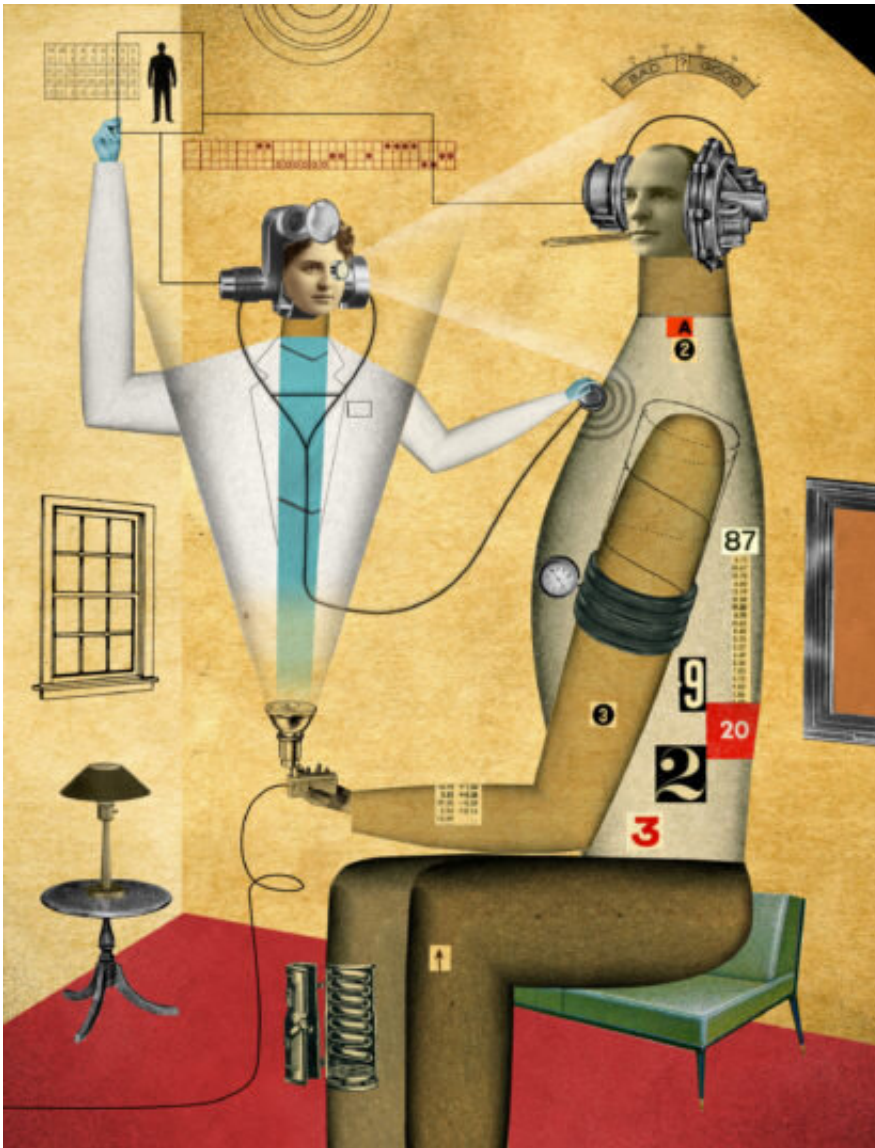


# Expect more virtual house calls from your doctor, thanks to telehealth revolution

October 7 2020, by Eric Lindberg

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Credit: David Plunkert

If you have serious lung disease, getting a [lung transplant](#) can add years to your life. It also adds a list of must-do tasks: getting regular tests, taking medication and visiting the doctor for checkups, all to keep the body from rejecting the new organ.

Even with strict regimens, though, the body's immune system can quietly start fighting the new lungs in ways a patient can't detect. But technology can. That's why experts at Keck Medicine of USC started sending lung transplant recipients home with devices that can spot signs of trouble. They collect vital stats like blood pressure and [heart rate](#) while also compiling data on how well the lungs are working, all of which is sent back to care providers in real time.

Patients can even report their symptoms each day, track their medications and schedule follow-up visits. Early results show patients who use the monitoring devices are 44% less likely to be readmitted to the hospital and spend 54% less time in the hospital if they do return.

"That's in no small part due to the fact that the daily check-ins allowed our caregivers to spot potential transplant rejections earlier than they normally would have by relying on in-person checkups alone," says Vaughn A. Starnes, Distinguished Professor and chair of the Department of Surgery at the Keck School of Medicine of USC.

That success story is one of many reasons Starnes and other USC health leaders see digital health technology as a gift to medicine. Another big reason: COVID-19.

Keck Medicine had been exploring digital technology approaches like virtual visits—known as telehealth or telemedicine—for several years. But the pandemic sent those efforts into overdrive.

"It certainly got everyone's attention," says Shawn Sheffield, Keck

Medicine's chief strategy officer. "Suddenly, everyone cared about telehealth."

Small pilot programs like the [lung transplant monitoring study](#) became the model for a massive [expansion of telehealth](#) across the health system. In a matter of weeks, Keck Medicine shifted from only a dozen or so telehealth checkups to 1,000 virtual visits a day under stay-at-home orders as COVID-19 cases spread throughout Southern California in mid-March.

Those virtual visits helped preserve critical protective equipment for doctors, nurses and other [health workers](#) treating patients with COVID-19 or other major health issues in person, says Smitha Ravipudi, CEO of USC Care, the clinical practice of Keck Medicine. But even by late summer, as equipment supplies stabilized and more patients began returning to the hospital under rigorous screening and disinfection protocols, telehealth at Keck Medicine remained strong—holding steady at 800 patient visits a day.

"This crisis has done so much to change the world, and obviously not much of it is favorable," Ravipudi says. "But there are a few things that organizations and people have benefited from, and one of the key areas is this shift to virtual care. Telehealth is absolutely going to be part of our ongoing strategy to make sure we are there for our consumers and they have a convenient, easy and accessible platform to connect with us remotely."

## **Ramping up the Digital Revolution**

Keck Medicine's experience parallels a [broader movement toward telehealth](#) amid COVID-19. In 2019, only 11% of U.S. health care consumers opted for online services like video chatting with doctors or having checkups remotely. That number jumped to 46% by the end of

May, according to an industry report. And 76% of U.S. patients now say they are interested in virtual visits.

Although safety is the primary concern during the COVID-19 era, Sheffield says health care workers and patients alike also recognize the convenience of telehealth.

In a survey of 187 USC doctors, 70% had never considered virtual visits before the pandemic. "Now 90% of them said they would absolutely continue delivering telehealth, even if social distancing rules are relaxed," she says. "That speaks to the broad adoption by our physicians. They like it, our patients like it. In some cases, there won't be a replacement for face-to-face care. But any visits that can be digitalized, we plan to do that, and we think it actually enhances the patient experience."

Sheffield sees virtual visits as only one promising aspect of the digital revolution in health care. Remote monitoring of patients like those in the [lung transplant](#) study is likely to grow in the coming years. Instead of coming to Keck Medicine, patients could stay in their local hospitals and clinics or at home and still be under the care of USC experts.

Technology also helps patients and loved ones stay in touch, especially during COVID-19. With strict limits on visitors to reduce the risk of spreading the virus, USC's hospitals and clinics began [providing digital tablets](#) to patients so they could talk with family members and friends.

As co-chair of Keck Medicine's Digital Health Task Force, Sheffield is looking beyond the walls of the hospital to other collaborators across the university—from engineers and social workers to filmmakers and computer scientists. She envisions major advances in areas like [wearable technology](#) that might track vital signs and send alerts to the care team if a user's results are outside the normal range.

"The creativity and intellectual capital coming together across the university is a big strength," she says. "With this growing emphasis on digital health, there's a great opportunity to knit together those strengths and come up with something fantastic."

## **Finetuning the Future of Telehealth**

Health care's embrace of digital technology and virtual visits—by both patients and health workers—came through necessity during the pandemic. Ravipudi acknowledges that the rush to adopt strategies like telehealth left room for improvement.

Technical issues with the platform used for virtual appointments still need to be ironed out. How patients check in and move through the daily workflow of busy doctors and nurses could be more efficient. That feedback from the front lines will guide how Keck Medicine adjusts its digital health offerings moving forward.

"I'm so proud of how our providers and staff came together to pull this off basically overnight," Ravipudi says. "Now we have an opportunity to take a breath and really be strategic in our actions as we weave this new approach to care into our fabric."

Despite the technical hiccups and learning curve, Starnes sees the promise of innovations like telehealth. During his virtual visits, the heart surgeon likes how his patients can speak with their whole care team at once and ask questions. They go over imaging results together, and Starnes can focus his full attention on his patients' appearance and mood.

He also worries that people might avoid a health care visit for what they view as a minor issue. The troublesome phenomenon became heightened during the pandemic, partly because people didn't want to use valuable health resources when others seemingly had much greater need. Starnes

says telehealth visits can reduce that concern about seeking care and encourage patients to take ownership of their health.

"The COVID-19 pandemic has brought a host of challenges to medical centers," he says. "But some of the necessary innovations will become long-run blessings. I believe that the discovery and use of telehealth's full potential will be one of them."

## **Tech Support**

Virtual visits with a doctor or nurse through a telehealth platform increased dramatically during COVID-19 to protect both patients and health workers. But [telehealth](#) is only one aspect of a broader shift toward high-tech innovations in health care. Here are a few other technologies USC is developing to embrace the digital health revolution.

## **SimSensei**

Using artificial intelligence, "virtual humans" interact with patients and collect data on facial expressions, body language and tone of voice. That information is then analyzed for signs of distress like depression and PTSD. This [collaborative project](#) involves the USC Institute for Creative Technologies, the U.S. Department of Defense and the Defense Advanced Research Projects Agency.

## **Monitoring Marines**

A mobile app paired with smartwatches gives medical experts a window into the [health](#) of U.S. Marines. The USC Center for Body Computing recently [tested the tech](#) with 115 Marines, collecting data on indicators like heart rate, sleep, hydration and emotional resilience. One key goal: to reduce the dropout rate from rigorous reconnaissance training.

## SmartSox

These [high-tech socks](#) use sensors and fiber optics to detect when people with diabetes start to develop foot ulcers. The Southwestern Academic Limb Salvage Alliance, which is based at the Keck School of Medicine, already has prototypes.

Provided by University of Southern California

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