ALEXA, CAN YOU TRANSFORM HEALTHCARE?

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These are the now-familiar "wake words" that we use to interact with our digital assistants and an ever-growing number of smart speakers. Chances are you have even interacted with one or more of these devices today. According to Allied Market Research, the smart speaker market is expected to reach $23.3 billion by 2025. A recent report states that last year's smart speaker shipments reached 92 million.

Speech is one of the things that makes us human, and for most of us, our voices are our primary method of communication. In healthcare, we use our voices to describe our symptoms, ask questions, and seek advice.

Voice-user interfaces (VUI) and smart speaker technologies offer a new frontier for healthcare. But just what are these "smart speakers," how do we interact with them, and what are the implications for managed care that guide us?

Voice User Interface

The dynamic loudspeaker—or speaker, for short—has been around for a long time. According to the Edison Tech Center, the electronic speaker that we know today was first built in the '20s. However, speakers that we can talk to, and that can talk back to us, is something pretty new. Thanks to modern voice assistants, you can get a smart speaker that won't just play music but will practically do whatever you tell it to. The term "smart speaker" trivializes the technology. According to *Forbes*, the real power behind the smart speaker technology "is not in the speaker, but in the cloud-based technology that powers the device." And the interaction between us and the digital assistant is all driven by our voice, through voice-user interface.

The VUI makes spoken human interaction with computers possible, using speech recognition to understand spoken commands and answer questions. Spoken commands, also known as "intents," are the primary way of interacting with virtual digital assistants on smartphones and smart speakers. VUI has been called the latest disruptive technology. Smart speakers and VUIs such as Amazon Alexa, Google Home, Apple Siri, and Microsoft Cortana are changing the way we relate to our digital devices—and the world in general. It seems like Amazon is, once again, the leader in a market. According to a report by Voicebot.ai, it is leading the U.S. market with 61%, followed by Google at 24%, and the other smart speaker manufacturers sharing the remaining 15%.

Amazon's Alexa VUI is available on more than 100 million devices from Amazon and third-party device manufacturers. With Alexa, you can build natural voice experiences, called "skills," that offer customers a more intuitive way to interact with the technology they use every day.

Now Amazon is making significant inroads into healthcare—or at least getting ready to. One significant milestone, as of April 2019, is that Amazon Alexa skills can now be compliant with Health Insurance Portability and Accountability Act (HIPAA). This is important, because developers of Amazon Alexa skills can meet the rules and requirements that govern how sensitive health information is transmitted and received if they follow the HIPAA guidelines. None of the other smart speaker and digital assistant vendors can make this claim as of yet.

VUI in Healthcare Settings

Hospitals and long-term care facilities are beginning to explore—cautiously by way of various pilot projects— how VUI technology might be used.

Cedars-Sinai Medical Center in Los Angeles ran a pilot that placed Amazon Echos in more than 100 patient rooms. The smart speakers use a voice assistant platform for healthcare, Aiva, and is intended to help patients communicate with their caregivers. After a patient tells Alexa what they need, Aiva routes it to the right person's mobile phone. For example, if someone needs medicine, her request goes to a registered nurse. If a response takes too long, Aiva reroutes the request "up the chain of command."

The New Jewish Home in Mamaroneck, New York, rolled out a pilot version of a virtual assistant program. The goal was to reduce the barriers to using technology for the residents. Administrators are already planning to expand the program beyond the initial group of about 40 participants.

In Bridgewater, New Jersey, Laurel Circle is an assisted living community where they are providing the Amazon Echo Show to their independent living residents. These residents can use the various Alexa skills to learn about the day's activities, community announcements, and information about meals for the next 30 days which is displayed on a screen. Amazon Echo Show can also be used for video calling and messaging.

VUI in these settings can be utilized to remind a patient to take their medication at a specific time and report if they are not adherent to treatment. These voice services can also be beneficial in supporting aging in place. "Older adults have often been on the fringe of benefiting from technology," noted an article titled "Voice-Controlled Intelligent Personal Assistants to Support Aging in Place," in the October 2019 issue of the *Journal of the American Geriatrics Society*. The article mentions five major areas in which older adults can benefit from voice-enabled technologies: entertainment, companionship, control of the home, reminders and emergency communication.

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Pharma and VUI

Big Pharma is also getting into the development of Alexa skills. Companies such as AstraZeneca, Bayer, Merck, Novo Nordisk, Pfizer, and Sanofi have all developed Alexa skills that do everything from provide flash briefings to report company news to help patients manage their diabetes. It is this latest support that will most impact patient outcomes and may provide an avenue to educate patients.

Because VUI can collect information, analyze it, and send back directions in a third of the time it takes to type and get a response; it can improve the flow of accurate, question-answering information—and do so in a way that is more natural and intuitive for most people. This capability means VUI lends itself to product-specific applications such as the "beyond the pill" marketing efforts by drugmakers and device companies. As a result, when assessing placement of specific pharmaceuticals in preferred positions on formularies, these specific VUI offerings may result in a positive position for these products.

Overall, VUI promises to improve patient education and interactions within our healthcare system. Additional applications in the next few years that should be able to better achieve the Quadruple Aim—Improving Patient Experience, Better Outcomes, Lower Costs, and Improved Clinician Experience.

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