

# SIGNAL 1

Managing the  
Complexity Curve:

What It Takes  
to Scale AI in  
Healthcare





## Introduction:

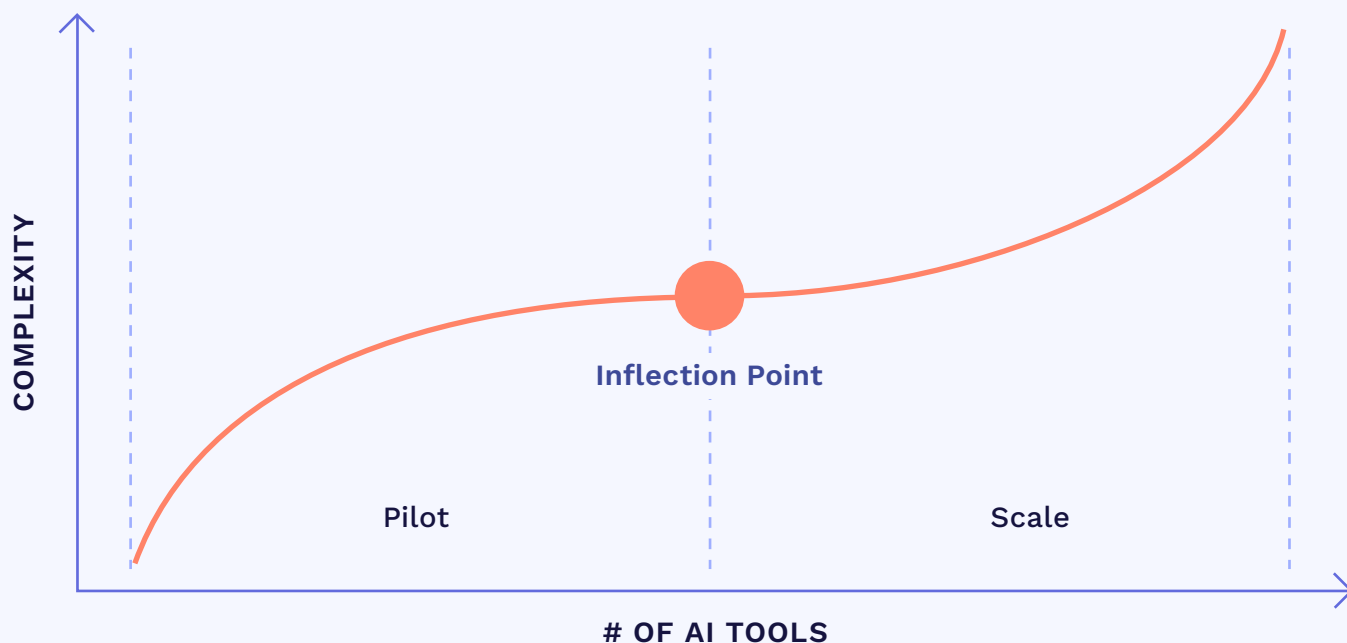
### A New Inflection Point for AI in Healthcare

Healthcare is at a pivotal moment. Mounting financial pressure — from shrinking margins, rising labor costs, and reduced federal support — is forcing health systems to seek innovative ways to reduce costs and grow revenue. While AI holds significant promise, many health systems remain in pilot mode, operating fragmented initiatives with limited oversight and slow timelines. In fact, 83% of health care organizations are currently piloting generative AI, yet less than 10% have built the infrastructure to scale beyond these early experiments.<sup>1</sup>


Building high-value AI programs offers a powerful lever to reduce costs, grow revenue, support staff, and buffer margins. But as the number of AI tools within a health system grows from a handful to potentially hundreds, the complexity of managing them doesn't rise linearly — it grows exponentially. Each new model adds more data, more users, more oversight and operational demands, and potentially novel risks.

This is what we call the **AI complexity curve**: the relationship between the number of AI tools and the overall complexity associated with managing those tools.

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<sup>1</sup>[www.aha.org/aha-center-health-innovation-market-scan/2025-05-06-4-critical-steps-scale-generative-ai](https://www.aha.org/aha-center-health-innovation-market-scan/2025-05-06-4-critical-steps-scale-generative-ai)



And, right now, many health systems find themselves at an inflection point on this curve: the point at which incremental growth in AI adoption suddenly gives way to disproportionately greater operational and governance challenges. Without centralized management, this curve becomes a barrier—one that overwhelms already-stretched teams, stalls innovation, and increases enterprise risk.

This paper explores what it takes to manage that curve—examining the operational and strategic challenges of AI expansion in healthcare and outlining the system-level capabilities required to scale safely, efficiently, and with measurable return on investment.

To meet today's financial realities, health systems must move beyond pilots and establish structured, scalable AI programs.

## The Financial Imperative to Scale AI—Now

The need to scale AI isn't just an operational challenge; it's a financial imperative. U.S. hospitals and health systems are under intense economic strain, facing:

- ◆ Cuts to Medicaid and supplemental payments
- ◆ Reductions in research grant funding
- ◆ Rising labor and supply chain costs

With margins under pressure, health systems must find new ways to drive cost efficiencies, generate incremental revenue, and improve access and utilization. AI has the potential to do just that - through things like task automation, optimized resource allocation, and patient engagement.

However, endless pilots and piecemeal deployments won't deliver enterprise-scale impact. Many organizations now have dozens of AI tools in flight—30, 50, even 100—either deployed or in pilot mode. While some may hold significant ROI potential, the absence of centralized oversight leaves leaders in the dark. They lack clarity on which tools are delivering value, which are underperforming, and which may introduce unacceptable risk.

To meet today's financial realities, health systems must move beyond pilots and establish structured, scalable AI programs—programs that can unlock measurable ROI while actively managing clinical, operational, and reputational risk.

# The Complexity Curve: From Linear Growth to Exponential Chaos

Scaling from a few AI tools to an ecosystem of hundreds introduces nonlinear complexity. At a small scale, governance can be managed manually—approval processes are often informal or decentralized, documentation lives in spreadsheets, and monitoring is retroactive. But as volume increases, this approach no longer works.

## Key complexity drivers include:



### More tools:

Generative, predictive, and agentic solutions developed in-house, by third-parties or embedded in existing software—each with different data and workflow integrations, risk profiles and oversight needs.



### More users:

Data scientists, engineers, IT operations, compliance officers and, of course, end users—each requiring role-based access and specific reporting.



### More workflows:

Risk assessments, solution evaluation, custom approval processes, monitoring many solution types, internal and external compliance.



### More accountability:

Executives and boards now expect measurable ROI and visibility into both impact and risk, not just innovation for innovation's sake.

These factors don't just add complexity—they **multiply** it. Without a dedicated system for AI lifecycle management, organizations face overwhelming administrative burdens, duplicative investments, operational inefficiency within their AI function, compliance risks, and, most significantly, limited progress on AI value creation.

As Boston Consulting Group notes,

“Disconnected AI deployments are increasingly exposing enterprises to unintended consequences such as duplicative efforts, security vulnerabilities, compliance risks, maintenance and scalability challenges.”

For health systems, this fragmentation isn't just inefficient—it's unsustainable. Without central coordination, the promise of AI becomes mired in operational chaos and growing risk exposure.

## Built-In Guardrails: The Key to Safer, Faster AI Deployment

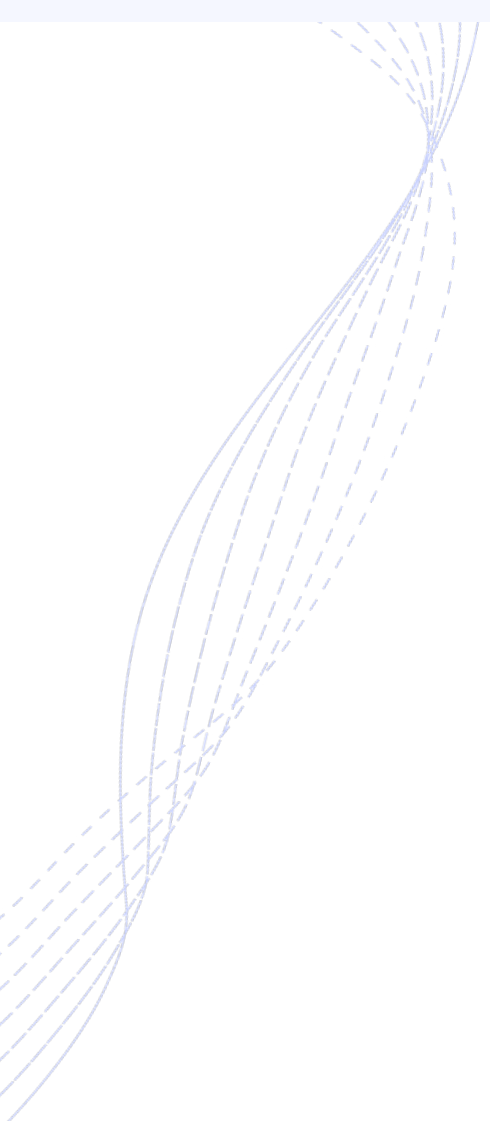
A major misconception about AI governance in healthcare is that oversight slows progress. In reality, the opposite is true—**when governance is embedded and automated, it becomes a force multiplier for innovation.**

Without a structured system, every new AI deployment requires additional manual effort to approve models, assess performance, track risk, and monitor ROI. Over time, this burden becomes unsustainable. Many health systems simply can't afford to scale due to the operational costs of managing an expanding portfolio of models. Worse, they often avoid adopting the most cutting-edge—and potentially most valuable—solutions because the challenge of validating and monitoring something unfamiliar feels too complex or risky.

Organizations that centralize governance and streamline oversight, however, are able to move faster. **By reducing manual processes and adopting standardized, auditable workflows, they eliminate the operational drag that typically accompanies growth.**

Predefined pathways for validation, monitoring, and compliance shift teams from reactive mode to proactive execution.

When governance is embedded and automated, it becomes a force multiplier for innovation.

An abstract graphic consisting of several curved lines, some solid and some dashed, originating from the left side of the page and extending towards the right. The lines are light blue and create a sense of movement and flow.

In these environments, oversight isn't an after-the-fact compliance exercise—it's embedded into the AI lifecycle. This integrated approach gives these organizations both the tools and the confidence to deploy safely and quickly, with visibility into model performance, risk, and impact from day one.

Balancing AI's risk and reward isn't about adding red tape — it's about laying the groundwork to scale with confidence, speed, and efficiency. The right infrastructure doesn't just manage complexity — it transforms it into a strategic advantage.

## From Fragmentation to Enterprise Strategy: What It Takes to Scale AI Responsibly

Scaling AI in healthcare requires more than good models, it demands a coordinated system that allows organizations to evaluate, monitor, measure, and optimize AI across its entire lifecycle. This includes:

- ◆ **Structured, repeatable approval workflows** to validate risk, performance, usability and alignment with organizational goals
- ◆ **Real-time performance monitoring and drift detection** to catch performance and safety issues early and avoid costly breakdowns
- ◆ **Standardized, configurable reporting** to track ROI and identify which models to scale and which models to retire
- ◆ **A unified view of AI assets** to eliminate redundancies, reduce overhead, and streamline governance

When these elements are in place, health systems are equipped not just to manage complexity, but to benefit from it. A diverse and growing AI portfolio can become a strategic asset, driving margin improvements across the system, enhancing care delivery, and accelerating innovation.

## Visibility Drives Better Investment Decisions

In a resource-constrained environment, visibility is paramount. Health system leaders can no longer afford to invest in AI without clear insight into what's working, what isn't, and where the biggest returns lie.

With the right tools in place, decision-makers can:

- ◆ Quantify ROI across clinical, operational, and financial dimensions
- ◆ Identify top-performing models to scale system-wide
- ◆ Sunset or recalibrate underperforming tools
- ◆ Prioritize pipeline investments based on real-world impact

This data-driven approach transforms the AI portfolio from a collection of isolated experiments into a strategically aligned program that contributes to both mission and margin.

This is not about slowing down innovation—it's about accelerating the right innovation, with confidence.

## Moving Forward: A Centralized Approach to AI Management

At this inflection point, with many health systems indicating plans to double their number of AI tools in the next 12 to 18 months, the need for a centralized, purpose-built approach to AI management is more urgent than ever. Health systems can't afford to manage dozens—or hundreds—of tools manually. Nor can they tolerate the risk, inefficiency, or lack of visibility of fragmented oversight.

A centralized platform provides the structure, automation, and visibility required to scale safely and strategically. It replaces manual processes with built-in workflows, fragmented monitoring with real-time dashboards, and uncertainty with measurable results.

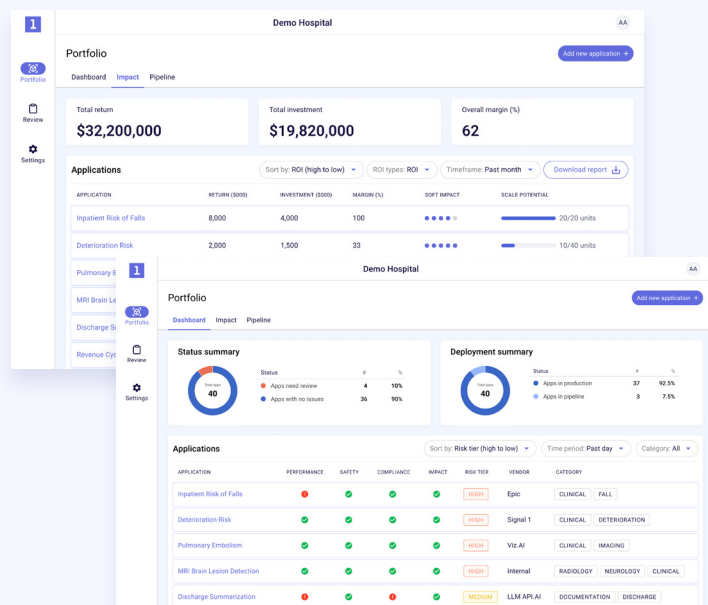
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# Conclusion: Turning Complexity into Competitive Advantage

Healthcare leaders are right to be thoughtful about how they scale AI. The risks are real, but so is the opportunity. Remaining in pilot mode is no longer viable—not when financial pressures are intensifying and valuable AI solutions are ready to deliver impact.

Managing the complexity curve isn't just about keeping up with growth—it's about turning that growth into transformation. **Health systems that act now—putting the right infrastructure, governance, and visibility in place—will be the ones that unlock rapid and sustained value from their AI investments.** Those that wait risk falling behind as complexity outpaces their ability to manage it. With the right systems in place, health systems can unlock the full value of AI – safely, strategically, and at scale.

With structured oversight, real-time visibility and healthcare-specific management tools, organizations can evolve from fragmented efforts to a coordinated, ROI-driven AI program. Governance doesn't have to slow progress – it can accelerate it by creating the clarity, confidence and control needed to scale AI responsibly.



## How Signal 1 Helps Health Systems Scale AI Responsibly

Signal 1 is a centralized AI management platform purpose-built for healthcare, designed to help health systems unlock the full value of their AI investments while managing risk. Our solution enables rigorous governance, continuous performance measurement, and efficient deployment—delivering visibility and control across every stage of the AI lifecycle. We help health systems balance risk and reward, so innovation can scale confidently and drive meaningful clinical and operational outcomes.

**Ready to unlock the value of your AI investments?**

Schedule a demo or contact us to learn how Signal 1 can support your organization's AI journey.

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