THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Pilot High-Fidelity Simulation for Pediatric Rheumatology Learners

Anna D. Dickson[3], Livie Timmerman Blackmon [1], Nick Rockwell [2], Chrystal Rutledge [2], Nancy Tofil [2], John M. Bridges [1]

[1]Division of Pediatric Rheumatology, [2] Division of Pediatric Intensive Care, [3]Department of Pediatrics
University of Alabama at Birmingham. Birmingham, AL

Children's of Alabama

Background

- ACGME core competencies for pediatric residency training include medical knowledge, patient care, and interpersonal communication skills.
- Pediatric rheumatology is not a required rotation for residents, so exposure is limited and varied.
- Pediatric rheumatology attendings identified key rare disease states unlikely to be clinically encountered during a short resident rotation.

Objectives

We designed a simulation module to expose pediatric learners to rare rheumatologic diseases with clinically distinct, recognizable presentation patterns.

1) Recognize juvenile dermatomyositis (JDM)
2) Recognize macrophage activation syndrome (MAS)
3) Gain confidence in communicating a consult to rheumatology.

Setting

Where? Pediatric Simulation Center at COA
Who? Final year medical students and residents participating in their pediatric rheumatology clinical rotation

Description

- Collaborated on creation of modules and piloted with the Simulation Center.
- Crafted a narrative for both JDM and MAS, with associated physical exam findings, vitals changes, and lab trends for learners to access
- Created scripts for associated actors
- Participants completed a pre- and post-test and participated in a debrief led by a Pediatric Rheumatologist

Table 1: Pre- and Post-Simulation Multiple Choice Scores by Topic

Topic	Pre-Simulation, N=25 *Mean (SD)*	Post-Simulation, N=16 *Mean (SD)*	*p*-value
Juvenile Dermatomyositis	65.3 (29.1)	84.4 (23.9)	<0.05
Macrophage Activation Syndrome	50 (50.8)	68.8 (47.9)	0.12
One sided t-test, assuming equal variance			

Table 2: Pre- and Post-Simulation Confidence Ratings by Topic

Confidence Categories	Pre-Simulation, N=25 *Mean (SD)*	Post-Simulation, N=16 *Mean (SD)*	*p*-value
Diagnostic suspicion of JDM	2.78 (1.07)	3.8 (0.74)	<0.005
Diagnostic suspicion of MAS	2.88 (1.28)	3.9 (0.83)	<0.005
Subspecialist Consultation	3.45 (0.87)	4.3 (0.48)	<0.005
All (100%) post-simulation survey respondents found the simulation module to be a helpful learning activity for the rotation			

Image 1: Simulation Mannequin Displaying Petechial Rash

Take Home Point

In light of pediatric rheumatology workforce challenges and large numbers of unnecessary referrals, simulation offers a promising method to increase access to pediatric rheumatology learning during medical school and residency training.

Evaluation

- Pre- and Post-module assessments distributed in multiple choice format
- Data analysis via descriptive statistics and one-sided t-tests assuming equal variance
- Learner confidence in diagnostic recognition and in subspecialist consultation was measured using a 5-point Likert scale.
- 100% of learners surveyed reported that the simulation module was a helpful learning activity for the rotation.

Lessons Learned

High-fidelity simulation in pediatric rheumatology is a promising educational method.

This module demonstrates knowledge retention and increased learner confidence in important core competencies.

Outlook

The long-term goal of this work is to design additional sessions into a modular curriculum for utilization by any training program with access to a simulation center.

This educational method has the potential to lead to improvements in disease recognition and timely referrals to a pediatric rheumatologist with the tools to alter the trajectory of the patient's disease process.

References

1. Tofil NM, Benner KW, Worthington MA, Zinkan L, White ML. Use of simulation to enhance learning in a pediatric elective. American journal of pharmaceutical education. 03/10/2010 2010;74(2).
2. Correll CK, Klein-Gitelman MS, Henrickson M, et al. Child Health Needs and the Pediatric Rheumatology Workforce: 2020-2040. Pediatrics. 02/01/2024 2024;153(Suppl 2).
3. Reiff DD, Bridges JM, Rife EC, et al. Majority of new patient referrals to a large pediatric rheumatology center result in non-rheumatic diagnosis. Pediatric rheumatology online journal. 10/13/2023 2023;21(1).

Author Contact

John M. Bridges, MD, MS
jmbridges@uabmc.edu