Microsoft Surface

Telemedicine solution improves health outcomes by connecting remote patients with specialists

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—Stefano Migliorisi, CEO and Founder, swyMed

swyMed™

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10 employees

United States

Health

Since its beginning in 2013, Lexington, Massachusetts–based swyMed has been working to expand telemedicine care to places where it was previously unavailable. Its commitment to creating reliable and easy-to-use solutions has made swyMed a leader in the mobile video-based healthcare industry. When swyMed CEO Stefano Migliorisi needed a highly capable yet lightweight device for the swyMed digitally enabled telemedicine backpack, he turned to Microsoft Surface Pro. The success stories and physician feedback he hears validate that choice.

Microsoft

When a patient suffers a stroke in a remote setting, critical treatment time is often lost. But swyMed, a provider of mobile telemedicine solutions, is out to change that. By adapting high-end videoconferencing technology coupled with an ingenious communication protocol that constantly monitors and adapts to changes in 3G coverage, swyMed has created a way for specialists to evaluate the patient remotely and have treatment protocols in place as soon as the patient arrives at the hospital.

Timing is everything when strokes and brain injuries happen

Three to four and a half hours: According to standard guidelines, that's the maximum time from the onset of symptoms that a stroke victim has to receive treatment from a custom-mixed dose of the clot-busting drug tPA. The stakes are incredibly high. "A human being loses millions of brain cells every minute a stroke is left untreated," says Dr. Sherita Chapman Smith, Vascular Neurologist at Virginia Commonwealth University, who was recruited by the hospital for her expertise in telemedicine for stroke treatment.

Treating stroke victims is complicated. Stroke-like symptoms can have other causes, and there are risks related to tPA, such as bleeding. So potential stroke victims are carefully evaluated prior to starting treatment, an evaluation that takes time. "For all patients, but especially those from outlying areas," says Chapman Smith, "the neurological exam and CT scan plus transport time reduce the small treatment window that we have to treat patients successfully. Every minute counts."

"The whole goal is to have the best possible outcome. Better outcomes translate into lower costs for rehabilitation and can even eliminate nursing home and long-term disability costs."

—Dr. Sherita Chapman Smith, Neurologist, Virginia Commonwealth University Hospital

A mobile solution that leads to better decisions

Migliorisi originally set out to develop mobile videoconferencing technology for the business world. But after his nine-year-old son had a serious fall resulting in a traumatic brain injury, Migliorisi began to think about other uses for video. His son's life and normal brain function were saved because of the speed of the paramedics and the fortunate proximity of a hospital that had a pediatric ICU—rare in Italy where the family lived at the time. "I realized that who can see you, assess you, and administer the right treatment in time makes all the difference," he says.

After moving to the United States, Migliorisi saw how the interplay of low-population areas, highly specialized physicians in urban areas, and a low primary-care physician to patient ratio confuse the issue of where to send trauma patients. Whether patients should be transported via helicopter to a specialized medical center or sent by ambulance to a local hospital or another facility depends on many factors. On-the-spot evaluation is key to sending patients to the most appropriate facility and guaranteeing the best outcome.

Migliorisi had an idea: adapt videoconferencing technology supported by 3G connectivity to guarantee uninterrupted transmission from low-bandwidth settings. The solution could be used at hospital bedsides, in remote locations, and in the ambulance to bring specialized expertise to where and when it's most needed. That meant developing software to process video encounters in real time and securely transmitting the two-way communication from remote and often mobile environments without

interruption. With a team of experienced Microsoft Visual Studio developers on staff, his next step was obvious. "To bring our vision to life, we needed to combine the right hardware, software, and services," says Migliorisi. "Microsoft is a key partner for us, providing the components that we required to create our solution."

Using Visual Studio, the swyMed team built a videoconferencing solution for the Windows operating system that can be used on portable devices. The devices can be mounted in the back of ambulances and quickly detached to be taken into a home or accident site. Data is managed through cloud-hosted Microsoft Azure services.

But tricky questions needed rock-solid solutions—and low broadband in rural areas and the disparity in cell signal encountered by a speeding ambulance had to be addressed. Migliorisi entered into a partnership with Verizon and other providers to address the service component of the solution.

What was needed to complete the solution was a go-anywhere device—one with solid communication capacity, camera technology to relay the patient's condition in real time for physician evaluation, and a small, light form factor.

The right equipment to help save lives

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—Stefano Migliorisi, CEO and Founder, swyMed

Seeking a Windows device to put in the hands of physicians was a natural choice. "Even though we work with iOS and Android, we cannot do all the things we're doing on Windows within those other environments," says Migliorisi. His team decided on Microsoft Surface Pro: a lightweight, portable device with the graphical capability needed to stream video images in real time under fluctuating data transmission conditions. Its sensitive touchscreen is highly responsive, and diverse medical providers with varying degrees of computer expertise would find it intuitive to use.

With AC Wave 2 Wi-Fi connectivity, the Surface Pro is equipped to transmit even in the most challenging situations. "That's an important differentiator," says Migliorisi. "There aren't that many tablets that actually support AC Wave 2." The swyMed software monitors its surroundings to constantly locate and switch to the strongest signal.

EMT personnel and physicians appreciate the Surface Pro front-facing camera and 1080p HD video 8.0MP rear-facing autofocus camera. Many medical professionals find that the Surface Pro cameras are more convenient than others—manipulating the camera on the Surface Pro is much easier, as are viewing images and taking notes.

The final challenge was to find a way to coordinate hardware and software into a portable format that could be installed seamlessly into the back of an ambulance or carried into a home for instantaneous remote assessment. The swyMed team created a hands-free solution for EMT personnel: a digitally enabled telemedicine backpack equipped with not only drugs and medical equipment but also the components needed to conduct a reliable, ultra-quality telemedicine encounter. With antennas, digital scopes, redundant dual-modem connection, integrated speaker/microphone, and a ruggedized, sunlight-readable device equipped with an HD camera, EMT personnel are set to handle emergencies wherever connectivity is a challenge—even if they're in the middle of the wilderness for a search and rescue mission. swyMed tested various devices for ambulances and the telemedicine backpack, and decided to standardize on Surface Pro, mirroring the solution designed for specialists based in hospitals.

And, thanks to its 3G capability, Surface Pro devices can transmit from locations where Wi-Fi is not available. The extended battery life of the Surface Pro means it can stay

up and running for up to 15 hours of continuous use and five days of standby time, making it the ideal device for the swyMed telemedicine backpack.

The swyMed solution is HIPAA (Health Insurance Portability and Accountability Act) compliant and interfaces with all the major EHR (electronic health record) systems.

Low costs with high-end devices

For patients and the professionals who care for them, a successful outcome is paramount. And for Chapman Smith, the patient always comes first. "The whole goal is to have the best possible outcome," she says. "Better outcomes translate into lower costs for rehabilitation and can even eliminate nursing home and long-term disability costs."

When cost savings from the solution itself result in wider availability of that technology, everyone wins. Medical administrators have found that while the initial setup cost for competing solutions can be as much as $50,000 for one ambulance, the latest swyMed solution can be installed for about $12,500 per ambulance.

Migliorisi is pleased with swyMed's contribution to telemedicine. "I'm very conscious that we're enabling very smart and very innovative people to do things differently. We're pleased to help bring new ways to deliver medicine."

Hardware

Microsoft Surface Pro

Software and services

Microsoft Azure
Microsoft Visual Studio
Windows 10

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Document published August 2017