

## Deliberate Practice for Development of Expertise in Basic Cardiopulmonary Resuscitation Skills

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**Background:** Simulation has been shown to be effective for teaching resuscitation skills, though optimal techniques for maximizing learner performance have not been defined. Expert opinion suggests that deliberate practice is a key feature of effective simulation, though the best way to implement deliberate practice in this setting has not been described.

**Objective:** To compare the resuscitation performance of students trained using traditional simulation techniques to those trained using a deliberate practice paradigm.

**Methods:** Both control and intervention groups consisted of 120 BLS-certified second year medical students participating in a one-hour simulation-based session focused on quality CPR and defibrillation. The control session consisted of a high-fidelity cardiac arrest scenario followed by a traditional debriefing using the “good judgment” model, after which the scenario was repeated and debriefed again. The DP session was conducted using a deliberate practice technique, in which students completed the arrest scenario followed by a short debriefing and didactic, after which they repeated the scenario several times until they were able to do it perfectly, rotating team roles each time. Each participant was then individually assessed in a different high-fidelity cardiac arrest scenario, and performance was graded using a standardized checklist focused on completion and timing of key interventions. Performance was compared between groups using chi-square analysis.

**Results:** Students in the DP group were more likely to call for help promptly (77% within one minute, vs. 55% of controls,  $p=0.0013$ ). DP students were also more likely to initiate CPR rapidly (75% within one minute, vs. 58% of controls,  $p=0.0115$ ). There was no difference in defibrillation times between groups (47% vs 40% within 3 minutes,  $p=0.287$ ). Student satisfaction was comparable in both groups, with the session rated as “very useful” by 98% of control students and 96% of DP students.

**Conclusions:** Incorporating a deliberate practice paradigm into simulation-based training was successful at improving the timeliness of some key resuscitation interventions, though this brief intervention did not enable learners to achieve expert performance standards. The technique was nonetheless effective for key outcome measures, and may help optimize the effectiveness of simulation in other areas as well.