



# Virtual Reality: The Future of Radiology



## What is Virtual Reality?

Virtual Reality (VR) is the utilization of computer technology to create a simulated, three-dimensional environment. The user is immersed and able to interact in an artificial world. VR tracks the user's head, hand, and body movement to sync the field of view with the user and computer system. VR also engages the user's sense of vision, hearing, touch, and occasionally smell. Engaging these senses can help with memory retention and can provide a captivating environment for the user.

## VR: Healthcare Training

Most healthcare students use textbooks and online learning modules while in school. Virtual reality is hoping to create new and engaging tools to improve healthcare training. The advantage of virtual reality over textbook and online learning is associated with a higher level of active learning. This is due to the increased social and environmental presence within the learning activity. Humans also tend to be visual learners. This makes virtual reality an effective learning tool.

There are a variety of uses for virtual reality in the healthcare environment. VR can be used to treat phobias, provide physical therapy, train healthcare professionals, and promote wellness. Virtual reality has a plethora of simulations in radiology, surgery, emergency care, preventive medicine, dental procedures, endotracheal intubation, and COVID-19 training.

There are many benefits to using virtual reality as a learning tool in healthcare. Researchers recently discovered that PrecisionOS, a VR healthcare simulation training, has decreased serious surgical errors by 50%. Virtual reality has so much potential!

## VR: Radiology Training

Radiology students benefit from the use of VR training because they can practice positioning the patient, moving the equipment, and setting technique with an unlimited amount of tries in an unbiased and risk-free environment. There are a variety of VR training simulations. A few examples of the simulations include diagnostic x-ray positioning, interventional radiology procedures, and even a simulation of an allergic reaction to contrast in a computed tomography scanner. The overall goal of VR training is to achieve rapid mastery of concepts and techniques.

## VR: Interventional Radiology Training

Medical students in interventional radiology (IR) have access to virtual reality simulated trainings. They can use a stereoscopic viewer that attaches to their smart phone. A case study is then presented to the student. The student must answer questions pertaining to patient diagnosis, indications, contraindications, equipment, and types of sedation. Next, the student scans a Quick Response (QR) code and is transported to a VR interventional radiology suite where they have access to equipment for a particular case. VR provides a safe and risk-free environment for the medical students to learn.

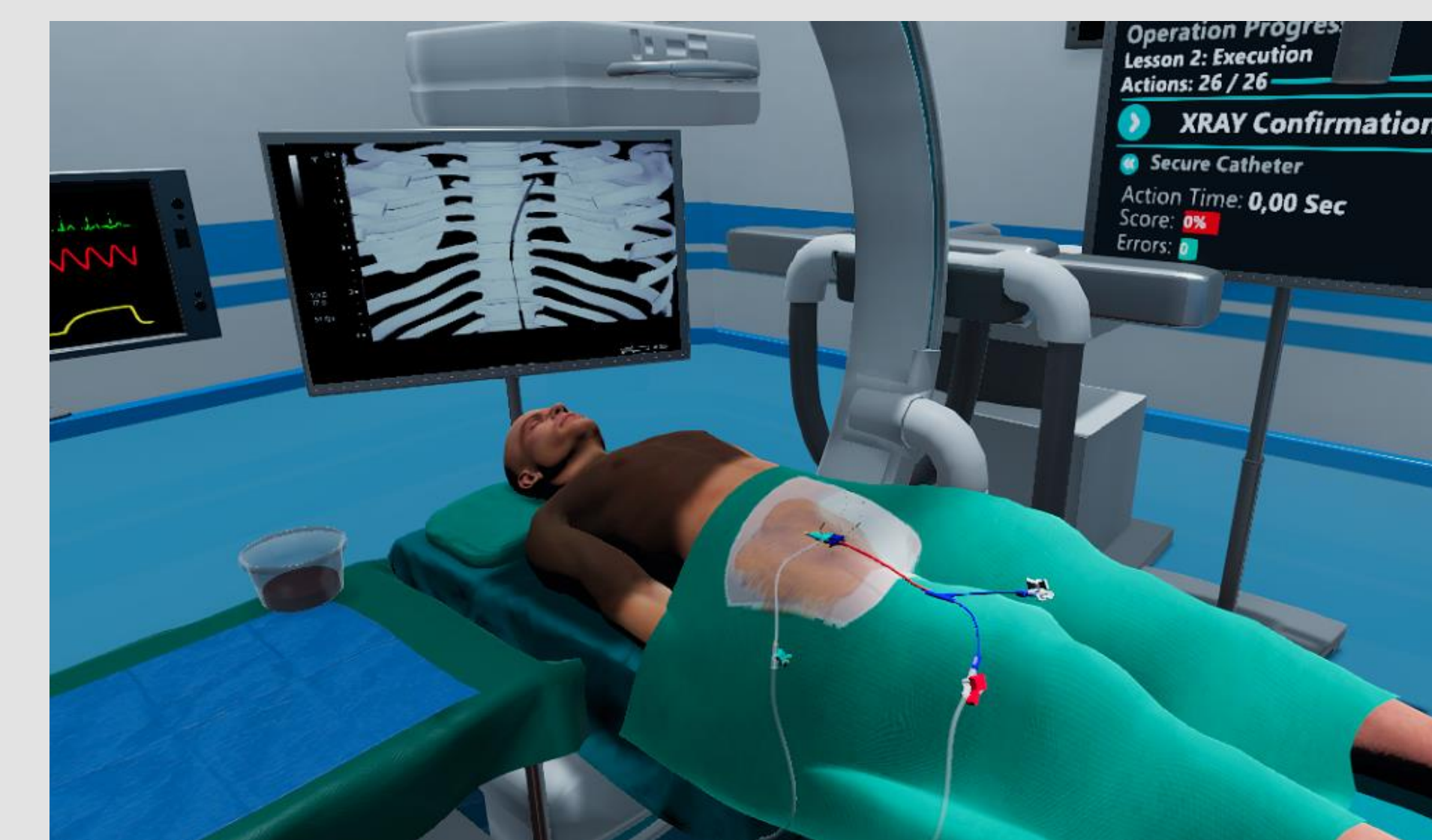
## VR: Medical Imaging Advancements

Virtual reality software is also able to manipulate conventional medical images and turn them into a 3-Dimensional experience. GE is currently working to create a virtual reality training. The company Surgical Theater is making major advancements in VR medical imaging. Their website displays virtual reality views of an aneurysm, meningioma/tumor, arteriovenous malformation, and a synovial sarcoma.

## VR: Diagnostic radiology



## Interventional Radiology VR Suite



## Stereoscopic Viewers



## Conclusion

Virtual reality has potential to leave a long-lasting impact on the healthcare industry. Companies such as Google, Apple, Lenovo, and others may surprise the industry with technological advancements in the future. Technology advances will, however, face barriers, such as; widespread healthcare adaptation, limitations on funding, inelegant hardware and software, general technology aversion, and pushback from unconvinced practitioners. Despite the barriers, virtual reality will likely play a large role in the future of radiology and healthcare training.

## Resources

- “Virtual Reality Radiography Simulation” [https://www.youtube.com/watch?v=llm-gz\\_-DYc](https://www.youtube.com/watch?v=llm-gz_-DYc)
- “Virtual Reality puts Radiologist Inside Blood Vessels” <https://www.youtube.com/watch?v=EDtAy4OovB4>
- “Precision VR™ Fly-Through - AVM & Aneurysm, Dr. Warren Selman” <https://www.youtube.com/embed/O1nN63Pagiw>

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