Institute *for* Healthcare Improvement

Sustaining Improvement

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The Institute for Healthcare Improvement (IHI) is a leading innovator in health and health care improvement worldwide. For more than 25 years, we have partnered with a growing community of visionaries, leaders, and frontline practitioners around the globe to spark bold, inventive ways to improve the health of individuals and populations. Together, we build the will for change, seek out innovative models of care, and spread proven best practices. To advance our mission, IHI is dedicated to optimizing health care delivery systems, driving the Triple Aim for populations, realizing person- and family-centered care, and building improvement capability. We have developed IHI's white papers as one means for advancing our mission. The ideas and findings in these white papers represent innovative work by IHI and organizations with whom we collaborate. Our white papers are designed to share the problems IHI is working to address, the ideas we are developing and testing to help organizations make breakthrough improvements, and early results where they exist.

Contents

Executive Summary

This white paper presents a framework that health care organizations can use to sustain improvements in the safety, effectiveness, and efficiency of patient care. The key to sustaining improvement is to focus on the daily work of frontline managers, supported by a high-performance management system that prescribes standard tasks and responsibilities for managers at all levels of the organization. To inform this work, we reviewed selected literature and interviewed leading organizations. The result presented here is a description of high-performance management in theory and practice, along with recommendations for organizations interested in pursuing these methods:

- **A theoretical context for high-performance management**, grounded in the Juran Trilogy (Quality Planning, Quality Control, and Quality Improvement) and selected current literature;

- **An organizational framework for a high-performance management system (HPMS)**, illustrating standard work for each tier of management and the integrated organizational hierarchy that reinforces, supports, and improves work at all levels;

- **A driver diagram that summarizes our theory of the key factors for implementing a HPMS** through standardized management tasks, pervasive Quality Control (as defined by Juran to mean monitoring the system and making necessary adjustments to ensure stability over time), coordinated Quality Improvement, and development of a culture of candid transparency that encourages and sustains these activities;

- **Case examples** that describe three health care organizations' approaches to testing and implementing management standard work; and

- **Appendices** containing additional guidance for organizations seeking to implement these practices.

Background

Leading health care organizations are coming to recognize that sustaining improvement is essential. Typically, they have spent years building improvement capability and applying it throughout the organization. But too often, hard-won improvements are lost as attention shifts to other priorities and staff revert to the "old way" of doing things.

Having achieved high levels of clinical quality and safety, organizations with reputations for clinical excellence are increasingly focused on sustaining improvement — ensuring that, following improvement, care and support processes continue to perform at the new levels of quality and safety. In the research that informs this white paper, we set out to understand the systems for sustaining improvement developed by ten outstanding health care systems — and to synthesize them into a framework that other health care organizations can use to ensure that improvements are sustained over time.

Two main schools of thought were especially influential in framing our investigation: Joseph Juran's "Trilogy"[1] for quality management (i.e., Quality Planning, Quality Control, and Quality Improvement); and Lean management, articulated by David Mann,[2] Steven Spear,[3] and others.

Our study of ten high-performance health care systems revealed a common focus on explicitly organized **frontline management** — daily work for unit leaders — that guides day-to-day provision of excellent patient care by all frontline staff. In this white paper, we refer to such regular daily work using the Lean term "standard work": the routine daily care and support tasks enacted in nursing units, ICUs, ORs, ERs, or clinics where patient and provider meet and care is sought and delivered. We also learned about specific coordinated practices at **higher levels of management** — an integrated "management system architecture" — that enable effective Quality Planning and reinforce, support, and improve work at the front line.

Using Juran's terminology and definitions,[1] our primary focus in this paper is not on *Quality Improvement*, but on *Quality Control* — and by Quality Control, we expressly are not referring to the regulatory systems of inspection and accreditation that play a vital role in standardizing quality across the health care industry; nor do we mean the kind of micromanagement practiced by some leaders. Of course, the astute reader will recognize that Quality Control and Quality Improvement are not separable activities, but integrated elements of a high-performance management system (HPMS).

Our investigation revealed a view of management work as disciplined standard work, analogous to the protocol-driven work of frontline caregivers, integrated vertically and horizontally by means of frequent team-based communication and ubiquitous, graphically displayed process measurement (often in the form of Shewhart control charts). Process abnormalities (special causes) trigger frontline adjustments or surface issues that are escalated to formal improvement initiatives. Continuous frontline attention to quality and a culture that focuses on problem analysis (versus personal blame) provide the foundation for Quality Planning, Quality Control, and Quality Improvement. Formal, negotiated Quality Planning relies on candid, energetic staff participation, and aligns frontline improvements with the organization's strategic intent. In a HPMS that incorporates standard work, managers serve primarily as coordinators and coaches in order to build staff capacity and expertise for improving quality.

While leadership commitment at the most senior levels (e.g., C-suite, boards of directors, vice presidents, chairs and chiefs of departments and divisions) is necessary to cultivate and lead improvement throughout an organization, frontline clinical leaders — those who most directly impact the patient experience of care — need complementary guidance in the form of a system of practical direction and support. Senior leadership commitment is needed to achieve fully integrated, consistently excellent performance; yet smaller, incremental steps within service delivery units can also build will and set the stage for whole system change.

Many of IHI's strategic partners have developed world-class improvement infrastructures and are now exploring the methods and benefits of managing standard work. This white paper seeks to understand their efforts, learn from their experiences, and suggest a way forward for organizations that are now starting down this path.

Representatives of the following organizations informed our work: Intermountain Healthcare (Utah); ThedaCare (Wisconsin); Virginia Mason Health System (Washington); Essentia Health (Minnesota); Greater Baltimore Medical Center (Maryland); Children's Mercy Hospital (Missouri); Saskatoon Health Region (Canada); Saskatchewan Health Quality Council (Canada); Denver Health (Colorado); and Cincinnati Children's Hospital Medical Center (Ohio).

These organizations were selected based on their reputation for clinical excellence and implementation of standardized management approaches (e.g., Lean, Juran, IHI's approach to

Quality Improvement) that characterize recognized world-class enterprises both within and outside of health care.[4]

Three case examples, drawn from interviews with informant organizations, illustrate in depth the implementation of a HPMS by three leading North American health systems (see Appendix A). Our investigations for this white paper focused on management systems in acute care settings; but the principles of high-performance management can be applied in any care setting, just as they have been deployed in diverse enterprises outside of health care. We expect to explore such variations in future research.

Theoretical Context: "Doing the Work, Improving the Work"

Excellence in care delivery demands systems capable of reliably supporting the clinical skills of physicians, nurses, and staff — and in such systems, everyone has two interdependent roles: doing the work and improving the work. Several key theoretical concepts underpin the high-performance management system described in this white paper.

Health Care as a System

W. Edwards Deming described a "system" as a set of interdependent components — structures, people, and processes — working together toward a common purpose.[5] A health care organization is a complex, adaptive system animated by hundreds or thousands of providers, administrators, patients, and support staff. For the organization to deliver on the promise expressed in its mission statement — for every patient, every time — requires that everyone in the system knows what to do and why, how and when to do it, and how to adjust when necessary to maintain fidelity with the organization's mission and values.

As demonstrated by our informant organizations, standardizing routine tasks at the front line of care creates an orderly, predictable work environment — thereby reducing the fumbles and ambiguities that take staff away from the patient's side, and that lead to "unintended variation" that endangers patient safety and impedes the effectiveness and efficiency of care.[6] Standard frontline work provides a stable "platform" on which clinicians can most effectively exercise their clinical skills, and on which systematic, integrated improvement initiatives can be conducted and their results sustained.[7]

As Deming proposed, management is responsible for establishing and maintaining such a system.[5] The coordination and alignment of diverse parts to the purposeful whole is the essential function of a high-performance management system.

The Juran Trilogy

The Juran Trilogy[1] consists of three key quality-related functions for managers: Quality Planning, Quality Control, and Quality Improvement. Together these functions constitute an active, integrated system for pervasive organizational attention to customers' (i.e., patients') needs, the design and delivery of products and services consistent with the best technical specifications to consistently meet those needs, and the ongoing management and continuous improvement of the systems of production.

- **Quality Planning (QP):** Quality Planning begins with a comprehensive understanding of customer needs. In health care, the Triple Aim provides a framework for conceptualizing the needs of patients: experience of care, health, and cost of care. Other stakeholders, including physicians, staff, payers, regulators, and the community at large, place additional demands on care systems. QP thus comprises processes for understanding patient experience; the establishment of evidence-based protocols; the design of physical space, technology, and specific care routines to ensure that the best available technical knowledge gets translated into standard practice; the establishment of a sustaining and rewarding work environment; and much more. QP also includes the design and operation of systems of management, such as the HPMS described in this paper, as well as an infrastructure to identify gaps in performance and commission improvement projects to close the gaps. This white paper can be used as guidance for Quality Planning to establish frontline Quality Control, based on the HPMS.

- **Quality Control (QC):** Quality Control focuses on operations: monitoring the system of production for stability, detecting emerging process problems (special causes), and taking steps to address them. QC is based on measurement of performance; processes are continually examined (via statistical methods, technology, or direct observation) for conformance with current quality expectations (goals). When gaps are detected between expected and observed performance, frontline staff undertake problem-solving methods such as root cause analysis to identify the source of the problem and devise a remedy. If the current process is not capable of meeting customer needs and the needed changes are beyond the scope of the frontline unit, a QI initiative is planned to redesign the process. Quality Control fundamentally is about *ensuring* that a process remains stable ("in control") over time — that is, its performance remains within the upper and lower control limits. QC is usually performed by those closest to the process.

- **Quality Improvement (QI):** In a QI initiative, a designated team of managers and staff with relevant expertise, with technical assistance from dedicated QI specialists, analyzes the current process, identifies the symptoms and causes of poor quality, and frames a theory of what is required to improve the process. The team uses a variety of methods and tools to develop, test, and implement changes, and if needed redesigns the relevant processes.[4] Following successful improvement, QC is then used to monitor the redesigned process to ensure it performs at a new level (with new upper and lower control limits), with new work specifications, improved results, and reduced variation.

Figure 1 shows QC and QI as interlocking loops of activity. Quality Control involves the routine enactment of standard tasks, monitoring quality, and making routine adjustments and local improvements. (Note that the "Adjust" step in the QC loop may involve frontline application of the Model for Improvement, with its own nested Plan-Do-Study-Act, or PDSA, cycles to test and refine changes that will lead to improvement.) When problems arise that are beyond the scope of the local team, or that point to the need for improvements in process capability (for example, when a new clinical protocol is introduced that fundamentally changes processes of care or patient expectations, or when the problem requires interdepartmental coordination), the problem is escalated to a higher-level QI initiative to redesign the process, or to Quality Planning functions to fundamentally revise the production system.

Figure 1. The Relationship of Quality Improvement and Quality Control
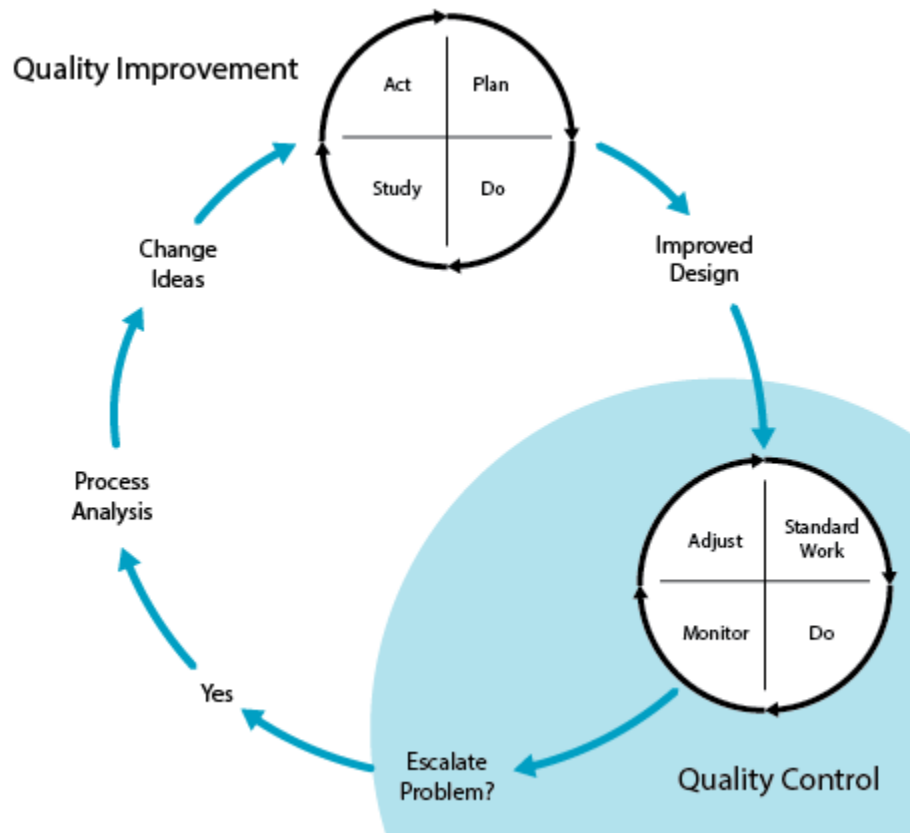
It is important to distinguish Juran's conception of Quality Control as an integral component of everyday work and management from the common misperception that QC is the same as quality assurance or inspection. It's well worth consulting *Juran's Quality Handbook*[1] on this point:

> "Quality control and quality assurance have much in common. Each evaluates performance. Each compares performance to goals. Each acts on the difference. However they also differ from each other. Quality control has as its primary purpose to maintain control. Performance is evaluated during operations, and performance is compared to goals during operations. The resulting information is received and used by the operating forces. Quality assurance's main purpose is to verify that control is being maintained. Performance is evaluated after operations, and the resulting information is provided to both the operating forces and others who have a need to know." (p. 4.3)

Accreditation is one particular form of quality assurance in health care and is performed by external regulators or standards bodies. While important, quality assurance and accreditation are not the focus of this white paper. Similarly, Quality Control should not be confused with the form of "control" exercised by some managers who periodically respond to summary reports with directives for staff to respond to problems that may not be current, or for which the manager lacks complete information. A variant is "tampering" — making changes to a process, based on a limited understanding of the principles of common cause and special cause variation.[6]

Other Important Sources from the Literature

Our review of selected literature surfaced a number of descriptions of high-performance management systems that are substantially consistent with the Juran Trilogy, although with differing terminology and methods. We reviewed key sources from the Lean tradition including Mann,[2] Spear,[3] and Toussaint.[8] Ando and colleagues document formal standard practices for "Daily Management" on behalf of the Japanese Society for Quality Control.[9] Nolan reports on IHI's work to develop "a framework for execution of strategic initiatives aimed at producing system-level results."[10] Case studies from the automotive industry provide insights regarding myriad issues involved in implementation of a HPMS.[11,12] Previous IHI work provides specific guidance for organizing frontline standard work to surface process problems requiring QC adjustments or QI interventions.[13]

A High-Performance Management System

Figure 2 presents an architectural overview of a high-performance management system, organized into QC and QI functions and tasks across representative levels of a typical health care organization. (Note that the authors discussed at length the merits of flipping the vertical dimension of this figure to show patients at the top, to indicate their position at the focus of the organization's purpose, with management tiers arrayed below to signify their role as supporters and facilitators of QC and QI. Ultimately, we decided on the figure as it now appears because we recognize the traditional "ups" and "downs" of organizational hierarchies, and we felt that a change would be confusing to readers.)

In the HPMS, Tier 1 Quality Control (operations management) focuses on guiding the direct provision of care. For example, huddles conducted by a unit manager at shift changes focus on immediate process management: ensuring that all job roles are assigned, identifying patients at risk or in need of special attention, and anticipating needs that will arise in the upcoming hours. During the shift, the unit manager ensures staff adherence to standard work, monitors care processes, takes corrective action to avoid errors, pitches in to help where needed, and coaches frontline staff on work skills, problem identification, and improvement methods. Operational issues beyond the control of the unit escalate upward, for response by the appropriate management tier, for whom triaging and acting on escalated issues is part of *their* regular Quality Control work. Daily updating and review of operational data, including sentinel events, by every tier ensures that responses to problems are prompt; delays at any level pose risks to the organization's purpose and reputation. (See Appendix A for additional examples that elaborate on such huddles.)

For Quality Improvement projects initiated to address problems that are surfaced during QP, Tier 1 managers, initially relying on support from organizational QI specialists, surface and scope local opportunities for improvement (often special cause variation identified in routine QC activities, but also including minor common cause issues),[13] prioritize them, coach staff on QI methods, monitor progress, and engage frontline staff in testing and implementing process changes. The unit manager and unit team are responsible (with QI specialist help) for translating key organizational metrics related to strategy and mission into unit-level measures. Over time, as frontline and Tier 1 personnel become adept at QI, the need for specialist assistance lessens.

Figure 2. Architecture of a High-Performance Management System

	Quality Control (Operations)			Quality Improvement (System Change)		
	Key Tasks	**Data for Control**	**Guidance**	**Key Tasks**	**Data for Improvement**	**Aims Alignment**

Tier 3 Executive, VP	• Define core values
	• Articulate principles
	• Obtain and deploy resources
	• Monitor "Big Dots"
	• Frequent frontline observation
		• "Big Dot" system metrics, process and outcomes metrics
		• Reports to external stakeholders
			• Coaching (all tiers) in workplace
			• Monitor T2 standard work
				• Monitor environment, anticipate change
				• Quality planning:
				  ◦ Set strategic direction
				  ◦ Commission and drive system-wide initiatives
				• Consistent messaging
				• Celebrate improvement
					• Aggregated system process and outcomes metrics
					• T2, system QI project status and metrics
					• Population, organization impact
						• Negotiate T2 strategic goals
						• Launch, prioritize system QI initiatives

Tier 2 Dept. Manager, Director	• Interdepartmental coordination • Obtain and deploy resources • Define department metrics • Monitor department operations, planning	• T2 summary of daily operational issues • Standard department operational metrics	• Coaching T1 on standard work • Monitor staff, process capability • Monitor T1 standard work	• Conduct root cause analysis • Quality planning: ◦ Commission T1 projects • Lead interdepartmental projects	• Aggregated unit process and outcomes metrics • T1 project status and metrics • Staff QI capacity	• Negotiate T1 goals • Launch, prioritize, monitor T2 projects
Tier 1 Unit Manager	• Monitor unit operational status • Define unit standard work, metrics • Manage shift staffing, shift patient priorities, etc. • Incident response, escalation	• Summary of daily operational issues • Standard unit operational metrics • Incident reports	• Coaching "what to do and how" • Coaching on problem detection and response • Monitor frontline standard work	• Coordinate with improvement specialist to surface problems, best practices • Lead T1 QI projects • Lead root cause analysis • Lead daily PDSA	• Unit project status and metrics • Problems for escalation to T2 projects • PDSA results	• Negotiate unit goals • Launch, prioritize, monitor unit-level QI projects
Charge Nurse, Frontline Staff	• Situational awareness, prioritize care tasks • Define frontline standard work • Adjust to usual process variation, patient needs • Respond to atypical process variation	• Observations of care process and environment • Patient feedback and observations • Clinical data, tallies of process operation	• Clear communication to support patient and family decisions and expectations	• Undertake simple process fixes ("See-Solve") • Identify ideas for change • Engage in PDSA	• Identify problems for escalation to T1 • Ideas for improvements	• Participation in QI teams for aligned improvement • Engage patients in improvement
PATIENTS and FAMILIES	• Trigger acute system responses • Report on current symptoms, situation, emerging needs, etc.	**Patient Care Interface** • Presentation • Stories and observations • "What matters to me?"	• Candid talk, transparent dialogue • Post quality data (online)	• QI team participation	**Patient Care Interface** • Identify process problems, offer suggestions • Stories and observations	• Patients and families shape aims for improvement

Moving up the management hierarchy, higher tiers identify, prioritize, and respond to improvement opportunities with increasing scope. At Tier 3, and to some extent at Tier 2, Quality Improvement gives way to Quality Planning: initiating, guiding, and monitoring system design and improvement at the organizational level. Information — about the current state of operations and the status of QI projects — flows upward at successively aggregated levels of granularity.[14,15] For QC issues, the flow of information is immediate: issues that might seriously impact patient safety should reach Tier 3 within hours, if not minutes.
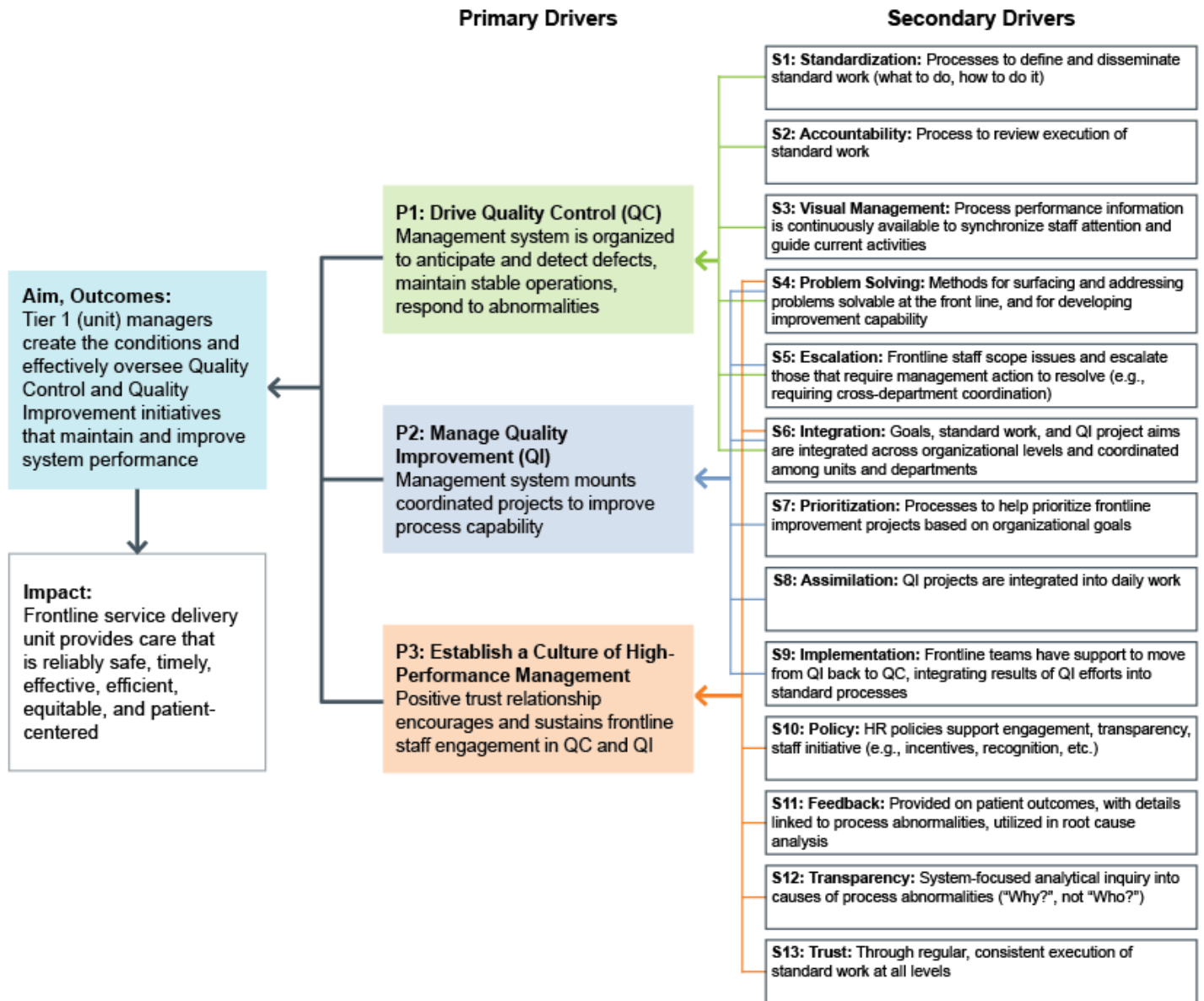
Measures of current operational status are aligned with organizational purpose, on multiple quality dimensions.[16] Operational guidance and alignment of QI with organizational purpose flow downward toward the front line. Integration of unit-level QI projects with overall organization-wide strategic Quality Improvement efforts can be achieved through an annual QP process of "catchball" negotiations between tiers (where ideas and information flow back and forth between tiers), beginning with Tier 3 strategic priorities, as at Virginia Mason Health System (see Appendix A). Tier 3 and Tier 2 negotiate Tier 2 priorities, initiatives, and goals, and the process is repeated downward to unit-level improvement projects, with unit-level goals and metrics aligned with the overall organizational strategy.

Key Drivers of High-Performance Management at the Front Line

What does it take to implement a high-performance management system? Through our literature review and interviews, we identified three primary drivers of a sustainable HPMS at the front line, as shown in the driver diagram in Figure 3. It's important to note that one reviewer of this white paper rightly pointed out that the drivers represented in this diagram may require substantial modifications in low-resource contexts, where infrastructure, government policies, funding, resource availability, existing quality management practices, and cultural norms may prioritize a different set of interventions.

The driver diagram targets key processes, structures, and cultural norms that our research identified as necessary factors for the establishment and maintenance of a high-performance management system at the front line. Primary drivers P1 and P2 are aligned with the Juran Trilogy: P1 focuses on management for Quality Control, P2 on Quality Improvement. Primary driver P3 highlights management practices for establishing the culture that sustains consistent execution of Quality Planning, Quality Control, and Quality Improvement activities. Quality Planning (QP) is not explicitly called out in this driver diagram, but permeates all of the functions represented; in effect, the diagram is a roadmap for Quality Planning. Appendix B provides examples of how seven of our informant organizations implemented the P1 drivers for Quality Control.

Figure 3. Driver Diagram: High-Performance Management System at the Front Line

Primary Drivers

P1: Drive Quality Control (QC)
Management system is organized to anticipate and detect defects, maintain stable operations, respond to abnormalities

P2: Manage Quality Improvement (QI)
Management system mounts coordinated projects to improve process capability

P3: Establish a Culture of High-Performance Management
Positive trust relationship encourages and sustains frontline staff engagement in QC and QI

Aim, Outcomes:
Tier 1 (unit) managers create the conditions and effectively oversee Quality Control and Quality Improvement initiatives that maintain and improve system performance

Impact:
Frontline service delivery unit provides care that is reliably safe, timely, effective, efficient, equitable, and patient-centered

Secondary Drivers

S1: Standardization: Processes to define and disseminate standard work (what to do, how to do it)

S2: Accountability: Process to review execution of standard work

S3: Visual Management: Process performance information is continuously available to synchronize staff attention and guide current activities

S4: Problem Solving: Methods for surfacing and addressing problems solvable at the front line, and for developing improvement capability

S5: Escalation: Frontline staff scope issues and escalate those that require management action to resolve (e.g., requiring cross-department coordination)

S6: Integration: Goals, standard work, and QI project aims are integrated across organizational levels and coordinated among units and departments

S7: Prioritization: Processes to help prioritize frontline improvement projects based on organizational goals

S8: Assimilation: QI projects are integrated into daily work

S9: Implementation: Frontline teams have support to move from QI back to QC, integrating results of QI efforts into standard processes

S10: Policy: HR policies support engagement, transparency, staff initiative (e.g., incentives, recognition, etc.)

S11: Feedback: Provided on patient outcomes, with details linked to process abnormalities, utilized in root cause analysis

S12: Transparency: System-focused analytical inquiry into causes of process abnormalities ("Why?", not "Who?")

S13: Trust: Through regular, consistent execution of standard work at all levels

Primary Driver P1: Drive Quality Control

The high-performance management system is organized to anticipate and detect defects, maintain stable operations, and respond to abnormalities.

We identified six secondary drivers (S1–S6) of Quality Control. (See Appendix B for examples of specific ideas for implementing the six secondary drivers, based on our informant interviews.)

- **S1: Standardization: Processes exist to help define and disseminate standard work (what to do and how to do it).**
  Managers at all levels should have well-defined daily, weekly, monthly, quarterly, and annual tasks (i.e., standard work). The Tier 1 unit manager must have a clear sense of the reliability of these tasks at all times, regardless of how they are represented (e.g., on a daily checklist, huddle board, or huddle agenda). Several informant organizations developed such standard work. For instance, Intermountain Healthcare developed detailed documented standard work for charge nurses, frontline staff, and Tier 1 unit managers, supported by checklists, education, and an internal website.

- **S2: Accountability: A process is in place to review execution of standard work.**
  The organization needs systems to continuously monitor whether staff are doing the work according to agreed-upon standards. This is crucial to maintaining QC of the process, understanding what staff training needs may exist, or identifying processes that do not work well. Managers use this information as the basis for analysis and improvement of the work unit; evaluation of individual staff performance for promotion or separation is secondary. Virginia Mason Health System, for example, developed a comprehensive tool to track manager standard work, self-reported up to the next management level on a quarterly basis.

- **S3: Visual Management: Process performance information is continuously available to synchronize staff attention and guide current activities.**
  Staff on the unit need current information — both quantitative and qualitative — about process performance to coordinate and guide their work. Most often, clinical units track key data using visual metric boards, displayed publicly or semi-publicly, that show key process indicators which in turn align with system-wide strategic goals. These visual data displays are typically accompanied by a daily communication process, such as a team huddle, to ensure that all staff understand the current context, issues, problems, and priorities for their work. Several of our informant organizations developed daily management boards to structure such team huddles. For example, Greater Baltimore Medical Center uses huddle boards with standard metrics organized according to four strategic aims: better health, better health care, less waste, and joy in work.

- **S4: Problem Solving: Methods are available for surfacing and addressing problems that are solvable at the front line, and for developing improvement capability.**
  Unit managers and frontline staff should be able to apply improvement methods and tools such as the Lean A3 method[17] or the Model for Improvement[18] to address process anomalies as they arise. Structured methods for identifying problems, diagnosing problems (e.g., flow diagrams, root cause analysis, cause-and-effect diagrams), and testing changes (Plan-Do-Study-Act cycles) are essential, but they must be used in a true spirit of inquiry by managers and staff who maintain a "preoccupation with failure."[19] Frontline unit managers and staff employ these methods and tools routinely, with QI specialists to provide support as needed. Higher-tier managers recognize and celebrate candid problem analysis and effective remedies. The "See-Solve" model articulated by Resar and colleagues provides a detailed,

tested method for engaging frontline staff in problem identification and scoping.[13] Among our informants, Virginia Mason expects unit managers to master such methods (including the 5 Whys, fishbone diagrams, and affinity diagrams), coach staff in these techniques, and lead problem-solving efforts via rapid improvement events (also known as *kaizen* events, a Lean term translated as "continuous improvement" or "beneficial change").

- **S5: Escalation: Frontline staff scope issues and escalate those that require management action to resolve.**
  Addressing process abnormalities may require system adjustments that are beyond the control of frontline staff and unit managers, such as when a sentinel event requires an immediate management response, or when new clinical evidence, system changes, or recurring exceptions point to needed updates in process design (e.g., new care protocols, changes in IT systems, or whenever the current process design is incapable of delivering acceptable results). In many cases, the root causes of a problem involve multiple units or departments, so improvement requires a coordinated initiative.

  Thus a well-functioning management system includes clear criteria to distinguish issues that should be escalated to higher management tiers, which then resolve the issue directly or commission an interdepartmental improvement project (a Quality Planning function). At ThedaCare, for example, if a patient care problem arises that a frontline staff member cannot solve within 15 minutes, the staff member escalates the problem to the next-level unit manager, and on up the hierarchy as needed. A sufficiently complex and/or acute problem can reach the CEO within 90 minutes.[8]

- **S6: Integration: Goals, standard work, and QI project aims are integrated across organizational levels and coordinated among units and departments.**
  To continuously reinforce and support proper care and the aims of local improvement activities, priorities and metrics must be vertically aligned at all levels of leadership in the organization and horizontally consistent across divisions, departments, and units. The standard work of frontline staff and leaders is critical for ensuring that patient care practices are consistent with organization-wide standards, goals, and strategy. Greater Baltimore Medical Center's HPMS has benefited from strong executive support, including daily C-suite workplace walks and regular, data-fueled huddles for executives.

Primary Driver P2: Manage Quality Improvement

The high-performance management system coordinates projects to improve process capability.

In addition to secondary drivers S4: Problem Solving, S5: Escalation, and S6: Integration (drivers for both QC and QI), we identified three secondary drivers that support unit managers in effectively managing frontline Quality Improvement efforts.

- **S7: Prioritization: Processes are established to help prioritize frontline improvement projects based on organizational goals.**
  At any given time, clinical units will have many different improvement initiatives they might implement, but to pursue them all would be wasteful and ultimately counterproductive.[20] Quality Planning in a HPMS helps establish clear procedures and criteria to prioritize unit-level improvements that are of greatest importance to both the goals of the unit and those of the organization. At Virginia Mason, service lines such as orthopedics maintain "Kaizen Plans," which include all improvement efforts currently underway. Service line leaders meet monthly to ensure that improvement priorities are correct and adjust them as necessary. To

avoid fragmented, duplicative efforts, the service line only undertakes large-scale improvement efforts that are consistent with this plan.

- **S8: Assimilation: Improvement projects are integrated into daily work.**
As suggested in the high-performance management system architecture (see Figure 2 above), initiating and directing Quality Improvement projects is a core component of standard work at all levels of the organization. Due to their daily involvement in patient care, Tier 1 unit managers are responsible for leading the testing and implementation of process changes at the unit level. Job descriptions, and senior managers' expectations, encourage active frontline staff and manager participation in QI work such as team meetings, rapid improvement events, PDSA testing, data collection, and data review. Staff are explicitly allocated the time required to participate in these activities. For example, at Children's Mercy Hospital, conducting PDSAs is included as part of frontline clinical leaders' regular standard work, along with attendance at QI project reviews.

- **S9: Implementation: Frontline teams have support to move from QI back to QC, integrating the results of QI projects into standard processes.**
Many QI projects do not yield sustainable improvement because the changes needed in support systems such as labs, purchasing, human relations, mechanical systems, or IT are never implemented. A HPMS has an established means to coordinate improvements across departments (see S6: Integration) and to incorporate the results of improvement projects into standard work at the front line. At ThedaCare[8] and Intermountain, management engineers work closely with frontline clinical managers to support improvement and help with the development and adjustment of standard work.

Primary Driver P3: Establish a Culture of High-Performance Management

The high-performance management system cultivates a positive trust relationship that encourages and sustains frontline staff engagement in Quality Control and Quality Improvement.

- **S10: Policy, S11: Feedback, S12: Transparency, S13: Trust**
This primary driver refers to the social and ethical milieu in which people go about their daily tasks and comprises four secondary drivers: policy, feedback, transparency, and trust. Although not the focus of this paper, these factors are absolutely essential to establish and maintain the deep, mutual sense of trust that pervades a high-performance management system. Such a culture provides the transparent atmosphere in which process problems can be quickly surfaced, understood, and addressed by frontline staff.[12,21]

A high-performance management system requires that managers trust staff to conscientiously embrace necessary standard practices, appropriately adjust processes in response to everyday problems, and candidly identify problems that represent opportunities for improvement. Conversely, a HPMS also requires staff to trust managers to take a "systems view": to provide the skills training and operational support systems needed for excellent performance, seek the true root causes of problems instead of blaming individuals, take prompt action to address systemic problems, and uphold the dignity of workers as an essential value for the organization. Aligned human resources (HR) policies, regular feedback to frontline staff about patient outcomes, and an objective, analytical response to problems are key drivers of this critical positive trust relationship.

In our interviews with informant organizations, we were most impressed by the rigor with which these organizations implemented management standard work (e.g., checklists) and their appreciation of the importance of its consistent completion — not only for ensuring reliable care, but as a means of building trust. The regular daily rhythm of huddles conducted in a spirit of open, blame-free inquiry with predictable follow-up and results enabled staff to gain trust in the management system.

Implementing a High-Performance Management System: Lessons from the Field

Together, the high-performance management system architecture (see Figure 2) and driver diagram (see Figure 3) describe the "changes" — structures, processes, and cultural norms — needed to establish and maintain a high-performance management system. The case examples in Appendix A offer a rich set of ideas and lessons from health care organizations that have implemented standard work as part of their efforts to implement a HPMS. This section of the white paper offers recommendations, in the spirit of PDSA, for putting these changes into practice — not as a guaranteed path to a HPMS, but as a set of ideas to be tested and adapted by those who wish to pursue the journey.

The Model for Improvement provides a framework for structuring an initiative to test these changes. At a whole system level, the plan to implement a HPMS initiative might look something like this:

- **Aim:** Improve patient outcomes and process performance based on system-wide implementation of a high-performance management system

- **Measures:**
  - Measures of patient outcomes, cost of care, and staff satisfaction aligned with system mission
  - Measures of clinical process reliability, efficiency, safety, timeliness, patient centeredness, and equity aligned with outcome goals
  - Measures of HPMS adoption: state of implementation of each secondary driver by unit, pace of unit implementation, qualitative data from leader observation, etc.
  - Balancing measures (e.g., joy in work)

- **Changes:** Described in the high-performance management system architecture (Figure 2), driver diagram (Figure 3), and organizational case examples (Appendix A)

- **Empirical Learning:** Based on a plan to test changes on a small (pilot) scale, then implement changes throughout the system with appropriate adaptations

Recommendations for Implementing Management Standard Work

Standard work is required of managers at all levels (Tiers 1, 2, and 3), referred to here as "management standard work" (MSW). For example, while Tier 1 leaders are responsible for identifying unit-level process measures, collecting the required data, and maintaining visuals for huddles, Tier 2 and Tier 3 leaders determine the measures needed to monitor the standard work

system and are responsible for acquiring the needed data (via huddles and direct observation, and with the help of improvement specialists). Spreading changes and sustaining performance improvement requires Tier 1 and Tier 2 managers to practice their own standard work, including coordination with other departments or service lines. Leaders at all tiers (including especially C-suite leaders) need to demonstrate their active engagement in standard work and improvement, and not just delegate changes to QI specialists or frontline units.

Prior work by the IHI Innovation team suggests a testable strategy for developing Tier 1 management standard work (MSW), as part of the HPMS, that is consistent with models in use at Thedacare[8] and elsewhere:

- **Frontline staff** at the unit level design, test, and implement detailed standard work with the support of QI specialists. Frontline staff focus on tracking process problems identified at the unit level and actions to resolve them, including conducting root cause analysis of problems and frequent testing of changes to improve processes.

- **QI specialists** coordinate standard work and improvement initiatives across units and departments, and serve as coaches to unit-level teams. Specialists work closely with the unit leader to establish and improve Tier 1 management practices (e.g., team huddles and visual displays of data about process performance), surface and scope problems requiring QI projects, provide data analysis, help with QI methods, facilitate rapid improvement events, and oversee implementation and spread of effective changes.

- **Unit managers** (Tier 1) supervise this work in collaboration with the QI specialist. Over time, the role of the specialist wanes as the unit manager gains skill and confidence with the daily exercise of QC and QI, and the HPMS itself.

The guidance presented here is focused on Tier 1, but full, sustained implementation of a HPMS ultimately requires wholehearted support from Tiers 2 and 3, with managers and leaders engaged as active, hands-on participants. IHI's experience with helping health care leaders inspire and manage system-wide change provides specific recommendations — mental models, behaviors, and areas of focus — that can support the implementation of a HPMS.[22]

Not all managers will find these changes palatable. A successful HPMS initiative may require reassignment of roles, as Intermountain discovered, and some staff turnover is to be expected. Our informant organizations offered four useful lessons for implementing MSW, as described below, that may inform other organizations' efforts.

1. Choose a pilot unit within your organization.

Most organizations introduce MSW by testing it on a small scale in one pilot unit (e.g., ThedaCare's "model cell"[8]). The pilot unit is carefully selected to maximize insights and build momentum for change. As with any improvement project, introducing changes to an existing process or system will be more successful when the target system is operating in a stable, predictable fashion.

The pilot unit should have the following characteristics:

- **Staff turnover is low.** High turnover makes it difficult to implement the sustained staff training and education necessary for a standard work initiative.

- **Tier 1 unit managers understand what is expected, know what the change will look like when implemented, and embrace the rationale for standard work.**

Unit managers serve as key champions for any successful standard work initiative. Without their buy-in and support, the initiative will likely fail.

- **Good management practices are in place.** Examples include effective budget management and a stable staff schedule. In addition, look for areas with relatively stable processes; a manager with an already chaotic daily schedule will be unable to focus attention on the change.

- **A respected local "champion"** stands ready to build excitement for change, encourage participation, coach the team, and celebrate success.

Although in principle the HPMS applies to work at all levels in a health care organization, several informant organizations observed that pilot units that resemble an "assembly line" or "production line" are stronger candidates for introducing MSW than units in which processes are less predictable. For example, a surgical unit, or radiology, or sterilization services might serve as better candidates for the pilot unit than a medical unit. Virginia Mason found it more challenging to implement MSW outside of such "assembly-line-like" units, despite an organization-wide commitment to the new management system. Potential adopters of MSW might consider choosing a pilot unit with standard processes already established, then spreading to other areas.

Early on, Saskatoon Health Region implemented MSW in support services such as human resources and housekeeping, with the prediction that "early win" improvements in such centralized functions would raise interest and buy-in across the organization. For example, efficiencies gained through standard work in human resources and housekeeping could free frontline unit managers and clinical staff of unnecessary paperwork and emails, allowing for more time spent at the patient bedside.

2. Start at the level of immediate supervision of point of care.

Many organizations looking to implement MSW may turn initially to the unit manager, an administrator. However, several informant organizations stressed that in their systems, the true frontline clinical leader is not the nurse manager, but rather the charge nurse.

An initial step, well-illustrated by Intermountain's experience, is to clarify and standardize the role and work of the charge nurse. In the absence of clearly defined roles, unit managers might feel obligated to perform standard work intended for charge nurses (e.g., basic coaching of frontline staff, leading frontline huddles, or rounding on patients). This sets up the nurse manager for failure in any attempt to do standard work appropriate to his or her own level.

3. Start with modest goals to secure early wins.

The initial pilot unit goals should be achievable within a relatively short period of time. For example, conducting a daily huddle to monitor medication administration, supported by a visual management board with simple metrics, could be tested and implemented over a period of three or four weeks, then elaborated on based on further testing. Complex goals that require significant interdepartmental teamwork — like medication reconciliation or staff onboarding — will likely be poor choices for initial testing. Several informants stressed the importance of "early wins" to boost staff engagement. For example, Greater Baltimore Medical Center introduces managers into their MSW system by first asking them to select one manageable metric to track, which aligns with the organization's overall strategic framework.

4. Create a sense of urgency and trust.

Above all, successful implementation of a HPMS depends on the continuing commitment of frontline staff who directly understand its benefits. Interventions that reduce chaos and workload and are perceived to be valuable by the people asked to use new methods are "more likely to be sustainably adopted, more likely to achieve their intended outcomes and encounter less ongoing resistance."[23] Hence, a new HPMS initiative can gain a sense of urgency by targeting acute problems that are widely recognized by staff. Over time, observable success on acknowledged problems in the pilot unit can build widespread support for the initiative.

Three of our informant organizations followed this strategy. Denver Health focused its efforts to create standard work in medical units on two top organizational goals: reducing patient falls and improving patient experience scores. Saskatoon Health Region focused much of its initial effort on scaling a province-wide safety protocol. Intermountain Healthcare implemented standard work in the context of its Transforming Care at the Bedside program.

We have already discussed the importance of daily activities such as huddles for building trust; in the longer term, it is essential to align career incentives such as promotions and performance reviews with HPMS tasks to sustain buy-in and support for the new management structure. At ThedaCare, high-potential professionals are assigned full-time to a Central Improvement Team for a period of time, to deepen their understanding of Lean methods and to help "reshape the career expectations of managers and executives" so that advancement is contingent on participation in continuous improvement.[8]

Conclusion

Sustaining frontline standard work remains a challenge even for organizations implementing comprehensive performance management and improvement systems — whether inspired by Lean or other improvement approaches. Many of our informant organizations were just beginning to explore high-performance management systems, with only a few organizations at a more advanced (yet still early) stage of implementation.

Health systems wishing to sustain the gains of more episodic, tool-based, or otherwise narrow approaches to Quality Improvement have found the development of more robust management systems an unavoidable step in their pursuit of higher performance — particularly in achieving sustained, quantified improvements in outcomes. Without a high-performance management system that includes a clear focus on developing standard work and using Quality Control to monitor and adjust the system as needed, even the best-intentioned and best-structured improvement programs are likely to fall short in their efforts to effect top performance in the longer term.

By focusing first on implementing standard work with frontline clinical units and managers, such as a charge nurse or team lead, organizations can build a solid "bottom-up" foundation for Quality Control and Quality Improvement that then supports more robust high-performance management at the system level.

Appendix A: Case Examples of Standard Work Implementation in Health Care

Case Example 1: Intermountain Healthcare (Salt Lake City, Utah)

Summary

Intermountain Healthcare carried out a pilot project between 2012 and 2014 that illustrates two key drivers of a high-performance management system (HPMS): S1: Standardization and S2: Accountability (see Figure 3). With a focus on standardizing and extending the role of the frontline charge nurse, the pilot unit — a 25-bed inpatient medical nursing unit — used task documentation, scripted huddles at shift change, and regular monitoring and coaching by charge nurses to structure and maintain frontline care processes. These changes resulted in increased nurse time for direct patient care, improved patient and staff satisfaction, and increased compliance with Centers for Medicare & Medicaid Services (CMS) core measures. That the pilot improvements were not spread system-wide was also instructive.

Background

Although Intermountain Healthcare began implementing Lean management principles in 2009, the organization had not seen sustained improvement in outcomes. After visiting other leading health systems, Intermountain leaders realized they needed to focus on standard work for frontline managers. They implemented several key elements of a HPMS, including standard work for frontline leaders and other unit roles, through a robust test of change with one pilot site. The pilot was a success; Intermountain saw significant gains in both efficiency and staff satisfaction. The case illustrates how a health system can begin to build a HPMS from the ground up, focusing first on frontline management (in this example, the charge nurse role) in a single pilot site.

Identifying the Initial Focus for the New Management System

Beginning in 2011, the medical leadership group's Lean committee selected a 25-bed inpatient medical nursing unit as a pilot site. The unit was simultaneously introducing the principles of Transforming Care at the Bedside (TCAB, an IHI-led initiative funded by the Robert Wood Johnson Foundation). Leaders felt implementing standard work and other improvements to their management system could help facilitate this effort.

As part of TCAB, management engineers identified suboptimal use of charge nurses, and poor role definition of charge nurses, as root causes of several problems on the unit such as inconsistent supervision of supply cart restocking. Given this challenge, and the focus on developing a new management system, charge nurses served as an initial focus for the efforts to develop the HPMS.

Focusing on Charge Nurses

"Charge nurse" had traditionally been an honorific position, usually based on seniority; many charge nurses were not interested in new skills and responsibilities. As an initial step to address the challenge, management engineers facilitated a retreat for charge nurses, with a focus on defining major roles and responsibilities.

When the retreat and subsequent coaching failed to result in the hoped-for gains, unit leaders took a dramatic step. They reduced the number of charge nurse positions and the nurse manager rewrote the charge nurse job description, reposted the job, and invited nurses on the unit to apply. This resulted in 30 percent staff turnover.

Next, the nurse manager, the assistant manager, a director, and a supporting management engineer held a retreat with the new charge nurses to develop a model for charge nurse standard work. At the same time, the unit leadership team created standard work for all the other roles on the unit, including techs, clerks, frontline nurses, manager, assistant manager, director, and patient educator.

The entire pilot unit staff received training on standard work — an opportunity to affirm the new status of the charge nurse, and to direct staff to listen to charge nurse directions. During roll-out of the project, the nurse manager and hospital nursing director met with management engineers weekly to discuss the development and roll-out of the standard work program. By spring of 2013, the pilot unit roll-out was complete. Ultimately, the timing of the pilot project did not mesh with top-management priorities, and the project lapsed.

Standardization: Developing Standard Work for Each Role on the Unit

Unit leadership created standards for a range of activities (such as admission, discharge, medication administration, and other major clinical and operational processes) and for all key roles, starting with the charge nurse. In their documentation of standard work, unit leaders clarified key items for each element: timing (how often?); details (what steps are involved?); and rationale (how does this item connect to organizational strategic goals and patient care goals?).

For example, leading huddles was a key item of charge nurse standard work. The standard work document specified that the huddle should take place at the beginning of each shift. Leading a huddle involved several standard steps: calling the team to huddle; reviewing the huddle sheet/agenda; acknowledging staff for successes; and completing an action register to improve key metrics. The rationale section cited several goals, including sustaining staff engagement and satisfaction, and improving patient engagement. The unit documented standard work in hard copy (assembled into binders, stored on the unit) and electronically in the unit's intranet system.

Accountability

Monitoring staff completion of standard work was another key element in the unit's system, essential to the system's success. As part of their standard work, charge nurses were required to conduct three assessments per day of whether or not frontline staff executed their standard tasks. The charge nurses could select which items of standard work were examined.

In general, these observations occurred anonymously. For example, the charge nurse might stand outside a patient room while a nurse conducted rounding. The charge nurse listened and determined whether the frontline nurse executed all required steps documented in the nurse's standard work. When the nurse left the room, the charge nurse had an opportunity to coach the nurse on any steps missed and provide positive feedback for steps conducted well. Charge nurses and other leaders also provided recognition regularly at staff meetings and huddles.

The charge nurse recorded these checks in a log, kept by the nurse manager. This log served to inform improvement activities. For example, the log revealed that nursing assistants did not conduct pain management properly. After further inquiry, the nurse manager learned that the nursing assistants had not received training in pain management. The leadership team created the training and resolved the issue.

The unit's management system included several other aspects that speak to the drivers of Quality Control, such as huddle boards (S3: Visual Management); stressing the PDSA technique of problem solving (S4: Problem Solving); and ensuring staff are aware of appropriate go-to people for problems they cannot immediately solve (S5: Escalation).

Results Point to a Promising Approach

Intermountain's standard work for charge nurses yielded exceptional results. By the end of 2014, the pilot unit achieved the following:

- An increase in time at the bedside, from 37 percent to 55 percent;

- A dramatic increase in HCAHPS scores: The unit went from being consistently in the bottom five among 45 units tracked system-wide to being among the top three units consistently;

- Increased employee engagement (tracked via Gallup), from a mean of 4.16 in 2012 to 4.62 by the end of 2014; and

- Consistent 100 percent compliance with CMS core metrics over several consecutive months.

While the development and introduction of standard work took some time — through the staff retreats and training described above — ultimately, it resulted in increased efficiency and staff and patient satisfaction. Intermountain hopes to ultimately scale up this model for standard work to other units and sites. Many of our informant organizations cited the importance of executive buy-in and engagement as key next steps in promoting scale-up of this work.

Case Example 2: Saskatoon Health Region (Saskatchewan, Canada)

Summary

Saskatoon Health Region (SHR) focused on patient safety, a high-priority quality issue, as the opportunity to develop elements of a HPMS. Standard work for frontline managers focused initially on a scripted algorithm, called "SAFER" (Stop, Assess, Fix, Escalate, Report), as the required response to safety-related incidents. Daily data-driven huddles focused on operational issues and key metrics aligned with organizational safety goals. Key factors in these efforts were support and encouragement for frontline problem solving and escalation of more complex problems. SHR found it important to look more broadly at the manager's daily work in order to reduce waste and ensure that practices like safety-oriented huddles were sustained.

Background

Saskatoon Health Region is the largest health system in Saskatchewan, Canada. Instead of focusing their HPMS pilot on a specific job role (such as charge nurses, as in the Intermountain example), SHR initially implemented the core functions of MSW around improvements in patient safety, a

system-wide concern at the time. As of this writing, they are focused on spreading elements of the HPMS more widely.

Using Safety as a Foundation

SHR has received significant support from the Saskatchewan Health Quality Council (SHQC), a province-wide group that is working to scale protocols and standard work to advance a provincial safety initiative to reduce harm to zero for patients and staff by 2020. At the heart of this province-wide safety initiative are explicit frontline protocols based on a common heuristic called "SAFER":

- **Stop:** Stop if staff see anything unsafe.

- **Assess:** Assess the situation. Ask for support from other staff, supervisors, or leaders.

- **Fix:** Fix the unsafe situation if they can.

- **Escalate:** If they cannot fix the situation, escalate the concern to the next person in the chain of command.

- **Report:** Report unsafe situations, environments, and practices, including "near misses" and incidents resulting in harm to patients or staff.

Saskatoon introduced important elements of the high-performance management system around safety through Plan-Do-Study-Act cycles (PDSAs) in 2013 and 2014. Leaders developed the outline for the HPMS around safety through a province-wide visioning session followed by a 3P (Production Preparation Process) event that encourages innovation and collaboration among key stakeholders early in a product or process redesign, and provides a structure for low-cost experimentation of the redesign. They focused first on creating huddle boards (visual management), then instituted huddles, followed by implementation of the accountability system that includes escalating huddles up the organizational hierarchy. The organization had a strong foundation in Lean methods, given province-wide efforts to adopt Lean in health care starting in 2010. Those efforts included formal training of senior leaders and managers in Lean tools.

Standardization

Beginning in 2014, SQHC quality specialists and consultants helped unit leaders design standard work aligned with the SAFER protocol in response to potential safety incidents. For example, the unit director on call has a sequenced set of tasks, with detailed task definitions and approximate "task cycle times," when safety incidents occur. Initially, the director on call contacts the designated frontline staff person, who briefs the director about the incident using the SBAR (Situation-Background-Assessment-Recommendation) format. This briefing generally takes at most 10 minutes. The director assesses whether he or she needs to respond to the situation in person. SHQC designed standard work around the SAFER protocol for charge nurses, frontline staff (nurses and physicians), unit managers, and executives.

Accountability

Directors' quarterly *gemba* ("workplace") walks in their units facilitate accountability. During these walks directors observe firsthand how the units function, review updates to the huddle boards, and the like. Further, frontline staff standard work supports management standard work. SHR maintains a safety "call line" that anyone can use to report safety issues — including patients, families, staff, physicians, and community members. Each day, directors huddle with the vice

president and CEO to discuss safety issues. A safety expert participates in the huddle to log all safety incidents reported via the call line; this helps ensure accountability. During the executive huddle, directors are expected to report all serious and critical safety incidents. If the safety expert reports an incident on a director's unit that the director did not know about, it becomes clear that the director has not followed through with MSW (which includes attention to all incidents of harm or near misses).

Visual Management

Individual units at SHR have huddle boards that predate the safety initiative, originating from their Lean performance improvement efforts. Units generally maintain two separate huddle boards: one focused on day-to-day operational considerations (e.g., bed capacity and demand, staffing), and the other focused on key performance measures that cascade up to organizational goals for quality, safety, delivery, and cost.

Problem Solving

SHR uses numerous problem-solving methods and frameworks as part of its safety work. The use of SBAR to analyze incidents is one example. In general, frontline staff surface problems and use a Plan-Do-Check-Act approach with small tests of change. Frontline supervisors also use and coach with the 5 Whys approach.

Escalation

To help facilitate problem solving with respect to safety, SHR's leadership distinguishes among three levels of safety challenges: critical incidents, with mandatory reporting to senior executives; serious challenges that can be addressed first by directors on call; and other incidents, which did not result in harm, and are within the jurisdiction of unit managers.

Cascading huddles at each level of management serve as a clear mechanism for problem escalation. Daily at 7:30 AM, managers huddle with their staff, with a focus on discussing any safety issues. At 8:15 AM, directors huddle with unit managers, who surface any safety issues and can request that directors help remove any relevant barriers to resolving such issues. Finally, directors participate in the executive huddle later in the morning, and the executive can again remove any barriers to resolving safety issues. Following the executive huddle, the CEO and the vice presidents meet to discuss any action items, such as response to critical incidents.

The SAFER protocol itself also clearly delineates an agreed-upon escalation protocol; if a staff member cannot resolve a safety-related problem directly, the protocol calls on staff to escalate the issue to the next available staff member in the "chain of command" (e.g., a frontline manager).

Integration

Saskatoon Health Region's approach has been successful in part because of strong executive support and engagement — with their safety initiative, their Lean efforts, and the development of MSW. Executives have their own MSW designed around safety. In addition to regular executive *gemba* walks, Saskatoon has developed a framework to support executive coaching of staff when a safety incident occurs. This framework, which encourages open-ended questions and a non-confrontational tone, helps executive leaders model standard work for others, and hence strengthen the MSW system overall.

SHQC performance improvement staff helped SHR staff design simulations for executives to facilitate their use of these guidelines. They videotape executives responding to a simulated safety incident, and then coach them through the response.

Designing a Broader System for Management Standard Work

SHR has seen impressive results from this work, including improvements in cycle time for safety incident responses and improvements in scores on safety culture surveys. Staff now have standard work when a safety incident arises; they know exactly what to do. Being able to call a dedicated line in response to a safety incident rather than fill out an online form has resulted in an average four-minute savings per incident for physicians and nurses. The hospital in which the model was most fully implemented saw many benefits, including more than 6,000 hours of staff time per year saved by reducing safety incident reporting time; 255 hours saved per year in eliminated duplicate reporting; and $281,000 saved, representing the value of labor gained due to increased productivity.

At the same time, leaders at SHR realized that managers did not have the time they needed to move from implementing a robust system of control for safety to also incorporating improvement. Safety incidents would arise and be managed through standard work. Managers and others would conduct root cause analysis to understand the underlying problem. But, given too many demands on a manager's day, the problem would often resurface because there was inadequate time to redesign processes and "error-proof" the work.

This realization led to broader efforts to spread the elements of the HPMS beyond their initial safety-focused application. For example, introducing elements of the HPMS to areas like human resources has meant that frontline clinical managers no longer need to worry about doing work best suited to other departments; those departments now work more efficiently. To stimulate development of the HPMS elements more broadly for managers across health care system departments, SHR leaders convened a rapid improvement workshop with managers and directors who volunteered to participate, facilitated by a Kaizen fellow. Participants agreed on a broad framework to organize all MSW for managers, with three key elements:

- Grow your people;
- Improve your processes; and
- Know your business.

Participants created a daily status sheet, with provocative questions to help them anticipate challenges throughout the workshop. They also received tips on how to modify daily huddles to make them more interactive.

Analyzing the Frontline Leader's Day to Create Momentum

To maintain momentum following the workshop, the Kaizen Promotion Office structured a time study to better understand how frontline clinical managers spend their time. A Kaizen fellow developed a time diary, asking 11 managers to record how they spent their time over two weeks, using 13 different categories (e.g., administrative work, safety efforts, hiring).

The fellow found that managers on average spent 45 percent of their time on administrative activities and meetings, and only 3 percent on activities related to the three core elements identified in the workshop. She is now using this data to help motivate managers to move forward

in their efforts to create MSW, and to help them structure their standardized daily tasks. These efforts move SHR closer to realizing the components of the HPMS on a broader scale, including a focus on the drivers of both Quality Control and Quality Improvement.

Case Example 3: Virginia Mason Health System (Seattle, Washington)

Summary

Virginia Mason Health System is a longstanding leader in Lean approaches to health care. With unflagging senior leadership commitment and ample resources to support staff learning, they have created a vertically and horizontally aligned management system that uses standard work at all levels to maintain consistent attention to operational issues and mount effective responses to emerging problems. This work has resulted in many innovative practices to improve the reliability, efficiency, and effectiveness of clinical care. Virginia Mason's work, now implemented at scale, offers highly visible working examples of tools and strategies useful for implementing a HPMS.

Background

Like Intermountain, Virginia Mason Health System began its journey toward developing a HPMS starting from long experience with Quality Improvement. After 15 years of sustained support from its executive team led by CEO Gary Kaplan, it is now world famous for the Virginia Mason Production System (VMPS), which has enabled them to reengineer many care and support processes based on Lean principles. Inspired by the Toyota Production System, VMPS prescribes continuously monitoring care, driving out waste through regular Rapid Process Improvement (*kaizen*) events and workshops.

Following Toyota principles, Virginia Mason implemented its new management system using VMPS. The management system is anchored in explicit statements of purpose, called compacts: one each for physicians, management, and the board of directors. These in effect constitute the institutional values and personal expectations for all Virginia Mason personnel. Virginia Mason initially introduced its management system in a small set of value streams, selected in line with their annual strategic planning process.

While many aspects of the VMPS speak to the secondary drivers of the HPMS, three key drivers are highlighted here that other health systems may find helpful in developing their own HPMS: a set of standardized tasks for frontline leaders (S1); a tool to support both learning and accountability (S2); and integration of work and purpose across organizational levels (S6).

Standardization

The development of Virginia Mason's system has prioritized frontline leaders' work. According to one system leader: "This is where things really happen in an organization... If you don't engage and get the alignment of middle management, you're not going to get anywhere."[24]

As part of the Virginia Mason Production System, frontline leaders have several key responsibilities, which become part of their standard work: they must know the status of planned work, know if frontline staff follow standard work, and understand the upstream and downstream impact of work at the front line.

In addition, the leadership system includes standardized tasks for frontline leaders. Leaders are expected to use visual management, maintaining a "reporting wall" (known as "PeopleLink wall"), which includes goals and the status in achieving those goals. They huddle at least weekly with their teams to review the status in achieving the goals, and use these meetings as an opportunity for coaching. In addition, on a daily and weekly basis, frontline leaders review financial performance, conduct manual and electronic "sweeps" of the workspace, and provide coaching to frontline staff.

Accountability

Huddles offer an opportunity for managers to review staff understanding of and compliance with standard work. Frontline managers also submit quarterly reports to the central Kaizen Promotion Office, which allows them an opportunity to reflect on their unit's progress in achieving the aims of high-performance management across a number of dimensions. The tool helps them assess progress in implementing visual management, huddles, root cause problem solving, review of team standard work, solicitation and tracking of improvement ideas from staff, and their own standard work overall.

This tool serves not only as an accountability mechanism, but also as a resource for learning; it includes numerous links to examples of tools that frontline managers throughout Virginia Mason have used to meet the aims of the Virginia Mason Production System.

Integration

Virginia Mason's orthopedic service line is a vivid example of integration in a high-performance management system. Prior to the new system, inpatient units and ambulatory care struggled with misaligned demand. Physician offices did a poor job of coordinating with scheduled surgery blocks in the OR. The OR in turn did a poor job of sending patients to the inpatient floors in a timely manner. In order to maintain attention to the problem and its evolving remedy, service line management regularly initiate weekly huddles that include unit managers from the OR, physician offices, and nursing. The huddles provide a forum for direct cross-department coordination; they are consistently and eagerly attended. Together, these department managers can respond to fluctuating circumstances, target specific problems, and sponsor initiatives to improve them. Adjustments to improve workflow are part of standard work. Under this standard work, the orthopedic service line now functions as a more cohesive whole, better able to consistently satisfy the expectations of staff and patients. Staff engagement is high because the system is directed at solving recognized problems and because the value it provides is widely acknowledged.

Virginia Mason's success in scaling the Virginia Mason Production System would not have been possible without major, sustained executive support and leadership. Beyond support, the organization's top leaders are active participants in the management system, regularly performing their own MSW. Every Tuesday, the executive team meets at 7:00 AM for a huddle to review current improvement projects. Three presenters give brief reports and receive feedback from the executive team, including physician leaders, C-suite executives, and value stream administrative leaders. This continuous feedback drives integration across the organization. It offers an opportunity for constructive criticism and for leaders to remove barriers where necessary.

Outstanding Outcomes

A high-performance management system focused on middle managers and frontline leaders serves as one crucial element of the Virginia Mason Production System — one that ties many other elements together and ensures sustained progress. Virginia Mason has achieved significant

progress as a result, including improvements in time spent by nurses at the bedside, consistent margin improvements,[24] and some of the highest quality and safety ratings in the country. Virginia Mason has among the lowest rates of complications like central line infections and surgical site infections in the US. Leaders at Virginia Mason remark that perhaps the most notable change that has resulted from their development of a HPMS is a dramatic reduction in turnaround time for routine problems that staff now themselves solve with greater ease, with fewer barriers.

Appendix B: Examples of How Informant Organizations Execute Drivers of Quality Control

This table outlines the ways in which seven of our informant organizations operationalized a high-performance management system at the front line — the drivers of Quality Control (noted in the left-most column in the table below, and depicted in Figure 3 above).

Abbreviations: QC: Quality Control; SW: Standard Work; PDSA: Plan-Do-Study-Act; HPMS: High-Performance Management System

Drivers of QC	Virginia Mason Health System	ThedaCare	Intermountain Healthcare	Greater Baltimore Medical Center	Children's Mercy Hospital	Saskatoon Health Region	Denver Health
S1: Standardization	SW at all levels of management for numerous departments/units	SW at all levels of management for numerous departments/units	Standardized activities at RN, charge RN, manager, and director levels for pilot unit; many processes and roles have SW organization-wide	SW at all levels of management for numerous departments/units (nursing units, ORs, environmental services, transport, and others)	Limited scope; unit managers in radiology have SW, including observations of critical processes; SW in development for perioperative care and ambulatory clinics	Early stages (i.e., in process of developing comprehensive SW for front line); SW in place for front line; frontline leaders in support areas (e.g., HR); SW for safety exists for numerous roles	Many processes standardized across units; in early stages of developing leader SW around high-priority areas such as fall prevention, pain control
S2: Accountability	Quarterly assessment tool captures essential elements of standardization in a unit; turned in to next-level manager	Spot checks daily/weekly	For pilot, 2 to 3 spot checks per week as part of charge nurse SW; checks captured in log	Spot checks of staff SW	Weekly report card for SW and manager SW submitted to next-level unit manager; director reviews all manager SW weekly and documents follow-up with each individual	Directors complete "audit sheet" in response to safety incidents, which they submit to dedicated safety staff; details SW steps	Spot checks on SW (e.g., for fall risks) at multiple levels

Drivers of QC	Virginia Mason Health System	ThedaCare	Intermountain Healthcare	Greater Baltimore Medical Center	Children's Mercy Hospital	Saskatoon Health Region	Denver Health
S3: Visual Management	Huddle boards	Huddle boards	Huddle boards	Huddle boards	Huddle boards, K Cards (picture to represent ideal state of an environment)	Two huddle boards per unit (one operational and focused on items like staff shortage or mitigation, the other quality oriented and focused on items like complications)	Huddle boards in development with measures aligned with executive-level goals and strategic aims
S4: Problem Solving	Multiple methods (5 Whys, PDSA, etc.)	A3 problem solving, other methods	PDSA, rapid improvement workshops	Multiple methods (5 Whys, PDSA, etc.)	PDSA, A3, Rapid Improvement Events; STP ("Situation, Target, Proposal"— staff submit and unit managers review weekly)	Use PDSAs and small tests of change; 5 Whys; safety issues presented in SBAR format to facilitate problem solving (Situation, Background, Assessment, Recommendation)	PDSAs, root cause analysis
S5: Escalation	Escalation integrated into SW (e.g., protocols to escalate problems to others when the usual person responsible is not available); dedicated protocol for escalating safety issues through Patient Safety Alert System	Time-based: If patient care problem cannot be solved in 15 minutes, escalate to next level	For pilot unit: Escalation integrated into SW (e.g., protocols to escalate problems to others when the usual person responsible is not available); escalation built into SW in many areas	Daily executive-level workplace walks facilitate problem escalation	Daily Safety Update (hospital-wide) facilitates problem escalation; quick hits and big issues listed on huddle board, escalated from daily huddles; use of abnormality trackers supports problem identification	Time-based escalation criterion for safety issues; cascading daily huddles offer means to escalate critical or serious safety incidents	Cascading huddles facilitate problem escalation (daily huddles at frontline staff level; weekly huddles among RN managers)

Drivers of QC	Virginia Mason Health System	ThedaCare	Intermountain Healthcare	Greater Baltimore Medical Center	Children's Mercy Hospital	Saskatoon Health Region	Denver Health
S6: Integration	Strong support and engagement; executive-level huddles; cascading SW up through executive level	"True North"; visual management organized around organizational priorities at all levels	HPMS in process of spread	Strong executive support; C-suite gemba walks; executive Lean workshops help establish early daily management board; visual management measures aligned with enterprise strategic goals	Strong executive support; executive-level initiated 5S workshops help establish early interest	Strong executive support, both at the health system level and at the province/policy level; "bottom-up" development of SW, starting with safety focus and with support areas (e.g., HR)	Strong executive support; measures on visual boards at all levels aligned with board-level strategic goals; C-suite monthly gemba walks

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