

The AI-Enhanced Patient Experience: What Boards Should Know

By Steve Jackson, President, NRC Health

Not long ago, the prospect of artificial intelligence (AI) making a meaningful contribution to healthcare seemed almost fanciful. Today, it seems inevitable.

Medicine has already felt the impact of several AI implementations. Researchers use AI to select candidates for clinical trials.¹ Algorithms routinely outperform human radiologists in spotting certain cancers.² Academics at Oxford and Yale predict that by the year 2053, all surgical work could be conducted by AI-powered machines.³

These technologies all affect the *practice* of medicine. Clinical work will never be the same. What, then, might advances in AI mean for the *business* of healthcare? How will it affect the patient experience? For hospital boards, this is an essential question—and one they should consider sooner rather than later. Like any important innovation, experience-centered AI will disproportionately reward early adopters. That does

1 Maxine Bookbinder, "[The Intelligent Trial: AI Comes to Clinical Trials](#)," Clinical Research News, September 2019.

2 Jeff Zagoudis, "[Artificial Intelligence Improves Lung Cancer Detection](#)," Imaging Technology News, April 18, 2018.

3 Katja Grace et al., "[When Will AI Exceed Human Performance? Evidence from AI Experts](#)," ArXiv, May 24, 2017.

Key Board Takeaways

- **Consider where your organization falls on the AI adoption curve.** AI's advantages are both significant and cumulative. Has your organization deployed an AI-augmented experience system yet? If not, what are the major points of resistance?
- **Test for data security.** For any possible AI initiative, seek an audit from internal IT staff. Ask about data-handling practices. Ensure that the vendor observes the strictest possible standards for PHI and sensitive internal data.
- **Test for clarity.** Ask any AI vendor to explain, in plain English, how their algorithms operate. It may take some time, but press on to ensure you understand how it works. If *you* can't understand it, neither will the hospital's staff. And if *they* can't understand it, they won't trust it.

not mean, however, that hospitals and health systems should rush to deploy an AI solution. For any AI implementation to be successful, leadership must understand AI's limits, as well as its promise.

This article will discuss 1) new and emerging AI technologies that shape patient experience, and 2) the constraints boards will need to navigate to ensure an effective deployment.

Poised for an AI Revolution

The moment is ripe for AI to augment how hospitals and health systems

serve their customers.⁴ Three specific technologies—one in use today, and two others in early phases of development—represent a landmark shift in AI's healthcare capacities.

Natural Language Processing

Verbal comments from patients—on feedback surveys and on social media—can easily number into the hundreds of thousands per year. No human workforce, however large, could possibly parse it all. Natural Language Processing (NLP) makes

4 Jacques Bughin et al., "[How Artificial Intelligence Can Deliver Real Value to Companies](#)," McKinsey Global Institute, June 2017.

this verbal information legible.⁵

NLP is an AI process that algorithmically “reads” patients’ comments, en masse and instantly. It then classifies comments according to subject matter and the sentiments that they express. The end result is a robust, at-a-glance understanding of how patients feel about their care experiences. It’s an invaluable tool for strategic planning.

Predictive Analytics

This nascent technology uses historical data to make predictions about the future. Healthcare organizations have only recently begun to embrace it, but it could have a profound effect on the industry.

A well-configured predictive-analytics engine generates insight on patient preferences from two datasets: patient health information (PHI) and observable patient behaviors. This puts hospitals and health systems in a proactive position. They will be able to *anticipate* patient needs and desires, instead of reacting to them—giving healthcare organizations time to prepare.

For instance, predictive analytics could help hospitals and health systems manage population health. Algorithms can use social-determinant data to more effectively stratify health risks among specific patient populations, and thereby inform leaders where to focus resources.⁶ Predictive analytics may also enable healthcare organizations to explore alternative payment models, including those that embrace

downside risk.⁷ Such models are untenable when organizations can’t forecast their future expenses. With predictive analytics, however, hospitals and health systems will be able to discern their future spending with increasing accuracy, as algorithms absorb more case data. They can then confidently proceed in negotiations with payers, certain of the cost-burden they will be expected to share.

Personalized Engagement

Personalized engagement engines take AI’s capabilities one step further. They don’t just *predict* consumer needs and behaviors—they help to *direct* them.

Think of the recommendation systems you might find on Amazon or Netflix. These absorb trillions of datapoints about their customers, and then algorithmically produce suggestions for what they might want to buy or watch. This kind of technology is not yet available for use in guiding patients through their healthcare experiences (although so-called “cognitive aides” already assist with clinical care⁸). Once this innovation matures, however, hospitals and health systems will be able to find new ways to maximize satisfaction, manage volumes, and pre-empt emergent clinical risks. For now, it’s science fiction. But it’s only a matter of time before it becomes fact.

AI’s Complications

For hospitals and health systems, AI’s value is indisputable. However, AI solutions don’t operate in a vacuum. Their utility wholly depends

on the human beings who develop and use them. To function within an organization, an AI solution must have the following.

1. Expert Data Management

In manufacturing, the quality of raw materials must be carefully vetted, or else the final product will be compromised. The same holds true for AI—except that in this case, the “raw materials” are data.

Data must be labelled and sorted by human analysts before an AI process can use it. It’s these analysts’ work that determines the quality of data, and data quality ultimately determines the value of an AI process.⁹ In healthcare, these analysts enter a demanding arena. Dueling classification systems (e.g., ICD-9 versus ICD-10), incompatible EHR systems, and rigid privacy constraints all make healthcare data uniquely prone to mislabeling and compromise. Board members should be careful to audit any vendor’s data-management practices before allowing them access.

2. Bias Controls

Machines may power AI algorithms, but humans design them. As such, any AI process inevitably reflects the viewpoint of its authors. This calls for a special conscientiousness from AI suppliers. They must avoid letting their biases affect the systems they build.

When AI products operate in hospitals and health systems, they work with the most deeply personal data imaginable—medical records. Even further, predictive analytics processes frequently use patient socioeconomic information (like race, income, or ZIP code) to perform their analyses. Access to

5 NRC Health, “[Authentic Voices: What Natural Language Processing Reveals about Your Patients.](#)” *Becker’s Hospital Review*, May 2019.

6 Jennifer Bresnick, “[10 High-Value Use Cases for Predictive Analytics in Healthcare.](#)” *HealthITAnalytics*, September 4, 2018.

7 Michael E. Cherner and Austin B. Frakt, “[The Case for Downside Risk \(or Not\).](#)” *Health Affairs*, October 16, 2018.

8 Bronwyn Middleton, Dean F. Sittig, and Adam Wright, “[Clinical Decision Support: A 25-Year Retrospective and a 25-Year Vision.](#)” *Yearbook of Medical Informatics*, May 20, 2016.

9 Trevor Strome, “[Productive Healthcare Analytics Results from High-Quality Data.](#)” *SearchHealthIT*, September 2017.

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such sensitive datapoints could easily lead to harmful outcomes if biases aren't carefully controlled. AI vendors should demonstrate—and document—their controls before serving any organization.

3. A Transparent, Legible Methodology

An algorithm, no matter how clever, is of no use to a hospital or health system if the organization's staff doesn't trust it. Designers of AI products must therefore spare a thought for clinicians.

At the root of this issue is AI's "black box problem."¹⁰ Because AI products are so complex, few people are equipped to assess their conclusions. The inner workings of AI are opaque to anyone without a background in computer science. This gives rise to credibility questions. Physicians—or any other professionals, for that matter—are unlikely to accept clinical input from an algorithm they can't

¹⁰ Dave Gershgorn, "[If AI Is Going to Be the World's Doctor, It Needs Better Textbooks](#)," Quartz, September 6, 2018.

understand. To respect the autonomy of clinical staff, then, and to earn their trust, AI processes must offer a fully explicable methodology. Without that transparency and trust, an AI initiative is unlikely to succeed.

AI's Very Human Future

Powerful as they may be, AI processes are no substitute for humanity in healthcare. They may offer direction, but it will always be providers who deliver the care. In AI, today's hospitals and health systems have a once-in-a-generation opportunity to shape their organizations. It will fall largely to board members' responsible assessment of AI solutions to ensure that this shaping is for the better.

The Governance Institute thanks Steve Jackson, President of NRC Health, for contributing this article. He can be reached at sjackson@nrchealth.com.

