



# Measurement of the validity of virtual patients for training and assessment of junior anesthesiology residents

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## INTRODUCTION

Standardized patient (SP) encounters have been widely utilized to train and assess novices' abilities to gather history, perform physical exams and synthesize data to form diagnoses. Yet, possible limitations exist with this method of training and assessment. Bias may arise from the lack of an abnormal physical exam. The University of Florida Virtual Experiences Research Group has developed a highly immersive virtual human (VH) to evaluate human-VH interactions. The VH enables the presentation of consistent abnormal physical findings across multiple repetitions. We compared junior anesthesiology residents' ability to suspect obstructive sleep apnea (OSA) during a preoperative assessment prior to elective major joint arthroplasty with SPs or the VH.

## STUDY POPULATION

34 CA-1 residents were recruited from the University of Florida anesthesiology residency program; 21 from the fall of 2008 performed preoperative assessment using SPs and 13 from fall of 2009 performed preoperative assessment using the VH

## METHODS

- Script was created for both SPs and VHs that included all of the historical features of OSA (snoring, daytime fatigue, observed apnea, hypertension and obesity)

### SP development

- Two experienced anesthesiologists trained three SPs on consistent delivery of the scripted history and exam
  - The SPs consisted of one Caucasian male, one African-American male and one Caucasian female.

### VH development

- The VH was designed to appear morbidly obese with a neck circumference of 40 in. An airway exam image of redundant soft tissue, prominent tongue and tonsillar hypertrophy would appear if requested.
- The VH script was developed using Virtual People Factory (VPF).
  - VPF is a web application for modeling conversations between real subjects and the VH.
- Two anesthesiology faculty members provided clinical questions and VH responses which represented frequently asked questions and statements that occur in actual patient interviews.
- Several senior residents were allowed access to the script. In their own language and without any prompts, these users interacted with the VH. The system attempted to respond by matching each trigger provided by the user to triggers entered by the authors.
- The final script consisted of 259 responses and 849 triggers for question and answer responses for the VH.

## THE 'PATIENTS'



SP 1. One out of 5 residents suspected OSA    SP 2. Four out of 11 residents suspected OSA    SP 3. None of the 5 residents suspected OSA

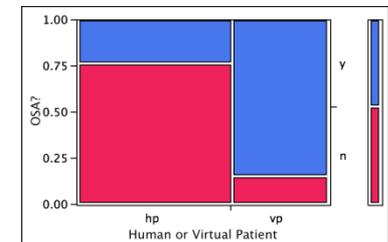


VH. Eleven of the 13 residents suspected OSA

## RESULTS

- Primary outcome assessed was the suspicion of OSA by residents who interviewed the SPs or the VH
  - Five out of 21 residents (23.8%) suspected OSA during the SP interviews
  - Eleven out of 13 residents (84.6%) suspected OSA during the VH interview
  - Chi-square analysis: odds ratio of suspecting OSA in VH compared to SP 17.6 (2.9-107), p<0.0006
- Nominal logistic regression analysis of other demographic factors revealed no impact on the suspicion of OSA
- Variability of the SPs' physical appearance revealed no association with suspicion of OSA when analyzed with the Fisher's Exact Test

## RESULTS



## CONCLUSIONS

The VH provides a unique opportunity for training and assessment of junior residents on detection of OSA. Differences in resident suspicion of OSA were strongly associated with interviewing the VH compared to the SPs. This difference is clinically relevant. Specifically, we can design the VH to have an almost limitless repository of physical abnormalities that can be consistently portrayed across countless repetitions that standardized patients cannot present reliably and consistently.

## REFERENCES

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