In the KNOW

Upgrade your grasp on artificial intelligence in the medical practice

By Brian Justice

The technology behind artificial intelligence (AI) is proceeding at a blinding pace and is undeniably complex. Still, the actual definition is quite simple: AI is an area of computer science that emphasizes the creation of intelligent machines that work and react like humans.[1] Common uses of AI now include speech recognition, learning, planning, and problem-solving.[1]

Already AI has a profound impact on almost every aspect of daily life, including health care. In fact, the market for AI in health care is expected to go from $2.1 billion in 2018 to $36.1 billion by 2025.[2] Moreover, AI is recognized for holding great potential in several particular areas[3]:

- Robotic surgery
- Virtual nursing assistants
- Clinical judgment and diagnosis
- Image analysis

Meanwhile, AI is also being used by practice managers in medical practices across the country on a more micro, everyday level.

AI on the rise

"I think that when most people think of AI in health care, they envision a robot that can assist in the surgical setting," says Gary Mangiofico, PhD, executive professor of organizational theory and management and academic director at Pepperdine Graziadio Business School. "But clinical care is delivered by humans. There is a pressing need to simplify and automate office functions, such as preauthorization to patient registration, coding and clinician documentation, and unadjudicated claims and resolutions. AI can make [these tasks] easier, faster, and more accurate."

Accuracy of electronic health records (EHRs) has been greatly affected by AI, according to Nicole Stice, CMA (AAMA), medical assistant and facilitator for the Hospital Sisters Health System (HSHS) Medical Group in Springfield, Illinois. "Technology has really helped streamline the patient experience," she says. "We can request records from another facility that uses another system, but we are at the mercy of how quickly other medical groups release those records. It can be hard to interface with the different EHR [systems] out there, but I do see it getting better."

Stice divides her time between several clinics, and autopopulated EHRs have made her job easier and more efficient. "I can log in from anywhere and access dosage calculations and other information that [the AI] learned from my activities, and I love that."

Patients can improve their health care by also using AI technology, suggests Tracy Smith, PCMH CCE, patient-centered medical home (PCMH) project coordinator for Rural Medical Services Inc. in Newport, Tennessee. Staff use AI to manage a diverse patient population that varies widely in age, literacy, and socioeconomic levels.

"Two of our clinics, in particular, serve aging populations with limited resources, chronic conditions, [and an inability] to travel," she says. Wearable devices offer solutions to both clinicians and patients. "Glucometers that communicate with patients' smartphones alleviate the need for frequent clinical visits [to monitor glucose]. Continuous monitoring allows our physicians to adjust treatment quickly for better patient outcomes and relieves

pressure on staff, especially when managing diabetes patients with comorbidities like dementia or Alzheimer disease."

Patients making appointments or arriving at a clinic may also find AI useful. For example, patients can check in through a smartphone or a tablet provided by the office. "We've seen this improve responses to questions that are necessary but may seem intrusive or offensive, such as the social determinant, sexual orientation, and even depression questionnaires," Smith says. "Eliminating the human aspect increases the potential for honest answers, allowing us to provide interventions and resources to meet patient needs and improve outcomes."

Getting with the program

Raj Toleti, cofounder and past CEO of HealthGrid (now FollowMyHealth), has been deeply involved in health care technology—AI specifically—for some time. He was instrumental in developing online bill paying for health care and one of the first tablet-based registration systems. Now a senior vice president and general manager for Allscripts, which acquired HealthGrid, he specializes in patient engagement and health care information technology (IT). "AI technologies are already prevalent and increasingly relevant within the health care sector," Toleti says. "Most people might not even realize that they're using them, but they are."

Toleti concentrates on more efficient scheduling through AI. Scheduling-based AI reduces no-shows: automated messaging sent a couple of days in advance to confirm appointments can also include options for canceling and rescheduling. "[The AI] can even infer, over time, what time of day is more likely to elicit a response from the patient and even detect language usage traits," Toleti explains.

Another application of AI tackles a significant concern that has developed as the nature and pace of health care delivery have evolved: burnout. "AI should do the heavy lifting of finding relevant histories,

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What's in store—or in the cloud—for the future?

Over time, artificial intelligence (AI) will only become more prevalent within health care, especially in organizational, clinical, and ambulatory care settings. The U.S. Food and Drug Administration has approved software for various purposes[5]:

- Screening patients for diabetic retinopathy without the need for a second opinion
- Analyzing computed tomography (CT) scans and notifying providers which patients are at a high risk for stroke
- Analyzing cardiac images stored in the cloud
- Spotting liver and lung lesions for cancer diagnostics

A panel on AI at the 2018 World Medical Innovation Forum produced a list of areas where AI shows the most promise[6]:

- Expanding access to care in underserved or developing regions
- Integrating and streamlining electronic health records (EHRs) further
- Containing the risks of antibiotic resistance
- Creating more precise analytics for imaging
- Turning EHRs into reliable risk predictors
- Expanding use of smartphones in diagnostics
- Revolutionizing bedside clinical decision-making

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test results, and [other] information and then making [all that information] accessible in a clinical context," says Dr. Mangiofico. "This should be paired with a real-time, voice-activated assistant that intuitively seeks out additional and relevant information that the physician needs, coupled with AI-fueled documentation services to capture the visit."

While this technology progresses, patients' opinions on the development of AI in health care provide useful insight to researchers, IT professionals, software designers, and health care providers. A 2018 poll asked respondents whether they would consider receiving medical advice via AI in a health care setting.[4] Of the 1,257 respondents, 35% said yes, and 40% said no. The remaining 25% of respondents were unsure, because of unfamiliarity with AI and its role in health care.[4] Concerns from people who would *not* consider receiving advice from AI included doubt about AI's ability to fully understand human emotion, stress, and pain[4]—a point not lost on Dr. Mangiofico. "AI is not meant to replace humans," he says. "[But] it can help

[health care professionals] make care delivery easier and more accurate." ✦

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