Introduction: The American Board of Internal Medicine requires knowledge of indications, contraindications, complications, and interpretation of thoracentesis for certification in internal medicine and strongly recommends that initial training be simulated. The Internal Medicine Residency Program at UNC-Chapel Hill does not have standardized and formalized thoracentesis training. The purpose of this study was to design a thoracentesis curriculum that meets the ABIM knowledge requirement. The secondary goals were to increase trainee comfort with performing thoracentesis and for trainees to learn thoracentesis on a simulator prior to performing a thoracentesis on a patient.

Methods: Subjects included all interns in the Internal Medicine and Internal Medicine/Pediatrics residency programs at UNC Chapel Hill. Each training session was conducted one-on-one with an intern and trained instructor. Prior to the session, the intern completed a pre-intervention assessment of comfort, prior experience, and knowledge with thoracentesis and viewed the New England Journal of Medicine instructional video on thoracentesis. The subject and instructor then reviewed indications, contraindications, and complications of the procedure. The subject was then trained on obtaining and optimizing the ultrasound image, identification of anatomical structures, familiarization of the thoracentesis kit, and performing a complete thoracentesis on the simulator. After the session, the subject completed a post-intervention assessment of comfort and knowledge for comparison. A comparison of pre-intervention and post-intervention data was analyzed using a two-tailed t-test.

Results: Fifteen interns participated in the training session to date. Data of one participant was excluded because post-intervention assessments were incomplete. We compared pre-intervention and post-intervention knowledge scores and competency scores using a two-tailed t-test (n=14). Pre-intervention and post-intervention knowledge scores were evaluated with a maximum knowledge score of 15. The mean pre-intervention knowledge score was 8.21 (95% CI 7.05-9.38). The mean post-intervention knowledge score was 14 (95% CI 13.46-14.54) with a mean difference in score of 5.79 (95% CI 4.76-6.82). A Likert scale (1 = very uncomfortable, 5 = very comfortable) was used to assess trainee comfort. Subjects were more comfortable performing a thoracentesis (pre-intervention 1.57, 95% CI 1.17-1.97 versus post-intervention 3.71, 95% CI 3.28-4.14), operating an ultrasound machine (pre-intervention 2.36, 95% CI 2.03-2.69 versus post-intervention 3.79, 95% CI 3.56-4.00), and interpreting thoracentesis ultrasound findings (pre-intervention 1.92, 95% CI 1.50-2.36 versus post-intervention 3.57, 95% CI 3.12-4.02) after the training session. This was the first thoracentesis for 13 of the 14 subjects (93%).

Conclusion: Our curriculum improved both the knowledge and comfort of performing thoracentesis. We also found that the majority of interns performed their first thoracentesis on a simulator, as recommended by the ABIM. Further studies will be conducted to evaluate the impact of this intervention on clinical outcomes.