Neonatal Resuscitation Program (NRP)

20th Anniversary

1987-2007

American Heart Association
Learn and Live

American Academy of Pediatrics
Dedicated to the Health of All Children
In only twenty years, the Neonatal Resuscitation Program (NRP) has undergone a fascinating evolution. The program germinated from a basic concept in the early 1980’s, to development of a superb educational program taught to over two-million health care professionals in more than 120 countries through award-winning state-of-the-art interactive educational media. Throughout this evolutionary process, volunteers also established a voice for the unique needs of the newly born within the adult-oriented world of emergency cardiac care, which led to the development of an international consensus on science and evidence-based neonatal resuscitation guidelines.

Following is a brief historical timeline of some of the significant milestones on this journey...
In the mid 1970s, with the emerging prominence of Neonatal Intensive Care Units, it became increasingly important that community hospitals recognize and provide initial management of infants requiring transfer to a NICU. At that time, the National Institutes of Health (NIH) funded five projects to provide education regarding the fundamentals of neonatal care to Level 1 hospitals. The Charles Drew Postgraduate Medical School in Los Angeles received one of those contracts. Dr Ron Bloom, the principal investigator, along with his nursing associate Cathy Copley, were seeking simple ways to focus neonatal resuscitation teaching. They developed an initial six-module series called the Neonatal Educational Program (NEP), much of which was focused on neonatal resuscitation.

Dr George Peckham, a neonatologist and cardiologist from the University of Pennsylvania, who was actively involved in the American Heart Association, became the Chair of the American Academy of Pediatrics (AAP) Section on Perinatal Pediatrics. During his tenure, the group he advocated for the development of a neonatal resuscitation core curriculum.

Dr Peckham gave an influential address at the American Heart Association’s (AHA) Standards Conference encouraging a standardized approach to the teaching and learning of neonatal resuscitation care principles, many of which differed significantly from the principles associated with resuscitating adults and older children.
• The AAP Executive Committee approved the Section on Perinatal Pediatrics proposal to further develop Dr Bloom and Cathy Cropley’s standardized curriculum. The Section was fortunate to receive a grant from Mead Johnson Nutritionals to help fund the initial steps in refining the curriculum.

• During this same year Dr Peckham, along with Dr Bill Keenan, met with representatives from the AHA, specifically Dr Leon Chamieides, a pediatric cardiologist and a major force for the advancement of pediatric resuscitation in the AHA, to explore a sustaining structure for such a course. At that time, both the AAP and AHA expressed a joint commitment to develop a training program aimed at teaching the principles of neonatal resuscitation with the goal of having a trained provider at every delivery.

• Dr Bloom developed the concept of training a core of National Faculty to disseminate the course utilizing the Regional Perinatal Network structure. The importance of multidisciplinary participation was recognized by inviting nurse-physician pairs to constitute the national faculty.

• In early 1987, Dr Errol Alden became the new Director of Education for the AAP and pledged his support to help the Section launch the program at the AAP Annual Meeting in New Orleans in November 1987.

• The program was officially named the Neonatal Resuscitation Program (NRP).

• On November 5, the first NRP National Faculty training session was held in New Orleans, LA. Additional national faculty courses were held around the country throughout 1987 and 1988.
By October, the NRP had reached 48 states and Canada with 184 National Faculty and 876 trained Hospital-based Instructors.

National Faculty and Hospital-based Instructors began to disseminate to providers at the local level.

AAP Life Support staff began to track and record course activity.

Mead Johnson Nutritionals provided critical funds to support a national promotional campaign to inform hospitals about the availability and utility of NRP.

As the program began to take hold within the US, early adopters were quick to bring the program materials to an international audience as well.

Courses were held for the first time in Bosnia, Brazil and Italy.

The first international course was held this year in India.

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1990

Courses were held for the first time in Bosnia, Brazil and Italy.

- The first international course was held this year in India.
- First revision of NRP student manual became available.
- NRP Steering Committee received an official invite from the Romanian Ministry of Health to train NRP National Faculty.

Courses were held for the first time in Oman, Philippines, and Saudi Arabia.

First issue of the *NRP Instructor Update* newsletter was developed.

Courses were held for the first time in Argentina, Kosovo, Latvia, Pakistan, and South Africa.

**NRP Steering Committee Membership**

**1998-1999**
- Waldemar Carlo, MD, FAAP, Cochair
- Susan Niemeyer, MD, FAAP, Cochair
- Susan Denson, MD, FAAP
- Martha Mullett, MD, MPH, FAAP
- Jeffrey Perlman, MB, ChB, FAAP
- David Boyle, MD, FAAP
- Luis Curet, MD, Liaison, American College of Obstetricians and Gynecologists
- Linda McCullum, PhD, RNC, CNMNP
- Liaison, ANA, AWHONN, and NANN
- Alfonso Solimano, MD, Liaison, Heart and Stroke Foundation of Canada
- Michael Speer, MD, FAAP, Liaison, AAP Committee on Fetus and the Newborn

**1999-2000**
- Waldemar Carlo, MD, FAAP, Cochair
- Susan Niemeyer, MD, FAAP, Cochair
- Jeffrey Perlman, MB, ChB, FAAP
- David Boyle, MD, FAAP
- Jay P. Goldsmith, MD, FAAP
- Thomas E. Wiswell, MD, FAAP
- Luis Curet, MD, American College of Obstetricians and Gynecologists
- Alfonso Solimano, MD, Liaison, Heart and Stroke Foundation of Canada
The NRP Research Grants Award program was established to encourage research in the broad area of resuscitation science and education.

Courses were held for the first time in Egypt, Fiji, Ireland, Laos, Mexico, Panama, Poland, Puerto Rico, and Vietnam.

Courses were held for the first time in Bahamas, Bahrain, Colombia, Great Britain, Hong Kong, Israel, Lithuania, Malta, Russia, Singapore, Thailand, and Yugoslavia.

Courses were held for the first time in Australia, Bolivia, Nigeria, South Korea, Syria, and Taiwan.

1994

1995

1996

Dr. George Little instructs students in South Africa.

NRP training at the 1996 International Pediatric Congress in Cairo, Egypt.

NRP training in Rio de Janeiro.

Michael Speer, MD, FAAP, Liaison, AAP Committee on Fetus and the Newborn
Barbara Nightengale, RNC, NNP, Liaison, ANA, AWOHNN, and NANN

2000-2001
Waldemar Carlo, MD, FAAP, Cochair
Susan Niermeyer, MD, FAAP, Cochair
Jeffrey Perlman, MD, ChB, FAAP
David Boyle, MD, FAAP

Jay P. Goldsmith, MD, FAAP
Thomas E. Wiswell, MD, FAAP
Alfonso Solimano, MD, Liaison, Heart and Stroke Foundation of Canada
Michael Speer, MD, FAAP, Liaison, AAP Committee on Fetus and the Newborn

Barbara Nightengale, RNC, NNP, Liaison, ANA, AWOHNN, and NANN
Jose Luis Gonzalez, MD, Liaison, American College of Obstetricians and Gynecologists

2001-2002
Waldemar Carlo, MD, FAAP, Cochair
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Jay P. Goldsmith, MD, FAAP
Thomas E. Wiswell, MD, FAAP

Dr. George Little instructs students in South Africa.
Official Spanish translation of the *Textbook of Neonatal Resuscitation* was completed by Dr Waldemar Carlo.

Courses were held for the first time in Indonesia, Iran, Japan, Kiribati, Marshall Islands, New Zealand, Spain and, the United Arab Emirates.

- The NRP Steering Committee held a pivotal strategic planning meeting to plan the 4th edition and set a rigorous agenda for scientific evidence, international expansion, educational program design, and service enhancement.
- The AAP and AHA formalize a new contractual partnership securing the future of the program and committing their organizations to ongoing collaborative efforts for pediatric cardiopulmonary science research and educational program development.
- Dr John Kattwinkel, MD, FAAP is named the science editor for the program and Jeanette Zaichkin, RNC, MN is named the editor for instructor development.
- On November 25, the one-millionth person trained in NRP was recorded in the NRP database.
- Official NRP Workgroups were established to foster greater collaboration and input by NRP instructors and providers.
- The NRP Steering Committee coordinated a training program in Argentina.

Courses were held for the first time in Armenia, Guam, Guatemala, Honduras, Palestine, and, Papua New Guinea.

**NRP Steering Committee Membership**

2001-2002 Cont.
- Lou Halamek, MD, FAAP
- Alfonso Solimano, MD, Liaison, Heart and Stroke Foundation of Canada
- Michael Speer, MD, FAAP, Liaison, AAP Committee on Fetus and the Newborn
- Barbara Nightengale, RNC, NNP, Liaison, ANA, AWHONN, and NANN
- Jose Luis Gonzalez, MD, Liaison, American College of Obstetricians and Gynecologists

2002-2003
- Waldemar Carlo, MD, FAAP, Cochair
- David Boyle, MD, FAAP, Cochair
- Jeffrey Petriman, MD, CHS, FAAP
- Jay P. Goldsmith, MD, FAAP
- Thomas E. Wiswell, MD, FAAP
- Lou Halamek, MD, FAAP
- Alfonso Solimano, MD, Liaison, Heart and Stroke Foundation of Canada
- Barbara Nightengale, RNC, NNP, Liaison, ANA, AWHONN, and NANN
- Jose Luis Gonzalez, MD, Liaison, American College of Obstetricians and Gynecologists
- Timothy Myers, BS, RRT, Liaison, American Association for Respiratory Care
• The International Liaison Committee on Resuscitation (ILCOR) invited the NRP Steering Committee to have a guest at its forum to provide guidance on a universal international statement on neonatal resuscitation science, which was published in late 1999.

• Members of the NRP steering committee also completed comprehensive evidence-based worksheets on select scientific neonatal topics and debated the questions and recommendations with a cadre of international experts at the Evidence Evaluation Summit.

• A comprehensive survey and database review of US hospitals revealed that 99% of all hospitals with delivery service had staff with active NRP status.

• NRP Website is developed.

• The NRP Steering Committee coordinated a training program in South Africa. Courses were held for the first time in Chile, Costa Rica, Ecuador, and Uzbekistan.

The findings from Dr Tom Wiswell’s randomized, controlled, multi-center study of delivery room management of the apparently vigorous meconium-stained infant, which was funded by the NRP Research Grant Program, was published in Pediatrics and became the basis of support for the first Level 1 neonatal guideline recommendation.

The evidence-based Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care were published in August and the neonatal portion of the guidelines reprinted in the September issue of Pediatrics.

The 4th edition NRP materials were released in September. The textbook core content was expanded to include the concept of simultaneous assessment, prematurity, congenital anomalies, and ethics.
• The newly released *Textbook of Neonatal Resuscitation* won the American Medical Publishers award for best Allied Health Publication.

• The state-of-the-art interactive CD included within each textbook, edited by Dr Dana Braner, wins the coveted Macromedia E-Learning Innovation Award and high praise from the industry stating, “rarely does an interactive textbook so effectively fulfill the promise of multimedia.”

Courses were held for the first time in Lebanon, Madagascar, Nepal, Nicaragua, Portugal, and Samoa.

• NRP continued to innovate educational offerings by coordinating a series of telephone seminars to orient instructors to the new guidelines and materials. More than 5,000 instructors participated in this initial series.

• NRP service innovation also continues and the web-based instructor database and online roster processing system were launched.

Courses were held for the first time in Cuba, Georgia, Hungary, Korea, Paraguay, Scotland, Uganda, and Zimbabwe.
• The International Liaison Committee reorganized and created a new mission to enhance the rigor of the evidence-evaluation worksheet process and developed an independent international scientific consensus that became the basis for individually prepared guidelines statements by participating countries.

• ILCOR invited a member of the NRP Steering Committee to be a liaison to the Pediatric Subcommittee. Dr Jeffrey Perlman took on this role and became the Cochair of the new ILCOR Neonatal Delegation.

Courses were held for the first time in British Virgin Islands, Ghana, Haiti, Jamaica, Mongolia, Seychelles Islands, US Virgin Islands, and Venezuela.

Johnson and Johnson Pediatric Institute funded a comprehensive five-year NRP education and dissemination initiative with the Chinese Ministry of Health. Drs Bill Keenan and Susan Niermeyer began to direct the new Freedom of Breath, Fountain of Life program in China.

Courses were held for the first time in Afghanistan, Albania, Dominican Republic, Iraq, Moldova, and Tonga.

Courses were held for the first time in Cape Verde, Germany, Kuwait, Malaysia, Micronesia, Saint Lucia, Sudan, Tanzania, and Zambia.

2002

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2004

Courses were held for the first time in Cape Verde, Germany, Kuwait, Malaysia, Micronesia, Saint Lucia, Sudan, Tanzania, and Zambia.

2007-2008

- Courses were held for the first time in Cape Verde, Germany, Kuwait, Malaysia, Micronesia, Saint Lucia, Sudan, Tanzania, and Zambia.

- Dr Susan Niermeyer instructs a participant during the Freedom of Breath, Fountain of Life launch in 2004 Beijing.
The ILCOR meeting in January brought together more than 40 internationally renowned neonatologists to debate the worksheet evidence and develop the first truly international consensus on neonatal resuscitation science.

Dr. William Keenan, considered the “Father of NRP,” was honored as a “2005 CPR Giant” by ILCOR for his contributions to the field of cardiopulmonary resuscitation and emergency cardiovascular care. He was the first neonatologist to receive this honor.

In late November the first ILCOR International Consensus on Science was published. In mid-December the American Heart Association Guidelines for CPR and ECC were released. The pediatric and neonatal portions of both publications were reprinted in the Spring 2006 issue of Pediatrics.

Courses were held for the first time in Angola, Cambodia, Ethiopia, Guyana, Netherlands, Qatar, and Trinidad.

In April, the AAP and the Canadian Pediatric Society, through the significant efforts of Dr. Nalini Singhal, formalize a partnership for the administration and growth of NRP within Canada.

On May 15, the two-millionth provider trained in NRP is recorded in the database.

On May 16, the NRP 5th edition materials were launched with innovations such as a state-of-the-art DVD with learner-directed scenarios, new online testing, and an updated course video with language tracks available in English, Spanish, Italian, Portuguese, and Chinese.

In August the first meeting of the NRP Global Implementation Task Force (GITF) was held. The goal of the task force was to develop a modified version of the NRP for use in resource-limited areas.
• In November, the AAP signed a landmark strategic alliance with Laerdal Medical AS to help advance the educational science and resources available to teach/learn neonatal resuscitation skills.

Courses were held for the first time in Azerbaijan, Belize, Botswana, Grenada, Lesotho, Libya, Namibia, and Yemen.

• In February, representatives from the World Health Organization met with the NRP GITF and pledge their support as a partner to help develop and disseminate the NRP curriculum for resource limited areas.

• In March, the NRP Steering Committee held a pivotal strategic planning meeting to review the program’s history and accomplishments and set the course for future program initiatives. Included among these will be the transition to simulation-based learning, a periodic ongoing review of knowledge and skills by both instructors and providers, continued work on outcomes evidence, and ongoing international outreach.

• In October, the new neonatal patient simulator, SimNewB, developed in partnership with Laerdal Medical AS and under the direction of Dr Lou Halamek, premiered at the 2007 AAP National Conference and Exhibition. The simulator displays realistic anatomic features and physiological parameters that change in response to the actions of the professionals undergoing training. It will facilitate high-fidelity simulation-based training in the comprehensive cognitive, technical, and behavioral skills necessary for optimal individual and team performance in the delivery room.
NRPs Research Grant Awards

1994
International Database of Neonatal Trials
- John Sinclair, MD

1995
Retention of Knowledge and Skills in Family Practice Residents Following Neonatal Resuscitation Program Course
- Cheryl Levitt, MB, BCh, BSc
A Computer-Based Program to Administer Post-Tests for the Neonatal Resuscitation Program (NRP)
- Linda Parker, BSN, MSN, NNP

1996
Effect of 100% Oxygen and 21% Oxygen During Resuscitation on Cerebral Cellular Function Following Neonatal Asphyxia
- David Hoffman, MD
Airway Management of the Apparently Vigorous Meconium-Stained Neonate: A Randomized, Prospective Trial
- Thomas Wiswell, MD

1997
Perceptions of Physicians Regarding Pre-Term Neonatal Resuscitation of Very and Extremely Low Birth Weight Infants
- Anita Joy Catlin, MSN, FNP
Consent for Neonatal Resuscitation Research—What are Societal Preferences?
- Deborah Davis, BSc, MDCM
Neuroprotective Effects of Postischemic Adenosine Potentiation and Mild Hypothermia in the Neonatal Rat
- Judith Halle, PhD, RNC
Trend Analysis to Reveal Changes in Neonatal Morbidity in Illinois After Initiation of the National Resuscitation Program
- Daksha Patel, MD

1998
Study to Measure Development of Competence in Neonatal Intubation by Pediatric Residents
- Marilyn Escobedo, MD
Development of a Simulated Delivery Room for the Study of Human Performance During Neonatal Resuscitation
- Louis Halamek, MD
Effect of Glucose Administration During Resuscitation on Brain Function Following Neonatal Asphyxia
- Jane McGowan, MD

1999
Impact of Education and Training of Neonatal Resuscitation on Asphyxia Related Morbidity and Mortality in Institutional Births
- Dharmapuri Vidyasagar, MD
Prevention of Heat Loss in the Delivery Room: The Effect of Polyethylene Occlusive Skin Wrapping Immediately After Birth in Very Premature Infants
- Sunita Vohra, MD

2000
Evaluation of Self-Efficacy Following Use of a Simple, Inexpensive Model for Teaching of Umbilical Vein Catheterization
- Andrew Macnab, MD

2001
Neonatal Resuscitation Program (NRP) Serial Evaluation of the Lead Resuscitator Based on Video Review
- Neil Norman Finer, MD
Potential Physiological Role of Vernix Caseosa in the Delivery Room
- Vivek Narendran, MD
Is Intrapartum Oro – and Nasopharyngeal Suctioning Effective in the Newborn Infants Born Through Meconium Stained Amniotic Fluid (MSAF)?
- Thomas Wiswell, MD

2002
Does Hypothermia Extend the Therapeutic Window for Anti-Inflammatory Neurprotective Strategies after Neonatal Cerebral Hypoxia-Ischemia in Rats?
- John Banks, MD
Comparison of Albumin Versus Normal Saline Administration on Resuscitation in an Asphyxiated, Hypotensive Neonatal Model
- Myra Wyckoff, MD

2003
Research Grant
HLM Analysis: Neonatal Outcomes in Rural Hospitals
- Susan Henly, PhD
Young Investigator Award
Post Hypoxic Resuscitative Oxygen Concentration and EGR-1 Expression in the Piglet Brain
- Melissa Tyree, MD

2004
Research Grant
Effect of Hypercapnia on the Newborn Brain: Need for Resuscitation
- Karen Fritz, MD
Resuscitation With 100% Oxygen vs Room Air in Premature Lambs: Effect on Oxidant Stress, Apoptosis, and Necrosis
- Vasanth Kumar, MD
Young Investigator Award
Protective Strategies Against Periventricular Leukomalacia
- Brian Sims, MD, PhD

2005
Research Grant
Prevention of Neonatal Hypoxic-Ischemic Brain Injury with Minocycline
- Kara Arvin, MD
Randomized Controlled Trial of End-Tidal CO2 Guided Cardiopulmonary Resuscitation in an Asphyxiated Neonatal Model
- Myra Wyckoff, MD

2006
Research Grant
Newborn Ventilation in the Delivery Room: Could We do it Better with a Mechanical Device?
- Waldemar Carlo, MD
Effect of Oxygen Concentration of Resuscitative Gas on Pulmonary Hemodynamics in Term Lambs
- Satyanaarayana Lakshminrusimha, MD
Young Investigator Award
Randomized Controlled Trial of Endotracheal Versus Intravenous Administration of Epinephrine During Neonatal Cardiopulmonary Resuscitation in Asphyxiated Neonatal Piglets
- Chad Barber, MD
Re-Oxgenation of Asphyxiated Neonatal Mice: Does Oxygen Concentration Matter?
- Tara Randis, MD

2007
A Randomized-Control Study Comparing Neonatal Outcomes for Traditional Birthing Attendants (TBAs) Trained in Neonatal Resuscitation that Incorporates a Reusable Pocket Mask Resuscitator Compared to Current Standard Birthing Practice in Luwanyama District, Zambia
- Nicholas Guerina, MD, PhD
Randomized Study of Vasopressin vs Standard and High-Dose Epinephrine in a Neonatal Porcine Model of Asphyxial Cardiac Arrest
- Patrick McNamara, MD, BCh
Comparison of Continuous Positive Airway Pressure Versus Free Flow Oxygen Administration on Oxygen Saturation During Resuscitation of Infants > 35 Weeks Gestation
- Rabi Yacov, MD
Screen-Based Computer Simulation as an Adjunct to Conventional NRP Training
- Thomas Strandjord, MD
In retrospect, the most critical ingredient for the success of the NRP over the last 20 years has been the goodwill and altruism of a broad and eclectic group of volunteer educators, researchers, and administrators who remain deeply committed to caring for our most vulnerable newborns.

– Bill Keenan, MD, FAAP
Neonatal Resuscitation Program (NRP)

Vision
To have every newborn in need of resuscitation effectively cared for by health care professionals.

Mission
To develop an education program for health care professionals that promotes optimal care and resuscitation of newborns.