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Advancing Patient Safety and Health Care Quality — Bridging Research, Policy, and Implementation

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Preventable harm continues to challenge health care safety and quality. Diagnostic errors, fragmented systems, and underreporting of patient safety events are key contributors. Insights from the Advancing Patient Safety and Healthcare Quality symposium in Washington, DC, highlight strategies to address these gaps. Focusing on high-risk conditions, leveraging real-time patient-reported data, and applying AI-enabled tools can reduce harm. Durable improvement requires integrated systems design, human factors training, and meaningful patient engagement, supported by aligned incentives and shared data infrastructure, to achieve safer, patient-centered care for all.

Introduction

The need to reduce preventable harm and improve patient safety and health care quality remains urgent, despite decades of research and interventions. Insights from the Advancing Patient Safety and Healthcare Quality symposium, held on May 16, 2025, in Washington, DC, and hosted by the Armstrong Institute for Patient Safety and Quality at Johns Hopkins Medicine in partnership with Patients For Patient Safety US, highlight practical, high-impact strategies to advance a shared vision for safer and higher-quality health care. The symposium, which convened researchers, policy makers, and patient advocates, focused on diagnostic excellence, patient experience, and systems design, underscoring the importance of cocreating improvements with patients and integrating responsible use of artificial intelligence (AI). These insights inform a road map for designing safer and higher-quality health care through strategic, evidence-informed actions to improve health care safety and quality.

The Case for Collaborative Systems Redesign

Patient safety remains one of the most pressing and persistent challenges in health care. Despite more than two decades of efforts to improve patient safety, medical errors continue to permeate health care settings at unacceptable rates.

Diagnostic errors warrant prioritized attention given their frequency and severity. Often rooted in cognitive and systems-level breakdowns, inaccurate or delayed diagnoses contribute to the staggering estimation of 900,000 cases of death or serious injury in the United States annually,[1] exceeding all other categories of serious patient harm events put together. To make the most impact, a focus on high-risk conditions that involve a disproportionately high number of diagnostic errors offers a practical and high-yield path forward.

Because health care delivery functions as a complex sociotechnical system — integrating people, technologies, environments, and workflows — safety depends on coordinated systems design rather than isolated, unit-based interventions. A "system of systems" approach that promotes cross-setting integration, adaptability, and cognitive support is essential.

Achieving durable improvement also requires the cocreation of care systems with patients and families, recognizing their unique longitudinal perspective. Patients are often the only ones who see the whole picture of care — across settings, providers, and time — and yet have few ways to contribute their lived experience to measurement or improvement work. There is much room for improvement in engaging patients as data providers and full intervention design partners.

Challenges and Pathways for Change

Despite consensus that patient safety is a public health priority, challenges continue to impede meaningful progress in this area. A key barrier is the fragmentation of health care systems, as many preventable harms occur during care transitions when there are gaps in communication necessary to coordinate care between different hospital units, inpatient or outpatient facilities, or home caregivers. Many safety interventions aimed at reducing fragmentation of care remain siloed and reactive, and are unable to address underlying structural flaws. Chronic underinvestment in implementation infrastructure leaves many proven interventions underused or poorly adapted to local contexts.

Another core challenge is the misalignment of financial and policy incentives with safety goals. Prevention of diagnostic errors would save the health care system in the United States a significant amount of money each year, yet these savings do not accrue to those responsible for implementing improvements. Hospitals may lose revenue by reducing unnecessary imaging, for example, even if it benefits patients. Without mechanisms to capture return on investment (ROI) or align payer incentives with outcomes, health care organizations struggle to scale up safety-enhancing innovations.

Gaps in real-time input and data continue to slow progress. Half of preventable harm events are never reported, according to studies by the U.S. Department of Health and Human Services Office of Inspector General.[2] Patient safety organizations, intended to perform as a national learning

system, have become data silos.[3] Patients and families often observe early signs of breakdowns in care but lack effective ways to report their concerns to learning systems. Instead, they are often funneled to litigation. Most diagnostic safety failures first emerge as liability claims years after harm occurred, not in real-time or near real-time reporting. The current health care system frequently fails to detect and learn from harm, making it difficult to address and prevent errors.

Reducing diagnostic errors requires a multipronged approach that prioritizes patient feedback on care experience, applies technology, and builds robust data systems. Noting that there are likely over 50 million diagnostic errors per year in the United States, with many of those causing death or serious harm, patient safety efforts should focus on the three conditions that account for the majority of diagnostic harms: vascular events, infections, and cancers. Targeted state-level demonstration projects using evidence-based bundles could generate measurable reductions in these areas without the complexity of national rollouts. Improved infrastructure to capture patient-reported data and diagnostic feedback in real time could enable early detection of errors.

To advance systems design, a shift from isolated fixes to holistic design in physical, technical, and organizational care environments that support safe and effective decision-making is needed. This includes creating resilient systems that anticipate variation, support cognitive work, and prioritize safety in every layer of care. Pathways to achieve this include incorporating human factors and systems training into Centers for Medicare and Medicaid Services (CMS) conditions of participation — in clinical education and leadership development, and as part of licensing requirements — and establishing clear ROI metrics for systems-level changes.

Improving patient experience requires engaging patients and families as active partners in care design and delivery, and systematically incorporating their lived experience into quality improvement. Clear pathways for patient feedback during and after care encounters, as well as technology-enabled channels — such as chatbots or ambient AI — can support communication and provide updates while maintaining clinician connection and oversight. Patient surveys should solicit feedback on safety events and diagnostic delays or inaccuracies. Financial incentives for patient participation and clinician communication can reinforce these efforts. Engagement strategies must be inclusive, ensuring that populations at higher risk of preventable harm are meaningfully involved.

Time Frames for Proposed Changes

Short-term goals for advancing patient safety and health care quality should focus on immediate wins through pilot initiatives and foundational groundwork, such as AI-enabled real-time patient feedback tools, launching early warning systems, and introducing basic training in human factors and systems engineering. Intermediate goals might center on scaling these pilots into demonstration projects, aligning policies and incentives, and integrating successful practices into routine care through state-level initiatives and systemwide reporting. The long-term goal is to achieve structural transformation by building and using a national data-sharing infrastructure, embedding systems design into clinical education and licensure, ensuring universal access to safety technologies, and fostering a culture of patient–clinician cocreation to sustain a patient-centered, zero-harm health care system.

Short Term (1–3 Years)

- **Uncover "hidden" data with large language models and AI tools.** Integrate AI-driven symptom tracking and patient-reported outcome tools, such as chatbots or ambient listening technologies, in select clinical areas to identify early signs of diagnostic errors.
- **Pilot early warning and rapid response mechanisms.** Implement digital alert systems that enable clinicians or patients to flag and review safety concerns in real time.
- **Mandate human factors and systems training.** Launch continuing education modules and professional development sessions on human factors and systems design for practicing clinicians.
- **Deploy AI tools for real-time feedback and adaptive listening.** Trial bedside digital assistants or apps to collect patient experience data that are connected to provider workflows and trigger a response in real time.
- **Involve patient and family advisors in institutional initiatives.** Include in quality improvement teams patient and family advisors who have clear roles in design, governance, or oversight structures.
- **Incentivize patient engagement financially.** Design small-scale financial incentive programs (e.g., co-pay discounts) for patients to incentivize their engagement in health care and safety.

Intermediate Term (3–5 Years)

- **Develop statewide demonstrations.** Launch state-based demonstrations focused on diagnostic safety bundles for vascular events, infections, or cancer-related conditions, integrating systems design.
- **Design "systems of systems."** Create integrated pathways and shared digital infrastructure that connect hospital units and fragmented health care settings (e.g., intensive care unit, emergency department, home care) to "systems of systems" that support collaboration, adaptability, and cognitive work across diverse care settings and players, including patients.
- **Build a learning platform.** Establish a national or multiinstitutional learning platform to record and analyze harms, innovations, and implementation strategies across health care environments.
- **Publicly report safety and experience metrics.** Work with CMS and accreditation agencies to mandate public reporting of select patient safety metrics beyond existing federal dashboards.

Long Term (5–10+ Years)

- **Create a national data architecture for shared learning.** Build the infrastructure for seamless sharing of diagnostic data across institutions — linking electronic health records, AI systems, patient-reported outcomes, and administrative data.
- **Integrate systems design into licensing and credentialing.** Require systems design education across all clinical training programs and licensures.

Table 1. Key Sectors for Advancing Patient Safety and Health Care Quality.*

Sector	Role
Health care systems	Central to implementation and change in clinical settings
Academic research centers	Drive innovation, evaluation, and dissemination
Government agencies (AHRQ, CMS)	Set policies, fund interventions, drive accountability
AI developers	Ensure responsible, widespread tech deployment
Patient advocacy groups	Provide legitimacy, urgency, and direct insight into needed solutions
Insurers and payers	Must align incentives to outcomes, not volume
Employers	Can drive demand for safer, more effective health care for employees
Commercial industry	Responsible for scaling technology, ensuring interoperability

*AHRQ denotes Agency for Healthcare Research and Quality and CMS, U.S. Centers for Medicare and Medicaid Services.

- **Develop ROI frameworks for system design.** Define economic models to demonstrate long-term ROI for system redesign and human-centered technology implementations.
- **Institutionalize real-time experience monitoring at scale.** Establish systemwide infrastructure for continuous, real-time patient input using embedded technologies that feed into daily operational and clinical decisions.

Key Sectors and Roles in Implementation

Driving system-level changes to advance patient safety and health care quality requires engagement of a broad range of sectors. Table 1 outlines the sectors involved and why their engagement is needed.

Actionable Steps to Improve Patient Safety and Health Care Quality

Table 2 summarizes the steps needed to improve patient safety outcomes and the groups responsible for their implementation.

Conclusion

Sustained progress in patient safety and health care quality requires a coordinated, systems-based approach that addresses diagnostic errors, fragmented care, and underutilized patient insights.

Table 2. Practical Steps for Advancing Patient Safety and Health Care Quality.*

Actionable Step	Responsible Groups
Develop real-time patient safety event and diagnostic inaccuracy and delay reporting tools	Health systems, health information technology vendors, government agencies, and patient advocacy organizations
Implement state-level diagnostic safety demonstrations	Federal funding agencies, state health departments, researchers, and patient advocacy organizations
Align reimbursement with safety outcomes metrics	CMS and private insurers
Incorporate human factors into safety training requirements	CMS, accrediting organizations, academic institutions, and clinical training programs
Cocreate shared research-practice agendas with patients	Federal agencies, patient advocacy organizations, researchers, and health systems

*CMS denotes U.S. Centers for Medicare and Medicaid Services.

Focusing on high-risk conditions, integrating human factors and systems design, and leveraging real-time patient-reported data and AI-enabled tools can substantially reduce preventable harm. Engagement of patients and families, inclusive of those most vulnerable to adverse safety events, is critical to designing resilient care systems. Aligning financial and policy incentives, building shared data infrastructure, and embedding safety-oriented education and practices across clinical settings can drive lasting improvements, ultimately achieving a safer, more patient-centered health care system.

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