

# ARTIFICIAL INTELLIGENCE:

## Healthcare's New Nervous System

**Growth opportunities are hard to come by without significant investment, but one major opportunity is a self-running engine for growth in healthcare: artificial intelligence (AI).**

According to Accenture analysis, when combined, key clinical health AI applications can potentially create \$150 billion in annual savings for the United States healthcare economy by 2026.

At hyper-speed, AI is re-wiring our modern conception of healthcare delivery. AI in health represents a collection of multiple technologies **enabling machines to sense, comprehend, act and learn<sup>1</sup>**, so they can perform administrative and clinical healthcare functions.

Unlike legacy technologies that are only algorithms / tools that complement a human, health AI today can truly augment human activity—taking over tasks that range from medical imaging to risk analysis to diagnosing health conditions.

<sup>1</sup> Accenture; "Why Artificial Intelligence Is the Future of Growth," <https://www.accenture.com/us-en/insight-artificial-intelligence-future-growth>

“We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next 10.”

- **BILL GATES**

With immense power to unleash improvements in cost, quality and access, AI is exploding in popularity. Growth in the AI health market is expected to reach \$6.6 billion by 2021—that’s a compound annual growth rate of 40 percent (see Figure 1).

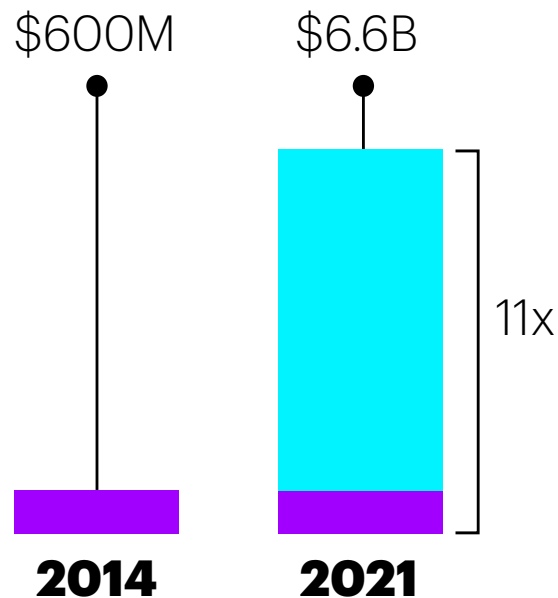
In just the next five years, the health AI market will grow more than 10x.<sup>2</sup> Growth is already accelerating, as the number of healthcare-focused AI deals went up from less than 20 in 2012, to nearly 70 by mid-2016.<sup>3</sup>

**FIGURE 1.**

## The AI health market is seeing explosive growth

### HEALTH AI MARKET SIZE 2014-2021

Acquisitions of AI startups are rapidly increasing while the health AI market is set to register an explosive CAGR of 40% through 2021













Source: Accenture analysis

<sup>2</sup> Frost & Sullivan, <http://ww2.frost.com/news/press-release/600-m-6-billion-artificial-intelligence-systems-poised-dramatic-market-expansion-healthcare>

<sup>3</sup> CB Insights; “From Virtual Nurses To Drug Discovery: 106 Artificial Intelligence Startups In Healthcare;” posted February 3, 2017 at <https://www.cbinsights.com/blog/artificial-intelligence-startups-healthcare/>

**FIGURE 2.**

## Top 10 AI Applications

	<b>APPLICATION</b>	<b>VALUE*</b>
	Robot-Assisted Surgery**	<b>\$40B</b>
	Virtual Nursing Assistants	<b>\$20B</b>
	Administrative Workflow Assistance	<b>\$18B</b>
	Fraud Detection	<b>\$17B</b>
	Dosage Error Reduction	<b>\$16B</b>
	Connected Machines	<b>\$14B</b>
	Clinical Trial Participant Identifier	<b>\$13B</b>
	Preliminary Diagnosis	<b>\$5B</b>
	Automated Image Diagnosis	<b>\$3B</b>
	Cybersecurity	<b>\$2B</b>
<b>TOTAL</b>		<b>= ~\$150B</b>

Growth is perhaps no surprise as AI delivers what many healthcare organizations today need, especially as companies weather the financial and operational turbulence of rising labor costs, digital expectations from consumers and increasing demand for interoperability, among other challenges.

Exemplified by the flurry of new entrants and explosion of data—which, combined with analytics—is leading to smarter systems, the case for AI adoption is stronger than ever. Health AI presents opportunities across a diverse set of therapy areas, including wellness and lifestyle management, diagnostics, wearables and virtual assistants. To fully comprehend the opportunity, healthcare organizations must understand the full taxonomy of AI applications—and the potential value each delivers financially, but also by way of organizational and workflow improvements.

### AI thinks *and* pays for itself

AI represents a significant opportunity for industry players to manage their bottom line in a new payment landscape, while capitalizing on new growth potential. To better understand the savings potential of AI, Accenture analyzed a comprehensive taxonomy of 10 AI applications with the greatest near-term impact in healthcare.

The assessment defined the impact of each application, likelihood of adoption and value to the health economy. The top three applications that represent the greatest near-term value are robot-assisted surgery (\$40 billion), virtual nursing assistants (\$20 billion) and administrative workflow assistance (\$18 billion) (see Figure 2). As these, and other AI applications gain more experience in the field, their ability to learn and act will continually lead to improvements in precision, efficiency and outcomes.

Source: Accenture analysis

\* "Value" is the estimated potential annual benefits for each application by 2026.

\*\* Orthopedic surgery specific

Robot-assisted surgery leads the AI pack in terms of value potential. Cognitive robotics can integrate information from pre-op medical records with real-time operating metrics to physically guide and enhance the physician's instrument precision. The technology incorporates data from actual surgical experiences to inform new, improved techniques and insights. Such improvements enhance overall outcomes and consumer trust for AI applicability across surgical areas of practice. Robotics outcomes include a 21 percent reduction in length of stay, according to Accenture analysis. The value will only increase with the development of robotic solutions for a greater diversity of surgeries.

Virtual nursing assistants are another frontrunner of AI value. When AI solutions remotely assess a patient's symptoms and deliver alerts to clinicians only when patient care is needed, it reduces unnecessary hospital visits. It can also lessen the burden on medical professionals. In the case of nurses, AI can save **20 percent of RN time** through avoided unnecessary visits.<sup>4</sup> As virtual nursing assistants become accustomed to patient diagnoses and conditions, their abilities will grow beyond effective triage into expertise and recommendations around patient treatment.

Timesaving administrative workflow assistant capabilities—such as voice-to-text transcription—eliminate non-patient care activities including writing chart notes, prescriptions and ordering tests. This equates to a work time savings of 17 percent for doctors, and 51 percent for registered nurses based on Accenture analysis.



## BRINGING AI TO THE OR

Mazor Robotics is using AI to aid minimally invasive surgical operations as well as operations with complex anatomy. Before an operation, a patient CT scan is loaded into a 3-D computerized planning system to indicate where a surgeon should place implants—all before the patient even arrives. Mazor's spinal surgery robot arm guides the orthopedic surgeon's instruments, allowing for an extremely high degree of precision.



## CARE, YOUR WAY

Virtual care company Sense.ly brings virtual health to your home. Nurse avatar Molly is happy to answer your questions. Need more than a nurse consult? Interact with doctors in real time via your phone, tablet, TV or computer. Sense.ly even integrates with wired and wireless medical devices. Data from those devices can be fed to clinicians, enabling them to monitor and assess risk, triage and coordinate a care plan.

<sup>4</sup> Sense.ly, [www.sensely.com](http://www.sensely.com)



# AI is becoming the new OS in health

As AI continues to become more prevalent and adoption flourishes, healthcare organizations must enhance their underlying structure to be positioned to take full advantage of new AI capabilities.

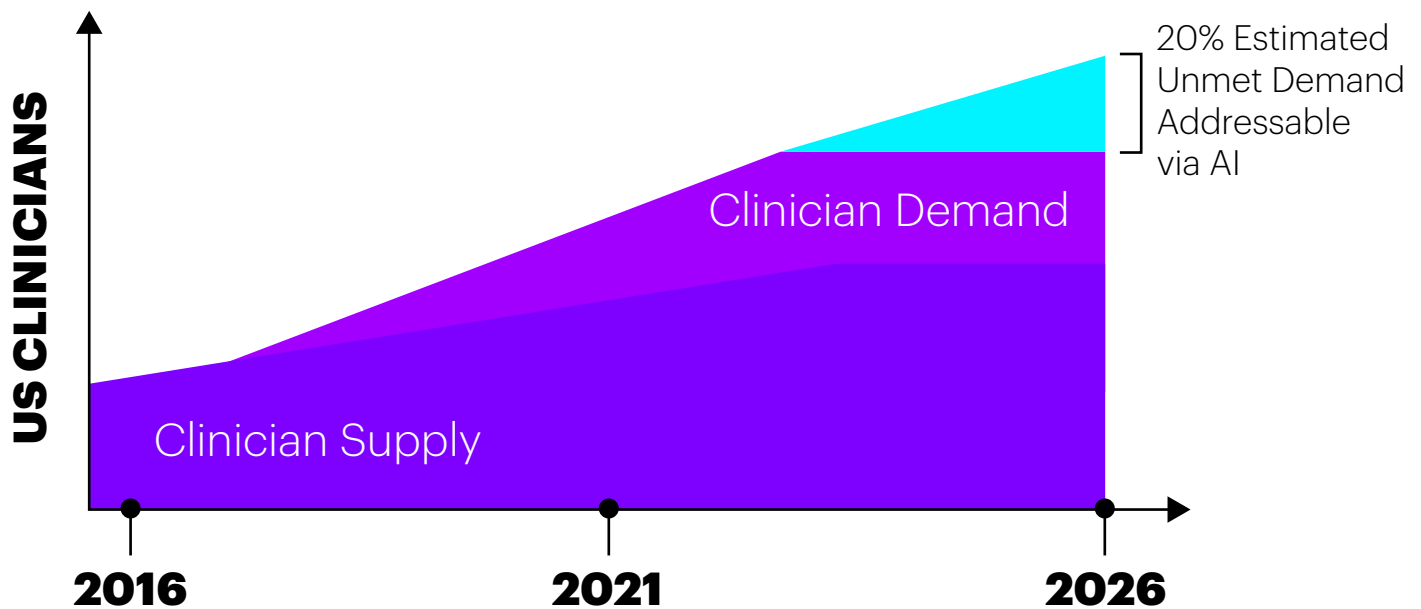
According to Accenture’s analysis, there are four areas to focus on:

**WORKFORCE.** The nature of work and employment is rapidly changing<sup>5</sup> and will continue to evolve to make the best use of both humans and AI talent. For example, AI offers a way to fill in gaps amid the rising labor shortage in healthcare. According to Accenture analysis, the physician shortage alone is expected to double in the next nine years.

AI has the power to alleviate burden on clinicians and give workers tools to do their jobs better. For instance, AI voice-enabled symptom checkers triage patients to lower-cost retail or urgent care settings and direct patients to the emergency department only when emergency care is necessary. AI can address an estimated 20 percent of unmet clinical demand (see Figure 3).

**FIGURE 3.**

## AI can address unmet clinical demand



Source: Accenture analysis. Graph is not to scale and is illustrative.

**INSTITUTIONAL READINESS.** To realize greater value from AI, healthcare players can incorporate AI expertise in their organization’s structure and governance. For instance, assigning a lead who is tasked with keeping apprised of AI adoption within the organization.

Governance and the operating model should also be revamped to align with an AI-enabled organization. Furthermore, healthcare organizations should build an AI-smart workforce and culture that will use AI to enhance efficiency, quality and outcomes for patients.

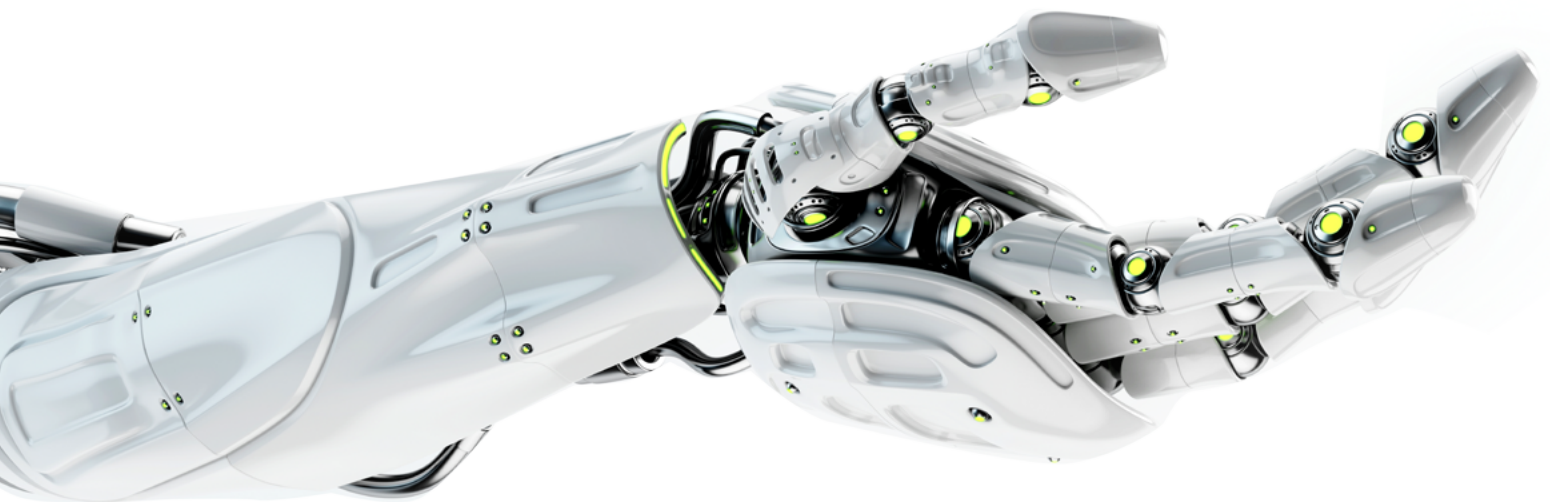
<sup>5</sup> Accenture; “Digital Health Tech Vision 2016: Liquid Workforce,” <https://www.accenture.com/us-en/insight-liquid-workforce-digital-health>

**CARE REACH.** Consumers want AI. In fact, they are **six times more likely to view AI as having a positive impact<sup>6</sup>** on society. AI can magnify care reach by integrating health data across platforms. However, as new technology is introduced, various data sources must be connected to enable a seamless experience for patients.

**SECURITY.** Parties in the ecosystem will need to work together in an ethical way, and be secure in how they manage critical information on patients. On average, **every breached health record will cost \$355.<sup>7</sup>** **And not only do healthcare organizations lose money when data is compromised, they lose consumer trust.<sup>8</sup>** As AI delivers benefits of greater efficiency, transparency and interoperability, organizations must maintain a clear focus on informational security

## Lead the future

AI is not an innovation coming down the pike—it's here. It's in our call centers, our homes and now, in our healthcare. Those who seize the AI opportunity and embrace these applications to deliver high-quality, cost-effective care will be the ones to leapfrog competitors.



<sup>6</sup> Weber Shandwick, "AI-Ready or Not: Artificial Intelligence Here We Come!," <https://www.webershandwick.com/news/article/ai-ready-or-not-artificial-intelligence-here-we-come>

<sup>7</sup> Healthcare IT News, "Cost of data breaches climbs to \$4 million as healthcare incidents are most expensive, Ponemon finds," posted June 20, 2016 at <http://www.healthcareitnews.com/news/cost-data-breaches-climbs-4-million-healthcare-events-most-expensive-ponemon-finds>

<sup>8</sup> Accenture; "Are You One Breach Away From Losing a Healthcare Consumer?," <https://www.accenture.com/us-en/insight-accenture-health-2017-consumer-survey>

## FOR MORE INFORMATION:



**Matt Collier**

matthew.d.collier@accenture.com



**Richard Fu**

richard.n.fu@accenture.com



**Lucy Yin**

lucy.yin@accenture.com

## CONTRIBUTOR




**Philip Christiansen**

philip.christiansen@accenture.com

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## METHODOLOGY

Considering viewpoints from external and internal subject matter experts, providers, payers and technologists, Accenture analyzed market trends, recent clinical studies and economic impacts to determine the top 10 use cases for AI in healthcare. With current AI capabilities in mind, Accenture estimated the value of their potential impacts on clinical and administrative processes, and the importance of widespread corporate adoption of AI.

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