

DEVICE AIDS PREMATURE INFANTS, HOLDS PROMISE FOR DISABILITY PREVENTION

As if things weren't tough enough for premature babies who have tubes down their throats and noses to survive, once the tubes are removed, they are often unable to take nourishment orally — that is, suck.

But 20 tube-fed preterm infants with respiratory distress syndrome treated with the NTrainer, a therapeutic device patented by the University of Kansas, rapidly learned to suck far better and transitioned to oral feeding faster than a control group of babies with respiratory distress syndrome.

The initial clinical trial of the NTrainer at the neonatal intensive care units at Stormont-Vail Regional Health Care in Topeka and the KU Medical Center in Kansas City, Kan., compared 20 tube-fed preterm infants with moderate-to-severe respiratory distress syndrome treated with the NTrainer to a control group of age-matched respiratory distress syndrome infants who received a sham consisting of a non-instrumented pacifier during tube feedings.

Respiratory distress syndrome, also known as hyaline membrane disease, is a common condition of prematurity, particularly in the youngest infants, because babies' lungs are too immature to survive outside the womb without the help of a ventilator and/or oxygen. Overall, it is the seventh leading cause of death among infants younger than one year, fifth for African-American and third for Hispanic infants.

Infants who received the patterned NTrainer treatment exhibited a near doubling of non-nutritive suck burst complexity, a 50 percent to 100 percent increase on select suck burst production measures and a tripling of their average daily oral feed levels to 72.8 percent compared to the untreated controls at 23 percent. The infants were sampled at 38 weeks post-menstrual age — the time between the first day of mother's last normal menstrual period and the day of the infant's delivery.

All of the infants quickly learned to bottle feed, one of the main objectives of Stormont-Vail project partners José Gierbolini, medical

director of newborn services, and Joy Carlson, neonatal nurse practitioner.

"We were delightfully surprised at the results," said KU speech-language-hearing professor Steven Barlow [BNCD Investigator], who directed the study. "This demonstrates the potent effect of the patterned NTrainer orocutaneous stimulation to drive and reorganize the rapidly developing nervous system."

Barlow, who directs the Communication Neuroscience Laboratories at KU, and University of Colorado professor Donald Finan invented the NTrainer technology (named after the neuroscientific term 'entrainment') and its companion technology, the Actifier, a mobile crib-side workstation that can be configured to permit real-time assessment of oromotor ability and therapeutic intervention in the premature infant.

"Non-nutritive suck [NNS] has been suggested

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BREAST MILK ASSOCIATED WITH GREATER MENTAL DEVELOPMENT

Extremely low birth weight premature infants who received breast milk shortly after birth, while still in intensive care units, had greater mental development scores at 30 months than did infants who were not fed breast milk, reported researchers in an NIH network. Moreover, infants fed breast milk were less likely to have been re-hospitalized after their initial discharge than were the infants not fed breast milk.



The study is a follow-up to a previous study in which the same infants were tested at 18 months, showing that the breast-fed infants held the developmental gains seen in the earlier study.

"These findings strongly suggest that, whenever possible, preterm infants should routinely be given breast milk during their stay in the intensive care unit," said Duane Alexander, M.D., Director of the NICHD, the NIH institute that conducted the study.

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by some neonatologists to provide a window into the development of the central nervous system,” said Barlow. “The NTrainer system represents the first objective physiologically based tools that give the physician and nurse almost instant feedback about the status of the infant’s oromotor system through the assessment of NNS.”

For babies born too soon, the development of non-nutritive suck — the precursor behavior to nursing — is often abruptly disrupted by the lifesaving but invasive breathing tubes that are inserted down the throat and feeding and oxygen tubes taped to a baby’s nose and face to keep it from thrusting the tubes out.

Besides delaying release from the neonatal intensive care unit, respiratory distress syndrome infants who cannot competently orally feed may be required to continue tube feedings at home, typically by way of a gastric tube. In worst case scenarios, children don’t learn to take nourishment orally for months or even years, according to Barlow.

As an ongoing objective of the study, Barlow’s research team will be examining the effects of NTrainer therapy on infants’ transitions to safely

feeding orally and the length of hospital stay.

Barlow hypothesizes that if the NTrainer can stimulate a specialized brain network known as the suck central pattern generator in infant brains through normal sucking patterns at the right time, approximately 32 weeks gestational age, development can proceed more normally for [infants with respiratory distress syndrome]. Application of the NTrainer may benefit other preterm populations, including infants with bronchopulmonary dysplasia or Down syndrome and very low birth weight preemies at risk for neurologic insults and compromised neurodevelopmental outcome.

Barlow is one of the 146 scientists from 20 academic departments affiliated with the Life Span Institute at KU. The Life Span Institute is one of the largest research and developmental programs in the nation for the prevention and treatment of developmental disabilities.

This full article can be viewed online at: <http://www.news.ku.edu/2008/september/4/ntrainer.shtml>. Contact Mary-Margaret Simpson, (785) 864-0697; or Karen Henry, (785) 864-0756.

BNCD INVESTIGATOR HIGHLIGHT

Steve Warren, vice provost for research and graduate studies and a BNCD Investigator, will receive the American Association on Intellectual and Developmental Disabilities 2008 Research Award this spring for his contributions to research in developmental disabilities.

Warren has a long and distinguished career as a professional and researcher. He has published more than 100 articles and book chapters and is internationally known as an expert in atypical language development. He is a Fellow of the American Psychological Association, the current President of its Intellectual and Developmental Disabilities Division, and a past president of AAIDD.

In conjunction with the BNCD, Dr. Warren’s major research interests are in the areas of early communication and language development and intervention and the prevention of mental retardation. Over the past 30 years he has investigated the effects of a variety of communication and language

intervention strategies intended for use with young children with developmental delays.

The award nomination lauded Warren’s significant contributions to the field for their quality, thoroughness and significance.

“His own research productivity merits recognition in and of itself, but in addition, he supports colleagues as a Center Director, promotes interest in our field nationally, and mentors individuals who will carry on future research relevant to intellectual and developmental disabilities.”

This full article can be viewed online at: http://www.lsi.ku.edu/~lsi/news/lifeline/winter_2008.html.



Steve Warren

Parenting in the NICU: Getting Close to Your Baby

If your baby was born prematurely, don’t expect them to have much interest in the world for a few weeks or even months. Similarly, if your baby is very sick, they need all their energy to recover. As your baby feels better and matures, they will become more interested in the world around them. To encourage your baby to respond to you, try some of the following strategies:

- **Focus on your baby.** Give yourself permission to relax and enjoy special moments. While it’s normal to feel anxious, breathing deeply may help you feel calmer and able to tune into your little one.
- **Pay close attention to your baby’s cues.** If they arch their back, change or hold back your touch. If they calm when you cup their head and feet with your hands, use that technique to soothe them.
- **Imitate your baby’s actions and level of interest.** By following your baby’s lead, you encourage them to stay calm and attentive.
- **Protect your baby from overwhelming stimulation.** If your baby is particularly sensitive to light, sound or touch, ask the NICU staff to dim overhead lights, turn down monitors, and provide the kind of touch your baby finds soothing.
- **Provide a calming touch, voice or activity.** By helping your baby stay calm when they’re awake, you help them stay alert without becoming overwhelmed.

Excerpted from the March of Dimes booklet, “Parent: You & Your Baby in the NICU,” written in collaboration with Deborah L. Davis, Ph.D., and Mara Tesler Stein, Psy.D. This full article can be viewed at: http://www.marchofdimes.com/prematurity/1295_6082.asp

Upcoming Events for Parents and Kids!

Winter Wonderland XI: A Celebration of Lights:

A Topeka holiday tradition, this two-mile lighted display is a delight for the child in everyone! Hundreds of themed holiday displays and benefits TARC. Open Nov. 21 to Dec. 23 from 6-10 p.m. at Lake Shawnee. Admission \$6. For more information:

Call: (785) 232-0597

Lawrence Downtown Holiday Parade:

Features horse-drawn carriages, wagons, and coaches decorated for the season. Parade takes place through downtown Lawrence on Dec. 6 at 11 a.m. Admission is free! For more information:

Call: (785) 838-9400

Annie Warbucks:

The world's favorite orphan returns in the sequel to the international smash hit, 'Annie.' Dates run weekends from Nov. 28 to Dec. 21 at the Topeka Civic Theatre. For admission prices and show times:

Call: (785) 357-5211 or



Visit: www.topekacivictheatre.com

Santa's Crayola Christmas Land:

Children can play on super-sized Crayola products while waiting to tell Santa all of their holiday wishes! Dates run Nov. 28 to Dec. 31 near Crown Center from 10 a.m.-9 p.m. Mon.-Sat. & 12-6 p.m. on Sunday.

For more information:

Call: (816) 274-8444

or

Visit:

www.crowncenter.com



Children's Holiday Shop:

Children's Holiday Shop provides a safe and fun place for children to shop for gifts for their families. Gifts are priced \$1 to \$5. For children aged 4th grade and younger. Even get a visit with Santa! Located at the Lawrence Arts Center on Dec. 13 from 10 a.m. - 4 p.m. and admission is free. For more information:

Call: (785) 843-2787 or

Visit: www.lawrenceartscenter.com

Disney Live! Winnie the Pooh:

With fun sing-a-long music, Winnie the Pooh is an interactive extravaganza that will have kids out of their seats and dancing in the aisles! At the Kansas Expocentre on Jan. 17 at 1:30 p.m. Tickets available starting Sept. 23 at the Expocentre box office or Ticketmaster locations.

For more information:

Call: (785) 234-4545 or

Visit: www.ksexpo.com

Junie B. Jones:

Watch out world, here comes outspoken, precocious, lovable Junie B. Jones, and she's definitely ready for a new school year! Performances held at 9:30 & 11:30 a.m. on Jan. 28 & 29 at the Folly Theater in Kansas City, MO. Suggested for grades Pre K-5. Admission fee does apply. For more information:

Call: (816) 474-4444

or

Visit:

www.follytheater.com



(Mental Development, Continued from page 1)

Extremely low birth weight infants are the tiniest and most fragile of premature infants, weighing less than 1,000 grams, or 2.2 pounds, at birth. This category of infants makes up about 1 percent of all U.S. births, or roughly 40,000 each year.

Researchers have long known the benefits of breast milk for full term infants, but its potential effects in preterm infants had not been well studied. Full term infants given breast milk are less likely to develop diarrheal diseases, skin allergies, ear infections, or upper respiratory infections. Some studies indicate that they are less likely to be overweight or obese as adults.

The researchers found that the benefits of breast milk first seen at 18 months were still present at 30 months. Children who had

been given breast milk received higher scores on the Mental Developmental Index (MDI), a test measuring the children's overall intelligence. The average MDI score was 76.5 for children who had not received any milk in the NICU, compared to a score of 89.7 for children who had received the greatest amount of breast milk. Children who had been given breast milk also showed greater ability to control and appropriately respond to emotions and were also less likely to have been readmitted to the hospital after their discharge and before 30 months.

The researchers hypothesized that breast milk may boost the children's immunity against respiratory infections, the principal reason children who had not received breast milk were hospitalized.

"Breast milk offers immune advantages for the infant. It has natural substances that protect against infection," said Dr. Rose Higgins, the NICHD author of the current study.

In the current study, mothers who provided breast milk for their infants also tended to have more education than those who did not. However, in their analysis of the data, the researchers mathematically compensated for the mothers' educational levels. With this adjustment, the researchers concluded that consumption of breast milk had a positive effect on infants' mental development scales, independent of mothers' educational levels.

For more information and to view the full article, please visit: <http://www.nih.gov/news/pr/oct2007/nichd-01.htm>.



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About this Newsletter:

The BNCD newsletter is designed to keep you informed about the ongoing research projects that are being conducted by BNCD researchers at the University of Kansas. Participants who have been part of recent research projects conducted by BNCD researchers, parents who have expressed interest in participating in future research, and individuals from organizations such as schools and daycare centers that have an interest in BNCD studies will receive this newsletter from time to time to keep them up-to-date about the research activities at the BNCD. If you do not wish to receive future newsletters, please call or e-mail the BNCD to have your name removed from our list. Research at the BNCD is supported in part by grant number 5 P30 DC05803 from the National Institute on Deafness and other Communication Disorders (NIDCD) at the University of Kansas.

Find the hidden words within the grid of letters. Stay warm this winter!

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H A T I V C C V V A A T B P P
B U D U B J X E H O S A L Y T
A R D D E N V U C L C O I I Z
M I T T E N S O Z D A C Z B C
A S X O A C C I L G R G Z X A
A D N V X T X O C N F G A G N
R H H O O J C K L I G L R W N
Y Y S H W V I X R D C V D H M
T N T T E F N Y V D I L D A A
W T X I D M L J J E A A E H F
V V I L O S E A V L Q F U S C
T Y P V P I W Z K S N O H N S
W U C F D F H G E E T Z L E H
X N Q A P X E O Q D Y C T U C
T V M L M N H T T M F R A U D
  
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blizzard cold hot cocoa mittens sledding
 coat hat icicle scarf snowflake