The Scottsdale Institute convened 24 chief medical informatics officers (CMIOs) for a virtual roundtable on August 20, 2020. These leaders gathered to discuss the current technologies and use cases of voice and speech technologies and their ability to help merge the historically siloed verticals of documentation, clinical documentation improvement (CDI), utilization management, case management and billing coding, and enable these combined functions to be more clinically driven. The group also reviewed and discussed the results of two surveys about CMIO application of and investment in ambient intelligent listening, measured pre-COVID and post-COVID.
PROMISE OF EFFICIENCY WITH AMBIENT INTELLIGENT LISTENING

Voice technologies and ambient intelligence hold promise for improvements and efficiencies in the clinical workflow, and over the past few years a variety of vendors and services have emerged both from within and outside of healthcare. To explore the state of the science, adoption and success of these technologies in the real world healthcare setting, the Scottsdale Institute surveyed its CMIO members to understand their organizations’ objectives and activities. The survey was fielded in early March 2020 prior to the COVID-19 outbreak in the United States with responses from 10 CMIOs from 10 different organizations, with a follow-up survey fielded in July 2020 to measure how goals and perceptions had evolved in the wake of the disease onslaught, which had responses from 15 CMIOs from 14 different organizations. Then, on August 20, 2020, 24 CMIOs convened for a virtual roundtable to discuss the findings and share their experience of the current state of speech and voice technologies in clinical care and the opportunity they project for the future. The roundtable discussion was moderated by Qammer Bokhari, MD from AdventHealth and Jeffrey Rose, MD from Hearst Health.

ROUNDTABLE PARTICIPANTS

Vic Becker, MD, VP & CHIO, Trinity Health
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GOALS AND SOURCES OF VOICE-ENABLED TECHNOLOGIES

An ambient intelligent-listening device leverages artificial intelligence (AI) to listen to doctor-patient conversations and automatically transcribe content. The survey of CMIOs in March 2020 offered insight into how this technology is currently used in hospitals. The types of voice-enabled technologies currently in use come from three vendor categories: healthcare vendors with existing EHR-integrated solutions; tech giants outside healthcare that offer listening devices; and startups or new entrants offering third-party apps. Hospitals and health systems work with these vendors to use ambient-listening devices to drive efficiencies, either clinically or in other ways. Potential clinical efficiencies from ambient intelligent listening include transcription of notes, instructions, problems or diagnoses, orders or other content fed into the electronic health record (EHR). Example use cases of other, non-clinical, efficiencies to be gained include listening devices in hospital patient rooms or conversational AI chatbots for patient communication.

Most organizations surveyed (80 percent) are not yet using ambient-listening devices to provide clinical efficiencies, and those that do generally work with vendors associated with EHR-integrated solutions versus with startups or with tech giants. Similarly, most organizations (78 percent) are not using ambient-listening devices to provide other types of efficiencies, and those that do are working with solutions from tech giants, versus startups or vendors with EHR-integrated solutions.

Notably, even with the availability of more robust technologies, traditional note-support methods—which are not enabled by advanced technology—such as scribes and phone dictation, are still widely in use (90 percent to 100 percent). Electronic dictation methods using a mobile app or computer microphone are also very prevalent (80 percent to 90 percent).

The most common goals for using voice technology are to improve workflow efficiency while decreasing clinician-documentation burden, and to improve the accuracy of the documentation. The greatest barrier to adoption of voice-enabled technologies is too many competing priorities.

**Primary Goals**

Q8 What are your organization’s primary goals in using voice technology? (Please select two)
ADOPTION OF VOICE RECOGNITION AND SPEECH RECOGNITION

To better understand the landscape and adoption of available technologies, Qammer Bokhari, MD offered some organizing principles and shared examples from the journey at AdventHealth. “Voice is the universe, and speech is the galaxy,” he described to the August 20 roundtable participants. Speech technologies use natural language processing (NLP) for a clinical use case, and voice technologies go beyond NLP to include ambient intelligence. In the past three to five years, the role of AI and machine learning (ML) in speech recognition has been transformative, with a reduction of medical transcription and even elimination of transcription at certain facilities. Bokhari also explained that, while voice and speech technology is in high demand among clinicians, including occupational therapy, physical therapy and behavioral health, it is not for everyone, with variability in demand based on the provider’s age.

At AdventHealth, Bokhari and his colleagues view voice technologies as a way to impact five verticals of healthcare operations that have traditionally been siloed and not always clinically driven: documentation, clinical documentation improvement (CDI), utilization management, case management and billing-related coding.

ADVENTHEALTH’S JOURNEY

Bokhari undertook a CDI initiative that was not focused on billing coding, but instead focused on providing documentation that was clinically accurate, complete and available in a timely manner, captured while the patient is being seen by the provider. AdventHealth’s philosophy is “Documentation by Exception,” meaning that documentation should be initiated for physicians by a template or a scribe, which is then voice-modified as appropriate. Their voice-tech initiative, which aimed to accommodate physicians who are very fast at the keyboard as well as those who prefer speech, was in high demand. They initially targeted high-volume physicians and provided them voice technology and templates.

It soon became clear that this initiative had the opportunity to drive improvements by combining the five verticals with a clinical focus. They implemented nudges—not alerts—to suggest how to add documentation, and today and over the next two to five years are working to merge the functions of documentation, CDI and billing coding. “No vendors are serving all five verticals—instead there is a best-in-class in each one,” Bokhari noted in describing why such horizontal integration must currently come from internal operations and clinical vision versus a single technology platform.

ADOPTION

Roundtable participants agreed with the organizing principles and shared their current levels of adoption. “For the past 24 to 36 months we have been investing in this,” said Nicholas Desai, MD. “The five verticals to merge are spot on, and similarly we are currently combining efforts in the three verticals of documentation, CDI and coding.”

“No vendors are serving all five verticals—instead there is a best-in-class in each one.”

– Qammer Bokhari, MD, VP & CIO, AdventHealth
“I agree with the tenets of this conversation, and with trying to use people’s habits to drive efficiencies. There is potential to use ML to drive efficiencies as well,” said Jeff Sunshine, MD. The participants also considered how different practice areas may benefit from these applications in different ways. “It is valid to think about how the OR, cath lab and ED could leverage voice, and what is the right thing to do in each of these places,” said Matt Sullivan, MD. Francis Chan, MD added, “We are working with traditional people, processes and technology, but making progress in this area is really about alignment of incentives to optimize resources.”

“The five verticals to merge are spot on, and similarly we are currently combining efforts in the three verticals of documentation, CDI and coding.”

– S. Nicholas Desai, MD, CMIO, Houston Methodist

TECHNOLOGY OF CHOICE

Jeff Rose, MD asked whether a clear technology winner will emerge as the leader in voice technology across the five verticals, and the group agreed it was too early to tell. “We will see a clear winner in 10 years but cannot call it today,” Michael Ross, MD said. “Right now it is pretty hard to beat a person doing this stuff. A well-trained scribe will do better than technologies.” Desai added that it can depend on the venue of care. He described how their ED physicians used in-person scribes and resisted digital scribes, but once the nurse practitioners optimized their templates and coupled them with voice tech, the ED physicians loved it. “This is more about change management and finding the right audience,” he said.

“CMIOs are the ones who see the need for merging the five verticals to be clinically driven,” said Bokhari. “We need to demand that these are integrated; we cannot keep them siloed.” He added that much investment is being made against these operations over the next two years, and there is a need to involve change management.

Added Chan: “There seem to be plenty of optimization opportunities using existing tech and contracts. New ones must provide enough value beyond the current state to justify investing.” The cost of technology should also be weighed against personnel costs. “We need to assess the value
of the CDI specialist versus the new technology to justify the investment,” said Howard Goldberg, MD. Sullivan commented that it can often be difficult to address the topic of a hard return on investment for reducing full-time equivalent employees. “There is an opportunity to help with physician burnout, but what is the cost?” he asked.

**ADAPTING IN THE COVID-19 ERA**

Response to the COVID-19 pandemic, beginning in mid-March of 2020, dramatically impacted healthcare delivery and priorities. However, that response has not adversely impacted investment in voice recognition/EMR integration, with 57 percent of CMIOs in the July 2020 survey reporting that investment has stayed the same and 29 percent reporting that investment has increased. The stability of this projected investment could be attributed to several factors. “Those who were stable on their EMR are able to increase their investment in this area,” said James Schweigert, MD. Sullivan added, “We may not know yet what COVID’s impact on the bottom line is,” so it is possible an investment impact could be seen in the medium term.

The July survey also showed that telehealth expansion during COVID-19 has impacted clinical informatics priorities, and 79 percent of CMIOs report that it has accelerated standardized workflows and documentation templates. “Before the pandemic, these were a ‘nice to have.’ Now, standard workflows are essential. Clinicians have been forced to learn new workflows, and it is becoming more normal,” explained Desai. “In fact, many of our clinics would like to retain virtual care as part of their practice on an ongoing basis.”

Rapidly adapting systems to maintain the new standard workflows brought about new best practices for managing development. “We prioritized all things COVID to get features into the system, shut down other changes, and are using Agile for all EHR-related projects to be more efficient,” said Alan Weiss, MD. “We have seen some incredible innovation with COVID.” Many others in the group shared this experience.

**VIRTUAL IS HERE TO STAY**

Virtual care and a hospital-at-home model are expected to mature and be widely implemented in the United States. In the July survey, 50 percent of CMIOs said they anticipate longer-term investment in virtual health as a result of the COVID-19 experience; 25 percent of CMIOs expect longer-term investment in remote patient monitoring, chatbots and mobile technologies.

“We used to expect the patient to come to us, and now we see there are more ways that we can come to them,” said Bokhari. “We can use voice up front and run AI in the background to start the documentation before the patient even shows up.”

“We need to assess the value of the CDI specialist versus the new technology to justify the investment.”

– Howard Goldberg, MD, CMIO, Baystate Health
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