

Skill Retention After Simulation-based Education

Arthrocentesis is a safe and effective procedure used by internists for both diagnosis and therapy of musculoskeletal problems. We commend Preisner et al for their recent publication regarding long-term retention of knee and shoulder aspiration and injection skills in internal medicine residents.¹ Retention of skills after educational interventions (including simulation) is rarely studied and worthy of further investigation. In their study, postgraduate year-1 residents completed joint aspiration and injection simulation-based training and a posttest. Six to 30 months later, residents were randomly assigned to receive web-based review of the material and skills testing or skills testing alone. Aspiration and injection procedural skills declined in both groups, although communication skills were maintained among residents who received the web-based review.

We agree with the authors that likely the reasons skills were not retained are that (1) the video review did not include procedural skills and (2) residents had limited opportunity to perform the procedure in the period between the intervention and retention testing. Thus, we believe that a major contributor to the finding may be the lack of skill mastery at the initial posttest. No minimum performance standard was required, and the presence of significant variance in performance at posttest shows that all residents did not acquire the same level of skill during simulation training.

We believe the findings of this study would be different if the authors employed a mastery learning model. Mastery learning, a strict form of competency-based education, is characterized by uniform education outcomes while the time for each learner to achieve the predetermined standard varies.² Deliberate practice of clinical skills, under supervision of an engaged instructor, is a key component of the

mastery model.³ Mastery learning is also characterized by small skill variation at posttest as all learners have achieved very high skill levels. Using this approach, we have shown that simulation-based mastery learning yields procedural skills that are resistant to decay in techniques such as central venous catheter insertion.⁴ Combining deliberate practice and mastery learning has also been shown to lead to skill transfer from the simulation laboratory to the bedside to improve patient care quality.⁵

In summary, the work of Preisner is important to medical educators. Arthrocentesis is a safe, and inexpensive procedure that benefits patients. We suggest that it is critical to fully acquire skills before studying retention and hope that the investigators will consider this approach in future work.

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