A Software Tool to Assist with Development and Deployment of Virtual Patient Scenarios via Mobile Devices

Bradley Tanner, MD, Mary Metcalf, PhD, MPH, Karen Rossie, DDS, PhD, Clinical Tools, Inc., Chapel Hill, NC

Key Message: With support from the NIH/NCATS (Grant #R44TR000576) we built a unique open-source software tool to create and deliver virtual patient scenarios to mobile devices and the web. Example content was created to address a specific educational need, opioid prescription drug abuse; however, the system can be applied to address the full range of medical topics. Case experiences can be shared with other educators as well as retrieved from other medical educators

Context: Our innovation in medical education addresses the following educational needs:

1) Interactivity in case-based instruction to: engage medical student learners, allow them to practice skills in a safe environment, and prepare them for more immersive simulation-based experiences and real-world clinical challenges
2) An easy to use tool for medical educators to create interactive, virtual patient scenarios supporting user choice and decision-making
3) A means to deliver virtual patient scenarios to the full range of devices including smart phones, tablets and the web
4) A common format in which educators can share virtual patient scenarios with other educators or retrieve and deliver case-based instruction from other educators

We have created and are assessing a software tool for this purpose. Using it, we have developed a series of patient cases focusing on the much needed topic of prescription pain medication abuse. Students need skills to address the epidemic of opioid prescription drug abuse including: death from overdose which currently outnumber automobile related deaths, rising hospital admissions, and disruption of the lives of patients and families.

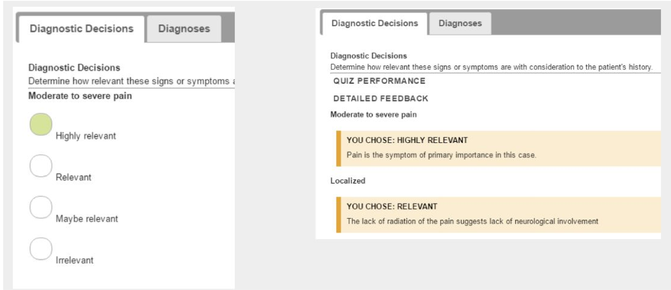
Background: Achieving positive patient outcomes depends on a logical strategy and correct application of medical knowledge including:

1) honing patient interaction skills to build rapport, collect data, and establish a diagnosis by selecting questions to ask and collecting historical data
2) choosing structured assessments (e.g., assessment scales) that aid diagnosis decision-making
3) identifying aspects of the physical examination to pursue
4) wisely selecting and interpreting appropriate lab and radiographic evaluations with feedback on risks, expense, and time delay
5) requesting consultation when appropriate
6) making differential and final diagnoses
7) treatment planning and implementation, including use of both non-pharmacological and pharmacological therapies

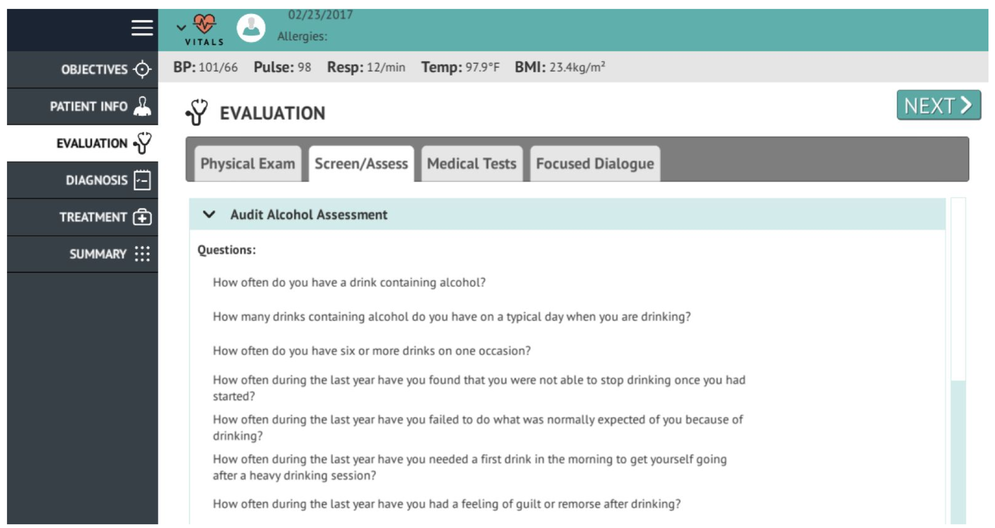
Objective: With support from National Institutes of Health/National Institute for Advancing Translational Sciences (Grant #R44TR000576), we are building an open-source mobile/web application to create and deliver virtual patient scenarios. The scenarios enhance clinical skills of medical students through automated feedback, guidance, and direction. A flexible design allows educators creating virtual patient scenarios to share them with colleagues if they wish.

In the application, medical students engage in discovery and clinical assessment by performing an evaluation of a virtual patient via a simulated electronic health record (EHR) interface. The EHR-like environment is delivered via a mobile/web-based device. In this environment, students practice a standard clinical approach, make clinical decisions, and experience realistic clinical outcomes.

Experience: Patient interactions include cases with acute and chronic pain in various presentations (e.g., back, knee, headache, neuropathic, and diffuse pain). For each case, medical students practice a number of clinical skills tied to known practice gaps.



Conclusion: Medical students need to strengthen their skills in a safe environment in order to prepare them from real world encounters. Our case-building tool can be used by medical educators to create and share a variety of cases for student use without significantly increasing faculty burden. This type of educational innovation represents a novel, scalable and easily accessible means by which medical students can take advantage of simulation style interactions to prepare themselves for the challenges ahead.



Future Directions: We plan to evaluate the software tool with medical students to assess educational impact and satisfaction.

Suggested Citation & Communication

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Contact Author: **bradtanner@gmail.com**

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