# Impact of a Simulator-Based Focused Transthoracic Echocardiography Training Course: videos for self-directed learning

critical care canada FORUM

UNIVERSITY OF TORONTO

Interdepartmental Division of Critical Care Medicine

## INTRODUCTION

The use of focused transthoracic echocardiography (FOTE) for the bedside assessment, diagnosis, and management of critically ill patients has significantly increased in the last decade. The greatest barrier to effective FOTE training is the limited availability of practical training opportunities. To overcome this limitation, simulation has been used for FOTE teaching and self-learning videos have become increasingly available.

## OBJECTIVES

We aim to assess the impact of incorporating self-learning videos into a FOTE training course that utilizes a high-fidelity echocardiography simulator for first and second-year Core Internal Medicine residents at the University of Toronto (UofT).

We hypothesize that the use of self-directed learning videos would be more effective than simulator-based training alone for FOTE training.

## METHOD

- Prospective, randomized study
- 1st and 2nd year Core Internal Medicine residents with no formal echocardiographic training
  - Randomized in 1:1 ratio
- Pre-test
  - Written test
  - Scanning abilities
  - Comfort level
- All received 2 hour in-person training by an NBE certified intensivist
  - Didactic lecture
  - Review of clinical cases
  - Hands-on session with simulator
- Post test: after 1 month


## AUTHORS

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## RESULTS

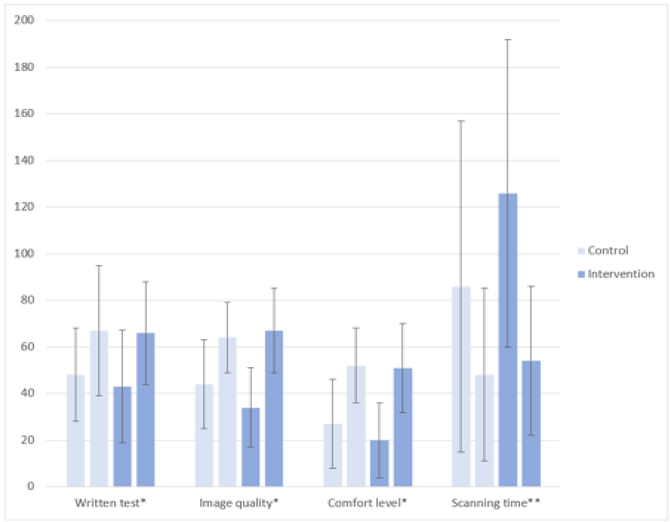
- 28 participants, 21 participants completed post-test (75%)
- Improvement in all the components evaluated in both groups, except control group's written test (p= 0.07).
- No significant difference in improvement between the groups in all components
- Significantly greater reduction in scanning time in the intervention group (72 vs 38s, p= 0.02)
- The average time spent reviewing videos was 1.1 + 0.7 hours

Table 1: Participant baseline characteristics and pre-course test scores

| Characteristic | Group | |
|---|---|---|
| | Control (N=10) | Intervention (N=11) |
| *Residency year* | | |
| *First* | 9 (90) | 6 (56) |
| *Second* | 1 (10) | 5 (44) |
| *Prior scanning experience* | 3 (27) | 3 (31) |
| *Number of previous scans* | 0 (0 – 1.5) | 0 (0 – 0) |
| *Written test** | 48 ± 20 | 43 ± 24 |
| *Image quality** | 44 ± 19 | 34 ± 17 |
| *Scanning time, seconds* | 86 ± 71 | 126 ± 66 |
| *Comfort level** | 27 ± 19 | 20 ± 16 |

Note: data are expressed in number (percentage), mean ± standard deviation, or median (IQR), *percentage grade

Figure 1: Comparison of pre- and post-course test scores for each group




*score in percentage, ** time in seconds

## CONCLUSION

Simulator-based FOTE training effectively increases theoretical knowledge, practical skills in a simulated setting, and scanning comfort of first and second-year Core Internal Medicine trainees.

The addition of limited exposure to self-learning videos did not show further significant improvements.


## ACKNOWLEDGEMENTS

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## REFERENCES


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5. Vignon P, Pegot B, Dalmay F, Jean-Michel V, Bocher S, L'Her E, et al. Acceleration of the learning curve for mastering basic critical care echocardiography using computerized simulation. Intensive Care Med. 2018;44(7):1097-105.

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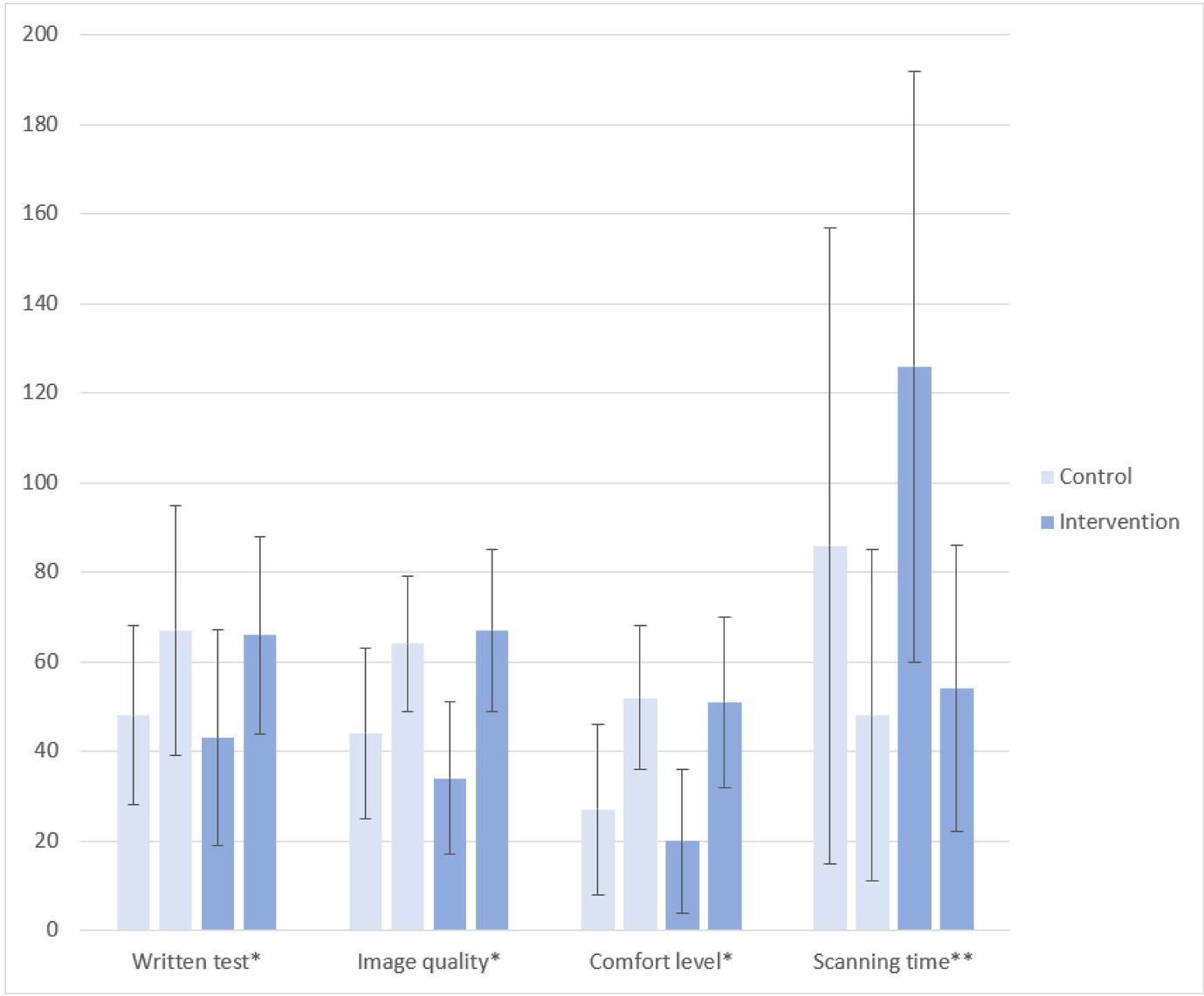


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