



OnQ Blog



Think F.A.S.T. VR training: Improving stroke education and saving lives

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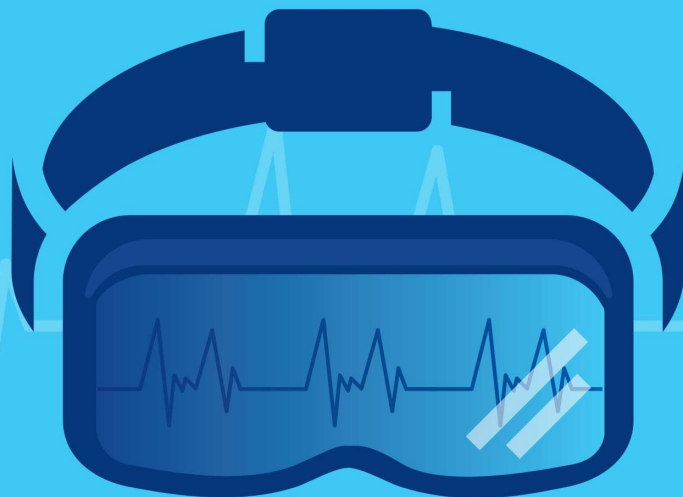
Strokes can happen to anyone at any time¹ and the number of strokes young people experience is rising. In America, there was a 44% increase² in the number of young adults hospitalized due to stroke over the last 10 years. Globally, it's the second-leading cause of death³.

Qualcomm Technologies (QTI) is helping medical practitioners and first responders diagnose strokes faster and in turn, reduce the long-term impact of the disease. We've collaborated with VR industry pioneers [ForwardXP](#) and [Leap Motion](#) as well as Dr. Raj Dahiya, a renowned radiation oncologist and founder of a high complexity diagnostic testing laboratory, to create Think F.A.S.T., a cutting-edge [Virtual Reality \(VR\) application](#), to demonstrate how VR technology can be utilized to educate people about stroke and ultimately, to save lives. The application leverages the [FAST](#) test for stroke diagnoses, endorsed by the American Stroke Association.

Poised to reinvent health care education and training, Think F.A.S.T. immerses anyone from medical students to patients into a medical VR environment where they receive hands-on instructional content that simulates a real-world comprehensive stroke examination. In fact, if you suspect you've experienced a stroke, you can identify your stroke symptoms and self-diagnose your condition, allowing you to rapidly react and seek medical help which could boost your odds of recovery.



5.5 million people die from stroke every year worldwide.



Think F.A.S.T. VR training can save lives.

Source: "The Atlas of Heart Disease and Stroke", World Health Organization (who.int.)

Performing your first stroke examination

When you step inside Think F.A.S.T.'s virtual world, you're the doctor. Here's a sneak preview of what you can expect. Once you strap on your Head Mounted Display (HMD) headset, you'll enter a futuristic-looking medical training facility. If you're a Trekkie, you'll notice that this virtual room resembles a mashup between the Enterprise's sick bay and its holodeck.

You'll then be greeted by a floating orb-looking ball (think BB-8 minus its head) and you'll notice that you can freely move about in this virtual world. This is helpful for examining your lifelike patient, who sits in the center of the room on a pedestal, waiting for you to examine him.

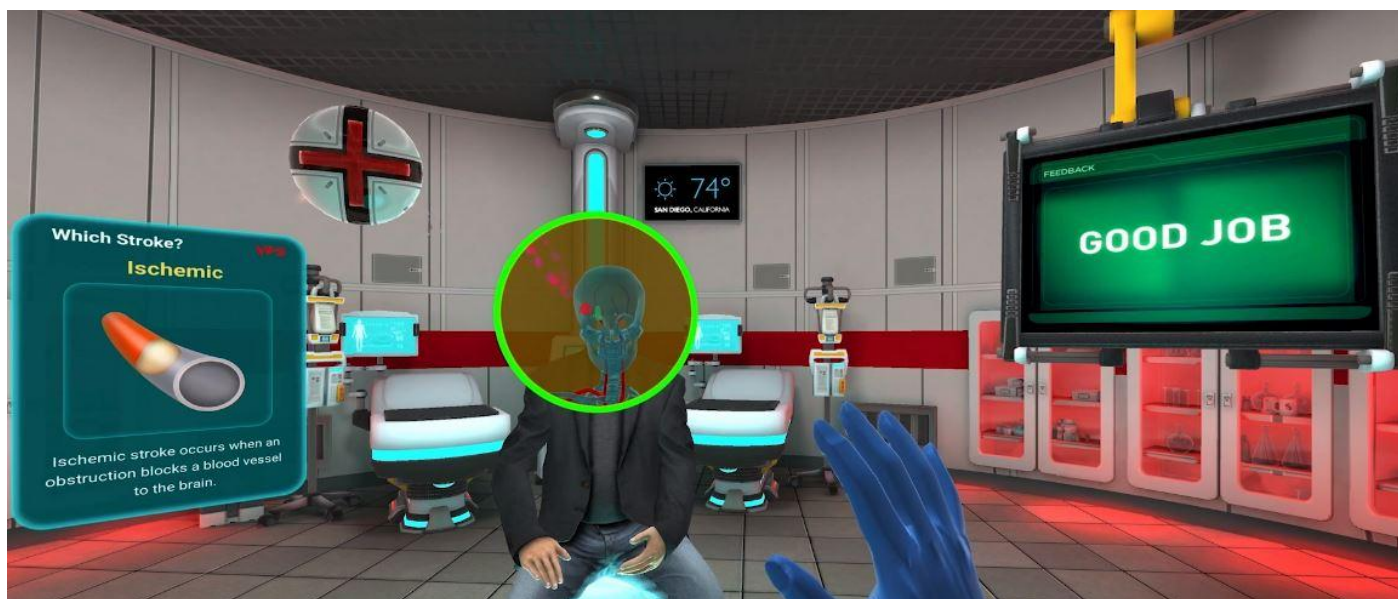
Next, the orb provides you with a short tutorial on stroke symptoms and walks you through the examination, utilizing the internationally recognized F.A.S.T. system for diagnosing a patient. For example, the orb instructs you to ask the patient to perform several physical movements which allows you to diagnose if the patient has suffered a stroke. As you perform your exam, you're having a verbal exchange with the patient and can walk around them, examining from any angle.





Think F.A.S.T coaches you on best practices for diagnosing stroke.

Finally, the orb introduces Think F.A.S.T.'s body scan capability. As you waive your hand over the patient's body, you scan it anatomically. This allows you to see the actual source of the stroke and determine which type of stroke the patient suffered.



Anatomically scan your patient's body with a hand gesture.

Engineering your VR training experience

QTI has integrated some outstanding technologies to fully immerse you into your Think F.A.S.T. virtual environment.



- Advanced hand tracking enables you to see your hands as you operate an intuitive interface display and make selections as you progress through your training module.
- 3D sound allows you to hear sounds like you'd hear them in real life. For example, if you were driving your car and a bus passed in front of you moving from left to right, your left ear would detect the bus first. Your bot mirrors that auditory experience — as it moves around and talks to you, your ears track its movement and position.
- Voice inputs create an interaction that you probably haven't seen before in a VR experience. During the examination, you and your patient exchange back and forth communication.
- 6 degrees of freedom (6DoF) meshes your virtual world with your physical world as your VR display is perfectly synchronized with your head and body movement. When you walk around your virtual training center, it's like you're walking around in the real world as you're fully mobile and untethered from a PC or laptop.

The arrival of 5G will take Think F.A.S.T. to another level. 5G enhanced mobile broadband (eMBB) will provide multi-Gbps ultra-low latency to reduce your throughput requirements, buffering requirements, and lag. Additionally, 5G will support uniform, anywhere usage ranging from cities to rural areas and in fast-moving situations, like cars. This will let you train wherever you want.



How can Think F.A.S.T. improve your stroke training experience?

Whether you're a medical university student, a health care provider in a third world with limited medical training, or a patient, everyone is trained in the same fashion with Think F.A.S.T. Designed to provide standardized instruction, Think F.A.S.T. facilitates consistency in stroke training worldwide.

Passively learning about stroke online, watching videos, or taking tests isn't the most efficient (or interesting) approach. To truly learn stroke symptoms, you'll need to trade your textbook for Think F.A.S.T. You'll conduct a comprehensive stroke examination — but in a risk-free virtual environment where it's fine to make mistakes. Think F.A.S.T. VR training allows you to learn by doing as you can repeat the simulation multiple times to better retain your training and increase your proficiency.

Think F.A.S.T. VR training also allows for tremendous cost savings. For example, stroke classroom training may require actors, which introduces a cost. Additionally, integrating cadavers into classroom training also presents a cost. Think F.A.S.T. VR isn't confined to a classroom - it can be utilized nearly anywhere, including remote areas around the world.

What's next for Think F.A.S.T.?

Think F.A.S.T. VR is pushing the boundaries of the traditional medical school education experience and the way people understand stroke, enabling the disease to be better understood than ever before. The possibilities of using this exciting technology platform are certain to extend beyond stroke diagnosis into a host of other clinical scenarios. Additionally, Think F.A.S.T. VR could also extend into other verticals such as enterprise and manufacturing to enable new means for training and optimizing workflow.

Learn more about the Think F.A.S.T. VR medical training module? Watch how the demo was developed and how it unfolds. 

For a deeper dive on 5G, please visit us [here](#).

1.“Stroke Statistics,” Strokecenter.org. <http://www.strokecenter.org/patients/about-stroke/stroke-statistics/> (accessed 10-3-17)

2.“Young Stroke Survivors,” Stroke.org. <http://www.stroke.org/understand-stroke/impact-stroke/young-stroke-survivors> (accessed 10-3-17)

3.“Heart Disease and Stroke Statistics 2017 At-a-Glance,” Heart.org. https://www.heart.org/idc/groups/ahamh-public/@wcm/@sop/@smd/documents/downloadable/ucm_491265.pdf (accessed 10-3-17)



Virtual Reality

Cognitive Technologies

5G

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