Quantified Surgical Training by Simulation for Ankle Fracture Care: Using Proficiency-Based Progression

P. Guy, MD; *Matt L. Graves, MD; Kevin Inkpen, MSc; Michael R. Baumgaertner; Anthony G. Gallagher, PhD*
University of British Columbia, Vancouver, British Columbia, CANADA

Purpose: Traditional assessment of surgical teaching occurs without validated metrics. The Proficiency-Based Progression training model (PBP) suggests a process where discrete error-recognizing (binomial) items are used to develop a score sheet. Learners are then trained to proficiency (using the items) before their performance of a task is evaluated. We compared the performance of residents who were randomly assigned 1 of 3 different types of learning approaches: video training alone (V), video plus practice on their own (P), and video plus practice to proficiency by a coach (PBP) prior to evaluation of tasks.

Methods: Junior residents attending an AO Basic Course randomly received 1 of 3 forms of teaching: V, P, or PBP. Following completion of their "teaching" they were asked to complete surgical tasks at 4 Sawbones skills stations and 1 fibular fixation station. Performances were recorded by digital video and scored live or at a later time by video by 2 independent assessors using the score sheet (IRR range = 0.7-0.75).

Results: 38 novice (N) residents and 20 experienced (E) faculty members participated. For ankle fixation station: there was a statistically significant difference in procedure time to completion between the E and N groups. The N group additionally showed a progressive decrease in time as practice intensified with PBP results nearly approximating the E groups. There were similar findings for error counts (Fig. 1).

Conclusion: This work demonstrates improved performance as the level of resident engagement intensifies, with the best results appearing in the PBP group. The present findings support moving to that model for teaching ankle fracture fixation.