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HIGH FIDELITY SIMULATION ENHANCES ADVANCED CARDIAC LIFE SUPPORT TRAINING IN MEDICAL STUDENTS.

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Objectives: As traditional Advanced Cardiac Life Support (ACLS) teaching methods are largely unrealistic, we mixed didactics and high-fidelity simulation to test improvement in primary outcomes: time to cardiopulmonary resuscitation (CPR) and defibrillation (DF). Secondary measures were total scenario score, dangerous actions, proportion of students voicing “ventricular fibrillation (VF),” 12-lead STEMI (ST-elevation myocardial infarction) interpretation, and return of spontaneous circulation (ROSC). **Methods:** As part of our “Resuscitation Boot Camp,” we taught 2010 ACLS to 19 senior medical students in didactic (12 h) and experiential (6 h) format. Immediately prior to the course, subjects were recorded performing a standard acute coronary syndrome/VF arrest scenario. We taught and assessed basic and advanced airway management. As the ACLS course’s final test, each student was recorded repeating the same scenario. Two expert ACLS instructors scored the before and after performances on a 121-point scale. Each student served as their own control; we used t- and McNemar tests for paired data with statistical significance of $p < 0.05$. **Results:** Prior to instruction, average time to CPR after arrest was 112 s, and to first DF 3.01 min. Students scored $45 \pm 9/121$ points, and 9/19 (49%) performed dangerous actions. After instruction, time to CPR was 12 s ($p = 0.004$) and to first DF 1.53 min ($p = 0.03$). Time to DF was delayed as students showed mastery of bag-valve-mask ventilation prior to DF. After instruction, students scored $97.6 \pm 4/121$ points ($p < 0.0001$) with no dangerous actions. Prior to training, only 4/19 (21%) students performed both CPR and DF within 2 min, and three of these had ROSC. After training, 14/19 (74%) achieved CPR +DF < 2 min ($p = 0.002$), and all had ROSC. Prior to training, 5/19 (26%) students said “VF,” 4/19 obtained an electrocardiogram (ECG), but none identified STEMI. After training, corresponding performance was 13/19 “VF” (68%, $p = 0.021$), and 100% ECG and STEMI identification ($p < 0.05$). **Conclusion:** This course significantly improved content and psychomotor skills. Critical actions required for resuscitation were much more common after training. High-fidelity simulation, despite increased cost, is an important and effective adjunct to traditional ACLS training.