

A Peer-Reviewed Instructional Video is as Effective as a Standard Recorded Didactic Lecture in Medical Trainees Performing Chest Tube Insertion: A Randomized Control Trial

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Description of the Innovation

In this study, we aimed to show that video-based teaching for procedural skill acquisition would be at least as good as the standard didactic method of teaching procedures. As technology becomes more prevalent in education and the format by which we learn and utilize knowledge changes¹, we hoped to lend evidence that video-based teaching could be used in lieu of didactic teaching without compromising knowledge acquisition and procedural performance.

Video-based teaching has been shown to be at least, if not more effective than didactic teaching²⁻⁵. Presenting a combination of visual and auditory material has been shown to be superior to didactic teaching and improves knowledge retention as multiple senses are engaged through this approach⁶. Videos also minimize extraneous loads of information by framing the instruction into clearly defined segments.⁷ Segmented videos allow students to have control over the sequence of their learning as they engage with the material at their own pace and re-watch different segments⁸. This approach is supported by the discovery theory (learning by inquiry) and Cook's connectivism theory (learning by interaction)⁷.

To test our hypothesis, we designed an RCT that assessed medical student knowledge acquisition and technical dexterities required for chest tube insertion. The educational session was randomized to either a peer-reviewed video-based module on chest tube insertion published under the Videos in Clinical Medicine with the New England Journal of Medicine (NEJM) or a video recording of a standard didactic session similar to the method by which Advanced Trauma Life Support (ATLS) courses are taught. Participants (30) were graduating medical students at the University of Western Ontario.

For the study, participants were asked to complete a questionnaire which asked for the indications, contraindications, materials required, and complications from chest tube insertion. They were then randomized to watch either the NEJM or ATLS video and then repeated the questionnaire. Following this, they each completed an objective structured clinical examination (OSCE) station with a cadaver, where they were filmed and assessed on their technical skills for chest tube insertion. The checklist used for assessment was adapted from a chest tube insertion OSCE station used by the University of Toronto for the technical skill evaluation of first year residents and reviewed by several physicians experienced in both teaching and performing chest tube insertion.

The results of our study showed that graduating medical students could learn the procedural skill as effectively with an online peer-reviewed NEJM video module as by watching a didactic lecture. We also showed that the knowledge required to perform the procedure was improved in the NEJM group. This has the potential to free up many teaching resources that are required to run recurrent, in-person, didactic sessions. Further, the ability to standardize sessions and ensure their quality through peer-review is a significant advantage to the potential teaching variability that exists within didactic modalities.

Obviously this modality of teaching has significant upfront resources required to establish a program; however, once this start-up work is accomplished, videos can be stored and easily utilized for planned teaching sessions or 'just-in-time' clinical teaching.

BOTTOM LINE:

In this study, we showed that modular video teaching was as effective as video-recorded didactic teaching for the knowledge and technical skills required for chest tube insertion with high user satisfaction. The utility of peer-reviewed standardized video teaching modules could free up significant teaching resources and improve teaching on various topics.

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