

Instructional Video Training for Point-of-Care Ultrasound of Pediatric Hip Effusion: A Pilot Study

Taichi Itoh, Robert Hagbom, Loren Yamamoto. Hawaii Residency Programs, Honolulu HI

METHODS

The study enrolled 12 participants (2 fourth-year medical students, 2 first-year pediatric residents, 2 second-year pediatric residents, 2 third-year pediatric residents, 2 pediatric hospitalists, and 2 pediatric EM physicians) who were randomized to IPT group or IVT group within each training level. IPT group participants attended a 20-minute lecture, discussion, and hands-on POCUS examination training on a model volunteer using a portable ultrasound machine. The participants interacted with instructors (trained for 1-hour by the radiology department) throughout the session.

A skill assessment after the session included the basic operation of the ultrasound machine, identification of anatomical and sonographic landmarks, identification of the joint capsule, and measuring the distance from the cortical layer of femoral neck to the joint capsule bilaterally in a different patient volunteer. Each participant's skill was classified as poor, good, or expert and time spent for the training session was recorded.

For the IVT group, each participant was provided with the same hand-held portable ultrasound machine used in the IPT and an instructional video similar to in-person training for a maximum of 5 days. An identical skill assessment was performed within the 5-day training period. Participants logged the amount of time spent for the training in minutes. During the video training period, no instructor help was provided. This study protocol was approved by the Western IRB and performed from October 2015 to May 2016.

GRANTS

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INTRODUCTION

Point-of-care ultrasound is a useful diagnostic and procedural adjunct to clinical findings in real-time. Pediatric ED physicians and subspecialists have expanded its use and POCUS education has increased accordingly; however, POCUS training continues to vary significantly due to multiple factors, including lack of training time and training personnel.¹

Instructional-video training is a novel method of POCUS training that utilizes the advancing technology of portable ultrasound machine and digital video. We sought to investigate an effective, time-efficient method of POCUS training for pediatric hip effusion assessment, comparing traditional in-person training (IPT) versus instructional-video training (IVT).

RESULTS

	n	Prior POCUS training	Training Time (minutes)	% Expert after training
In-Person Training	6	3/6	75 & 80min	100%
Instructional Video Training	6	4/6	30-120 min (avg 71 min)	100%



REFERENCES

1. Marin JR, Zuckerbraun NS, Kahn JM. Use of emergency ultrasound in United States pediatric emergency medicine fellowship programs in 2011. *Journal of Ultrasound Medicine*. 2012;31(9):1357-1363.
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DISCUSSION

To the best of our knowledge, this study is one of the first training trials to compare the traditional IPT method with an IVT coupled with a hand-held portable ultrasound machine with respect to their effectiveness and the time-efficiency for hip effusion POCUS assessment.

In this study, all participants achieved an expert level for performing POCUS hip effusion assessment, suggesting that the both methods of training have similar efficacy.

Total amount of training time spent by both training groups was similar, suggesting that the time-efficiency of each training method was equivalent. However, the IPT took place during the normal business hours and trainees were excused from their clinical duties, while IVT was flexible to trainees' schedules without interfering with clinical responsibilities. The American College of Emergency Physicians (ACEP) states² that an 8- to 16-hour course with education and hands-on experience is a standard foundation for introductory ultrasound training. Still, for most peds EM trainees, one of the most common barriers to learning POCUS was "a lack of time".¹ The instructional-video training with a portable ultrasound machine has the potential to address this time constraint.



We also noticed that the IPT method of POCUS was more resource-intensive while the IVT group required only the instructional video and the portable ultrasound machine. IVT achieved the same level of training proficiency with reduced resources; hand-held portable ultrasound machine and video can be played repetitively as needed, which becomes more efficient for large numbers of trainees and programs that lack training personnel.

A limitation of this study is the applicability of the IVT method to other POCUS examinations, particularly more anatomically complex organs, in which case IVT should be combined with other methods of training. Another limitation is the number of participants in this study, and these results warrant further investigation with a larger sample size.