

Promoting Obstetric and Neonatal Collaboration for NRP[®]



As an NRP instructor, you can help fill this gap for obstetric providers. Your instruction can improve communication and teamwork between the obstetric and neonatal teams.

I imagine that “Dr Newell” has requested the neonatal resuscitation team’s attendance at the vaginal birth of a term infant. You ask the OB provider the four pre-resuscitation questions and receive the following responses:

1. The infant is 41 weeks’ gestation.
2. The amniotic fluid is meconium-stained.
3. There is one baby.
4. Additional risk factors include a Category II fetal heart rate tracing with good variability and intermittent variable decelerations.

A few hours later, a baby girl is born. The amniotic fluid is meconium-stained, as expected. The infant appears term. She has good tone and shallow respirations, but is not yet crying.

The OB provider holds the infant securely on her left arm and holds the bulb syringe in her right hand. She is not sure if she should:

- Clamp the cord immediately and pass the infant to the neonatal team.
- Suction the mouth and nose, as she has the habit of doing for meconium-stained, vigorous newborns.
- Place the infant on the mother’s chest so that the RN can dry, stimulate, and further assess the newborn.
- Start drying the infant with a towel and delay cord clamping for 30-60 seconds.

She hesitates and looks at you. You respond by saying, “Dr Newell, the baby looks term, has good tone, and is beginning to breathe. After you suction the meconium out of her mouth and nose, she can stay with her mother if she starts crying. Do you agree? That will give us some time to delay cord clamping.”

Later, Dr Newell thanks you for quickly talking through the steps of managing this newborn.

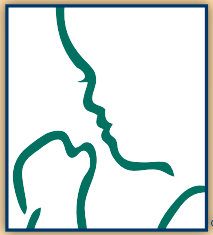
What Has Changed in the Obstetric Provider’s Familiarity With NRP

Your neonatal resuscitation team may have noticed that some obstetric providers are more uncertain about their responsibilities in neonatal resuscitation. In the past, obstetric residents often had designated rotations in the NICU with neonatal resuscitation teams, ranging from 2 weeks to 3 months. Over the past decade, NICU rotations were ended in most OB/GYN residency programs, and residents may be unfamiliar with current neonatal resuscitation guidelines. On the other hand, experienced OB providers may remember practice guidelines from the past and are now unsure of the current and correct treatment of the depressed neonate: Suction or no suction? Stay with mother or go to the warmer? Clamp or delay clamping the cord?

Jessica Illuzzi, MD, MS, the ACOG Liaison to the NRP Steering Committee, describes it this way, “Experienced OB providers remember past newborn resuscitation guidelines; for example, to pass the infant with meconium to the warmer, but they are not so familiar with current guidelines. Obstetric residents used to learn about newborn resuscitation during their neonatal rotations and were actively involved in practicing these skills at deliveries. Now that this aspect of OB resident training is no longer explicitly required, there has been a palpable decrease in collaborative experiences between obstetrics and neonatology. This has had an impact on the continuity of care of the maternal-fetal-neonatal triad.”

As an NRP instructor, you can help fill this gap for obstetric providers. Your instruction can improve communication and teamwork between the obstetric and neonatal teams, help ensure that current resuscitation guidelines are followed, and may increase the OB provider’s comfort level with performing initial steps of resuscitation and stating the plan for delayed cord clamping.

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NRP® Acknowledgements

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Statements and opinions expressed in this publication are those of the authors and are not necessarily those of the American Academy of Pediatrics or American Heart Association.

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What's New in the NRP® Instructor Toolkit?

The NRP Instructor Toolkit (ITK) was officially launched in June 2016 and contains all the information, forms, and checklists needed to teach an NRP Provider course. New materials will be added to the ITK quarterly, to support ongoing instructor learning and provide requested resources.

In September 2016, a series of “What Would You Do?” videos were added to the ITK. These compelling video vignettes provide solutions for challenging classroom situations, including:

Scenario 1: Learners forget to turn on compressed gas while attempting positive-pressure ventilation with T-piece resuscitator.

Scenario 2: Learners are nervous and lose their ability to suspend disbelief, begin to giggle, and take the scenario off-track.

Scenario 3: Learners begin to lead the scenario, do not listen to cues from the instructor, and convey the manikin's vital signs.



Screenshots above are from the “What Would You Do?” video scenarios that have been added to the Instructor Toolkit.

How Do I Access the NRP Instructor Toolkit?

For detailed how-to guides that provide step-by-step instructions on how to access the ITK, and all activities within the Instructor Renewal bundle, please visit the NRP website at http://www2.aap.org/nrp/7thinfo_LMS.html#HowTo.

The NRP Instructor Toolkit can be accessed by purchasing the NRP Instructor Renewal bundle. The 7th Edition NRP Instructor Renewal bundle includes the following learning activities:

- Instructor Toolkit
- Instructor Course Learning Activity
- NRP Instructor Exam
- eSim Cases

You may purchase or obtain the Instructor Renewal bundle in 2 ways:

Individually

1. Log into the new NRP Learning Management System (LMS) system (you may use your existing login for the NRP 6th Ed Online Exam).
2. Set up your Master Account in the system.
3. Search “NRP Instructor Renewal” in the course catalog. Then purchase and enroll.

Through Your Institution

Your institution's administrator can purchase Instructor Renewal for you and assign access.

Roster History Will Disappear—Consider Printing Historical File!

The NRP database will no longer be accessible after **February 2, 2017**.

What Does This Mean?

- All 6th edition NRP rosters must be submitted by February 2, 2017. (Remember, 6th edition courses can only be taught through December 31, 2016.)
- NRP Instructors will no longer be able to view their complete roster history after the database is retired.
- Only the past 4 years of rosters have been transferred to the new LMS. Only the roster dates will be transferred; student information will **not** be imported.
- Consider printing a historical file for your records. Consult your hospital risk manager about your hospital's policy or recommendation for record retention.

Premature Anne® Goes From Concept to Final Product



“Because Premature Anne is produced for international use, she had to meet the regulations in numerous countries for using oxygen, electronics, and the Bluetooth components.”

The Premature Anne team in Stavanger. From left: Torbjørn Gjerdevik (Plant Manager), Jan Steinar Bolme (Production Engineer), Suzanne Shea (Platform Director, Emergency Care), Jostein Håvardsholm (Senior Product Developer, Electronics), Pamela Leon Loreto (Industrial Designer), Wei Liao (Product Developer, SW), Karen Toennesen (Product Manager), Sylvain Bougain (Regulatory Affairs), Tor Elden (Senior Product Developer, Mechanics), Wenche Lillehei (Discipline Manager, PD Test & Verification), and Linn Sømme (System Architect/Senior Product Developer).



Creating a one piece skin was challenging.

Premature Anne was born out of the need for an extremely preterm newborn manikin that could be used for neonatal resuscitation training. In Part One of this two-part article in the Fall/Winter 2015 issue (http://www2.aap.org/nrp/docs/IU/2015_FallWinter_ju.pdf), we learned how Premature Anne went from concept to functional prototype. These handcrafted prototypes were piloted at five beta sites. At the same time, other models of Premature Anne traveled the world for review, allowing medical providers to offer feedback about which features met training objectives and what was lacking.

On November 1, 2014, the Laerdal Gatesville, Texas team handed over the final Premature Anne concept to the Laerdal Stavanger, Norway team. The Stavanger team worked to turn the handcrafted prototype into a product for mass production. This “industrialization” phase of Premature Anne involved a team that made sure Premature Anne met the user requirements for appearance, functionality, and durability, as well as the regulatory and technical requirements for the agencies that govern the applicable markets around the world. The industrialization phase began by making CAD models (3D scanned images) of the hand-sculpted parts made in Texas. These CAD models were then used to optimize designs, create prototype molds for continued testing and production molds for manufacturing the final babies.

The prototype molds were made with Laerdal's partner and supplier, Limbs and Things. Creating a mold for a one-piece skin did pose some challenges. Removing the skins from the mold without harm and reproducing the intricate design of the airway required work. After much collaboration and a few iterations, the molds became the desired parts for the new baby.

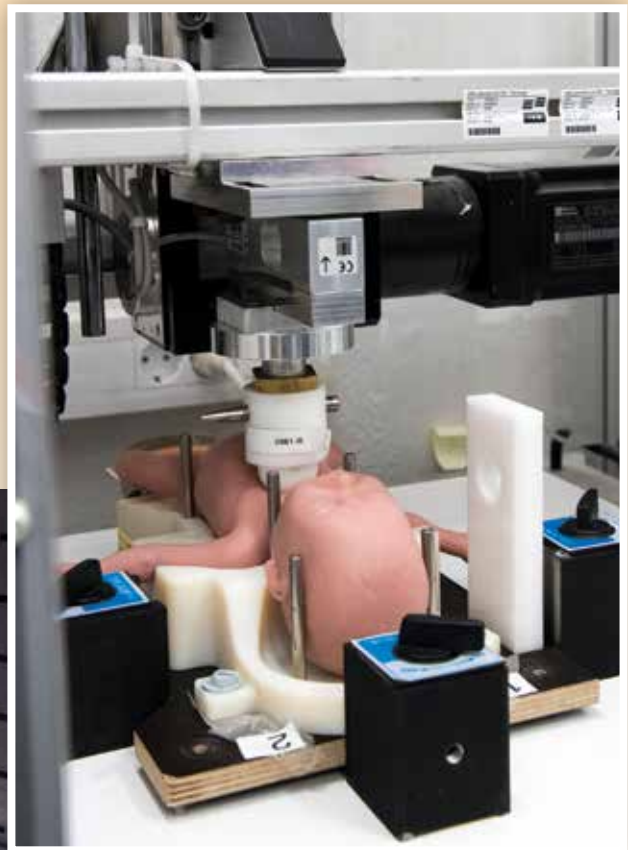
Premature Anne underwent lots of rigorous testing. Because airway management is the primary training objective met with this trainer, the airway was the focus of much of the durability testing. The trainer's airway is made of softer material than used in SimNewB. The silicone used for Concept Model 8 was made to replicate the feel and behavior of the airway in tiny babies. The challenge, and much of the testing, was to ensure the preferred silicone met the requirements for appearance, functionality, and durability.

After creating production quality models, Laerdal needed to do "real life" testing of the product. Each Premature Anne went through extensive airway testing and withstood 100,000 closed chest compressions. These lifetime testing numbers represent the estimated usage of an NRP course being run every day for one year.

Laerdal performed airway durability testing by training 40 people who worked in the manikin assembly area to do oral intubation and asked NICU staff from the University Medical Centers in Stavanger and Bergen to test nasal intubation (common in Europe). Premature Anne successfully passed all her testing requirements.

More durability testing was performed with chest compressions. Compressions were performed using an automatic compression machine. Premature Anne's internal components (including the acoustics components for heart and breath sounds) tolerated these tests and continued to function properly.

Our tiny friend also endured some internal requirements testing, such as an accelerated aging test. To ensure mechanical parts would endure the lifetime of the product, Premature Anne and her parts were placed in an oven at 60°C (140°F) for more than 20 weeks, after which the manikin's internal parts were inspected for wear and tear and functionality.



Above: The automatic compression machine tested Premature Anne's durability with more than 100,000 compressions.

Left: Premature Anne lounged in the oven at 140°F for over five months to make sure that the mechanical parts could endure the lifetime of the product.

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Premature Anne...

Jostein Håvardsholm (Senior Product Developer, Electronics) verifies the functionality of the electronics in Premature Anne by measuring the voltage on the Printed Circuit Board using an oscilloscope.



Wei Liao (Product Developer, SW) and Jostein Håvardsholm (Senior Product Developer, Electronics) used innovative solutions to develop the acoustic system in Premature Anne. Here they check heart and lung sounds.



Because Premature Anne is produced for international use, she had to meet the regulations in numerous countries for using oxygen, electronics, and the Bluetooth components. For example, the team had to make sure that Premature Anne could be safely used in all types of environments. David Singleton, Group Product Manager-Emergency Care, remembers the process, which was new to Laerdal. “Laerdal used the safety standard for medical devices and Laerdal added a few more parameters to ensure that she was safe for use in clinical environments,” Singleton said.

It is highly unlikely that purchasers would use Premature Anne in extreme conditions, but testing in extremes is what makes the testing meaningful. Linn Sømme, System Architect and Senior Product Developer, said, “We always have to consider the ‘what-ifs’ when testing. We considered the absolute worst case scenarios and asked, ‘Could she survive?’ Then we would test those scenarios and assess for damage.”



Above: Pamela Leon Loreto (Industrial Designer) and Camilla Fosnes (Graphic Designer) work on the packaging and the user information.

Left: Eva Nerona (Operator) is carefully gluing the zipper to the skin.

Below: Kirsten Wilhelmsen (Operator) has carried out a final product test, cleaned the manikin and is now packing the Premature Anne Task Trainer with all its accessories in the box



Above: The resuscitation team at the University of Texas Southwestern Medical Center in Dallas, performed the NRP Premature Anne scenarios to validate user instructions and programming.

Friendlier testing was also performed ensuring the functionality of Premature Anne's other components. The acoustic system (heart and lung sounds) underwent extensive development before the team was satisfied with the quality of the sound. The electronics in the concept model consisted of off-the-shelf model components embedded into a 3D printed skull. The industrialization group had to develop expanded modules and batteries that would still fit in the skull. Apart from the constraints of a small volume space, the team focused on solutions for sound quality, runtime, and operating temperature.

The project group worked to develop a manufacturing process acceptable for an assembly line. Because the Premature Anne simulator involves assembling tiny parts inside a small form, many hours were spent developing and refining this process. For example, Premature Anne needed a high quality gluing process that required new tools to facilitate production.

Packaging and user information are critical components to the final product. Premature Anne fits into a specially made box that cushions her safely and includes the "bits and pieces" needed to operate her in a realistic scenario. User information was developed and tested to ensure it was clear to users who needed to understand the instructions for setting up and operating the task trainer and simulator.

The NRP Premature Anne scenarios were created by members of the NRP Steering Committee. The "end-user testing" was completed by resuscitation teams led by Myra H. Wyckoff, MD, FAAP, and Vishal Kapadia, MD, MSCS, FAAP at the University of Texas, Southwestern Medical Center in Dallas. This testing validated both the instructions and programming for Premature Anne operation. Actual scenarios were performed to make sure the simulator's responses were appropriate to resuscitation team interventions. After each scenario, debriefing and reviews were done to validate that instructor materials were robust, and provided appropriate background and details for the operation of the simulators. Once these scenarios were refined, they were programmed for the SimPad PLUS® by the Laerdal Copenhagen, Denmark team.

NRP instructors and resuscitation team members conducted end-user testing by running Premature Anne scenarios and providing feedback to scenario editors and Premature Anne programmers and developers.

The objectives of the industrialization phase have now been met. The concept phase produced a prototype model that was usable for NRP providers in terms of appearance and functionality. The Laerdal Stavanger team took a prototype and continued its development by creating refined features, better durability for users, and mass production ability for Premature Anne.

Promoting Obstetric and Neonatal Collaboration for NRP®

Promoting Collaboration in Your Setting

Neonatal providers are required to update their NRP knowledge and skills at least every 2 years, and most are aware that resuscitation guidelines are revised every 5 years. Obstetric providers who are not required to be NRP providers may not be as tuned in to when the guidelines change and how revised guidelines affect their management of the newly born infant.

The NRP instructor can promote the obstetric providers' understanding of revised newborn resuscitation guidelines in several ways. Just as the NRP provider knows that the in-person NRP provider course is more valuable to learners when the participants are in multidisciplinary teams, the NRP instructor is most effective when he or she is a credible resource to both the neonatal and the obstetric team.

- If you are an NRP Instructor with neonatal skills, team up with an NRP instructor who is an obstetric provider, such as a Labor & Delivery nurse, CNM, or physician. This gives you a better chance of understanding the obstetric perspective on neonatal resuscitation and may help open doors to attend meetings or provide training. If you are an NRP instructor with obstetric skills, team up with a neonatal NRP instructor.
- Attend your hospital's OB staff meeting periodically to present a brief (less than 10 minutes) presentation about a component of neonatal resuscitation that impacts the OB provider. Provide literature that supports the intervention. Most pertinent literature can be found by using the links within the 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care (<https://eccguidelines.heart.org/index.php/circulation/cpr-ecc-guidelines-2/>). This document also includes a useful appendix that lists which practice recommendations were updated for 2015, which are new for 2015, and which were not reviewed in 2015 and remain the same.
- If your goal is to promote collaboration between the obstetric and neonatal medical providers, get help from a physician leader from both groups to champion your cause and help

create a periodic meeting where both specialties can meet and discuss common issues and form sub-committees focused on standardizing care and creating protocols such as delayed cord clamping.

- Remember the value of just-in-time NRP skills review. When OB teams and neonatal teams are assembled and waiting for a birth, suggest a 5-minute simulation session in an unoccupied patient room to ensure everyone's understanding of the plan of care. The objective of the scenario is to ensure that team members know how to ask about the plan for managing the newborn at birth, including the plan for beginning initial steps during delayed cord clamping and moving the newborn to the radiant warmer if necessary.

The Big Picture

At this time, studies are ongoing regarding the best methods for resuscitation of the newborn at birth. For example, one pilot study (<http://www.ncbi.nlm.nih.gov/pubmed/27305177>) has assessed the feasibility of preterm infants receiving CPAP or PPV during 90 seconds of delayed cord clamping. If this practice eventually proves beneficial, this kind of change would require major collaboration between the obstetric and neonatal teams—first among professional organizations and then in the hospital setting.

A smooth transition for revisions in neonatal resuscitation are facilitated by strong relationships between the American Academy of Pediatrics (AAP), the American College of Obstetricians and Gynecologists (ACOG), American College of Nurse-Midwives (ACNM), the Association for Women's Health, Obstetric, and Neonatal Nurses (AWHONN), the National Association of Neonatal Nurses (NANN), the American Association for Respiratory Care (AARC), and the American Association of Birth Centers (AABC). To promote effective collaboration and synchronous change, these key professional groups should include liaisons to decision-making bodies, such as the Committee on Fetus and Newborn, the Obstetric Practice Committee, and the NRP Steering Committee. Co-endorsement of committee statements should be based on current evidence that sets the standards in each organization. These committees can then plan education programs and activities to facilitate competency and changes in practices.

2017 NRP® Research Grant and Young Investigator Award Call for Applications

The American Academy of Pediatrics Neonatal Resuscitation Program (NRP) Steering Committee is pleased to announce the availability of the 2017 NRP Research Grant and Young Investigator Awards. The awards are designed to support basic science, clinical, or epidemiological research pertaining to the broad area of neonatal resuscitation.

Physicians in training or individuals within four years of completing fellowship training are eligible to apply for up to \$15,000 through the **NRP Young Investigator Award**. Any health care professional with an interest in neonatal resuscitation can submit a proposal for up to \$50,000 through the **NRP Research Grant Program**.

Grants are currently available to fund research projects in the United States and Canada.

The NRP Research Grant and Young Investigator Award Program Guidelines and Intent for Application will be available in January 2017. To obtain a copy of the guidelines, a list of potential research topics, or a list of previously funded studies, please visit the NRP website at www.aap.org/nrp and select the "Science" tab.

