

## 9 predictions on how artificial intelligence will change clinical care — for the better or worse?

Written by Laura Dyrda | May 18, 2017

Nine leaders in the healthcare and IT space discuss artificial intelligence and how it will affect clinical care in the future.

**Larry Briski. Director in the West Monroe Partners Healthcare Practice:** "Artificial intelligence will continue to rapidly advance and reshape the healthcare experience for patients over the next 20 to 30 years. The days of doctors using their own experience and education to diagnose issues will be long gone. In place, there will be medical technicians that work with patients to input symptoms, test results, and data from wearables into an AI-enabled system that determines an ailment based on hundreds of millions of data records. Based upon the latest medical advances, AI will help recommend the best treatments and treatment settings. Physicians will play the role of confirming a diagnosis, treatment plan and performing AI-enabled surgeries, which will require a different set of skills that adds technical training onto the traditional medical education."

**Alan Cudney. Principal Healthcare Consultant in SAS' HLS Global Practice:** "Clinicians will use intelligent clinical decision support at the point of care, using data sources that are aggregated and integrated across the continuum of care. Healthcare organizations will employ predictive models that continuously re-evaluate illness burden and likelihood for clinical deterioration, stratifying according to need for intervention and assigning patients into specific categories of care management intervention."

Healthcare consumer engagement models will continuously incorporate data feeds from social media, healthcare patient portals, credit card companies and drug stores in order to predict likelihood of increased healthy behaviors and engagement with clinical treatment plans.

Medical supply companies will utilize artificial intelligence to predict future supply and demand needs for durable medical equipment at the facility level, across the entire service area. The model will continuously learn and adjust as new data arrives. Pharmaceutical companies will customize prescription drugs based upon understanding of individual DNA and likelihood of

intended response. The predictive models will continuously optimize themselves as new clinical data comes in from hospitals and doctor offices."

**George Dealy, Vice President of Healthcare Applications of Dimensional Insight:** "Within the next 20 to 30 years, providers will begin to have artificial intelligence capabilities right at their disposal, in most cases for the first time, where the technology will continue to improve over time. Clinicians will be able to receive advanced decision support for diagnosis and treatment and will be able to more accurately predict outcomes based on how an individual patient's profile matches a cohort of similar individuals. That means better care in the case of illness, but even more importantly, avoiding illness altogether where possible.

The combination of increasingly comprehensive and timely population-wide data sets and artificial intelligence techniques will allow healthcare provider organizations to quickly identify and proactively respond to opportunities for care intervention. This will not only allow for more efficient care delivery, but for even greater success with population health initiatives.

Perhaps the biggest advance from artificial intelligence will be individuals having more insight into, and control over, their own health. The precision medicine approach will allow for continuous feedback on various aspects of an individual's health based on genetic profiles, physical characteristics, social determinants and bio-feedback from personal monitoring devices."

**Simon Lorenz, Co-founder of Klara:** "Stanford researchers predict that physicians will work together with 'automated reasoning assistant' AI systems that can translate the patient's symptoms in an input-output situation. The researchers also assert that human physicians will still be necessary to interpret and apply the data. The doctor-patient relationship will still be very important in understanding the holistic context around the symptoms.

I predict that the introduction of AI will lead to higher patient retention for physicians, as they will move toward a more relationship-based form of care across the lifespan.

One barrier for now is adoption. With AI being adopted and normalized in other areas (such as self-driving cars), consumers will become more comfortable with AI aspects in healthcare. Consumer adoption and behavior change are the barriers to these innovations, not necessarily effectiveness or quality of the technology."

**Richard Mammone, PhD, Founder of ClearView Diagnostics:** "Today, much of the dialogue around AI in healthcare pertains to how the technology will end up replacing doctors and leave countless providers out of work.

After working in the healthcare industry and AI for more than 20 years, I can tell you that this sentiment is 100 percent incorrect. AI is not now, nor should it ever be looked at as a technology to replace doctors. It should, however, be seen as something that can help providers spend more time with patients. At ClearView, we work with doctors at University of Pittsburgh Medical Center, University Radiology Group, USC and UCLA and are finding that the technology can assist radiologists in diagnostic decision-making.

With AI growing in popularity and use, we can also expect to see task shifting occur in the healthcare space. Today, diagnosis is a task predominately done by radiologists but with AI technology other professionals like nurses and medical assistants will be able to screen patients, expanding their overall skillset. With more high-level tasks to perform their pay scale will go up while at the same time freeing up time for radiologists to spend more time with the patients who need it most."

**Matt Michelson, Chief Scientist of Inferlink Corp.:** "As AI matures, it will begin to take over a number of the more tedious and administrative tasks, freeing doctors and nurses to focus on what AI can't do, namely the humane side of healthcare. Basically, any task where a human is trained by looking at examples, the AI will eventually be able to do. This could be providing clinical support for treatment or diagnosis using evidence mined from the literature, reading labs and imaging studies, and shifting treatment based on personalized information from the EMR.

As AI systems mature, they will branch into more sophisticated endeavors, perhaps more robust robotic surgery, administration of medications and routine checks of vital signs (imagine the bed, toilet and other patient-touching items being equipped with sensors and AI to communicate and make sense of it all). However, an AI can't comfort you, explain your condition and treatment with compassion, or provide the human touch of a nurse. So, I view the AI as a companion, removing the tedium and potential for error, and freeing doctors and nurses to focus on the patient-centered pieces of healthcare."

**Jack Stockert, MD, Managing Director, Strategy and Business Development at Health2047:** "In the next 20 years, we'll see AI playing a vital role in the practice of medicine. Some folks like to use a turn of phrase and call it Intelligent Augmentation, but this is too cute and undermines the point of the technology. The value is to think about how AI can be leveraged in all areas of care delivery. It won't be a replacement for the doctor or nurse — no one wants Dr. Robot for those complex issues and questions. Rather, AI will be a tool to radically change the productivity of care delivery teams. Healthcare is evolving to a more continuous model to tackle the unprecedented chronic disease epidemic. Employing AI in cognitive learning can push levels of mastery in understanding and decision making, transforming how doctors deliver care and individuals live their lives.

This effort is not without its challenges. Two important ones to consider: 1) engaging with physicians in design and product development, and 2) training a new workforce of physicians and support staff. Related to the first, in addition to technical training for hospital systems and physicians, incorporating physicians into the innovation process from the very beginning ensures that the innovations compliment and shape existing workflows. As it relates to training, the growing workforce must be able to engage, audit and manage algorithms and AI that are supporting care."

**Rana el Kaliouby, PhD, Co-founder and CEO of Affectiva:** "Doctors today have a variety of tools to capture physical health conditions, measuring base vital signs like blood pressure when patients first enter their office. But, despite the fact that the healthcare community has recognized mental health and emotions as crucial components of overall well-being, mental health is still subject to self-reporting, creating a gap when it comes to capturing emotion data.

With recent developments in Emotion Artificial Intelligence technology and facial emotion recognition platforms, patients and doctors are now able to capture emotion data, and quantify mental health. As Emotion AI continues to mature, emotion data will increasingly play a role in diagnoses and personalized treatment plans, enabling doctors to gain a more holistic view of patients' physical and mental health. The implications of Emotion AI in healthcare span beyond in-person patient/doctor interactions, as healthcare providers can leverage the technology to get real-time feedback through video communication on the emotional state of remote patients. And, by digitally tracking facial expressions of emotion between doctor visits, patients can flag if they deviate from their norm."

**Matt Sanchez. Founder and CTO of CognitiveScale:** "As chronic conditions add \$2.4 trillion to annual healthcare costs and providers struggle with a deluge of patient data, the priority for healthcare providers will be to extract actionable insights from data, improving health outcomes for patients, and creating the software infrastructure for a broad shift to a continuous care model.

Cognitive healthcare providers like doctors and hospitals that use what we call 'augmented intelligence' systems can deliver better outcomes by using this intelligence to interpret multi-structured big data and declared, observed and inferred user behaviors to weave knowledge and learning across the organization. This could mean using cognitive insights to deliver improved care, prevent avoidable hospitalizations and better manage chronic illnesses.

Doctors, for example, would be able to infer from the cognitive insights which of their patients are at the highest risk for hospitalization for an asthma attack due to an upcoming weather pattern. The doctor would then be able to reach out to those patients to let them know the things they can do to improve their chances of staying healthy in the coming days. In the same vein, the hospital would be able to infer that usually when this type of weather hits, around 15 patients come into the ER for treatment. They can be adequately staffed and prepared with the right supplies to minimize drain on hospital resources."