



NEWSLETTER

Winter 2005

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2004 ANNUAL MEETING NEW CHALLENGES FOR NEONATOLOGY

The 2004 Vermont Oxford Network Annual Meeting held in Washington, DC, on December 11, 2004, brought together over 500 NICU health professionals representing multiple disciplines from around the world to discuss a broad range of topics. Several important new challenges for our field were identified and addressed.

The Network Annual Meeting began with the yearly update of Network activities by Chief Executive and Scientific Officer, Jeffrey D. Horbar, MD. Dr. Horbar reviewed the growth and accomplishments of the Network. He also presented initial research using the empirical Bayesian technique of shrinkage estimators to calculate the excess of observed versus expected cases of morbidity and mortality at Network centers. The results have important applications to Network reporting and to setting priorities for improvement. Preliminary analyses using these techniques indicate that if all Network hospitals could perform at a level currently achieved by the best 20% of units, over 2500 cases of chronic lung disease, 2150 cases of nosocomial infection, 1215 deaths, and 800 cases of severe IVH could be prevented each year at Network hospitals. These results present a serious challenge to all of us. Why can't we all achieve the results that 20% of our colleagues are already getting?

Roger Soll, MD, Director of Clinical Trials, reviewed the current status and plans for Network randomized trials (see accompanying article). Maureen Reilly, RRT, from Sunnybrook and Women's College Health Science Center, Toronto, CA, reviewed the protocol and plans for the Heat Loss Prevention Trial (HeLP). This trial will test the hypothesis that polyethylene occlusive wrap applied immediately after delivery to infants < 28 weeks gestation will result in decreased mortality.

Charles Mercier, MD from the University of Vermont, presented updated findings for the Extremely Low Birth Weight Infant Follow-Up Project, 1998-2001. The health and developmental status at two years of age for 2446 infants weighing 1000 grams or less at birth was reported. Unfortunately, the outcome for these infants continues to be problematic. Severe

disability defined as cerebral palsy, inability to walk, cognitive delay (MDI<70), visual loss in both eyes, or hearing loss requiring amplification was present in 31% of the infants followed. These results present another critical challenge to the field of neonatology, improving the long term outcomes for our most vulnerable patients.

The audience was treated to an inspirational presentation by Hiroshi Nishida, MD, Professor and Chairman of the Tokyo Women's Medical University, Tokyo, Japan. Dr. Nishida's presentation, The Importance Of Nurturing Warm Heartedness To Children, described his personal philosophy. He defined warm heartedness as, "care about others, to feel pains and sorrows of others, and to know continuity with others". Dr. Nishida has devoted himself to nurturing warm heartedness especially to those most fragile infants cared for in NICUs. He has completed a Silk Road Journey to spread his message. Running 2500 km from the Vatican to Istanbul, he stopped at 17 places to offer his message of warm heartedness from the perspective of a neonatologist. A video of this wonderful running journey was shown. Our challenge is to practice the warm heartedness described by Dr. Nishida in our daily work.

The afternoon session of the Annual Meeting began with a special session on Global Neonatology. Gary Darmstadt, MD, Senior Research Advisor at Save the Children Federation described the epidemiology of newborn mortality and morbidity in the developing world. The major importance of birth asphyxia which affects 4 to 9 million newborns and causes 1 to 2 million deaths each year in the developing world was highlighted. His presentation described the research being done by Saving Newborn Lives to reduce the global burden of newborn disease.

The session on global neonatology continued with a presentation by Zulfiqar Ahmed Bhutta, MD, PhD, the Husein Laljee Dewraj Professor of Child Health, Aga Khan University Hospital, Karachi, Pakistan. Dr. Bhutta provided an illuminating Global Review of Community-Based Interventions to Reduce Perinatal and Newborn Mortality. He reviewed the evidence for a variety of community interventions and concluded that there are a number of effective and simple

community interventions that have the potential to prevent 55% to 60% of all neonatal deaths in the developing world. This is perhaps the biggest challenge presented at the Annual Meeting! (See Lancet, Neonatal Survival Series, March 5, 2005.)

The session on global neonatology concluded with a fascinating presentation by Steven Ringer, MD, PhD, Chief of Newborn Medicine, Brigham and Women's Hospital, Boston, MA. Dr. Ringer described the Development and Implementation of a Low-Cost CPAP Device in Vietnam. By closely collaborating with colleagues at the National Hospital of Pediatrics in Hanoi, Dr. Ringer and his team were able to show that introduction of the simple, locally built CPAP device reduced 24 hour mortality from respiratory distress from 35% to 10% over the initial 2 months of use. Widespread implementation throughout Vietnam has the potential to save up to 20,000 infants each year.

The Annual Meeting continued with a series of breakout sessions. Drs. Bhutta, Darmstadt and Ringer led a session on Global Neonatal Health, Getting Involved, which provided members the opportunity to explore potential ways they could contribute and participate in global improvement efforts for newborns. Thelma Patrick, PhD, RN, chaired a session with members of the Network Multidisciplinary Advisory Committee addressing the relationship of nurse staffing to NICU quality and exploring potential avenues for Network research in this area. Dr. Soll conducted a session reviewing the Cochrane Neonatal Group evidence related to early use of nasal CPAP. Joe Carpenter, Network Statistician, led a session for users and future users of the eNICQ software.

In summary, the 2004 Vermont Oxford Network Annual Meeting was a success. Important topics were discussed and a number of critical challenges to our field were identified. These include:

1. Preventing thousands of cases of infection, IVH, death and CLD
2. Improving the neurodevelopmental outcomes for ELBW infants
3. Practicing warm heartedness towards children
4. Preventing the majority of newborn deaths in the developing world
5. Understanding the relationship between nurse staffing and quality

We look forward to seeing everyone at the 2005 Vermont Oxford Network Annual Meeting, Saturday, December 3, 2005 in Washington, DC. Please reserve the date!

The Key Sponsor for the 2004 Annual Meeting was Discovery Laboratories. Supporters of the meeting were Massimo Corporation and Ross Products Division of Abbott Laboratories, Inc. The Vermont Oxford Network is pleased to acknowledge this generous sponsorship and support. Jeffrey D. Horbar, MD

5TH ANNUAL QUALITY CONGRESS FOR NEONATOLOGY IMPROVING QUALITY AND SAFETY IN THE NICU

The Vermont Oxford Network 5th Annual Quality Congress for Neonatology was held in Washington, DC, on December 12, 2004. Co-chaired by Paul E. Plsek, internationally respected quality improvement consultant and Jeffrey D. Horbar, Chief Executive and Scientific Officer of the Vermont Oxford Network, the meeting attracted an international audience of over 500 NICU health care providers representing multiple professional disciplines. The Congress addressed a broad range of quality and safety topics related to newborn medical care.

Dr. Horbar opened the meeting with a brief introduction to the Vermont Oxford Network activities to promote quality and safety. He described the NICQ and iNICQ Improvement Collaboratives, and the anonymous voluntary error reporting system for neonatal units developed by the Network.

Jim Reason, Professor Emeritus of Psychology at the University of Manchester, Manchester, UK, addressed Patient Safety in the NICU. Professor Reason, a pioneer in the patient safety movement, distinguished the person approach which focuses on violations and errors made by individuals, from the systems approach that focuses on tracking causal factors back into the system as a whole. In an informative and entertaining presentation that included Shakespearean performance and scientific erudition, he concluded that naming, blaming and shaming of individuals have no remedial value, whereas designing a health care system in the NICU for human beings, warts and all, has the best chance for creating a culture and environment for safety.

Donald Goldmann, MD, Senior Vice President at the Institute for Healthcare Improvement and Professor at the Harvard Medical School, Boston, MA, discussed the JCAHO National Patient Safety Goals. He reviewed each of the goals for 2004 and the new goals planned for 2005 specifically as they relate to the NICU, giving valuable examples from NICUs in the Vermont Oxford Network NICQ Improvement Collaboratives.

Robert Ursprung, MD, Attending Neonatologist at Cook Children's Medical Center, Fort Worth, TX, described a unique new approach to patient safety that he has developed in collaboration with the faculty of the Center for Patient Safety in Neonatal Intensive Care. The Random Safety Audit builds on an approach that has been successfully applied in a number of high risk industries. By selecting randomly each day from a deck of patient safety cards, each containing a specific safety related question, NICU teams can detect errors, provide rapid feedback and involve large numbers of staff in promoting patient safety. Dr. Ursprung described the initial experience of a 5 week pilot study of the Random Safety Audit in one NICU. During this time period 324 errors or safety hazards were identified using the cards. Errors included unlabeled or mislabeled syringes or medications at the bedside, inappropriate pulse oximeter alarm settings, problems with ID bands and patient identification, laboratory errors, and communication errors among others. Many of the NICUs in the Vermont Oxford Network Improvement Collaboratives are now customizing and implementing the Random Safety Audit as a routine part of their patient safety improvement efforts.

James Handyside, Quality Improvement Leader of the NICQ 2005 Improvement Collaborative, presented new data on Human Factors in the NICU. He reviewed the importance of human factors in NICU safety and described the Human Factors Checklists that he has developed for the Vermont Oxford Network Improvement Collaboratives. This series of checklists, designed to direct attention to human factors issues, guide change and improve system reliability, includes modules on labels and displays, device usability, clinical alarms, procedures and task guidance, alertness, team performance and unit design.

Blanton Godfrey, PhD, Professor at North Carolina State University, College of Textiles, Raleigh, NC, addressed The Science of Quality Improvement. He reviewed the history of the quality improvement field and its evolution focusing on developments in the Six Sigma approach and how it could be applied in health care.

Christopher P. Landrigan, MD, MPH, Director of the Sleep and Patient Safety Program, Brigham and Women's Hospital, Boston, MA, reviewed the topic of fatigue and safety. Dr. Landrigan reviewed the physiology of sleep and alertness, and presented the findings of the Harvard Work Hours, Health, and Safety Study which have recently been published (NEJM 2004;351:1829 and 1838). This landmark

research demonstrates that fatigue among physicians is a significant cause of medical errors. Modifying work schedules for house officers and attending physicians has substantial potential to improve patient safety.

Brenda Zimmerman, PhD, Associate Professor at the Schulich School of Business, and Director of the Health Industry Management Program, Toronto, Ontario, CA, discussed Complexity in the NICU. She focused on the NICU through the lens of complexity (interdependence, emergence, order without central control). Dr. Zimmerman classified systems as simple (following a recipe), complicated (sending a rocket to the moon) and complex (raising a child). She argued that the NICU is a complex system and that promoting quality and safety in this complex system will require application of new concepts from complexity science.

Paul Plsek reviewed the 4 Key Habits for clinical improvement (Change, Systems Thinking, Collaborative Learning, and Evidence-Based Practice) and discussed how these habits could be applied to achieve improvements in multiple domains including clinical, operational, and cultural aspects of NICU care.

The Quality Congress ended with a poster session. Over 50 posters from NICU teams around the world were available for viewing and discussion. A wide variety of practical improvements in NICU quality and safety were presented. Many of the posters were presented by teams in the Vermont Oxford Network NICQ and iNICQ Improvement Collaboratives. These posters represent intensive multidisciplinary collaboration. Thank you to all teams that shared their work.

We look forward to seeing everyone in Washington, DC on Sunday, December 4, 2005 for the Vermont Oxford 6th Annual Quality Congress for Neonatology. Please reserve the date!

The Key Sponsor for the 5th Annual Quality Congress for Neonatology was Discovery Laboratories. Supporters of the meeting were Massimo Corporation and Ross Products Division of Abbott Laboratories, Inc. The Vermont Oxford Network is pleased to acknowledge this generous sponsorship and support.

Jeffrey D. Horbar, MD

MARK YOUR CALENDAR

NETWORK ANNUAL MEETING: Sat., 12/03/05
6th ANNUAL QUALITY CONGRESS: Sun., 12/04/05

Omni Shoreham Hotel
Washington, DC

NIC/Q YIN AND YANG

The NIC/Q Collaborative now has two separate arms, YIN (Your Ideal NICU) for veteran centers and YANG (NIC/Q 2005) for new and veteran centers.

YIN, under the direction of Quality Improvement Expert Paul Plsek, has 12 centers working intensively to develop their own ideal NICU. The idea of the name YIN is that there is no one "ideal", each NICU must decide what is ideal for them and then achieve it. Your ideal and mine may not be exactly the same. While continuing to build on the concepts learned through the NIC/Q project, this group of "pioneers" will also explore the application of Microsystems thinking to NICUs from the work of The Center for the Evaluative Clinical Sciences at Dartmouth Medical School. These 12 centers will work closely with experienced coaches and associate coaches from the Clinical Microsystems Resource and Development Group based at Dartmouth. Our hope is that at the end of this project, the YIN group will create a library of Your Ideal NICU "Playbooks" that provide detailed case studies on how to create ideal processes and systems for common situations in NICU care. These playbooks will describe what was done, how a NICU went about it, measures to monitor, videotapes describing the before and after process, and other resources. Other outputs will be case studies of Value Compasses and Balanced Scorecards for NICUs with complete how-to advice, "road maps", and "travel guides" for others to follow the path toward creating their own ideal NICU. These materials will be valuable to other NICUs in designing and achieving their own unique "ideals".

YANG (NIC/Q 2005), under the direction of Quality Improvement Expert Jim Handyside, has 42 centers participating. These centers are a combination of new and veteran NIC/Q collaborative members. All new centers have done work in Quality Improvement, either through their involvement in the iNICQ Internet Collaborative or the Quality and Safety Course. While continuing to build on the Four Key Habits, this group will work closely with experts, facilitators and clinical leaders in the following Exploratory Groups: Neonatal Pharmacy, Hemodynamics, Surgery, Respiratory Care, Nutrition, Physical Environment, and OB-Perinatal Care.

YIN and YANG will have collaborative meetings this April in Portland, Oregon.

iNICQ

INTERNET INFECTION COLLABORATIVE 2005

The Vermont Oxford Network is pleased to report that multidisciplinary teams from 51 neonatal intensive care units in North America and around the world have registered for the iNICQ Internet Infection Collaborative. This collaborative is the fourth in a successful series of Internet-based improvement collaboratives sponsored by the Vermont Oxford Network.

This series is a continuation of the work begun in the previous iNICQ Infection Collaborative which ended in November 2004. The goal of this collaborative is to achieve and sustain reductions in Nosocomial Infection...the motto is "**Making it Work, Making it Stick...Transforming Ideas into Action!**" We are pleased that 21 new teams have joined past participants to begin this work on reducing infection in the NICU! This clinically based, action oriented series includes 5 interactive 90 minute web conferences focused on Reducing Infection in the NICU. Presented by nationally recognized experts in health care improvement and building on the learning and materials from the Network's successful NIC/Q Quality Improvement Collaborative, each web conference provides formal teaching, interactive discussion and time for teams to work together. Prior to each conference, participating teams are provided with materials and prework assignments designed to prepare the team for action.

Between conferences, Quality Improvement Coaches, through 3 multi-team teleconferences, will help iNICQ centers focus on the Quality Improvement process. iNICQ teams will have the opportunity to share their experiences with one another, while being guided through the improvement process by an expert facilitator. These facilitators will help teams learn strategies to overcome barriers and to make measurable improvement.

Collaborative members have access to a dedicated e-mail listserv as well as access to VON's private collaborative website nicq.org, where participants have rapid access to tools, skills, information and resources designed to improve the quality and safety of medical care for newborn infants and their families. Free CME, Contact Hours and CRCE credits are available to iNICQ Collaborative participants.

The topic areas of the iNICQ Infection Collaborative are as follows:

iNICQ 2005 Project Start-up

April 28, 2005

Introduction of series content, design, review and emphasize the improvement model and sustaining change; introduction of the Random Infection Audit Tool.

Hand Hygiene, Infection Control and the Behavioral Sciences

June 16, 2005

This conference includes the following: hand hygiene and behavioral science; introduction of Hand Hygiene Auditing Tools.

Central Line Care Bundle and Reliability Science

July 26, 2005

This conference includes the following: introduction of line care bundle concept and specifics; reliability science and line care.

Appropriate Antibiotic Use

September 2005 (date to be determined)

This conference includes the following: summary of literature and practices in use of antibiotics in NICU: improvement aims for antibiotic use.

Case Studies in Improvement

November 15, 2005

This conference will provide opportunities for participating centers to present local breakthroughs in improvement.

Space is limited. For more information on iNICQ, please contact Pam Ford, iNICQ Coordinator at 802-865-4814 x204 or e-mail pam@vtoxford.org.

NURSING RESEARCH IN THE VERMONT OXFORD NETWORK PLANS FOR THE FUTURE

Nursing care is a critical determinant of the quality and safety of medical care. Although this should be self-evident, the idea has been resisted by some who are interested in cutting costs through staffing reductions without regard for the impact on quality. There is a growing body of evidence to indicate that for adult medical and surgical patients inadequate levels of nurse staffing result in unsafe and poor quality care. Few studies are available for the NICU. The UK Neonatal Staffing Study of 13,334 infants at 186 NICUs in the United Kingdom found that mortality was increased at higher nursing workloads (Lancet 2002; 359:99-107). Similar findings are likely to apply in the US, but many questions are unanswered. How variable is staffing among and within NICUs in the US? Is this variation associated with differences in quality and safety of care? What

is the appropriate and safe level of staffing for NICU patients? How can staffing best be matched to individual patient needs on every shift of every day? What unit and institutional staffing strategies are most effective? What are the effects of different organizational structures and cultures on NICU staffing requirements? How are nurse satisfaction and turnover affected? These questions are extremely interesting and critically important.

The Vermont Oxford Network is exploring how to contribute to research in this area. We are working with Jeannette Rogowski, PhD, a health economist at the University of Medicine and Dentistry of New Jersey, and Thelma Patrick, PhD, RN, a nurse researcher at the University of Pittsburgh to explore potential research questions. With the help of the Vermont Oxford Network Multidisciplinary Advisory Committee, we are planning to develop a research proposal focused on how nurse staffing in the NICU affects the quality and safety of care for infants and their families.

We look forward to working closely with nurses at Vermont Oxford Network hospitals. If you have ideas or suggestions, or are interested in hearing more about our plans, please contact Thelma Patrick, PhD, RN, (RSITEP@MWRI.MAGEE.EDU).

A WONDERFUL ARTICLE

Dr. Atul Gawande, an endocrine surgeon from Boston, is one of the best medical science writers I've ever read! If you are not familiar with his work I suggest you start with "The Bell Curve: What happens when patients find out how good their doctors really are?" in the December 6, 2004 issue of the New Yorker magazine. I know it's strange for me to do a commercial for a popular magazine article. I just had to do it. The article is that good!

You will learn about the current status of medical care for patients with cystic fibrosis and will understand benchmarking and quality improvement without all the jargon. It's a lucid, inspiring account of the work of LeRoy Matthews, Warren Warwick, Don Berwick, the Cystic Fibrosis Foundation, the Cincinnati Children's and the Robert Wood Johnson Foundation.

The lessons and insights in this article can be, indeed, should be, applied to many areas of pediatrics care. It won't be easy, but it can be done. Knowing where you stand on the bell curve is going to be scary. Who wants to be average? If you're bored or ignoring all the fuss about quality improvement and evidence-based medicine, this article brings it to life and will inspire you to join such endeavors. Jerry F. Lucey, MD

THE VERMONT OXFORD NETWORK REGISTRY FOR NEONATAL ENCEPHALOPATHY

Background

Neonatal encephalopathy has been defined as a "syndrome of disturbed neurological function in the earliest days of life in the term infant, manifested by difficulty with initiating and maintaining respiration, depression of tone and reflexes, subnormal level of consciousness, and often by seizures."¹ The prevalence of neonatal encephalopathy has been estimated to be 3.8 per 1000 live term births.^{2,3} In the past it was accepted that fetal asphyxia during labor and delivery was the predominant cause of neonatal encephalopathy and cerebral palsy, leading to the diagnosis of hypoxic-ischemic encephalopathy, HIE, for most infants presenting with encephalopathy soon after birth. More recently, it has been recognized that there may be multiple etiologies for neonatal encephalopathy, that the proportion of cases attributable to perinatal hypoxic-ischemic injury is unclear, and that the significant predisposing factors and those contributing to unfavorable long-term outcome are for the most part unknown.⁴ Two additional arguments support the need for a registry of neonatal encephalopathy. First, given the paucity of scientific data, variation in routine practice for the diagnosis and management of neonatal encephalopathy is likely to be great, leading to deficiencies in the quality and safety of medical care for these high risk infants.⁵ Second, if new therapies such as hypothermia and neuroprotective agents are to be tested appropriately and used effectively, selection criteria for treatment must be developed and assessed, and prospective studies planned and designed.⁶ Recently, several groups have reported improved outcomes for infants with hypoxic-ischemic encephalopathy treated with either total body or head cooling.^{7,8} As evidence accumulates, there will be many questions about when and how to introduce hypothermic therapy into routine practice.

Goals

The Vermont Oxford Network is establishing a Registry for Neonatal Encephalopathy. The Registry will enroll newborn infants with documented encephalopathy to identify their demographic characteristics, associated perinatal factors, medical treatments, co-morbidities and outcomes. The Registry will allow us to characterize the population of infants with encephalopathy, evaluate variations in current practice, monitor the introduction and dissemination of new neuroprotective therapies such as hypothermia, assess selection criteria for neuroprotective therapy, identify opportunities for improvement in the quality and safety of care for infants with encephalopathy, define important

questions for clinical research, and plan prospective research and randomized trials.

Methods

Eligibility and Data Management: All hospitals in the Vermont Oxford Network currently using eNICQ software and participating in the Expanded Database are eligible to join the Registry. The Registry data will be collected for infants with neonatal encephalopathy using the eNICQ software. We anticipate the number of infants at each hospital will be small and thus the additional workload will be low. At a later time, after piloting the Registry system, we will open enrollment to all Vermont Oxford Network member hospitals.

Routine Reporting to Participating Hospitals: Participating hospitals will receive quarterly and annual reports comparing their own data with those of all hospitals participating in the Registry.

Observational Research: The Registry will be used to perform observational research including describing the population of infants with encephalopathy, associated perinatal factors, medical treatments, co-morbidities and outcomes. There will be an opportunity to link the Registry with ongoing Network efforts to track neurodevelopmental outcomes using simple parent questionnaires. A planned focus of the observational research will be to monitor the introduction and dissemination of new neuroprotective therapies such as hypothermia, to assess selection criteria for neuroprotective therapy, and identify variations in routine practices and outcomes. The Registry will be reviewed by the IRB at the University of Vermont and by the IRBs at the participating hospitals.

Jeffrey D. Horbar, MD, Director
Jerold F. Lucey, MD, Co-Director
Roger F. Soll, MD, Co-Director
Joseph H. Carpenter, MS, Statistician

Steering Committee:

Terrie Inder, MD, PhD, Royal Children's, Melbourne
Karin B. Nelson, MD, Senior Investigator, NIH
Adre du Plessis, MBChB, MPH, Harvard Medical School

Timeline

Enrollment of hospitals: June to December 2005
Data collection begins: January 2006

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Are you Interested?

If you are interested in learning more about the Vermont Oxford Network Neonatal Encephalopathy Registry and how to enroll, contact Nancy Morse (nancy@vtoxford.org) for additional information.

ATTENTION DATA CONTACTS!!!!

Coming soon to a computer near you.....
 "THE DATA FILE CABINET" will be part of the Vermont Oxford Network website (www.vtoxford.org) and is designed especially for the **DATA CONTACTS** at our member hospitals. You will be able to access hints for data collection reminders for any forms or might need and submission, important dates, manuals you and MORE.....



STAY TUNED!

VERMONT OXFORD NETWORK TO INTRODUCE CONFIDENTIAL INTERNET REPORTING

The Vermont Oxford Network is pleased to announce that beginning in September 2005, members will have access to confidential Network reports via the Internet. Using a simple, state-of-the-art web interface, authorized users at member hospitals will be able to access their center's very low birth weight data and generate comparative reports in multiple formats. The Expanded Database will be added to the Internet reporting system at a later date.

Tables and figures can be created based on the data items in the Vermont Oxford Network Database. The user will have the option of designing customized reports for specific years, birth location, birth weight categories or gestational age groupings. The total Network data will be used for comparison. PDF files can be saved and printed and the figures can be saved as files for use in creating slide presentations.

The Internet reporting tool will be secure and confidential. Each member center will be asked to identify an administrator for Internet reporting. The center administrator will have the authority to authorize additional users from their center using a simple administrative tool on the web. Thus it is up to each member center to decide who at that center has access to the Internet reporting tool. Only the users authorized by the center administrator will have access to center specific data. Of course all authorized users will have access to combined Network data for comparisons.

The Internet reporting tool will be free to all member hospitals as part of the annual membership fee. In order to sign up for the Internet reporting tool, each member hospital will need to sign an Internet access agreement with the Vermont Oxford Network. This agreement will identify the local center administrator. Lynn Stillman, Network Administrator, will be sending out the agreements to all members in the next few weeks. In September 2005, all member centers that have completed the access agreement can start using Vermont Oxford Network Internet Reporting to review their very low birth weight data.

In September 2005, each center will also receive a confidential Quality Management Report for infants born in 2004. You will once again have a choice whether to receive the report on paper or on CD-ROM (see article on page 10). We hope that you will find the Internet reporting tool easy to use and informative, and look forward to hearing your feedback.

Please email Lynn Stillman, Network Administrator for additional information at lynn@vtoxford.org.

CLINICAL TRIALS AND FOLLOW-UP PROJECTS

We have a lot of news to report as we begin 2005. There has been a great deal of activity, both in clinical trials and in our follow-up projects. The Delivery Room Management Trial continues to actively enroll infants, the Heat Loss Prevention Trial has begun, The Extremely Low Birth Weight Follow-up Project begins the sixth year of data collection, and the Parental Interview and Reporting Questionnaire survey is in progress. A short summary of each of these projects follows:

Delivery Room Management (DRM) Trial

The Delivery Room Management Trial is perhaps our most ambitious effort ever. The DRM Trial is evaluating three distinct approaches to stabilization and support of premature infants at high risk of respiratory distress syndrome. Thirty-six participating centers successfully completed the early educational phase of the trial (Phase 1). These centers participated in a series of web conferences that addressed issues regarding the use of nasal continuous positive airway pressure and the conduct of clinical trials. Centers then completed a feasibility and "run-in" phase, and with its success have proceeded to the formal DRM Trial (Phase 3). Currently, we have 27 centers actively participating; 288 infants have been enrolled. We anticipate the DRM Trial continuing through the spring of 2006. Congratulations to all the centers that have progressed and are participating in this trial – this is an important but difficult and challenging study and we appreciate your efforts!

Heat Loss Prevention Trial (HeLP)

Prevention of hypothermia is thought to be critical to survival of the smallest premature infants. The Heat Loss Prevention Trial (HeLP) evaluates whether polyethylene occlusive wrap applied immediately after delivery has an impact on mortality and morbidity in very preterm infants born at less than 28 weeks gestation. The HeLP Trial was proposed by Network members at Sunnybrook and Women's College Hospital in Toronto and at the University of Alberta (Co-Principal Investigators, Maureen Reilly and Sunita Vohra). Funding for study coordination and the core data process has been obtained from the Canadian Institute of Health Research. The trial has been reviewed by FDA and Health Canada and approval for the trial has been given. Forty-five

centers are currently involved in the trial and 21 infants have been randomized. Go to the website at <http://www.vtoxford.org/home.aspx?p=research/help/index.htm> for a more detailed description of the study. This trial is still looking for interested centers. If your center wishes to participate, please contact Maureen Reilly by email: maureen.reilly@sw.ca or Julia Crapo at: Julia.Crapo@sw.ca

Trials Publications

The manuscript for the Neonatal Skin Care Trial was published in Pediatrics in May 2004. (Edwards WH, Conner JM, Soll RF and the Vermont Oxford Neonatal Skin Care Study Group. The effect of prophylactic ointment therapy on nosocomial sepsis rates and skin integrity in infants with birth weights 501 to 1000g. Pediatrics 2004;113:1195-1203)

Extremely Low Birth Weight (ELBW) Infant Follow-up

The Extremely Low Birth Weight Follow-up Project has been collecting data on ELBW infants over the past six years! Data collection is currently being completed on infants born during 2002 and 2003 with birth weight between 400 and 1001 grams. There are 28 centers currently participating in this project. The database now contains the survival status at two years adjusted age on 3241 infants born during 1998, 1999, 2000 and 2001.

The four year cohort (1998-2001) was presented at the Annual Meeting in December and has been selected for presentation at the Society for Pediatric Research Meeting in Washington DC on Monday, May 16th at the 8:00 AM Poster Symposium Session. A brief snapshot of the survival status at two years adjusted age on 3,241 infants born during 1998 through 2001 is noted below:

Of the 3,241 surviving infants, 2,446 had neurodevelopmental evaluations conducted.

75% came from two-parent households
62% of parents had some college education

42% were rehospitalized after discharge
29% required support after discharge
32% required surgery

34% had poor weight gain
13% had microcephaly

1% had bilateral blindness
2% had hearing impairment requiring amplification

9% had cerebral palsy.
31% had severe disability: defined as having one of the following: cerebral palsy, inability to walk, cognitive delay, hearing loss requiring amplification, or visual impairment of bilateral blindness.

Centers with high reporting rates of follow-up (>=60%) had more infants with severe disabilities 32% vs. 29% compared to centers with low reporting follow-up rates (<60%).

Parental Interview and Reporting Questionnaire (PIRQ)

The purpose of the Parental Interview and Reporting Questionnaire (PIRQ) is to correlate parental perception of their child's health and developmental status with information gained from formal medical evaluation. The interview tool has 17 structured (yes/no) questions and one open-ended question. The interview is administered before the follow-up exam, does not require a health care provider to administer, and is not to be shared with the health care provider responsible for the follow-up evaluation. Hopefully, this tool will allow for large scale, inexpensive follow-up of high risk infants that will at least identify the major medical and developmental issues these children encounter.

In our preliminary analysis, twelve participating centers evaluated 83 children. The PIRQ questions evaluating vision, hearing, cerebral palsy and independent walking demonstrated high specificity. The questions evaluating cognitive performance were neither sensitive nor specific. The questions pertaining to cognitive function will require further refinement in the questionnaire. Results will be presented at the Society for Pediatric Research Meeting in Washington DC on Monday, May 16th at the 5:15 PM Poster Session.

CONTACT US

For more information on **Clinical Trials** and the **Extremely Low Birth Weight (ELBW) Follow-Up Project**, please contact **Karla Ferrelli** at 802-865-4814, ext 212 or email <mailto:karla@vtoxford.org>

For more information on the **HeLP Trial**, please contact **Maureen Reilly** by email at <mailto:maureen.reilly@sw.ca> or **Julia Crapo** at: Julia.Crapo@sw.ca

JOE TAKES THE PLUNGE!

Vermont Oxford Network Statistician and Director of Technical Operations, Joe Carpenter recently took a dip into the icy waters of Lake Champlain in support of the Vermont Special Olympics.

Joe had mentioned to co-worker Mary Freeman, that if she could raise the \$175 needed to qualify for entry into the Annual Penguin Plunge, he would do it. Mary dove into his challenge with aplomb and approached Network employees for contributions. Within minutes, co-workers eager to see him chill out, happily raised more than enough money for Joe to jump into the fund-raiser.



Joe (circled) departing from icy Lake Champlain.

With the temperature at 20° (F), February 12th was indeed a brisk day at the Burlington Waterfront but this did not deter Joe from fulfilling the expectations of his co-workers!

Joe and 600+ other locals, ranging in age from 5 to 75, participated in the event. Among those brave enough to endure the frigid dip were a young boy in a wheel chair, numerous groups of school children, a woman in a red evening gown and spike high-heels, a flock of fairies, and a group of pre-teens donning toilet plungers.

What does Joe have to say about the event? "The temperature didn't feel that cold to me. There was no wind. I'm glad it wasn't 20 degrees colder...that would have made for a different story! There was a lot of energy there...it was a "quickenig" experience!"

Will Joe take the plunge again next year? "I think I might!", he said, but added that temperature will be the final determining factor in his willingness to experience the big chill again.

Thank you Joe for your cool accomplishment and willingness to participate in such a worthy cause!

FORMAT CHOICE FOR ANNUAL 2004 QMR

The Vermont Oxford Network Quality Management Reports (QMR) for infants born in 2004 will be available in September 2005. Each member center will have the choice of receiving their confidential, center specific QMR either in print or as a CD-ROM. These reports are a benefit of Network membership. If a center would like both a print and a CD-ROM version of the QMR there will be a \$250 charge.

Your center will receive a form asking which format you prefer for the Annual 2004 QMR - **CD** or **Paper**. This form will be sent to all Report Contacts in early May 2005. Since there was some confusion last year about the choice and who had made it, you might want to consult with the other members of your team about which format will be most useful for your center.

It is important to return the form indicating your center's choice of QMR format. **If you do not return this form you will automatically receive the Annual 2004 QMR in a CD format.**

Please contact Lynn Stillman, Network Administrator, for additional information.

LEVELS OF NEONATAL CARE

The Vermont Oxford Network now has more than 500 member hospitals around the world. Although all of these hospitals provide intensive care for very low birth weight infants, they represent a very broad range of neonatal units with a wide variety of functional capabilities and characteristics. This diversity is our strength, but it also poses difficulties in using the database to assess performance and identify opportunities for improvement.

When members compare their performance with other units in the Network they would like the comparisons to be with units that are "just like them" or at least as close as possible. Members want to compare apples with apples. Unfortunately, there is no universally agreed upon system for classifying NICUs. The Vermont Oxford Network has used a simple three tiered classification of NICUS in its reports to members (*Type A*: restriction on ventilation or no major surgery; *Type B*: no restriction on ventilation, major surgery except open heart surgery for neonates; *Type C*: major surgery including open heart surgery for neonates). This system was introduced as a temporary approach while we waited for an official system of NICU classification to be developed and adopted. Well, our wait may now be over!

The Committee on Fetus and Newborn of the American Academy of Pediatrics (COFN) has

recently released a policy statement defining the levels of neonatal care (Pediatrics 2004;114:1341-1347. Available online at: <http://www.pediatrics.org/cgi/content/full/114/5/1341>).

Level I neonatal care (basic)

Well-newborn nursery: has the capabilities to
Provide neonatal resuscitation at every delivery
Evaluate and provide postnatal care to healthy newborn infants

Stabilize and provide care for infants born at 35 to 37 weeks' gestation who remain physiologically stable

Stabilize newborn infants who are ill and those born at <35 weeks' gestation until transfer to a facility that can provide the appropriate level of neonatal care

Level II neonatal care (specialty)

Special care nursery: level II units are subdivided into 2 categories on the basis of their ability to provide assisted ventilation including continuous positive airway pressure

Level IIA: has the capabilities to

Resuscitate and stabilize preterm and /or ill infants before transfer to a facility at which newborn intensive care is provided

Provide care for infants born at >32 weeks' gestation and weight ≥ 1500 g (1) who have physiologic immaturity such as apnea of prematurity, inability to maintain body temperature, or inability to take oral feedings or (2) who are moderately ill with problems that are anticipated to resolve rapidly and are not anticipated to need subspecialty services on an urgent basis

Provide care for infants who are convalescing after intensive care

Level IIB has the capabilities of a level IIA nursery and the additional capability to provide mechanical ventilation for brief durations (<24 hours) or continuous positive airway pressure

Level III (subspecialty) NICU: level III NICUs are subdivided into 3 Categories

Level IIIA: have the capabilities to

Provide comprehensive care for infants born at >28 weeks' gestation and weighting >1000 g

Provide sustained life support limited to conventional mechanical ventilation

Provide minor surgical procedures such as placement of central venous catheter or inguinal hernia repair

Level IIIB NICU: has the capabilities to provide

Comprehensive care for extremely low birth weight infants (≤ 1000 g and ≤ 28 weeks' gestation)

Advanced respiratory support such as high-frequency ventilation and inhaled nitric oxide for as long as required
Prompt and on-site access to a full range of pediatric medical subspecialists

Advanced imaging, with interpretation on an urgent basis, including computed tomography, magnetic resonance imaging, and echocardiography

Pediatric surgical specials and pediatric anesthesiologists on site or at a closely related institution to perform major surgery such as ligation of patent ductus arteriosus and repair of abdominal wall defects, necrotizing enterocolitis with bowel perforation, tracheoesophageal fistula and/or esophageal atresia, and myelomeningocele

Level IIIC NICU: has the capabilities of a level IIIB NICU and also is located within an institution that has the capability to provide ECMO and surgical repair of complex congenital cardiac malformations that require cardiopulmonary bypass

* Committee on Fetus and Newborn, Levels of Neonatal Care, Pediatrics, Vol. 114 No. 5, November 2004, p. 1345.

Proposed Uniform Definitions for Capabilities Associated With the Highest Level of Neonatal Care Within an Institution *

The Vermont Oxford Network would like to begin using this classification in its reports starting with the Quality Management Report for infants born in 2004

that will be available in September 2005. In preparation for introducing this classification we have distributed a survey to all member hospitals asking them to provide the necessary data to classify their unit according to the COFN policy statement. The results of the survey will be used to assign each member NICU to one of the newly defined categories.

Since the classification has never been used before, it is possible that some units may not fit neatly into one of the categories. Also, there may be ambiguity or uncertainty in some of the data points used in the classification. The Network survey will help us to understand these issues and to determine how to most effectively introduce the classification in our reports.

The Committee on Fetus and Newborn has done a great service by developing this classification for Levels of Neonatal Care. Ultimately this system will be extremely valuable in facilitating the development and implementation of consistent standards of service provided for each level of neonatal care. For now, however, our goals are much less ambitious. The aim of the Vermont Oxford Network is to use the levels of care to create more homogeneous comparison groups in our reports. We look forward to the results of the survey.

Please contact Lynn Stillman, Network Administrator, with questions about the Network survey of levels of care.

WELCOME PAT!

When you reach the Vermont Oxford Network switchboard, you are most likely speaking to Patricia Lavalette who joined the Network Data Processing Team in June of 2004.

Prior to joining VON, Pat worked as Salon Coordinator at Reflection & Company. She lives in Charlotte, Vermont with her husband, George. Pat and George have three grown children and three grandchildren. Pat's hobbies include singing in the church choir, photography and reading.

We are very happy to welcome Pat as the newest member of our team!

SURVEY AND DATA VERIFICATION PLAN

The *2004 Membership Survey*, the *Contact Information Report* and the *Data Verification Plan* for

2005 for your center were mailed to all Team Leaders in January 2005.

It is essential that we obtain the *2004 Membership Survey* information from each participant in the 2004 database before we complete the Annual Quality Management Report (QMR) later this year. We need this survey information to be as complete as possible so it will provide a detailed and accurate description of the membership.

The 2005 *Data Verification Plan* is a form that each participating center is required to fill out and update each year. Its purpose is to insure that all eligible infants are included in the Database each year. Every participating center must have their plan on file before they can be included in the Annual Quality Management Report.

This year some centers have returned the "sample" copies of the survey and data verification plan from the Data Finalization Guidelines for 2004 booklet that was sent out earlier this year. These samples were not specific for your center and should not be used for submission to the Network. If you think you have submitted the wrong version of the survey or data verification forms, please contact Lynn Stillman at 802-865-4814 extension 211 or lynn@vtoxford.org.

Also included in this mailing, the *Contact Information Report* is a list of the contact information we have in our files for your center. This information should be updated each year so we can keep all center files as current as possible.

The survey and the data verification plan are due by April 2005. If you want another copy of this mailing sent to your center please call Lynn Stillman at 802-865-4814 extension 211.

2004 DATA FINALIZATION DEADLINES REMINDER

APRIL 1ST – COMPLETE

MAY 15TH – CONFIRM

JUNE 1ST – CORRECT

JUNE 15TH - CLOSE

IF ALL ITEMS ARE COMPLETE, CONFIRMED, CORRECT AND CLOSED BY JUNE 15TH, 2005, YOUR CENTER WILL RECEIVE THE 2004 NICU QUALITY MANAGEMENT REPORT (QMR) IN SEPTEMBER, 2005

PLEASE REFER TO THE VON DATA FINALIZATION CHECKLIST RECENTLY SENT TO DATA AND REPORT CONTACTS AT ALL PARTICIPATING CENTERS.

RECENT AND UPCOMING PUBLICATIONS AND PRESENTATIONS

Publications in 2004

1. Rogowski JA, Horbar JD, Staiger DO, Kenny M, Carpenter J, Geppert J. Indirect Versus Direct Hospital Quality Indicators for Very Low Birth Weight Infants. *JAMA* 2004;291:202-209.
2. Suresh G, Horbar JD, Plsek P, Gray J, Edwards WH, Shiono PH, Ursprung R, Nickerson J, Lucey JF, Goldmann D. Voluntary Anonymous Reporting of Medical Errors. *Pediatrics* 2004;113:1619-1627.
3. Horbar JD, Carpenter JH, Buzas J, Soll RF, Suresh G, Bracken MB, Leviton LC, Plsek PE, Sinclair JC, for the members of the Vermont Oxford Network. Timing of Initial Surfactant Treatment for Infants 23 to 29 Weeks Gestation: Is routine practice evidence-based? *Pediatrics* 2004;113:1593-1602.
4. Lucey JF, Rowan CA, Shiono P, Wilkinson AR, Kilpatrick S, Payne NR, Horbar JD, Carpenter J, Rogowski J, Soll RF. Fetal Infants: The Fate of 4172 Infants With Birth Weights of 401 to 500 Grams—The Vermont Oxford Network Experience (1996–2000). *Pediatrics* 2004;113:1559-1566.
5. Horbar JD, Carpenter JH, Buzas J, Soll RF, Suresh G, Bracken MB, Leviton LC, Plsek PP, Sinclair JC. Collaborative quality improvement to promote evidence-based surfactant for preterm infants: a cluster randomized trial. *BMJ* 2004;329:1004.
6. Edwards WH, Conner JM, Soll RF for the Vermont Oxford Network Neonatal Skin Care Study Group. The Effect of Prophylactic Ointment Therapy on Nosocomial Sepsis Rates and Skin Integrity in Infants with Birth Weights of 501 to 1000 g. *Pediatrics* 2004; 113:1195-1203.
7. Payne NR, Carpenter JH, Badger GJ, Horbar JD, Rogowski J. The Marginal Increase in Cost and Excess Length of Stay Associated With Nosocomial Bloodstream Infections in Surviving Very Low Birth Weight Infants. *Pediatrics* 2004;114:348-355.
8. Rogowski JA, Staiger DO, Horbar JD, Variations in the quality of care for very low

birth weight infants: Implications for policy. *Health Affairs* 2004;23:88-97.

9. Morales LS, Staiger DO, Horbar JD, Carpenter J, Kenny M, Geppert J, Rogowski J. Mortality Among Very Low Birthweight Infants in Hospitals Serving Minority Population *Am J Pub Health* (accepted for publication).

ABSTRACTS AT THE PEDIATRIC ACADEMIC SOCIETIES MEETING WASHINGTON, DC MAY 2005

Saturday, May 14, 2005

Health Services Research—Improving Care 3:15:00 PM- 5:15:00 PM

Nathaniel Payne, et al. Reduction of Chronic Lung Disease (CLD) Among Very Low Birth Weight (VLBW) Infants: Experience of a Vermont Oxford Network (VON) Quality Improvement Collaborative (NIC/Q 2002)

Room 144 C (Washington Convention Center)
4:15 PM (10-minute oral presentation)

Monday, May 16, 2005

Neurodevelopmental Disabilities Poster Symposium 8:00 AM to 10:00 AM

Mercier C, et al. Severe Disability in Surviving Extremely Low Birth Weight Infants: The Vermont Oxford Network Experience
Room 151 (Washington Convention Center)

Poster Session III 5:15 PM to 6:45 PM

Walsh M, et al. Changes in Postnatal Steroid (PNS) Use in VLBW Neonates in 3 Large Neonatal Networks
Poster Board #: 280

Mercier C, et al. The Parental Interview and Reporting Questionnaire: Simplified Follow-Up for Extremely Low Birth Weight Infants
Poster Board #: 315

Payne N, et al. Secondary Outcomes Also Improved Among Breathsavers Group Participating Centers in the Vermont Oxford Network (VON) Quality Improvement Collaborative (NIC/Q 2002)
Poster Board #: 407

Horbar JD, Carpenter JH. Variation in NICU Outcomes: Opportunities for Improvement.
Poster Board #: 409

PLANS FOR THE 2005 NETWORK MEETINGS ARE UNDER WAY!

2005 Annual Meeting, Saturday, December 3rd

- Network Activities and Plans
- Update on Trials and Follow-Up
- Translating Evidence Into Practice
- Neonatal Encephalopathy
- VON Database for 2006
- Breakout Sessions
 - Hot Topics in Neonatal Nursing
 - Global Neonatology
 - eNICQ Users
 - Cochrane Neonatal Reviews
- The Next 10 Years at Vermont Oxford:
Ideas from the Membership

6th Annual Quality Congress for Neonatology

- Organizational Learning for Improvement
- Systematic Review of Organizational Interventions
- Organizational Experiments in the Laboratory
- Collaborative Quality Improvement
- New Strategies for Quality and Safety
- Poster Presentations

Faculty

Richard M. Burton, BS, MBA, DBA

Professor of Management and Organization
Duke University, Durham, NC

Joseph Carpenter, MS

Director of Technical Operations
Vermont Oxford Network, Burlington, VT

Gary L. Darmstadt, MD, MS

Associate Professor,
Johns Hopkins University, Baltimore, MD
Senior Research Advisor,
Save the Children Federation, Washington, DC

Martin P. Eccles, MB BS, MD, FMedSci, FRCP, FRCGP, MFPHM

The William Leech Professor of Primary Care
Research and Professor of Clinical Effectiveness,
University of Newcastle upon Tyne,
Newcastle upon Tyne, UK

Louis P. Halamek, MD

Stanford Associate Professor of Pediatrics and
Director of the Fellowship Training Program,
Stanford University, Palo Alto, CA

James R. Handyside, B. Sc.

President,
Improvisation, Lucan, Ont., Canada

Jeffrey D. Horbar, MD

Chief Executive and Scientific Officer,
Vermont Oxford Network
Professor of Pediatrics,
University of Vermont, Burlington, VT

Terrie Inder, MBChB, MD, FRACP

Associate Professor,
Royal Children's Hospital, Royal Women's Hospital,
Children's Research Institute,
University of Melbourne, Melbourne, Australia

Jerold F. Lucey, MD

President,
Vermont Oxford Network
The Henry Wallace Professor of Pediatrics
University of Vermont, Burlington, VT

Deb Miller, BScN

Director, Organizational Development and Learning
Services, St Joseph's Health Care,
London, Ont., Canada

Robert H. Pfister, MD

Fellow of Neonatology
Fetcher Allen Health Care,
University of Vermont, Burlington, VT

Steven Ringer, MD, PhD

Chief, Newborn Medicine
Brigham and Women's Hospital, Boston, MA

Stephen M. Shortell, PhD, MPH

The Blue Cross of California Distinguished Professor
of Health Policy and Management,
Dean, School of Public Health
University of California-Berkeley, Berkeley, CA

Roger F. Soll, MD

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Charleston, SC

Jon E. Tyson, MD, MPH

Professor of Pediatrics, Obstetrics, Internal Medicine
and Epidemiology,
Center for Clinical Research & Evidence-Based
Medicine, The University of Texas Medical School
Houston, TX

Steve Wall, MD

Save the Children Federation, Washington, DC

Michele Walsh, MD, MSE

Professor of Pediatrics
Case Western Reserve,
Rainbow Babies & Children's Hospital,
Cleveland, OH

For more information on the Annual Meeting and
Quality Congress, please contact Nancy Morse at
802-865-4814, ext 208 or email: nancy@vtoxford.org

WELCOME TO OUR NEWEST MEMBERS!

Network membership continues to increase with the addition of more than 60 new centers in this past year. There are now 543 active centers of which 85 are from countries outside of the United States.

We welcome our newest members listed below!

Advocate Good Samaritan Hospital Downers Grove, IL
Allentown's Neonatal Intensive Care Allentown, PA
American Hospital, VK Foundation Istanbul, Turkey
Aurora Baycare Medical Center Green Bay, WI
Cerrahpasa Medical Faculty, Neonatology Istanbul, Turkey
Children's Hospital of Philadelphia Philadelphia, PA
Children's Hospital San Diego at Scripps San Diego, CA
Christus St. Frances Cabrini Hospital Alexandria, LA
Columbia Regional Hospital Columbia, MO
Community Hospital - Neonatology Munster, IN
Derriford Hospital Plymouth, United Kingdom
Dixie Regional Medical Center St. George, UT
Dominican Hospital Santa Cruz, CA
East Jefferson General Hospital Metairie, LA
El Centro Regional Medical Center El Centro, CA
Farwaniya Hospital, Neonatal Unit Salmiya, Kuwait
Frederick Memorial Hospital Frederick, MD
Good Shepherd Medical Center Longview, TX
Hospital Clinic (sede Maternitat) Barcelona, Spain
Hospital Clinico San Carlos Madrid, Spain
Hospital e Maternidade Santa Joana Sao' Paulo, Brazil
Hospital Sotero Del Rio Santiago, Chile
Hospital Universitari Joan XXIII de Tarragona,
Tarragona, Spain
Hospital Universitario de Canarias
Santa Cruz de Tenerife, Spain
Hospital Universitario de Salamanca, Pediatría
Salamanca, Spain
Hospital Universitario La Paz Madrid, Spain
Inova Fair Oaks Hospital Fairfax, Virginia
Jersey Shore University Medical Center Neptune, NJ
John H. Stroger, Jr. Hospital of Cook Chicago, IL
John Muir Medical Center Walnut Creek, CA
Kaiser Permanente Oakland Medical Oakland, CA
King Faisal Specialist Hospital & Research Centre
Riyadh, Saudi Arabia
Los Robles Regional Medical Center Thousand Oaks, CA
LPCH Special Care Nursery at Sequoia Redwood City, CA
LPCH Special Care Nursery at Washington Fremont, CA
Mattel Children's Hospital at UCLA, NICU Los Angeles, CA
Mercy Medical Center Cedar Rapids, IO
Methodist Hospital of Sacramento Sacramento, CA

Monroe Carell Jr. Children's Hospital Nashville, TN
Northern Alberta Neonatal Intensive Care
Edmonton, Alberta, Canada
Ohio State University Medical Center Columbus, OH
Palmetto Health Richland Columbia, SC
Rockdale Medical Center Conyers, GA
S.O.C. Neonatologia Udine, Italy
Sierra Vista Regional Medical Center San Luis Obispo, CA
Silesian U. Neonatal Intensive & Special Katowice, Poland
Southeast Missouri Hospital Cape Girardeau, MO
St. Agnes Neonatal Unit in Fresno Madera, CA
St. Dominic's Hospital East London, South Africa
St. John Medical Center Tulsa, OK
St. Luke's Hospital Cedar Rapids, IA
Torrance Memorial Medical Center Torrance, CA
Tulsa Regional Medical Center Tulsa, OK
University of Arizona Health Sciences Tucson, AZ
University of Connecticut Health Center Farmington, CT
Valley Medical Center/Northwest Newborn Renton, WA
Welkom Medi-Clinic Welkom, South Africa
White Memorial Medical Center Los Angeles, CA
Women's Hospital Newburgh, IN

DON'T FORGET TO MARK YOUR CALENDAR!

Dec 3: Vermont Oxford Network Annual Meeting

Dec 4: Annual Quality Congress in Neonatology

Dec 4 - 6: Hot Topics in Neonatology

