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## From burnout to breakthrough:

Transforming the physician  
workforce with training  
and technology

# Contents

Executive summary	3
Introduction	4
The performance gap	5
Building the workforce to lead	6
A roadmap for empowering physical productivity	7
A cross-sector call to action	10
Authors & acknowledgments	11
Endnotes	11

# Executive summary

As the US health care system faces a growing physician capacity challenge, health systems and investors are increasingly looking to technology to help close the gap. Artificial intelligence (AI), automation, and digital tools can help streamline workflows and boost productivity, with billions already being spent to deploy them across the care continuum. Deloitte analysis indicates that if physician productivity improved by about 9%, the projected national shortfall could potentially be closed—even under high-demand scenarios.<sup>1</sup>

Technology-driven productivity gains will not materialize uniformly or automatically. The uneven distribution of workforce shortages—particularly in primary care—underscores that this is not simply a problem of supply, but one of system design. Addressing these constraints will require both improving productivity and rethinking who delivers care, expanding beyond a physician-centric model to include a broader array of professionals who coach, guide, and support patients in proactive and preventive ways. Closing the gap will require more than incremental efficiency; it calls for a transformation in how physicians are trained, supported, and empowered to lead within a digitally enabled, team-based model of care.

## Four strategic imperatives that may help address the physician shortfall

- 1. Expand medical school and graduate medical education (GME) pathways:** Integrate innovation and digital health into MD/GME curricula; scale industry-aligned tracks.
- 2. Reinvent the physician operating model:** Empower physicians through new roles that integrate clinical care, technology, and system leadership, supported by clear advancement pathways.
- 3. Redesign lifelong training and education:** Build modular, cross-disciplinary programs through academic-industry collaboration to keep physicians current and adaptable.
- 4. Evolve medical education funding and regulatory frameworks:** Reform licensure, reimbursement, and regulatory models to reflect new care delivery.

These recommendations can be achieved through coordinated action across sectors. Academic institutions, industry partners, and policymakers each have a distinct role to play. This paper explores how health system stakeholders can take action to address the physician workforce shortage by increasing productivity through technology and education.



# Introduction

## A system under strain

The US health care system is facing a growing physician capacity challenge. By 2036, the projected shortfall could reach up to 86,000 physicians, driven by rising demand, burnout, early retirements, and limitations in how the physician workforce is trained, funded, and deployed.<sup>2</sup> While the shortage is widespread, the strain is particularly acute in primary care, behavioral health, and underserved regions.

Multiple forces are driving this imbalance. Burnout and early retirements are accelerating attrition: A recent study showed nearly half of surveyed physicians report symptoms of burnout.<sup>3</sup> Administrative burden and rigid reimbursement structures further erode clinical time, pulling physicians away from direct care.

## The opportunity to unlock capacity

Even as workforce shortages deepen, health care stands on the verge of a transformation. Rapid advances in AI, automation, and digital health tools are creating opportunities to reimagine how care is delivered—and who delivers it. When designed and implemented well, these tools can reduce administrative burden, extend clinical reach, and enable physicians to focus on patient care. Early deployments demonstrate this potential. For example, ambient AI documentation has reduced after-hours work and meaningfully improved physician satisfaction in large health systems,<sup>4</sup> while AI-enabled documentation support has been associated with significant reductions in burnout across multiple academic medical centers. These outcomes underscore a critical insight: Technology creates capacity when it augments clinical workflows rather than adding friction. For example, AI scribes were associated with a 21.2% absolute reduction in burnout at Mass General Brigham.<sup>5</sup>

These early outcomes illustrate the potential when technology augments, rather than interrupts, clinical work. The proliferation of consumer health apps, always-on sensors, and wearable devices offers an opportunity for consumers and physicians to improve shared decision-making. Deloitte research found 60% of households own a wearable device and 87% of wearable owners use them to track health metrics.<sup>6</sup> Our Future of Health™ framework suggests that this proactive, personalized, and prevention-focused approach to care not only can improve physician efficiency and patient outcomes, but also could dramatically reduce medical and pharmacy spending on cancer and kidney disease research.<sup>7</sup>

Even modest efficiency gains could have profound implications. Deloitte analysis indicates that if physician productivity improved by about 9 percent, the national physician shortfall projected through 2036 could potentially be closed in aggregate—even under high-demand scenarios.

But closing the gap on paper and realizing it in practice are not the same.

The first challenge is scaling effective implementation of these tools. While early pilots show potential for significant impact, the pace of investment has far outstripped the maturity of deployment. In the first half of 2025, venture capital funding in digital health reached \$6.4 billion, an increase from \$6 billion in the first half of 2024.<sup>8</sup> One leading academic medical center has committed to investing more than \$1 billion in AI over the next several years.<sup>9</sup>

Nearly 90% of surveyed health system executives report that digital and AI transformation is a high or top priority for their organization.<sup>10</sup> Yet, a 2025 analysis of 116 patient-centered digital health applications found that more than 85% remain in early stages of development, with few demonstrating sustained real-world integration or robust clinical validation.<sup>11</sup> Likewise, an HFMA survey found that while 88% of health systems reported using AI in some form, only half said they had sufficient resources in place to support implementation.<sup>12</sup> The result is a widening performance gap: large sums invested in technology that often add friction rather than removing it.

The second gap is targeting capacity gains to specialties and geographies that suffer the most constraint: primary care, mental health, and rural communities. Solutioning for this will involve more complex system and workforce transformation. The goal is to not only improve the efficiency of health care delivery, but reimagine and incentivize career pathways that address the highest-need areas.

AI scribes were associated with a 21.2% absolute reduction in burnout at Mass General Brigham.

## The performance gap

Health care faces a turning point: Will technology clarify complexity or compound it? Recent Deloitte research shows that many health systems struggle to capture value from digital investments not because of technology limitations, but because of gaps in clinical ownership, workforce alignment, and delivery discipline.<sup>13</sup>

To unlock technology's potential, transformation will need to occur on two fronts: (1) solutions should be shaped by those closest to first-order clinical and operational problems, and (2) the workforce will need to evolve to enable clinicians and technology to operate in complementary, hybrid models that scale innovation and impact.

Lessons from early missteps demonstrate how easily progress can stall when technology is introduced without clinical partnership or when workforce structures fail to support meaningful adoption.

These lessons reveal clear insight into what should change moving forward:

- **Triage tool deactivation.** Early triage AI models in emergency departments were shelved within months due to low accuracy and workflow disruption, reflecting the risks of limited frontline engagement.<sup>14</sup>
- **Electronic health record (EHR)-driven burnout.** A review of EHR-related research found that poor usability, rising documentation demands, and unreimbursed patient messaging have increased cognitive load and clerical burden—making EHRs a contributor to physician burnout, especially in primary care.<sup>15</sup>
- **Trust without transparency.** A 2025 study of an AI tool for breast cancer decision support found that when the system displayed high-confidence scores (indicating strong algorithmic certainty), some clinicians were more likely to trust the output, which has the risk of overreliance and reduced diagnostic accuracy.<sup>16</sup>

These examples highlight a fundamental performance gap: Technology can extend capacity, but only if the physician workforce is equipped and empowered to lead its integration.

## Building the workforce to lead

Meeting the evolving demands of care will require more than filling gaps in headcount—it will mean aligning skills, incentives, and workforce distribution with the realities of modern health care.

To correct course, the next generation of physicians should be equipped not only with digital fluency but also with an understanding of the structural levers that drive imbalance—how compensation, debt, and career incentives influence where physicians practice and what specialization of care they provide. A forward-looking workforce strategy should cultivate these skills alongside technology-enabled leadership to ensure capacity is distributed where it delivers the greatest impact.

This is the pivot from incremental improvement to systemic redesign—from deploying tools around physicians to enabling physicians to drive the deployment of tools and the redesign of the system itself. Achieving this vision will require transformation across four fronts: how physicians are educated, how they work, how they continue to learn, and how the system around them is structured and financed.



# A roadmap for empowering physician productivity



## Recommendation 1: Expand medical school and GME pathways

With rapid transformation underway in health care, traditional medical education pathways risk failing to keep pace. Many training programs remain primarily focused on preparing clinicians for traditional, in-person, one-to-one models of care. The future of health care is expected to embrace a more hybrid approach, blending in-person care with digital, technology-enabled models that empower patients to participate in their own health journey. These innovations are essential to delivering high-quality, coordinated, cost-effective care.

At the same time, demand for physician expertise is expanding beyond traditional care settings, as health systems and technology-enabled organizations increasingly recruit clinicians with skills in digital health, informatics, and systems transformation. While a handful of forward-looking institutions are beginning to embed these competencies into medical curricula, progress remains fragmented and insufficient relative to the pace of change:

- A recent survey found that 56% of clinicians expect to base most of their future clinical decisions on tools that utilize AI—yet 69% report feeling overwhelmed by the volume of data and anticipate digital health technologies will become an even greater burden without proper training. Eighty-three percent of respondents said training must be overhauled to keep pace with technological advancement.<sup>17</sup>

**Medical schools and academic leaders should take the lead in modernizing medical education.** Many institutions have begun to introduce innovation and digital health content into existing curricula, as seen in the following examples:

- Stanford Medicine offers electives in biomedical data science and digital health through the Center for Digital Health and programs like the Clinical Informatics Fellowship.
- Dell Medical School at UT Austin has embedded innovation into the curriculum from the ground up—prioritizing community-based, interprofessional care and launching the *Innovation, Leadership, and Discovery* (IL&D) track to support students interested in systems change.
- Mayo Clinic Alix School of Medicine incorporates coursework in artificial intelligence, health systems engineering, and team-based care, along with research opportunities through its Center for Digital Health.

- Alice L. Walton School of Medicine, founded in 2025 in Bentonville, Arkansas, reimagines medical education through a curriculum grounded in whole-person care, the arts, culinary medicine, and community-based practice—designed to prepare physicians for a more holistic and integrated approach to health.

While these programs represent important steps, a more concerted approach is needed. Matching the scale of change happening across the health care system requires moving from isolated curricular updates to a structural expansion of educational pathways.

This means building and scaling dedicated tracks in digital health, artificial intelligence, entrepreneurship, and interdisciplinary collaboration, as evidenced in the following examples:

- Carle Illinois College of Medicine, founded in 2018 as the world's first engineering-based medical school, was designed to prepare physicians for cross-sector roles by combining the problem-solving rigor of engineering with data-driven insight and the humanism of medicine.
- The Clinician Innovator Pathway at Mass General Brigham supports residents pursuing careers in digital health and startup leadership.
- The Tech Innovation Pathway at NYU Langone offers structured training in product development, venture creation, and digital transformation.
- A recent study highlighted how co-developed, project-based capstones can strengthen applied digital health competencies while helping align graduate medical education with evolving health system needs.<sup>18</sup>
- There are a growing number of MD/MBA and MD/MPH dual-degree programs, with more than 50 US medical schools now offering MD/MBA options.<sup>19</sup>

Academic institutions, with support from national organizations and system partners, should foster cross-disciplinary coursework in areas like engineering, computer science, and business; incentivize faculty to lead innovation-focused tracks; and forge partnerships with industry to deliver real-world training experiences. These career paths are not departures from medicine but extensions of the profession.

Ultimately, the goal is not to pull physicians away from care—it is to prepare and empower them to shape how care is delivered. By expanding and legitimizing new medical education pathways, physicians can enter the workforce ready to lead transformation across sectors—and close the physician capacity gap in ways that strengthen care for patients, providers, and systems alike.



## Recommendation 2: Reinvent the physician operating model

As the health care landscape evolves, so too, do the ways physicians engage in their work. One notable shift is the steady decline of private practice: In 2024, only 42.2% of physicians worked in private practice, down from 60.1% in 2012.<sup>20</sup> Increasingly, physicians are employed by large health systems, private equity-backed organizations, and nontraditional entities. These structures offer scale and coordination but often reduce doctors' clinical autonomy and influence over innovation agendas.

While this trend reflects broader system-level changes, it also underscores the need to reconsider how physician expertise is integrated into transformation efforts. Designing roles that restore opportunities for leadership, cross-functional contribution, and innovation is essential—not only for professional engagement, but to ensure that emerging tools and models improve care delivery, reduce cost, and reflect clinical realities.

To accomplish this, new career pathways for physicians need to be developed. This goes beyond single roles, such as chief medical officer, which still remains a critical role, and should embrace career advancement from entry-level physicians to mid-career and advanced-career opportunities. These roles encompass areas such as product development, artificial intelligence, data science, digital innovation, change management, and clinical workflow transformation.

New competency frameworks should pinpoint where physicians are well positioned to contribute while amplifying clinician identity. Operating models, such as clinical informatics and digital health, will need to be reimaged to clearly outline these new capabilities and clarify how physicians will work within the broader enterprise. Performance management, evaluation, and recognition systems should be aligned around the contributions of clinicians, including innovation and transformation.

Health systems, health plans, technology companies, and startups can work collaboratively with medical schools and GME programs to develop these pathways and create programs to connect with medical students prior to transitioning into industry. Internship, capstone, and fellowship programs have been highly effective in other advanced-degree programs, such as business administration, and can help cultivate a physician workforce that is ready to lead across sectors.



## Recommendation 3: Redesign lifelong training and education

Physicians entering leadership, innovation, and technology roles are increasingly doing so without a clear roadmap. As health care evolves into a more multidisciplinary, data-driven, and technology-enabled system, traditional postgraduate education is no longer sufficient. A new model is needed—one that supports ongoing skill development throughout their careers and equips physicians to lead transformation across clinical, operational, and industry settings.

A continuum of learning opportunities should be available to physicians during and beyond their formal education. These should include training in emerging areas such as digital health, AI, data science, product development, and organizational change. For physicians transitioning from clinical care into new roles—whether in system transformation, technology development, or innovation leadership—access to structured, high-quality upskilling programs will be essential.

To deliver on this vision, academic institutions should embrace a more flexible, cross-disciplinary approach. Universities can draw on in-house expertise across business, engineering, computer science, and law to build programs that reflect the realities of modern health care. However, unlocking this potential may require rethinking long-standing structures; breaking down academic silos; sharing curricula across departments; and enabling learners to access leading instruction, including certificate programs.

Importantly, this transformation will require new funding and resource-sharing models. Traditional medical education financing mechanisms are not designed to support modular, cross-sector programs for mid-career professionals. Institutions should explore a blend of funding strategies—drawing on tuition models, employer sponsorship, system investment, philanthropic support, and grant funding—to make these opportunities both scalable and accessible. Jointly developed training programs resourced by both academic and private-sector experts can offer real-world exposure and build networks across care delivery, startups, technology companies, and consulting. For example:

- Coursera offers a Health Informatics Certificate developed by Johns Hopkins University, and an AI for Medicine Specialization in partnership with Stanford.
- Guild works with employers to upskill health care workers, boasting 3.5x higher internal mobility for learners who complete its programs. Its model supports internal transitions into high-need clinical and leadership roles.<sup>21</sup>

- [Deloitte's Physician Leadership Academy](#), offered in collaboration with the Wharton School, equips rising physician leaders with business acumen, transformation capabilities, and a cross-sector network.
- Mass General Brigham's (MGB) Health Innovation Bootcamp is an on-demand, inventor-designed course for early-career clinicians, covering the fundamentals of health care innovation, invention, and commercialization. MGB also hosts Innovation Grand Rounds, Commercialization Bootcamps, and the Housestaff Innovation Studio, engaging more than 330 participants annually with practical innovation training and mentorship.

These programs demonstrate the growing demand—and opportunity—for postgraduate training that reflects the complexity and ambition of today's health care system.

To scale impact, this transformation also needs to be cultural. Institutions should acknowledge that roles in innovation, tech, and systems leadership are an essential evolution of medicine. Supporting physicians through these transitions will require intentional mentorship, organizational recognition, and expanded access to skill-building opportunities beyond traditional clinical pathways.

Ultimately, redesigning post-medical education is not just about individual career development. It is about enabling the health care workforce to be better equipped to lead in an era of rapid innovation and increasing complexity.



#### **Recommendation 4: Evolve medical education funding and related frameworks**

Current policy, funding, and regulatory models have a significant impact on the supply of physicians entering the workforce. The cap on Medicare-funded GME residency slots has remained largely unchanged since the Balanced Budget Act of 1997.<sup>22</sup> Although Medicare continues to fund roughly two-thirds of GME positions, the overall number of funded slots has not kept pace with population growth, physician attrition, or evolving care models.<sup>23</sup>

Today's GME structure remains largely oriented around traditional, full-time, clinically focused residencies, which do not reflect the diversity of roles the health care system increasingly needs physicians to fill. Flexible, hybrid GME tracks that incorporate digital health, systems leadership, innovation, and interdisciplinary care may require funding models that evolve beyond traditional structures. These new tracks would position physicians to lead transformation efforts, not just deliver care within legacy systems.

Health systems, philanthropic foundations, private payers, and technology companies all have a role to play. Models such as the Robert Wood Johnson Foundation's Clinical Scholars Program, which supports physicians in health services research and policy, offer a proof of concept. Expanding and adapting such models to support digital transformation and innovation training is a logical next step.

An evolution of the funding and regulatory models surrounding GME residencies would likely involve coordination across policymakers, education leaders, and industry stakeholders. Such shifts could create space for workforce models where physicians are trained and empowered to lead in care redesign, digital transformation, and systemic innovation.



## A cross-sector call to action

Failing to address the growing physician shortage in the US will likely have profound consequences. It can erode access, strain quality, deepen health inequities, and potentially push an already overburdened system further beyond its limits.

Emerging technologies—including AI, remote monitoring, and digital-first care models—offer the potential to unlock new forms of clinical efficiency and patient engagement. But this depends not only on technical capability but on how effectively they are embedded in the realities of care. Without the active engagement and leadership of physicians, these innovations will likely remain disconnected, underutilized, and poorly scaled.

A bold rethinking of how physicians are trained, deployed, and empowered across their careers is necessary. It means redesigning education to reflect new models of care, creating flexible pathways into roles beyond the bedside and aligning policy and funding

structures to support a more adaptable, innovative, and system-oriented workforce. This includes embracing multidisciplinary learning, fostering new career pathways, and equipping clinicians to lead in innovation—not just deliver care.

Failing to act may not only deepen inequities but impose significant economic costs on systems already under strain. Investments that are made in physician leaders who can harness AI, predictive analytics, and system design—to not only deliver care, but prevent disease and manage health upstream—can do more than address today's shortage. A more resilient, responsive, and future-ready health care system can be built that puts physicians at the center of progress and patients at the center of care.



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