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## Upcoming Medical Meetings

**15<sup>th</sup> World Congress of the World Association for Infant Mental Health**  
May 29-Jun. 2; Prague, Czech Republic  
<http://waimh2016.org>

**European Neonatal Ethics Conference 2016**  
Jun. 1- 2; Oxford, UK  
[www.wonapedu.com/NeoEthics-Conference.html](http://www.wonapedu.com/NeoEthics-Conference.html)

**The 2<sup>nd</sup> International Neonatology Association Conference (INAC 2016)**  
Jul. 15-17, 2016; Vienna, Austria  
[2016.worldneonatology.com](http://2016.worldneonatology.com)

**40<sup>th</sup> Anniversary Miami Neonatology 2016**  
Nov 5-8, 2016; Miami Beach, FL USA,  
[pediatrics.med.miami.edu/neonatology/international-neonatal-conference](http://pediatrics.med.miami.edu/neonatology/international-neonatal-conference)

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Company Offices:  
PO Box 444  
Manzanita, OR 97130 USA

Editorial and Subscription Offices  
16 Cove Rd, Ste. 200  
Westerly, RI 02891 USA

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## The Role of Technology in Routine Vision Screening of Infants and Young Children - *A New Policy Statement from the American Academy of Pediatrics (AAP) Places Heavy Emphasis on Photoscreening to Detect Treatable Vision Defects*

By Sean P. Donahue, MD, PhD

There have been long-standing recommendations from various professional societies and organizations for all young children to be evaluated for potentially treatable visual defects, and for identified at-risk children to be referred to a pediatric ophthalmologist. The rationale is easy to understand: early referral leads to early intervention, and early treatment prevents vision loss. In addition, the efficacy of treatment for amblyopia decreases as children get older.<sup>1-4</sup>

Despite these recommendations, implementation into regular clinical practice has remained less than ideal. As many as 15% of children have risk factors for amblyopia, yet fewer than 20% of children receive adequate screening.<sup>5,6</sup> To date, too many eye diseases go undetected at a stage where intervention would have otherwise been effective. As a result, amblyopia remains the most common cause of monocular visual impairment among children, as well as young and middle-aged adults.<sup>7</sup>

In some regards, the disconnect between the policy statements and lack of optimal implementation reflects the difficulties of exercising the suggested policies. Recently revised screening guidelines offered by the American Academy of Pediatrics (AAP - [www.aap.org](http://www.aap.org)) reinforce the need for early routine visual screening, while also supplying guidance on a mechanism for achieving the ambitious goal of universal adoption. Advancements in technology and screening methods since the last policy statement, and, in particular, growth within the photoscreening technology sector, now provide tools for overcoming obstacles associated with vision screening implementation. Of note, the market readiness of smartphone solutions represents

an example of how technology can be harnessed for the betterment of patient care, especially because their portability and accessibility enable an affordable and efficient means of executing photoscreening.

### Background

The policy statement, "Visual System Assessment in Infants, Children, and Young Adults by Pediatricians,"<sup>8</sup> replaces the 2012

***"Recently revised screening guidelines offered by the American Academy of Pediatrics (AAP) reinforce the need for early routine visual screening, while also supplying guidance on a mechanism for achieving the ambitious goal of universal adoption. Advancements in technology and screening methods since the last policy statement, and, in particular, growth within the photoscreening technology sector, now provide tools for overcoming obstacles associated with vision screening implementation."***

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policy statement on Instrument-Based Screening;<sup>9</sup> the 2003 policy statement on Eye Examinations Among Infants, Children, and Young Adults by Pediatricians;<sup>10</sup> and the 2008 statement on Red Reflex Examination in Neonates, Infants, and Children.<sup>11</sup> The AAP felt that competing documents were redundant and potentially confusing. In 2011, I was recruited to be the lead author of a revised policy statement and ferry it through the approval process; in truth, I played only a small role in the drafting of this statement and the accompanying clinical report, the latter of which serves as practical guidance on how ocular examination of infants and young children can be accomplished.<sup>12</sup> The many individuals who served on the various committees that collaborated on this report should be commended for their expert involvement and insight on this important topic.

One of the most important changes that clinicians will notice in the current Policy Statement is a shift from an elective recommendation for vision screening from age 6 months to 3 years to a full recommendation that automated vision screening, if available, should begin as early as 1 year of age.

Another significant change from previous guidance documents is that the language regarding the potential role of photoscreening is much stronger, saying that this modality is no longer experimental and that payers ought to reimburse for it. The document points out that photoscreening is a widely accepted and utilized technology; that it is effective; and that it is supported by the US Preventive Services Taskforce, among others. It is the consensus of the various committees involved with the policy statement that: photoscreening is one of many important tools that can be used to detect vision problems in young children. We could not unequivocally state that it should supplant traditional methods for conducting a vision examination in a pediatrician's office; yet, the statement acknowledges that photoscreening is a legitimate way to screen kids and detect vision issues that need to be corrected.

### What Has Changed

One of the real challenges of drafting a cogent policy on vision screening of infants and young children by pediatricians was that the writing committee had to be careful not to recommend anything that was beyond the capacity of care providers. The complexity of evaluating pediatric patients using vision charts is well known: the requirement for a dedicated 20-foot long space; the time it takes to train children on how to take the test and for nurses or staff to administer it; difficulty getting children to comply with the test, especially if they are sick or distracted; language barriers; and the low sensitivity and specificity of vision charts for detecting vision problems.

I was involved in a study published in 2005 that looked at the positive predictive value of traditional and photoscreening methods in a pediatrician's office. In this study, photoscreening had a high positive predictive value to detect both amblyopia and its risk factors.<sup>13</sup> In the ten years since that report, the technology used for photoscreening has evolved exponentially.

The introduction of digital photography and automated interpretation accelerated the acceptance of automated screening in the medical home. The next advance was embedded referral

criteria that could be altered to effect sensitivity and interpreted as a prompt for follow up. In the case of certain handheld photoscreening devices that are connected to the Internet, such as: *GoCheck Kids* - ([www.gocheckkids.com](http://www.gocheckkids.com)) from Gobiqurity, Inc. ([gobiqurity.com](http://gobiqurity.com)), the transfer of information is instantaneous and the time for interpretation and follow-up is significantly reduced. Over the past two decades, RVU and CPT codes have emerged, which has made the use of such devices reimbursable.

The availability of *GoCheck Kids* is particularly intriguing. *GoCheck Kids* is a comprehensive pediatric vision screening app for smartphones, with mobile photoscreening and digital visual acuity. Its photoscreening functionality efficiently detects risk factors for amblyopia in real-time. A real advantage of *GoCheck Kids* is that it is a downloadable mobile application and, therefore, portable, affordable, and easily accessible to providers and patients. For a monthly subscription, a physician is provided unlimited utilization, breaking even after only 4-6 reimbursable tests of the 40 conducted on average each month by a physician.

At the individual provider level, the decision between devices may come down to the needs of the practice—perhaps fittingly. Some of the tabletop instruments may be more comprehensive, with features that offer the ability to print the image, but also come with an \$8,000 to \$10,000 price tag. A practice would have to have significant volume to justify the cost, which might be burdensome and insurmountable. Thus the availability of a handheld, portable screening tool that is used with a common smartphone is a promising alternative.

### Caveats and Conclusions

A smartphone-based vision screening instrument may engender some thoughts about whether it is truly powerful enough or accurate enough to be useful. The functionality has been clinically validated; in one study it was shown to have 81% sensitivity, 91% specificity, and 3% inconclusive results.<sup>14</sup> In this study of consecutive patients in a pediatric eye practice, *GoCheck Kids* performed as well as, or better than 3 other photoscreening instruments.

Every photoscreening instrument currently commercially available has a set of manufacturer-suggested referral criteria that are based on preclinical testing; as the device gets used over time, those criteria are refined and made more precise. Gobiqurity, because it offers a mobile application with a web interface, has the ability to monitor the overall referral rate. As such, there is every reason to believe that as it is rolled out, the follow-up and accumulation of more data will help improve the utility of the solution.

The bottom line is that pediatricians need to be screening kids on a regular basis, but, historically, too many cases continue to slip through the cracks. The advent of photoscreening technology provides a mechanism to be used in conjunction with or to supplant traditional ocular examinations with eye charts to detect the risk factors for amblyopia and other treatable refractive errors. Photoscreening provides a means to do a quicker and more efficient vision screening than traditional methods, and the availability of handheld devices, such as



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Technology, it seems, has caught up to our desire to provide vision screening for all infants, children, and young adults. As health care providers, we should welcome devices that make it easier to provide high quality vision screening that patients need to detect eminently treatable vision defects.

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***“Technology, it seems, has caught up to our desire to provide vision screening for all infants, children, and young adults. As health care providers, we should welcome devices that make it easier to provide high quality vision screening that patients need to detect eminently treatable vision defects.”***

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NT



*Sean P. Donahue, MD, PhD  
Coleman Professor and Vice Chair for  
Clinical Affairs Chief, Pediatric  
Ophthalmology Service  
Departments of Pediatrics  
Ophthalmology, and Neurology  
Vanderbilt University Medical  
Center/Vanderbilt Eye Institute  
2311 Pierce Ave.  
Nashville, TN 37232-8808 USA  
sean.donahue@vanderbilt.edu*

*Assistant to Dr. Donahue:  
Katia Marie Hauk: [katia.m.hauk@vanderbilt.edu](mailto:katia.m.hauk@vanderbilt.edu)*

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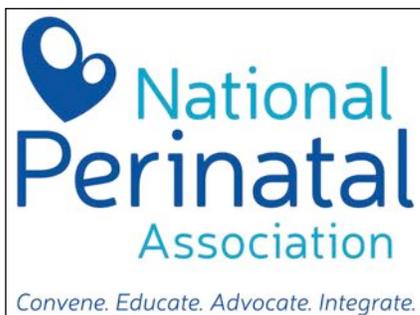
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# Supporting NICU Staff Mental Health

By Cheryl A. Milford, EdS

Members of the NPA write a regular column in *Neonatology Today*.



It is well-understood that having a baby in the Neonatal Intensive Care Unit (NICU) is a very stressful experience for parents, and there is growing awareness about the importance of addressing the mental health needs of families. While more research and increasing attention has focused on the needs of

families, less emphasis has been placed on the mental health needs of the NICU staff. There is no debate among NICU staff that the NICU is a challenging place to work. Recognizing the mental health needs of both parents and staff, the National Perinatal Association (NPA) recently published the "Interdisciplinary Recommendation for Psychosocial Support of NICU Parents," in the December 2015 *Journal of Perinatology* ([www.nature.com/jp/journal/v35/n1s/index.html](http://www.nature.com/jp/journal/v35/n1s/index.html)), which includes a chapter on staff education and support.<sup>1</sup> Staff support includes acknowledgment of the emotional, physical and social needs of all members of the team (physicians, nurses, respiratory therapists, unit secretaries, environmental services and allied health staff). Research has documented that NICU staff deal with significant stress in their interactions with babies and their families.<sup>2</sup> Daily exposure to the trauma families experience by having a premature or sick baby in the NICU can lead to staff becoming emotionally overwhelmed. Sometimes staff can be unaware of how emotional distress at work is impacting them in both their professional and personal lives.<sup>3</sup> It is therefore, essential that NICU and hospital administration are cognizant of the emotional and mental health needs of all NICU staff, and provide the needed support systems.<sup>2,3</sup>

There are many effective interventions and techniques that have proven to be successful in supporting the mental health of NICU staff. Having a psychologist included as an integral member of the NICU team to provide ongoing support is viewed by staff as a valuable service.<sup>3,5</sup> NICU psychologists provide opportunities for staff to debrief after particularly stressful events by creating a safe environment in which to express their thoughts, feelings and concerns, and can also serve as a liaison between families and staff in challenging situations.<sup>5</sup> Staff need layers of education and support just as parents and families do. The NICU psychologist or mental health professional can assist staff in recognizing and normalizing their emotional and stress

responses, and also provide education about the emotional and stress responses of family members in the NICU.<sup>5</sup>

In addition to providing mental health services for staff in the NICU, the hospital must also be aware of the impact that other aspects of the workplace, such as: policies on staffing, documentation, on-going training, days off and benefits, have on the ability of the staff to function optimally. Hospitals that engage in policies and practices perceived by staff to be respectful and supportive, decrease the potential for emotional and stress responses.<sup>4</sup>

Open and clear lines of communication between staff and hospital and NICU administration are essential. Staff must be aware of whom to contact, speak to or email about their needs, wants and concerns. Debriefing sessions, staff meetings and bereavement activities all provide communication opportunities and demonstrate support by the administration for the staff and their work.<sup>2</sup>

Providing on-going education on signs of emotional and stress responses is considered best clinical practice. Such education empowers staff members to have the confidence to become self-aware, to be supportive of co-workers and to deal effectively with challenging situations.<sup>4,5</sup> Offering educational experiences such as webinars, resource guides, and continuing education credits can help to defray some of the staff's costs associated with on-going education.

Because the NICU is often a traumatic environment for staff as well as families, trauma-informed care principles should be integrated into the culture of the unit to support optimal mental health for everyone. The tenets of trauma-informed care are: safety, empowerment, trust, collaboration and choice,<sup>4</sup> which are the very same tenets of family-centered care.<sup>1</sup> When expanded to include all participants in the NICU environment, opportunities are created for positive and caring relationship development among staff and between staff and families.<sup>2</sup>

While staff members are responsible for self-care and self-awareness, making time for these activities and recognizing their importance is difficult and often minimized in the lives of the very people who need them. Developing a work-life balance is a first step. Practicing wellness habits including good sleep hygiene, healthy nutrition and hydration, exercise and relaxation will sustain the NICU professional, both at work and in their personal life.<sup>3,4</sup>

All members of the NICU team can benefit from education that assists them in understanding their individual style of interaction, as well as their particular triggers and stress responses. When professionals understand how they personally function and respond, and learn to recognize patterns of responses in others, they can become self-aware and open to change.<sup>4</sup> Mental health professionals in the NICU have the expertise to educate and



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provide this type of ongoing support for staff, and by doing so, can help staff to develop resilience and coping mechanisms that will decrease the potential for mental health difficulties.

All of the policies, techniques and interventions described above should be viewed as foundational to the optimal functioning of the NICU and essential to adequately equip the staff to provide ongoing supportive care for infants and their families. When analyzing the financial impact of these tools, it is important to remember the benefits that include improved staff retention and job satisfaction, as well as increased family satisfaction with their NICU experience.<sup>2</sup> Administration professionals must become aware of and acknowledge that providing this level of care is considered to be best practice and will become increasingly expected as the standard of care. Without these techniques, interventions and policies, NICU staff can - and do - develop vicarious traumatization, compassion fatigue and eventually burnout.<sup>4</sup> This is not only detrimental to the individual staff member, but also to the unit and the hospital.<sup>3,4</sup> Recognizing the signs of these syndromes is important for administrators and all NICU staff, not only for themselves, but also to support their coworkers.

Vicarious traumatization is the process of being emotionally impacted by the trauma experienced by others. This occurs on a daily basis for many NICU staff as they witness the trauma experienced by infants and families. It is especially difficult when NICU staff must contribute to the trauma experienced by infants and families by doing necessary, but painful procedures, even if the procedures are deemed to be essential to save lives or improve outcomes. The stress responses observed in vicarious traumatization include viewing their life and world in a negative manner, not feeling safe, decreased self-esteem, becoming disconnected from their work, withdrawal from social interactions and negative attitudes.<sup>4</sup> Vicarious traumatization is often seen in the NICU staff.

Compassion fatigue in the NICU occurs when staff are unable to cope with the emotional aspects of their work and develop traumatic stress responses such as: sleep difficulties, gastrointestinal symptoms, irritability, anxiety and guilt.<sup>4</sup>

Staff with compassion fatigue often try to compensate by over-engagement and working even harder in an attempt to decrease their anxiety and guilt.<sup>2,4</sup>

“Burnout” is a syndrome that develops gradually over time, and is related to prolonged and significant stress in the workplace.<sup>4</sup> Burnout symptoms include: being tired both physically and emotionally, accompanied by withdrawal from interactions with families and co-workers. Staff experiencing burnout may demonstrate the behaviors of depression, and low self-esteem. They often express feelings that their work is overwhelming and without merit.

All of these syndromes require assessment and treatment with a properly trained mental health professional. Because they are so prevalent in intensive care units and are actually a well-documented hazard of the NICU work environment, mental health services should be provided through the hospital. Staff should not be stigmatized for requesting or being offered such services. Co-workers need to reach out to colleagues demonstrating these behaviors, and NICU management must be available and supportive of the emotional needs of all staff. The culture of the NICU should acknowledge the stressful and emotional nature of working in an intensive care unit, the need for ongoing support and specialized mental health services when required.<sup>2,4</sup>

Supporting the mental health of the NICU staff is as important as scaffolding the mental health needs of parents. Utilizing the family-centered care principles and the tenets of trauma-informed care in maintaining professional attitudes, choices and behaviors is vital to the practices and culture of the NICU. Acknowledging the challenges and stresses of this work by the hospital and NICU administration encourages staff confidence and competency. Nurturing and respecting the staff facilitates their ability to nurture and respect the infants and families in their care. Current research and clinical recommendations make it clear that it is imperative to care for the caregivers, as well as the families in intensive care settings.<sup>1,2,3</sup>

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**“Supporting the mental health of the NICU staff is as important as scaffolding the mental health needs of parents. Utilizing the family-centered care principles and the tenets of trauma-informed care in maintaining professional attitudes, choices and behaviors is vital to the practices and culture of the NICU.”**

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*Cheryl A. Milford, EdS  
Neonatal Psychologist  
Board Member  
National Perinatal Association  
P.O. Box 392  
Lonedell, MO 63060 USA  
www.nationalperinatal.org*

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# Medical News, Products & Information

Compiled and Reviewed by Tony Carlson, Senior Editor

## Research Shows Efficacy of Steroid Use in Late Preterm Delivery: Use of Steroids in Women at Risk for Late Preterm Delivery Reduces Rate of Neonatal Respiratory Complications

Current recommendations are for all women who go into labor prior to 34 weeks gestation to be given antenatal corticosteroids (betamethasone) to help mature the baby's lungs. However, many babies born in the late preterm period - between 34 and 36 weeks gestation - require respiratory support at birth. A recently completed study asked the question, "Would neonates born at these later gestational ages also benefit from antenatal corticosteroids?"

The answer is "yes" and is detailed in "Antenatal Betamethasone for Women at Risk for Late Preterm Delivery," a study from the Eunice Kennedy Shriver National Institute of Child and Human Development Maternal Fetal Medicine Units Network (MFMU) with co-sponsorship from the National Heart, Lung and Blood Institute. The research was recently published in the *New England Journal of Medicine*.

Dwight Rouse, MD, of the Division of Maternal-Fetal Medicine at Women & Infants Hospital of Rhode Island, a Care New England hospital, a Professor of Obstetrics and Gynecology at The Warren Alpert Medical School of Brown University, and the Brown/Women & Infants Principal Investigator for the MFMU, said, "For many years, obstetric and pediatric providers have known that steroids administered in preterm labor help speed the development of the preterm baby's lungs at 34 weeks gestation or earlier. This new research has shown that these same steroids when given to women who are at risk for late preterm delivery can significantly reduce the rate of neonatal respiratory complications."

The multicenter, randomized trial involved approximately 2,800 women who were pregnant with one baby at 34 weeks to 36 weeks, 5 days, gestation and at high risk for late preterm delivery. The participants were randomly assigned to either receive two injections of betamethasone or placebo 24 hours apart. Researchers then looked at whether the infants needed respiratory treatment during the first 72 hours after delivery. In the placebo group, 14.4% of babies required respiratory treatment as compared to 11.6% of the babies in the betamethasone group. Further, severe respiratory complications, including prolonged oxygen supplementation, surfactant use, mechanical ventilation, and a form of chronic lung disease in newborns called bronchopulmonary dysplasia also occurred significantly less frequently in the betamethasone group.

"This research supports the use of known medications that will allow us to help even more babies get the healthiest start at life," explained Dr. Rouse. "I am proud of our hardworking MFMU Network research team for their dedication to this project. I am also very grateful for the contribution of Women & Infants' obstetricians and midwives, who gave their ongoing support to this study and encouraged their patients - to whom I am also profoundly grateful - to participate. As a result, Women & Infants contributed more than ten percent of the patients enrolled in this large trial, more than any other participating hospital."

## Yale-New Haven Children's Hospital Honored with Quality Award for Improving Care for NAS Patients

Children's Hospital Association: Yale-New Haven Children's Hospital was selected as the overall winner of the 2015 Pediatric Quality Award for a quality improvement project that reduced the number of days infants with Neonatal Abstinence Syndrome (NAS) were hospitalized. Since 2011, the effort of bundled interventions has resulted in \$5.4 million in total savings due to a reduction in patients' average length of stay and a reduction in morphine treatment, a pharmacological protocol for NAS patients. The award was presented at the Quality and Safety in Children's Health Conference held in New Orleans, LA this week.

"As leaders in quality improvement, children's hospitals are continually innovating new standards of care across multiple patient populations, from the sickest infants to well children, with the goal of better health outcomes," said Amy Wimpey Knight, Chief Operating Officer, Children's Hospital Association (CHA). "Yale-New Haven Children's Hospital focused on improving care for babies born with opiates dependencies, a growing problem in our country. We are very proud to honor this important initiative with the Pediatric Quality Award."

By increasing the practice of non-pharmacological care such as low-stimulation rooms, swaddling, soothing, feeding on demand and rocking to enhance the bond between mother and child, the hospital worked with families to decrease average length of stay from 28 days (measured from 2003-2006) to 8.5 days (re-measured in 2014-2015) for patients in its Neonatal Intensive Care Unit (NICU) and 6.5 days for patients transferred from the nursery directly into the general inpatient unit (without a NICU stay). Morphine treatment in the NICU was decreased from 98% to 44%, and the maximum dose administered to this population was reduced by over 50%.

In the last 15 years, NAS, a condition where newborns exposed to addictive opiates while in utero display withdrawal symptoms impacting their neurological, gastrointestinal and musculoskeletal systems, has increased five-fold. The rise of NAS nationally has led to a steady increase in length of stay across hospital NICUs, costing the U.S. health care system as much as \$1 billion per year.

"The staff at Yale-New Haven demonstrated innovative and important work in its identification of non-medical intervention in delivering quality improvement," said Helen Burstin, MD, MPH, FACP, Chief Scientific Officer of The National Quality Forum who served as an industry judge for the award. "The study was elegantly designed and yielded impressive results leading to meaningful engagement with patients."

Awarded biennially by CHA, the Pediatric Quality Award honors successful quality improvement initiatives that significantly improve care for pediatric patients. The overall winner was selected from 76 entries by a panel of more than 40 quality improvement and patient safety leaders from children's hospitals as well as two industry experts in addition to Burstin: Peter Lachman, MD, MPH, MBBCH, FCP Deputy Medical Director, Great Ormond Street Hospital for Children NHS Trust; and Virginia Moyer, MD, MPH Vice President for Maintenance of Certification and Quality, the American Board of Pediatrics.

In addition to being named the overall winner for its initiative, titled, "Sustained Reduction in Length of Stay for Neonates with Neonatal Abstinence Syndrome, Yale-New Haven Children's Hospital," was the winner in the clinical care category.

Three other children's hospitals were named category winners, and one was recognized with a distinctive achievement award, for its improvement initiatives:

- Delivery System Transformation Category Winner: Levine Children's Hospital at Carolinas HealthCare System, Charlotte, NC Developing Future Improvement Leaders: Experiential QI Training in Residency
- Patient Safety and Reduction of Harm Category Winner: Doernbecher Children's Hospital at OHSU, Portland, OR Reducing Radiation Exposure: Pediatric Modified Barium Swallow Studies
- Waste Reduction and Improved Efficiency Category Winner: Children's of Alabama, Birmingham, AL Decreasing Hospital Length of Stay for Post-operative Adolescent Spinal Fusion Patients
- Distinctive Achievement Award, Clinical Care: Cincinnati Children's Hospital Medical Center, Cincinnati, OH Using Quality Improvement to Reduce Necrotizing Enterocolitis across Hospital Systems

For video footage of winning projects visit Children's Hospital Association.

### Clinical Trial Substantiates Wyss Institute's Apnea Prevention Technology

Wyss Institute at Harvard: Scientists, engineers and clinicians at the Wyss Institute for Biologically Inspired Engineering at Harvard University and its collaborating institutions, the Beth Israel Deaconess Medical Center (BIDMC) and the University of Massachusetts Medical School (UMMS), have shown in a clinical trial in the BIDMC Neonatal Intensive Care Unit (NICU) that their new prevention technology reduces apneic events and improves critical clinical parameters in preterm infants. The findings were reported in the November 23<sup>rd</sup>, 2015 issue of *Pediatrics*.

In the United States, one in nine infants is born prematurely and many of these newborns are at higher risk for apnea of prematurity, typically characterized by prolonged pauses in breathing of at least 20 seconds each. Apneic episodes occur in greater than 50% of infants born prior to 37 weeks and in almost every baby of Very Low Birth Weight, and these events can be life threatening. Even if treated in a NICU, apnea can result in insufficient oxygen delivery to critical organs such as the brain, which can cause developmental delays and long-term cognitive deficits.

"Apneic breathing and its associated risks is a major challenge in NICUs today, which can also lead to prolonged and expensive hospital stays. This prompted us to develop a non-invasive, non-pharmacological solution that can address the immature respiratory control in these preterm infants," said



*A clinical trial performed with 36 preterm infants prone to apnea demonstrates that stochastic resonance applied by vibrations in a specifically designed mattress can reduce the number of apneic episodes and improve breathing and oxygen saturation. Credit: Wyss Institute at Harvard University.*

David Paydarfar, MD, a Wyss Institute Associate Faculty member and a Professor at UMMS, who was the scientific lead on the apnea prevention program. While others were focused on the moment a baby stops breathing, Paydarfar and his team at UMMS, were investigating how to prevent apnea from occurring in the first place.

Key to the infant apnea prevention technology is the principle of 'stochastic resonance': early work by the Wyss Institute's Core Faculty member James Collins, PhD, revealed the counterintuitive phenomenon in which application of a small amount of random vibratory stimulation or "noise" to a complex biological system, such as the human body, increases the sensitivity of that system. Collins is also the Termeer Professor of Medical Engineering & Science at the Massachusetts Institute of Technology (MIT) and a Professor of Biological Engineering at MIT.

Paydarfar applied this principle to the problem of apnea of prematurity. In an early pilot study done at UMMS, Paydarfar and his colleagues showed that adding "noise" in the form of a

subtle vibration in the mattresses of preterm infants helps to stabilize their breathing and improve blood oxygenation without waking the infant. This suggested that a stochastic resonance approach could compensate for the immaturity of the preterm infants' respiratory control system, and thereby prevent dangerous apneic events from occurring.

"Our team subsequently developed a new mattress device designed to deliver the same level of therapeutic vibration that was found to be effective in Paydarfar's previous studies while limiting the vibrations that would otherwise be delivered to the head of the infant to further protect the developing brain from any potential undesired effects," said John Osborne, a Senior Staff Engineer at the Wyss Institute who helped to develop the new therapeutic mattress technology and co-lead authorship on the publication.

The team has now validated this new mattress device in the BIDMC trial, studying a cohort of 36 preterm infants that had at least one previous event of apnea. The results of the trial provide comprehensive clinical evidence for the method's ability to benefit breathing stability.

"We tested the effects of the therapeutic mattress vibrations within each infant by comparing the 30-minute periods when the vibrations were 'on' to the 30-minute periods when the vibrations were 'off'. With this approach, we saw a reduction in the incidence of apnea by 50%, and, perhaps equally important, we ameliorated every clinically significant aspect of oxygen desaturation events as well as decreased the severity of bradycardia events. These effects were in addition to any caffeine effects. The technology therefore might be used as a stand-alone or as a supplement to the caffeine therapy with which many preterm infants are commonly treated," said Vincent C. Smith, MD, MPH, Assistant Professor of Pediatrics at Harvard Medical School and Associate Director of the BIDMC's NICU who is also lead author on the published study.

"It has been exciting to watch this apnea prevention technology go from concept to prototype and onward to successful demonstration of efficacy in a human clinical trial. These findings exemplify, once again, the power of our translation engine here at the Wyss Institute, and how we can quickly develop and validate solutions for important clinical problems," said Wyss Institute Founding Director Donald Ingber, MD, PhD, who also is the Judah Folkman Professor of Vascular Biology at Harvard Medical School and Boston Children's Hospital, and Professor of Bioengineering at the Harvard John A. Paulson School of Engineering and Applied Sciences.

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### Study Develops New Equation for Estimating Gestational Age

In a study presented in February 2016, at the Society for Maternal-Fetal Medicine's annual meeting, The Pregnancy Meeting™, in Atlanta, researchers presented findings from a study titled, "The NICHD Fetal Growth Studies: Development of

a contemporary formula for estimating gestational age from ultrasound fetal biometrics."

Accurate assessment of gestational age is an important variable affecting perinatal morbidity and mortality. The most commonly used formula for estimating gestational age has been Hadlock's formula which uses biparietal diameter, head circumference, femur length and abdominal circumference. If gestational age is not accurately estimated, induction of labor may be performed inappropriately. A smaller premature fetus may be thought to have fetal growth restriction and undergo induction of labor, which can produce prematurity. A fetus wrongly thought to be post term may also undergo induction of labor, which is an unnecessary intervention. It is important to accurately estimate gestational age.

Researchers used fetal biometric data from the National Institute of Child Health and Human Development Fetal Growth Studies. They sought to develop and validate a new gestational age estimation equation and compare its accuracy to Hadlock's formula created in 1984.

Healthy women from four racial/ethnic groups comprised of 614 (26%) non-Hispanic whites, 611 (26%) non-Hispanic blacks, 649 (28%) Hispanics and 460 (20%) Asians. All were low-risk for altered fetal growth, and reported an accurate last menstrual period, underwent serial ultrasound every four weeks starting at an average of 19.7 weeks.

Biparietal diameter (BPD) which is one of the basic biometric parameters to assess fetal size, abdominal circumference (AC), femur length (FL) and head circumference (HC) were used to develop a formula for estimating gestational age. The formula was validated using 50% training and test set paradigm; a 50% random sample was used to develop the predictor and the remaining 50% was used to evaluate predictive accuracy. This procedure was run one thousand times and the predictive accuracy measures averaged. Comparative formula accuracies were assessed using the standard deviation of prediction derived from the predicted versus actual population gestational ages.

Daniel W. Skupski, MD, one of the researchers of the study who is with New York Presbyterian Queens in Flushing, NY, and who presented the findings said, "We have developed and validated a new equation for estimating gestational age from fetal biometrics measured between 14 and 22 weeks gestational age using a multi-racial/ethnic population, certified sonographers and modern ultrasound units." The study shows a slight improvement in this newly developed formula over the traditional Hadlock with accuracy of less than nine days versus less than 10 days for Hadlock. It also validates the establishment of this new formula in a large, high-quality multi-center study.

The Society for Maternal-Fetal Medicine (est. 1977) is the premiere membership organization for obstetricians/gynecologists who have additional formal education and training in maternal-fetal medicine. The group

The logo for 99nicu, featuring the text "99nicu" in a bold, yellow, sans-serif font on a dark blue background.

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hosts an annual meeting in which groundbreaking new ideas and research in the area of maternal-fetal medicine are shared and discussed. For more information visit <http://www.smfm.org>.

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### Fall in One-to-One Nursing Care of Very Sick Newborns Linked to Higher Death Rate

Newswise — University of Warwick, Coventry, England research indicates that a fall in one-to-one nursing care of very sick and premature newborns is linked to a higher death rate in neonatal intensive care.

The findings, which have been published in the *Archives of Disease in Childhood (Fetal & Neonatal Edition)*, show the proportion of this type of nursing care provided in intensive care units fell by around a third between 2008 and 2012.

The British Association of Perinatal Medicine (BAPM) recommends one-to-one nursing care for new-borns in neonatal intensive care in the UK, and a ratio of one nurse for every two infants in high dependency units. For infants in receipt of special care, the recommended ratio is 1:4. Yet few neonatal units have achieved the required staffing ratios.

Lead author Dr. Sam Watson, of the university's Warwick Medical School said, "We believe the results in this study provide some evidence in support of a one-to-one nurse-to-patient ratio in neonatal intensive care in England, in line with BAPM guidelines, and therefore, provide increased nursing labour provision on neonatal units in England."

The academics wanted to assess the impact of one-to-one nursing on the monthly death rate in tertiary level neonatal units - those designated to provide intensive care - in England.

They, therefore, extracted monthly data supplied to the National Neonatal Research Database (NNRD) on infants admitted to 43 tertiary level care units between 2008 and 2012.

Using these figures, they calculated the proportion of neonatal intensive care days or intensive care admissions for which one-to-one nursing care was provided during this timeframe.

Between 2008 and 2012 the proportion of one-to-one nursing care provided in tertiary level neonatal units fell by a third, from an average of 9% to an average of around 6%.

Similarly, the proportion of infants admitted who received one-to-one nursing care fell from around 39.5% to just under 36%.

During this period, an average of 4.5 infants out of every 100 (4.5%) in receipt of intensive care, died every month.

They calculated that a 10 percentage point fall in the proportion of intensive care days in which one-to-one nursing care was provided was linked to a monthly increase in the inpatient death rate of 6 per 1000 infants (0.6%) in intensive care.

Dr Watson said: "While these findings from an observational study support an increase in one-to-one nursing provision in tertiary level neonatal units, they do not inform us whether a one-to-one nurse to patient ratio for all intensive care days would have a beneficial effect."

In a linked editorial in the research, Drs Fenton and Turrill, and the Chief Executive of Newborn Baby Charity, Bliss, point out that over 90,000 babies were admitted to neonatal units in

England, Scotland, and Wales in 2014: just under 14% of the care days these babies received was in intensive care.

They highlight the health secretary's ambition, announced at the end of last year, to cut the rate of stillbirths, neonatal and maternal deaths in England by 30% by 2030.

Laudable though this might be, "the announcement has so far singularly failed to acknowledge the importance of improving staffing levels in order to reduce neonatal deaths, despite consistent information from neonatal professionals," they write.

And recent government policy may worsen shortages, they suggest.

"In addition, while the Secretary of State has acknowledged the mistake made by the coalition government in 2010 in cutting the number of student nurse places commissioned, it is still far from clear whether the government's plans to replace student nurse bursaries with loans, as outlined in the 2015 Comprehensive Spending Review, will have the desired effect of increasing the number of nurses trained, or will just put a barrier in the way of those who wish to join the profession," they conclude.

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### Parents Wary of Online Doctor Ratings

Newswise — For many, checking online reviews has become nearly routine for decisions on everything from cars to restaurants. But when it comes to choosing a doctor, the majority of parents aren't convinced online ratings are reliable – or even real, a new national poll shows.

More than two-thirds of parents believe some online doctor reviews are fake, while slightly fewer say there are not enough ratings to make a good decision, according to this month's report from the C.S. Mott Children's Hospital National Poll on Children's Health. More than half of parents also feel doctors may influence who leaves ratings.

"Online rating sites are becoming an increasingly common and potentially influential source of information for parents as they choose a doctor," says lead author David Hanauer, MD, a pediatrician at U-M's C.S. Mott Children's Hospital. "Websites reviewing doctors are readily available, but concerns about how trustworthy they are may be preventing parents from using them broadly."

Nearly one-third of parents report looking at online doctor ratings for themselves or a family member over the past year. Moms are more likely than dads to visit these websites – 36% compared to 22%, respectively. Among parents who have considered online ratings, two-thirds say they either chose or avoided doctors based on what they read.

Among parents who selected a doctor because of ratings, 87% say the online ratings accurately reflected their subsequent experiences.

Older parents also generally had more concerns about online doctor ratings than younger parents. Of parents age 30 and older, 71% were concerned about the possibility of fake reviews compared to 59% under the age of 30.

"People are regularly using online reviews to help make decisions about cars, movies and restaurants. It's no surprise that more websites are allowing patients to publicly share their experiences about their doctors as well," says Hanauer, who is

also a clinical associate professor at the U-M Medical School with a joint appointment in the School of Information and member of the U-M Institute for Healthcare Policy and Innovation.

“Doctor rating sites have the potential to help make the patient-physician relationship more service-oriented. In order for online rating sites to become a more accepted and useful tool, doctors will need to be more engaged in the process, in ways that assure that ratings are authentic.”

To learn more see C.S. Mott Children's Hospital National Poll on Children's Health at: [MottNPCH.org](http://MottNPCH.org).

The C.S. Mott Children's Hospital National Poll on Children's Health – based at the Child Health Evaluation and Research Unit at the University of Michigan and funded by the University of Michigan Health System – was designed to measure major health care issues and trends for U.S. children.

**Data Source:** This report presents findings from a nationally representative household survey conducted exclusively by GfK Custom Research, LLC (GfK), for C.S. Mott Children's Hospital via a method used in many published studies. The survey was administered in January 2016 to a randomly selected, stratified group of parents age 18 and older with at least one child age 0-17 (n=1,407). Parents were selected from GfK's web-enabled KnowledgePanel® that closely resembles the U.S. population. The sample was subsequently weighted to reflect population figures from the Census Bureau. The survey completion rate was 54% among panel members contacted to participate. The margin of error is ± 2 to 9 percentage points.

The findings of the poll reflect the views of the public and do not represent the opinions or positions of the University of Michigan, the University of Michigan Health System, or the C.S. Mott Children's Hospital National Poll on Children's Health.

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PO Box 444  
Manzanita, OR 97130 USA  
[www.NeonatologyToday.net](http://www.NeonatologyToday.net)

### Publishing Management:

- Tony Carlson, Founder, President & Senior Editor - [TCarlsonmd@gmail.com](mailto:TCarlsonmd@gmail.com)
- Richard Koulbanis, Group Publisher & Editor-in-Chief - [RichardK@Neonate.biz](mailto:RichardK@Neonate.biz)
- John W. Moore, MD, MPH, Group Medical Editor - [JMoore@RCHSD.org](mailto:JMoore@RCHSD.org)

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## Neonatal Nurse Practitioner, St. Luke's Children's Hospital - Idaho!

### Boise, Idaho

St. Luke's Children's Hospital in Boise seeks an NNP to assist with coverage in our NICU's. The Neonatology team is comprised on 10 BC Neonatologists and 10 NNP's. The Children's Hospital provides a full complement of Pediatric Subspecialty services with the exception of ECMO & complex congenital heart surgery. The level IV Boise NICU is a modern 61-bed unit with 900 admissions annually providing advanced technology support (HFV, iNO, therapeutic hypothermia, non-invasive ventilation), semi-private rooms and a priority of family-centered care. The program is supported by a skilled Obstetrical department including 5 full-time MFM specialists. At this facility NNP's provide daily rounding support and in-house night coverage along with a Neonatologist. In addition, the team provides coverage at our 12-bed, Level IIb NICU in Meridian, ID 0 just 10 miles from Boise. NNP's provide weekend coverage and home call at this facility.

Known as the "City of Trees," [Boise](#) is Idaho's capital city—both a cultural center and a playground for those who love the outdoors. A vibrant downtown area affords fine dining, theatre, music, and college and semi-professional sports. Whole Foods, Trader Joe's, The Boise Co-op, and seasonal farmers markets are within a mile of the hospital. The Greenbelt follows the beautiful Boise River corridor for more than 30 miles, and the Boise foothills are home to miles of hiking and biking trails.

### Twin Falls, Idaho

St. Luke's Children's Hospital seeks an experienced NNP to join the team in our Twin Falls location! This position currently covers nights with opportunity for future daytime coverage. The ideal candidate for this position is an experienced NNP with strong teaching skills and a desire to educate front-line staff to the higher skill set that a Level II NICU demands. Built in 2011, this state-of-the art 18-bed Level IIIa NICU with 250 admissions annually, and excellent growth potential. While based in Twin Falls, this position rotates regularly through the NICU at St. Luke's Children's in Boise. This provides opportunity to maintain a higher acuity skillset and consistency across the Health System NICUs. Additionally, as part of this larger practice group, coverage for time off and conferences is well-supported.

Twin Falls is located in an area of Idaho referred to as the Magic Valley. It has a population of 44,000 and is the fastest growing city in south central Idaho. It is located in the heart of a rich agricultural area of the state along the mighty Snake River. Housing is affordable, and recreational opportunities abound, with rafting, hiking, skiing, and fishing easily accessible in the immediate area. South central Idaho has a mild, 4-season, high-desert climate. Summers are hot with low humidity, great for outdoor activities. In winter, the valley is largely protected from the cold arctic fronts by the mountains to the north, with occasional snow within the city. Sun Valley, Idaho is just an hour away with excellent skiing in the winter and abundant outdoor recreation in the summer.



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# NEONATOLOGY TODAY

News and Information for BC/BE Neonatologists and Perinatologists

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## Key Contacts

Tony Carlson - *Founder, President & Senior Editor* - [TCarlsonmd@gmail.com](mailto:TCarlsonmd@gmail.com) or call +1.301.279.2005  
Richard Koulbanis - *Group Publisher & Editor-in-Chief* - [RichardK@neonate.biz](mailto:RichardK@neonate.biz)  
John W. Moore, MD, MPH, *Group Medical Editor* - [JMoore@RCHSD.org](mailto:JMoore@RCHSD.org)

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