NEONATOLOGY TODAY

News and Information for BC/BE Neonatologists and Perinatologists

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IN THIS ISSUE

NEONATOLOGY TODAY

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Neonatology Today (NT) is a monthly newsletter for BC/BE neonatologists and perinatologists that provides timely news and information regarding the care of newborns and the diagnosis and treatment of premature and/or sick infants.

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Highlights from NEO— the Conference for Neonatology 2008

By Alan R. Spitzer, MD

Although only in its second year, the NEO Conference actually represents the 30th year of the meeting from which it grew, The Management of the Tiny Baby Conference. That meeting, started by Dr. Gregor Alexander, Chairman of Pediatrics at Winnie Palmer Hospital for Women and Babies, and Dr. Willa Drummond, Professor of Pediatrics at the University of Florida, was long one of the finest teaching conferences in all of neonatal medicine. Now expanded by a day, the meeting has become a great celebration of neonatal medicine, and there were more than 850 people in attendance at this year's event. This year's conference was held at the Walt Disney World Yacht and Beach Club on February 7-10, 2008.

The meeting started with a session devoted to the early management of the neonate. The history of our understanding of neonatal resuscitation was superbly recounted by Thomas Wiswell, MD, a member of the AAP NRP Committee, bringing us up to the present time with current considerations for the evolution of NRP. Tom's talk served as a great opener for the meeting. Following this initial talk, Dr. Alan Spitzer had to stand in for Dr. Ola Saugstad, who was trapped in Europe by inclement weather, and could not be present. Dr. Spitzer enlightened the audience by presenting Dr. Saugstad's elegant work on the rationale behind room air resuscitation. This presentation left little doubt as to the growing significance of this increasingly important delivery room approach.

After the morning break, Myra Wyckoff, MD, led the audience through many of the considerations for optimal thermal management of neonates in the delivery room. Her excellent presentation summarized the critical nature of temperature management, and how ideal management can have a profoundly important effect on outcome. Lew Halamek, MD, continued with the morning's theme and demonstrated the great value of simulation-based training in neonatal resuscitation, a new approach that has been greatly aided by current microprocessor technology. The ways in which behavior in the DR can be modified and improved provided a thoughtful approach to new ways in which resuscitation can be improved.

The morning session was closed by Steven Donn, MD, whose outstanding talk provided the audience with knowledge accumulated from his years of experience in developing optimal strategies for ventilator use in the acute phases of NICU therapy. Steve's review closed the morning's session on an extremely high note.

The afternoon seminar breakouts, covering a wide variety of topics, were well attended and many of the breakout rooms were filled to near overflowing. Drs. Steinbach, Young, and Mangum drew some of the largest crowds for their skillful presentations on a variety of interesting topics of importance, such as the genomics of disease, the PDA,

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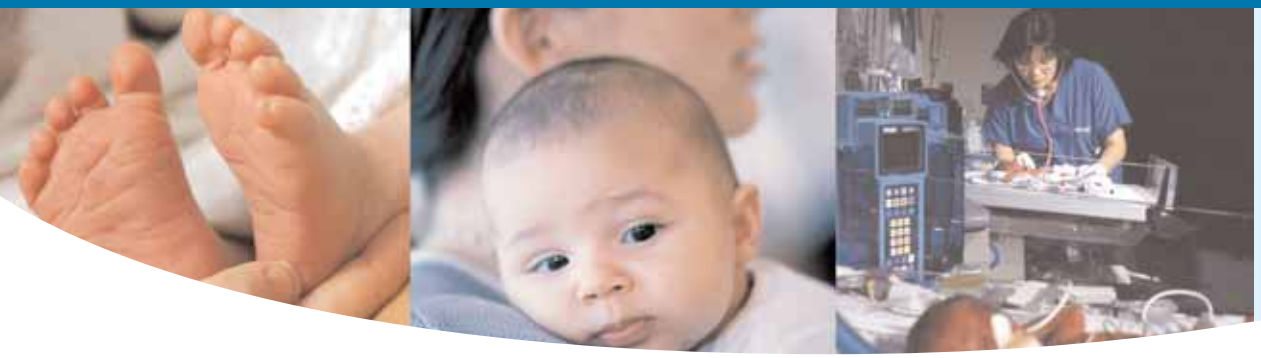

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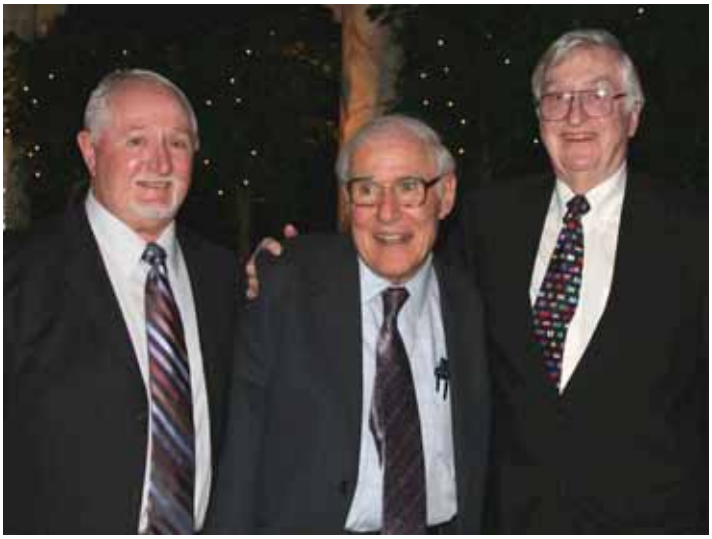


Legends of Neonatology - Drs. Fanaroff, Klaus, and Lucey

and adverse drug reactions. Drs. Ludington, Cusson, Karlsen, and Ms. Hoffman also provided extremely stimulating breakouts for the attendees in their sessions.

The second day of the NEO Conference proved to be an outstanding follow-up to the opening day, with Dr. David Burchfield serving as session moderator. The morning session, which focused on the ongoing care of the NICU graduates, got off to a great start when Maureen Hack, MD, presented her long experience with NICU follow-up care. Maureen's results and observations provided insights into the issues that confront the NICU graduate, which few other people in the field have.

Dr. Hack was followed by Alan Spitzer, MD, who presented some of the issues in the current understanding of infant apnea, and its possible relationship to Sudden Infant Death Syndrome (SIDS). Dr. Spitzer's experience in running the major SIDS programs in the city of Philadelphia provided a unique background for a very complex problem, and how it may be best approached.

Following the break, Dale Phelps, MD, discussed her extraordinary experience with the care of infants with retinopathy of prematurity, and how her understanding of this disease has evolved over time. Dr. Phelps' recommendations about early diagnosis and management of these infants provided excellent take-home lessons for conference attendees.

The neonate with neurological injury was described by Robert Clancy, MD, whose knowledge of this area is second to none. He described the etiology, evaluation, and management of these infants, contrasting their situation to the infant with congenital

Richard Polin, MD

Thomas Wiswell, MD

heart disease who requires circulatory arrest during surgery. Dr. Clancy's unique experience and the breadth of his knowledge provided great insights into the complexities of hypoxic-ischemic injury.

Richard Schanler, MD, one of the foremost experts in the country in neonatal nutrition, discussed optimal nutritional management of the low birth weight infant, especially after NICU hospitalization. His outstanding talk offered many new insights into the best ways to achieve optimal growth during infancy for these babies. The afternoon breakout sessions were once more very well attended, and were a series of great talks by leaders in their fields.

One of the highlights of the day was the "Legends of Neonatology" award ceremony, honoring Marshall Klaus, Avroy Fanaroff and Jerold Lucey, which had nearly 500 people in attendance. The evening presentation by Drs. Alan Spitzer and

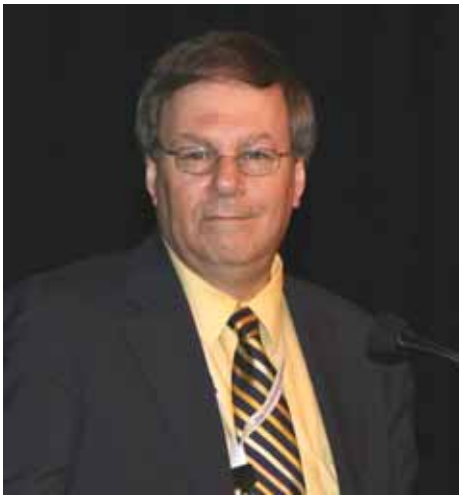
Maureen Hack, MD

David Burchfield outlined the unique place occupied by each of these legendary neonatologists. Dr. Spitzer also presented a brief history of respiratory distress syndrome and the foundations of care, as well as the history of development of our approach to hyperbilirubinemia. It was a great night for everyone, especially these great "Legends" of Neonatology.

The third day of the meeting focused on Issues in Neonatal Infectious Diseases. Pam Griffin, MD, described some novel techniques for diagnosing neonatal sepsis that she has been working on for many years. Tom Young, MD, followed this talk with a fascinating depiction of the newer infections that are confronting the neonatologist, and some of the novel drugs that are being introduced to combat these infections.

Following the break, Richard Polin, MD, spoke about the evaluation and management of early-onset neonatal sepsis, an area that he has worked in for several decades. His talk was very well received, and provoked many questions in the question and answer session. Danny Benjamin, MD and David Kaufman, MD, followed Dr. Polin, and spoke eloquently on the emergence of late-onset infection, and the diagnosis and management of fungal infections. Each of their talks was very thought-provoking and state-of-the-art.

The final day of the conference was a unique examination of new aspects of neonatal surgical practices. David Burchfield described our current concepts of neonatal pain and its management. This session was a superbly thoughtful review of this considerable problem. David was followed by Redmond Burke, MD, who outlined his novel data management system and approach to congenital heart surgery. The outstanding transparency that he has pro-



Steven Donn, MD

duced for parents should serve as a model for many fields of medicine.

Andrew Tzakis, MD, one of the great transplant surgeons in the world, was next on the podium. He presented his remarkable work on intestinal and related organ transplantation, which represents some of the most significant work in this area. After a short break, Saleem Islam, MD, discussed his novel techniques for minimally invasive surgery in the neonate, giving one of the best talks of the entire meeting. The conference was closed by Ann Schwentker, MD, who presented her exciting work on Brachial Plexus and Facial Nerve Injury and reconstruction. Dr. Schwentker's data represents years of outstanding effort in creating a new approach to these common birth injuries.

The meeting overall was a great success. Next year's dates will be February 26 to March 1, 2009 at the Walt Disney World Yacht and Beach Club in Orlando, Florida. Please make plans to join us. More information for the 2009 meeting will soon be available at the web site for the meeting, www.neoconference.com.

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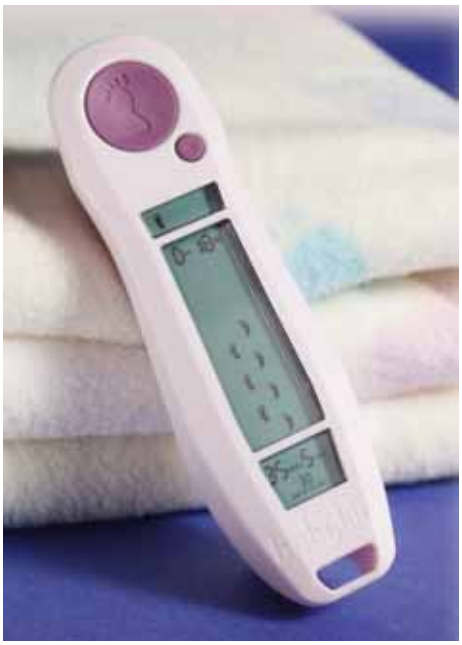
Kick Counting Can Save Lives

By Diep Nguyen, OB/GYN, MD



babyKick kickTrack

Neonatologists are asked many questions by moms-to-be, and some of those are surrounding prenatal screening tests for conditions such as Down Syndrome and diabetes. A related topic that is important, but not as frequently discussed, is kick counting. Women can help reduce their risks of pregnancy complications by adding this prenatal care activity to their daily routine. By becoming familiar with the baby's movement pattern, expecting parents can be even more proactive in taking steps toward a safe pregnancy, and have peace of mind between prenatal visits.

While neonatologists are faced with healthcare challenges after birth, patient families can benefit by learning about kick counting for future pregnancies. Here's a brief overview of kick counting, to provide you with basic information that can be shared with parents.

About Kick Counting

Kick counting, a daily systematic record of moms' perception of their baby's movement during the third trimester, is a reliable, harmless, simple and effective screening for the baby's well-being. Kick counting can document changes in the fetal movement pattern, and can help parents notify their healthcare provider of potential problems. A timely evaluation can allow intervention and potential prevention of the least talked about pregnancy complications – stillbirth.

All pregnant women should discuss kick counting instructions with their obstetrician. Kick counting is a free and simple method of monitoring babies' health. Kick counting can be started at 28 weeks in normal pregnancies, and as early as 24 weeks for high-risk or complicated pregnancies.

Decreased Fetal Movement

Unfortunately, not all pregnant women know that they should pay attention to their babies' movement. Studies have shown that fetal movement is indicative of a baby's health in the womb. The 2007 Harvard's Forum discussed a quality improvement study with an alarming discovery: the rate of stillbirth in pregnancies complicated by decreased fetal movement was four-fold above the general population. The study concluded that health care providers should educate women about the importance of fetal movement in an effort to reduce delays in intervention.

Stillbirth is the unexpected death of a baby after 20 weeks of pregnancy and according to the National Institutes of Health, claims the lives of 26,000 babies in the United States every year—that's ten times SIDS. More than half of all stillbirths happen after 28 weeks; those that happen after 36 weeks occur mostly in otherwise normal pregnancies.

Kick Counting Guidelines

The American College of Obstetricians and Gynecologists (ACOG) recommends that expectant mothers can note the time it takes for their baby to complete ten move-

Risk Factors for Stillbirth: Sidebar

While stillbirth deaths cut across all socio-economic classes, races, religions and maternal age groups, several risk factors have been identified.

- **Advanced maternal age:** Women 35 years and older are at an increased risk for stillbirth.
- **Maternal obesity:** Women with a body mass index of 30+ have a two-three fold high rate of stillbirth, and are especially at risk in late pregnancy.
- **Maternal smoking:** Women who smoke while pregnant have a rate of stillbirth up to three times that of non-smokers.
- **Prior stillbirth:** Women who have previously suffered the loss of stillbirth are up to ten times as likely as other women to experience stillbirth again.
- **Uncontrolled maternal diabetes:** Studies have demonstrated a two-four fold increased risk of stillbirth among women with diabetes.
- **Maternal hypertension:** Women with high blood pressure are at an increased risk for stillbirth.
- **Multiple births:** The stillbirth rate among twins and other multiples is four-fold higher than single births.
- **First-time pregnancy:** Women who are pregnant for the first time have a slightly increased risk for stillbirth.
- **Race:** Non-Hispanic black women have a rate of stillbirth twice the rate compared to other ethnic groups.

ments, at approximately the same time each day when the baby is usually most active. The understanding that babies have sleep cycles can alleviate mothers' anxiety toward kick counting. In general, healthy babies should complete ten movements within two hours, and most babies achieve this in less than 15 minutes. A few basic tips to share with pregnant women:

- Do kick counting about the same time each day during the time period when your baby is usually active.
- Get in a comfortable sitting or lying position. Relax and dedicate this time to feel your baby's precious movements.
- You may want to rest your or your partner's hands on your abdomen to better feel the movements.
- Your ability to feel the baby depends on the thickness of your abdominal wall, placental location and your sensitivity to the movements.
- Movements include kicks, turns, twists, swishes, jabs and rolls, but exclude hiccups.
- Jot down the time of the baby's first movement and the time of the 10th movement. Most babies take less than 15 minutes. Free kick count charts are available for moms to track their babies' movements at: www.makeeverykickcount.org.
- If your baby moves less than usual or has less than ten movements in two hours, arouse your baby by drinking fluid or by walking for a few minutes and repeat the kick counting session.
- Contact your health care provider or the labor and delivery if there is still decreased fetal movement or if there is a significant change in your baby's usual activity or if your baby takes longer than two hours for ten movements. DO NOT WAIT.
- If you have been evaluated for decreased fetal movement and sent home, make sure to have a follow-up visit with your provider.
- Discuss kick counting and the importance of decreased fetal movement with your health care provider.
- Today, moms-to-be also have the option of tracking fetal movements with the assistance of kickTrak, a handheld, noninvasive digital kick counter, developed by an OB/GYN, to simplify kick counting and keeping tab of the pregnancy progress.

The Heinz Family Philanthropies has partnered with First Candle to share information about kick counting with women by launching Kicks Count, a public service campaign. Families in Iowa and Pittsburgh can now hear the announcements on local radio stations.

About Dr. Nguyen

Diep Nguyen is a Los Angeles-based, board certified obstetrician/gynecologist and mother of three. She founded the Baby Kick Foundation to promote a healthy pregnancy and prevent stillbirth through awareness, education, and advocacy of kick counting. Dr. Nguyen also created kickTrak, a digital kick counting device designed to keep a record of fetal movement; a portion of proceeds is donated to the BabyKick Foundation and First Candle. Visit www.babykick.com and www.makeeverykickcount.org to learn more.

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June Symposium Focus

Evidence vs. Experience in Neonatal Practices®
June 20-21, 2008; Chicago, IL USA
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Presentations include:
- Surfactant Treatment for ARDS
- GERD and Gut Dysmotility in Preterm Infants
- Late Preterm Infants: Unique Problems
- Low Systemic Blood Flow and Neurodevelopmental Outcomes
- To Tube or Not to Tube Babies with RDS
- Neonatal Ventilators: How Do They Differ?

Sessions:
Session 1: Focus on Nutrition
Session 2A: Focus on Surfactants
Session 2B: Focus on Surfactants
Session 3A: Focus on Hemodynamics
Session 3B: Focus on Hemodynamics
Session 4: Focus on Ventilation

Keynote Presentation: "Low Systemic Blood Flow and Neurodevelopmental Outcome" by Nicholas J. Evans, DM, MRCPCH, Sydney, NSW, Australia

Organizing Committee: Kris Sekar, MD, FAAP, Program Chair; Jatinder Bhatia, MBBS; Rangasamy Ramanathan, MD; Istvan Seri, MD, PhD;

Faculty: David H. Adamkin, MD; Michael S. Caplan, MD; Virgilio P. Carnielli, MD, PhD; Steven M. Donn, MD; Nicholas J. Evans, DM, MRCPCH; Fernando Moya, MD; Roger Franklin Soll, MD; Christian P. Speer, MD, FRCPE; Kristi Watterberg, MD

Learning Objectives:
- Apply critical nutritional care to their preterm infants
- Incorporate current knowledge of surfactants into practice
- Utilize appropriate interventions for hemodynamic problems
- Provide appropriate ventilator care to preterm infants

ANNUAL NEONATAL PRACTICES CONFERENCE
SCHEDULED FOR CHICAGO ON JUNE 20-21, 2008

The Fifth Annual Evidence vs Experience in Neonatal Practices® CME conference returns to Chicago June 20-21, 2008

This popular meeting, to be held at the Renaissance Chicago Hotel, will address the timeliest topics in the management of neonates. A faculty of 13 thought leaders in neonatology will describe recent developments in this fast-evolving field, including state-of-the-art treatment options that are improving outcomes for preterm infants.

The two-day conference will focus on a wide range of subjects in areas such as nutrition, surfactants, hemodynamics and ventilation.

Presentations will include:

- Surfactant Treatment for ARDS
- GERD and Gut Dysmotility in Preterm Infants
- Late Preterm Infants: Unique Problems
- Low Systemic Blood Flow and Neurodevelopmental Outcomes
- To Tube or Not to Tube Babies with RDS
- Neonatal Ventilators: How Do They Differ?

Kris Sekar, MD, FAAP

In their in-depth lectures, speakers will describe the use of surfactant pre-extubation, developments in synthetic vs. natural surfactants, and prebiotics/probiotics. Research into inhaled nitric oxide, relative adrenal insufficiency, and hypotension in preterm infants will also be discussed. Nicholas J. Evans, DM, MRCPCH, of the University of Sydney and Royal Prince Alfred Hospital in Australia, will deliver the keynote address on "Low Systemic Blood Flow and Neurodevelopmental Outcome."

Kris Sekar, MD, FAAP, of the University of Oklahoma Health Sciences Center and The Children's Hospital in Oklahoma City, will serve as Chair of this thought-provoking conference. Other members of the Organizing Committee are Jatinder Bhatia, MBBS (Medical College of Georgia), Rangasamy Ramanathan, MD (Keck School of Medicine of USC), and Istvan Seri, MD, PhD (also of the Keck School of Medicine). Faculty members include neonatologists from the United States, Europe and Australia.

The target audience for this important conference includes physicians, nurse practitioners, nurses and other clinicians caring for preterm infants. The faculty will encourage the audience to participate fully in the program, interacting with not only the speakers but also with one another, and offering their own insights and perspectives into recent research and patient care in neonatal medicine. An Audience Response System will be used to help determine what participants have learned.

This annual conference will be co-sponsored by the Annenberg Center for Health Sciences at Eisenhower and the Keck School of Medicine of USC and supported by an independent educational grant from DEY, L.P.

To register online for **Evidence vs. Experience in Neonatal Practices®** , or for additional conference information, program updates, and accreditation information, visit the conference. Website: **www.5StarMedEd.org/neonatal.**

Questions about this event can be addressed to the Annenberg Center for Health Sciences at Eisenhower by calling Nina Pratt at 800-321-3690 (toll-free) or 760-773-4500 (8 a.m. to 5 p.m. Pacific time).

Introduction

In 2004, there were more than half a million preterm births in the US (about 12.5% of live births). The problems encountered by a premature infant are related to the immaturity of the organ systems. The infant requires specialized care until his or her organ systems have developed enough to sustain life without specialized support. Depending on the extent of prematurity, this may take weeks to months. This meeting will continue the examination of newly developing treatment options for these problems, while reviewing current evidence for treatment protocols. International thought leaders in the field will help clarify desired and efficacious treatment options.

Learning Objectives

Upon completion of this activity, participants should be better able to:
1. Apply critical nutritional care to their preterm infants
2. Incorporate current knowledge of surfactants into practice
3. Utilize appropriate interventions for hemodynamic problems
4. Provide appropriate ventilator care to preterm infants

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How does your salary compare with your peers? Please complete the following anonymous salary survey. We will publish the findings in a follow-up article on salary levels in Neonatology.

1. How many years has it been since your Fellowship? _____Years

2. Are you Board Certified in Neonatology (Place an "X" in the appropriate box)?
   a❑ Yes b❑ No c❑ In the process of becoming B/C

3. In terms of your compensation, what is your base salary? $_____

3A. How much is your bonus? $_____

4. What type of position do you hold (check all that apply)? a❑ Academic b❑ Clinical

5. What type of healthcare benefits do you receive (check all that apply)?
   a❑ Healthcare c❑ Dental
   b❑ Vision d❑ None

6. If you receive healthcare, is it (check one)? a❑ Individual Only b❑ Family

7A. Is your healthcare (check one) a❑ Fully Paid by Employer b❑ Partially Paid by Employer

7B. How many vacation weeks per year do you get? _____ Weeks

8. Do you get a CME allowance (check one)? a❑ Yes b❑ No If yes, how much? $_____

9. Is your Malpractice Insurance paid by your employer (check one)? a❑ Yes b❑ No c❑ Partially paid

10A. What type of Retirement Plan do you have through your place of employment (check one)?
   a❑ 401K b❑ 401B c❑ Other d❑ None

10B. What is the approximate value of your employer's participation in your retirement? $_____

11. How many years have you been at your current place of employment? _____ Years

12. For demographic analysis only, what is your 5-digit residential (home) Zip or postal code? _____

13. **Optional:** Do you have any additional comments you would like to share: _____

_____

_____

Thank you,

Research Department
Neonatology Today

Medical News, Products and Information

Factors Other than Age Affect Preemie Survival

Premature infants are more likely to survive-and survive without a disability-if the baby is female, from a single birth, is of a higher birth weight, and if the mother has received steroids to help the baby's lungs mature before birth, says research partially conducted at UAB and published in the April 17, 2008 issue of the New England Journal of Medicine. The combination of factors is more important than the single issue of gestational age.

Waldemar Carlo, MD, Professor and Director of the UAB Division of Neonatology, said researchers in the National Institute of Child Health and Human Development (NICHD) Neonatal Research Network observed 4,446 infants born between 22 and 25 weeks gestational age. These extremely low birth-weight infants, those weighing less than 1,000 grams, (or 2.2 pounds), make up about 1% of babies born in the United States each year, or roughly 40,000 babies a year. More than 150 extremely low birth-weight babies are born at UAB each year.

Carlo, who also holds the Edwin M. Dixon Chair in Neonatology, said this population of babies was studied by UAB and other researchers in the NICHD Neonatal Research Network because each day physicians and new parents have to make difficult decisions on the types of care to provide to extremely low birth-weight infants, the smallest, most frail category of preterm infants.

"These infants are born in the 22nd through the 25th week of pregnancy-far earlier than the 40 weeks of a full-term pregnancy," Carlo said. "Many die soon after birth, despite our best attempts to save them. Some survive and reach adulthood, relatively unaffected. The rest experience some degree of life-long disability, ranging from minor hearing loss to blindness, to cerebral palsy, to profound intellectual disability. In deciding the kind of care to provide, traditionally, physicians have relied heavily on an infant's gestational age because it is known to play a large role in the infant's survival. We knew that the closer a baby was to the 25th week, the better its chances. But, it often is hard to calculate a baby's gestational age. It's easy to miscount by a week, and that could make a large difference in the baby's chances of survival. We wanted to know other factors that play roles in survivability so that we can help new parents make decisions regarding the care of their premature infant."

Using standardized measures of mental development, vision and hearing, the researchers assessed the health status of surviving infants when the infants were from 18 to 22 months corrected age-the age they would have been had they been born full-term. Carlo said 21% lived and did not have a disability while the remainder died or experienced some degree of disability. They determined that infants were more likely to survive-and more likely to survive without disability-if they were of: older gestational age, their mothers had been given corticosteroids to help mature their lungs, if they were female, were a singleton rather than part of a multiple birth, and been of a higher birthweight. Carlo said it is important to note that UAB's survivability rates for all premature babies, and survivability with no apparent disability, is significantly better than the national average.

"Our study found that that it is much more accurate if the infant's assessment is based on the combination of these five factors, rather than just on gestational age, Carlo said.

Carlo said the study involved only infants born at level III neonatal intensive care facilities and the study findings may not apply to infants born at Level I and Level II facilities. Level III facilities like UAB are the most advanced of neonatal care facilities. They offer the highly specialized medical care that extremely low birth weight infants need to survive. UAB is the only full service Level III facility, with neonatologists on staff 24 hours a day, seven days a week in the state.

Carlo said this study provides what may be the largest source of information on the survival of extremely low birth-weight infants. As such, the NICHD is making it available to parents and physicians on the NICHD Web site http://www.nichd.nih.gov/about/org/cdbpm/pp/prog_epbo/. Doctors and parents can type certain key characteristics about a particular infant into a Web form. A program will provide statistics about survival and disability, based on the experiences of the 4000 infants in the network.

"The Web form can be a useful reference for outcome data for a certain set of circumstances," Carlo said. "We know parents and physicians need more information when deciding the course of treatment for an extremely low birth-weight infant. It will generate statistics, based on the factors in the NICHD article. The Web tool is only intended to inform treatment decisions, not predict what will happen. Every baby is an individual human being and deciding what kind of care to provide is best done by the family and the health care team."

Preterm Birth Associated With Diminished Long-Term Survival

An analysis of births in Norway found that persons born preterm had an increased risk of death throughout childhood and lower rates of reproduction in adulthood, compared to persons born at term, according to a study in the March 26, 2008 issue of JAMA.

Preterm birth, defined as birth within 37 weeks after conception, is a leading cause of infant death in the industrialized world,

after congenital abnormalities. Disability occurs in 60% of survivors born at 26 weeks and in 30% of those born at 31 weeks, according to background information in the article. Little is known about the long-term risk of death and overall health among persons born preterm.

Geeta K. Swamy, MD, of Duke University Medical Center, Durham, NC, and colleagues conducted a study to determine how preterm birth affects long-term survival, subsequent reproduction and next-generation preterm birth. "Such information may be useful to practitioners caring for families with survivors of preterm birth as well as parents of preterm infants," the authors write.

The researchers analyzed data from the Medical Birth Registry of Norway for 1,167,506 births from 1967-1988. The group was followed up through 2002 for survival. There was also an analysis for those born from 1967-1976 for assessment of educational achievement and reproductive outcomes through 2004. Of the 1,167,506 births, 60,354 (5.2%) were preterm. The percentage born preterm was higher among boys (5.6%) than among girls (4.7%), which is consistent with the male-dominated sex ratio of all births.

The researchers found that the preterm participants had an increased risk of death throughout childhood. For boys born at 22 to 27 weeks, mortality rates were 1.33% and 1.01% for early (1-5.9 years) and late (6-12.9 years) childhood death, with a 5.3 times higher risk for early death, and 7 times higher risk for late childhood death. The mortality rate for girls born at 22 to 27 weeks was 1.71% for early childhood death, with a 9.7 times higher risk for early childhood death; there were no late childhood deaths.

For 28 to 32 weeks, the early and late childhood mortality rates among boys were 0.73% and 0.37%, with higher risks of death of 2.5 times, and 2.3 times, respectively. Girls born at 28 to 32 weeks did not have a significantly increased risk of childhood death.

Reproduction during adulthood was diminished for participants born preterm compared to those born at term. For men and women born at 22 to 27 weeks, absolute reproduction was 13.9% and 25%, with men being 76% less likely to reproduce; women, 67% less likely. For those born at 28 to 32 weeks, absolute reproduction was 38.6% and 59.2% for men and women, with lower rates of reproduction of 30%, and 19%, respectively. Preterm women, but not men, were at increased risk of having preterm offspring.

"In this study population, preterm birth was negatively associated with both long-term survival and reproduction. As the preterm birth survivorship continues to grow, further studies will show whether improvements in obstetric and neonatal care affect survival as well as reproductive capacity and long-term quality of life. Continued research aimed at elucidating causal pathways and better therapeutic approaches are imperative for successful strategies to prevent preterm birth," the authors conclude.

In an accompanying editorial, Melissa M. Adams, MPH, PhD, of RTI International, and Wanda D. Barfield, MD, MPH, of the Centers for Disease Control and Prevention, Atlanta, comment on the findings of Swamy and colleagues.

"At present, clinicians can extend guarded optimism to the families of children who are born very preterm. The findings of Swamy et al illustrate that the survival of preterm infants-although lower than that of their term peers-improves to adulthood. Nonetheless, compared with their adult term peers, fewer adult preterm survivors reproduce. These risks should be interpreted cautiously because the majority of preterm infants have good health and good reproduction. Norway demonstrates better outcomes than the United States, which has persistent, stark racial disparities."

"Because lifetime risk of poor health is increased among individuals who were born preterm, patients should inform their clinicians about their history of preterm birth. This information may help clinicians identify and manage childhood and adult chronic conditions. Clearly, population-based data on preterm delivery and its long-term consequences may be pertinent medical history for the nation's future health."

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