

Can High-Reliability Organization Principles Help Transform Healthcare Delivery in the U.S.?

HIMSS Roundtable Insights Review

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U.S. Healthcare Delivery: At A Systemic and Operational Crossroads?

The COVID-19 pandemic exposed the myriad operational vulnerabilities in the U.S. healthcare system. Within a matter of weeks, hospitals and health systems were overwhelmed with an influx of COVID-19 patients and were forced to make difficult decisions in prioritizing limited resources. A significant challenge for many hospitals and health systems was a lack of visibility to patient flow and available capacity within individual hospitals and across integrated health systems. Coupled with a lack of established collaboration across shared geographic regions, healthcare organizations struggled to load balance patients with available staffing and resources. The pandemic highlighted an opportunity for the U.S. healthcare system to become more efficient and effective in delivering care during times of public health crises and beyond.

In April 2022, HIMSS hosted a roundtable discussion with leaders from TeleTracking Technologies and health system executives to look at the operational deficiencies and blind spots they experienced during the pandemic. The discussion focused on how certain organizations were better able to manage through the crisis while continuing to deliver care to non-COVID-19 patients, because they had adopted high-reliability organization (HRO) principles.

HRO principles provide a viable option for hospitals and health systems across the U.S. to effectively and sustainably address operational deficiencies exposed by the COVID-19 pandemic. Often used as the standard operating model for many organizations in aviation, the military and government agencies, HROs provide an opportunity in healthcare to improve operations, access and delivery of patient care. The discussion looks at some of the challenges in adopting HRO principles and shares valuable and actionable insights from healthcare organizations on their HRO journey.

The roundtable was led by Michelle Skinner, Chief Clinical Executive, TeleTracking Technologies; Paul Davenport, Vice President Emergency & Care Management Services, Carillon Clinic; Susan Kilgore, Regional Vice President Operations and Patient Management, Methodist Hospital; Doug Rosendale Consultant, TeleTracking Technologies; and Bill Lovell, General Manager, TeleTracking Government Services, who were joined by individuals from many health systems across the country.

What is an HRO?

The Department of Veterans Affairs outlines a framework for becoming an HRO, or one that achieves quality, safety and efficiency through adopting a set of guiding principles (*figure 1*). Many industries have long used HRO principles to lessen errors in high pressure, unpredictable settings and circumstances.

During the pandemic, resource allocation and capacity management became even more complex. Healthcare organizations who adopted HRO principles fared comparatively well in managing operational demands. The five key principles deployed by HROs encompass the following:

1. Sensitivity to Operations

A key characteristic of an HRO is a heightened state of awareness to every aspect of their operations and they are attuned to systems and processes that have become irrelevant or ineffective. To create a heightened state of awareness, it is imperative that every employee have some understanding of shared workflows and communication, even if it does not impact them specifically. The organization's culture should foster a high level of interaction and engagement between functions and departments, so employees are continually learning and sharing more about what other people do and how what they do relates to their own job. This creates a collaborative environment with opportunities to improve processes and optimize operations, promoting a high level of cross-departmental interaction.

High-reliability organization (HRO) principles

The Department of Veterans Affairs presents five industry HRO principles in its evidence brief, *Implementation of High-Reliability Organization Principles*.¹

1. Sensitivity to operations: Heighten awareness of the state of relevant systems and processes
2. Preoccupation with failure: View near misses as opportunities to improve rather than proof of success
3. Reluctance to simplify: Accept that the work is complex, with the potential to fail in new and unexpected ways
4. Commitment to resilience: Prioritize emergency training for many unlikely but system failures
5. Deference to expertise: Value insights from staff with the most pertinent safety knowledge over those with greater seniority



2. Preoccupation With Failure

The second guiding characteristic of HROs is an understanding of the challenges and issues of an organization from a multi-lens approach. HROs focus on the near misses that could have happened in managing through a challenge, process them thoughtfully as lessons learned, and seek to identify opportunities to correct them and improve upon them in the future. This principle allows for reflection and open communication around potential misses, supporting the “fail quickly and learn quickly” mentality.

3. Reluctance to Simplify

The third guiding principle for implementing an HRO culture is to avoid oversimplifying a challenge and spend time understanding the problem and defining a collaborative solution. An HRO understands that work can be very complex and that there will always be potential to fail—even in new and unexpected ways. Accepting and learning from failures and inculcating a reluctance to automatically simplify are cornerstones of an HRO culture.

4. Commitment to Resilience

The fourth guiding principle of HROs is fostering a cultural commitment to resilience, regardless of the severity of a setback. That commitment to resilience involves building in steps that the organization should take for having some degree of preparedness in place when facing new and unexpected challenges.

5. Deference to Expertise

The fifth and final principle that guides all HROs is humility. Successful HROs recognize that not all expertise resides with senior executives within an organization. Expertise can come from any employee regardless of where they sit in an organization’s hierarchy or seniority. Whatever relevant insights and learnings are needed for a given situation, HROs identify and value those employees that offer and contribute their knowledge.

UNDERSTANDING THE BARRIERS TO HRO ADOPTION IN HEALTHCARE

System-Wide Complexity, Uneven Care Delivery

The U.S. healthcare system is one of the most complex systems in the world, with expenditures that are incongruent with overall quality of care and financial sustainability. The primary factor contributing to its complexity is poor acknowledgement and lack of shared understanding to the sheer scale of health ecosystem complexity—from a lack of operational

interoperability to disparate systems and poor visibility and communication across key stakeholders.

These challenges become magnified when organizations with divergent processes and capabilities are driven to collaborate. The ramifications of this can be particularly harmful for hospitals and health systems serving rural communities and underserved patient populations that are hard to reach, such as veterans. These issues are often a result of facilities not taking a systemic approach to healthcare delivery method design and problem-solving. Before health systems can be connected, each system needs to identify and correct barriers and inefficiencies to deliver more effective healthcare across their hospitals and owned care facilities, so any systems that are dysfunctional do not spread that dysfunction by linking with another. HRO principles provide a roadmap and process for internal health systems and hospital self-correction so hospitals and health systems can begin to connect, integrate and partner with one another.

RESOURCE ALLOCATION AND MANAGEMENT CHALLENGES

System complexity can paralyze hospitals and health systems, preventing them from self-correcting care delivery incongruities and inefficiencies.

The pandemic exposed and magnified the fragmented nature of hospitals and health systems, highlighting serious challenges around resource allocation, staffing, capacity management and lack of shared visibility and communication to day-to-day operations. For the first time, the public was exposed to the complexity of healthcare at scale, from managing PPE and other supplies to aligning staffing to patient demand. COVID-19 revealed that hospitals and health systems cannot afford to have operational blind spots. It became imperative to have shared communication across workflows and visibility to track and manage all aspects of their operational ecosystem in real-time.

Strategies for Implementing HRO Principles Within a Health System or Hospital

TRANSFORMING A HEALTH SYSTEM INTO AN HRO

To transform a health system into an HRO, an organization must first acknowledge the vast complexity and competing needs of their system. By understanding current processes, a health system can develop a sustainable strategy that engages all stakeholders in the organization.

During the roundtable discussion, hospital executives discussed how they are able to better manage their organization by having adopted HRO principles. Panelists discussed how

their operational command centers proved to be a solid foundation for leveraging and mobilizing their teams during the pandemic. Command centers, like air traffic control centers at airports, help to facilitate shared visibility and automation around workflows, capacity management and access to care. The centers are run using HRO principles by a team of clinical and non-clinical personnel and have agreed upon standard processes and protocols, cross-departmental communication, high situational awareness, and enterprise-wide visibility to help make data-driven decisions.

Paul Davenport, vice president emergency and care management services at Carilion Clinic, called the HRO-based ecosystem he and his leadership team have been building a “healthcare spider web” of different system clusters or components, versus just a group of hospitals and departments. He acknowledges the complexity of the center that is made up of relationships and interdependencies that can be pulled on from any side of the entire Carilion ecosystem. Davenport and his leadership team have placed a high priority on understanding HRO principles and have intentionally used HRO principles at Carilion to create an environment with a higher sensitivity to operations, and a commitment to resilience and shared communication. Davenport acknowledges that the organization remains on guard, recognizing that hospitals and health systems are complex systems with competing priorities, so there will always be a need to manage failures and the unexpected. Davenport recognizes that, “at the end of the day, our health system has been on a journey of learning and growing and evolving, and while we are always acknowledging that HRO principles are at play, we are human, so the system is naturally pulling on that spider web.”

Below are the key strategies discussed at the HIMSS roundtable for successfully implementing and embedding HRO principles in their cultures. Two leading health systems explain how HRO principles helped them better manage the operational and care delivery challenges posed during the pandemic and sustain improved outcomes post-pandemic.

Strategy 1: Developing Effective Leadership

Leaders must be empowered to take charge and guide others at every level of the organization. The pandemic highlighted the necessity for all health system staff to be empowered and trained to step into acting leadership roles due to the burden on fellow healthcare professionals. Cultivating leadership across a health system directly promotes and reinforces this HRO principle, building “deep benches” through continuous succession planning. With properly trained staff, HROs can maintain quality, safety and efficiency with robust leadership development opportunities and skills training that fosters collaboration between employees and across health care entities and departments. This approach establishes leadership at every layer of the system and provides leaders with nimble information systems to adapt and improve processes in real-time, daily.

Doug Rosendale, a consultant at TeleTracking Technologies and a former CMO at Western Colorado Healthcare System, affirmed that leadership is a key component to any HRO. “Leadership must build a safety culture within the HRO culture that can anticipate where errors may happen, avoiding ‘Swiss cheese’ examples of mistakes, understanding that the dynamic always changes,” says Rosendale. “The current and future leadership of HRO-driven health systems must promote first and foremost an ability to adapt, make daily real-time process improvements a critical priority and guard against getting stuck in old ways of policies and procedures.”

Strategy 2: Prioritizing Training and Learning

The key to preparedness for any health system in times of crisis, like a pandemic, is reducing variability and establishing a consistent operational platform. Through hands-on training, realistic simulations, mock drills and preparatory exercises, each system and hospital team member becomes equipped with tools to operate efficiently in times of crisis. Setting up guidelines for training processes also allows healthcare delivery systems to quickly train new staff in times of emergency or duress.

Health systems that have leaders with prior military, aviation or emergency role training or backgrounds are particularly well-suited to institute training programs, especially given the military’s philosophy of training for what could happen and being prepared for it. Having a “mission” mindset, often adopted from military culture, which embraces continuous learning and improvement principles deployed initially in the COVID operating environment but later integrating those same principles in post-COVID day-to-day operations, is another key characteristic of health systems that can make the transition to becoming HROs.

Programs including a high frequency of disaster drills, simulations and exercises to prepare staff for emergency as well as day-to-day normal operations impacting patient flow create an amenable environment for the promotion of HRO principles.

Susan Kilgore, regional vice president of operations and patient management at Methodist Health System, reflects on how her early career training as an emergency flight nurse gave her the needed skills to implement HRO-level training procedures across her system. “Emergency nursing taught me that you have to be planning all the time, have different plans, but always be ready to pivot and reassess,” says Kilgore. “I’ve brought that mindset and have tried to infuse these principles here at Methodist, where on one hand you have to be able to do multiple things at once, but also have to be able to disconnect and continue to move forward if something didn’t happen correctly.” Kilgore adds that this type of training—to reflect on what could have been done differently but then disconnect from the mistake—is essential because as humans often we were raised to believe we would get in trouble whether it was totally your fault or not. However, the most important

point Kilgore makes about what it takes to create an HRO culture is to constantly train to follow procedures put in place, otherwise you will not know why an outcome occurred, only that it occurred, and you will have a structure that doesn't allow procedures to be changed on the fly. "At Methodist, our command operations center is our structure for ensuring that any changes in procedure that are made is done on a step-by-step basis and you can't just send out a memo saying a certain change is effective immediately and everyone has to follow it." Kilgore draws upon one final skill she learned as a helicopter flight nurse that she has brought to the HRO culture at Methodist—constantly scan the environment for obstacles upon takeoff or landing as that is the most dangerous time, so all training must be to that standard. In every room of the Methodist Command Center to every operating unit, that training kicks in, so tunnel vision or blind spots are avoided.

Strategy 3: Building Robust Data Systems

Easy-to-access, reliable data is critical in driving efficient operations and process improvements. Integrated data systems also improve shared situational awareness with everyone accessing the same information in real-time. Command centers function as the source of truth for shared data around operations, workflows and access to care. In the center, dashboards provide a real-time view of a health systems operations, with the ability to dive deeper with role specific dashboards comprised of relevant information and automated processes. For Paul Davenport, data from their command center is what provides process improvements in operations at Carillon Clinic, enabling them to track patient transfer and migration leakage and identify and implement services that were missing. "Our command center data systems were invaluable in helping us manage our patient search and capacity plan targets that were hugely impacted during the pandemic in terms of surges and dips and the boards in our center gave everyone visibility into that data at the same time—this information in real time eliminated assumptions, confusion from multiple sources and inefficiencies in communications as it became our single source of truth," explains Davenport. As a result, Davenport points to command center-generated information as facilitating the enactment of several HRO principles, including sensitivity to operations, reluctance to simplify/recognition of complexity and an opportunity to better understand how Carillon Clinic can fail in new ways and take steps to try and preempt them before they happen.

Strategy 4: Implementing Successful Interventions

With more accessible data and information across health systems, HRO principles can be more easily applied to improve patient care interventions, particularly in emergency and urgent acute care scenarios. High-reliability industries and organizations such as air traffic control and NASA utilize sophisticated command center technology. For healthcare, health system command centers harness data in real-time to increase efficiency, safety, effectiveness and care coordination. A streamlined and shared approach can help individual health

systems achieve higher quality outcomes.

All the HIMSS roundtable participants agreed that private-public health initiatives at the federal and state level to encourage and facilitate cross health system patient flow and care data would help prevent hospitals from making inaccurate decisions around capacity management and load balancing that can have ripple effects on patient care interventions across the entire healthcare ecosystem.

Susan Kilgore testifies to how real-time information and data access enabled better patient care decision making across the Methodist system. The health system started from a point of having no shared visibility to what was happening from hospital to hospital within their system and as a result, patient transfer opportunities were being missed. When they opened their command center, they had the ability to see all their 2,000 beds across their system in real time, making more informed decisions about optimizing patient care interventions, improving access to care and automating workflows around resource availability. "We could remediate isolation issues for our stroke and heart alert patients given the new level of visibility, increase efficiency for bed turnover times and decrease ED holds and expand capacity to accept more patients to get care," Kilgore says. "We just know a lot more about what our entire health system is doing now in terms of where staffing shortages may be and where patient care is most needed, even collaborating with communities in some of our regions to establish specialty clinics so those patients can stay local to receive care."

Strategy 5: Creating a Culture of Improved Patient Flow

The foundation of strong patient flow is quality and efficiency. Command centers can help track patient placement and transfers, bed turnover and capacity, thereby decreasing emergency department (ED) holds and increasing throughput and quality. Command centers facilitate:

- Data sharing
- Establishment of strategic and effective processes
- Evaluation of current metrics
- Identification of opportunities for improvement

Tracking and maximizing patient flow within each hospital or healthcare facility is critical—and it is just as important to be able to track patients referred to other clinics, hospitals and testing centers. This requires a patient-centered approach with patient-oriented technologies and partnerships that leverage local and regional health information exchanges (HIEs).

By creating command centers with a common language, common goals and common functionality, healthcare systems can work efficiently and effectively to make the best decisions for patients.

Part 6: Driving HRO-led Care Improvement Across the Continuum

Adopting appropriate technology opens the door to establishing a more consistently effective healthcare ecosystem. Command center solutions provide a path not just for building high-reliability healthcare systems, but a high-reliability nation that cares for the welfare of its citizens.

As more health systems adopt command center technology, communities can benefit from—and promote—improved care. When emergency situations arise, communities are already well-positioned to respond with shared visibility and collaboration to save more lives. They can leverage shared data and decision-making to maximize this capability.

Harnessing both command center technology and HRO strategies also helps healthcare systems function optimally in routine times, not just during emergency or episodic care situations. By doing so, a system can collaborate more efficiently and effectively with other healthcare entities, as well as with community organizations and governing institutions.

Of course, command centers are put to the test during times of stress—such as in a national pandemic. But with HRO principles and framework laying a foundational culture of continuous learning and growth, healthcare systems can continue to deliver high-reliability results.

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References

1. <https://www.ncbi.nlm.nih.gov/books/NBK542883/>