

## Case study

# Palmetto Health- USC Medical Group



## HP EliteBook x360 and 3D multimedia education improve healthcare literacy and patient outcomes<sup>1</sup>

### Industry

Healthcare

### Objective

Measure the impact of mobile 3D multimedia healthcare education on patient engagement in clinical settings

### Approach

Use of HP EliteBook x360s with Patient Nexus animated content by physicians, health educators, and case coordinators

### IT matters

- Convertible, thin design for seamless use in clinical settings
- Lightweight, innovative technologies well suited for a mobile clinical workforce and workflows
- Fast, versatile, and efficient performance to handle 3D animation and interactive content

### Business matters

- Improve health literacy and comprehension of clinical consultations
- Reduce patient anxiety and increase adherence and attendance to treatment procedures
- Enhance clinician efficiency and cost management
- Encourage patients to more fully engage in their healthcare journey



**“What I like about HP devices is they incorporate the latest lightweight and innovative technologies for the mobile workforce and workflows.”**

– Dr. Benjamin Schooley, Associate Professor of Health Information Technology, Department of Integrated Information Technology, College of Engineering and Computing, University of South Carolina

**Palmetto Health USC**  
MEDICAL GROUP

The complexity of healthcare treatments can result in challenging patient-provider communications and education. When advanced medical information is explained in a 3D visual and easy-to-follow format, clinicians observe improved patient engagement. Using HP EliteBook x360s and Visual Health Solutions' Patient Nexus animated videos and 3D dissectible and rotatable anatomical models, experts at the University of South Carolina are conducting clinical research to validate the benefits of multimedia education. Thus far, after use of the solution, 95% of over one hundred surveyed patients have indicated they are more likely to follow the directions of their physician. Their study aims to improve physician efficiency and treatment outcomes, and ultimately motivate patients to engage more fully in their healthcare journey.

## Dynamic 3D education for improved patient outcomes

When complex medical information is explained in a dynamic and easy-to-follow format, patients get it. Compared to drawings and text, multimedia education improves comprehension, reduces anxiety, and motivates patients to more fully engage in their healthcare journeys.

That's the hypothesis of medical and technology leaders at the University of South Carolina (USC) and its affiliate, Palmetto Health. They're ready to test the theory that animated and engaging healthcare education can improve patient outcomes, clinician efficiency, and cost management.

"Our premise is that patients will get more valuable education and take better care of themselves after viewing animated videos of their condition and treatment," says Nick Patel, M.D., physician and executive director of clinical informatics, Palmetto Health-USC Medical Group.

As an IT authority at Palmetto Health and longtime HP Healthcare Advisory Council member, Patel understands the union of technology and medicine. The same is true for his research partner, Benjamin Schooley, Ph.D., associate professor, College of Engineering and Computing, USC, and the author of many technology-focused patient education reports.

"A recent study of 3D-based education on tablets in clinical settings generated positive perceptions and acceptance of the format," says Schooley. "Another multimedia education trial showed positive influence of adherence and attendance to endoscopy procedures when used just prior to the appointment."

Now, the two are embarking on a new study; this time in a more natural point-of-care setting, administered by educators and case coordinators in Patel's internal medicine office. This research brings the HP EliteBook x360—a thin, convertible laptop—into exam rooms to display Visual Health Solutions (VHS) Patient Nexus 3D animated content.

Patient Nexus videos visually describe conditions and procedures. Conditions like diabetes, hypertension, and heart disease are increasingly common in South Carolina and challenge local providers to change the way they communicate with patients.

## Challenge of 2D patient education

Changing demographics are placing a considerable strain on healthcare delivery systems, not just in the southern U.S. but across the nation. The Population Reference Bureau states that today's 46 million seniors, 65 and older, currently account for 15 percent of the population. By 2060, this share rises to 24 percent<sup>2</sup> and all will require treatment and education throughout their healthcare journeys.

Across the nation, 88 percent of deaths in 2014 were due to chronic, non-communicable diseases according to the World Health Organization.<sup>3</sup> Including cancer, cardiovascular, and chronic respiratory diseases, this category far outweighs infectious disease. Globally, the United Nations estimates the cumulative economic loss from chronic disease could reach \$47 trillion by 2030.<sup>4</sup>

This trend toward an aging population and chronic disease is shifting clinician workflow to ongoing and evolving care that requires greater patient education than ever before. Unfortunately, the complexity of today's healthcare treatments can lead to imperfect patient-provider conversations and sometimes, miscommunication. Furthermore, the patient education challenge is magnified for the young, elderly, and under-educated population.

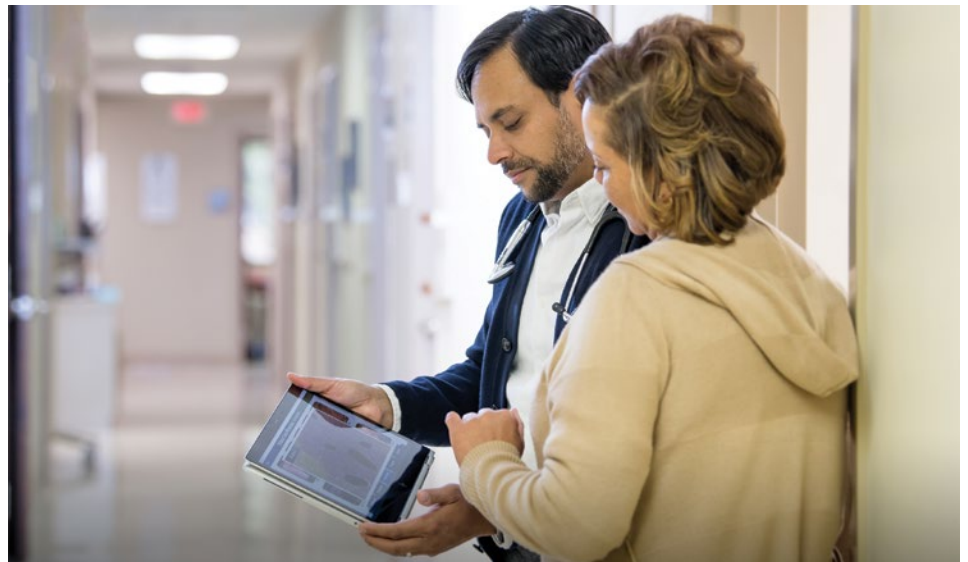
"We always want patients to increase their healthcare literacy and be empowered to make good decisions. We want their care to be more accessible and personalized, and for them to ultimately realize a better healthcare experience."

— Nick Patel, M.D., Physician and Executive Director of Clinical Informatics, Palmetto Health-USC Medical Group

Distribution of printed educational materials to patients is a common requirement for insurance reimbursement. Therefore, it is widely upheld and tracked by physicians. This behavior, however, does not lead to better patient outcomes, according to Patel. "Our current Cerner eHealth system has educational information that we print and give to patients," says Patel. "But we're finding the eight-to-ten-page content is consumed by only 20 percent of

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patients and many times it ends up in the trash on the way out of the clinic.”

Additionally, Patel observes that physicians who need to effectively educate patients resort to drawing on printed diagrams but receive no compensation for this approach. “That’s where we have a major disconnect as we’re getting credit for something that is not providing a patient benefit, and the insurer is not receiving a good return on investment,” adds Patel. “It’s a system of misaligned incentives.”

With previous indications that multimedia patient education generates positive results, Patel and Schooley aim to influence and modify the healthcare delivery system—to realign incentives through use of effective multimedia patient education.

## Innovative technologies to improve delivery systems

To influence delivery systems, practitioners like Patel and Schooley are working to prove the superiority of 3D animation and multimedia patient education using state-of-the-art mobile devices. That’s what brings VHS and HP innovation into the clinics at Palmetto Health.

“In our kickoff meeting, we demonstrated the Patient Nexus animation on HP mobile PCs and everybody loved it,” says Patel. “Now, we’ll test this combination with patients and measure the results against the efficacy baseline of text and drawing education.”

The Palmetto Health team will use surveys to measure the benefits of 2D content from Healthwise point-of-care solutions and the 3D

animated content in Patient Nexus videos. Staff feedback will reveal clinical workflow and care delivery improvements and help to leverage the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey instrument and data collection methodology.

“In addition to the surveys, we’ll be able to see if they looked at the multimedia content, how they’re consuming it, and for how long,” says Patel. “We want to make sure what we’re measuring is meaningful.”

Already, the Palmetto Health-USC Medical Group is realizing benefits from its HP relationship and the HP early adopter program that aims to prove the efficacy of immersive technology for increased patient engagement.

“We’re very surprised at how deep HP is reaching into healthcare with industry-specific PCs and monitors, 3D printing, and content security, and even research on specific medical treatments,” adds Patel. “I’ve not seen any other vendor hit this level of commitment.”

“To conduct field studies on human-computer interaction for patient education in a mobile setting, I need high-quality hardware that has the capabilities to facilitate this research,” adds Schooley. “What I like about HP devices is they incorporate the latest lightweight and innovative technologies for the mobile workforce and workflows.”

The team is impressed by the Patient Nexus content designed for clinics, hospitals, and cloud-based remote access before or after a medical procedure. They have found its visual approach with animation and diagrams to be extremely engaging and effective at promoting healthcare literacy.

## Customer at a glance

### Application

3D animated education content in clinical settings for improved patient engagement, clinician efficiency, and cost reduction

### Hardware

- HP EliteBook x360

### Software

- Visual Health Solutions Patient Nexus

“The 3D modeling of anatomy allows a physician or social worker to have better dialogs with patients, especially when using a touch-enabled tablet, drawing with a pen, or zooming into a diagram,” says Patel. “That’s true education.”

The HP EliteBook x360 thin, convertible PC combined with Patient Nexus animation provide a tool for patients to take ownership of their health. This includes the ongoing management of the small but impactful daily activities that result in preventative care and patient well-being.

“Education is extremely important because if you need patients to participate in their treatment, they’re more likely to do it if they understand what you’re asking and the consequences if they don’t,” adds Patel.

## Patient empowerment and healthcare literacy

“Previous studies in more controlled environments showed patients want relevant information at the point of care when they’re already focused on their health. So, it will be interesting to observe their interaction with this content in a more natural setting,” says Schooley.

Unfortunately, physicians don’t have much time to sit down with a patient and watch an eight-minute video. But with engaging content, educators and care coordinators can step in and take some of that responsibility. Furthermore, patients can consume the visual information on their own, turning the 45-minute average time spent in waiting rooms into a constructive learning episode.

In addition, push notifications of relevant, cloud-based education will provide patients with skills to better manage their health when and where they need. This will go a long way toward improving the healthcare delivery system.

“During breast cancer awareness week, we can send a message to ‘click here’ and schedule a mammogram or watch a video,” says Patel. “Or for smokers, we can ask if they’ve reached their daily goal to cut back on cigarettes.”

Animated video on mobile devices can help with pre-operative informed consent and other

industry compliance requirements. Content can extend to those taking care of patients at home.

“As a care coordinator, I get a lot of calls from families who want education,” adds Carol Waters, clinical social worker, Palmetto Health-USC Medical Group. “With this solution, they can get the same information and better help the patient, even if they’re not able to attend a visit.”

All involved in this research agree that a joint understanding of the diagnosis and treatment can lead to better patient engagement. And they all believe 3D animated education on state-of-the-art mobile devices can improve patient outcomes and help reinvent this component of the healthcare delivery system.

“We always want patients to increase their healthcare literacy and be empowered to make good decisions,” states Patel. “We want their care to be more accessible and personalized, and ultimately realize a better healthcare experience.” There is no question that this benefits everyone.

## Survey Results

Before the study commenced, staff used paper brochures as the primary means of educating patients 100 percent of the time. The staff felt most age groups could benefit from digital multimedia education content. Heart disease, diabetes, and hypertension were the diagnoses for which multimedia content was most helpful. Preliminary results indicate ninety-five percent (95%) of the patients felt the multimedia patient education content provided by the educator on a mobile device was helpful.

Sixty-five percent (65%) of the patients felt the content allowed them to feel much more capable of making medical decisions together with their physician and about the same percentage felt it allowed them to take much better care of themselves at home. Another thirty-five percent (35%) felt that it somewhat helped. Ninety-five percent (95%) of the patients felt that they were more likely to follow the directions of the physician.

Learn more at [hp.com/go/healthcare](http://hp.com/go/healthcare)

<sup>1</sup>As used in this case study, the term “outcome(s)” refers to behavioral objectives, including patient engagement, participation, comprehension, retention of information, adherence, compliance, and lifestyle change. It does not refer to the results, consequences, or efficacy of any particular treatment, medication, or healthcare regimen.

<sup>2</sup>“Aging in the United States,” Population Reference Bureau, January 2016, <http://www.prb.org/Publications/Media-Guides/2016/aging-unitedstates-fact-sheet.aspx>

<sup>3</sup>“Noncommunicable Diseases (NCD) Country Profiles, World Health Organization, 2014, [http://www.who.int/nmh/countries/usa\\_en.pdf](http://www.who.int/nmh/countries/usa_en.pdf)

<sup>4</sup>Non-communicable disease could cost \$47 trillion by 2030, Stanford University, March 2017, <https://publicpolicy.stanford.edu/news/non-communicable-disease-could-cost-47-trillion-2030>

HP provided the hardware and software to USC for the study.

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