

# Virtual Reality Adds New Dimension to Patient Education

**T**his article is one of a seven-part series published on ACCCBuzz ([www.accc-cancer.org/acccbuzz](http://www.accc-cancer.org/acccbuzz)) that highlights the achievements of each of ACCC's annual Innovator Award winners. You can learn more about the winning innovations being recognized this year and the people who pioneered them by attending the ACCC 38th (Virtual) National Oncology Conference, November 9-10, 2021. Learn more at [acc-cancer.org/NOC](http://acc-cancer.org/NOC).

Effective education about their disease helps patients better understand their diagnoses and participate in shared decision-making with their providers. Traditionally, such education has taken the form of oral communication during office visits, with some video and reading components incorporated into post-appointment materials. But Douglas Holt, MD, former Chief Resident of Radiation Oncology at the University of Colorado Cancer Center, UCHHealth-Oncology Services, helped take patient education to the next level: virtual reality.

"Patients really don't have a good understanding of what's happening within their bodies, and it's something that I think has plagued medicine for a long time," Holt explained. "There's some great studies showing that verbal teaching alone is the least effective teaching method. And that's what we predominantly use in medicine."

Patients often do not have the education necessary to fully understand the scope of their disease—what their MRI and computerized tomography (CT) images show, why they are experiencing certain symptoms, and why their specific treatment plan was selected. Engaging education materials can help patients more actively participate in their

care, decreasing their anxiety, and helping improve their treatment adherence.

The problem, Holt noted, is that many providers in medicine, including oncologists, believe that patients do not want to know about their disease and treatment in depth, because receiving too much information may scare them and put a heavier burden on them and their families. But Holt said providers who educate their patients during office visits may overestimate how well they can teach patients during those short time windows. "This is a blind spot for physicians," Holt stated.

This is especially true for providers in radiation oncology, he added. "We're treating with invisible X-rays and targeting something [a tumor] in the body that they don't already understand," said Holt. "We might as well be speaking a foreign language."

To better engage patients in their cancer journeys, Holt employed VR (virtual reality) to give patients a concrete visualization of what is happening in their bodies. He takes patients' CT scans (or individual image slices) and stacks them on top of one another to form a three-dimensional image of the patient and their tumor. With VR headsets and state-of-the-art computers, patients gain a better understanding through a clear visualization of their tumor: where it is located in the body, what organs it is near, and how large it is.

Patients step into the VR space with Holt and their caregiver(s), where he can visually demonstrate to patients how their radiation treatment plan will work, showing them the size of the radiation beam and where it will be targeted. Going beyond two-dimensional images and verbal explanations, this tool gives patients much-needed intuitive context about their disease and treatment. As patients come face to face with their disease, they can better advocate for themselves and their health.

Developing this technology, including the virtual reality software and a transportable cart of headsets and computers, took time and buy-in from various members of Holt's cancer care team. Funded by a grant from the Colorado Cancer Coalition and one from the University of Colorado Cancer Center's radiation oncology department, Holt partnered with Colorado State University in December 2019 to improve its VR software to meet the needs of the cancer center. The university's software needed to be able to transpose patients' images and scans into a virtual, three-dimensional space within any clinic room in the cancer program. To deploy his tool, Holt purchased state-of-the-art computers and headsets that could be moved room to room via a portable cart. By August 2020, the VR cart was ready for a pilot program.

Since first studying this new technology, Holt said patients have been nothing but positive about their experience with it: "I had a 95-year-old woman who said, 'I've had breast cancer for 4 years, and this is the first time I finally understood it.' In my research, more than 80 percent of patients have said VR is the best educational tool they've come across."

Since using VR to educate patients, Holt has seen patients become more enthusiastic about starting their treatment and adhering to their systemic therapy. "Something else that was really surprising was how positive it was," he noted. "We're looking at cancer, we're looking at patients' mortality, and they would comment on how positive and how good it is just to see what they're facing and how we are going to treat it."

As Holt continues to study the effectiveness of VR in oncology patient education and make improvements to the VR cart, he hopes to see this new technology become a standard of care. "I really think it's going to be the best educational tool and interface from physicians to patients," he explained. "There's still a lot of things to be improved upon for this to be scaled. The hope is to keep continuing to develop it to make it something that will eventually become the standard of care for consultations with patients." **OT**

Attend the ACCC 38th [Virtual] National Oncology Conference to learn more about how Holt developed and implemented VR technology to improve patient education. Other topics to be addressed by 2021 ACCC Innovator Award winners include addressing costs of care and financial toxicity with a mobile app and developing an integrated health team that provides clinical interventions and wellness checks in patients' homes.



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