

Hospitals Utilize Artificial Intelligence to Treat Patients

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Health care providers are getting into the artificial intelligence game, and the technology is being used in myriad ways.

Just six months after [El Camino Hospital](#) in Silicon Valley implemented artificial intelligence technology, the rate at which patients suffered dangerous falls dropped 39 percent. The key, alongside additional fall prevention strategies, was a software program that predicts which individuals are most likely to fall by combing over [electronic health records](#) for risk factors and merging the data discovered there with real-time tracking of patients.

"Every time a patient pushes a call light or hits a bathroom or bed alarm, it's recorded," says Cheryl Reinking, chief nursing officer at El Camino. The software takes that information and compares the rate at which a patient is requesting assistance to data such as what surgeries he's had or which medications have been prescribed.

These data are all processed through "machine learning" – a form of artificial intelligence whereby computers take in new information and perform tasks based on it without being reprogrammed to do so. In this case, the program "learns" if a person may be more likely to fall based on his behavior and treatments. "Then it pushes an alert to the nurse saying 'your patient in room 2308 is at risk right now for falling,'" Reinking says, after which that individual might be moved closer to the nursing station or monitored via video.

The ability of computer systems to assume tasks for humans has improved efficiency in virtually every industry, from manufacturing to transportation. Now hospitals are getting into the game, deploying AI to take on challenges from diagnosing patients more quickly in the emergency room and streamlining communication between doctors to lessening the risk of complications so patients can go home sooner – and avoid being readmitted.

One big way in which patients will benefit directly is in AI's ability to help clinicians make diagnoses. IBM brought AI into the mainstream of medical care a few years back, when it offered its "Jeopardy!"-winning system Watson to cancer centers to help oncologists determine the best treatments for patients. Physicians can now plug patient diagnoses into IBM's Watson for Oncology and instantly receive treatment recommendations based on patient data and information pulled from reams of medical journal articles.

Since Watson's initial baby steps, AI has quickly demonstrated its potential to be a game-changer in many areas of health care. Other technology developers, for example, are focusing on software that can read CT scans and other medical images and then suggest the most likely diagnosis by reviewing similar images stored in patient databases. And these programs can accurately process these tasks far faster than human technicians. AI's potential is so promising that some experts predict it will eventually be every doctor's and nurse's go-to assistant.

James Shoemaker, a physician with Elkhart Emergency Physicians in Elkhart, Indiana, can attest to its value. Shoemaker uses a program called VisualDx, which allows him to input medical images along with patient symptoms and immediately pull up a list of possible diagnoses. One parent brought in a child with a bad rash that turned out to be a rare disorder called Stevens-Johnson syndrome, he recalls. "I had an idea it could be that," Shoemaker says. The program "reinforced my diagnosis and helped me figure out the next step."

[New York University's Langone Medical Center](#) is developing one AI system to predict which patients are likely to develop the dangerous condition sepsis and another that alerts doctors to cases of heart trouble. "If you're admitted to the ER for pneumonia, the people who are treating you may not think about the fact that you also have congestive heart failure," says Michael Cantor, an internist and associate professor in the hospital's departments of population health and medicine. The system will go through each patient's record when they're admitted and automatically alert cardiologists to anyone who has heart failure, so they can advise on how to avoid treatments that might exacerbate that condition.

Artificial intelligence is also being employed to improve efficiencies. Several hospitals are experimenting with technology to optimize schedules for surgeries and imaging tests by predicting how long each procedure that's scheduled in a particular day will take. Partners HealthCare, which includes [Brigham and Women's](#) and [Massachusetts General](#) hospitals in Boston, announced in May that it will work with General Electric over the next 10 years to incorporate AI into virtually every area of patient care, including developing applications to cut down on unnecessary biopsies and streamline administrative tasks for doctors.

These are all tasks that people traditionally do, but sometimes machines do them better, says Michael Williams, president of the University of North Texas Health Science Center. "Reducing ER wait times, improving surgical workflows – those are key to improving the patient experience, and AI has a real role to play."

If there's anything that's holding back the widespread adoption of AI in hospitals, it's nagging doubts that the technology will produce a good return on investment. A 2017 survey by HIMSS Analytics and Healthcare IT News found that 35 percent of health care organizations plan to adopt AI within two years, but 15 percent of respondents said they couldn't make a business case for doing so. And more than 20 percent said they thought the technology was still underdeveloped.

The field of AI in health care suffered a setback in February, when the [University of Texas MD Anderson Cancer Center](#) put its partnership with IBM on hold after an internal audit reported that the institution's effort to incorporate Watson into patient care ultimately failed to meet its goal. In an email, a spokeswoman for MD Anderson said the organization is constantly reviewing technologies that promise to improve cancer prevention and patient care, and that "while a variety of approaches have been examined, a final approach using this technology to benefit patients has not been determined at this time."

Rob Merkel, general manager of oncology and genomics for Watson Health, says the company is making headway in the market with Watson for Oncology, which IBM developed with [Memorial Sloan Kettering Cancer Center](#) in New York. And he cites research the firm did with MD Anderson that he believes shows Watson's potential. "We demonstrated 95 percent concordance with what Watson would recommend as a treatment option versus what an MD Anderson physician would recommend," he says.

Meanwhile, the University of Pittsburgh Medical Center is funding a project aimed at using AI to get treatment ideas for individual cancer patients by comparing genomic information from their tumors to molecular data housed in the Cancer Genome Atlas – an interactive database maintained by the National Institutes of Health containing data on 10,000 tumor samples of 33 cancer types.

So could AI someday even substitute for doctors? Peter Slavin, president of Mass General, believes people will always be essential to delivering high-quality care – but that machines will become increasingly vital to making that care better. Improvements in computing power and the ability of computer programs to emulate neural networks in the brain unlock enormous possibilities for the use of AI in medicine, Slavin says. "We haven't really even begun to see its impact."