SimNewB™ and the NRP: Simulation at Its Best

It seems only yesterday when the American Academy of Pediatrics and Laerdal Medical of Norway began devising a plan to develop a realistic, state-of-the-art newborn patient simulator to complement the existing NRP course curriculum. The vision of this collaboration was a high fidelity newborn simulator that could be used to enhance the hands-on neonatal resuscitation training experience for NRP instructors and learners throughout the United States and overseas.

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In just over two years, that lofty goal has become a reality with the advent of the SimNewB™ Neonatal Simulator. The SimNewB™ patient simulator looks and feels like a full-term – appropriate for a gestational age – newborn female weighing seven pounds and measuring 21 inches. Embedded scenarios correlating to NRP cases in the Textbook of Neonatal Resuscitation, 5th Edition provide the flexibility to create simulation training as basic or advanced as instructors choose.

“We’re off to a great start. The NRP is moving toward a simulation approach to teaching neonatal resuscitation and away from the standard slide and lecture course format,” said Jay P. Goldsmith, MD, FAAP, Cochair of the NRP Steering Committee. “Simulation education provides one of the best ways to teach hands-on neonatal resuscitation skills. It offers the best opportunity to retain knowledge, and it can be done very effectively because it doesn’t necessarily require more time in the classroom. We also realize that we have to teach NRP instructors how to use simulation technology and methodologies and how to incorporate debriefing strategies into their course structure.”

The SimNewB™ comes with NRP Simulation Support Materials filled with information to enable instructors to easily integrate simulation into their existing NRP course and other neonatal training programs. With the standard version of the simulator, a hand-held device that resembles a television remote control is used by the instructor to direct the simulator’s responses to mimic a resuscitation scenario that may arise in the delivery room or NICU. Scenarios feature six pre-set patient levels varying in intensity, ranging from a limp, cyanotic newborn with no vital signs to a moving, crying, vigorous newborn. The simulator also features a realistic trachea, has the capability of changing color, and varying lung sounds and heart rate.

The cost to purchase this infant patient simulator ranges from $15,000-$22,000. “Very early on, this particular device, this one technology, was designed to meet the NRP learning objectives at an affordable price point so people can plan and budget for it,” said Lou Halamek, MD, FAAP, Cochair of the NRP Steering Committee, and Associate Professor, Division of Neonatal and Developmental Medicine at Stanford University in Palo Alto, California. “We also want the NRP to continue to be independent of any specific technology and what we hope to do is drive the industry to produce technology that meets the NRP learning objectives and give NRP instructors and trainees their choice of a whole host of learning tools.”

“We’re trying to provide a turnkey operation for NRP instructors, but we are in no way limiting them,” added Dr. Goldsmith. “We want to make sure our instructors don’t feel pushed or intimidated into purchasing this product. The (newborn) patient simulator is just an option for instructors to consider if they wish to add to their training environment. Although the SimNewB™ is one alternative, there are many ways to teach NRP using either high or low fidelity simulation programs.”

While the SimNewB™ technology and methodologies were being put into place, national beta sites continued to conduct regular hands-on training sessions focusing on specific scenarios using the newborn patient simulator. Beta sites were located at Weill Cornell Medical College, New York, New York; Parkland Health & Hospital System, Dallas, Texas; Stanford University, Palo Alto, California; and Children’s Hospital of Philadelphia, Pennsylvania.

“In particular, we’ve been working on finding an effective way to simulate a meconium-stained baby. We’ve tried to develop some other strategies to mimic the actual consistency of meconium
before proceeding with the other steps towards stabilization,” explained Myra Wyckoff, MD, FAAP, member of the NRP Steering Committee. She is Assistant Professor of Pediatrics at the University of Texas Southwestern Medical Center in Dallas and oversees the beta site at Parkland. “We want our trainees to go through the mechanics and frustrations that they may encounter with neonatal resuscitation, and this is an attempt to simulate that experience.”

Dr. Wyckoff conducts onsite training in a clinical practice area every day, typically with teams comprised of nurses, respiratory therapists, medical students, fellows, and pediatric residents. “You want people to suspend their disbelief and believe they’re in a real resuscitation situation. The simulator is a great tool that we hope will allow instructors to truly get to the heart of whether the person they’re training is competent at resuscitation,” said Dr. Wyckoff.

Jeffrey Perlman, MB, ChB, is leading another beta site at Weill Cornell Medical College in New York City. “I’m a total believer in simulation training and in doing so, I’ve learned how to better educate providers,” said Dr. Perlman, Professor of Pediatrics at Weill Cornell Medical College. “The providers love the simulation technology because it’s very realistic. In fact, we’ve had some providers who, once they get involved with a simulation training exercise, start to sweat and they get flushed in the face because what may seem safe at first suddenly becomes real.”

Dr. Perlman believes the key to simulation training is the ability for the learner to actually hear a heart rate and feel a pulse in the newborn simulator. “The truth is you don’t need all the bells and whistles. Quite frankly, the ability to hear the heart rate in the (newborn) simulator is all you really need. That’s the key to me,” said Dr. Perlman.

“The rewarding thing is that the NRP has always been at the forefront,” Dr. Halamek added. “NRP has always led, never followed. The program has fostered innovation, and it’s never been about having to do things in a rigid way. Rather, it’s been about the instructors using their creativity, and we hope they will be willing to try some new things.”

### Neonatal Resuscitation Program Research Grants Awarded

**Congratulations to the following individuals who received 2007 NRP Research Grant Awards:**

- **Paul Schumacker, PhD**, Professor, Northwestern University, Chicago, for “Preventing Cell Death in Neonatal Hearts during Cardiac Arrest and Resuscitation.”
- **John Kattwinkel, MD**, Charles Fuller Professor of Neonatology, University of Virginia, Charlottesville, for “Use of a Neonatal Lung Model to Evaluate Changes in Lung Compliance with Flow-Inflating Versus Self-Inflating Resuscitation Bags.”
- **Kari Roberts, MD**, Assistant Professor of Pediatrics, University of Minnesota Children’s Hospital, Minneapolis, for “Laryngeal Mask Airway for Surfactant Administration in a Newborn Animal Model.”
- **Dharmapuri Vidyasagar, MD**, Director, Division of Neonatology, University of Illinois, Chicago, for “Endotracheal Intubation and Suctioning of Non-Vigorous Infants Born to Mothers with Meconium Stained Amniotic Fluid: Does it Affect Outcome?”

**Young Investigator Award:**

- **Caroline Chua, MD**, Fellow, Neonatal–Perinatal Medicine, Maria Fareri Children’s Hospital at Westchester Medical Center, Valhalla, for “Effects of Hyperoxia on Germinal Matrix Hemorrhage in Premature Rabbit Pups.”

**Congratulations to our research grant winners!**

The Fall/Winter 2008 issue of the *NRP Instructor Update* will include information about the 2009 NRP Research Grant Program and Young Investigator Award opportunities.