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# Generative AI is poised to transform healthcare.

## Is healthcare ready?

# The fast-moving tech's revolutionary potential promises to redefine a massive industry and its slow-mover history—and the stakes have never been higher.

# Healthcare is primed for its GenAI moment


**"Gradually, then suddenly."** This long-standing wisdom captures the sneaky cadence of transformational change and its ability to upend entire industries seemingly overnight, from paradigm-changing new products to business-ending financial meltdowns.

And, today, it also captures the most significant inflection point the Healthcare industry has faced in a century: After years of marginal progress on business innovations and technology advances, Healthcare is at the precipice of a rapid transformation fueled by the rise of Generative AI (GenAI) technologies, which can revolutionize the industry by unlocking solutions to previously insurmountable challenges.

Sure, Healthcare has always tended to be an innovation and technology follower, bogged down by regulatory red tape, legacy systems, data complexity, and more. But given GenAI's vast potential for change—and Healthcare's vast landscape of untapped opportunities—no other industry today is more uniquely positioned to leap ahead by tapping into GenAI's innovation superpowers. And GenAI arrives just in time, because "gradual" change is no longer sustainable for a Healthcare model that is under increasing pressure from all directions.

Enter GenAI, which allows Healthcare to seize its "suddenly" moment and fundamentally transform, reimagine, and redefine the industry forever—and for the better.

# The view today

**To understand the size of the opportunity, look no further than the size of the industry: Healthcare accounted for 18.3 percent of the U.S. economy in 2021, and the sector is forecast to grow to almost 20 percent of GDP over the next decade.[1]**


The sheer breadth of the Healthcare industry and its highly diversified lines of businesses make it an omnipresent part of everyday American life: doctors, hospitals, pharmacies, and health insurers, of course; but also medical supplies and equipment, specialists like dietitians and health coaches, urgent care, broad-based population health programs for chronic disease management, targeted house calls for high-risk patients, mobile apps, wearable tech and gadgets, and much more. And an aging, ever more health-conscious American public consumes it all, from basic band-aids to robotics-enabled surgeries, at an ever-increasing rate.

But massive market size and demand do not generate innovation and opportunity on their own, especially given Healthcare's long-standing (and largely accurate) reputation as a risk-averse, stay-in-your lane industry dominated by major corporations. The industry has also long been routinely viewed as a technology laggard, slow to adopt new technologies (trailing other mature industries by at least a decade, according to one much-cited report[2]) despite generating about one-third of the world's data.[3]

Take a closer look, though, and you'll see a Healthcare industry that is increasingly leaning into change and poised to flip that last-mover, luddite narrative.

Consider just some of the recent developments that have started to blur the lines between those previously regimented lines of business:

- A major health insurer acquired by a major retail pharmacy
- Hospital systems taking on the role of health insurers
- Employers opting to manage their employees' health risks directly
- Major retailers opening their own in-store clinics
- A mega online retail giant acquiring a concierge primary care provider

Clearly, real change is already happening in Healthcare, and it's coming from multiple directions, including: traditional industry players; some non-traditional mega-entities who are pretty certain they can "fix" Healthcare; and disruption-minded startups and niche companies, unburdened by legacy Healthcare infrastructure and business models, who can more agilely address consumer expectations on the quality, delivery, and costs of healthcare.

The common thread for all: The driving realization that transformative technologies—and, most uniquely for Healthcare, GenAI—can open the floodgates on decades of untapped opportunities and transform the "way we've always done it" Healthcare industry into a dynamic engine of growth and life-changing innovations.

1 Centers for Medicare & Medicaid Services (September 6, 2023). [link for reference, not publication unless approved]

2 Business Wire (March 22, 2018). [link for reference, not publication unless approved, and the actual source Forrester study is not publicly available]

3 Forbes, Nick Culbertson (August 6, 2021). [link for reference, not publication unless approved]

# The roadmap for change

**In many ways, GenAI and Healthcare are on a collision course—the unstoppable force meeting the immovable object. The industry's massive role in American life juxtaposed with its ever-rising costs and persistent inefficiencies is simply unsustainable math.**

The warning signals are everywhere. Healthcare costs continue to take up a larger share of budgets for both employers and individuals, even as inflation adds overall cost pressures for everyone. The U.S. government's Medicare program—the industry's largest and most influential payer—is forecast to go broke in less than a decade.[4] Staffing shortages and labor pressures, which had started to take shape even before the pandemic, are now a full-on crisis. And then the headline: This historically inefficient industry has as much as $1.5 trillion in unrealized potential, according to one report.[5]

But now comes GenAI, which is uniquely suited to propel Healthcare—finally—to the types of rapid innovations that will be needed to unlock that potential. And anyone who doubts that a single technology can be so impactful so quickly need look no further back than the Internet's seismic reshaping of the world just two decades ago.

Broadly speaking, generative AI is a subset of a larger umbrella of AI technologies that include machine learning, deep learning, predictive algorithms, and more. Traditionally, these technologies have excelled at ingesting large amounts of data and delivering valuable outputs on a scale that human bandwidth simply cannot match.

But while AI has typically been limited to well-organized data and templated output models, generative AI is able to mine both structured and unstructured data and then generate creative, human-like content outputs—for example, reports, analyses, and even prioritized suggestions on next steps. Now match that capability with Healthcare, an industry that is fundamentally built around collecting data, evaluating it, and then generating the appropriate next steps—from mundane claims notifications to live-saving diagnoses.

4 Money.com, Adam Hardy (April 5, 2023). [link for reference, not publication unless approved]

5 McKinsey & Company, Addie Fleron and Shubham Singhal (September 8, 2022). [link for reference, not publication unless approved]

# The roadmap for change *continued*

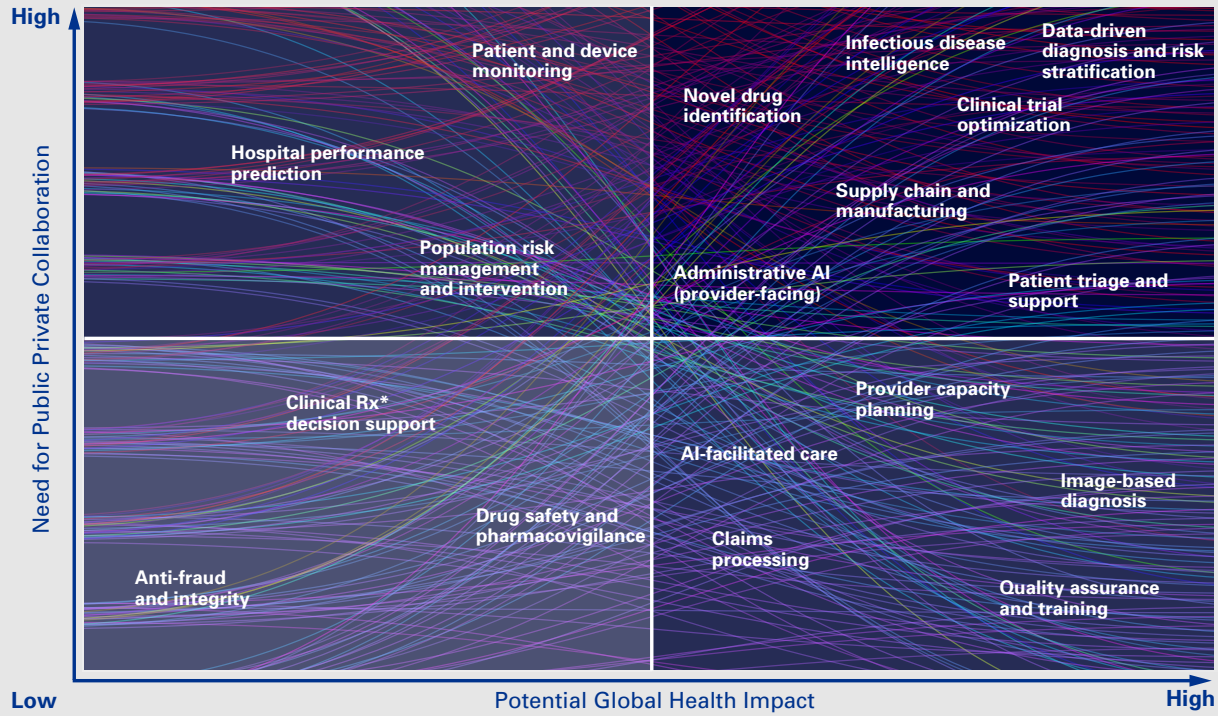
AI is poised to transform Healthcare rapidly, fueled by a roughly 10X increase in Healthcare's AI investment globally over the next seven years—from $20 billion in 2023 to a forecast of $188 billion by 2030.[6] And of course GenAI itself is still developing at its own rapid rate, with an expanding arsenal of tools and applications that suggest an unprecedented pace of innovations on the roadmap ahead.

One research firm[7] envisions Healthcare's GenAI roadmap playing out in three building-block phases:

- **Short-Term** (through 2025), with advances in GenAI fundamentals like language modeling, text generation, and the initial development of synthetic images and data that can be used in training.
- **Mid-Term** (through 2028), during which GenAI will rapidly extend its meta learning—its "healthcare literacy," essentially—by expanding the types of data it looks at (text, voice, images, video) and increasing both the speed and value of its human-like creative outputs.
- **Long-Term** (2029 and beyond), which will see the emergence of largely autonomous AI systems (albeit always with human oversight) capable of complex data syntheses and outputs—diagnostics, discoveries, preventive measures, and more.

## Impact and degree of difficulty

Critical healthcare AI applications in terms of the need for complex collaboration and potential global impact




The GenAI revolution requires collaboration between both private and public health organizations to harness its full potential. Use-cases that have demonstrated successful integration are mapped here based on two characteristics: global health impact and potential to positively affect healthcare outcomes, access, and efficiency (x axis); and the complexity of the required public-private partnership to make the changes happen (y axis).

6 Statista, Conor Stewart (September 28, 2023). [link for reference, not publication unless approved]

7 MarketsandMarkets (May 30, 2023). [link for reference, not publication unless approved]

# Potential use-cases

The variety, volume, and inherent value of GenAI's applications in Healthcare seem almost limitless. And it's no longer the stuff of some future world: GenAI is already making an impact in Healthcare today, even if just in initial steps, such as summarizing notes from a patient visit or generating pre-approval letters to expedite authorizations for care.

Even with such a vast canvas of opportunities, though, we believe the potential use-cases fall into three foundational areas, driven by the industry's three essential players: patients, providers, and payers.

Here's a snapshot of just a few GenAI use-cases for each one, with a look at how GenAI can play a role today, short-term enhancements, and potential long-term breakthroughs.

## For Patients

### Personalized Medicine

#### Now
GenAI tools can review unique patient details and generate specific suggestions for general patient education—for example, information guides on diabetes management.

#### Next
Enhanced natural language models that give patients more rapid feedback and more specific recommendations for care management, including accurate translations for different languages and dialects.

#### Future
Tools that monitor unique patient data in real-time to develop highly customized treatment plans based on a wide range of information, such as genetic/genomic details, look-alike responses to drugs and therapies, social factors, and more.

### Access to Care

#### Now
Generating appointment reminders, confirming or changing schedules, and supporting remote consultations and virtual care.

#### Next
Virtual assistants that can monitor patient status based on data from wearable devices or other home-based equipment and tee up recommended actions for both patients and providers—and significantly mitigate gaps in care.

#### Future
Enhanced tools for remote diagnostics and virtual care delivery (e.g., medication doses, blood tests, vital signals) for an expanding list of conditions.

# Potential use cases *continued*

## For Providers

### Care Management

**Now**
Capturing voice-to-text notes from patient visits and generating templated forms for things like referrals or pre-approvals for specialists.

**Next**
Fully automated back-office tasks (notes, histories, required forms, appointments, etc.) that mitigate staffing shortages and free providers and their teams to spend significantly more time focused directly on patient conversations and care.

**Future**
Advanced diagnostic and treatment tools that validate a provider's hypotheses and monitor patients and treatments to identify opportunities to improve care based on leading practices.

### Training and Education

**Now**
Enhanced ability to capture the latest knowledge and best practices and make them more rapidly available to a wide range of training disciplines.

**Next**
Access to global expertise and the opportunity to personalize training based on a student's strengths, weaknesses, and learning styles.

**Future**
Virtual reality/augmented reality applications that simulate surgery and other complex medical procedures while mapping in the latest leading-practice techniques.

## For Payors

### Revenue Cycle Automation

**Now**
Initial progress on automating highly manual processes, such as prior authorizations and notifications of claims approvals/denials.

**Next**
Improved financial insights generated from more robust data sets, including both internal data (structured and unstructured) as well as external data signals and market intelligence.

**Future**
Fully GenAI-enabled financial planning and analysis functions with faster and more accurate reporting cycles that reduce operational costs.

### Compliance, Risk, and Fraud

**Now**
AI tools can review large amounts of claims data and look for patterns of fraud.

**Next**
Enhanced risk identification capabilities from GenAI tools that look at broader data sets to automatically review invoicing and pricing (based on contractual agreements) and manage compliance.

**Future**
Personalized health insurance based on advanced behavioral analytics and highly precise individual analyses that significantly reduce the role of risk in healthcare.

# The promise—and the challenges—ahead

**Generative AI is no magic wand, of course. Delivering its vast potential for Healthcare will require new and imaginative thinking from an industry that has traditionally been slow to adopt and implement change. Challenges to execution abound, including labor shortages, an aging population, outdated data models and KPIs, and even the current business climate of high interest rates that makes investing in transformation harder still.**

Perhaps the biggest barrier to progress, though, is the complex public-private partnership that will be needed to realize many of GenAI's potential innovations for Healthcare—an industry historically bogged down by a regulatory thicket that includes multiple federal and state agencies. GenAI's ability to mine and manipulate personal health information, for example, will require more imaginative and agile public-private collaboration than the industry has ever seen.

But, as we stated earlier, the current Healthcare model is simply not sustainable, on multiple levels: workflows, costs, staffing needs, legacy systems, and, most important, patient experiences and health outcomes. Something has to give in Healthcare, and we believe that something will be driven by GenAI: A once-in-a-generation technology that is uniquely suited in so many ways to fundamentally reimagine the Healthcare industry forever.

So what are the next steps for those in the Healthcare sector? Well, not even ChatGPT can answer that one (yet). But here are some steps to consider for your organization:

- Understand the broad potential of GenAI, and also specifically how its ability to generate human-like information and insights makes it more advanced and potentially value-creating than current iterations of AI.
- Identify actual use-cases for your organization, both in the near- and long-term.
- Develop a roadmap informed by collaboration across all relevant teams that focuses on rapid testing and feedback cycles that helps you identify and establish useful GenAI applications for your company.
- Establish a GenAI working group or center of excellence to expand your organization's understanding of AI, identify and prioritize the potential applications for your company, and then guide their development and rollout.
- Establish comprehensive governance and security for all of the related AI applications and data, with regular reviews to ensure the latest legal and ethical best practices are in place.

Regardless of where your organization is in its planning, though, one thing that is abundantly clear: For the Healthcare industry overall, GenAI is not another wait-and-see moment. Proven AI tools and applications exist today that are driving dynamic new opportunities (and results) for other industries and transforming the way myriad other businesses meet consumers' needs.

Now it's Healthcare's turn. Companies must challenge their organizations to meet this massive opportunity head-on—or risk obsolescence. They need to stay mindful of ethical concerns and establish appropriate guardrails, but they also need the entire workforce to lean into the transformation. The stakes have never been higher: GenAI is a once-in-a-generation opportunity for the entire industry to reset the direction of Healthcare, reduce costs, improve outcomes, and forever transform the way Americans live.

# Authors Biographies

**David Ledbetter**

David is focused on helping to bridge the gap between healthcare professionals and data scientists to push the limits of clinical data science and AI. He understands the importance of fostering communication and enabling collaborations that are necessary to solve real clinical problems that require significant cross-disciplinary expertise. He also has a passion for training aspiring data scientists looking to break into healthcare to make a meaningful impact.

**Marc Scher**

A recently retired partner at KPMG, Marc spent 40 years with the firm and served as the partner in charge of the Global and U.S. Healthcare Audit Practice. He worked with a wide range of major health systems, long-term care providers, hospitals, biotech companies, payers, purchasing cooperatives and research organizations.

His areas of expertise includes healthcare transformation, financial reporting, auditing, board governance, risk assessment and tax-efficient financing.

Marc is the current Chair-elect for the Healthcare Financial Management Association.

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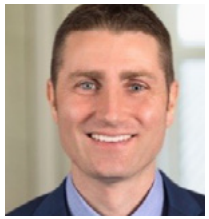

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