

**Title:** A Directed Core EPA 10 Curriculum of Standardized Simulation Cases and Asynchronous Instructional Videos Improves Medical Student Performance in Core EPA 10 Competencies and Entrustment Scores

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**Abstract:**

**Objectives:**

The goal of this study was to develop and evaluate a standardized curriculum and assessment tool for Core Entrustable Professional Activity (EPA) 10 competencies and entrustment scoring in a cohort of medical students in their emergency medicine (EM) clerkship.

**Methods:**

This is a prospective, pretest-posttest study of medical students during their emergency medicine (EM) clerkship. Using the Thomas and Kern curriculum framework, we created a curriculum of simulation cases on chest pain/cardiac arrest and respiratory distress, novel assessment checklists of critical action items, and instructional videos on recognizing and managing emergencies. Students were individually pretested on EPA 10 competencies using the simulation cases. Two reviewers scored students using standardized checklists of critical actions. Students then watched the instructional videos, underwent a posttest with the simulation cases, and were scored by the raters using the checklists. Differences between pretest and post-test scores were analyzed using paired t-tests and Wilcoxon signed-rank tests.

**Results:**

73 out of 85 students completed the curriculum. Mean scores from pretest to final post-test in the chest pain/cardiac arrest and respiratory distress cases significantly improved from 14.8/19 (SD 1.91), to 17.1/19 (SD =1.00),  $t(68) = 10.56$ ,  $p < .001$  and 8.5/13 (SD 1.79), to 11.1/13 (SD 0.89),  $t(67) = 11.15$ ,  $p < .001$ , respectively. The kappa coefficients were 0.909 ( $n=2698$ ,  $p < 0.001$ ) and 0.931 ( $n=1872$ ,  $p < 0.001$ ), respectively. Median modified Chen entrustment scores improved from 1b (e.g., “Watch me do this”) to 2b (e.g., “I’ll watch you”) for the chest pain/cardiac arrest case ( $p < 0.001$ ) and 1b/2a (e.g., “Watch me do this”/ “Let’s do this together”) to 3a (e.g. “You go ahead, and I’ll double-check all of your findings” for the respiratory distress case ( $p < 0.001$ ).

**Conclusion:** A new directed curriculum of standardized simulation cases and asynchronous instructional videos improved medical student performance in EPA 10 competencies and entrustment scores. This study provides a curricular framework for formative assessments for making entrustment decisions.

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