Can We "Up Our Game" in Bronchoscopy Procedural Training?

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In this issue of *ATS Scholar*, Mallow and colleagues (1) report the results of a novel study evaluating the use of video games to improve bronchoscopy skills of novice learners. Limitations on pulmonary trainee time and access to procedures reduce opportunities to acquire the necessary bronchoscopy skills. Bronchoscopy simulators provide fewer impediments, creating a safe, low-stakes, more easily accessible environment for learners. However, universal accessibility to simulation training for bronchoscopy can be limited by the expense of equipment, accessibility of the simulation laboratory, and time constraints due to clinical responsibilities. In theory, the use of video games to improve bronchoscopy skills could provide a new level of freedom for learners because they can practice in the comfort of their own homes on their own time.

Simulator training has been found to be superior to no simulator training across many medical specialties (2). This has been confirmed in bronchoscopy with studies demonstrating that bronchoscopy simulator training is superior to traditional apprenticeship training when comparing novice trainee performance on patients (3). Colt and colleagues demonstrated that a short, focused course of instruction followed by simulator time enables novice trainees to perform at a technical skill level similar to that of colleagues with several years of experience (4).

In this study, all subjects underwent a half-day standardized course on introduction to bronchoscopy modeled after the essential bronchoscopist curriculum (5) and completed the institutional introduction to bronchoscopy curriculum designed for first-year pulmonary fellows. This included didactic teaching on basic airway anatomy coupled with hands-on training in basic bronchoscopy skills using both low- and high-fidelity bronchoscopy simulators. They were evaluated on the same day via the Bronchoscopy Skills and Tasks Assessment Tool (BSTAT) (5), a collection of research-validated measurements designed to measure technical and interpretive bronchoscopy skills. BSTAT evaluates posture and hand positioning, the ability to maneuver the scope in the airways and to identify anatomy, and the ability to enter all bronchial segments and perform basic skills such as forceps biopsy and brushing. Subjects also underwent a baseline visuospatial assessment. They were then randomized 1:1 to either a control condition or to play video games 2.5 hours every week over the next 8 weeks. All subjects returned at 4 weeks for an

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anatomy review and hands-on practice using the bronchoscopy simulator. Subjects returned 4 weeks later to complete the final assessment.

At baseline, the intervention group, video gamers, defined as individuals with baseline video game skills, had less airway collisions than non–video gamers (control group) ($P = 0.01$). Video gamers had significantly higher spatial awareness scores, but there was no significant difference in time on the simulator, and BSTAT scores were similar. The video game intervention did not measurably add to simulation-based education in improving performance of basic bronchoscopy and related tasks. Notably, 44% of the intervention group were baseline video gamers, and only 7% of the control subjects were baseline video gamers, so it is possible that 2.5 hours per intervention with already seasoned video gamers is not enough time to see an improvement.

This study enrolled a broad range of students, which is a strength because the authors have not preselected students for procedural skills. The study confirms that simulation in relatively brief sessions is effective at improving skills, but this video game intervention was not additive to the simulator experience. It is known that a relatively short amount of simulator practice will lead to improved bronchoscopy performance of complete novices (6). It is less clear how much training is needed throughout fellowship, and this will vary per trainee. Wahidi and colleagues showed large variability in bronchoscopy performance at the 50th procedure between learners' skill levels, and this variability was also seen in simulator-trained cohorts (7). Simulation training in the form of a video game, accessible at home, may allow trainees to practice until reaching an established level of competency (8) for basic skills before moving to the patient bedside.

Skills can be mastered via low- and high-fidelity training, but no specific recipe exists as a one-size-fits-all approach for each learner. The move toward competency-based learning represents the need for flexibility in numbers required for each individual to master the skill. The use of video game types of simulation-based learning to enhance bronchoscopy training has not been studied before. Although a benefit was not found in this small study with a relatively modest intervention of 2.5 h/wk, the study sets the stage for further investigation. Perhaps what is needed is the creation of a video game with bronchial airway anatomy and a controller to mimic a bronchoscope. This would allow learners the additional option of having their own bronchoscopy simulator at home to achieve competency in basic maneuvers and learn airway anatomy. Improved skills before patient contact has the potential to reduce procedural time and reduce airway wall trauma. The ongoing balance in procedural training is to ensure patient safety while allowing learners to develop mastery of skills. Simulation is useful, but in its traditional form, it is still not as readily available to an individual learner as much as may be necessary. Perhaps it is time to think outside the simulator box!

Author disclosures are available with the text of this article at www.atsjournals.org.

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