

COMPUTERIZED STANDARDIZED PREOPERATIVE PATIENT INTERVIEW SIMULATOR

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Background: Performing a preoperative evaluation is a critical skill for anesthesiologists [1]. Training and assessing the performance of preoperative evaluations with standardized patients is expensive, time consuming, resource intensive. In certain cases, virtual humans may provide more fidelity than standardized patients for certain kinds of pathophysiology [2]. Residents are increasingly familiar and comfortable with virtual reality and this technology has the potential to offer a scalable, portable solution to such a problem.

We created a virtual human preoperative patient interview simulator (Avatar) as a joint project with LogicJunction, Inc. (Cleveland, Ohio). The Avatar presents an immersive environment to match the sensory experience of interviewing a patient in the holding area of our hospital. Users may ask free text questions of the patient as well as perform physical examination and order relevant laboratory studies. The AI model for the Avatar was created through an iterative test-build process. At the conclusion of the interview, the participant entered their assessment and anesthetic plan and was given performance-based feedback based on a 23-item checklist generated by a panel of anesthesia experts via a modified delphi process.

Methods: All 24 CA-1 residents in our program were recruited to participate in this study at four months into their training. As part of a standard performance assessment, residents were asked to perform a preoperative interview on an ASA 2 female patient presenting for emergent appendectomy. The residents were randomly assigned to interview the Avatar or a standardized patient. Interviews with a standardized patient were observed and adherence to feedback criteria was recorded. Performance of residents interviewing the Avatar was assessed by reviewing system logs.

Results: Group makeup as determined by characteristics and self-reported confidence in performing resident duties was comparable. Residents interviewing the Avatar spent 1.75 minutes longer asking questions (7.33 +/- 0.9 min vs 4.48 +/- 0.5 min; p=0.002) however total number of questions asked was comparable (26.92 +/- 2.3 vs 29.00 +/- 1.5; p=0.09). Residents interviewing the Avatar were more likely to perform physical examination (83% vs 33%) and check vital signs (83% vs 8%). Overall performance as measured by total scores on feedback criteria was similar (16.25 +/- 0.6 vs 16.58 +/- 0.5; p=0.26).

Conclusions: Resident performance of preoperative interview on a virtual reality simulated patient and a standardized patient was comparable. While average interview time was increased, total number of questions, and performance on objective feedback criteria was similar between the two groups.

References

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2. Wendling AL, Halan S, Tighe P, Le L, Euliano T, Lok B. Virtual humans versus standardized patients: which lead residents to more correct diagnoses? *Acad Med*. 2011 Mar;86(3):384-8.