigate such impacts, as necessary; and leveraging the full breadth of our public health tools, including enforcement tools to stop fraudulent activity as we oversee the safety and quality of FDA-regulated products for American patients and consumers.

Today, we are providing updated and more detailed information about the status of FDA inspections in China and the agency's oversight of imported products from China, which have been impacted by this outbreak. While we are not able to conduct inspections in China right now, this is not hindering our efforts to monitor medical products and food safety. We have additional tools we are utilizing to monitor the safety of products from Chi-

na, and in the meantime, we continue monitoring the global drug supply chain by prioritizing risk-based inspections in other parts of the world. The FDA is not currently conducting inspections in China in response to the U.S. Department of State's Travel Advisory to not travel to China due to the novel coronavirus outbreak. We will continue to closely monitor the situation in China so that, when the travel advisory is changed, we will be prepared to resume routine inspections as soon as feasible.

We already use other tools to help complement our inspections, including import screening, examinations, sampling, and import alerts, relying on a firm's previous compliance history, and we use information from foreign governments as part of mutual recognition agreements. Thus, at this time, we can rely on these other tools to give us comprehensive oversight of FDA-regulated products entering this country. This is all part of our agency's risk-based approach to ensuring quality, as well as compliance with applicable FDA requirements.

It is important to reiterate that inspections are one of many tools that the agency uses to inform our risk strategy for imported FDA-regulated products and to help prevent products that do not meet the FDA's standards from entering the U.S. market. A wide variety of FDA-regulated products are imported from China, which makes it important to assure the public of



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the quality of these products. At this time, over 60% of FDA-regulated products imported from China are medical devices and 20% are housewares (like food packaging).

In response to the COVID-19 outbreak, the FDA will utilize, where appropriate, our authority to request records from firms "in advance or in lieu of" drug surveillance inspections in China. The Federal Food, Drug, and Cosmetic Act, as amended by the FDA Safety and Innovation Act (FDASIA) of 2012, gives the FDA authority to request records "in advance of or in lieu of" on-site drug inspections. Congress enacted this provision to improve the effectiveness and efficiency of inspections, given the increasing globalization of drug production. Along with other FDASIA provisions, this inspection record request authority was viewed as a way to "level the playing field" between foreign and domestic drug inspections by allowing the FDA to review records ahead of time and take a more risk-based approach to conducting both domestic and foreign inspections. These records will help the agency when we resume drug inspections in China. By applying the use of paper records in our risk-based inspection framework, we can prioritize our early inspections on those deemed most needed, based on the records. By doing so, we hope to rapidly assess what could become a backlog number of on-the-ground surveillance inspections this fiscal year if travel restrictions persist.

In addition to records requests, the FDA will continue working with U.S. Customs and Border Protection to target products intended for importation into the U.S. that violate applicable legal requirements for FDA-regulated products, which may come from a variety of sources, such as first time importers unfamiliar with regulatory requirements or repeat offenders trying to skirt the law. FDA has the ability through our risk-based import screening tool (PREDICT) to focus our examinations and sample collections based on heightened concerns of specific products being entered into U.S. commerce. The PREDICT screening continues to adjust risk scores as necessary throughout the COVID-19 outbreak. We are keeping a



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close eye out for indications of port shopping or cargo diversion and will continue our oversight of shipments through potentially higher-risk venues such as International Mail Facilities. We can refuse admission of products that fail sample testing or may violate other applicable legal requirements.

Fortunately, currently, we are not seeing the impacts of this outbreak resulting in an increased public health risk for American consumers from imported products. There is no evidence to support transmission of COVID-19 associated with imported goods and there have not been any cases of COVID-19 in the United States associated with imported goods. As noted, this remains a dynamic situation and we will continue to assess, and update guidance as needed.

We also continue to aggressively monitor the market for any firms marketing products with fraudulent COVID-19 prevention and treatment claims. The FDA can and will use every authority at our disposal to protect consumers from bad actors who would take advantage of a crisis to

deceive the public, including pursuing warning letters, seizures, or injunctions against products on the market that are not in compliance with the law, or against firms or individuals who violate the law. We know the public may have questions or concerns for the FDA as a result of this outbreak, including you and your family's risk of exposure, or whether your critical medical products are safe and will continue to be available in the future. We assure you that the FDA is working around the clock to monitor and mitigate emerging coronavirus issues through collaborative efforts with U.S. regulators, international partners, and medical product developers and manufacturers to help advance response efforts to combat the COVID-19 outbreak.

The FDA, an agency within the U.S. Department of Health and Human Services, protects the public health by assuring the safety, effectiveness, and security of human and veterinary drugs, vaccines and other biological products for human use, and medical devices. The agency also is responsible for the safety and security of our nation's food supply, cosmetics, di-





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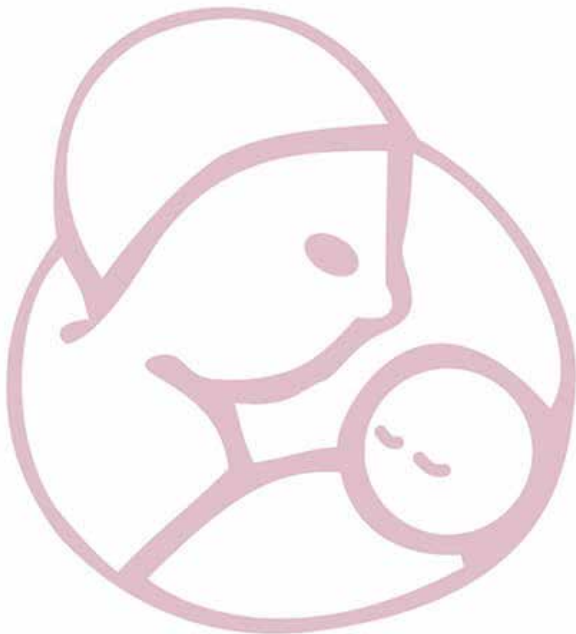
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Transcript - CDC Media Telebriefing: Update on COVID-19

Transcript of recent CDC call regarding COVID-19

Press Briefing Transcript ([MP3](#))
[COVID-19 Digital Press Kit](#)
Wednesday, March 10, 2020

I'd like to inform all participant that the phones are on listen only. Today's call is recorded. If anyone has any objections, you can disconnect at this time. I would like to turn the call over to Paul Fulton with CDC public affairs. Thank you, you may begin.

Thank you. Thank you all for joining us today for this briefing to update you on CDC's COVID-19 response. We're joined by Nancy Messonnier, director of CDC's National Center for Immunization and Respiratory Diseases. We'll make opening remarks. I turn the call over to Dr. Messonnier.

Good afternoon. Thank you all for joining us. As of today, there are more than 110,000 cases of COVID-19 worldwide. In the U.S., as of Sunday evening, 34 states plus New York City and D.C. have reported more than 500 cases of COVID-19 to CDC and 19 deaths. Nearly half of reported cases are in California and Washington. 18 of the deaths are in Washington. The remaining one is in California. Right now the states with the most cases are California and Washington. But other communities are also dealing with cases of COVID-19. That's why I'd like to talk to you today in greater detail about risk. Risk can be looked at in two ways. There is risk

of being exposed and getting sick from this virus and there is risk of getting very sick or dying from illness with this virus. This virus is capable of spreading easily and sustainably from person to person based on the available data. The report of the World Health Organization mission to China describes the virus as being highly contagious. And there's essentially no immunity against this virus in the population because it's a new virus. Based on this, it's fair to say that as the trajectory of the outbreak continues, many people in the United States will at some point in time either this year or next be exposed to this virus and there's a good chance many will become sick. But again, based on what we know about this virus, we do not expect most people to develop serious illness. Reports out of China that looked at more than 70,000 COVID-19 patients found that about 80% of illness had — was mild and people recovered. 15 to 20% developed serious illness. Let's talk about who those people are. So far it seems like it's not children. Of the 70,000 cases, only about 2% were in people younger than 19. This seems to be a disease that affects adults. And most seriously older adults. Starting at age 60, there is an increasing risk of disease and the risk increases with age. The highest risk of serious illness and death is in people older than 80 years. People with serious underlying health conditions also are more likely to develop serious outcomes including death. The people who are at greatest risk are those older and who also have serious long-term health conditions like diabetes, heart disease, or lung disease. Last week CDC added guidance to our website for people who are at higher risk for serious illness. Our goal is to protect you. This will require you and your family to take action. I'd like to go through our recommendations for people at highest risk. Make sure you have supplies on hand like routine medications for blood pressure and diabetes. And over-the-counter medicines and medical supplies to treat fever and other symptoms. Have enough household items and groceries so that you will be prepared to stay home for a period of time. Take everyday precautions like avoiding close contact with people who are sick, cleaning your hands often, and to the extent possible, avoid touching high touch surfaces in public places. Avoid crowds especially in poorly ventilated spaces. This weekend the federal government made a very specific recommendation in this context that travelers particularly those with underlying health issues defer all cruise ship travel worldwide. We also recommend that people at higher risk

avoid nonessential travel such as long plane trips. Lastly, and most importantly, know what's going on in your community. If you could end up in the role of helping to care for a family member or friend who is at greater risk, we recommend you familiarize yourself with your loved ones' medication and help them get extra to have on hand. Help them also get food, medical supplies and other necessities so they can minimize trips to the store. Create a plan for if they get sick and if you get sick. You have to identify backups to take care of them. Everyone has a role to play to protect our family members, friends, colleagues, and neighbors who are at most risk. I understand these recommendations may not be popular and that maybe — and that they may be difficult for some people. At CDC, our number one priority is the health and safety of the American people. These are the kind of recommendations that I have made to my parents and I'm taking the appropriate steps recommended for family members of vulnerable people. Other staff at CDC are doing the same. We have more than 1,500 people who have worked on this response so far. And we take the health and safety of our employees very seriously. CDC is an essential component of the U.S. critical infrastructure on this response. To date no one in CDC's workforce has tested positive for COVID-19. We will continue to work with the Office of Personal Management on federal government strategies and guidance. Some businesses and local governments are already taking similar measures. The point of these is to reduce exposures, reduce illness which in turn can protect our most vulnerable. But it's also a strategy to keep workplaces up and running though on a modified basis. Government officials and public health departments will make decisions based on local conditions at the time. We urge you to follow their lead. Before I close, I want to give you an update on public lab capacity. 78 state and local public health labs across 50 states now have the capacity to test up to 75,000 people for COVID-19. We will have more information online this afternoon for clinicians on how to access the tests. The information will also be about the commercially available kits. However, we want to caution people that different states will have different capacity for testing as well as different policies about who should be tested. Lastly, I want to recognize and share your concern about the outbreak and what might happen here in the United States. We've gotten a lot of questions about events and conferences where cases have been identified. CDC is working with state and lo-

cal public health departments to reach these people but we also want those who attended these functions to monitor themselves for COVID-19 symptoms and call their health care provider if they become ill. Especially if they're in a high risk group. During an outbreak with the new virus, there is a lot of uncertainty. Our guidelines and recommendations are likely to be interim and subject to change as we learn more. We know that in South Korea no one under the age of 30 has died and in Japan no one under the age of 50 has died. Data from these countries help us understand the potential risk here in the U.S. That's why it's so important for older adults and people with serious underlying health conditions to be prepared. I'll be happy to take questions now.

If you'd like to ask a question, please press star 1. Record your name slowly and clearly. Your name is required to introduce your question. Our first question is from Tom Howell with the Washington Times, your line is open.

The first publicly documented case in mid-January is someone that traveled from China to Washington. I want to know what

about is there anything about that fact that speaks to what we're seeing now in Washington state? I'm just wondering if contact tracers investigated that and if there is any link to what we're seeing now. Thank you.

Messonnier: You may remember that the response to that initial case in the United States was quite aggressive with the health department having the lead in CDC supporting them. They did very aggressive contact tracing looking to identify anybody who had had contact with that initial case and sort of concentric circles outward. They didn't find any evidence of COVID-19 in any of those contacts. Now I think you're probably referring to a publication that came out within the past couple of weeks looking at the genetic sequencing data of the initial patient versus — and comparing it to the cases that are now circulating in Washington state. And one hypothesis that the author made was that the changes between the initial case and now suggested that the strain had been circulating in the population. I think that's an interesting hypothesis. But another hypothesis is that a secondary seeding of the community and the strain causing the more recent cases in Washington state matches


sequences that have been posted from China. So I think that's an interesting hypothesis. I expect we'll see more of it. But there are alternate explanations of the same findings.

Thank you. Next question, please.

Thank you. Our next question comes from Issam Ahmed with AFP. Your line is open.

Yeah. Thank you for doing this. I was wondering with regards to your advice about, you know, higher risk Americans inviting them to stock up on groceries and medicine at this point. Where would you draw that cutoff at this point? Is that for over 60? Thank you.

Messonnier: Thanks for letting me clarify. You know, I want to clarify the reason to stock up is that there is a rational for being in a higher risk group wanting to avoid congregate settings. So it's not — the reason to stock up now is so you can stick close to home. The reason I went into data in greater detail is because it's important for the American public to understand the risk. We use the broad categories of over 60 or over 65, but the data really says that as you get older,



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the risk goes up and so in the broader age category of over 60 or over 65, over 80 or older has the greatest risk. So I would recommend that people make their own decisions based on an understanding of that risk. My parents are in their 80s. They're not in an area where there is currently community transmission. But I've asked them to stick close to home so they can avoid the potential risk of being in congregate settings.

Next question.

Thank you. Our next question comes from Eben Brown with FOX news. Your line is open.

Thank you very much for taking my call. I just want to piggyback on an earlier question. There is even just for my own personal goings about a lot of empty shelves in stores and things like that. There seems to be — I was in an airport the other day where someone had not just a regular old mask but like a big molded plastic mask with canisters on. There seems to be like a growing — I don't want to say panic, but kind of headed that way. Is there a way that we all can provide some sobriety here because the last thing I think we all need is a panic but we want to be people vigilant and make the right decisions.

Messonnier: I think that's a really great point. And really important thing for the media to try to communicate. You know, right now in the United States most communities by far the vast majority of communities are not having community transmission. This is a time for people to prepare for what they might need to do but not a time for people to clear out the shelves. And I really want to focus on the United States and the families at highest risk because in the setting where it's really clear that it is older Americans who are at the highest risk right now, we want to make sure that they're taking every precaution to prepare themselves so that if there is more widespread transmission, they can stick close to home. In terms of masks, as you implied and I'll say, we really do not think this is the time for Americans to be going out and getting masks. Masks are really important for those at highest risk in the health

care setting and we want to make sure that we save enough masks for our health care workers on the front lines who will need to continue to be able to do their work and take care of all of us. So in particular in the setting of concern about masks, I ask people to please fight the urge to buy a mask and make sure we save them for the people that really need them.

Next question.

Thank you. Our next question comes from Andrew Joseph from STAT. Your line is open.

Hi. Thanks. Can you elaborate a little more on how you all see this potentially playing out? Obviously, there are mitigation efforts and hopefully they work. But you're saying many people will get exposed this year or next. So if you can just sort of explain what that might look like if it is kind of persists for months to years.

Messonnier: Yeah. I think that as we said since the beginning, respiratory viruses that's spread like this tend to spread. And what we as a community need to do is do everything we can to protect ourselves and our families and our communities so that the — if it does spread, it is in a slower fashion so that we're all better prepared and so that our health care sector can take care of patients. We continue to believe that in most communities contact tracing is really appropriate because it identifies the contacts and keeping them from spreading can have a significant role in slowing this down. You likely will see in some communities like in Seattle and in California more efforts towards broad fed community mitigation as an attempt at a community level to slow this spread. I think we need to be — we need to make sure that we're listening to our local health departments. I also think people need to understand that there are personal responsibilities that we're asking everyone in the United States to take to make sure that they're doing their best to protect themselves and their families and their communities and right now especially to make really strong efforts to protect those who are older and at

underlying risk. As a community, the United States we can really mitigate the impact of this disease and as long as we work together that, will continue to be CDC's goal.

Next question, please.

Thank you. Our next question comes from Lindsey Tanner with the Associated Press. Your line is open. Lindsey, your line is open. (No response)

Our next question comes from Roni Rabin with the New York Times. Your line is open.

Hi. Dr. Messonnier, can you be more specific by with have a high rate of diabetes and chronic conditions in people that are much younger than 80s, can you be more specific about people in their 40s and 50s should be doing and people in their 60s and 70s?

Messonnier: I think it's really important for us to stress as we have I think throughout the course of this that we are making recommendations based on the available data and when more data becomes available fine tuning them and trying not to get beyond what we know. What we know from the data is the highest risk is those in both older and with underlying health conditions. There are reports of individuals who are adults but with serious underlying health conditions who have also had more serious outcomes. And I think that if you're in one of those groups separately or together that is underlying illness, underlying illness and older adult or underlying illness and younger, you need to be thinking towards what personal precautions you might want to take. And certainly for those with diabetes and high blood pressure, managing your diabetes and high blood pressure is a priority. When more data becomes available from our investigations in the United States and from our work globally investigating we'll certainly provide more direct data. But right now, there is not data to be as precise as we're asking.

Next question, please.

Thank you. Our next question comes from Brenda Goodman from WebMD. Your line



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is open.

Hi, Dr. Messonnier, I was hoping that you could explain a little bit about the difference between containment and mitigation. And also tell us if there are any communities in the U.S. that have moved from containment to mitigation, for example, Seattle? And why.

Messonnier: Sure. That's a great question. I think it's really important to make it really clear that this is not an on/off switch that you switch from one to the other. In general, containment means that you stop the spread. What it has meant in this setting is decreasing the number of potentially exposed people coming into the United States through border control. And then tracking every case and every potential contact, every case in order to keep them from spreading it further. So very much sort of what you would imagine when you think about person x had in contact with person y and person y had contact with six others and tracking down every one of those individuals and asking them to stay home, you can, we've seen you can keep it from spreading further. Mitigation is more community level interventions. And what that means is that you're working to decrease the impact of the disease on a community. In Seattle and in California, they haven't stopped entirely contact tracing but they have started mitigation. And I think that you will likely see local health departments deciding when there is community spread to start turning on more of the mitigation measures even while they're still doing some level of contact tracing. So again, it's not an on/off switch. It's a dimmer. You will see I think lots more communities starting to implement some kind of mitigation measures when they're seeing community spread. It will look different in different places and that's why it's really important for folks to stay informed of what is going on in their local area and to follow their advice of the local health department.

We have time for three more questions. Next question, please.

Thank you. Our next question comes from Jose Paley with Univision. Your line is open. Hi, doctor. My question is New York City is an area with community transmission and earlier in the call you mentioned people should avoid crowds and poorly ventilated spaces. My question is what does that mean for subways and busses where commuters like myself are regularly pressing up against each other in very tight closed spaces.

Messonnier: Again, I think it's really important for two different things. One is to pay attention to the recommendations from your local health department which are going to be more tailored to the specific situation in terms of spreading your community and the risks. In terms of avoiding crowded settings, our focus really is on those with the higher risk and oldest among us and especially those with underlying illnesses. So for people again, older and underlying illnesses, we are recommending avoiding crowds, congregate settings because those are places where in general there is lots of transmission of respiratory diseases. We're asking individuals to be aware of the risks but individuals are going to have to make personal decisions based on their own situations.

Next question, please.

Thank you. Our next question comes from John Tozzi with Bloomberg News. Your line is open.

Thank you for taking the question. I want to clarify. You said earlier that 78 state and local health labs have the capacity to test up to 75,000 people. Is that 75,000 in what period? Is that cumulative? Daily 75,000? Weekly?

Messonnier: Cumulative. Again, it's the public health sector CDC lab kits, 75,000 but more are coming onboard soon. 75,000 cumulatively. But, I think as you know the number of commercially available kits, the number of commercially available tests is much larger than that and our expectation within the next couple weeks is more and

more commercial entities become – come onboard is the majority of the available testing will actually be from the commercial sector.

Okay. Last question, please.

Thank you. Our last question comes from Brianna Abbott with The Wall Street Journal.

Your line is open.

Hi. Thanks for taking my question. As you mentioned, there have been cases that are now starting to be linked to conferences and mass gatherings. Companies have taken steps to cancel these. I wonder from a public health perspective, is cancelling mass gatherings something we should broadly start doing or is that an overreaction? Where do we stand on that?

Messonnier: It is really difficult to make those kind of pronouncements broadly. I think the thing at this point we're recommending is consideration of the local situation, consideration of what is going on in the locale where the event is being held. But and also where people are coming from and what the event is and how big it is. So the decisions, for example, in Seattle may look quite different than the decisions being made in a location right now where there is not community spread. I think that we're going to need to follow the local community's lead. And again, a lot depends on the population. So we're looking both at risk of exposure but also the risk to the individuals and as you look at those two factors together, in consultation with local and state health departments, decisions may be different in different events and different locations.

Thank you, Dr. Messonnier and thank you all for joining us for today's briefing. Please check CDC's COVID-19 website for the latest updates on CDC's response efforts. If you have more questions, please call our number or e-mail us. Thank you.



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

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

That concludes today's conference. Thank you for participating, you may disconnect at this time.

###

CDC works 24/7 protecting America's health, safety and security. Whether diseases 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.

NT

EXPERT PITCH: Social distancing doesn't have to mean social isolation.

Laurie Theeke, a WVU nursing professor who researches loneliness and its effects on health, offers tips on how people can feel connected during social distancing efforts to slow the spread of COVID-19.

NEWSWISE: 18-Mar-2020 11:05 AM EDT,

by West Virginia University

As people across the nation prepare for social distancing to slow the spread of the novel coronavirus, they may stock up on groceries, fill all of their prescriptions and reschedule doctor's appointments. What they may not think to do is plan ways to keep from feeling lonely.

"Social isolation is very harmful to health and contributes to poor health outcomes, especially for older adults," says Laurie Theeke, a nursing professor at West Virginia University and nurse practitioner at WVU Medicine.

She suggests 10 ways to stay connected with others and prevent loneliness during the coronavirus pandemic.

Identify your vital connections "These are connections that you view as essential to your health, well-being and quality of life. This could be a broad range of people, including friends, neighbors and family."

Make sure you have contact information

"This includes phone numbers, mailing addresses and email addresses for vital connections. This way you can call, email and—yes—mail things to people you want to stay connected with on a regular basis."

Evaluate your connectivity resources "Do you have a cell phone? Consider using FaceTime to talk to someone rather than just calling. Being able to see the face of another person can make you feel more connected. Do you have a computer? If so, is there an online blog or group you could join to help others and stay connected? Do you have a walkie-talkie set? It might sound odd, but sometimes playing with this type of old-fashioned connection can be a fun way to get in touch with people."

Make a schedule "A schedule helps us to stay on track and will help you to feel engaged throughout the day. Include items in your schedule that help you to stay connected. For example, put it on your schedule to call a different neighbor each day if that helps. Add calling a child or parent daily. These types of scheduled contacts will help you get through the pandemic and help you to feel good about your proactive approach to maintaining social ties."

Engage in positive health behaviors "Make every effort to stay healthy because it is known that a lack of sleep and exercise will contribute to loneliness. Know that foods like fruits and vegetables contribute to hormones that increase your happiness. For many, social distancing means cooking at home, so plan for healthy meals."

Consider helping other people as much as you can "Helping others makes people feel better. Is there a list of people that you can connect with by phone in an effort to help them feel more connected? Make a list and call them. Ask them if it is OK to check in daily."

Get creative "People in Appalachia corner the market on crafting and do-it-yourself projects. Plan to use the time you gain from social distancing to start an at-home project or get back into a hobby. We know that engaging in creative activities can help to prevent feeling lonely. It is hard to be lonely when you are enjoying doing something."

Go outside "Staying at home to social-

distance doesn't mean that you can't be outside at all. You can take a short walk, sit on the porch or wave to a neighbor. As the weather warms up, consider starting some seeds for an upcoming garden."

Have a virtual movie meetup or book club "Plan to read the same book at the same time as your friends or relatives, and then call or group-chat to talk about it. Watching the same movie can provoke discussion, too.

Connect with healthcare Call now to find out what your providers are doing so that you can still receive care. This may be through telephone visits, online support groups, messaging through your electronic health record, using call-in numbers or having e-visits. Your providers can do many things by distance, so check to make sure you know what is available."

Resources

[From Loneliness to Belonging – WVU Magazine](#)

[WVU study suggests loneliness can hinder management of diabetes, hypertension](#)

[WVU nursing researcher intervenes between patients and loneliness](#)

West Virginia University experts can provide commentary, insights and opinions on various news topics. Search for an expert by name, title, area of expertise or college/school/department in the Experts Database at WVU Today.

-WVU-

NT



American College of Surgeons offers triage guidance for non-emergent surgical procedures during the COVID-19 outbreak

Guidance is provided for elective surgical procedures.

Newsweek — CHICAGO (March 18, 2020): The American College of Surgeons (ACS) has released “COVID-19: Guidance for Triage of Non-emergent Surgical Procedures” to provide surgeons with additional guidance on the management of non-emergent operations during the Coronavirus Disease 2019 (COVID-19) pandemic. The document was developed in response to the rapidly evolving challenges faced by hospitals in response to COVID-19 outbreak, including broad calls to curtail “elective” surgical procedures. This document follows the release of the College’s “COVID-19: Recommendations for Management of Elective Surgical Procedures,” which can be found here.

To view the guidance document on triage, visit: <https://www.facs.org/about-acsc/covid-19/information-for-surgeons/triage>.

About the American College of Surgeons

The American College of Surgeons is a scientific and educational organization of surgeons that was founded in 1913 to raise the standards of surgical practice and improve the quality of care for surgical patients. The College is dedicated to the ethical and competent practice of surgery. Its achievements have significantly influenced the course of scientific surgery in America and have established it as an important advocate for all surgical patients. The College has more than 82,000 members and is the largest organization of surgeons in the world. For more information, visit www.facs.org.

NT

Chinese case study suggests COVID-19 is not transmitted from pregnant mothers to newborns

Four babies born in a hospital in Wuhan, the epicenter of the novel coronavirus outbreak, did not show signs of infection and remain healthy today

17-Mar-2020 12:50 PM EDT, by Frontiers

Newsweek — Finally, some good news has emerged about the novel coronavirus that has spread to about 50 countries across the world. Chinese professors report in the journal [Frontiers in Pediatrics](#) that it doesn't appear that the viral infection is transmittable from pregnant mothers to newborns at birth.

The study is the second out of China within the last month to

Family Centered Care is trendy, but are providers really meeting parents needs in the NICU?

Consider the following:

Surveys show hospital support groups are being widely underutilized by parents.



And only 10% of NICUs surveyed connect parents with non-hospital support.

Graham's Foundation, the global support organization for parents going through the journey of prematurity, set out to find the missing piece that would ensure all parents have real access to the support they need.

See what they found by emailing info@grahamsfoundation.org to request a free copy of the 2017 whitepaper, “Reaching Premie Parents Today” (Heather McKinnis, Director, Premie Parent Mentor Program, Graham's Foundation).

You may be surprised to see what NICUs are doing right and where their efforts are clearly falling short.

Graham's Foundation empowers parents of premature babies through support, advocacy and research to improve outcomes for their preemies and themselves.



Visit www.GrahamsFoundation.org to learn more.

confirm that mothers infected with coronavirus disease 2019 (COVID-19) during pregnancy did not infect their babies.

All four mothers in the current study, which focused on the health of the newborns, gave birth at Wuhan's Union Hospital while infected. Wuhan in Hubei Province is believed to be the epicenter of

the current outbreak that has sickened more than 100,000 people worldwide and killed more than 3,400 -- most of them in China.

None of the infants developed any serious symptoms associated with COVID-19 such as fever or cough, though all were initially isolated in neonatal intensive care units and fed formula. Three of the four tested negative for the respiratory infection following a throat swab, while the fourth child's mother declined permission for the test.

One newborn did experience a minor breathing issue for three days that was treated by non-invasive mechanical ventilation. Two babies, including the one with a respiratory problem, did have body rashes that eventually disappeared on their own.

It's impossible to conclude whether there's a connection between these other medical issues and COVID-19. "We are not sure the rash was due to the mother's COVID-19 infection," said study co-author Dr. Yalan Liu at Huazhong University of Science and Technology. She also works in the Department of Pediatric at Union Hospital.

All four infants remain healthy, and their mothers also fully recovered.

[In the previous retrospective study on nine pregnant mothers infected with COVID-19](#), researchers also found no evidence that the viral infection can pass to the child. All nine births were done by cesarean section. Three of the four pregnancies in the current study were also brought to term by C-section.

"To avoid infections caused by perinatal and postnatal transmission, our obstetricians think that C-section may be safer," Liu said. "Only one pregnant mother adopted vaginal delivery because of the onset of the labor process. The baby was normal. Maybe vaginal delivery is OK. It needs further study."

In previous coronavirus outbreaks, scientists found no evidence of viral transmission from mother to child, but SARS and MERS

PROTECT YOUR FAMILY FROM RESPIRATORY VIRUSES

flu

coronavirus

pertussis

RSV



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



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were both associated with "critical maternal illness, spontaneous abortion, or even maternal death," according to Liu.

Globally, an estimated 3.4 percent of reported COVID-19 cases have died, according to the latest data from the World Health Organization. In comparison, seasonal flu generally kills far fewer than 1 percent of those infected. However, COVID-19 does not appear to spread as easily as influenza. Note that transmission and fatality rates are currently subject to change and revision as more research is done on the virus.

tential COVID-19 infection in newborns and children are needed. For example, the sensitivity of the current diagnostic test for detecting the virus is about 71 percent, so they suggest evaluating its reliability in children.

Toward that end, the researchers are collecting additional samples from the newborns, including placenta, amniotic fluid, neonatal blood and gastric fluid, among others, to detect possible receptors for the virus.

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The authors said further investigations into other aspects of po-

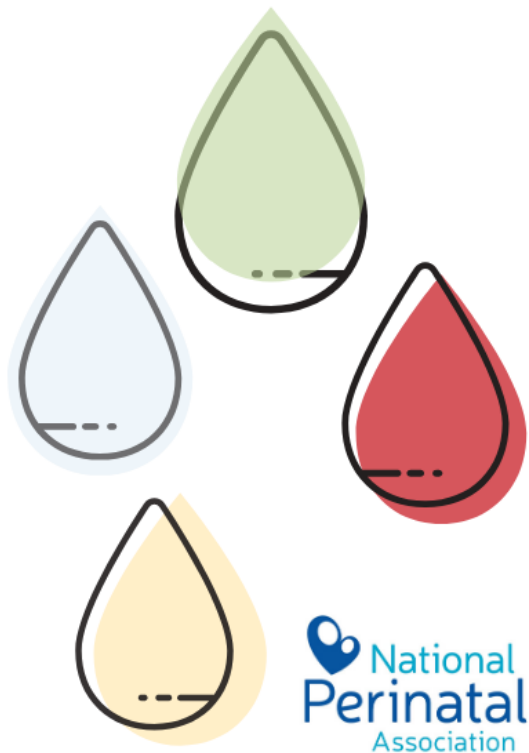
NATIONAL PERINATAL ASSOCIATION

Update: CORONAVIRUS COVID-19

According to the data in
The Lancet, even when
mothers were infected

**No virus was
detected in:**

- NASOPHARYNGEAL SWABS OF THE BABY
- AMNIOTIC FLUID
- CORD BLOOD
- BREASTMILK



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Neonatology Solutions NICU Directory: The NICU Directory Completion is Now Within Sight!

Scott Snyder, MD



The NICU Directory completion is now within sight! With over 1,020 NICUs now represented, we are working on data for the last states yet to be compiled. In the next month, we anticipate having final data for MN, MO, TX, CA, and IL. Once the final NICUs are entered, the remaining 15 state summaries will be completed and uploaded to the site. We are excited to be able to provide the most comprehensive dataset for US NICUs on the web and thank our users for the continued encouragement of the substantial efforts behind this challenging data procurement.

The Neonatology Conference page continues to be updated regularly as new conferences become available. In light of the recent COVID-19 outbreak, we recognize that some conferences will be canceled or rescheduled. We will endeavor to keep the conference page current with the latest information regarding potential changes to assist you with your conference planning, and we have active links directly to the conference registration pages for you to access the most up-to-date information.

Last month we celebrated our six month anniversary and the >2000 users who have utilized the site and provided us feedback and support. In the subsequent month, we have added close to another 1000 additional new users. We are grateful for this validation of the benefit and value of this free professional resource for our field to use for networking, collaboration, and career search opportunities.

“ In light of the recent COVID-19 outbreak, we recognize that some conferences will be canceled or rescheduled. We will endeavor to keep the conference page current with the latest information regarding potential changes to assist you with your conference planning, and we have active links directly to the conference registration pages for you to access the most up-to-date information.”

If you have not yet had a chance to do so, please visit the site and double-check your local information. Kindly notify us of any errors or omissions so we can ensure the data is valid and reliable for you. You may reach out via the easy-to-use links on the website, or directly to me at Scott@NeonatologySolutions.com.

Stay healthy!"

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1. <https://neonatalogysolutions.com/explore-nicus-and-programs/>

The author is a principal of Neonatology Solutions, LLC.

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the full spectrum of disorders

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Update: **CORONAVIRUS**
COVID-19

According to data published in The Lancet

Because of the risk of developing severe pneumonia, pregnant women and newborn babies should be considered key at-risk populations.

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nationalperinatal.org/mental_health

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



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- **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
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www.infanthealth.org

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NCfIH National Coalition for Infant Health

Genetics Corner: A Lethal Ciliopathy Affects Two Siblings with Renal Dysplasia and Oligohydramnios

Robin Clark, MD, Subhadra (Subha) Ramanathan, M.Sc., M.S.,
Daisy Hernandez

A Case History:

A genetics consultation was requested for a one-day-old 38-week gestation male because of prenatal diagnosis of multiple congenital anomalies: severe oligohydramnios, IUGR, renal dysplasia (renal cysts, pelviectasis, calyceal dilatation, dilated ureters), microcephaly, Dandy-Walker malformation, and bilateral club feet. A fetal MRI at 37-weeks' gestation also showed a mega cisterna

“The parents denied consanguinity. The family history was positive for a similarly affected female fetus, with a normal chromosome microarray that was electively aborted at 20 weeks gestation at another facility in 2017.”

magna. The fetal echocardiogram was normal.

The parents denied consanguinity. The family history was positive for a similarly affected female fetus, with a normal chromosome microarray that was electively aborted at 20 weeks gestation at another facility in 2017. An autopsy was not performed, but an external exam showed micrognathia, thick nuchal fold, and pre-axial polydactyly of the toes, which were medially deviated and duplicated halluces with a wide sandal gap. A photograph of that fetus is shown in Figure 1.

A genetic counselor and I had met with this Spanish-speaking couple during gestation. A fetal microarray was normal. A trio whole-exome sequencing test revealed two variants in C2CD3, a gene on chr 11q13.4 linked to an autosomal recessive ciliopathy: Orofaciodigital syndrome XIV (MIM 615948; OFD14). A likely pathogenic variant in C2CD3: c.994dupG was maternally-derived and a variant of uncertain significance: c. 2504A>T was paternally-derived.

The baby was born at term by vaginal delivery to a 24-year-old G2P1 healthy mother. B.W. was 2775 g (11th%ile, Z -1.35), B.L. was 46 cm (2nd %ile, Z -2.05), H.C. was 30 cm (Z -3.51). Apgar scores were 1st, 7th, and 9th. He did not cry spontaneously at birth, his color was blue, and his tone was flaccid. He was treated initially with positive pressure ventilation and then successfully intubated and mechanically ventilated. He did not pass urine. He lacked a urethral meatus and a urethral catheter could not be passed. The renal U.S. showed irregular echogenicity in the renal fossae suggesting bilateral dysplastic kidneys. He was ineligible for peritoneal dialysis. His parents agreed to withdraw support. He was extubated and died at nine days of age. Post mortem photographs are shown in Figure 2.

Genetics evaluation:



Figure 1. Similarly affected female fetus at 20 weeks gestation

On physical exam, the baby had microcephaly and deformations consistent with intrauterine compression due to severe oligohydramnios, including bilateral club feet. He also had micrognathia, microglossia, and a high arched palate. A subtle midline notch was evident in the upper lip post mortem (when all tape had been removed). The intraoral exam was pertinent for microglossia, multiple accessory frenulae, abnormal adhesions between the tongue, the mandibular alveolar ridge, and the buccal mucosa with several pearly hamartomatous nodules in the mucosal webs. The maxillary and mandibular alveolar ridges were irregular and notched. There was no polydactyly.

“He lacked a urethral meatus and a urethral catheter could not be passed. The renal U.S. showed irregular echogenicity in the renal fossae suggesting bilateral dysplastic kidneys. He was ineligible for peritoneal dialysis. His parents agreed to withdraw support.”



Figure 2a. Post-mortum facial photograph



Figure 2b. Post-mortum facial photograph

Discussion:

The primary cilia are microtubular-based organelles that project from the cytoplasmic membrane of almost all cells in vertebrates. They function in many developmental processes and a broad range of sensory functions. Ciliopathies encompass a diverse group of disorders, including the rare orofaciodigital (OFD) syndromes, of which 16 causal genes have been delineated. (1) Each OFD subtype has a distinct phenotype, but they share characteristic craniofacial (hypertelorism), oral (lingual hamartoma, abnormal frenulae, and lobulated tongue) and digital (polydactyly, brachydactyly) anomalies as well as other (CNS, renal, skeletal) malformations. Of these 16 subtypes, OFD14 is among the rarest and also one of the most recently described. In 2014, Thauvin-Robinet et al. reported two affected families with severe microcephaly and cerebral malformations who had pathogenic variants in the evolutionarily conserved gene, C2CD3, which is required for centriole assembly. (2)

The Orofaciodigital syndromes are among the many ciliopathies that can present in the newborn period, including situs inversus, polycystic kidney disease (autosomal recessive ARPKD and autosomal dominant ADPKD), Joubert syndrome, Jeune syndrome (thoracic dystrophy), Bardet-Biedl syndrome, and Meckel syndrome. The shared pattern of anomalies in this group includes renal cysts, polydactyly, and cerebellar anomalies. Other features are only apparent in the older child or adult, such as intellectual disability, retinal deterioration, anosmia, obesity, and infertility.

“The Orofaciodigital syndromes are among the many ciliopathies that can present in the newborn period, including situs inversus, polycystic kidney disease (autosomal recessive ARPKD and autosomal dominant ADPKD), Joubert syndrome, Jeune syndrome (thoracic dystrophy), Bardet-Biedl syndrome, and Meckel syndrome.”

Although their paper does not include a discussion of orofaciodigital syndromes, Hildebrandt et al. published a useful review of ciliopathies in 2011. (3) Their excellent figures illustrate the anatomy of cilia, which are microtubule-based structures that are found on almost all vertebrate cells. They originate from a basal body, a modified centrosome, which is the organelle that forms the spindle poles during mitosis. Microtubules extend from the centriole, constituting the basal body, and form the axoneme. The surrounding membrane is called the ciliary membrane, distinct from other membranes. Unlike motile cilium with a 9+2 microtubular structure, the primary cilium has a 9+0 structure. The important role

that the cilium-centrosome complex plays in the normal function of most tissues appears to account for the involvement of multiple organ systems in ciliopathies. As of 2017, there were 35 known ciliopathies, and with hundreds of ciliary proteins, the number is sure to grow. (4)

OFD14 is not uniformly fatal, and the phenotype is variable. Boczek et al. (2018) described five affected children with biallelic C2CD3 variants in three families, identified by Whole Exome Sequencing. (5) Three of these children survived. In addition to the classic oral and digital anomalies (including postaxial polydactyly), they exhibited a wide variety of brain and CNS anomalies: simplified gyral pattern, molar tooth sign, cerebellar hypoplasia, encephalocele, gray matter heterotopia, and retinal colobomas.

Interestingly, our patient and his sister have both overlapping and distinctive features that are not shared. Her duplicated great toes and his subtle midline upper lip defect, lingual hamartomas, and accessory frenulae are typical of OFD, and both had renal dysplasia. By adding their features, we might have been able to make a clinical diagnosis of OFD and determine the gene involved by using a gene panel for diagnosis. However, we did not have access to the fetal photograph until our evaluation was nearly complete.

“Interestingly, our patient and his sister have both overlapping and distinctive features that are not shared. Her duplicated great toes and his subtle midline upper lip defect, lingual hamartomas, and accessory frenulae are typical of OFD, and both had renal dysplasia. By adding their features, we might have been able to make a clinical diagnosis of OFD and determine the gene involved by using a gene panel for diagnosis.”

Practical Applications:

1. Be aware that Whole Exome Sequencing (WES) is now increasingly available, both prenatally and postnatally. This test can identify rare single-gene disorders that cause multiple congenital anomalies and lethal disorders, that would have gone undiagnosed even a few years ago.
2. Recognize the pattern of anomalies associated with ciliopathies that present in the newborn period. Suspect ciliopathies when brain malformations occur with renal cysts and polydactyly in an autosomal recessive pattern of inheritance.

In the absence of a whole-exome sequencing test, this diagnosis can be made with a gene panel designed to detect ciliopathies.

3. Request an autopsy whenever a deceased fetus or infant has congenital anomalies. If the family declines an autopsy, offer a more limited or focused examination (e.g., percutaneous renal biopsy), an external exam with photographs, or ask for permission to take a blood or tissue sample for DNA banking.
4. When an autopsy is not possible, perform a careful physical examination yourself. Document unusual features with photographs whenever possible.
5. Understand that the phenotype of a genetic disorder can vary, even between affected individuals within the same family, due to differences in gene expression patterns caused by gene-gene or gene-environment effects.

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The authors have no relevant disclosures.

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Reduce Your Use



There are simple things you can do to limit the harm substances might do.

- Use fewer substances
- Use smaller amounts
- Use less often
- Learn how to use safer



Reducing or quitting smoking is a good place to start. Set your goals, then ask for help.

One of the best things you can do is to stop using alcohol. We know that even small amounts are risky. And when combined with benzos and opioids, alcohol can kill.



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if you are opioid dependent



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You deserve a healthy pregnancy & childbirth.

- Eat healthy and take your prenatal vitamins
- Find the right balance of rest and exercise
- Surround yourself with people who care

Your Health Matters



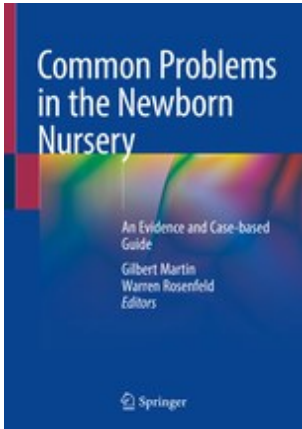
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Editors: **Martin**, Gilbert, **Rosenfeld**, Warren (Eds.)



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New Research, More Doubts About Tubing Safety for Infants

Susan Hepworth and Mitchell Goldstein, MD



The National Coalition for Infant Health is a collaborative of more than 180 professional, clinical, community health, and family support organizations focused on improving the lives of premature infants through age two and their families. NCfIH's mission is to promote lifelong clinical, health, education, and supportive services needed by premature infants and their families. NCfIH prioritizes safety of this vulnerable population and access to approved therapies.

A recent University of Florida study found that the risk of inaccurate dosing with new tubing technology known as ENFit is significantly higher than accepted standards. ENFit was designed to reduce misconnection errors through a system in which tubes have unique shapes and functions – making them easier to distinguish

from one another. But ENFit's design introduces a new risk. The connector features a moat where excess medication can linger. That means syringes can deliver the wrong amount of medication.

For infants, this can be deadly. Precision is critical for small doses – and small patients. Perhaps that's why ENFit has sparked concerns before. Just earlier this year, a separate study demonstrated that the ENFit tubing connector “significantly increases the opportunity for inaccurate dosing.” (1-3)

“Just earlier this year, a separate study demonstrated that the ENFit tubing connector 'significantly increases the opportunity for inaccurate dosing.'”

As an example of potential dosing dangers, University of Florida researcher and pharmacist Keliana O'Mara alludes to infants facing neonatal abstinence syndrome. An infant being weaned off of opioids might receive morphine every three hours for 30 days. “That's 240 chances to have a problem with dosing accuracy,” O'Mara emphasized. (4)

Safety issues also raise difficult questions for hospitals. While some have voluntarily transitioned to using ENFit, other hospitals



are resistant to the transition, citing patient safety risks and lack of evidence. Other safe, FDA-approved options continue to be available. (5)

Finding the right balance between innovation and safety can be challenging. As hospitals consider new tubing technology, they should move cautiously and with the benefit of all available information. The needs of the tiniest patients depend upon it.

Disclosures: The authors do not have any relevant disclosures.

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NT



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National Coalition for Infant Health Values (SANE)

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

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

Nutrition. Proper nutrition and full access to health care keep premature infants healthy after discharge from the NICU.

Equality. Prematurity and related vulnerabilities disproportionately impact minority and economically disadvantaged families. Restrictions on care and treatment should not worsen inherent disparities.



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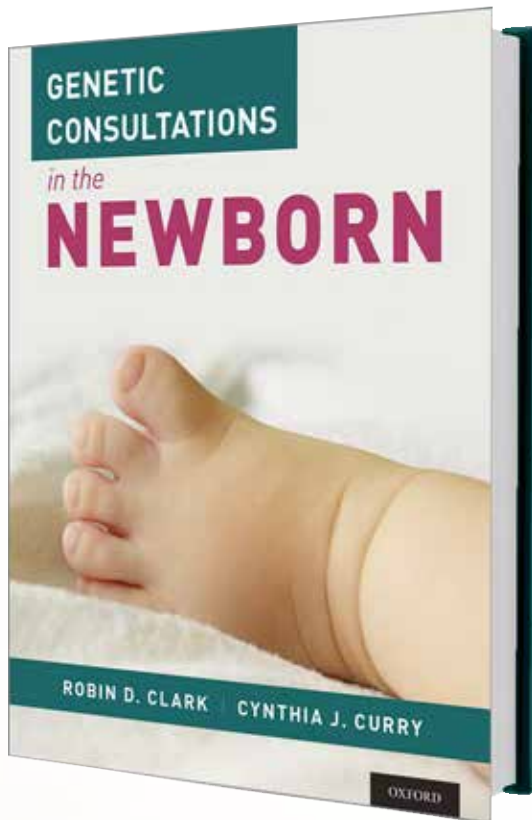


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OXFORD

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

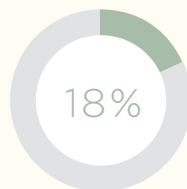
Preparedness

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.

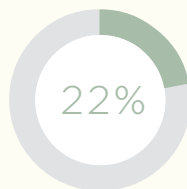
Specialty health care providers reiterated these concerns; 70% agreed that parents of their patients have a low awareness of RSV. Meanwhile, specialty health care providers themselves actively monitor for RSV. They reported that:

PARENTS

Only 18% said parents know “a lot” about RSV, reflecting an awareness level that's roughly half that of the flu

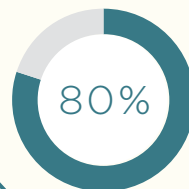


Only 22% of parents consider themselves “very well prepared” to prevent RSV.

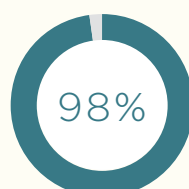


SPECIALTY HEALTH CARE PROVIDERS

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%).



Clinical Pearl: We Need to Intubate Before the Meconium Stained Baby's First Breath: Times Have Changed!

Joseph R. Hageman, MD

It is 1977, and I am a first-year pediatric resident in the delivery room at Evanston Hospital during my first Infant Special Care Rotation (ISCU) rotation. I did a sub-Internship as a senior medical student with the pediatric surgeons at Children's Memorial Hospital and helped to care for a number of surgical neonates in the Neonatal Intensive Care Unit (NICU). As a result, I had the opportunity during this rotation to learn and perform many endotracheal intubations. Now, as a first-year pediatric resident with a definite interest in neonatology and lots of opportunity in the delivery room, I had the chance to perform a lot of intubations in meconium-stained newborn infants. Subsequently, I began to transport infants for Evanston and Children's and moonlight in the NICUs at Evanston and Prentice Women's Hospital over the next four years when we were taught that, first the obstetrician would suction with a DeLee suction catheter or bulb syringe on the perineum; then we would suction the mouth with a DeLee, visualize the cords and intubate the baby's airway. If there was meconium below the vocal cords, we were to continue to reintubate until the airway was clear of meconium. This was especially the case if there was thick meconium seen. Once I completed my 2-year neonatal fellowship in 1982, I worked with a group of dedicated ISCU nurses and my colleague, Dr. Elaine Farrell, and we did a prospective survey of delivery room practice of meconium-stained infants and published the results in *Journal of Perinatology* in 1988. (1) In that collection of patients from 1984-85, we cared for 464 meconium-stained infants and performed endotracheal intubation in 413 infants (89%). (1) There was evidence of meconium below the vocal cords in 76% of the infants when meconium was present at the level of the vocal cords 126/171 patients. (1) If no meconium was present on the vocal cords, it was present below the vocal cords only 7% of the time in those infants who were also intubated. (1) A total of 14 infants developed evidence of meconium aspiration syndrome (MAS), and of these, 2 developed persistent pulmonary hypertension of the newborn (PPHN). All 14 infants survived. (1) Of the 413 patients who were intubated, 3 developed transient stridor or hoarseness (0.7%). (1)

“Our thought process regarding the management of the airway of the infant with meconium staining of the amniotic fluid (MSAF) was divided into two parts. First, it was important for the obstetrician to suction the infant's airway using a bulb syringe or, at that time, a DeLee suction catheter on the perineum before the first breath. (1,2)”

Our thought process regarding the management of the airway of the infant with meconium staining of the amniotic fluid (MSAF) was divided into two parts. First, it was important for the obstetrician to suction the infant's airway using a bulb syringe or, at that time, a DeLee suction catheter on the perineum before the first breath. (1,2)

However, a more recent Cochrane review of routine oropharyngeal suctioning vs. no suctioning by Foster and colleagues demonstrated that:

“The currently available evidence does not support or refute the benefits or harms of routine oro/nasopharyngeal suction over no suction. Further high-quality studies are required in preterm infants or term newborn infants with thick meconium amniotic fluid. Studies should investigate long-term effects such as neurodevelopmental outcomes”. (3)

Also, the American College of Obstetricians and Gynecologists (ACOG) opinion concluded that:

“Infants with meconium-stained amniotic fluid should no longer routinely receive intrapartum suctioning, whether they are vigorous or not. In addition, meconium-stained amniotic fluid is a condition that requires the notification and availability of an appropriately credentialed team with full resuscitation skills, including endotracheal intubation. Resuscitation should follow the same principles for infants with meconium-stained fluid as for those with clear fluid”. (4,5)

“However, the need for ongoing respiratory support after the first postnatal day of life decreased from 36% to 11%, $p < 0.02$. (6) This observation is important as we used to believe that oropharyngeal and endotracheal suctioning to meconium-stained amniotic fluid was essential to prevent and attenuate the development of meconium aspiration syndrome (MAS).”

This history brings us to a new study just published in *Hospital Pediatrics* by Patrick Myers and Arika Gupta, of the effect of no longer routinely intubating non-vigorous term infants with MSAF (14,322 infants) between 2014 and 2017 (6). Overall, their analysis demonstrated a temporal improvement in one minute Apgar scores and a decreased need for respiratory support after the first day of postnatal life when comparing preintervention (January

1, 2014-January 1, 2016) with post-intervention (January 2016-January 1, 2017). There was also a significant decrease in the number of intubations in the delivery room (6). There was also no change (51% vs. 52%) in the percentage of infants with MSAF with respiratory symptoms and who required respiratory support at admission to the NICU (43% vs. 41%). (6) However, the need for ongoing respiratory support after the first postnatal day of life decreased from 36% to 11%, $p < 0.02$. (6) This observation is important as we used to believe that oropharyngeal and endotracheal suctioning to meconium-stained amniotic fluid was essential to prevent and attenuate the development of meconium aspiration syndrome (MAS). (1,2) A thoughtful editorial by Gupta and Lee suggests a large multicenter randomized controlled trial of the management of non-vigorous infants with MSAF to answer the question about optimal management would be ideal, but really challenging. (7)

One other important point made by Myers and Gupta in their study and discussed by Gupta and Lee is the fact that providers now have fewer opportunities to perform endotracheal intubations on infants with MSAF in the delivery room, which, for all of us who practiced in the 1980s and had many opportunities, found to be challenging at times. (1,6,7) The era of “see one, do one, teach one” has ended, and simulation provides a less stressful opportunity to practice endotracheal intubation on newborn infant high fidelity models with experienced instructors. (6,7) For those of us who practiced in that era, and now have had the opportunity to experience simulation, I found this simulation experience really helpful. One example of the efficacy of simulation in the retention of delivery room skills for pediatric residents is illustrated in the paper by Kamath-Ray and colleagues. (8)

The approach to delivery room management of infants with MSAF continues to evolve with well designed clinical observation studies, including the study by Myers and Gupta. (6) The editorial by Gupta and Lee also provides some other excellent examples for review. (7)

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Which Infants are More Vulnerable to Respiratory Syncytial Virus?

RSV is a respiratory virus with cold-like symptoms that causes 90,000 hospitalizations and 4,500 deaths per year in children 5 and younger. It's 10 times more deadly than the flu. For premature babies with fragile immune systems and underdeveloped lungs, RSV proves especially dangerous.

But risk factors associated with RSV don't touch all infants equally.*

*Source: Respirator Syncytial Virus and African Americans

Caucasian Babies	Risk Factor	African American Babies
11.6%	Prematurity	18.3%
58.1%	Breastfeeding	50.2%
7.3%	Low Birth Weight	11.8%
60.1%	Siblings	71.6%
1%	Crowded Living Conditions	3%

! AFRICAN AMERICAN BABIES bear the brunt of RSV. Yet the American Academy of Pediatrics' restrictive new guidelines limit their access to RSV preventative treatment, increasing these babies' risk.

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Early intervention can help preterm infants:



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Build more effective learning techniques



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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.



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Visit CDC.gov to find contact information for your state's early intervention program.

Survey Says: **RSV**

RESPIRATORY SYNCYTIAL VIRUS, or RSV, is a dangerous virus that can lead to:

Hospitalization

Lifelong health complications

Death

for infants and young children.



ACCORDING TO A NATIONAL SURVEY, *Specialty Health Care Providers say:*

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

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

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



But Parents are Unprepared.

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

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



RSV EDUCATION & AWARENESS CAN HELP

After parents learned more about RSV, they were:

65% "More concerned" about their child contracting the disease

67% Likely to ask their doctor about RSV



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

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

In Recognition of Women Physicians on National Women's Physician Day

Mark Hudak MD

February 3rd was National Women Physicians Day. In recognizing this day, the Section of Neonatal-Perinatal Medicine wishes to reflect upon the origins of women in medicine and to appreciate the tremendous and ever-increasing contributions made by our women physicians.

“In recognizing this day, the Section of Neonatal-Perinatal Medicine wishes to reflect upon the origins of women in medicine and to appreciate the tremendous and ever-increasing contributions made by our women physicians.”

This date honors the 1821 birthday of Dr. Elizabeth Blackwell, the first woman who graduated from medical school in the United States. Dr. Blackwell was born in Bristol, England. She and her family emigrated to the US in 1832 to seek better opportunities and to leave an environment that was inimical to the family's liberal social and religious beliefs (her father became an active abolitionist before he died in 1838). A young Elizabeth decided, despite much advice to the contrary, to seek entry into medical school. It was not an easy road from the beginning. She applied to and received rejections from 29 medical schools before her admission to Geneva Medical College in 1847. [Historical note: Geneva Medical College was founded in 1834 in Syracuse, NY. Geneva College is now the Hobart and William Smith Colleges. The Medical College became part of Syracuse University in 1871. The State University of New York at Syracuse acquired it in 1950 for \$1]. History relates that the medical faculty, not in favor of her admission but at the same time reluctant to make that decision, transferred the question to its 150 male medical students. The students voted to accept her; some accounts relate that the students believed the faculty made the request in jest. I am sure that when she graduated first in her class in 1849 (medical training was much shorter then), she had made a powerful impression on the faculty and her fellow students! Shortly thereafter, she became the first licensed woman physician in the US.

After graduation, she returned to England and Paris with the hope of training more extensively in major hospitals of Europe. The only hospital that accepted her at the start was La Maternité in Paris, where she apprenticed in midwifery. Unfortu-

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Elizabeth Blackwell, 1821-1910 ca. 1877 digital file from b&w film copy negative. <https://www.loc.gov/pictures/item/2005679734/> Library of Congress. Blackwell Family Papers, Manuscript Division. No known rights on publication.

nately, she developed “purulent ophthalmia” (see <https://jamanetwork.com/journals/jama/article-abstract/449373> for an 1894 JAMA article about this condition) after performing a procedure on an infant. This caused unilateral blindness that ended her aspirations to become a surgeon. She then trained at St. Bartholomew's in London. In 1851, she returned to New York City and focused on preventive care and hygiene. Dr. Blackwell opened a free clinic in 1853 that provided outpatient care to poor women and children. In keeping with her activist nature, in 1857, she closed her clinic to open the New York Infirmary for Indigent Women and Children (which started the lineage for the New York University Downtown Hospital). In 1861, she helped organize the US Sanitary Commission with the support of President Abraham Lincoln to bring state-of-the-art hygienic medicine to battleground operating suites.

By the mid-1860s, a few medical schools had opened that only admitted women. Dr. Blackwell believed that women should receive medical training side-by-side with men. However, when one woman after another who trained at her Infirmary failed to gain entrance to medical school, reality set in, and she helped

to found a women's medical college based at the Infirmary. This school opened in 1868 with 15 students and 9 faculty, including her younger sister Emily, a Professor of Obstetrics and Diseases of Women. In 1869, Dr. Blackwell returned to England as she had intended. She was the first woman physician listed on the British Medical Register. By the late 1870s, she had stopped practicing medicine due to poor health but remained active in women's issues. She died in Hastings, England, on May 31st, 1910.

February 3rd was either the 4th or the 5th National Women Physicians Day, depending on how these days are counted. This Day was founded in 2016 by Physician Moms Group and Medelita (making this the 5th such day) but was not recognized "officially" by the Registrar at National Day Calendar until 2017 (which would make it the 4th day).

Because there are a finite 365 days on the annual calendar, most days are "named" for multiple people, events, or causes. So February 3rd is also known as "National 'The Day the Music Died Day'" (to commemorate the deaths of rock 'n roll icons Buddy Holly, Richie Valens, and P. Richardson in a 1959 plane crash, as referenced in Don McLean's American Pie); National Carrot Cake Day; National Football Hangovers Day (since 1967); and National Missing Persons Day. While not lessening the importance of the latter somber tragedy, the Section gives center stage to our women physicians on this day.

I reflect today back to my medical school years at Johns Hopkins. Hopkins opened its doors in 1893 to a class of 18, 3 of whom were women. I am guessing that my own class numbered about 130, perhaps 10 of whom were women. One might want to conclude that the inner city location of the medical campus and the urban unrest might have been impactful in this ratio; but 3 years later my wife's class entered with only 5 women at a time when the city had calmed. Now, women comprise more than half the Hopkins class. I do remember well many of the inspirational and now legendary women physicians who came to eminence there - Dr. Helen Taussig and Dr. Katherine Neill (pediatric cardiology), Dr. Carol Johns (internal medicine), Dr. Catherine DeAngelis (general pediatrics), and Dr. Mary Betty Stevens (rheumatology).

"Over the years, progress for women in medicine has continued but at too slow a pace; women have not yet achieved parity. There are still many disparities to correct within our profession related to perception, promotion, leadership, and compensation."

Over the years, progress for women in medicine has continued but at too slow a pace; women have not yet achieved parity. There are still many disparities to correct within our profession related to perception, promotion, leadership, and compensation. These are especially important to address in Pediatrics, where the great majority of trainees are women physicians. We have a dynamic cadre of women neonatologists (Women in Neonatology) who are

taking on these equity issues.

So congratulations to all of the women in the Section for having taken on the mantle of healing, and for the great work that you do every day to advance our many missions as physicians.

Let's cheer for our women!

Mark Hudak MD

Mark Hudak MD
Chair, AAP Section on Neonatal-Perinatal Medicine

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1. <https://www.loc.gov/pictures/item/2005679734/>
2. <https://jamanetwork.com/journals/jama/article-abstract/449373>

The author has no conflicts of interests to disclose.

NT



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Did you know that
PMAD
related suicides
account for

20%

of Postpartum
Maternal Deaths?

Join  NPA

nationalperinatal.org/mental_health

OPIOIDS and NAS

When reporting on mothers, babies, and substance use

LANGUAGE MATTERS



I am not an addict.

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



I was exposed to opioids.

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



NAS is a temporary and treatable condition.

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



My mother may have a SUD.

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

My potential is limitless.

I am so much more than my NAS diagnosis. My drug exposure will not determine my long-term outcomes. But how you treat me will. When you

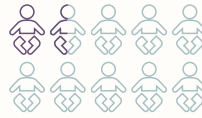
invest in my family's health and wellbeing by supporting Medicaid and Early Childhood Education you can expect that I will do as well as any of my peers!



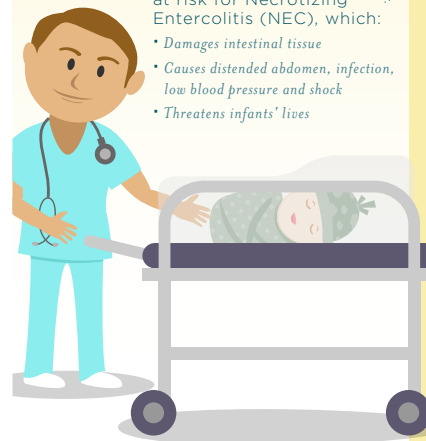
Learn more about Neonatal Abstinence Syndrome at www.nationalperinatal.org



Why PREMATURE INFANTS Need Access to an EXCLUSIVE HUMAN MILK DIET



In the United States, more than **1 IN 10 BABIES ARE BORN PREMATURE.** Micro preemies are born severely premature, weighing less than 1,250 grams.

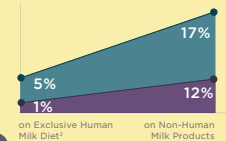


MICRO PREMIES are at risk for Necrotizing Enterocolitis (NEC), which:

- Damages intestinal tissue
- Causes distended abdomen, infection, low blood pressure and shock
- Threatens infants' lives

NEC occurrence increases when a preemie consumes non-human milk products.

When that happens:



30% of micro preemies needing surgery will die from NEC†

HOW TO HELP PREVENT NEC: EXCLUSIVE HUMAN MILK DIET

What is an Exclusive Human Milk Diet?



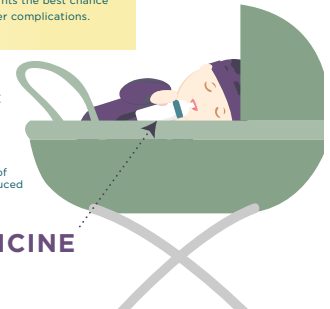
- ✓ mother's milk
- ✓ human donor milk
- ✓ human milk-based fortifier

Why Is An Exclusive Human Milk Diet Important?

An Exclusive Human Milk Diet gives vulnerable infants the best chance to be healthy and reduces the risk of NEC and other complications.

When a micro preemie can access an EXCLUSIVE HUMAN MILK DIET:

- Mortality is reduced by **75%***
- Feeding intolerance decreases*
- Chances of NEC are reduced by **77%**†



HUMAN MILK = MEDICINE

LEARN MORE >

NCJIH National Coalition for Infant Health
Promoting the best for Perinatal Infants through Age 100

* Hair AB, et al. "Beyond Necrotizing Enterocolitis Prevention: Improving Outcomes with an Exclusive Human Milk-Based Diet." *Breastfeeding Medicine* 2015; 10:106-116. DOI: 10.1089/bfm.2015.0124

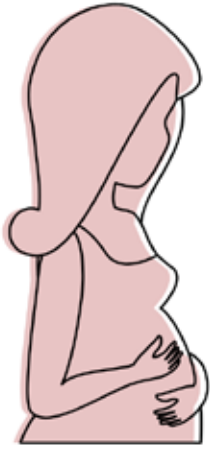
† Abrams SA, et al. "Greater Mortality and Morbidity in Extremely Premature Infants Fed a Diet Containing Cow Milk Protein Products." *Breastfeeding Medicine* July/August 2014; 9(6): 281-285

‡ Hall SA, et al. "Mortality and management of surgical necrotizing enterocolitis in very low birth weight neonates: a prospective cohort study." *J Am Coll Surg*. 2014 Jun;218(6):1148-55.

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NATIONAL PERINATAL ASSOCIATION

Update: **CORONAVIRUS**
COVID-19



According to data published in The Lancet

Pregnancy and the risk of
VERTICAL TRANSMISSION

LOW



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DID YOU KNOW?

Postpartum depression affects

10%

of fathers

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Time is precious, just like your patients.

 **PedNOTES**

SAVE YOUR LIFE:

Get Care for These POST-BIRTH Warning Signs

Most women who give birth recover without problems. But any woman can have complications after the birth of a baby. Learning to recognize these POST-BIRTH warning signs and knowing what to do can save your life.



<p>Call 911 if you have:</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Pain in chest <input type="checkbox"/> Obstructed breathing or shortness of breath <input type="checkbox"/> Seizures <input type="checkbox"/> Thoughts of hurting yourself or your baby
<p>Call your healthcare provider if you have:</p> <p>(If you can't reach your healthcare provider, call 911 or go to an emergency room)</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Bleeding, soaking through one pad/hour, or blood clots, the size of an egg or bigger <input type="checkbox"/> Incision that is not healing <input type="checkbox"/> Red or swollen leg, that is painful or warm to touch <input type="checkbox"/> Temperature of 100.4°F or higher <input type="checkbox"/> Headache that does not get better, even after taking medicine, or bad headache with vision changes



Tell 911 or your healthcare provider:

"I had a baby on _____ and
(Date)
 I am having _____."
(Specific warning signs)

These post-birth warning signs can become life-threatening if you don't receive medical care right away because:

- Pain in chest, obstructed breathing or shortness of breath (trouble catching your breath) may mean you have a blood clot in your lung or a heart problem
- Seizures may mean you have a condition called eclampsia
- Thoughts or feelings of wanting to hurt yourself or your baby may mean you have postpartum depression
- Bleeding (heavy), soaking more than one pad in an hour or passing an egg-sized clot or bigger may mean you have an obstetric hemorrhage
- Incision that is not healing, increased redness or any pus from episiotomy or C-section site may mean you have an infection
- Redness, swelling, warmth, or pain in the calf area of your leg may mean you have a blood clot
- Temperature of 100.4°F or higher, bad smelling vaginal blood or discharge may mean you have an infection
- Headache (very painful), vision changes, or pain in the upper right area of your belly may mean you have high blood pressure or post birth preeclampsia

GET HELP My Healthcare Provider/Clinic: _____ Phone Number: _____
 Hospital Closest To Me: _____



This program is supported by funding from Merck, through Merck for Mothers, the company's 10-year, \$500 million initiative to help create a world where no woman dies giving life. Merck for Mothers is known as MSD for Mothers outside the United States and Canada.

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Why Pregnant and Nursing Women Need Clear Guidance on THE NET BENEFITS OF EATING FISH

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



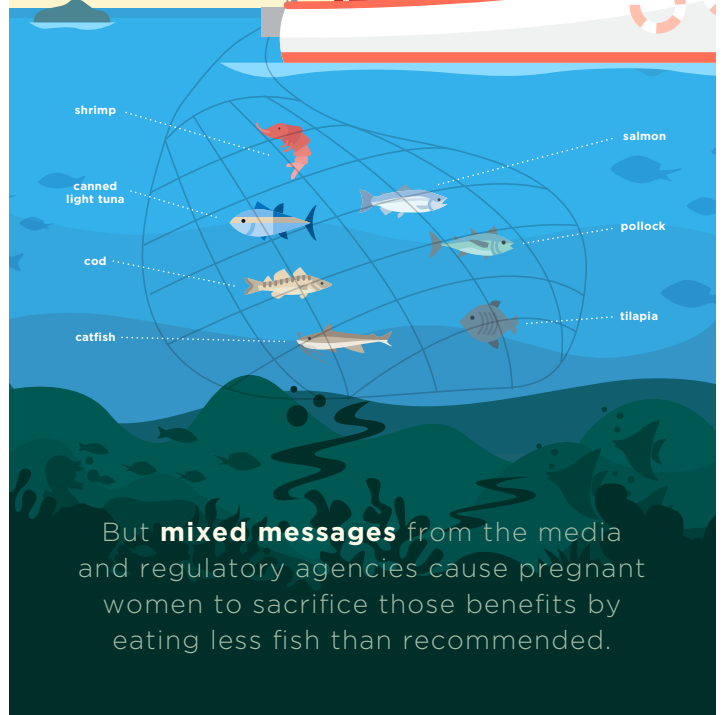
Iron



Omega 3 fatty acids



Earlier Milestones for Babies



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



Did you know that
PMAD
related suicides
account for

20%

of Postpartum
Maternal Deaths?

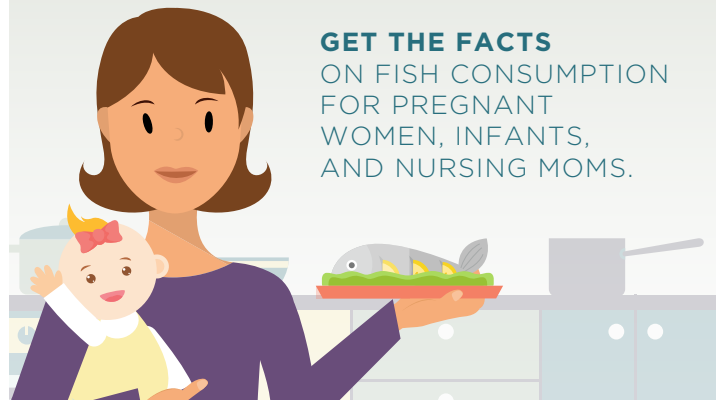
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**Support the
Open Letter**



**Breastfeeding
Innovations
Team**



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ON FISH CONSUMPTION
FOR PREGNANT
WOMEN, INFANTS,
AND NURSING MOMS.

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Letters to the Editor

February 9, 2020 10:39 AM (via email)

Hageman, Joseph [PED]

The Coronavirus Outbreak is a Pressing Concern

Dear Dr. Goldstein,

With this evolving Coronavirus (COVID-19) pandemic, I am wondering what the status of the development of technology of the diagnosis, therapeutic interventions (antivirals), and vaccine development is? I just wrote an editorial for Pediatric Annals for general pediatric providers that was just published and realized from reading brand new papers in Pediatrics and Science that things have changed significantly in the last couple of days,

Appreciate your thoughts,

Joe
Joseph R. Hageman, MD
Section of Neonatology
Director of Quality Improvement

Editor-in-Chief
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Chicago, IL.

No one is useless in this world who lightens the burdens of another. Charles Dickens

Dear Dr. Hageman:

Thank for asking this question. There are quite a number of concerns regarding this pandemic.



The Coronavirus (COVID-19) outbreak is a pressing concern. Many national organizations have devoted considerable attention to risk factors, prophylaxis, and the development of a vaccine. The unknown reservoirs, communicability, long term morbidities, and seasonality has confounded conventional wisdom. It is unknown whether this episode is a singular or limited event like SARS or one that will be repeated in successive years. (1-6)

National meetings have been canceled. Individual companies are prohibiting their employees from traveling. Many airlines have canceled or decreased their international flights by 50% or more. (2-4, 6)

Estimates of those affected will soon pass 200,000. While vast numbers of deaths are concentrated in China, other foci of infection are present in Japan, South Korea, Iran, Italy and now the United States. (7-11) Of concern is that those who are elderly, with other co-morbidities, or those who have an immunological risk may be even more susceptible. Children have been affected, but the vast majority of those affected have been adults. (12) Overall, the mortality has been estimated at 3.4%. (9) This estimate is significantly greater than that from the flu. (2, 9, 13-16)

Because of similarities to other viruses, and ongoing development of various techniques designed to produce a rapid path to a vaccine, some estimates have indicated that this vaccine could be available as early as this coming year, providing the FDA can ascertain safety and overcome regulatory hurdles. (1, 14, 17-19) This outbreak is a health crisis of unprecedented magnitude.

Or is it?

Annually, 177,000 patients are admitted for Respiratory Syncytial Virus (RSV). 14,000 die, approximately 8% or almost twice the rate of those admitted with influenza. (13, 16, 20, 21) The deaths from RSV are likely underestimated. (20) Major pharmaceutical manufacturers have been working on a vaccine for years. While these vaccine candidates progress through channels at a snail's pace, RSV returns year after year. (19, 22, 23)

While coronavirus makes the headlines and enhanced monitoring and reporting is encouraged by the Centers for Disease Control, no one knows about RSV. Reporting is not required. People are quarantined, restricted from traveling, hospitalized as a precaution, and scared to venture outside without a mask because of Coronavirus. For RSV, there is hardly a mention. (1-3, 6, 9, 24) There is a serious issue here.

For Coronavirus, we look forward to having a vaccine to administer to our patients within months; for RSV, it may be years. Considerations of effectiveness aside and differences in the immunogenicity of the resultant products, there is a vast disparity. RSV just does not receive the same press that Coronavirus does. (8, 14, 21, 23, 25, 26)

Certainly, Coronavirus deserves attention. Its prevalence, demographics, and associated mortality require definitive action, but the need for RSV awareness and vaccine development is even more pressing. The FDA should not only fast track solutions for

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Coronavirus but an even more dangerous adversary, RSV. (21, 23)

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Sincerely,

Mitchell Goldstein, MD

Editor in Chief

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c/o Mitchell Goldstein, MD

NATIONAL PERINATAL ASSOCIATION

CORONAVIRUS

COVID-19

RELIABLE RESOURCES:

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

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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.

NT

Erratum (Neonatology Today February, 2020)

Neonatology Today has identified erratum affecting the February, 2020 edition.

Joseph Hageman, MD was mistakenly identified as "Toseph Hageman, MD." NT regrets the error.

Corrections can be sent directly to LomaLindaPublishingCompany@gmail.com. The most recent edition of Neonatology Today including any previously identified erratum may be downloaded from www.neonatologytoday.net.

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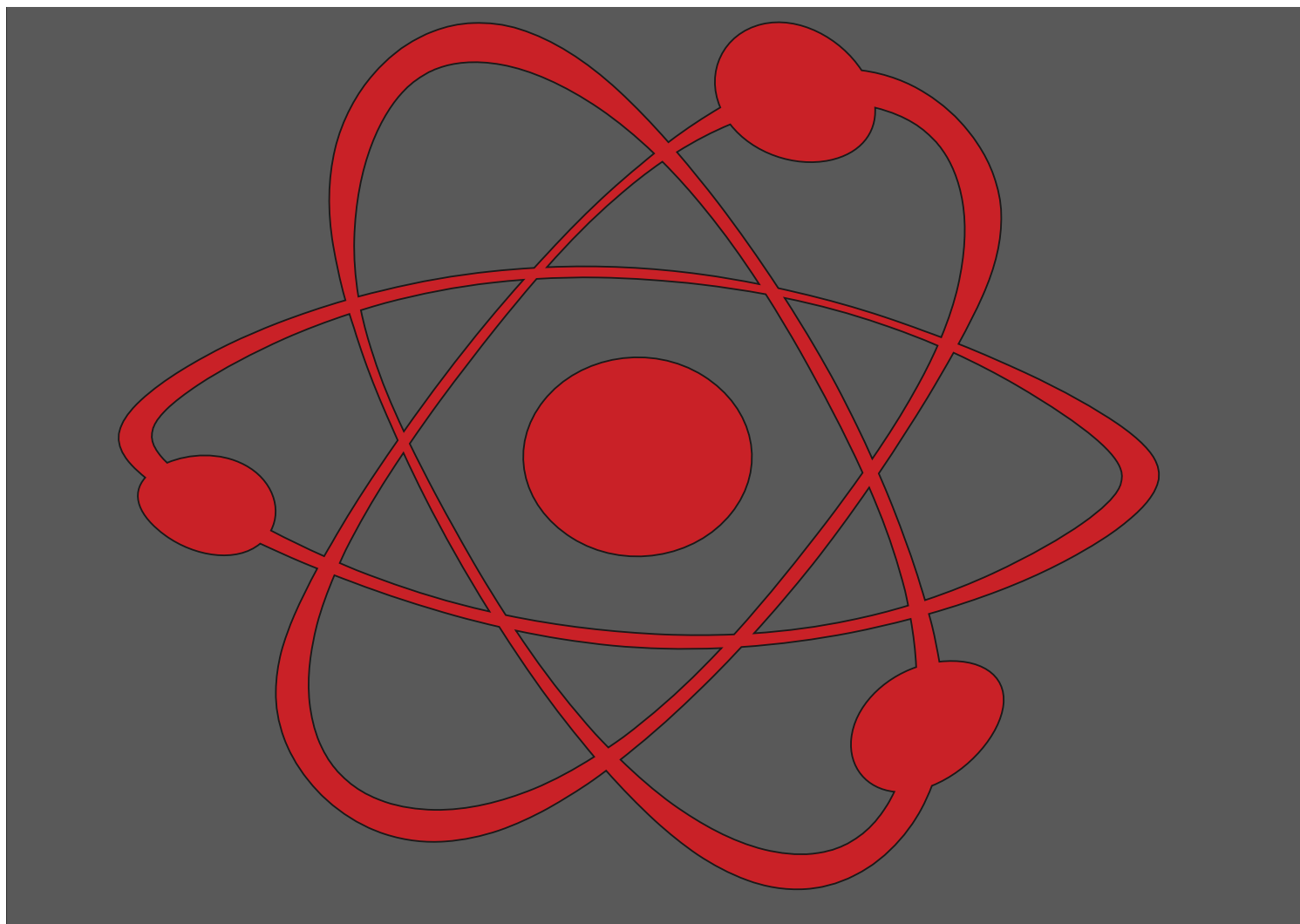
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Will your **PRETERM INFANT** need **EARLY INTERVENTION** services?

Preterm infants are:

2x more likely to have developmental delays

5x more likely to have learning challenges



1 in **3** preterm infants will require support services at school



Early intervention can help preterm infants:



Enhance language and communication skills



Build more effective learning techniques



Process social and emotional situations



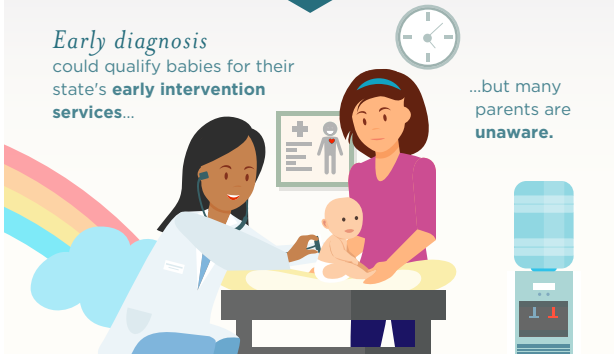
Address physical challenges



Prevent mild difficulties from developing into major problems

Early diagnosis could qualify babies for their state's **early intervention services**...

...but many parents are **unaware**.



NICU staff, nurses, pediatricians and social workers should talk with NICU families about the challenges their baby may face.

Awareness, referral & timely enrollment in early intervention programs can help **infants thrive** and grow.



NCFIH National Coalition for Infant Health
Protecting Access for Premature Infants through Age Two
www.infanthealth.org

Visit CDC.gov to find contact information for your state's early intervention program.

Las nuevas mamás necesitan acceso a la detección y tratamiento para **LA DEPRESIÓN POSTPARTO**



1 DE CADA **7** MADRES AFRONTA LA DEPRESIÓN POSTPARTO, experimentando



Sin embargo, sólo el **15%** recibe tratamiento¹

LA DEPRESIÓN POSTPARTO **NO TRATADA PUEDE AFECTAR:**

El sueño, la alimentación y el comportamiento del bebé a medida que crece²



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

PARA AYUDAR A LAS MADRES A ENFRENTAR LA DEPRESIÓN POSTPARTO



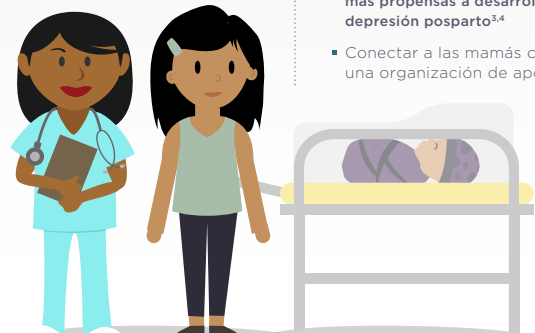
LOS ENCARGADOS DE FORMULAR POLÍTICAS PUEDEN:

- Financiar los esfuerzos de despistaje y diagnóstico
- Proteger el acceso al tratamiento



LOS HOSPITALES PUEDEN:

- Capacitar a los profesionales de la salud para proporcionar apoyo psicosocial a las familias... **Especialmente aquellas con bebés prematuros, que son 40% más propensas a desarrollar depresión postparto**^{3,4}
- Conectar a las mamás con una organización de apoyo



NCFIH National Coalition for Infant Health
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www.infanthealth.org

¹ American Psychological Association. Accessed on: <http://www.apa.org/women/resources/reports/postpartum-depression.aspx>

² National Institute of Mental Health. Accessed on: <http://www.nimh.nih.gov/health/publications/postpartum-depression-facts/index.shtml>

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Upcoming Medical Meetings

Meetings that have been delayed or cancelled.

The 37th Annual Advances in Therapeutics and Technologies Conference

March 24-28, 2020
Snowbird, UT

<http://paclac.org/advances-in-care-conference/>

Perinatal Care and the 4th Trimester: Redefining Prenatal, Postpartum, and Neonatal Care for a New Generation

March 25 - 27, 2020
Aurora, Colorado

<http://www.nationalperinatal.org/2020conference>

4th Future of Neonatal Care Conference

AKA the #99nicuMeetup!
15-19 April 2020
Vienna, Austria

<https://99nicu.org/meetup/>

1st Annual Innovations in Maternal, Fetal, and Neonatal Medicine

March 27 - 29, 2020

Johns Hopkins All Children's Hospital

St. Petersburg, Florida

<http://www.cvent.com/events/the-annual-innovations-in-maternal-fetal-and-neonatal-medicine-the-continuum-of-care-conference/event-summary-772b578c0e5348d3bba8a80915ffcac8.aspx>

Pediatric Academic Societies 2020 Meeting

April 29 – May 6, 2020
Philadelphia, PA

<https://2020.pas-meeting.org/>

Meetings that are still planned.

Innovations in Neonatal Care August 10 - 12, 2020

Mednax
Austin, Texas

<http://www.innovationsconference.com/>

AAP National Conference & Exhibition

October 18 - 20, 2020

American Academy of Pediatrics
San Diego, California

<https://aapexperience.org/>

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

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Academic Neonatologist Opportunity in Southern California

Loma Linda University Faculty Medical Group, Department of Pediatrics, Division of Neonatology, is seeking board certified or board eligible Neonatologists to join their team.

The Neonatal Intensive Care Unit (NICU) at Loma Linda University Children's Hospital is committed to providing the highest quality of family-centered medical care with our skilled, multi-disciplinary neonatal team. Our unit has 84 licensed beds for the most critically ill babies. As one of the few level 4 tertiary centers in Southern California, we are equipped to provide the highest level of care for newborns with the most complex disorders. Our facility has the largest Level IV NICU in California, serving approximately 25 percent of the state.

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. Pediatric neurologists work together with us in our NeuroNICU to diagnose, treat and monitor babies with neurologic injury or illness and we focus on providing neuroprotective, developmentally appropriate care for all babies in the NICU. Very specialized care is given in our Small Baby Unit to babies born at less than 30 weeks gestation. Babies at risk for developmental delay are followed up to 3 years in our High-Risk Infant Follow-up Clinic. Genetics specialists are available for evaluation and consultation.

Our Children's Hospital is designated as a Baby Friendly Hospital that supports breastmilk feeding for both term and preterm babies. Neonatal Social Workers and Child Life Specialists are important members of our team. It is our goal to support babies and families in culturally sensitive ways as our patients come from many different ethnic and religious backgrounds.

Loma Linda is located in the center of Southern California. A sunny climate augments the cultural benefits of Los Angeles and Palm Springs and the year-round recreational opportunities of nearby mountains, deserts and beaches.

This opportunity is not eligible for a J1 Waiver.



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Who We Are

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

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

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

Contact Us

Please visit our website <http://careers.llu.edu> or contact Jeannine Sharkey, Director of Advanced Practice Services at jsharkey@llu.edu or (909) 558-4486.

If you are an individual who understands and embraces the mission and purpose of Loma Linda University and its entities as premier Seventh-day Adventist Christian institutions, please visit our website or call 1-800-722-2770. EOE/AA/M/F/D/V



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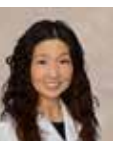
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Neonatology and the Arts

This section focuses on artistic work which is by those with an interest in Neonatology and Perinatology. The topics may be varied, but preference will be given to those works that focus on topics that are related to the fields of Neonatology, Pediatrics, and Perinatology. Contributions may include drawings, paintings, sketches, and other digital renderings. Photographs and video shorts may also be submitted. In order for the work to be considered, you must have the consent of any person whose photograph appears in the submission.

Works that have been published in another format are eligible for consideration as long as the contributor either owns the copyright or has secured copyright release prior to submission.

Logos and trademarks will usually not qualify for publication.

Dr. Mitchell Goldstein provides us with Flamingos in Coronado, CA relaxing outside the California Association of Neonatologist meeting earlier this month.



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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 (i.e., open access). There is no charge for your manuscript to be published under open access

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 "Vancouver" format (APA 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.

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