

MaineHealth

MaineHealth Knowledge Connection

Costas T. Lambrew Research Retreat 2021

Costas T. Lambrew Research Retreat

2021

A Simulation-Based Outreach Program Improves Delivery Room Team Confidence in Neonatal Resuscitation at Rural Community Hospitals

Allison Zanno
Maine Medical Center

Misty Melendi
Maine Medical Center

Micheline Chipman
Maine Medical Center

Jeffrey Holmes
Maine Medical Center

Alexa Craig
Maine Medical Center

See next page for additional authors

Follow this and additional works at: <https://knowledgeconnection.mainehealth.org/lambrew-retreat-2021>



Part of the [Obstetrics and Gynecology Commons](#), and the [Pediatrics Commons](#)

Recommended Citation

Zanno, Allison; Melendi, Misty; Chipman, Micheline; Holmes, Jeffrey; Craig, Alexa; Piro, Samantha; Gilbert, Anna; Gabrielson, Sarah; Mallory, Leah; Culter, Anya; and Ottolini, Mary, "A Simulation-Based Outreach Program Improves Delivery Room Team Confidence in Neonatal Resuscitation at Rural Community Hospitals" (2021). *Costas T. Lambrew Research Retreat 2021*. 20.

<https://knowledgeconnection.mainehealth.org/lambrew-retreat-2021/20>

This Book is brought to you for free and open access by the Costas T. Lambrew Research Retreat at MaineHealth Knowledge Connection. It has been accepted for inclusion in Costas T. Lambrew Research Retreat 2021 by an authorized administrator of MaineHealth Knowledge Connection.

Authors

Allison Zanno, Misty Melendi, Micheline Chipman, Jeffrey Holmes, Alexa Craig, Samantha Piro, Anna Gilbert, Sarah Gabrielson, Leah Mallory, Anya Culter, and Mary Ottolini

A Simulation-Based Outreach Program Improves Delivery Room Team Confidence in Neonatal Resuscitation at Rural Community Hospitals

Allison Zanno MD, Misty Melendi MD, Micheline Chipman, RN, MSN, CHSE, Jeffrey Holmes MD, & Alexa Craig MD on behalf of the MOOSE Research Team

Background

- >50% of neonates in Maine are born in community hospitals with 2/3 have less than one birth/day
- State-wide database of infants with HIE* revealed a significant outcome disparity for those born at a community hospital compared to a tertiary care center
- Neonatal resuscitation practices contribute to this difference
- Neonatal resuscitation training decreases neonatal mortality
- Participant skills improve following trainings
- In situ simulation can also be effective at evaluating latent safety threats

*Hypoxic ischemic encephalopathy

Objective

Our goal is to pilot the use of an onsite Neonatal Community Outreach Education Program to improve provider confidence with procedural skills and neonatal resuscitation in the delivery room.

Methods

- The Neonatal Community Outreach Education Program is an in-situ rural simulation training program delivered by a team of neonatologists and simulation experts.
- The entire delivery room team participates, including rural physicians, nurses and respiratory therapists, as well as hospital leadership, including quality and safety officers.
- Procedural sessions include specific skills training in airway management, medication administration, emergency vascular access and neonatal stabilization.
- Three high fidelity scenarios (maximal airway management, moderate respiratory effort, full code) assess medial knowledge, teamwork, communication, and latent safety threats.
- A pre- and post-simulation training provider confidence questionnaire was used at each site with ratings ranging from 1, indicating no confidence with a certain skill, to 5, indicating complete confidence.
- Confidence was analyzed using a t-test.

Manikin and Set Up



Super Tory Manikin

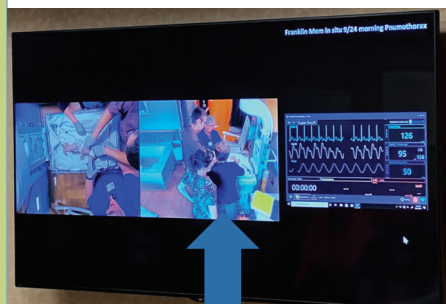


Cyanosis on
Super Tory



Orientation to
Super Tory Manikin

Simulations and Debriefing



SimCapture® and B-Line Systems,
Remote View

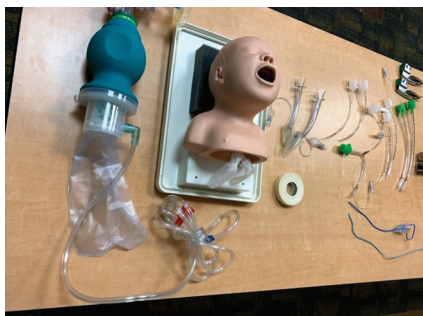


Debriefing Session

A Simulation-Based Outreach Program Improves Delivery Room Team Confidence in Neonatal Resuscitation at Rural Community Hospitals

Allison Zanno MD, Misty Melendi MD, Micheline Chipman, RN, MSN, CHSE, Jeffrey Holmes MD, & Alexa Craig MD on behalf of the MOOSE Research Team

Skills Stations



Airway
Management

Drawing Up
Medications



Umbilical Line
Placement



Chest Tube Placement

Results

Self-Efficacy Data

Table 1: Sample of questions from the survey administered anonymously pre and post simulation training. (12 of 14 questions had statistical significance)	Pre-Sim Score (n=39)	Post-Sim Score (n=58)	p-value
I am confident in my knowledge of neonatal resuscitation	3.6 (0.8)	4.3 (0.7)	<0.001
I am confident in neonatal airway management	3.6 (0.8)	4.2 (0.7)	<0.001
I am confident in my ability to manage emergency medications	2.8 (1.1)	3.9 (1.0)	<0.001
I am confident in my ability to perform emergency intravenous access	2.4 (1.2)	3.6 (1.2)	<0.001
I am confident that my team members have the skills/knowledge to perform NRP	3.5 (0.9)	4.4 (0.7)	<0.001
I feel confident that my team is a cohesive unit with clear communication	3.7 (0.8)	4.3 (0.7)	<0.001

Conclusions

- An in-situ simulation based rural community outreach program improves provider confidence in neonatal resuscitation, including procedural skills, in a low-delivery volume setting.
- We anticipate expanding this program to all delivery room hospitals in Maine.

References

- Perlin JM, Wyllie J, Katzwinkel J, 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.
- Donohue LT, Hoffman KR, Marcin JP. Use of Telemedicine to Improve Neonatal Resuscitation. *Children (Basel)*. 2019;6(4).
- Moster D, Lie RT, Markestad T. Relation between size of delivery unit and neonatal death in low risk deliveries: population based study. *Arch Dis Child Fetal Neonatal Ed*. 1999;80(3):221-225.
- Jukkala AM, Henly SJ. Provider readiness for neonatal resuscitation in rural hospitals. *J Obstet Gynecol Neonatal Nurs*. 2009;38(4):443-452.
- Patel A, Kharib MN, Kurba K, Bhargava S, Bang A. Impact of neonatal resuscitation trainings on neonatal and perinatal mortality: a systematic review and meta-analysis. *BMJ Paediatr Open*. 2017;1(1):e000183.
- Matterson IHH, Sohal D, Green BK, et al. Neonatal resuscitation experience curves: simulation based mastery learning booster sessions and skill decay patterns among pediatric residents. *J Perinat Med*. 2018;46(8):934-941.
- Patel J, Posencheg M, Ales A. Proficiency and retention of neonatal resuscitation skills by pediatric residents. *Pediatrics*. 2012;130(3):515-521.
- Bender J, Kennedy K, Shickels R, Overly F. Does simulation booster impact retention of resuscitation procedural skills and teamwork? *J Perinatol*. 2014;34(9):664-668.
- Bhat Hayden EM, Kharib A, Kelly HR, Yager PH, Salazar GM. Mannequin-based Telesimulation: Increasing Access to Simulation-based Education. *Acad Emerg Med*. 2018;25(2):144-147.
- Jewer J, Parsons MH, Dunne C, Smith A, Dubrowski A. Evaluation of a Mobile Telesimulation Unit to Train Rural and Remote Practitioners on High-Acuity Low-Occurrence Procedures: Pilot Randomized Controlled Trial. *J Med Internet Res*. 2019;21(8):e14387.
- Hashmi N. Delayed Initiation of Therapeutic Hypothermia for Outborn Infants is Associated with Adverse Outcomes. *Maine Medical Center*. 2019:685.