

Developing Clinical Case Scenarios for the LVHN Virtual Simulation Center

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Developing Clinical Case Scenarios for the LVHN Virtual Simulation Center

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BACKGROUND

The Department of Education is currently developing an online-accessible virtual reality (VR) training program, called the LVHN Virtual Simulation Center (VSC), to educate students, nurses, physicians, and other hospital personnel. Within the virtual environment of the LVHN VSC, learners interact with virtual patients as their avatars, enabling them to practice interpersonal and clinical skills, as they are trained to assess vital signs, recognize the symptoms of patient deterioration, and develop diagnoses and treatment care plans according to the specific disease processes.

Purpose: Create a variety of clinical case scenarios to operate using the LVHN VSC

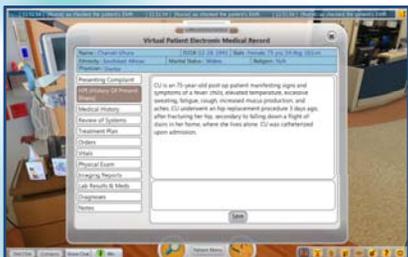
ADVANTAGES OF VR SIM TRAINING

- Enables learners to refine their problem-solving, critical thinking, and clinical skills
- Builds confidence and stimulates motivation
- Diminishes the demand for on-site training at limited hospital locations while also providing an alternative to over-booked live simulation training facilities¹
- Allows for repetitive practice thus reducing the occurrence of medical errors in the future¹

Figure 1. Log in options for hospital staff avatars



Figure 2. A virtual patient's history of present illness documented in the Electronic Medical Record



- Greater knowledge acquisition and retention²
- Improves communication by facilitating dialogue between multiple learners and with the virtual patients
- Learning from mistakes without causing harm to real patients³
- Online accessibility

METHODS

- **Template completion**
 - Used as a blueprint to plan a case scenario
 - A simplified outline with boxed categories that fulfill the details of scenario components
- **Case authoring application**
 - Data from the template serves as a guide to transfer information to the authoring app
 - Patient health problems, demographics, appearance, vital signs, level of consciousness, lab tests, medications, and physical exam findings are manipulated to fit the central health issue of the case
- **Event authoring**
 - The process of sequencing a series of interventions with their corresponding patient outcomes
 - Controls the immediate physiological responses to medical interventions or actions taken by the learner

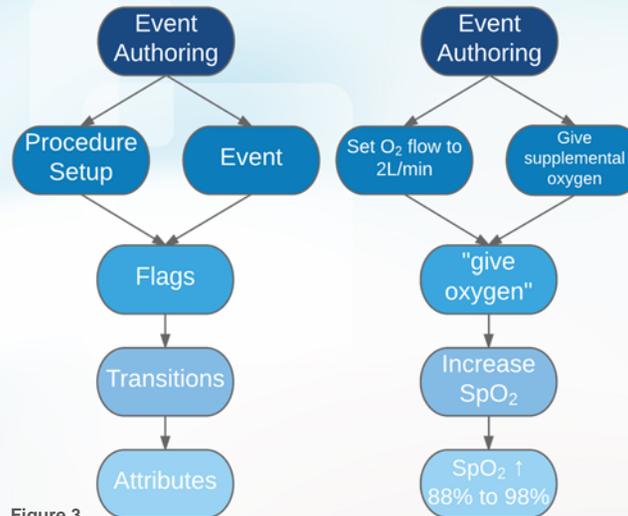


Figure 3.

On the left: A model of the event authoring process, beginning with procedure and flag partnering, followed by framing the transitions of patient attributes. This enables event setup, which is composed of flag triggers and transitions.

On the right: Example values are substitute in for the model diagram on the left.

In this scenario, when the flag is triggered by the procedure of setting the O₂ flow, the event is launched, and the patient attribute (vital sign) transitions to increase the SpO₂

RESULTS

- **Six clinical case scenarios have been created**, each virtual patient has a specific health problem: Deep vein thrombosis, chest pain, ischemic stroke, urinary tract infection, respiratory distress, and Hepatitis A.
- Virtual patient demographics represent LVHN's diverse patient population

Figure 4. Screenshots running the clinical case scenarios with virtual patients within the LVHN VSC



CONCLUSION

These case scenarios will be used for VSC demonstrations and as foundations for designing more complex cases. The overall goal is to motivate learners to take what they have learned from the VSC and apply it to real-life hospital situations thus promoting the delivery of better care, therefore reducing the frequency of medical errors and lowering the costs that result from malpractice.

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