

Simulating capnography in software on the METI Emergency Care Simulator™

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Abstract

Introduction. We attempted to adapt an METI Emergency Care Simulator™ (ECS) to support anesthesia scenarios but faced two challenges: the CO₂ gas exhaled by the mannequin does not represent the simulated patient's physical status, and the METI Waveform Display™ software does not support capnography monitoring.

Methods. We developed a software application that simulates a CO₂ trace that corresponds to the mannequin's ventilation. The software generated a range of CO₂ waveform shapes while the mannequin was either spontaneously breathing or being mechanically ventilated. We tested the software in three environments: (1) a full-scale simulator research study of advanced anesthesia monitoring displays, (2) simulator-based training courses at the Royal Adelaide Hospital, and (3) at the Sydney Medical Simulation Centre.

Results. The research study participants successfully used the simulated monitor to confirm correct intubation and detect airway events. Instructors at the Royal Adelaide Hospital reported improvement in the fidelity of simulations for anesthesia trainees. Simulation coordinators at the Sydney Medical Simulation Centre were able to use their ECS simulator for anesthesia training scenarios which they were previously unable to run.

Conclusion. We were able to significantly increase the realism of our anesthetic scenarios for research studies and training participants and trainees with only a small increase in the fidelity of our capnography monitoring.

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