



NeonatalNews.Netsm

From the Section of Neonatology, Department of Pediatrics, Baylor College of Medicine, Houston, Texas

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Faculty Spotlight

Carol Lynn Berseth, MD

Dr. Carol Lynn Berseth has enjoyed a multi-faceted career. She has an active interest in issues related to eating difficulties in the preterm infant and has been actively involved in educating medical students and residents on ethical issues in the newborn intensive care unit (NICU).

Dr. Berseth attended medical school at the University of Pittsburgh and she developed a love for neonates during a student elective in the NICU at Magee Women's Hospital. She completed her pediatric residency training at Baylor College of Medicine when Dr. Arnold Rudolph was establishing the core nurseries at Texas Children's Hospital.

During her residency training, she became intrigued by gastrointestinal physiology. Her subspecialty training was at Stanford University with Dr. Philip Sunshine. Dr. Berseth completed her training including several projects in the Department of Physiology at the University of Texas Health Science Center at Houston.

As a faculty member at Mayo Clinic and Foundation, she began a long, fruitful collaboration with several investigators in the internationally acclaimed Gastroenterology Research Unit. There Dr. Berseth began her pioneering clinical studies focusing on the motor function of the preterm neonatal gastrointestinal tract.

Ten years later, Dr. Berseth sold her snowblower and returned to Houston where she continues to focus on the feeding problems of preterm infants.

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The Front Line:

Oral feeding of premature infants

by Chantal Lau, PhD

Healthy term infants can feed by mouth immediately after birth, by breast or bottle. This is not so for the premature.

Safety is the primary concern with oral feeding. Babies need to feed without oxygen desaturation, apnea, bradycardia, or aspiration. Although fetal sucking, swallowing, and breathing have been observed, it is unknown when this process becomes coordinated in premature infants. Nor do we know when the premature infant is ready to feed by mouth, though oral feeding is usually introduced around 33-34 weeks' postmenstrual age.

Premature infants may have difficulty transitioning from tube to oral feeding. Oral feeding should be a pleasant, nurturing, and positive experience. Given the repetitive noxious oral stimuli that the very smallest infants experience, they must have time to



Chantal Lau, PhD

dissociate oral feeding from these aversive interventions. Some infants develop long-term feeding difficulties, even after hospital discharge. These infants should be promptly identified and referred to a feeding disorder clinic.

A premature infant is not a full-term infant, which may seem self-evident but in practice is not always considered. Prematures have an immature suck and are not efficient feeders. They rapidly fatigue and have poor endurance; thus, the feeding duration should be short. They often change states (sleepy, awake, crying) and cannot perform a task for a prolonged period.

Therefore, to improve oral feeding success, it is important to take advantage of certain factors. An optimal environment includes dim nursery lights, low noise levels, increased positive

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Breaking news:

Managing procedural pain

by Marlene Walden, PhD

Newborn infants, particularly those born preterm, are routinely subjected to an estimated average of 61 invasive procedures performed from admission to discharge, with some of the youngest or sickest infants experiencing more than 450 painful procedures during their hospital stay. These frequent, invasive, and noxious procedures occur randomly in the neonatal intensive care unit (NICU) and many times are not routinely managed with either pharmacologic or nonpharmacologic interventions. The International Evidenced-Based Group for Neonatal Pain provides guidelines for preventing and treating neonatal procedural pain. Experts from several countries, professional disciplines, and practice settings developed the guidelines using systematic reviews, data synthesis, and open discussion to develop a consensus on best clinical practice. Suggested strategies for the management of diagnostic, therapeutic, and surgical procedures commonly performed in the NICU are summarized in the Table on page 2.

see Pain, page 2

Berseth (continued from page 1) —

Over the past 20 years, Dr. Berseth has been a devoted teacher. At Mayo Clinic she coordinated the medical ethics course for first-year medical students and the Human Values Seminar Series for second and third-year medical students, and she served as a research mentor for pediatric gastroenterology fellows and pediatric residents. At Baylor, she assists with the medical ethics course for first-year medical students and has been a research mentor for medical students, neonatal fellows, and pediatric gastroenterology fellows.

Pain (continued from page 1) —

Anand KJS, International Evidence-Based Group for Neonatal Pain. Consensus statement for the prevention and management of pain in the newborn. *Arch Pediatr Adolesc Med* 2001;155:173.

Anand KJS, Selanikio JD, SOPAIN Study Group. Routine analgesic practices in 109 neonatal intensive care units (NICUs). *Pediatric Research* 1996;39(4 Pt 2):192A.

Barker DP, Rutter N. Exposure to invasive procedures in newborn intensive care unit admissions. *Arch Dis Child Fetal Neonatal Ed* 1995;72:F47.



Michael E. Speer, MD
Professor of Pediatrics—
Neonatology, Baylor College
of Medicine, Houston

Editor's Corner: Patient safety

It seems that the issue of patient safety is a topic of the day in the lay press and medical editorials. Calls for improved hospital system processes, such as identifying patients with bar codes to decrease medication errors, are being debated. The public wants to know whether the hospital in which they or their children are cared for is as safe as can be designed. The neonatal intensive care environment, in particular, has been found to be one of the areas where, because of the disease acuity of the patient population, medical errors can and do occur. No one wants an error to occur; however, care processes in the NICU frequently

involve many different personnel from many different disciplines who must work together in a coordinated manner with multiple handoffs taking place. Neonatologists, nurses and hospital administrators must work together to reduce risks to patients. One area that can be addressed is to identify processes whereby data (such as lab and medication order entry) is transmitted among many individuals. By decreasing the number of handoffs between people, errors can be reduced.

Suggested management of procedural pain in neonates at Baylor College of Medicine

(Adapted from International Evidence-Based Group for Neonatal Pain, 2001)

Procedure	Pacifier	Sucrose	Swaddling, Containment, or Facilitated Tucking	EMLA Cream	Subcutaneous Infiltration of Lidocaine	Opioids	Other
Heel lance	✓	✓	✓				Consider venipuncture; skin-to-skin contact with mother; mechanical spring-loaded lance.
Percutaneous venous catheter	✓	✓	✓	✓		✓	Consider similar approach for venipuncture.
Percutaneous arterial catheter	✓	✓	✓	✓	✓		Consider similar approach for arterial puncture.
Peripheral arterial or venous cutdown	✓	✓	✓	✓	✓	✓	
Central venous line	✓	✓	✓	✓	✓	✓	Consider general anesthesia.
Umbilical arterial/venous catheter	✓	✓	✓				Avoid placement of hemostat clamps on skin around umbilicus.
Peripheral central catheter	✓	✓	✓	✓		✓	
Lumbar puncture	✓	✓		✓	✓		Use careful physical handling.
Subcutaneous or IM injection	✓	✓	✓	✓			Give drugs intravenously, whenever possible.
ET intubation						✓	Various combinations of atropine, ketamine, thiopental sodium, succinylcholine chloride, morphine, fentanyl, non-depolarizing muscle relaxant; consider topical lidocaine spray
ET suction	✓	+ / -	✓			✓	
Nasogastric-oro gastric tube	✓	✓	✓				Gentle technique and appropriate lubrication.
Chest tube	✓	✓			✓	✓	Anticipate need for intubation and ventilation in neonates spontaneously breathing; Consider short-acting anesthetic agents; Avoid midazolam.
Circumcision	✓	✓		✓	✓		Dorsal penile nerve block, ring block, or caudal block using plain or buffered lidocaine; Consider acetaminophen for postoperative pain.
Ongoing analgesia for routine NICU care and procedures	✓	+ / -	✓			✓	Avoid long-term sedation; Avoid midazolam; Consider acetaminophen therapy; Reduce acoustic, thermal, other environmental stresses.

Neonatal Case Study

by Michael E. Speer, MD

Case presentation

This infant was born by elective cesarean because of oligohydramnios at 35⁴/₇ weeks' gestation. Following a short trial of blow-by oxygen, the infant was intubated because of marked increased work of breathing. Over the next several hours the infant's respiratory status improved and he was able to be extubated and then weaned to room air. A renal ultrasound showed small kidneys without hydronephrosis and massively dilated ureters. A voiding cystourethrography (VCUG) showed reflux on the right, no reflux on the left, enlargement of the urinary bladder, and dilation of the posterior urethra. A Foley catheter was placed for bladder drainage and amoxicillin was started for prophylaxis. The serum creatinine and BUN values slowly increased from birth, requiring the institution of peritoneal dialysis.

Denouement

This infant's findings are characteristic of Triad Syndrome (hypogonadism, absence of abdominal wall muscle, dilated ureters/renal failure) also known as Eagle-Barrett or prune belly syndrome. The reported incidence is 1:40,000, and 95% of the affected infants are male. Pulmonary hypoplasia is a frequent finding as is acute and chronic renal failure secondary to *in utero* development of either renal dysgenesis or hydronephrosis. Far fewer cases may have congenital cardiac malformations and/or intestinal malrotation. Some also have feeding difficulties secondary to impaired peristalsis due to abdominal wall laxity. These children frequently require chronic dialysis and renal transplantation later in life. They have a functional bladder outlet obstruction that accounts for some of the findings regarding the bladder and ureters. Although *in utero* urinary diversion procedures have been attempted, they have had very limited success.

Research Highlights

Grants / Funding

Couroucli, Xanthi, MD. Cytochrome P450 regulation by hyperoxia and nitric oxide, National Heart, Lung, and Blood Institute, \$598,825.

Events

Diane Anderson, RD, LD, PhD,

- Program Director, Neonatal Nutrition Conference, Houston, supported in part by a grant from the Department of Health and Human Services, Health Resources Services Administration (HRSA) and Maternal Child Health Bureau (MCHB).
- appointed to the Pediatric Weight Management Certificate Program Committee, Commission of Dietetic Registration, March 2002.
- appointed advisor by American Dietetic Association's Pediatric Nutrition Practice Group in revising the book *Preparation of formula for infants in health care facilities*.

William D. Clark, MD and **Camellia Fituch, MD** received the Arnold J. Rudolph Award at the 7th Annual Rudolph Memorial Grand Rounds, February 2002.

Charleta Guillory, MD, elected March of Dimes Gulf Coast Chapter representative to March of Dimes State Public Affairs Committee, 2002-03.

Michael E. Speer, MD

- course organizer and senior course director for the AAP "Perinatal Workshop on Practice," Scottsdale, Arizona, April 2002.

- participating member of American Academy of Pediatrics Neonatal Resuscitation Program Steering Committee strategic planning meeting, Chicago, March 2002.
- AAP liaison and participant in the final meeting of the American College of Obstetrics and Gynecology Task Force on Neonatal Encephalopathy to develop a white paper, Washington, DC, April 2002.

Marlene Walden, PhD appointed a member of the Executive Board of Directors for the Texas Perinatal Association, January 2002.

Presentations

Gerardo Cabrera-Meza, MD

- presented "Environmental Neonatology" at a neonatal developmental care course for nurses at The Hospital Angeles de las Lomas and Hospital Infantil Privado, Mexico City, Mexico, April 2002.
- participant in the Workshop for Medical Schools Faculty to Consolidate the IMCI Textbook, sponsored by the Pan American Health Organization/world Health Organization, in Buenos Aires, Argentina, April 2002.

Patricia Ramsay, MD

- invited speaker; topic: "Respiratory epithelial cell gene expressions relevant to bronchopulmonary

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Contact Us

The Baylor College of Medicine Section of Neonatology has staff at four hospitals in Houston's Texas Medical Center and in the local community.

To request a neonatal consultation at any of our locations, call 1-877-NEONATE (1-877-636-6283)

Texas Medical Center locations:

Texas Children's Hospital

6221 Fannin Street, Houston TX 77030
Director of Nurseries: James M. Adams, MD

For neonatal transport, call the Kangaroo Crew:

In Houston: 832-824-5550
Toll-free: 1-877-770-5550

St. Luke's Episcopal Hospital

6720 Bertner Avenue, Houston TX 77030
Director of Nurseries: Michael E. Speer, MD

The Methodist Hospital

6565 Fannin Street, Houston TX 77030
Director of Nurseries: Michael E. Speer, MD

Ben Taub General Hospital

1504 Taub Loop, Houston TX 77030
Director of Nurseries: Joe Garcia-Prats, MD

Community locations:

Bayou City Medical Center-South

6700 Bellaire Blvd, Houston TX 77074

Woman's Hospital of Texas

7600 Fannin Street, Houston TX 77056

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Fellowship Opportunities Available

The Baylor College of Medicine Neonatal-Perinatal Medicine Fellowship Program accepts applications year-round.

For information

- visit our website: www.neonate.net
- send email to: fellowship-program@neo.bcm.tmc.edu
- write to Dr. Leonard Weisman at the address on page 4 of this newsletter.

Leonard E. Weisman, MD
Professor of Pediatrics
Head, Section of Neonatology

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Feeding (continued from page 1)

human contact, and making sure the infant is warm. Oral feeding is best when the infant is in a drowsy or calm alert state; oral feeding should not be given when the infant is sleeping or disorganized (highly aroused, fussy, crying). When disorganized, the infant will have difficulty coordinating sucking, swallowing, and breathing.

An infant is *not* ready to feed when he/she stares or avoids looking at you, has an expression of panic or worry, cannot wake up or yawns excessively, is tremulous, gasping or gagging, has abnormal vital signs, or has color changes. Similarly, oral feedings should *stop* if the baby manifests any of these same signs or shows evidence of fatigue (eg, drooling, no suck, apnea/bradycardia/oxygen desaturation).

With prematures, focus on developing good functional feeding skills rather than the quantity of milk ingested at one feeding.

The Neonatal Feeding Team of the Baylor College of Medicine Section of Neonatology provides consultative and evaluative services throughout the nurseries of Baylor-affiliated hospitals.

Highlights (continued from page 3)

- dysplasia" at Baylor University Medical Center, Dallas, February 2002.
- invited speaker; topic: "Molecular mechanisms of oxygen-induced repression of the clara cell secretory protein gene" at Children's Research Institute, Columbus, Ohio, February 2002.

Marlene Walden, PhD co-presented "Symposium: Methodological considerations for physiologic research," 16th Annual Conference, Southern Nursing Research Society, San Antonio, Texas, February 2002.

Leonard E. Weisman, MD, presented "RSV: Current prevention strategies in high-risk infants" at the Japanese Pediatric Society Annual Meeting, Nagoya, Japan, April 2002.



Baylor Perinatal Outreach Program

26th Annual Perinatal Nursing Symposium

October 25, 2002
Hilton University of Houston

For registration information, contact:

Email: mcbrand@texaschildrenshospital.org

Telephone: (713) 873-3515

On the Web: www.neonate.net
(Click: *Perinatal Nursing Symposium*)

Jointly presented by
Texas Children's Hospital • Baylor College of Medicine • St. Luke's Episcopal Hospital

Neonatal Nutrition Fellowship Opportunities

The Baylor College of Medicine Neonatal Nutrition Fellowship Program (for Registered Dietitians with clinical experience) accepts applications year-round for two training periods (January–March and April–June).

For additional information contact Diane Anderson, PhD, RD

- email: dianea@bcm.tmc.edu
- telephone: 832-824-1346
- mail: to the address at the top of this page

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