

The Angiogram Procedure Through Virtual Reality Patient Education

Kyle Wilcocks¹, Nour Halabi², Priya Kartick¹, Robert Savaglio¹, Alvaro Uribe Quevedo³, Chi-Ming Chow⁴, Bill Kapralos⁵

1. Software and Informatics Research Centre, University of Ontario Institute of Technology 2. Software and Informatics Research Centre, University of Ontario Institute of 3. Software and Informatics Research Centre, Ontario Tech University, Oshawa, CAN 4. Department of Internal Medicine, University of Toronto, Toronto, CAN 5. Faculty of Information Technology/Health Education Technology Research Unit, Ontario Institute of Technology, Oshawa, CAN

✉ **Corresponding author:** Kyle Wilcocks, kyle.wilcocks@uoit.net

Categories: Medical Education, Cardiology, Medical Simulation

Keywords: angiogram, augmented reality, virtual reality

How to cite this poster

Wilcocks K, Halabi N, Kartick P, et al. (2017) The Angiogram Procedure Through Virtual Reality Patient Education. Cureus 9(11): e.

Abstract

A catheterization laboratory (also known as a cath lab) is an examination room within the cardiac department in a hospital or clinic with diagnostics imaging equipment used to visualize the arteries and chambers of the heart, where various heart-related procedures are performed (e.g., angiogram, angioplasty, ablation and pacemaker/ICD insertion). Patients that are scheduled for a cath lab procedures are typically provided with pamphlets outlining the procedure. However, paper-based methods are not highly engaging and may lead to misinterpretation and miscommunication. While the use of virtual simulation, serious gaming, and immersive technologies is becoming popular in medical education from an instructor-trainee point of view, it can also have a great impact in patient education and more specifically, in improving the patient experience and awareness.

We employed immersive technologies to provide the patient with a positive and engaging learning experience regarding the angiogram procedure. To implement the interactions within the virtual angiogram scenario, we identified the tasks, the feedback, and the player's expected interactions related to picking up the tablet, placing the electrodes, blankets and numbing agent on the patient, placing the needle and inserting the wire in it, placing the guided cath and nitroglycerin on the wrist, placing the Tiger cath, and finally, placing the contrast dye in the tube.

A room-scale virtual reality (VR) configuration using an HTC Vive VR headset was employed to provide the patient with the opportunity to learn about the procedure that they will undergo, all within with a highly immersive, interactive, safe, and engaging virtual environment. In addition to the VR setup, we have also implemented an augmented reality- (AR-) based version. The patient, then using simple gestures like "Tap" and "Hold" as well as voice recognition to interact with the augmented world.

Future work will continue with the refinement of our angiogram simulation followed by more formal user testing that will examine the effectiveness of the simulation and compare its effectiveness with traditional methods of patient education.

Open Access

Published 11/30/2017

Copyright

© Copyright 2017

Wilcocks et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 3.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Distributed under

Creative Commons CC-BY 3.0



65