

INNOVATION

Virtual Reality Simulations In Healthcare



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Virtual reality is redefining what is possible in the healthcare industry. Patients are already benefiting from advanced and more precise surgeries, simulations for mental illness treatments and many other improvements thanks to VR solutions. VR helps make the work of healthcare professionals more effective and the lives of patients easier.



So, let's get straight to the point and see what exactly VR offers to the medical field.

Simulations For Healthcare: A Market Overview

Healthcare simulations are broadly used to improve the safety, effectiveness and efficiency of healthcare services. Software developers build virtual simulations to help build a bridge between traditional classroom learning and real clinical experience.

Often, simulations in the medical field are [defined](#) as “a technique (not a technology) to replace and amplify real life experiences with guided ones, often ‘immersive’ in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion.”

Simulations have been used for [a very long time](#). In the 18th century, for example, doctors in France used a cloth birth simulator to teach techniques to midwives and surgeons. In the early 1960s, doctors described the techniques of mouth-to-mouth cardiopulmonary resuscitation, and a special simulation was born — a plastic toy manufacturer designed a realistic doll used by hundreds of thousands of CPR trainees to teach chest compression and artificial ventilation.

Years passed, technologies moved forward, and VR came along as an advanced tool to enhance and upgrade simulations of myriad medical activities.

Research [suggests](#) an expected growth of AR and VR in healthcare at a CAGR of 30.7% by 2025. Can you imagine how much that will influence medical care? The key growing domain will be in surgical solutions, and we'll discuss those first.

Let's review the market for VR simulations, consider what this technology offers to the healthcare industry and learn about some of the providers.

Training For Surgeons

[Fundamental VR](#) builds multimodal software platforms that take advantage of available VR hardware, both tethered and stand-alone, to let surgeons learn new or practice existing skills. Practicing in a safe, controllable space is a huge benefit for surgeons who want to enhance and rehearse their skills before operating on real patients.

The company has two solutions: HapticVR, which combines force feedback technology with VR to create extremely immersive and realistic simulations, and HomeVR, for stand-alone headsets for at-home training. All of the company's solutions are accredited by the Royal College of Surgeons of England, and the company has a strategic alliance with Mayo Clinic.

Surgical Robots

Surgical robots are solutions built at the intersection of robotics and virtual reality. The robots built by [Vicarious Surgical](#) use just a single small port, requiring an incision as little as 1.5 cm to put in a camera and robotic instruments and then transfer management to a human surgeon.

- 40 The robot's purpose is to maximize visualization and precision in minimally invasive, robotic-assisted surgeries. Using a VR helmet, the surgeon is fully immersed inside a patient's body and has 360-degree access. The robot's arms are designed to replicate a surgeon's body movement, from shoulders to wrists.

Preoperative Planning

- 45 Another facet of employing VR for surgeons involves preoperative planning. For example, Surgical Theater develops a so-called "surgical rehearsal platform" — [precision VR](#) for neurosurgical procedures. With this solution, both patients and surgeons can go through an upcoming surgery in VR for a better understanding of a scenario.

Preoperative planning in VR reduces uncertainty, helps deal with anxiety and helps both parties get ready for surgery.

- 50 The Stanford School of Medicine, St. Joseph's Children's Hospital, the Mayo Clinic, and UCLA School of Medicine are among those [already using this solution](#).

Now, let's move on to VR in mental health. VR shows [great results](#) in helping patients battle mental disorders, fears and various syndromes. Let's look at some of the solutions on the market.

Chronic Pain Treatment

- 55 [Karuna Labs](#) offers HIPAA-compliant and FDA-registered solutions for chronic pain treatment. The company uses evidence-based approaches to build VR solutions to help treat chronic pain via simulations.

The solutions offer patients at-home and local clinic programs that address chronic pain and help to "unlearn" it. With a combination of physical and cognitive retraining, the brain is re-taught to see painful movements from a different perspective and no longer force the body to feel pain.

- 60 **Treatment Of Mental Disorders And Fear**

VR is also being used to help patients manage mental disorders. One of the companies that provide VR solutions for coping with mental health issues is Oxford VR, which won the 2020 award for [Best Mental Health Immersive Technology](#) at the MedTech Visionaries Awards.

- 65 Oxford VR is a technological partner of the United Kingdom's National Health Service and the McPin Foundation, [among others](#). The company focuses on virtual reality to relieve symptoms of mental disorders. For example, one of its solutions is designed to help patients overcome fear and anxiety [provoked by social interactions](#).

Social avoidance is prevalent in many disorders, such as depression or panic disorder, and a VR simulation helps patients battle this fear by exposing them to social interactions in a safe and controlled environment.

- 70 But is it effective? Treatment in VR demonstrates a huge potential. After only two hours of exposure to a solution that treats fear of heights, for example, the patients' anxiety was reduced by an average of 68%.

To Sum Up

- 75 I personally hope VR will penetrate as many industries as possible — and in particular that more and more healthcare organizations will adopt VR simulations to treat patients and help doctors advance in healthcare services.

It's good to see that a technology once misconceived as something for gaming only is now accepted and recognized by such highly regulated and demanding industries as healthcare.



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Founder and Member of the Management Board at [HQSoftware](#). Expert in software development. Passionate about VR. Read Sergei Vardomatski's full executive profile [here](#).

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