

At CES 2018, Digital Health Took Center Stage

By Ben Algaze on January 13, 2018 at 10:31 am



LAS VEGAS — Unless you've been living under a rock, or are perhaps a company executive or a member of Congress with a gold-plated, fully paid-for insurance plan, you know healthcare costs in the United States have skyrocketed in the past 30 years. The issue, which has been politically charged with the recent moves to defang the Affordable Care Act, is not just about insurance costs. High health insurance premiums simply reflect a complex health care system that has seen little significant structural change to reduce costs or new business models, or to use a favored word in tech, disruption. But we know technology has caused significant disruption in a host of industries. Healthcare is ripe for innovations that enable that disruption.

At we saw at CES 2018, small and large companies are taking advantage of consumer technology to enable new models and empower people to monitor and manage their health and wellness. Here are our favorites looking to shake up the status quo in several areas.

Sleep

Sleep is an important factor in maintaining good health, and recent research suggests lack of sleep (or “quality sleep”) can result in many things from weight gain to premature aging — besides just feeling perpetually tired. Wearables like Fitbit, along with other bands and smartwatches, already have apps to track sleep based on movement, heart rate, and breathing patterns, but not everyone wants to wear a band to sleep. The new trend is to use “contactless” devices that you can place near you or in your bed to track and monitor your sleep.

To that end, a couple of new devices take different approaches. Nokia Sleep is a pad that is placed under your mattress, and deploys sensors and a mobile app to track heart rate, breathing patterns, and snoring. Algorithms make sense of the sensor data to give you a sleep score, and estimate how much REM sleep you get. As a plus, the device can be integrated with the IFTTT service to tie into home automation scenarios, as in turning thermostats up or down, and lights on and off depending on your sleep and waking preferences.

SleepScore Max (from startup SleepScore labs) is also a contactless solution, but employs a device that sits on a nightstand and looks a bit like a Bluetooth speaker. The companion app asks some questions about alcohol and caffeine consumption to gain more insight into variables that can affect sleep. Then the device uses bio movement analysis (similar to echolocation) to determine quantity and quality of sleep, as well as monitoring environmental factors like temperature. It aggregates that into a numerical sleep score as well as analysis of quality of sleep and phases. The company also aims to improve sleep patterns by curating and recommending products around lighting, pillows, and sound therapy based on the individual's personal sleep data.

UV Exposure

Laroche-Posay's UV Sense is a battery free UV sensor that can track your UV exposure. It communicates with a companion iOS or Android app via NFC, and uniquely is also powered by NFC. This is one of several digital projects emerging from L'Oreal's (yes, the beauty giant) technology incubator. The device is less than 2mm in width and 9mm in diameter, and can be stuck on the wristband of a wearable. Able to hold three months of UV exposure data at a time, it's reusable and the adhesive can be stuck on most any exposed part of the wearer. UV exposure can affect aging as well as skin cancer, and few people actually think about how much time they're exposed or what levels are harmful. This device can shed light on that (pun intended). In the future, I could see the technology integrated into a smartwatch or fitness band, or even hats or clothing.

Vision

Vision issues and the need for correction is typically something that people go to a professional for evaluation. The EyeQue Insight Insight is a mobile app and hardware viewer set that aims to enable people to test their own vision. While regulations vary in different countries and you still need a prescription in the US to get contacts or eyeglasses, EyeQue can help you determine if you have an issue with your vision, if your current prescription is okay, or whether you need that visit to a professional.

The app administers the typical vision test usually done in an office using a viewer you attach to your smartphone. The company notes that there are millions of people in the world with easier access to a smartphone than an eye care professional, so the solution can help detect problems with children's eyesight or other people for whom access to a vision test is not an easy or cheap proposition. For older people, this type of test can also determine what type of reading glasses they might require. Magnified reading glasses don't require prescriptions, and this type of vision test that you can do as many times as you like, as opposed to once a year or every few years, empowers people to monitor their vision health and know when they might need to seek help.

Hearing

Similar to vision, people with hearing issues typically will be referred to an audiologist for testing. Again, regulations vary as to medical devices that assist with hearing. In the US, the FDA recently announced it would enable people over 18 years of age to sign a waiver that they don't need a medical evaluation to purchase a hearing aid. Hearing aids are expensive, partly because of the technology they employ, but also because of the audiologist channels they are sold through. As in eyeglasses, e-commerce capabilities and the ability to deliver information and service over the internet has the ability to squeeze cost out of the business.



Eargo Hearing Aid

Eargo is one of several companies looking to upend the traditional hearing aid business. A well-funded Silicon Valley startup, it's making hearing aids using some fiber materials that offer a unique fit and nearly invisible look for the wearer. They're rechargeable and packaged similarly to high-end audio earbuds. Part of their innovation is to have trained audiologists on staff, and a process where the customer answers some questions about their hearing issues. The professionals help determine whether you need a hearing aid, and the device is already tuned, charged, and ready to use when delivered. Unlike other hearing aids, there is not much tuning to do on Eargo other than some adjustments users can do with simple taps on the ear. While designed for mild-to-moderate hearing loss and not severe cases, Eargo is looking to bring restored hearing to a large number of people with reduced complexity and cost.

Diabetes

DiabiLive is a mobile and web application that will enable people living with diabetes to better monitor and manage their care. There are a number of glucose-monitoring devices and solutions, but one difficult aspect of managing insulin dosage is activity and caloric intake as well as glycemic levels. The app takes all that data into account into calculating the right insulin dosage, as the dosage can be hard to manage. Aside from that, the app has opt-in capabilities to join a community of users around the world, so others can share their experiences and help each other.

IV Leakage

Moving into areas of technology applied to professional medical services, ivWatch is a company that has spent 15 years perfecting a solution to a big problem with intravenous infiltrations. IV infiltrations and extravasations — IVs leaking outside of veins — can cause moderate to severe issues, from infections to phlebitis and tissue necrosis. It's a common problem with people who are on constant IVs, especially cancer patients on immunotherapy. Typically, it's up to nurses to monitor IVs and ensure that infiltrations are caught early and stopped. IvWatch's device, costing about \$3,000, employs sensors that use near-infrared light to detect changes in the optical properties of tissue near the IV insertion point. The device is currently in clinical testing, and is demonstrating a high degree of sensitivity in detecting infiltrations. If a problem is detected, it can monitor the nurse so that it's addressed early before any serious symptoms occur.

Medical Training

Virtual reality continues to advance given rapid increases in graphics computing power and the design of headsets and peripherals. While many of us might think of the technology for gaming and immersive entertainment, SimforHealth is a French company that has designs immersive VR training solutions medical training. I had the opportunity to experience the simulation at HTC Vive's suite at CES, and it was illuminating. The simulation had the intern making an incision on a patient on an operating table, locating a vein, and placing a catheter in the vein, while using an ultrasound monitor that helps identify the vein. Then I tried it; while the virtual patient bled to death many times over with my bumbling hands, the creators explained to me the simulation teaches the process of the procedure in a realistic, immersive way without risk, preparing the students for the pressures of the real environment.

Motion Sickness

For people who get nauseated easily from motion sickness, Reliefband Technologies is offering a drug free way to get relief. The device is a wristband that users can wear to counter nausea and vomiting symptoms from motion sickness, morning sickness, chemotherapy, and VR activities. The technology behind it is neuromodulation, which has been around for 15 years and is endorsed by healthcare professionals. A metal conductor in the band emits programmed pulses with highly specific waveforms, frequency, and intensity to modulate the median nerve on the underside of the wrist. This stimulation of the nerves uses the body's natural neural pathways to block the waves of nausea produced by the stomach.



Reliefband 2.0

Cannabis

Finally, for something a bit different in the wellness department, Oblend is making a device aiming to be the “world’s first home dispensary.” The device allows the user to make their own cannabis-infused massage oils, culinary oils, herbal drinks additives, and tinctures. The device links to an app that can also recommend recipes. The business model is somewhat like a Nespresso or Sodastream machine, where you buy a product that takes a proprietary packaging of the supply. Oblend will sell supplies of pods like oils and herbals for blending, but the customer supplies the cannabis. As 18 states have laws on the books regarding specifics about the legality of CBD, the main ingredient of medical cannabis products, perhaps this is a market ready to go higher.