

Simulation-based mastery learning using a substantial asynchronous component is an effective way for senior medical students to learn and retain EM clinical skills” Reed et al (2016).

Abstract:

INTRODUCTION: Simulation-based mastery learning (SBML) improves procedural skills among medical trainees. We employed an SBML method that includes an asynchronous knowledge acquisition portion and a hands-on skill acquisition portion with simulation to assess senior medical student performance and retention of the following 6 core clinical skills: (a) ultrasound-guided peripheral intravenous placement, (b) basic skin laceration repair, (c) chest compressions, (d) bag-valve mask ventilation, (e) defibrillator management, and (f) code leadership.

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METHODS: Seven emergency medicine (EM) faculty members developed curricula, created checklists, and set minimum passing standards (MPSs) to test mastery of the 6 skills. One hundred thirty-five students on an EM clerkship were pretested on all 6 skills, viewed online videos asynchronously followed by a multiple choice computer-based skill-related quiz, received one-on-one hands-on skill training using deliberate practice with feedback, and were posttested until MPS was met. We compared pretest and posttest performance. We also retested, unannounced, a convenience sample (36%) of students from 1 to 9 months postintervention to assess skill retention.

RESULTS: All students passed each quiz. The percentage of students who reached each MPS increased significantly ($P < 0.001$) from pretest to posttest for all 6 clinical skills. Ninety-eight percent of the students scored at or above the MPS when retested 1 to 9 months later. There was no significant decrease in mean score for any of the 6 skills between posttest and retention testing.

CONCLUSIONS: Simulation-based mastery learning using a substantial asynchronous



component is an effective way for senior medical students to learn and retain EM clinical skills. This method can be adapted to other skill training necessary for residency readiness.

Reference:

Reed, T., Pirotte, M., McHugh, M., Oh, L., Lovett, S., Hoyt, A.E., Quinones, D., Adams, W., Gruener, G. and McGaghie, W.C. (2016) Simulation-Based Mastery Learning Improves Medical Student Performance and Retention of Core Clinical Skills. *Simulation in Healthcare*. April 18th. .

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