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Cardiac Arrest Simulation: Complementary Approaches for Undergraduate and Graduate Medical Education

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Background

- Cardiac arrests require critical thinking and leadership skills
- Two simulation models—medical student and resident—were designed to enhance training for cardiac arrest
- Medical students focused on the individual resuscitation components
- Residents focused on team-related tasks

Study Design: Medical Student

- Students were assigned roles (Table 1) to start the simulation which initially only included a few team members
- The scenario was rehearsed with other participants observing until the group felt comfortable moving forward
- The scenario was repeated with the gradual addition of the remaining team members until each student felt comfortable in their respective role

Objectives

- Enhance the understanding of team roles and dynamics for medical students
- Improve residents' performance of components of a cardiac arrest simulation

Tables

Table 1. Medical student team roles

Medical Student	Role
1	Team Leader
2	Airway/Ventilation
3	Chest Compressions/Quality Check #1
4	Chest Compressions/Quality Check #2
5	IV Access/Medication Administration
6	Cardiac Monitoring/Defibrillation
7	Recording/Timekeeping
8	Pre-hospital personnel

Table 2. ROBG levels and criteria for successful completion

	Goal	Successful Completion Criteria
Level 1	Decrease off-the-chest time during patient transfer from EMS stretcher to ED bed	CPR interruptions of < 10 seconds
Level 2	Decrease off-the-chest time during defibrillation	CPR interruptions of < 3 seconds
Level 3	Decrease off-the-chest time during pulse check	CPR interruptions of < 10 seconds

Study Design: Resident

- Designed around recursive objective-based gameplay (ROBG)[1] wherein a team advances through cases only by successfully completing levels (Table 2)
- Upon demonstrating consistency in achieving the goal, groups were given a "pass" for the level allowing them to progress through the simulation
- If a team was unsuccessful in achieving a goal, the scenario was reset to the beginning of the simulation

Conclusions

- No formal assessment was performed
- Medical students expressed feeling more confident in their ability to perform specific tasks
- Residents recognized how the persistent emphasis of minimizing CPR interruptions led to observable improvements in overall CPR quality

References

1. Sunga K, Sandefur B, Asirvatham U, et al LIVE. DIE. REPEAT: a novel instructional method incorporating recursive objective-based gameplay in an emergency medicine simulation curriculum BMJ Simulation and Technology Enhanced Learning 2016;2:124-126.

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