

Title:

The Use of a Simulation Center to Improve Resident Proficiency in Performing Ultrasound-Guided Procedures.

Authors:

Mishal Mendiratta-Lala MD, Nishant de Quadros MD, Todd Williams MD, John Bonnett MD

Contact Information:

Mishal Mendiratta-Lala MD
mishal_lala@yahoo.com
6675 Tamerlane Dr.
West Bloomfield Mi. 48322
248-259-8819

Institution:

Henry Ford Hospital, Department of Radiology
2799 West Grand Blvd, MI 48202

Purpose:

With advancements in technology and push for health care reform and reduced costs, procedures have become an essential part of radiology. In particular, ultrasound-guided procedures are utilized in nearly all divisions of radiology. However, accurate and safe procedure performance requires technical skills as well as confidence. Residents demonstrate an initial lack of manual dexterity and confidence when learning to perform US guided procedures. By incorporating standardized training methodologies in a risk free environment through utilization of a simulation center with phantom training for these procedures, we hope to improve proficiency, confidence, efficiency and ultimately patient safety.

Methods:

We enrolled 29 radiology residents from all four levels of training to participate in this prospective study. The residents were given written, video, and live interactive training from two body interventional staff on the basics of ultrasound guided procedures. Residents were given six months to practice these skills in our simulation center on a phantom mannequin that contained both hypo- and hyperechoic nodules. Written and practical examinations were performed before and after training to assess for changes in resident competency/proficiency. At the end of the course, the participants completed a 5 question survey to evaluate utility of the training. The simulation model incorporated four of the six ACGME core competencies. All of the teaching materials were created by residents and staff radiologists at the institution.

Results:

Residents demonstrated statistically significant improvement ($p < 0.05$) between their pre- and posttest scores on both the written and practical examinations.

They also showed improved dexterity in the technical aspects of ultrasound guided procedures ($p = 0.07$) before and after training. On the survey questionnaire, residents attested that this course improved their knowledge level and technical ability pertaining to ultrasound guided procedures. Furthermore their confidence levels for performing these biopsies improved dramatically.

Conclusions:

The use of a controlled simulation based training course can be an invaluable tool to improve the knowledge level, dexterity, and confidence of residents performing ultrasound guided procedures. Resident's can improve their knowledge base and procedural skills without compromising patient care and safety. Additionally, a simulation model allows standardization of education. As a result we have expanded this course to include phantom training for CT guided interventional procedures, including angled gantry technique. Ultimately, this additional simulation training translates to improved patient care and safety, as well as patient satisfaction, decreased risk of complications, decreased procedural time, and the ability to improvise in difficult or unexpected situations.