Human Focused AI:
Creating High-Reliability Programs for Follow-up Care

Industry Whitepaper
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inflo HEALTH

> “To build the most effective high-reliability program, technology has to be in the trenches, understanding the root causes of missed follow-ups, empowering people with information and insights, and building the pathways that facilitate positive patient outcomes at scale.”

METHODOLOGY

Inflo Health estimated two measures of follow-up conformance:

- The prevalence of recommendations for additional imaging. The numerator of this measure is the number of studies that contain a recommendation for additional imaging. The denominator for this measure is the total volume of imaging studies.
- The closure rate of recommendations for additional imaging. The numerator for this measure is the number of recommendations for additional imaging that Inflo Health estimates were closed. The denominator for this measure is the number of studies that contain a recommendation for additional imaging.

Analysis was performed on radiology exams spanning January 1, 2022, to December 31, 2024

Patients Are Missing Follow-up Appointments

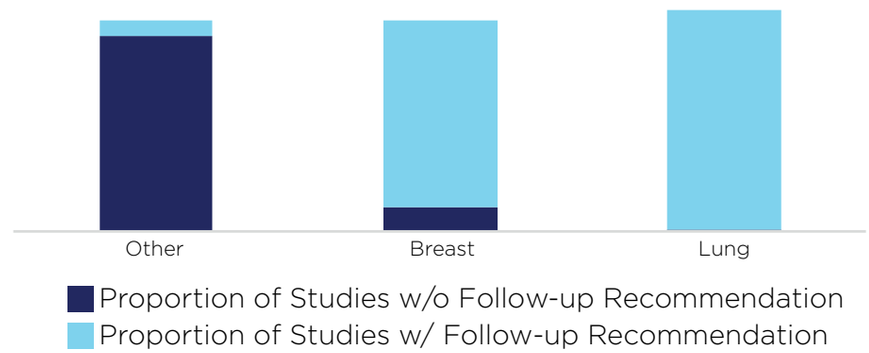
An estimated 370 million radiology studies are performed yearly in the United States. According to the American College of Radiology (ACR), 10% of those studies will recommend additional imaging. That's 37 million people who need a second look to find a potential cancer, improve their prognosis, and positively impact their quality of life. Approximately half of these follow-ups will not happen. The reasons vary, but for 18.5 million Americans, the likelihood that they will have the opportunity to catch a life-threatening condition or disease comes down to a coin flip.*

This is what happened to Jill, a former colleague and friend of Inflo Health CEO, Angela Adams, RN. Jill went to the ER with severe abdominal pain. A CT showed acute appendicitis. It also uncovered a breast lesion. The team addressed the appendicitis, and Jill made a full recovery. The breast lesion, however, wasn't communicated to her or her primary care physician for follow-up. By the time she found it during her routine mammogram nearly a year later, the cancer had metastasized into an inoperable brain tumor.

Inflo Health recently undertook an ambitious data analysis exercise, providing additional insights into the problem of missed follow-ups. Across six million studies analyzed, recommendations for follow-up were made **15%** of the time, although that frequency varied across programs. The highest rates of follow-up prevalence were found in breast and lung programs, which often include yearly exams, at **70% and 98%**, respectively. Studies that fall outside of an established program, which we coded as "other," had a follow-up prevalence rate of **7%.**

High rates of recommendations for follow-up occur more often across a few key populations. Lung cancer screening programs in particular, primarily target individuals at high risk, typically those aged 50 to 80 years with a significant smoking history (at least 20 pack-years) who currently smoke or have quit within the past 15 years. While breast and lung follow-ups have the highest prevalence, the number of studies performed outside of these programs comprised an average **88%** of all studies performed by a hospital or health system.

Fig 1. Proportion of Total Studies to Follow-up Recommendations by Program



Follow-up closure rates varied by program, with more mature programs having higher closure rates. Breast, one of the more established and best-resourced programs within the hospital setting, had the highest average closure rate at **64%**. Lung programs came in at a close second with an average closure rate of **60%**. Although these rates fall short of the **80%** target, closure rates above **60%** indicate that teams have established and accepted defined processes, roles, and responsibilities.

Many other required follow-ups surface incidentally and do not fall neatly into an established program. These are typically referred to the primary care provider to coordinate care. Many, like Jill's story, are found when looking for something else. Without established processes, ownership, and lines of communication, these follow-ups often fall through the cracks, with only **51%** completed.

We lost Jill to cancer that the healthcare system should have caught. Without established processes, ownership, and lines of communication, these follow-ups often fall through the cracks, with only 51% completed. We founded Inflo Health in Jill's memory, and our mission is to ensure that no patient misses a follow-up.

18.5 Million People Equals:

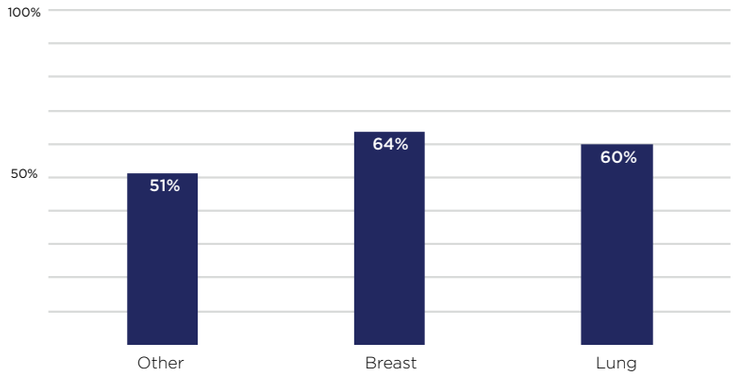
The Population of New York State

28,000 Boeing 747s

265 Football Stadiums

*Excludes dental imaging

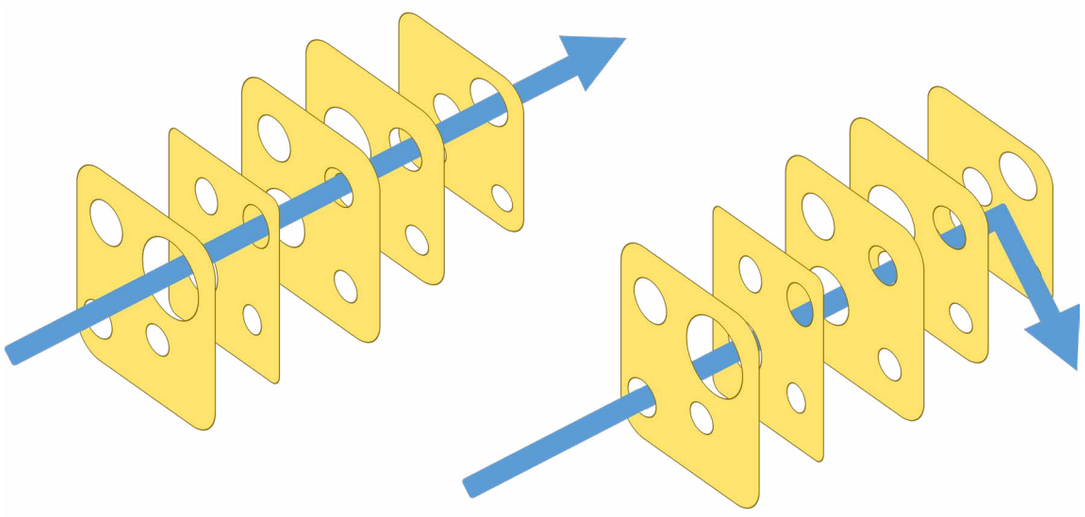
Fig 2. Follow-up Closure Rate by Program



A High-Reliability Approach to Follow-up Care

Within quality improvement circles, there is an established concept called the High Reliability Organization (HRO). It comprises systems and processes designed to reach error-free, high-quality outcomes even in the most complex and high-risk environments. A Swiss cheese model is sometimes used to describe the approach. Think of each layer or step of the patient journey or the hospital workflow as a slice of Swiss cheese—mostly solid, but each having holes throughout. Each process, practice, or safeguard has weaknesses. HROs recognize these vulnerabilities and try to ensure that the "holes" in each "slice" of the system don't line up—that is, the overlap between each step closes the risk and avoids an error.

Fig 3: Swiss Cheese Model of High Reliability



The most effective HROs share a few characteristics:

- **They are preoccupied with failure:** they are constantly measuring, monitoring, and learning from near misses about potential failure points
- **They avoid oversimplification:** they dive into the root causes behind failures and under performance
- **They are sensitive to operations:** they know what is going on at the front line and the real-time status of performance and risk exposure
- **They defer to expertise:** they value the input and authority of those with the most relevant and hands-on knowledge
- **They are committed to resilience:** they develop and execute an ability to adapt, recover, and respond to unexpected changes and risks

To solve for missed follow-ups, hospitals, health systems, and clinics are implementing programs designed to bring high reliability to follow-up care. Leading that change process is the American College of Radiology Learning Network's ImPower Program. This program delivers a structured, quality-improvement-focused, team-based approach to helping healthcare organizations implement and sustain change. Comprising several cohorts all focused on quality improvement in radiology, ImPower specifically addresses recommendations for follow-up care for indeterminate lung nodules. Participating teams are presented with a framework and methodology that help them implement high-reliability principles and a process for applying the framework to other areas of patient care.

The quality improvement approaches that see the greatest success take a strategic approach to technology. Kandice Garcia Tomkins, RN, Quality Improvement Director for the ACR ImPower Program, explains:

> "One thing we've learned is that when teams bring their vendor as part of the project team, they work like one of your front line staff. These teams understand not only what the technology can and can't do, but how to optimize the technology to optimize the team."

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Attributes and Outcomes of a High-Reliability Solution

To operationalize high-reliability concepts, a technology solution—as well as any underlying AI models—must be grounded in foundational HRO principles. For example, Large Language Models and Natural Language Processing may be used in recommendations report generation and identification. A high-reliability approach puts the radiologist—the expert—at the center of the process and uses technology to amplify the radiologist's recommendation, not replace or second-guess it. As Angela Adams, RN and CEO of Inflo Health explains

> "The most effective AI-enabled solutions elevate the work of the human. In the case of recommendations for follow-up, technology should alleviate manual tasks, provide feedback and alerts only when needed, and automate the administrative drag that distracts highly skilled medical experts away from delivering patient care."

The following table summarizes the HRO principles, what they look like within a high-reliability follow-up platform, and the outcomes enabled by the approach.

Principle	Preoccupation with Failure	Avoid Over-simplification	Sensitive to Operations	Defer to Expertise	Commitment to Resilience
Platform	AI-driven detection of actionable findings and automated tracking	Advanced NLP models categorizing findings & automating diverse care pathways	Real-time EHR integration and centralized dashboards for operational visibility	Prioritizes radiologists' recomm-endations & refers to guidelines in decision logic	Automated escalation paths (SMS, direct mail, provider alerts) for unresolved cases
Outcome	Proactive identification of 100% of follow-up needs, reducing missed cases	Standardized follow-up protocols, eliminating oversimplified workflows	Frontline staff/ radiologists maintain situational awareness of follow-up status	30-40% increase in clinically appropriate follow-ups and reduced false positives	40-50% improvement in follow-up adherence and closure

High-Reliability in Action: A Case Study

East Alabama Medical Center (EAMC), a 314-bed regional referral hospital, recognized a significant threat to patient safety stemming from inconsistent and inefficient radiology follow-up processes for incidental lung nodules. Staff relied on manual tracking, requiring them to parse unstructured radiology reports—which in turn led to variable practices and low reliability in completing recommended follow-up imaging. Communication breakdowns between acute care and primary care providers further undermined system resilience, limiting the ability to reliably close follow-up loops at scale.

A High-Reliability Solution

To create a high-reliability follow-up program, EAMC partnered with Inflo Health and the ImPower program. Inflo Health's AI-enabled solution applied natural language understanding (NLU) to automate consistent identification of recommendations for follow-up in radiology reports, dramatically enhancing process standardization and reducing manual review from five hours weekly to just 15 minutes—a 95% improvement. The platform promoted adherence to standardized documentation protocols aligned with Fleischner Society Guidelines, enhancing accountability among radiologists. Automated outreach, integrated directly through Cerner EHR, strengthened closed-loop communication with primary care providers, ensuring timely, consistent patient follow-ups.

Results

The implementation of high-reliability organizational principles delivered:

- 74% increase in completion rates for recommended lung nodule follow-ups.
- 20% improvement in adherence to the Fleischner Society Guidelines, raising compliance from 65% to 85%.
- 95% increase in staff efficiency, allowing clinical teams to focus more on patient care.

These improvements were achieved without additional resources, underscoring the effectiveness of embedding high-reliability practices into clinical workflows. This initiative established a new benchmark for operational excellence and patient safety at EAMC.

Steps to Building a High-Reliability Follow-up Program

The journey toward high-reliability follow-up can, on its face, seem overwhelming. A maturity model can serve as the jumping off point that provides a baseline; empowers prioritization across people, process, and technology efforts; and delivers a pathway to what high reliability looks like when operationalized.

The following framework builds off the ACR ImPower program and focuses on key areas for high-reliability follow-up:

- **Patient navigator:** Evaluates dedicated staffing resources (full-time equivalent patient navigators) committed to follow-up care.
- **Ownership:** Examines the established processes and organizational accountability ensuring follow-up care completion.
- **Follow-up identification:** Assesses methods used to reliably identify follow-up care recommendations.
- **Follow-up tracking:** Reviews how consistently follow-up completion is monitored and documented.
- **Appropriateness of recommendations:** Measures the adherence to established guidelines for documenting follow-up care recommendations.
- **Follow-up closure rate:** Determines the rate at which recommended follow-up care is effectively completed.

Lever	No Program/ Initiation	Developing	Mature	Optimal
Patient Navigator	None	Part-time	Single FTE	Multiple FTEs
Ownership	None	Decentralized	Hybrid	Centralized
Follow-up Identification	None	Manual	Macro Driven	NLP Driven
Follow-up Tracking	None	Manual	Hybrid	Automated
Appropriateness of Recommendations	Unknown	Ad hoc/ Informal	Ad hoc/ Structured	Systematic/ Integrated
Follow-up Closure Rate	Unknown	<50%	50-76%	>75%

Where an organization falls on the continuum can help determine what resources need to be activated, how to start the conversation with leadership, and where to focus.

Continue The Journey—Where to Go for More Information

Inflo Health is leading the development of high-reliability solutions for follow-up care. Recognized by the ACR and serving as a Learning Network partner, Inflo drives the innovations and capabilities that close gaps in the patient care process, alleviating manual tasks, streamlining communication across providers and patients, and delivering a generation of AI-enabled solutions that elevate the patient and clinician. We understand that healthcare feels chaotic. Our approach is to drive success in complexity and ensure that no patient misses a follow-up.

New resources are released every month including:

The Success in Chaos Podcast

Inflo Health Blog

ROI Calculator

For more information on Inflo Health and high-reliability follow-up, visit our website and connect with us.

Implementation of HRO principles delivered:

- **74%** increase in follow-up completion rates
- **20%** improvement in documentation appropriateness
- **95%** increase in staff efficiency