2017

An Evidence-Based Approach to Designing Virtual Patients

Benjamin Collins
VCU

An evidence-based approach to designing virtual patients

Benjamin X. Collins, Virginia Commonwealth University School of Medicine

Background

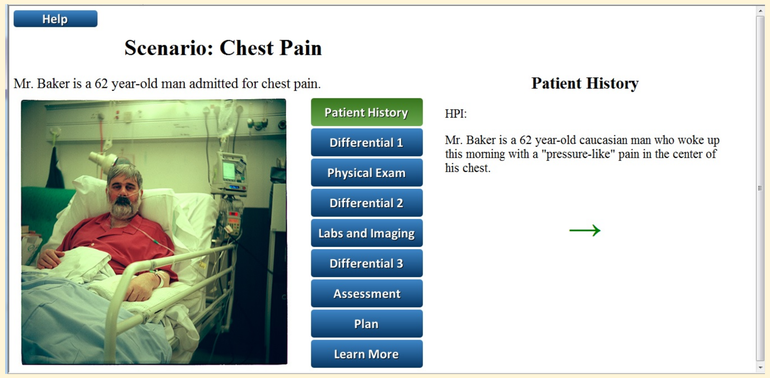
Virtual Patients (VPs) are known to be at least as effective as traditional teaching methods for the development of clinical reasoning. However, we do not know the maximum potential for their effectiveness or how to achieve that. There is wide variation in the construct of VPs, but there are few studies that look at specific features of and their effectiveness[1]. This study attempts to create a comprehensive overview of which features are effective based on prior studies involving virtual patients, which features may be effective based on educational theory, and provide a blueprint for how one might use this information to create VPs.

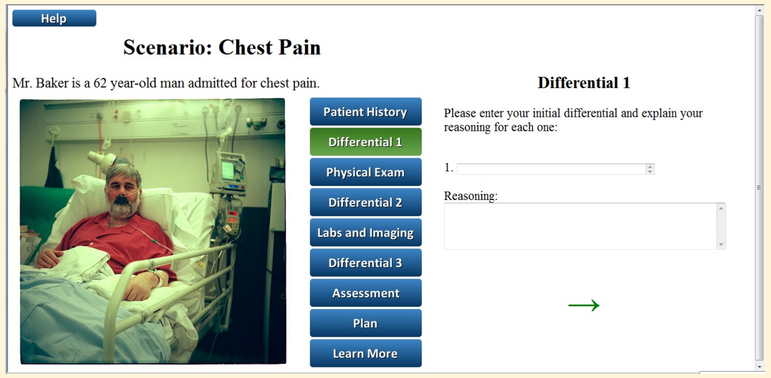
Methods

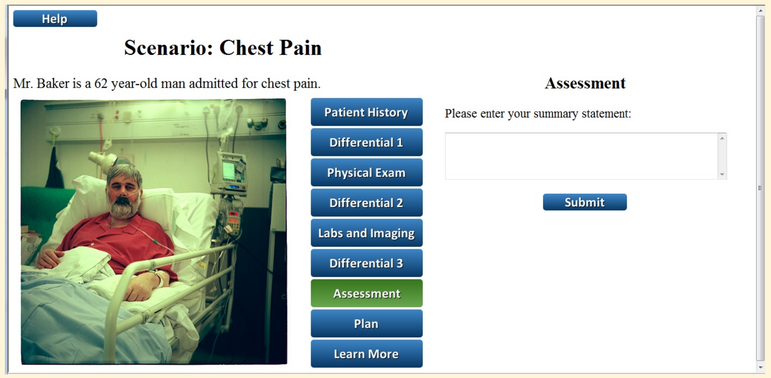
A thorough literature review was performed, searching for articles through PubMed related to virtual patient design. Design features were ranked based on the quality and quantity of evidence supporting their use. The quality of evidence was measured based on type of evidence with a scoring system relaying 3 points for a randomized trial, 2 points for other objective evidence, and 1 point for subjective evidence or indirect evidence from educational theory. The points for each piece of evidence relating to a feature were added to arrive at the quantitative score used to prioritize evidence. From this, a virtual patient blueprint was designed using CoffeeCup Free HTML editor.

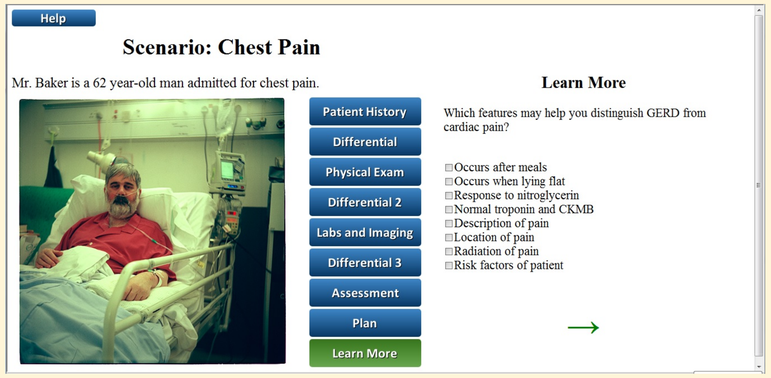
Results

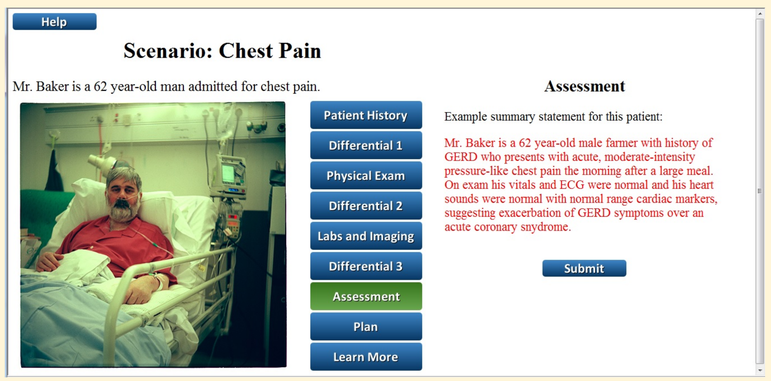
- Free-text summary statements
- Common things being common
- Avoid cognitive overload
- Use Patient Profile Images
- Branched vs. Linear Case
- Prompt Early Differential Diagnosis
- Address Intellectual Property Rights
- Avoid mistakes in case
- Relationship threshold of three
- Allow learning from errors
- Use EHR if feasible
- Make available offline
- Establish User familiarity
- Use a menu format
- Key feature problems and Bayesian reasoning questions

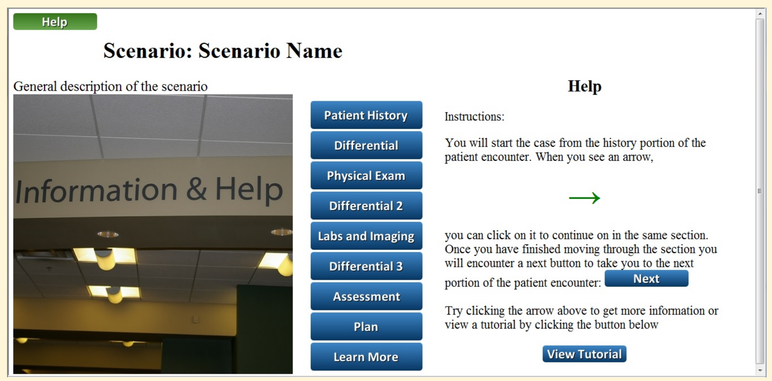












Discussion

Final results remain pending, but further results and discussion are available in handout. Currently, a total of 32 evidence based features have been identified. The study is limited by the author's bias in determining what qualifies as a feature of virtual patient design. The sample design is intended to be a generic blueprint on which to base future VPs and is limited by user knowledge of web programming. More research on VP design is needed.

References

1. Cook D., & Triola M. (2009). Virtual patients: a critical literature review and proposed next steps. Medical Education, 43, pp.303-311.
2. Heist, B.S., et al. (2016). Virtual patients to explore and develop clinical case summary statement skills amongst Japanese resident physicians: a mixed methods study. BMC Medical Education, 16(39).
3. Botezatu, M., Hakan, H., & Fors, U.G. (2010). Virtual patient simulation: what do students make of it? A focus group study. BMC Medical Education, 10(91).
4. Bateman, J. et al. (2013). Virtual patient design: exploring what works and why. A grounded theory study. Medical Education, 47, pp. 595–606.
5. Jk-digital. "The Patient." 24 Feb 2010. Online Image. Flickr. 06 April 2017. https://www.flickr.com/photos/41849532@N04/4384566229
For full list of references, see handout.