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ECG Monitoring in the Delivery Room

Why is a cardiac monitor now recommended as the most accurate method for assessing the newborn's heart rate?



Hear rate is a major indicator for decision-making during assessment of the newborn. Heart rate is important in determining the need for positive-pressure ventilation, chest compressions, and medication administration. Errors in interpretation of heart rate could lead to the omission of treatment required for newborn resuscitation or to inappropriate administration of treatment, both of which may result in patient harm.

Auscultation is subject to human error and is often inaccurate. In one study, in one-third of deliveries the inaccuracies of the auscultated heart rate led to errors in treatment.¹ Palpation of the heart rate at the umbilicus is not possible almost 20% of the time, and even less often if the infant is compromised. It is during this hemodynamic compromise that the heart rate assessment is most critical for guiding treatment decisions.

The initial assessment of heart rate is generally made by auscultating the left side of the chest with a stethoscope. If the heart rate cannot be determined by auscultation and the newborn is not vigorous, a pulse oximeter should be placed on the right hand or wrist. If the pulse oximeter has an unreliable signal, applying ECG leads and using a cardiac monitor is recommended. The most recent recommendation suggests using a cardiac monitor for accurate assessment and monitoring of heart rate, when:

- auscultation of the heart rate is difficult, and the newborn is not vigorous.
- pulse oximetry has an unreliable signal.
- PPV begins, to guide subsequent decision-making with the most accurate heart rate assessment possible.
- the heart rate is very low and perfusion is poor, for example, when chest compressions are indicated.

Pulse oximetry was introduced into the NRP flow diagram in the 6th Edition (2011). Although pulse oximetry is important in guiding oxygen management during resuscitation, oximetry is slower and less accurate in providing a heart rate than a 3-lead cardiac monitor.^{3,4,5} The ECG monitor is able to ascertain the heart rate within 2 seconds of being applied to the patient, while a pulse oximeter takes an average of 24 seconds to provide a heart rate reading after application.³ When an oximeter signal is obtained, it can take another 2 minutes for the pulse oximeter to accurately reflect the heart rate when compared to a 3-lead ECG monitor.⁵ When the pulse oximeter has a strong waveform, it generally reflects the infant's heart rate accurately, but is least reliable when the infant's heart rate is very low, resulting in poor perfusion.⁴

Continued on inside cover. ►

The NRP Roadshow—Coming Your Way in 2019!

The NRP Steering Committee is planning a special 1-day Instructor workshop to be held in multiple locations around the country throughout 2019/2020. Workshop highlights will include **Simulation Scenario** sessions featuring hands-on debriefing opportunities with expert faculty, and **NRP Live** sessions featuring NRP Steering Committee members and experts. There will be opportunity for interaction with NRP experts to demonstrate and discuss **YOUR questions** about NRP science, administration, simulation, and educational methodology questions/challenges.

Additional details—including dates, locations, and an agenda—will be posted to the NRP Instructor Toolkit/website/NRP Facebook in Fall 2018.

NRP Online Exam—Test Your Knowledge



The only 2 points of evaluation in the NRP provider course are:

- A. The online exam and the Integrated Skills Station
- B. The online exam and simulation and debriefing
- C. The online exam and the Performance Skills Stations
- D. The online exam and the eSim cases

See back cover for the correct answer and explanation. ►



Continued from cover.

ECG Monitoring in the Delivery Room...

The NRP Steering Committee realizes that this recommendation may require a practice change for many institutions. This recommendation reflects the science that ECG is superior to other modalities for verifying the heart rate, which is the primary determinant for treatment in the NRP flow diagram. Just as the pulse oximeter is not required for each delivery, it is anticipated that the ECG monitor will be required only during complex resuscitation. As institutions were able to creatively incorporate pulse oximetry into resuscitation equipment, they can do the same with an ECG monitor by mounting it onto a pole with the pulse oximeter or adding it to a resuscitation cart. The NRP Steering Committee encourages institutions to practice using a cardiac monitor during simulation training and to provide ideas on how to incorporate this piece of equipment into the standardized equipment checklist. The ECG monitor will prove valuable when auscultation is difficult, pulse oximetry is not reliable, and the infant has poor perfusion during complex resuscitation.

References

1. Voogdt KG, Morrison AC, Wood FE, van Elburg RM, Wyllie JP. A randomised, simulated study assessing auscultation of heart rate at birth. *Resuscitation* 2010, 81(8): 1000-1003.
2. Perlman JM, Wyllie J, Kattwinkel J, Wyckoff MH, et al. Part 7: Neonatal Resuscitation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation* 2015, 132(16 Suppl 1): S204-241.
3. Katheria A, Rich W, Finer N. Electrocardiogram provides a continuous heart rate faster than oximetry during neonatal resuscitation. *Pediatrics* 2012, 130(5): e1177-1181.
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NRP Acknowledgements

The Neonatal Resuscitation Program (NRP) Steering Committee offers the *NRP Instructor Update* to all AAP/AHA NRP Instructors.

Editor

Marya L. Strand, MD, MS, FAAP

Associate Editor

Jeanette Zaichkin, RN, MN, NNP-BC

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Myra H. Wyckoff, MD, FAAP

Comments and questions are welcome and should be directed to:

Marya L. Strand, MD, MS, FAAP
Editor, *NRP Instructor Update*
345 Park Blvd, Itasca, IL 60143
aap.org/NRP

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Your Feedback Counts: Updates to the NRP 7th Edition

Coming Soon!

Since the release of the NRP 7th Edition, the NRP Steering Committee has been working diligently to develop and improve NRP materials and communications. Throughout 2017, committee members conducted an instructor survey and facilitated a series of instructor focus groups to determine how NRP 7th Edition is being put to work, and to identify any gaps in resources or knowledge.

Based on your feedback, the NRP Steering Committee is focusing on the following areas:

NRP Instructor Toolkit (ITK)

- Developing resuscitation skills videos for the NRP audience. These will be available to all learners.

COMING SOON!

New Skills Videos:

- Positive-pressure Ventilation with a Face Mask
- CPAP in the Delivery Room
- Performing and Assisting with Endotracheal Intubation
- The Laryngeal Mask
- Chest Compressions
- Drawing Up Epinephrine

COMING SOON!

New “What Would You Do?” Videos:

- Instructor has difficulty conveying vital signs to learners.
- Instructor mentor tells learners they need to repeat the Provider course.

- Improving and simplifying ITK navigation and incorporating a more graphic design to strengthen the overall user experience.
- Building discussion boards to provide instructors an opportunity to network on key NRP questions.

NRP Learning Management System (LMS)

- Improving roster scheduling/adding students, especially for community-based instructors teaching at multiple institutions.
- Automatically adding the NRP Instructor who creates the roster as event personnel.
- Improving location filters when students search for an Instructor-led Event in their area.

Thank you to all NRP Instructors who completed the NRP survey or participated in a focus group. Your knowledge and expertise are critical to the ongoing development and improvement of the NRP. For a full summary of results, please visit the NRP Instructor Toolkit.



Sneak peek images from March 2018 filming.

NRP Research Grants Awarded

Congratulations to the following individuals who received 2017 NRP Grant Awards.

YOUNG INVESTIGATOR AWARDS:

Praveen Chandrasekharan, MD, MS, FAAP
State University of New York at Buffalo

Optimizing Chest Compressions Targeting Gas Exchange and Hemodynamics in a Transitional Cardiac Arrest Model

Heidi Herrick, MD, FAAP
Children’s Hospital of Philadelphia

Impact of Flow Disruptions in the Delivery Room

RESEARCH GRANT AWARD:

Jayasree Nair, MBBS, MD, FAAP
State University of New York at Buffalo

Delayed Cord Clamping in Term Lambs with Asystolic Cardiac Arrest

Congratulations to our research grant awardees!

The Fall/Winter issue of the *NRP Instructor Update* will include information about the 2019 NRP Research Grant Program.

Congratulations!

2018 NRP® Current Issues Seminar

Orlando, FL | November 2, 2018 | Registration Opens May 1

American Academy of Pediatrics

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National Conference & Exhibition

November 2 – 6, 2018 | Orlando

The American Academy of Pediatrics (AAP) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

This activity has been approved for *AMA PRA Category 1 Credit*™



The 2018 NCE will be held November 3-6, 2018 at Orange County Convention Center in Orlando, FL.

Registration for the 2018 National Conference will open on May 1, 2018 – please check aapexperience.org!

Save the date for **Friday, November 2, 2018** and join us in sunny Orlando for the **NRP Current Issues Seminar** to be held in conjunction with the 2018 American Academy of Pediatrics (AAP) National Conference and Exhibition (NCE).

This year's session features a dynamic format, allowing more hands-on opportunities and an extended **NRP Live** session. **NRP Live** is an open dialogue and demonstration with NRP Steering Committee members and textbook editors to discuss *your* questions/challenges related to science, administration, simulation, and/or educational methodology.

In the afternoon breakout sessions, attendees will have the choice of participating in the *Speaker Series* or the *Simulation Scenarios*. The *Speaker Series* will feature the editor of the *NRP Instructor Toolkit* and experts in the field of simulation and human factors. The *Simulation Scenarios* will feature hands-on simulation and cover expert strategies in facilitating scenarios and debriefing.

The seminar is best suited for current NRP instructors and clinical healthcare professionals involved with neonatal resuscitation.

See reverse side for session schedule and seminar credit. ▶

NEW! NRP Bright Ideas Showcase

We are excited to add a session entitled "**NRP Bright Ideas Showcase**" where you can help educate others about the innovative way you are teaching NRP! More information about submitting your ideas, with templates and examples, is available on the NRP website. Bright Ideas are due by **June 29, 2018**.



Unable to join in person? Join us on Facebook!

You can still participate and have your NRP questions answered! **NRP Live** will be streamed via Facebook Live so you can join us from home or work. Remember to follow us on Facebook for an opportunity to submit questions to the NRP Steering Committee.

2018 NRP® Current Issues Seminar

Orlando, FL | November 2, 2018 | Registration Opens May 1

8:00-8:15AM	<p>Welcome/Overview <i>Marya Strand, MD, MS, FAAP, Program Chair</i> <i>Taylor Sawyer, DO, MEd, FAAP, Program Chair</i></p>
8:15-9:15AM	<p>Mission Complete: Thoughts On Space Shuttle Training And How It Can Impact NRP <i>Michael Sterling, SGT, Inc.</i></p>
9:15-9:25AM	<p>NRP Grants Summary <i>Marya Strand, MD, MS, FAAP</i></p>
9:25-10:00AM	<p>NRP Bright Ideas Showcase </p>
10:00-10:15AM	<p>Break</p>
10:15AM-12:15PM	<p>NRP Live <i>Bobbi Byrne, MD, FAAP</i> <i>Gary Weiner, MD, FAAP</i> <i>Taylor Sawyer, DO, MEd, FAAP</i> <i>Jeanette Zaichkin, RN, MN, NNP-BC</i></p>
12:15PM-12:30PM	<p>Explanation Of Breakout Sessions/ Room Assignments <i>Marya Strand, MD, MS, FAAP</i> <i>Taylor Sawyer, DO, MEd, FAAP</i></p>
12:30-1:00PM	<p>Lunch</p>

Breakout Sessions

Simulation Scenarios (1A & 1B) **OR** Speaker Series (1C)

1:15-3:15PM	<p>Breakout 1A: Simulation Scenarios (NRP Instructors)</p> <p>Breakout 1B: Simulation Scenarios (Non-Instructors)</p> <p>Breakout 1C: Speaker Series The Science of NRP: Knowledge Gaps & Transitional Physiology <i>Marya Strand, MD, MS, FAAP</i> <i>Myra Wyckoff, MD, FAAP</i></p> <p>Navigating Instructor Resources: What's In Your Toolkit? <i>Jeanette Zaichkin, RN, MN, NNP-BC</i></p>
3:15-3:30PM	<p>Break</p>
<p>Breakout Sessions Continued</p>	
3:30PM-4:30PM	<p>Breakout 2A: Simulation & Debriefing: Do Your Objectives Meet Your Goals? <i>Bobbi Byrne, MD, FAAP</i></p> <p>Breakout 2B: I'm An Instructor Mentor?! What Do I Need To Know? <i>Taylor Sawyer, DO, MEd, FAAP</i></p>
4:30PM	<p>Evaluation Drop-off/Certificate Pick-up</p>

Seminar Credit

The American Academy of Pediatrics (AAP) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The AAP designates this live activity for a maximum of 6 *AMA PRA Category 1 Credit(s)*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

This activity is acceptable for a maximum of 6 AAP credits. These credits can be applied toward the AAP CME/CPD Award available to Fellows and Candidate Members of the AAP.

This program is accredited for 6 NAPNAP CE contact hours of which 0 contain pharmacology (Rx), content per the National Association of Pediatric Nurse Practitioners (NAPNAP) Continuing Education Guidelines. The AAP is designated as Agency #A17. Upon completion of the program, each participant desiring NAPNAP contact hours should send a completed certificate of attendance, along with the required recording

fee (\$13 for NAPNAP members, \$15 for nonmembers), to the NAPNAP National Office at 5 Hanover Square, Suite 1401, New York, NY 10004. Keep this certificate for your records for six (6) years. Requests for duplicate certificates should be made to the AAP.

The American Academy of Physician Assistants (AAPA) accepts certificates of participation for educational activities certified for *AMA PRA Category 1 Credit(s)*™ from organizations accredited by the ACCME. Physician assistants may receive a maximum of 6 hours of Category 1 credit for completing this program.

This activity is being submitted to the Ohio Nurses Association (OBN-001-91) for approval to award contact hours. The Ohio Nurses Association is accredited as an approver of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is being submitted to the American Association for Respiratory Care (AARC) for continuing education contact hours for respiratory therapists.

▲ Tear off to keep as a handy reference. ▲

The NEW SimNewB is Almost Here!

Over 10 years ago, the American Academy of Pediatrics (AAP) and Laerdal Medical entered a strategic alliance and collaborated on a newborn patient simulator that meets the specific learning objectives of NRP and neonatal emergency medicine and resuscitation courses. Since the initial introduction in 2008, SimNewB has played a role in the training of thousands of novice and experienced healthcare providers in how to respond to those unique changes that occur during the transition from intrauterine to extrauterine life.

For the past 3 years, Laerdal Medical and the NRP Steering Committee have continued this collaboration to ensure that SimNewB continues to meet the neonatal training requirements of the healthcare community and to improve the feature set, physiology, and functionality of the simulator.

Laerdal Medical, in collaboration with the AAP, is pleased to announce that the new updated version of the SimNewB neonatal simulator will be available this summer. The new version of SimNewB retains all the vital features of the original simulator, but has been improved in many ways:

- Tetherless simulation technology allows easy transport and mobility, allowing use in a variety of settings (see photo).
- A completely redesigned airway is more realistic and allows learners to perform intubation with correct technique.
- The metal snaps on the chest are gone, improving the realism of the manikin.
- Light and dark skin tones reflect more diversity.
- Central cyanosis is more realistically placed in and around the mouth.



The new SimNewB is tetherless, allowing learners to carry or move SimNewB without cords and wires.

- Body proportions are more characteristic of a term newborn.
- Remarkably flexible neck allows for critical head tilt maneuver and realistic newborn head lag.
- Improved umbilical access includes a closed umbilical reservoir to prevent spillage of simulated blood and a new drainage system to accommodate high volume infusion.
- Seizure activity is more realistic and controllable for arms and/or head.
- Available with NRP scenarios mapped directly to the NRP course curriculum.
- Available with the Laerdal SimPad PLUS or Laerdal LLEAP software.

The new SimNewB meets the changing needs of neonatal resuscitation and stabilization focusing on the first 10 minutes following delivery.

To learn more about the new SimNewB, visit Laerdal.com/SimNewB.

Continued from inside cover.

Answer to NRP Online Exam—Test Your Knowledge



The correct answer is A: The online exam and the Integrated Skills Station

The online exam and the Integrated Skills Station are the only two points of learner evaluation during the NRP course. At a minimum, every participant in an NRP Provider Course must complete the following requirements:



REQUIRED EVALUATION
COMPONENT

1. **Online Exam** (knowledge evaluation): Successful completion of the online exam is required before participants attend the classroom portion of the NRP course.
2. **eSim Cases** (learning activity): Learners receive a score to enable self-assessment of progress, but eSim is for learning only/reinforcement of algorithm and is not an evaluation point.



REQUIRED EVALUATION
COMPONENT

3. **Integrated Skills Station** (knowledge and skills evaluation): Learners demonstrate the steps in the NRP flow diagram using the proper sequence, timing, and technique. *The instructor does not coach the learner or interrupt the demonstration.* If the learner makes significant errors in timing, sequence, or technique, the learner should receive additional help and practice before re-attempting the Integrated Skills Station and before proceeding to Simulation and Debriefing.
4. **Simulation and Debriefing** (learning activity): Learners integrate knowledge, technical, and behavioral skills within a simulation setting where participants feel safe to make mistakes for the purpose of learning from them.