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# Newborn Care Curriculum: Newborn Medications

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## Abstract

**Introduction:** Based on a 2014 newborn education needs assessment, 39.6% of surveyed pediatric hospitalists expressed interest in receiving more education on newborn medications, and 94% were interested in computer-based learning modules as the method of learning. Thus, this module was designed to serve as a self-study tool or as a tool for small-group teaching. **Methods:** Initially designed for pediatric hospitalists, the module can be used for any learner interested in newborn care as it is meant to provide practical applications to the bedside clinician. This module was first implemented as part of the multimodule Newborn Care Curriculum within the pediatric hospitalist division at Children's National Health System in Washington, DC, from May to June 2016. **Results:** The module was well received, demonstrating an overall increase in learners' knowledge after completion of the module. Feedback from learners indicated that this learning tool met their overall needs. Eighty-three percent of learners agreed or strongly agreed that the material presented in the module would change their clinical practice, and 92% agreed or strongly agreed that the module increased their comfort with teaching. **Discussion:** As pediatric hospitalist programs expand in their breadth of clinical roles, they also expand pediatric hospitalists' roles in newborn medicine. The results of the initial implementation of this module suggest that it is a useful tool to assist pediatric hospitalists with their evolving roles in newborn medicine and ultimately improve overall patient care delivery.

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## Introduction

Newborn care and delivery room management are part of the Society of Hospital Medicine's Pediatric Hospital Medicine Core Competencies.<sup>1</sup> Specifically, pediatric hospitalists should have knowledge of and skills in normal newborn care, delivery room attendance, newborn resuscitation and stabilization, and level II neonatal care. As pediatric hospitalist programs continue to expand, particularly in the community hospital setting, so do pediatric hospitalists' roles in newborn medicine.<sup>2</sup> With this in mind, in 2014, an anonymous, electronic, cross-sectional survey was sent to the American Academy of Pediatrics' Section on Hospital Medicine Listserv. The goal was to survey pediatric hospitalists' level of confidence on 18 newborn care topics adapted from the Pediatric Hospital Medicine Core Competencies, as well as their interest in receiving more education on each topic and in new computer-based learning modules to provide information about each topic. A total of 179 pediatric hospitalists responded.

For the topic of newborn medications, 39.6% of surveyed hospitalists expressed interest in receiving more education on the topic. In addition, 94% of respondents were interested in computer-based learning modules as a method of learning about the different topics.<sup>3,4</sup> Thus, this learning module was created in a computer-based format as part of a multimodule curriculum on newborn care to assist pediatric hospitalists with their evolving roles in newborn medicine and ultimately improve overall patient care delivery. Each module of the curriculum stands alone and requires no prior knowledge from any of the other modules.

The purpose of this resource is to serve as a self-study tool or as a tool for small-group teaching. The target audience was initially intended to be pediatric hospitalists; however, the resource can also be used for any learner interested in newborn care including, but not limited to, advanced practitioners, fellows, residents, students, and nurses. There is no prerequisite knowledge or skill for this module.

The ideal context for implementation is in the setting of learners providing clinical care for newborns. There is a moderate amount of literature and several guidelines on the topic of newborn medications. The American Acade-

Rechtman L, Conroy R. Newborn Care Curriculum: newborn medications. *MedEdPORTAL Publications*. 2017;13:10568. [https://doi.org/10.15766/mep\\_2374-8265.10568](https://doi.org/10.15766/mep_2374-8265.10568)

Published: April 13, 2017

my of Pediatrics and the Centers for Disease Control and Prevention publish guidelines on each of the newborn medications discussed in the module. These guidelines have been developed using an evidence-based approach and have been formed by multidisciplinary subcommittees. The goal of this module is to be succinct and not to duplicate information that already exists but rather to take currently available resources and provide practical applications for the bedside clinician. The computer-based format is also intended to make the information easily accessible from any location. Currently, there is limited literature on this topic in MedEdPORTAL. This module is unique from other resources available because it offers clinically relevant information in one cohesive, easily accessible location. Rather than learners having to search through multiple resources to identify the uses, adverse effects, contraindications, and guidelines for each specific medication, the pertinent, evidence-based information is provided here in a single resource.

### Methods

As described, the computer-based format of this learning module was chosen based on an overwhelming response from a 2014 newborn education needs assessment showing that 94% of surveyed pediatric hospitalists were interested in computer-based learning modules as a method of learning about different newborn topics.<sup>3,4</sup>

This module was first implemented as one of several in the Newborn Care Curriculum piloted within the pediatric hospitalist division at Children's National Health System in Washington, DC, from May to June, 2016. The pilot group consisted of voluntary participants, including pediatric hospitalist attendings, fellows, and advanced practitioners. Some of the participants provided newborn care in their current clinical role, and some did not. For the purpose of the pilot study, this module was used for self-study; however, it can also be used for small-group teaching.

As implemented in the pilot study for self-paced learning, the main component of this learning tool is the PowerPoint presentation (Appendix A). The presentation consists of slides complemented by a detailed script for enhanced learning. The script is written in the notes section of each slide. Reading the script along with viewing the slides is crucial to achieving the learning objectives for the module. In order to read the script and advance through the slides/animations at the same time, it is a requirement to use

### Educational Objectives

By the end of this session, learners will be able to:

1. Describe the definition and basic pharmacologic mechanism for newborn medications, including vitamin K, erythromycin ointment, vitamin D, and hepatitis B vaccination.
2. Describe the use, dosing, adverse reactions, and contraindications of each medication.
3. Understand the recommendations for the newborn medications listed above.
4. Respond to parents' concerns and common misconceptions regarding the medications listed above.

the presenter view option with the PowerPoint program. Instructions on how to use presenter view are provided in Appendix B. Using presenter view allows the learner to advance through the slides and read the detailed script at the same time. The learner is prompted to click through the animations when applicable.

Prior to completing the main content of the learning module, there is a slide within the module that prompts the learner to complete a pretest (Appendix C) to assess baseline knowledge and behavior surrounding the topic of newborn medications. After the main content of the module has been finished, a slide prompts the learner to complete a posttest (Appendix E) and an evaluation of the module (Appendix G). After completion of the posttest and evaluation, the learner is instructed to view the pre- and posttest answer keys (Appendices D & F) to review the correct answers and explanations. This allows the learner to receive immediate feedback on the assessment and ensure that the correct answer explanations reinforce the key take-home points of the learning session.

If the module is used for small-group teaching, use of some of the files varies slightly. The main component is still the PowerPoint presentation (Appendix A). As described above, the detailed script in the notes section of this presentation is crucial to the content of the module and should be read aloud by the instructor. The instructor may use presenter view (instructions given in Appendix B) or may print the slides with notes and read from this paper printout while advancing through the slides. Prior to starting the learning session, the instructor should ask each learner to complete the pretest (Appendix C). The instructor may use the pretests to help gauge learner needs and perhaps focus the discussion on any deficiencies.

cies. After completing the teaching session, the instructor should ask all learners to complete a posttest (Appendix E) and an evaluation (Appendix G). Finally, learners can be handed a copy of the pre- and posttest answer keys (Appendices D & F).

The mean pre- and posttest scores for the module were calculated based on participants' responses during the pilot study. These were analyzed using an independent *t* test. Feedback from the evaluations was used to drive edits and changes to the module, pretest, and posttest, all of which are reflected in the documents and tools included here.

## Results

During the pilot study of the Newborn Care Curriculum, this specific learning module was completed by 12 learners. The learners consisted of pediatric hospitalist attendings, fellows, and advanced practitioners, 75% of whom provided newborn care in their current role. The average pretest score was 75%, which increased to 95% after learners completed the module ( $p = .0002$ ).

Using a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*), average scores were created for the evaluation questions (Table). As seen in the Table, 100% of learners agreed or strongly agreed that the module met the learning objectives and was relevant to their clinical practice. Furthermore, 83% of learners agreed or strongly agreed that they would change their clinical practice based on the module's content.

**Table.** Student Evaluation Responses

Evaluation Question	Agreed or Strongly Agreed
This learning activity met the stated learning objectives.	100%
Material presented in this learning activity was relevant to my clinical practice.	100%
Material presented in this learning activity will change my clinical practice.	83%
Material presented in this learning activity increased my comfort with teaching about this topic.	92%
This learning activity would be useful for small group teaching.	100%
Format of this learning activity was appropriate for my learning needs.	100%
Format of this learning activity would be more effective with an audio narration.	67%

Comments from the evaluations included the following:

- “Helpful decision trees. Animation added interest to the presentation. Very relevant topic, clearly presented with the right amount of detail.”
- “Explained common scenarios in dealing with some difficult parents.”
- “Very useful for teaching.”
- “Good overview, comprehensive.”
- “I learned something.”
- “Outstanding information. Very practical advice about how to advise parents, excellent clinical context for information!”

## Discussion

The newborn medications learning module was very well received in its implementation in a small pilot study.

The assessment tools demonstrated an overall increase in knowledge after completion of the module, and the evaluation showed that this learning tool met the overall needs of its learners. While the implementation was only in the self-study format, it is also important to recognize that 100% of learners agreed or strongly agreed that this learning activity would be useful for small-group teaching, for which it was also designed. Moreover, 92% agreed or strongly agreed that the module increased their comfort with teaching on the topic.

The broader goal of implementation of this learning module is to improve overall patient care delivery. With that in mind, it is important to note that 83% of learners agreed or strongly agreed that the material presented in the module would change their clinical practice.

As pediatric hospitalist programs continue to expand, particularly in the community hospital setting, so do pediatric hospitalists' roles in newborn medicine.<sup>2</sup> One of the goals of this module and the overall curriculum is to serve as a resource for hospitalists who have not provided newborn care in recent years and are now being asked to fill that role. Seventy-five percent of learners who completed this module in the pilot study already provided newborn care in their current role. It is likely that this module will prove to be even more effective when completed by those who have been away from newborn care for several years. An additional goal of the curriculum is to be succinct and focused in order to be realistic for practitioners to complete in a timely manner. This module required 15 minutes to complete when we timed it. Assuming an additional 5 to

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10 minutes needed by someone unfamiliar with the topic, the module is within the goal completion time of 20 to 30 minutes. Completion time was not obtained as part of the pilot study but should be considered in future studies.

There are several limitations to this module. The study itself is limited by the small sample size. The content is somewhat limited due to our goal of keeping the module focused and brief. Therefore, future modules may be developed to expand on this topic. Additionally, parents may have additional comments or concerns regarding the medications that have not been addressed in this module. In the future, it may be beneficial to develop a module dedicated strictly to parent concerns regarding newborn medications. The development of this learning module was limited by the use of PowerPoint slides. While 100% of learners agreed or strongly agreed that the module format was appropriate for their learning needs, 67% agreed or strongly agreed that the format of this learning activity would be more effective with audio narration. This provides guidance and a rationale for the possibility of converting this module into an audiovisual format in the future.

### Keywords

Pediatrics, Newborn Care, Newborn Medications, Vitamin K, Erythromycin Ointment, Vitamin D, Hepatitis B Vaccination

### Appendices

- A. Newborn Medications.pptx
- B. Presenter View Instructions.docx
- C. Pretest.docx
- D. Pretest With Answer Key.docx
- E. Posttest.docx

- F. Posttest With Answer Key.docx
- G. Module Evaluation.doc

*All appendices are considered an integral part of the peer-reviewed MedEdPORTAL publication. Please visit [www.mededportal.org/publication/10568](http://www.mededportal.org/publication/10568) to download these files.*

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*Disclosures: None to Report.*

*IRB/Human Subjects: This publication does not contain data obtained from human subjects research.*

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**Submitted: November 7, 2016; Accepted: March 21, 2017**