Implementation of Fellows EBUS Workshop Improves Procedural Knowledge

Melissa New1,2, Matthew Rustici3, Anna Neumeier1,4, Tristan Huie1,5
1 University of Colorado, Division of Pulmonary Sciences & Critical Care Medicine; 2 Rocky Mountain Regional VA Medical Center; 3 Denver Health Medical Center; 4 Denver Health Pulmonary and Critical Care Medicine; 5 National Jewish Health;

BACKGROUND
Bronchoscopy is a skill learned by pulmonologists during the course of their fellowship training. Endobronchial ultrasound (EBUS), which is performed to visualize airway-adjacent lesions or lymph nodes in the hilum and mediastinum, is a skill that is frequently utilized by pulmonologists and increasingly standard of care for diagnosing patients with certain conditions, including lung cancer and sarcoidosis.

A needs assessment of bronchoscopy education for our Pulmonary and Critical Care fellowship program revealed that EBUS is a skill that most fellows wanted to learn and be able to perform independently, but most fellows felt they were not receiving sufficient training to accomplish this goal. Bronchoscopy education in our program has traditionally used an apprenticeship model of instruction, however when a validated objective assessment tool, the EBUS-STAT, was used to evaluate our upper-level fellows, this confirmed that fellows are not adequately trained to perform EBUS independently.1 Simulation has been shown to improve procedural education, including for EBUS, and is now a recommended approach.2-4 We endeavored to create a workshop to teach fellows necessary skills to be able to perform EBUS.

GOALS & OBJECTIVES
Goal: Teach pulmonary fellows to perform endobronchial ultrasound, including performing EBUS for lung cancer staging.

Objective 1: Determine the cognitive and procedural skills required to perform EBUS.

Objective 2: Develop materials to teach the cognitive and procedural skills for EBUS to be delivered in a workshop teaching session.

Objective 3: Evaluate outcomes of the EBUS workshop, including fellows’ knowledge and confidence regarding performing EBUS.

Objective 4: Assess retention of knowledge and skills with objective measurements at a remote time following the workshop.

MATERIALS & METHODS
We developed a half-day EBUS training workshop to teach the cognitive and procedural skills needed to perform EBUS for lung cancer staging. The procedural skills that were taught were: (1) driving the EBUS scope; (2) performing transbronchial needle aspiration (TBNA). The cognitive skills taught included: (1) lymph node station anatomy including anatomic borders; (2) approach to a lung cancer staging procedure and staging results; (3) radiographic identification of lymph node stations by CT scan interpretation; (4) interpretation of ultrasonographic views obtained by EBUS.

To teach these skills, the workshop included multiple learning stations: (1) hands-on transbronchial needle aspiration (TBNA) instruction and practice; (2) interactive lung cancer staging cases using a schematic map; (3) use of a virtual reality EBUS simulator to practice EBUS scope driving and ultrasonographic image identification; (4) CT lymph node station image identification with anatomy review. Pre- and post-assessments of self-assessed knowledge and confidence of components of an EBUS procedure, including anatomical knowledge and procedural comfort, were collected using a 4-point Likert scale. Learners were also asked about the usefulness of all portions of the session.

RESULTS
Prior to attending the session, fewer learners agreed/strongly agreed with all self-assessment questions of knowledge and confidence in EBUS procedures. Upon completion of the session, self-assessments demonstrated that fellows uniformly agreed that they knew how to identify relevant anatomic structures (90-100%), could identify lymph node stations on CT and EBUS imaging (100%), knew how to perform TBNA (95%), and were confident in staging a patient for lung cancer (85%). Fellows agreed that all components of the workshop were useful and should be included in future sessions.

CONCLUSIONS
We found that the apprenticeship approach to EBUS training has been inadequate for teaching this skill in our program. The implementation of an EBUS workshop significantly improved fellows’ self-assessed knowledge and confidence in performing EBUS procedures. Additional objective assessments and entrustment evaluations are now being performed to assess knowledge and skill retention following the implementation of this workshop. Future areas of focus will include more interactive learning for mediastinal anatomy and lung cancer staging.

REFERENCES

ACKNOWLEDGEMENTS & CONTACT
This work was funded by the University of Colorado Department of Medicine Program for Academic Clinician Educators (PACE) Scholarship. Thank you to the VA for support of this work, and to the University of Colorado Pulmonary and Critical Care Fellows for their participation. Please contact Melissa New at MELISSA.NEW@CUANSCHUTZ.EDU regarding this study.

Table 1. Pre/post knowledge and confidence self-assessment responses, percentage of fellows selecting “agree” or “strongly agree” on a 4-point Likert scale.

Table 2. Fellow assessment on the usefulness of each part of the EBUS workshop, fellows selecting “agree” or “strongly agree” on a 4-point Likert scale.