

# A CEO Checklist for High-Value Health Care

Delos Cosgrove, Michael Fisher, Patricia Gabow, Gary Gottlieb,  
George Halvorson, Brent James, Gary Kaplan, Jonathan Perlin,  
Robert Petzel, Glenn Steele, and John Toussaint\*

June 2012

\*Participants in the IOM Roundtable on Value & Science-Driven Health Care

---

*The views expressed in this discussion paper are those of the authors and not necessarily of the authors' organizations or of the Institute of Medicine. The paper is intended to help inform and stimulate discussion. It has not been subjected to the review procedures of the Institute of Medicine and is not a report of the Institute of Medicine or of the National Research Council.*

---

## AUTHORS

**Delos Cosgrove, MD**

President and CEO  
Cleveland Clinic

**Michael Fisher**

President and CEO  
Cincinnati Children's Hospital  
Medical Center

**Patricia Gabow, MD**

Chief Executive Officer  
Denver Health and Hospital Authority

**Gary Gottlieb, MD, MBA**

President and CEO  
Partners HealthCare System, Inc.

**George Halvorson**

Chairman and CEO  
Kaiser Permanente

**Brent James, MD, MStat**

Executive Director  
Intermountain Institute for Care  
Delivery Research

**Gary Kaplan, MD**

Chairman and CEO  
Virginia Mason Health System

**Jonathan Perlin, MD, PhD**

President, Clinical and Physician Services  
HCA, Inc.

**Robert Petzel, MD**

Undersecretary for Health  
Department of Veterans Affairs

**Glenn Steele, MD, PhD**

President and CEO  
Geisinger Health System

**John Toussaint, MD**

Chief Executive Officer  
ThedaCare Center for Healthcare Value

The authors were assisted by the following individuals:

**Albert Bothe, MD**

Geisinger Health System

**Jonathan Darer, MD, MPH**

Geisinger Health System

**Duane Davis, MD**

Geisinger Health System

**Tejal Gandhi, MD**

Partners HealthCare System, Inc.

**Uma Kotagal, MBBS, MSc**

Cincinnati Children's Hospital

**Tom Lee, MD**

Partners HealthCare System, Inc.

**Peter Markell**

Partners HealthCare System, Inc.

**J. Michael McGinnis, MD, MPP**

Institute of Medicine

**Geraldine McGlynn, MEd**

Veterans Health Administration

**E. Lynn Miller**

Geisinger Health System

**Kathleen Paul**

Virginia Mason Health System

**Brian Powers**

Institute of Medicine

**Lucy Savitz, PhD**

Intermountain Healthcare

**Pat Schrepf**

Virginia Mason Health System

**Earl Steinberg, MD**

Geisinger Health System

**Leigh Stuckhardt, JD**

Institute of Medicine

**Jed Weissberg, MD**

Kaiser Permanente

**Robert Wyllie, MD**

Cleveland Clinic



**As leaders** of health care organizations, we are acutely aware of the pressures that rising health care costs place on individuals, employers, and the government, as we are of unacceptable shortfalls in the quality and efficiency of care. But we have also learned, through experiences in our own institutions and through communication and collaboration with colleagues in others, that better outcomes at lower costs can be achieved through care transformation initiatives that yield improved results, more satisfied patients, and cultures of continuous learning. These transformation efforts have generated certain foundational lessons relevant to every CEO and Board member, and the health care delivery organizations they lead. We have assembled these lessons here as a *A CEO Checklist for High-Value Health Care* to describe touchstone principles, illustrated with case examples, central not only to our work to date, but to sustaining and reinforcing the system-wide transformation necessary for continuous improvement in the face of rapidly increasing pressures, demands, and market changes.

This *Checklist* is intended to be a living and dynamic document, and we invite both suggestions to improve its utility and reach, and co-signing by our CEO colleagues who wish to support these strategies for effective, efficient, and continuously improving health care for all Americans.

## NEEDS AND OPPORTUNITIES

Health care in the United States is at a critical point. Excessive costs are no longer tenable and mediocre outcomes are no longer tolerable. For 32 of the past 40 years, health care costs have grown faster than the rest of the U.S. economy.<sup>1</sup> Federal health care costs—expected to reach \$950 billion in 2012—will become the largest contributor to the national debt.<sup>2</sup> States, too, are being crippled by health care costs. Medicaid now consumes almost a quarter of state budgets, crowding out investments in education and infrastructure.<sup>3</sup> In the private sector, escalating costs have eroded the bottom line for employers who purchase health care for their employees and have eliminated any appreciable gains in income for American families during the past decade.<sup>4,5</sup> Purchasers simply cannot afford the status quo.

Despite these expenditures, outcome shortfalls are pervasive. Population health measures such as life

expectancy and preterm birth lag behind those of almost every other developed nation. Patients are still harmed by medical errors. Recent assessments indicate that 10 years after the IOM report *To Err Is Human* estimated that medical errors cause up to 98,000 deaths in hospitals each year,<sup>6</sup> roughly 15 percent of hospital patients are still being harmed during their stays.<sup>7</sup> Poor care coordination places further strain on patients and the system, with roughly 20 percent of discharged elderly patients returning to the hospital within 30 days.<sup>8</sup> Faced with concerns about the cost and quality of health care, purchasers are

developing concrete plans to leverage their buying power to reduce expenditures and demand high-value care—care that achieves better outcomes at lower costs.

These are the realities for health care executives today. As demand for high-value health care builds, care delivery leaders face the near-term imperative to transform the way their organizations operate. We know the potential for improvement exists. The amount of waste in the system—estimated to be at least 30 percent<sup>9</sup>—provides both the opportunity and the mandate for transformation. Replacing wasteful practices and procedures with those marked by effectiveness and efficiency can improve health outcomes and bottom lines at a time when pressures are growing on both counts.

**The Checklist's 10 items reflect the strategies that, in our experiences and those of others, have proven effective and essential to improving quality and reducing costs.**

Given the urgency at hand, each of us, with the assistance of farsighted staff and in cooperation with many of you in other institutional

leadership positions, has been engaged in these kinds of efforts. To aid and accelerate the system-wide transformation necessary, we have assembled what we are calling “A CEO Checklist for High-Value Care” (the Checklist). The Checklist’s 10 items reflect the strategies that, in our experiences and those of others, have proven effective and essential to improving quality and reducing costs. They describe the foundational, infrastructure, care delivery, and feedback components of a system oriented around value, and represent basic opportunities—indeed obligations—for hospital and health care delivery system CEOs and Boards to

improve the value of health care in their institutions.

The strategies in this Checklist are not, of course, of the “one-and-done” variety. Rather, the items we present here are elements that must become core components of an organization’s DNA. In some ways, they represent more a credo of commitment than a simple checklist, but each Checklist item is every bit as vital as the items on the checklists routinely used by pilots taking complicated aircraft into quickly changing conditions. Taken together, the Checklist provides a blueprint for improving quality and reducing cost amid a changing landscape.

We realize that while the elements on the Checklist are necessary to achieve high-value health care within an institution, they are not sufficient to reach full potential across the system. Forces outside the control of any single institution—economic incentives that reward volume over value, inequitable access to needed services, poor linkage of community and clinical services, and unnecessary regulatory requirements—can all serve as barriers to the transformation required. However pervasive, we cannot allow these issues to obscure the substantial gains that can be achieved from the steps well within our control as leaders of our institutions.

What follows is an item-by-item review of the basic issues, opportunities, and expectations for the 10 items on the Checklist, along with case material that briefly describes a sample of our experiences. To improve readability and access, we have been deliberately brief in the case descriptions, but more details may be found in the material in Appendix I, where follow-up contact information is also provided for additional conversations. Because this paper addresses the system-level issues that are central to achieving high-value health care, we do not discuss or spotlight some important work that has been developed around individual services that are often overused, unnecessary, or otherwise wasteful. In recognition of the utility of such analyses and inventories, we have included summaries of some of that work in Appendix II.

Ultimately, the transition to high-value care will be led and championed by executives who recognize high quality and lower cost as institutional aims, and will be sustained by a system-wide culture of continuous improvement. When successfully implemented, these systematic improvements that reduce waste and improve outcomes will maximize the value of health care delivered in the United States.

## A CHECKLIST FOR HIGH-VALUE HEALTH CARE

Just as we offer an invitation to each staff and Board member of our respective institutions to hold us accountable for fully engaging, implementing, and sustaining attention to every Checklist item, we invite you to be in touch as we work together to build the field of health care transformation and better health for all Americans.

### Foundational elements

- ✓ **Governance priority**—visible and determined leadership by CEO and Board
- ✓ **Culture of continuous improvement**—commitment to ongoing, real-time learning

### Infrastructure fundamentals

- ✓ **IT best practices**—automated, reliable information to and from the point of care
- ✓ **Evidence protocols**—effective, efficient, and consistent care
- ✓ **Resource utilization**—optimized use of personnel, physical space, and other resources

### Care delivery priorities

- ✓ **Integrated care**—right care, right setting, right providers, right teamwork
- ✓ **Shared decision making**—patient–clinician collaboration on care plans
- ✓ **Targeted services**—tailored community and clinic interventions for resource-intensive patients

### Reliability and feedback

- ✓ **Embedded safeguards**—supports and prompts to reduce injury and infection
- ✓ **Internal transparency**—visible progress in performance, outcomes, and costs

## FOUNDATIONAL ELEMENTS

To create lasting, sustainable change, the pursuit of continuous improvement and better value for patients must define an organization's culture, mission, and leadership. It is a pursuit that is never complete, but with a relentless operational ethos of continuous improvement and assessment, we can achieve the value potential for the care within our institutions and the health of the populations we serve.

✓ **Governance priority**—visible and determined leadership by CEO and Board

✓ **Culture of continuous improvement**—commitment to ongoing, real-time learning

### ✓ Governance Priority

Visible and determined leadership by CEO and Board

Senior executive leaders and Board members are the central stewards of high-value care. Responsible for both our institutions' financial health and the quality of care provided, we are inherently the most visible champions for a culture of continuous improvement in quality and high-value care. Our steadfast engagement with front-line staff, management, and other organizational leaders to evaluate performance and explore opportunities for improvement is the key ingredient to achieving high-value care. Similarly, engaging our Boards as fully informed and visible partners in our quality and value innovations will foster stronger attention to and appreciation of the rewards from related staff efforts, engender more dynamic and productive meetings on the issues, and improve the reward structure to focus on reinforcing the culture of continuous improvement.

QUESTIONS WE ASK OURSELVES, OUR SENIOR LEADERS, AND OUR BOARDS TO ASSESS PROGRESS:

- What is our strategy for continuous improvement in the effectiveness and efficiency of care, and are we reinforcing it with every member of our organization?
- What else can our Board and its members do to emphasize and help drive our continuous improvement efforts?

## ✓ Culture of Continuous Improvement

Commitment to ongoing, real-time learning

The sustainability of efforts to improve the quality and value of care is contingent on an institutional culture of continuous improvement. Evaluating tasks and processes to identify better approaches allows hospitals to reduce waste, improve outcomes, and yield significant savings. Rather than prescribing behavior, managers and executives who teach problem solving, develop standard work, and remove barriers to improvement help their employees excel. This requires a management system built on the tenants of respect for all people in the organization, in which leadership behavior is focused on humility, facilitation, and mentorship. Front-line staff are taught to

1. analyze processes to identify waste and inefficiency,
2. propose changes to eliminate wasted resources and effort,
3. test proposed solutions on a small scale, and
4. if successful, scale the improvements to the entire organization. This process is never complete. Existing workflows must be continually refined and new opportunities for improvement continually sought.

A culture of continuous improvement demands that all workers apply this method to their tasks to drive iterative improvements in the efficiency of hospital operations.

QUESTIONS WE ASK OURSELVES AND OUR SENIOR LEADERS TO ASSESS PROGRESS:

- In what ways are our employees at every level supported and empowered to improve effectiveness, efficiency, and outcomes in their daily work?
- What tools have we built into our processes for continuous feedback and action to improve care delivery?

## OUR EXPERIENCES { Culture of Continuous Improvement }

**Denver Health** adopted Lean as the philosophy and toolset to use in redesigning care. Lean is built on respect for people and continuous improvement, and focuses on reducing waste from the customer perspective.

- **Better care:** Achieved lowest observed-to-expected hospital mortality (among University Healthsystem Consortium)
- **Lower costs:** Since 2006, \$158 million in financial benefit realized despite a 60 percent increase in uncompensated care

**Virginia Mason** adapted elements of the Toyota Production System to develop the Virginia Mason Production System (VMPS), aimed at identifying and eliminating waste and inefficiency in the many processes of health care delivery.

- **Better care:** Patients spend more value-added time with providers and experience fewer errors
- **Lower costs:** Multiple years of 4 to 5 percent margins

**ThedaCare** implemented the Business Performance System, a management process that supports front-line workers to solve problems every day. This moves away from a project mentality for improvement to a system transformation that builds a continuous improvement culture.

- **Better care:** 88 percent of safety and quality indicators improved; 85 percent of customer satisfaction indicators improved; 83 percent of staff engagement indicators improved
- **Lower costs:** Days cash on hand increased from 180 to 202 (\$36 million improvement); cash-flow margin improved from 10.5 percent to almost 12.5 percent

# INFRASTRUCTURE FUNDAMENTALS

Infrastructure components serve as foundation stones that enable the delivery of high-value care. As fundamental as governance and culture, certain technical capabilities promote the delivery of best practices and enable quality-improvement processes and assessment. These infrastructure elements are often critical first steps to transitioning to a system of high-value health care. Many of the specific care delivery and reliability strategies discussed below rely on a robust internal infrastructure.

- ✓ **IT best practices**—automated, reliable information to and from the point of care
- ✓ **Evidence protocols**—effective, efficient, and consistent care
- ✓ **Resource utilization**—optimized use of personnel, physical space, and other resources

## ✓ IT Best Practices

Automated, reliable information to and from the point of care

Reliable information systems are critical not just to ensure care quality, but also to improve efficiency in administrative and other process measures. Implementing EHRs and other technologies to enhance connectivity and efficiency can achieve cost savings and improve quality. These systems aid hospitals in automating order entry and reducing paperwork; optimizing staffing levels and scheduling; managing equipment and resources; defining care protocols and providing clinical decision support; managing billing and revenue cycles; reducing adverse drug events and duplicate tests; and improving care coordination.

## QUESTIONS WE ASK OURSELVES AND OUR SENIOR LEADERS TO ASSESS PROGRESS:

- How well is our IT system used to help providers streamline administrative tasks and improve the care experience and patient outcomes?
- How well is our EHR aligned with Meaningful Use requirements?

## OUR EXPERIENCES { IT Best Practices }

**Geisinger** implemented a series of health IT initiatives to improve quality and enhance efficiency, such as electronic health records; a health information exchange; ePrescribing modules; a data warehouse; and comprehensive document management.

- **Lower costs:** During the past 5 years, savings of \$1.7 million from reduced chart pulls; more than \$600,000 from reduced printing and faxing; more than \$500,000 per year from reduced nursing staff time through ePrescribing; and more than \$1 million from reduced transcription

**HCA** implemented Barcode Medication Administration (BCMA) in all of its hospitals. BCMA combines an electronic medication administration record of the specific medications ordered for the patient with barcode verification of the patient's identity (armband) and medication (label).

- **Better care:** Fewer adverse drug events; reduced length of stay
- **Lower costs:** 58.5 percent reduction in the total number of liability claims related to medication errors

**Veterans Health Administration's** Adverse Drug Event Reporting System (VA ADERS) was created to streamline and improve ADE monitoring. VA ADERS is an integrated web-based application that fully automates the ADE reporting process (including direct submission to FDA MedWatch) through a single portal for all facilities. VA ADERS allows for a wide range of

pharmacovigilance functions as well as an improved ability to make pharmacy-benefit and formulary-management decisions.

- **Better care:** Seven-fold increase in ADE reporting; standardized reports on ADEs available to all VA medical centers, with breakdowns by facility and region

**Kaiser Permanente's** electronic medical library helps give caregivers access to the information they need when they need it, even in the exam room at the point of care, in order to best treat Kaiser's members and patients. The system contains data from thousands of medical texts and journals, and includes a full array of recommended best practices, proven care protocols, and advice.

- **Better care:** More than 10,000 uses per day of the electronic medical library by Kaiser clinicians; single site of contact for all clinical content for faster dissemination of best practices, new medical information, and new medical science

**Cleveland Clinic** has integrated a "hard stop" function into their computerized physician order entry system to reduce medically unnecessary same-day duplicate tests. Providers are able to override the stop through a call to the clinical pathology group.

- **Lower costs:** 13 percent reduction in blood gas determinations; \$10,000 in monthly savings for laboratory tests (excluding blood gas); \$117,000 in first-month savings for molecular testing

## ✓ Evidence Protocols

Effective, efficient, and consistent care

The delivery of high-value care is contingent on having the best information on what treatment works best for whom, and under what circumstances. Evidence-based protocols for managing the diagnosis and treatment of various conditions improve the reproducibility and standardization of care while allowing for tailoring to the unique needs of individual patients. Evidence-based protocols go beyond guidelines. Integrated within an EHR, they automatically provide clinicians with the best evidence about a particular condition as well as a decision pathway for diagnosis and treatment. Experience suggests that evidence-based care protocols may be most effective when developed and refined within institutions, blending protocols developed elsewhere with local issues and circumstances.

### QUESTIONS WE ASK OURSELVES AND OUR SENIOR LEADERS TO ASSESS PROGRESS:

- For which of our most common and highest-cost conditions and procedures do we not yet have evidence-based care protocols? What is our strategy for filling these gaps and keeping others current?
- Which of our care protocols are not yet integrated into provider workflows via our EHR and what is our plan to fully integrate them?

## OUR EXPERIENCES { Evidence Protocols }

**Geisinger** cardiac surgeons identified evidence- or consensus-based best practices from nationally published guidelines for patients undergoing elective coronary artery bypass. A variety of standardized order sets, decision-support tools, and reminders were created in the EHR, with tracking and reporting of adherence to the provision of each element of care.

- **Better care:** 67 percent reduction in operative mortality; 1.3-day decrease in length of stay
- **Lower costs:** Revenue minus expense improved by more than \$1,900 per case; cost per case for the Geisinger Health Plan decreased by 4.8 percent

**HCA** developed a “bundle” of standardized, evidence-based care practices related to high-risk obstetrical conditions in order to improve patient outcomes and reduce the costs of perinatal services.

- **Better care:** Maternal death rate of ~6.5 per 100,000 births (compared to national average of 13)
- **Lower costs:** \$68 million in system-wide annual savings; 75 percent reduction in malpractice claim costs

**Virginia Mason** embedded pre-established evidence-based decision rules into the existing workflow of providers at the point of ordering an advanced imaging test to reduce variability. If the provider cannot specify an appropriate evidence-based decision rule, the test cannot be ordered.

- **Better care:** Reduced delays for necessary imaging; no unnecessary tests
- **Lower costs:** Substantial decrease in imaging utilization: MRI rate for

headache by 23.2 percent; lumbar MRI rate by 23.4 percent; and sinus CT rate by 26.8 percent

**Intermountain Healthcare** applied rigorous evidence protocols and process improvement methodology to more than 60 clinical processes that constitute roughly 80 percent of care delivered. One example is the elective induction of labor. When women arrive at an Intermountain labor and delivery facility, nurses, through the EMR, must demonstrate that all criteria for elective delivery are met. If the criteria are not met, approval/consultation is required to proceed.

- **Better care:** Inappropriate elective induction rate fell from 28 percent to less than 2 percent; women spend 750 fewer hours in delivery per year
- **Lower costs:** Over c-section rate ~40 percent lower than national average, producing overall cost savings of \$50 million; \$10 million reduction in maternal and newborn variable costs per year

**Kaiser Permanente’s** Healthy Bones Program, conceived by KP orthopedists, is a set of measures to identify and proactively treat patients at risk for osteoporosis and hip fractures. Physicians participating in the program implemented a number of initiatives, including increasing the use of bone density tests (DXA scans) and anti-osteoporosis medications, adding osteoporosis education and home health programs, and standardizing practice guidelines for osteoporosis management.

- **Better care:** During the course of 5 years, the Healthy Bones Program reduced hip fracture rates for at-risk patients by nearly 50 percent

## ✓ Resource Utilization

Optimized use of personnel, physical space, and other resources

Providing high-value care requires the efficient use of finite resources, yet much of health care today is suboptimal on both counts. Operations-management tools can help improve returns on fixed-capital investments. Variability in the flow of patients into a hospital unit results in overcrowding, worse health outcomes due to fluctuations in staffing levels, increased staff stress, lower patient and staff satisfaction, reduced access to care, and higher costs.<sup>10</sup> Strategies such as Queuing Theory and Variability Methodology can be used to eliminate sources of artificial variability, improving occupancy without increasing staffing or capacity or reducing lengths of stay. Furthermore, systematic process-improvement efforts such as Lean can be used to make more efficient use of personnel and other resources. Structured analysis of daily work can eliminate inefficiencies, increase value-added time spent with patients, reduce staff stress, and optimize the use of supplies and other resources.

QUESTIONS WE ASK OURSELVES AND OUR SENIOR LEADERS TO ASSESS PROGRESS:

- What procedures have we put in place for continuous monitoring of patient flow, occupancy, and staffing levels for each major service line?
- What indices do we use to identify and eliminate unnecessary and wasteful fluctuations, variation, and inefficiencies in each element?

## OUR EXPERIENCES { Resource Utilization }

**Cincinnati Children's** implemented a series of operations-management interventions to smooth patient flow through the intensive care unit to reduce daily artificial variation and make bed occupancy more predictable.

- **Better care:** Fewer delays in/cancelling of elective surgeries due to bed availability
- **Lower costs:** \$100 million in capital costs (75 new beds) avoided due to improved patient flow

**Virginia Mason** used the tools and methods of the Virginia Mason Production System to reduce inefficiencies in the workflow of nurses. Using 5-day workshops (Rapid Process Improvement), nursing teams analyzed their work and implemented methods to improve efficiency. For example, instead of the usual method of caring for patients throughout a unit, nurses now work as a team with a patient-care technician in “cells” (groups of rooms located near each other).

- **Better care:** Nurses spend 90 percent of time in direct patient care (compared to 35 percent); nurses can more easily monitor patients and quickly attend to needs; enhanced communication among team members; improved skill–task alignment

**Intermountain Healthcare** actively addressed inefficiencies in the supply chain using an evidence-based approach. Internal supply chain experts work with Intermountain’s clinical staff to develop effective processes and strategies that remove the supply burden from caregivers. These teams analyze supply chains to identify the practices and products that drive the best outcomes.

- **Better care:** 2.3 percent reduction in catheter-associated bloodstream infections
- **Lower costs:** More than \$200 million in savings during the past 5 years

## CARE DELIVERY PRIORITIES

The core motivation for any hospital or health system is to deliver care that is safe, effective, patient-centered, timely, efficient, and equitable.<sup>11</sup> Certain strategies can help care-delivery organizations reengineer care around these principles. Often, this involves changing the existing construct of care delivery to one of open collaboration with patients, team-based care, delivery of care within and outside the hospital, and more active management of the health of the patient population by allocating resources based on severity of need.

- ✓ **Integrated care**—right care, right setting, right providers, right teamwork
- ✓ **Shared decision making**—patient-clinician collaboration on care plans
- ✓ **Targeted services**—tailored community and clinic interventions for resource-intensive patients

### ✓ Integrated Care

Right care, right setting, right providers, right teamwork

In response to financial pressures and patient preferences, hospitals and health systems must find new ways to deliver care in the most appropriate and cost-efficient setting. Targeted clinics, home care programs, and other models aimed at ensuring that care is delivered in the most appropriate setting can help reduce costs and improve outcomes. This sort of integration promotes patients' participation in their care, allows for monitoring of key chronic disease indicators, and reduces hospital readmissions that are stressful for patients and costly for health systems. Results improve when these efforts are supplemented by teaming and partnership strategies that promote care integration, as well as staffing patterns that optimize skill-task alignment.

### QUESTIONS WE ASK OURSELVES AND OUR SENIOR LEADERS TO ASSESS PROGRESS:

- What procedures ensure optimal care transitions, both within units of the hospital and between the hospital and the community?
- How do we assess which care setting is most cost-effective and appropriate to the patient experience and outcome?
- How do we define the patient's care team and ensure that each care step is delivered by the most appropriate team member?

## OUR EXPERIENCES { Integrated Care }

**Partners HealthCare's** Connected Cardiac Care Program (CCCP) is a home monitoring program for heart failure (HF) patients at risk for hospitalization. CCCP's core components are care coordination, education, and development of self-management skills through the use of telemonitoring. Patients use home monitoring equipment to submit weight, blood pressure, heart rate, and symptoms on a daily basis.

- **Better care:** 51 percent reduction in HF hospital readmission; 44 percent reduction in non-HF hospital readmission
- **Lower costs:** More than \$10 million in savings to date (\$8,155 per patient)

**Geisinger** leveraged two key components of its integrated health system structure—Geisinger Clinic and Geisinger Health Plan—to develop an advanced medical home model, named ProvenHealth Navigator® (PHN). The PHN model has five core elements: (1) re-engineered patient-centered primary care, (2) integrated population management, (3) 360° care systems to form a medical neighborhood, (4) measurement of quality of care, and (5) a value-based reimbursement model.

- **Better care:** 18.2 percent decrease in acute admissions; 20 percent decrease in readmissions
- **Lower costs:** 7.1 percent reduction in the total cost of care during the past 5 years

**Veterans Health Administration's** Patient-Aligned Care Teams (PACT) improved veterans' access to high-quality primary care. PACTs, the VHA's version of the Patient-Centered Medical Home, deliver evidence-based, value-oriented, patient-centered team-based care with a focus on prevention and population health. To facilitate and improve access to care, PACTs employ multiple modalities, such as telephone clinics, home telehealth, secure messaging, and mobile apps.

- **Better care:** 15 percent increase in same-day access to primary care physicians
- **Lower costs:** 8 percent reduction in urgent care visits; 4 percent reduction in admission rates

## ✓ Shared Decision Making

### Patient-clinician collaboration on care plans

Patient-centered care hinges on shared decisions. Shared decision processes help hospital staff inform patients about the risks and benefits of various treatment options and give patients the opportunity to consider how these options align with their goals for care and communicate these goals with their care providers. These processes encourage open communication among patients and ensure the development of an evidence-based care plan free of duplication and waste. Once properly informed about their care options, patients often reveal preferences for lower-cost and less-intensive treatments, which can reduce costs associated with overuse.

### QUESTIONS WE ASK OURSELVES AND OUR SENIOR LEADERS TO ASSESS PROGRESS:

- What tools are being provided to our clinicians to aid in the communication of complex medical information to patients and their families?
- How do we require and facilitate the routine engagement of patients and their families as fully-informed, active decision makers in the planning and execution of their care?

## OUR EXPERIENCES { Shared Decision Making }

**ThedaCare's** Collaborative Care Units are a redesign of inpatient care that focuses on those elements of care that add value to the patient experience. The basic unit of collaborative care is the interdisciplinary team with the patient at the center. On admission, a physician, nurse, discharge planner, and pharmacist jointly meet the patient and, with the patient's input, develop a single plan of care.

- **Better care:** Average length of stay dropped 10 to 15 percent; medication reconciliation errors were eliminated and compliance with care protocols improved; patient satisfaction scores rose to 95 percent (from 68 percent)
- **Lower costs:** 25 percent reduction in direct and indirect costs of inpatient care

**Cleveland Clinic** initiated a care-enhancement process for patients undergoing lung transplants to improve patient and family engagement with clinicians and care plans. Daily “huddles” with the patient and all caregivers were initiated to inform the patient and family of expected progress and develop a consistent plan among caregivers.

- **Better care:** 1.5-day reduction in average length of stay; 3 percent improvement in 30-day survival; 28 percent improvement in patient satisfaction with clinician communication
- **Lower costs:** 6 percent reduction in total cost of care

## ✓ Targeted Services

Tailored community and clinic interventions for resource-intensive patients

Patients who visit emergency rooms more frequently than others, whose illnesses require extensive inpatient care, and whose health care costs are among the highest in the community are a key cost-driver for health care institutions. A recent report from the Agency for Healthcare Research and Quality found that 5 percent of the American population is responsible for roughly half of the nation's health expenditures.<sup>12</sup> To better target care for these highest-risk patients, health care systems can employ patient-stratification techniques to identify these patients, ensure timely and appropriate access to care, and customize their treatment. Current inadequacies in the safety net and reimbursement hurdles for nontraditional models of care make this challenging, but we have found several viable strategies for targeting services to those who need them most. Care coordination, case management, and improved transitions can all enhance the care experience while reducing the costs associated with readmissions and visits to the emergency department (ED).

### QUESTIONS WE ASK OURSELVES AND OUR SENIOR LEADERS TO ASSESS PROGRESS:

- What is our procedure for identifying, engaging, and tailoring the management of high-risk, resource-intensive patients?
- What resources are we dedicating to the targeting and intensive management of the health of these patients, here and in the community?

## OUR EXPERIENCES { Targeted Services }

**Cincinnati Children's**, partnering with local physician practices, launched a large-scale asthma-improvement initiative across 38 community-based pediatric practices. This comprehensive initiative uses population segmentation to specifically target the “high-risk” cohort, and helps enable the delivery of best care through components such as multidisciplinary-practice quality-improvement teams; real-time patient-, practice-, and network-level data/reporting; and automated routing of ED/urgent care visit and admission alerts to primary care practices.

- **Better care:** 92 percent adherence to best practices for care management; 93 percent of parents rate their child's asthma as under control
- **Lower costs:** In the past year, 92 avoided admissions (\$322,000 in savings) and 266 avoided ED/urgent care visits

**Partners HealthCare System** participated in a 3-year demonstration project to test strategies to improve the coordination of high-cost Medicare patients. To help primary care physicians manage these patients, case managers were integrated into primary care practices. Case managers developed personal relationships with enrolled patients and worked closely with physicians to help identify gaps in patient care, coordinate providers and services, facilitate communication (especially during transitions), and help educate patients and providers.

- **Better care:** 20 percent reduction in admissions; 13 percent reduction in ED visits
- **Lower costs:** \$2.65 saved for every \$1 spent; 7 percent net savings for each patient in the program

**Virginia Mason** worked with Boeing to launch the Intensive Outpatient Care Program (IOCP) to improve quality of care and reduce costs for Boeing's most expensive employees and their adult dependents. IOCP participants were enrolled in an intensified chronic care model centered on intensive in-person, telephonic, and email contacts. Services include frequent proactive outreach by an RN, education in self-management of chronic conditions, rapid access to and care coordination by the IOCP team, and direct involvement of specialists in primary care contacts, including behavioral health when feasible.

- **Better care:** 14.8 percent improvement in physical function; 17.6 percent improvement in timeliness of care
- **Lower costs:** 33 percent reduction in per capita claims; 56.5 percent reduction in work days missed

**Kaiser Permanente**, in conjunction with the President's Advisory Council on HIV/AIDS, the VA, and NCQA, developed and piloted a series of performance measures to improve care and reduce disparities among its 20,000 patients with HIV. Kaiser Permanente's best practices for HIV/AIDS care include quality-improvement programs that measure gaps in care; testing, prevention, and treatment guidelines; multidisciplinary care team models that emphasize the “medical home”; and education for both providers and patients.

- **Better care:** 94 percent median treatment adherence among patients regularly in care and on antiretroviral therapy; HIV mortality rates that are half the national average; 69 percent of all HIV-positive patients have maximal viral control (compared to 19-35 percent nationally)

## RELIABILITY AND FEEDBACK

No single action, project, or program can drive transformation. Continuous improvement on the delivery of high-value care requires health care institutions to continually monitor and improve reliability and performance. Building safeguards into clinical workflows helps prevent adverse events, and providing decision support for providers ensures that the right care is delivered. Equally important are the collection and analysis of feedback data on cost, quality, and outcomes. Transparency in internal metrics helps organizations encourage a culture of high-value care through good stewardship of resources and improved performance on outcomes indicators.

- ✓ **Embedded safeguards**—supports and prompts to reduce injury and infection
- ✓ **Internal transparency**—visible progress in performance, outcomes, and costs

### ✓ Embedded Safeguards

Supports and prompts to reduce injury and infection

Reducing preventable patient harm is a fundamental aspect of high-value care. System-level factors such as procedures to guide the delivery of care, checklists, and care protocols can be embedded to create an environment that guards against human error. Such interventions support front-line workers in their tasks and promote a culture of consistent, reliable, high-quality care.

QUESTIONS WE ASK OURSELVES AND OUR SENIOR LEADERS TO ASSESS PROGRESS:

- For which of the most common injuries and errors have we developed or adapted specific protocols to reduce their incidence, and what are the priorities ahead?
- How are these protocols fully integrated into existing workflows, such as through prompts in our EHR?

## OUR EXPERIENCES { Embedded Safeguards }

**Cincinnati Children's** implemented a bundle of interventions—a robust detection system to accomplish real-time awareness and analysis of all failures, microsystem-level process and outcome data, and standardized pediatric process bundles—to reduce rates of specific hospital-acquired conditions.

- **Better care:** 85 percent reduction in ventilator-associated pneumonia; >50 percent reduction in catheter-associated bloodstream infections; 43 percent reduction in class I and II surgical site infections
- **Lower costs:** \$5.6 million saved per year

**HCA** conducted a multi-year effort to reduce central line-associated bloodstream infections (CLABSIs). This program incorporates the latest evidence-based recommendations, including insertion and maintenance practices, supply standardization of central-line kits, and competency training for all HCA physicians as part of their biannual credentialing.

- **Better care:** Up to 200 lives saved; 57.4 percent decrease in hospital-acquired bloodstream infections within the ICU since 2006; 80 HCA facilities with zero hospital-acquired bloodstream infections
- **Lower costs:** \$17.5 million saved system-wide annually (\$44,000 per case)

**Kaiser Permanente** established early-intervention protocols for diagnosing and treating community-acquired sepsis. Nursing, physician, informatics, and quality leaders translated existing guidelines into specific competencies, practices, and roles for the care delivery staff. Patient care protocols in the ED and ICU were changed to provide early-recognition and treatment-intervention opportunities.

- **Better care:** Sepsis mortality reduced by over half; 3.5-day reduction in the length of stay for patients with a principal diagnosis of sepsis; ~3-fold increase in the number of sepsis cases diagnosed

**Partners HealthCare** implemented pharmacy barcoding at Brigham and Women's Hospital to reduce serious medication errors. Pharmacists barcode-scan all medications dispensed from the pharmacy to ensure that the medications match the physicians' orders. Nurses at the bedside then scan the medications prior to administration to patients, and are alerted about possible errors.

- **Better care:** 31 percent reduction in serious medication-administration errors; increased on-time medication availability on nursing units
- **Lower costs:** \$3.3 million in cumulative 5-year savings (costs recouped within first year)

**Veterans Health Administration's** Methicillin-Resistant Staphylococcus Aureus (MRSA) Prevention Initiative was implemented in 2007 to decrease MRSA infections acquired at acute care facilities nationwide. The program focused on a bundle of evidence-based best practices known to prevent MRSA and the leadership of a MRSA Prevention Coordinator (MPC) charged with overseeing implementation at each medical center.

- **Better care:** 1,000 prevented MRSA infections and a 62 percent reduction in ICU MRSA rates nationwide from October 2007 to June 2010; currently, more than 70 percent of VHA facilities have zero MRSA monthly

## ✓ Internal Transparency

Visible progress in performance, outcomes, and costs

Variability in clinician practices is inevitable—even within high-performing organizations. By making providers aware of variations in practice, their utilization rates, and their performance against internal and external benchmarks, institutions can guide providers' behavior toward improved value. Additionally, making health care providers aware of the costs associated with procedures encourages better stewardship of limited resources.

### QUESTIONS WE ASK OURSELVES AND OUR SENIOR LEADERS TO ASSESS PROGRESS:

- How do we measure and benchmark adherence to evidence protocols, service utilization rates, and performance on quality, costs, and outcomes?
- What are our procedures for using performance data to improve outcomes and reduce variability, costs, and waste?
- How do we communicate clinician-specific performance data back to clinicians, and how can we improve that communication?

## OUR EXPERIENCES { Internal Transparency }

**Denver Health** developed preventive-health and chronic-disease patient registries for users of their community health center network. One aspect of this system is the creation of performance report cards aggregated across patients and time and populated by nearly real-time data. An essential feature of the report cards has been non-blinded display of performance by site of primary care and by primary care provider, which drove reduced variation and improved overall performance.

- **Better care:** During the past 3 years, colorectal cancer screening rates nearly doubled; breast cancer screening rates increased by 20 percent; hypertension control rates increased from 60 percent to 72 percent

**Cleveland Clinic** implemented web-based business intelligence tools to collect and display provider performance data for a wide variety of metrics in order to engage providers in quality improvement and waste reduction. By giving providers transparent access to metrics that identify variations in practice, utilization rates, and performance against internal and external benchmarks, Cleveland Clinic has seen dramatic reductions in waste, improved quality, and a sustained change in culture.

- **Better care:** >40 percent reduction in central-line infections; 50 percent reduction in urinary-tract infections (UTIs)
- **Lower costs:** Cost avoidance of \$30,000 for each central-line infection and \$5,000 for each UTI

## THE YIELD

Estimates vary, but several assessments concluded that at least 30 percent of our nation’s health expenditures—roughly \$750 billion—do not improve health.<sup>13</sup> We believe that the type of system-level improvements outlined in the Checklist hold the key to capturing this lost value. It is difficult to attribute dollars saved to the various items in the Checklist, because each is interrelated and, as discussed, some are fundamental enablers of more targeted

strategies. However, when taken as part of a broad strategy to improve quality, our experiences have yielded promising results. To help give a sense of the possible yield of operationalizing a commitment to high-value care, displayed below are selected examples of better care and lower costs achieved within each of our institutions. If these results could be scaled nationally, the effect would be truly transformational.

BETTER CARE			
LIVES SAVED	67% decrease in elective CABG mortality at Geisinger	HIV mortality rate half the national average at Kaiser Permanente	Up to 200 lives saved at HCA from reduced CLABSIs
HEALTH GAINED	50% reduction in heart failure readmissions at Partners	~60% reduction in ICU MRSA rates at VHA	~20% reduction in admissions and readmissions for medical-home patients at Geisinger
PEOPLE SATISFIED	95% percent of patients at ThedaCare’s Collaborative Care Unit rate it 5 out of 5	More than 90% satisfaction with Geisinger’s medical home	~18% improvement in timeliness of care at the Virginia Mason IOCP program

LOWER COSTS			
THE RIGHT CARE	\$10 million saved (\$8,000 per patient) with Partners heart failure home monitoring	\$17.5 million saved system-wide at HCA from decreased CLABSIs	\$6.3 million saved from reduced surgical site infections at Cincinnati Children’s
AT REDUCED COST	7.1% reduction in total cost of care for medical-home patients at Geisinger	25% reduction in direct and indirect costs of patient care in ThedaCare Collaborative Care Unit	35% reduction in indirect cost of inpatient care for high-cost Medicare beneficiaries at Partners
EFFICIENTLY DELIVERED	\$100 million in capital costs avoided at Cincinnati Children’s	\$158 million in financial benefit at Denver Health since 2006	\$200 million saved in 5 years through supply chain improvement at Intermountain

# OPPORTUNITIES TO ADVANCE HIGH-VALUE CARE

The items in this Checklist reflect core elements for the health care transformation needed to deliver high-value care—better outcomes at lower costs. On the other hand, many of the levers for true transformation lie outside the control of institutional leaders and in the domain of broader, system-wide policies and incentives. In many ways, we are operating in a time of turbulent optimism. Recent legislation and changes in the health care marketplace afford numerous opportunities for change, but systemic barriers to successful transformation remain.

Reference has already been made to the challenges faced by each of us at the individual and institutional levels, and the challenges to

the efficient operation of the system as a whole. In addition, prevailing system-wide payment models have placed an economic disincentive on adopting some of the cost-containment strategies outlined above. In a system that rewards volume over value, many health care delivery organizations have invested in expensive technologies and equipment, hired unnecessary personnel, and expanded their brick-and-mortar operations. This kind of overcapitalization creates an economic incentive to maximize revenue from capital that has already been invested, rather than seek out opportunities to reduce costs and improve quality. Few institutions have been spared the consequences of this phenomenon, including our own, but working to address it is a very real mandate, and a core motivator

of our interest in sharing experiences on ways to improve. Most fundamental to enabling the transition envisioned is the alignment of incentives and operations to reflect the principles of high-value care. Patients, and employers who share in paying for their care, should be provided information and incentives to seek out institutions that provide high-value care, and delivery sites should be reimbursed in accordance with the value of care delivered.

Faced with the extreme consequences of growing costs, many purchasers are beginning to leverage their power to demand

high-value care. Employers are attempting to rein in health care costs by contracting with providers and insurers, redesigning

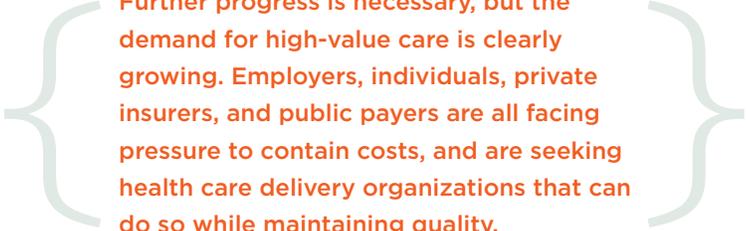
benefit plans, and providing incentives and information to employees. Individuals, too, are increasingly looking to contain health care expenditures. Mounting costs for individual coverage as well as cost-sharing/shifting in group plans have increased consumer discretion. While this shift is already under way in some markets, considerable progress is still needed. Accelerating this progress revolves around increasing transparency on cost and outcomes. Only with the knowledge of which delivery sites provide the best care for the lowest cost can employers and other purchasers drive volume to institutions that provide high-value care.

Reimbursement models that favor high-value care also create an imperative

**Patients, and employers who share in paying for their care, should be provided information and incentives to seek out institutions that provide high-value care, and delivery sites should be reimbursed in accordance with the value of care delivered.**

for health care delivery system transformation. Here, too, progress is under way. In the private market, Blue Cross Blue Shield of Massachusetts' Alternative Quality Contract and Geisinger's ProvenCare® are models of bundled, value-based reimbursement that are receiving increasing attention. Several pilot initiatives are also under way in the private sector. UnitedHealth Group began an episode-based reimbursement plan for oncology practices, and the Integrated Healthcare Association launched a Bundled Episode Payment Pilot Program involving several of the nation's largest private insurers. The shift toward value-based reimbursement is also occurring at the state level. In the face of acute budget pressures, more and more states are shifting Medicaid enrollees to managed-care plans. For example, New York and Florida—two of the states with the largest Medicaid populations—plan to enroll all beneficiaries in managed-care plans within the next several years.<sup>14</sup>

A fundamental opportunity for transitioning toward value-based reimbursement lies with the federal government and in the implementation of certain provisions in recent health reform legislation. The Centers for Medicare & Medicaid Services has been experimenting with value-based reimbursement pilots for years, but elements of the Affordable Care Act (ACA) have the potential to accelerate this transition. Provisions in the ACA establish programs for bundled payments, value-based purchasing, and for reducing Medicare payments to hospitals for errors and avoidable readmissions. One particularly relevant provision is the Medicare Shared Savings



**Further progress is necessary, but the demand for high-value care is clearly growing. Employers, individuals, private insurers, and public payers are all facing pressure to contain costs, and are seeking health care delivery organizations that can do so while maintaining quality.**

Program, designed to spur the development of Accountable Care Organizations (ACOs). Under this program, ACOs are responsible for providing high-quality care and, if they reduce costs for Medicare patients, share in the savings.

The ACA also created the Center for Medicare & Medicaid Innovation, which is charged with investing a budget of \$10 billion over the next 10 years to accelerate the development and implementation of innovative payment and delivery models for Medicare, Medicaid, and the Children's Health Insurance Program (CHIP). The Innovation Center already launched programs for the development of ACOs and Patient-Centered Medical Homes, as well as bundled payment initiatives for acute care. While the initial target of the Innovation Center is cost reduction in federal programs, its ultimate goal is to develop scalable models for all payer arrangements.

Further progress is necessary, but the demand for high-value care is clearly growing. Employers, individuals, private insurers, and public payers are all facing pressure to contain costs, and are seeking health care delivery organizations that can do so while maintaining quality. Current and forthcoming initiatives provide considerable incentives to implement the strategies for high-value care described in this Checklist.

## IMPLEMENTATION AGENDA

The items in the Checklist describe the foundational, infrastructure, care delivery, and feedback components of a system oriented around value. They are our best approximation of the interventions key to improving health care while lowering costs, and to weathering impending regulatory and reporting changes and shifting purchaser demands. The business case for their adoption is compelling. For leaders using this Checklist as a resource to improve the value of care provided in their institutions, particular attention should be paid to the phasing and sequencing of adoption. We have found that early successes are affirming and will pave the way for continued improvement. Ultimately, the cadence for implementation will be derived from the particular culture of the institution and the needs of its patient population.

Successful implementation of the items on this Checklist is dependent on close partnerships between executives and their Boards. Responsibility rests with hospital health system leaders to embrace higher quality and lower costs as institutional aims, to foster a culture that prioritizes high-value care, to determine a path forward, and to steward and sustain the transformation. While executives oversee the day-to-day operations of the institution, the Board is ultimately accountable for the organization's clinical and financial success, for its reputation in and commitment to the community, and for partnering with executives to shape the organization's mission. In turn, Boards bear responsibility for holding the organization and its executives accountable for the outcomes achieved and for fostering high-value care as an institutional priority.

Partnerships with insurers and employers are also fundamentally important in building demand for and enabling the transition to high-value care. This has been a critical step for many of us as we have attempted to improve the value of care delivered in our institutions. Our experiences with these initiatives have brought to light the advantages of direct, transparent communication with purchasers, payers, and consumers. Such partnerships can help accelerate the shift to reimbursement models that favor high-value care and ensure that adhering to the strategies in this Checklist is fiscally sustainable.

Ultimately, it is our responsibility to improve care delivery in our institutions. More broadly, as health care community leaders, responsibility rests with us for eliminating waste from the system and reinvesting it to maximize the quality and efficiency of health care in the United States. It is our utmost desire that all of us, together, rise to the challenges of a changing health care landscape and transform our organizations into engines of sustainable, efficient, high-quality care for all Americans. We invite your partnership in this effort.

### Join us in the Checklist

Please contact us at [CEOChecklist@nas.edu](mailto:CEOChecklist@nas.edu) to become a co-signatory.

## REFERENCES

1. Centers for Medicare and Medicaid Services. 2012. *National health expenditure data*. Available at: <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/index.html> (accessed May 22, 2012).
2. Keehan, S. P., A. M. Sisko, C. J. Truffer, J. A. Poisal, G. A. Cuckler, A. J. Madison, J. M. Lizonitz, and S. D. Smith. 2011. National health spending projections through 2020: Economic recovery and reform drive faster spending growth. *Health Affairs* 30(8):1-12.
3. The quarter of state budgets figure used includes both federal and state Medicaid contributions, as well as all federal contributions to the total budget. National Association of State Budget Officers. 2011. *State Expenditure Report 2010 (Fiscal 2009-2011 Data)*. Available at <http://www.nasbo.org/sites/default/files/Summary%20-%20State%20Expenditure%20Report.pdf> (accessed April 25, 2012); Kaiser Family Foundation. 2011. *Moving ahead amid fiscal challenges: A look at Medicaid spending, coverage and policy trends results from a 50-state Medicaid budget survey for state fiscal years 2011 and 2012*. Available at <http://www.kff.org/medicaid/upload/8248.pdf> (accessed January 23, 2012).
4. Kaiser Family Foundation. 2011. *Employer Health Benefits Survey*. Available at <http://ehbs.kff.org/pdf/2011/8225.pdf> (accessed November 4, 2011).
5. Auerbach, D., and A. L. Kellermann. 2011. A decade of health care cost growth has wiped out real income gains for an average US family. *Health Affairs* 30(9):1630-1636.
6. Institute of Medicine. 1999. *To err is human: Building a safer health system*. Washington, DC: National Academy Press.
7. Landrigan, C. P., G. J. Parry, C. B. Bones, A. D. Hackbarth, D. A. Goldmann, and P. J. Sharek. 2010. Temporal trends in rates of patient harm resulting from medical care. *New England Journal of Medicine* 363(22):2124-2134; U.S. Department of Health and Human Services. Office of Inspector General. 2010. *Adverse events in hospitals: National incidence among Medicare beneficiaries*. Washington, DC: Department of Health and Human Services.
8. Jencks, S. F., M. V. Williams, and E. A. Coleman. 2009. Rehospitalizations among patients in the Medicare fee-for-service program. *New England Journal of Medicine* 360(14):1418-1428.
9. Institute of Medicine. 2010. *The healthcare imperative: Lowering costs and improving outcomes*. Washington, DC: The National Academies Press.
10. Litvak, E., and M. Bisognano. 2011. More patients, less payment: Increasing hospital efficiency in the aftermath of health reform. *Health Affairs* 30(1):76-80.
11. Institute of Medicine. 2001. *Crossing the quality chasm: A new health system for the 21st century*. Washington, DC: National Academy Press.
12. Cohen, S. B., and W. Yu. 2011. *The concentration and persistence in the level of health expenditures over time: Estimates for the U.S. population, 2008-2009*. Available at [http://meps.ahrq.gov/mepsweb/data\\_files/publications/st354/stat354.pdf](http://meps.ahrq.gov/mepsweb/data_files/publications/st354/stat354.pdf) (accessed January 17, 2012).
13. James, B., and K. B. Bayley. 2006. *Cost of poor quality or waste in integrated delivery system settings. Final report*. Rockville, MD: Agency for Healthcare Research and Quality; Fisher, et al. 2003. The implications of regional variations in Medicare spending. *Annals of Internal Medicine* 138(4):273-298; Institute of Medicine. 2010. *The healthcare imperative: Lowering costs and improving outcomes*. Washington, DC: The National Academies Press.
14. Iglehart, J.K. 2011. Desperately seeking savings: States shift more Medicaid enrollees to managed care. *Health Affairs* 30(9):1627-1629.

## Case Material Supporting Checklist Items

The cases presented here are more detailed descriptions of our institutions' experiences implementing the 10 Checklist items, along with follow-up contact information for additional conversations.

### Foundational elements

✓ **Governance priority**—visible and determined leadership by CEO and Board

#### CASE **Leading Commitment to Value at Virginia Mason Health System**

In order to better orient its leaders toward quality, Virginia Mason (VM) Health System leadership and the Board of Directors developed a new strategic plan that adopted the business case for quality as a key strategy with an unequivocal focus on the patient. Responsible governance is a foundational element of VM's strategic plan. VM's board, comprised of a wide range of community members, is ultimately responsible and accountable for the organization's success. Responsible governance means a Board that is committed to doing everything necessary to ensure a clinically superb, fiscally healthy, and innovative environment. At VM, this means that:

- The Board receives regular education about health care quality issues
- The Board is structured to emphasize quality
- The Board spends significant time at each of its meetings attending to quality
- Executive review and compensation are tied to specific quality metrics
- The organization can demonstrate improvements in quality and outcomes during the last 3 years
- Focus on quality is evidenced in the Board's approach to finance—both in terms of capital allocation and operating priorities

#### RESULTS

Virginia Mason received the inaugural Leapfrog Governance for Quality Award (an award given to one hospital or health system in the country annually) for the work its Board has done to mobilize the organization to improve the quality of patient care.

#### FOR MORE INFORMATION

Please contact: Lynne Chafetz, JD ([lynne.chafetz@vmmc.org](mailto:lynne.chafetz@vmmc.org))

## FOUNDATIONAL ELEMENTS

GOVERNANCE PRIORITY—VISIBLE AND DETERMINED LEADERSHIP BY CEO AND BOARD

### CASE Board Governance and Engagement at Kaiser Permanente

To increase Board attention to quality and continuous improvement, Kaiser Permanente (KP) initiated a Quality Systems Assessment (QSA), supplemented by surveys of front-line staff, managers, and organizational leaders about our Quality strategy, visibility to the Board, and performance. As a result, a series of recommendations were made, including the use of whole-system performance measures; establishment of direct communication between the regions and the Board; evaluation of performance through multiple reporting methods; and differentiation of hospital versus health plan actions. KP developed the Big Q Performance Metrics Dashboard—a comprehensive and integrated view of KP’s quality and service performance in six key domains: clinical effectiveness, safety, service, resource stewardship, risk management, and equitable care. KP caregivers and Board members use the Big Q dashboard to track KP’s performance relative to national benchmarks, as well as trends over time.

### RESULTS

As a result of the QSA process and ongoing Board engagement and leadership, Kaiser Permanente has been able to:

- Improve patient satisfaction
- Achieve nation-leading performance in quality of care
- Identify the gaps between the perspectives of leaders and the front line
- Improve awareness of quality and accountability throughout the organization
- Develop a culture of patient- and family-focused care

### FOR MORE INFORMATION

Please contact: Jed Weissberg, MD ([jed.weissberg@kp.org](mailto:jed.weissberg@kp.org))

## FOUNDATIONAL ELEMENTS

✓ **Culture of Continuous Improvement**—commitment to ongoing, real-time learning

### CASE **Lean Improvement Efforts at Denver Health**

In order to reduce waste from the customer perspective, and to build respect for people and continuous improvement into its operations, in 2005, Denver Health adopted Lean—a strategy for reducing waste and improving continuously—as the philosophy and toolset to use in redesigning care. Denver Health utilized a two-pronged approach to implement Lean: (1) organizational leaders (Black Belts) trained in Lean used Lean in their day-to-day work to identify and eliminate waste and (2) week-long rapid-improvement events were derived from 16 areas of focus or “value streams.” The areas of focus spanned the entire integrated system of care, from paramedics to obstetrics and from back-office functions to clinical care.

### RESULTS

- Since August 2006, \$158 million in financial benefit realized despite a 60 percent increase in uncompensated care
- Achieved lowest observed-to-expected hospital mortality (among University Healthsystem Consortium)
- Widespread employee acceptance of Lean philosophy—78 percent of employees understand how Lean enables Denver Health to meet its mission

### FOR MORE INFORMATION

Please contact: Phil Goodman ([philip.goodman@dhha.org](mailto:philip.goodman@dhha.org))

## FOUNDATIONAL ELEMENTS

CULTURE OF CONTINUOUS IMPROVEMENT—COMMITMENT TO ONGOING, REAL-TIME LEARNING

### CASE The Virginia Mason Production System

To identify and eliminate waste and inefficiency in the main processes of health care delivery, in 2002, Virginia Mason (VM) Health System adapted elements of the Toyota Production System to develop the Virginia Mason Production System (VMPS). VMPS is a daily part of work at VM and is integral to the organization's success. All leaders attend mandatory VMPS leadership training, are required to lead at least one formal improvement event each year, and are expected to routinely coach and train staff in how to improve their work using VMPS tools and methods. Managers from all areas routinely serve periods in the Kaizen Promotion Office, the team that guides improvement work. VMPS strategies range from small-scale ideas tested and implemented immediately to long-range planning that redesigns new spaces and processes. VM has completed 1,280 continuous-improvement activities involving staff, patients, and guests.

### RESULTS

- Steadily improved financial health—multiple years of 4 to 5 percent margins
- Patients spend more value-added time with providers
- Better patient safety, less delay in seeing physicians for care and more timely results and treatments
- Reduction of waste in administrative processes

### FOR MORE INFORMATION

Please contact: Diane Miller ([diane.miller@vmmc.org](mailto:diane.miller@vmmc.org))

**CASE** Business Performance System at ThedaCare

To ensure the sustainability of its system-improvement efforts, in 2008, ThedaCare implemented the Business Performance System, a management system to deliver and sustain improvement-management processes and to support front-line workers in solving problems every day. Sustainable improvement results require moving away from a project mentality for improvement to a system transformation that builds a continuous-improvement culture. This, in turn, requires standard work for management, which means managers and executives have a new playbook for their behaviors and actions. The system starts with an 8:00 to 10:00 a.m. meeting-free zone each day. During this time, all managers and executives attend “gemba,” which means they go to where the “real work” is done or where value is added to the customer. They spend this time in the ED, ICU, or clinic, etc. They go with a specific set of questions concerning the quality, safety, people, delivery, and cost of delivering care that day. Problems are identified by staff, managers, and executives, which are then solved immediately by front-line staff, who are given the tools, training, and encouragement they need to tackle almost any problem. The 10 components of the Business Performance System are taught in a 16-week mandatory course for managers and executives. This learning occurs not in a classroom but in the workplace, supported by knowledgeable coaches. The students must prove competency through observation to be installed as a permanent manager.

**RESULTS**

- 88 percent of safety and quality indicators improved; 85 percent of customer satisfaction indicators improved
- 83 percent of staff-engagement indicators improved
- 50 percent of financial indicators improved
- Days cash on hand increased from 180 to 202 (a \$36 million improvement) from 2008-2011
- Cash-flow margin improved from 10.5 percent to almost 12.5 percent from 2008-2011
- 4 percent profit margin in 2011, despite a doubling of Medicaid volume

**FOR MORE INFORMATION**

Please contact: ThedaCare Center for Healthcare Value ([info@createvalue.org](mailto:info@createvalue.org))

## INFRASTRUCTURE FUNDAMENTALS

✓ **IT Best Practices**—automated, reliable information to and from the point of care

### CASE Streamlining Administrative Processes with Health IT at Geisinger

To improve quality and enhance efficiency at 40 outpatient centers and 3 hospitals, Geisinger implemented a series of health IT initiatives. The foundation of this effort was an electronic health record, but it has subsequently expanded to include a health information exchange, ePrescribing modules, a data warehouse and comprehensive document management.

### RESULTS

During the past 5 years:

- \$1.7 million saved from reduced chart pulls
- More than \$600,000 saved from reduced printing and faxing
- \$500,000 saved from reduced cost of management of outside documents
- More than \$500,000 saved per year from reduced nursing-staff time through ePrescribing
- More than \$1 million saved from reduced transcription

### FOR MORE INFORMATION

Please contact: James M. Walker, MD, FACP ([jmwalker@geisinger.edu](mailto:jmwalker@geisinger.edu))

CASE Barcode Medication Administration at HCA

To improve the efficiency of medication ordering and delivery practices, HCA implemented Barcode Medication Administration (BCMA) in all of its hospitals. BCMA combines an electronic medication-administration record of the specific medications ordered for a patient with barcode verification of patient identity (armband) and medication (label). The nurse or therapist uses this technology while administering medications to ensure general confirmation of the “Five Rights” of medication administration (right patient, right medication, right route, right dose, and right time). Full deployment of BCMA in all inpatient settings was completed in 2005.

RESULTS

- 58.5 percent reduction in the total number of liability claims related to medication errors
- Readiness for Stage 2 Meaningful Use requirement for secure bedside medication administration
- Improved data capture for billing on administration and accuracy of charges
- Improved inventory control

FOR MORE INFORMATION

Please contact: Karla Miller, PharmD ([karla.miller@hcahealthcare.com](mailto:karla.miller@hcahealthcare.com))

CASE The VA Adverse Drug Event Reporting System

In order to streamline and improve adverse drug event (ADE) monitoring capabilities for pharmacovigilance, the VA created a national database known as the VA Adverse Drug Event Reporting System (VA ADERS). VA ADERS is an integrated web-based application that fully automates the ADE reporting process (including direct submission to FDA MedWatch) through a single portal for all VA facilities. VA ADERS allows for a wide range of pharmacovigilance functions, including building standardized reports, looking at preventability issues, and engaging in ad hoc evaluations of possible safety signals (case finding), which can then undergo further scrutiny and evaluation as deemed necessary. Compared to the VA's legacy database, VA ADERS has improved the efficiency of adverse drug reaction coding. Overall, VA ADERS' function is integral to the VA's contemporary pharmacovigilance efforts, and it plays an important role in many VA pharmacy benefits and formulary management decisions.

RESULTS

- Seven-fold increase in reported ADEs
- Ability to generate standardized reports on adverse drug reactions and events with breakdowns by region and by facility

FOR MORE INFORMATION

Please contact: Michael Valentino, RPh, MHSA ([michael.valentino@va.gov](mailto:michael.valentino@va.gov))  
Fran Cunningham, Pharm.D ([fran.cunningham@va.gov](mailto:fran.cunningham@va.gov))

CASE Enterprise Data Warehouse at Intermountain Healthcare

To improve the effectiveness and efficiency of clinical management, Intermountain Healthcare constructed an enterprise data warehouse (EDW) function that compliments the electronic medical record (EMR) system used across its 23 hospitals and 200-plus clinics. The Intermountain EDW consists of a number of “data marts” organized by high-priority clinical processes. The contents of a data mart are derived from the evidence-based best practice guideline that a series of condition-specific standing Intermountain teams generate to manage clinical care delivery. A data mart functions as a clinical registry, tracking all patients who experience a particular clinical process over time. It produces a full set of process-management reports, organized as a series of nested dashboards with increasing levels of detail. The EDW system draws together a series of parallel data flows into coordinated information. For example, the EDW combines financial data (case mix information, insurance claims submissions, and detailed information from Intermountain’s activity-based costing systems); clinical data (data from laboratory, microbiology, blood bank, imaging, procedure room, and bedside charting EMR systems); and patient satisfaction information (CMS-mandated HCHAPS data and a more detailed internal survey).

RESULTS

Development of Intermountain’s EDW has allowed for:

- The ability to track individual patient results in real time
- The ability to monitor patients across all of their concurrent conditions
- Full integration of clinical, financial, and care-process data

FOR MORE INFORMATION

Please contact: Lucy Savitz, PhD ([lucy.savitz@imail.org](mailto:lucy.savitz@imail.org))

CASE Reducing Overuse Through Computerized Physician Order  
Entry (CPOE) at Cleveland Clinic

To reduce medically unnecessary same-day duplicate tests, Cleveland Clinic initiated a review of all computerized order sets and monitored the frequency of laboratory tests that show no significant variation during at least a 24-hour period of time. All standard order sets were updated, and after background collection of data, Cleveland Clinic initiated a same-day block or “hard stop” of eight laboratory tests. When duplicate orders were placed within the electronic medical record, providers were notified of the current day’s result or that the test was pending. A provider override system was created via a call to the clinical pathology group. The “hard stop” preventing ordering was expanded to 100 and later to 1,241 individual tests. A second tier of screening was instituted for genetic testing. After collaboration with the relevant clinical providers, a series of molecular tests for 30 conditions were restricted to providers with appropriate training to independently order the tests. Others were required to consult a genetic counselor prior to ordering tests.

RESULTS

- 13 percent reduction in blood gas determinations
- \$10,000 in monthly savings for laboratory tests (excluding blood gas)
- \$117,000 in first-month savings for molecular testing
- Ability to target and educate providers found to most frequently order unnecessary tests

FOR MORE INFORMATION

Please contact: Robert Wyllie, MD ([wyllier@ccf.org](mailto:wyllier@ccf.org))

CASE **The Kaiser Permanente Electronic Medical Library**

To give caregivers quick, comprehensive access to the latest practice protocols in real time, Kaiser Permanente (KP) built an electronic medical library, an online compendium of research-based guidelines, evidence-based care standards, and clinical material. The electronic medical library helps give KP caregivers access to the information they need when they need it, even in the exam room at the point of care, in order to best treat KP's members and patients. The system allows a single site of contact for all clinical content, leading to faster dissemination of best practices, new medical information, and new medical science across KP.

**RESULTS**

- Contains data from thousands of medical texts and journals, and includes a full array of recommended best practices, proven care protocols, and advice
- More than 10,000 uses per day of the electronic medical library by KP clinicians

**FOR MORE INFORMATION**

Please contact: Jed Weissberg, MD ([jed.weissberg@kp.org](mailto:jed.weissberg@kp.org))

## INFRASTRUCTURE FUNDAMENTALS

✓ **Evidence Protocols**—effective, efficient, and consistent care

### CASE Improving Coronary Artery Bypass Graft (CABG) Surgery at Geisinger

To improve care delivered to patients undergoing elective coronary artery bypass, Geisinger cardiac surgeons identified evidence-based or consensus-based best practices from nationally published guidelines. After 40 best practices were agreed on, workflow from initial evaluation to postoperative rehabilitation was redesigned by the entire surgical team of providers to ensure reliable performance of each desired element of care. A variety of standardized order sets, decision-support tools, and reminders were created in the electronic health record with tracking and reporting of adherence to the provision of each element of care.

#### RESULTS

- 67 percent reduction in operative mortality
- 1.3-day decrease in length of stay
- Revenue minus expense improved by more than \$1,900 per case
- Cost per case for Geisinger Health Plan decreased by 4.8 percent
- 23 percent increase in contribution margin for the episode of care (decision to operate to 90 days post discharge)

#### FOR MORE INFORMATION

Please contact: Alfred Casale, MD ([ascasale@geisinger.edu](mailto:ascasale@geisinger.edu))

CASE **Perinatal Services at HCA**

HCA delivers a quarter-million babies yearly in 110 hospitals, representing nearly 6 percent of all U.S. babies born and reflecting a patient population more heterogeneous than the United States at large. To improve patient outcomes and reduce costs, HCA developed a “bundle” of standardized, evidence-based care practices related to high-risk obstetrical conditions. Standardized competencies were developed for fetal monitoring, requiring delivery nurses to prove ability in accurate monitoring and creating core requirements for physicians for credentialing and privileging. Guidelines were also developed for safe use of oxytocin and misoprostol and administration to appropriate patients. HCA also developed a variety of patient-safety protocols and programs designed to reduce the risk of maternal death. These included a novel policy that called for the universal use of pneumatic compression devices (for DVT prophylaxis) in all women undergoing C-sections.

**RESULTS**

- 75 percent reduction in malpractice-claim costs since 2010
- \$68 million in system-wide annual savings
- Maternal death rate of ~6.5 per 100,000 births (compared to national average of 13)

**FOR MORE INFORMATION**

Please contact: Janet Meyers, RN, MBA ([janet.meyers@hcahealthcare.com](mailto:janet.meyers@hcahealthcare.com))

CASE **Imaging Utilization at Virginia Mason Health System**

Advanced imaging is a well-documented driver of high costs. At Virginia Mason (VM), review of medical records revealed substantial variation in provider use of advanced imaging. After an intensive program of provider education failed to result in improvement, VM began a plan to embed pre-established evidence-based decision rules into the existing workflow of providers at the point of ordering an advanced imaging test. Decision rules were installed in the software application used to schedule each of the advanced imaging studies. The format is that of a checklist, requiring the provider to click on the evidence-based indication for the imaging study to complete the electronic scheduling sequence. The same click needed to order the imaging study also specifies the evidence-based indication for the test. If the provider cannot specify an appropriate evidence-based decision rule, the test cannot be ordered.

**RESULTS**

- The MRI rate for headache decreased by 23.2 percent; the lumbar MRI rate decreased by 23.4 percent; and the sinus CT rate decreased by 26.8 percent
- No added provider time, no waits or delays to patient care, and minimal administrative cost

**FOR MORE INFORMATION**

Please contact: Robert Mecklenberg, MD ([robert.mecklenburg@vmmc.org](mailto:robert.mecklenburg@vmmc.org))

CASE **Active Care Management at Intermountain Healthcare**

To improve the efficiency and effectiveness of care, in 1996, Intermountain launched a long-term strategic initiative to extend full management oversight to high-priority clinical processes. Now, more than 60 such processes (which represent almost 80 percent of care delivered) are under active management. “Active management” means (1) an evidence-based best practice guideline, blended into clinical workflows; (2) an aligned data system, also embedded into clinical workflows, that tracks guideline variance in parallel with intermediate and final clinical, cost, and service outcomes; (3) full integration into Intermountain’s electronic medical record system; and (4) a full set of educational materials for patients, family, and professional staff. An example of a clinical process under active management is elective induction of labor. It embeds into the clinical workflow at the point where a woman, referred by her obstetrician, first comes to an Intermountain labor and delivery facility for elective induction. Intermountain’s nurses review the nine criteria established by the American College of Obstetrics and Gynecology (ACOG) for appropriate elective induction. If the woman meets all criteria, the induction and delivery proceeds. Otherwise, the nurses contact the referring obstetrician, as the guideline requires consultation from the department chair or a high-risk pregnancy specialist before induction can take place. Since its implementation in 2001, the guidelines and protocol continue to be refined.

**RESULTS**

- Inappropriate elective induction rate fell from 28 percent to less than 2 percent
- Over c-section rate approximately 40 percent lower than the national average; overall cost savings of \$50 million
- \$10 million reduction in maternal and newborn variable costs per year
- Women spend 750 fewer hours in delivery per year, freeing up resources for the delivery of an additional 1,500 infants

**FOR MORE INFORMATION**

Please contact: Lucy Savitz, PhD ([lucy.savitz@imail.org](mailto:lucy.savitz@imail.org))

CASE **The Healthy Bones Program at Kaiser Permanente**

To reduce the incidence of osteoporosis and hip fractures, Kaiser Permanente (KP) instituted the Healthy Bones Program—a set of measures to identify and proactively treat at-risk patients. Conceived by KP orthopedists, physicians participating in the program implemented a number of initiatives, including increasing the use of bone density tests (DXA scans) and anti-osteoporosis medications; adding osteoporosis education and home health programs; and standardizing practice guidelines for osteoporosis management.

**RESULTS**

During the course of 5 years, the Healthy Bones Program has:

- Tracked more than 625,000 male and female patients over the age of 50 in Southern California who had specific risk factors for osteoporosis and/or hip fractures
- Reduced hip fracture rates for at-risk patients by nearly 50 percent

**FOR MORE INFORMATION**

Please contact: Tadashi Funahasi, MD ([tadashi.t.funahashi@kp.org](mailto:tadashi.t.funahashi@kp.org))

## INFRASTRUCTURE FUNDAMENTALS

✓ **Resource Utilization**—optimized use of personnel, physical space, and other resources

### CASE Smoothing Patient Flow at Cincinnati Children's Hospital Medical Center

To smooth patient flow through the intensive care unit (ICU), Cincinnati Children's implemented a series of operations-management interventions, with the goal of reducing daily artificial variation to make bed occupancy more predictable. To do this, staff analyzed patient-flow dynamics, evaluating surgical providers' predicted need for intensive care and predicted length of stay (LOS). When a procedure was scheduled, surgical providers made initial LOS estimates on the basis of personal experience, the complexity of the case, patient co-morbidities, best-practice plans, and historical data. The electronic surgical scheduling system was revised so that the operative case and an ICU bed (if needed postoperatively) were scheduled (reserved) at the same time. In addition, the surgeon estimated a projected LOS when the case was initially scheduled. Reserved beds were continuously monitored, and the computerized scheduling system restricted operative-case scheduling if a bed was needed and the elective case limit for that day had been reached. An admission control model was used to limit the maximum allowable elective surgical cases requiring ICU access per day. A simulation model was developed for the ICU to predict bed occupancy for all medical and surgical (elective and emergent) patients. The information from this simulation was used to identify the appropriate admission-control limit (cap) for elective surgical cases that would allow maximum occupancy while minimizing the need to cancel elective cases. This cap was adjusted if available staffed beds increased or decreased due to construction or changes in capacity. Finally, a morning huddle was established. This 6:00 a.m. meeting, including the chief of staff, manager of patient services, and representatives from the operating room, pediatric ICUs, and anesthesia, was used to confirm ICU bed availability and anticipate needs for the next day. Over time, the morning huddle strategy broadened to include discharge prediction of outflow units. This allowed demand/capacity matching for patients transferring from the pediatric ICU to patient floors, reserving available open beds for predicted outgoing ICU patients and ensuring bed access for new elective surgical patients.

### RESULTS

- \$100 million in capital costs (75 new beds) avoided due to improved flow and patient placement
- Decrease in variability of new elective surgical admissions
- Decrease of diversion of patients to other units and delay/cancellation of surgical procedures
- Elimination of occasions in which beds in the pediatric ICU were not available when needed for urgent medical or surgical use

### FOR MORE INFORMATION

Please contact: Uma Kotagal, MBBS, MSc ([uma.kotagal@cchmc.org](mailto:uma.kotagal@cchmc.org))

## INFRASTRUCTURE FUNDAMENTALS

RESOURCE UTILIZATION—OPTIMIZED USE OF PERSONNEL, PHYSICAL SPACE, AND OTHER RESOURCES

### CASE Reducing Inefficiencies in Nurses' Workflow at Virginia Mason Health System

In most hospitals, nurses spend only about 35 percent of their time on direct patient care. Using the tools and methods of the Virginia Mason Production System (VMPS), nursing teams increased that metric to 90 percent. They used 5-day workshops (Rapid Process Improvement) to evaluate their work and make improvements. For example, instead of the usual method of caring for patients throughout a unit, nurses work as a team with a patient-care technician in “cells” (groups of rooms located near each other).

#### RESULTS

- Enhanced communication among team members and better skill–task alignment
- Allows nurses to more easily monitor patients and quickly attend to needs
- Most commonly used supplies for each unit were moved to patient rooms so that nurses reduced time spent walking back and forth to get supplies. Steps walked per day were reduced from 10,000 to approximately 1,200

#### FOR MORE INFORMATION

Please contact: Charleen Tachibana, RN ([charleen.tachibana@vmmc.org](mailto:charleen.tachibana@vmmc.org))

## INFRASTRUCTURE FUNDAMENTALS

RESOURCE UTILIZATION—OPTIMIZED USE OF PERSONNEL, PHYSICAL SPACE, AND OTHER RESOURCES

### CASE Supply Chain Management at Intermountain Healthcare

In order to improve patient care and reduce costs, Intermountain Healthcare used an evidence-based approach to improve supply chain efficiency. Intermountain's supply chain organization (SCO) works with Intermountain's clinical programs to develop effective processes and strategies for supply chain management. Key to the SCO strategy is removing the supply burden from caregivers. When Intermountain found that a significant number of central line-associated bloodstream infections (CLABSIs)—which impact patient recovery and are non-reimbursable—were occurring in the bone marrow transplant unit, a committee consisting of clinicians and supply chain experts was formed to research the practices and products associated with superior outcomes.

#### RESULTS

- Overall: More than \$200 million in savings during the past 5 years from supply chain improvements
- For CLABSI: 2.3 percent reduction in the rate of infections; 32 percent reduction in cost per line

#### FOR MORE INFORMATION

Please contact: Lucy Savitz, PhD ([lucy.savitz@imail.org](mailto:lucy.savitz@imail.org))

## CARE DELIVERY PRIORITIES

✓ **Integrated Care**—right care, right setting, right provider, right teamwork

### CASE Connected Cardiac Care Program at Partners

To better monitor patients' health outside the hospital setting, Partners introduced the Connected Cardiac Care Program (CCCP), a home monitoring program for heart failure (HF) patients at risk for hospitalization. CCCP's core components are care coordination, education, and development of self-management skills through the use of telemonitoring. Patients use equipment (a monitoring device and peripherals) in their home to submit weight, blood pressure, heart rate, and symptoms on a daily basis for 4 months. Telemonitoring nurses monitor these vitals, respond to out-of-parameter alerts, and guide patients through structured biweekly heart failure education.

### RESULTS

- More than \$10 million in savings to date (\$8,155 per patient)
- 51 percent reduction in HF hospital readmission and 44 percent reduction in non-HF hospital readmission
- Improved patient understanding of heart failure and self-management skills
- High levels of clinician and patient receptivity and satisfaction

### FOR MORE INFORMATION

Please contact: Joseph Kvedar, MD ([jkvedar@partners.org](mailto:jkvedar@partners.org))

## CARE DELIVERY PRIORITIES

INTEGRATED CARE—RIGHT CARE, RIGHT SETTING, RIGHT PROVIDER, RIGHT TEAMWORK

### CASE Geisinger's ProvenHealth Navigator®

To better integrate patient care, in 2006, Geisinger leveraged two key components of its integrated health system structure—Geisinger Clinic, which delivers primary care, and Geisinger Health Plan (GHP), which handles insurance risk and provides population health management services—to develop an advanced medical-home model named ProvenHealth Navigator® (PHN). The PHN model has five core elements: (1) re-engineered patient-centered primary care; (2) integrated population management; (3) 360° care systems to form a medical neighborhood; (4) measurement of quality of care; and (5) a value-based reimbursement model. The PHN model is in use at 42 primary care sites (plus 9 non-employed groups) that care for more than 300,000 lives.

### RESULTS

Data from the past 5 years on 80,000 GHP members were analyzed and yielded:

- 7.1 percent reduction in the total cost of care during 5 years
- 91 percent of patients rate the quality of care as better than in the past
- 93 percent of physicians would recommend PHN as a model to other primary care physicians
- 18.2 percent decrease in risk-adjusted acute admissions
- 20 percent decrease in risk-adjusted re-admissions
- 99 percent of the patient population agrees that care management works with them effectively

### FOR MORE INFORMATION

Please contact: Thomas Graf, MD ([trgraf@geisinger.edu](mailto:trgraf@geisinger.edu))

## CARE DELIVERY PRIORITIES

INTEGRATED CARE—RIGHT CARE, RIGHT SETTING, RIGHT PROVIDER, RIGHT TEAMWORK

### CASE Patient-Aligned Care Teams (PACT) at the Veterans Health Administration

In order to improve the delivery of primary care, the Veterans Health Administration (VHA) developed and implemented Patient-Aligned Care Teams (PACT), the VHA's model of the patient-centered medical home. The PACT model is data-driven, evidence-based, and value-oriented, and strives to deliver patient-centered, team-based care with a focus on prevention and population health. To facilitate and improve access to primary care for veterans, the Department of Veterans Affairs (VA) has made multiple modalities available, such as telephone clinics, home telehealth, secure messaging, and mobile apps. Also, in order to give PACT the skills needed to deliver optimal care via this new model, intensive training was provided to the primary care workforce. To test this new model of care delivery, the VA simultaneously funded five regional "demonstration labs" designed to evaluate PACT innovations, and, in turn, improve and accelerate the quality and impact of system-wide PACT implementation.

### RESULTS

- ~10,000 out of ~18,500 primary care team members (physicians, nurse practitioners, physician assistants, nurses, pharmacists, etc.) have been trained
- 16 percent increase in total PACT encounters in FY 2011 (e.g., face-to-face, phone, group, secure messaging)
- 15 percent increase in same-day access to primary care physicians in FY 2011
- Overall, urgent care visits by primary care patients decreased by 8 percent and admission rates decreased by 4 percent since the implementation of PACT

### FOR MORE INFORMATION

Please contact: Richard Stark, MD ([richard.stark@va.gov](mailto:richard.stark@va.gov))

## CARE DELIVERY PRIORITIES

INTEGRATED CARE—RIGHT CARE, RIGHT SETTING, RIGHT PROVIDER, RIGHT TEAMWORK

### CASE Medical Team Training at the Veterans Health Administration

In order to improve the quality and efficiency of surgical procedures at the Veterans Health Administration (VHA), in 2003, the VA National Center for Patient Safety (NCPS) developed and launched a pilot medical team training (MTT) program focusing on patient-centered, checklist-guided briefings and debriefings in operating rooms. Key objectives of this program were to improve communication among clinicians in high-risk situations and to deliver safer care. This program was grounded in aviation’s high-reliability crew resource management (CRM) approach. Participation in the training program required—and continues to require—leadership, clinical, and support-service staff participation prior to and following the training (feedback on implementation results and pre-/post-attitudinal data is collected). Success among the pilot sites in both patient care (e.g., increased timeliness of care) and staff satisfaction (e.g., team skills) during the pilot led to a mandatory national roll-out of the program during subsequent years for all facilities with operating rooms. Following the mandatory roll-out, the MTT program became a voluntary, self-enrolled program available to any facility. The success of this initial program led to the expansion of team training and CRM techniques to a wider variety of clinical settings (e.g., inpatient wards, outpatient care, dental clinics, etc.).

### RESULTS

- 18 percent decrease in surgical mortality
- 17 percent decrease in surgical morbidity
- 25 percent decrease in operating room adverse events

### FOR MORE INFORMATION

Please contact: Robin R. Hemphill, MD, MPH ([robin.hemphill@va.gov](mailto:robin.hemphill@va.gov))

## CARE DELIVERY PRIORITIES

✓ **Shared Decision Making**—patient–clinician collaboration on care plans

### CASE ThedaCare Collaborative Care Units

To better involve patients in care planning and to eliminate wasteful and contradictory steps that result from having multiple care plans, ThedaCare introduced Collaborative Care, a redesign of inpatient care to focus on those elements of care that add value to the patient experience. It was designed using Lean methods, with patients and caregivers working together to identify the steps in the inpatient care process that are important to care while eliminating the steps that are wasteful. The basic unit of collaborative care is the interdisciplinary team with the patient at the center. On admission, a physician, nurse, discharge planner, and pharmacist jointly meet the patient, and with the patient’s input, develop a single plan of care. This unified plan replaces the multiple, sometimes contradictory, plans of care previously maintained separately by physicians, nurses, and ancillary practitioners. The nurse monitors the progression of care using evidenced-based guidelines available in the single care plan, which exists in the electronic health record. When they detect a barrier to the progression, it is the nurse who contacts the team’s physician with recommendations, not the other way around.

### RESULTS

- 25 percent reduction in direct and indirect costs of inpatient care
- Average length of stay dropped 17 percent
- Elimination of all medication-reconciliation errors and near 100 percent compliance with care protocols
- Patient satisfaction scores rose to 95 percent rating their care as 5 out of 5 (from 68 percent previously)

### FOR MORE INFORMATION

Please contact: ThedaCare Center for Healthcare Value ([info@createvalue.org](mailto:info@createvalue.org))

**CASE** Lung Transplant Care at Cleveland Clinic

To improve outcomes, lower costs, and enhance the patient experience for lung transplants, Cleveland Clinic initiated a care improvement process that involved mapping all aspects of the procedure and involving patients and their families, cardiothoracic surgery, pulmonary medicine, anesthesia, intensive care, respiratory therapy, nursing, physical therapy, and case management in the care improvement process. In 2010, protocols were developed for ventilator management, blood utilization, respiratory therapy, medication administration, and postoperative patient mobilization. Daily “huddles” with the patient and all caregivers were initiated to inform the patient and family of the expected progress and to develop a consistent plan between caregivers and the patient. Attending physicians were scripted to take a threefold approach with patients: (1) introduction of the attending, in which the attending states that he/she will be responsible for the patient’s care; (2) if another attending is assuming care, the current attending announces the change, including the incoming attending’s name and states that the incoming attending will review the case with the current attending. The incoming attending then introduces himself/herself to the patient and reviews the discussion with the transferring physician; and (3) on the day of discharge, the attending meets with the patient and family to review the course of the hospitalization, home-going medications, follow-up appointment(s), and who to contact with problems and questions. Follow-up data was obtained after 12 months and compared to pre-protocol implementation.

**RESULTS**

- Total length of stay reduced by 1.54 days (6.9 percent) with an 1.34-day (18.7 percent) decrease in the ICU length of stay
- 6 percent decrease in costs of care
- 28 percent improvement in patient satisfaction regarding clinician communication
- 30-day survival improved by 3 percent (93.8 to 96.8 percent)

**FOR MORE INFORMATION**

Please contact: Robert Wyllie, MD ([wyllier@ccf.org](mailto:wyllier@ccf.org))

## CARE DELIVERY PRIORITIES

- ✓ **Targeted Services**—tailored community and clinic interventions for resource-intensive patients

### CASE High-Risk Asthma Patient Initiative at Cincinnati Children's Hospital Medical Center

To better focus its resources toward high-risk patients, in October 2003, a primary care independent practice association (Ohio Valley Primary Care Associates, LLC) and a physician–hospital organization (Tri State Child Health Services, Inc.) affiliated with Cincinnati Children's Hospital Medical Center, launched a large-scale asthma-improvement initiative across 38 community-based pediatric practices, impacting nearly 13,000 children with asthma (approximately 40 percent of the pediatric asthma population across the region). This initiative is ongoing, with a significant focus on the following interventions: strong physician leadership at the Board and practice levels; network-level goal setting by the Board (network-level improvement defines success); measurable practice-level quality-improvement participation expectations/requirements (linked to American Board of Pediatrics Maintenance of Certification approval and payer reward programs); multidisciplinary practice quality-improvement teams; web-based registry with all-payer population reconfirmation at regular intervals; real-time patient, practice, and network-level data/reporting; transparent, comparative practice data on process and outcome measures; concurrent use of data collection/decision-support tools at point of care through high-reliability principles/workflow changes (generates disconfirming data at point of care); pay-for-performance/incentive models aligned with improvement objectives; evidence-based care components (“perfect care” composite measure); population segmentation with a significant focus on the “high-risk” cohort; cross-practice communication/shared learning forums to spread successful interventions; integration of multiple administrative/electronic data sources (hospital, practice, regional health information exchange); automated routing of ED/urgent care visit and admission alerts to primary care practices; and network- and practice-level sustainability measurement/interventions.

### RESULTS

- 35 percent reduction in both admissions and ED/urgent care visits in the physician–hospital organization vs. comparison group for commercially insured, population-based asthma
- 92 percent of all-payer asthma population receiving “perfect care” (composite measure of severity classification, written management plan, and controller medications [if patient has “persistent” asthma])
- Reduction in commercially insured asthma-related admissions: savings estimated at \$322,000 for the most recent 12-month period (92 admissions avoided)
- Reduction in commercially insured asthma-related ED/urgent care visits: savings estimated at \$93,000 for the most recent 12-month period (266 ED/urgent care visits avoided)

### FOR MORE INFORMATION

Please contact: Uma Kotagal, MBBS, MSc ([uma.kotagal@cchmc.org](mailto:uma.kotagal@cchmc.org))

## CARE DELIVERY PRIORITIES

TARGETED SERVICES—TAILORED COMMUNITY AND CLINIC INTERVENTIONS FOR RESOURCE-INTENSIVE PATIENTS

### CASE High-Risk Medicare Patient Demonstration Project at Partners

To reduce emergency department visits and readmissions among high-risk Medicare patients, in 2006, Massachusetts General Hospital (MGH), a member of the Partners HealthCare System, participated in a 3-year demonstration project to test strategies to improve the coordination of Medicare services for high-cost, fee-for-service beneficiaries. To help the primary care physicians manage these patients, MGH integrated 12 care managers into their primary care practices. The care managers developed personal relationships with enrolled patients and worked closely with physicians to help identify gaps in patient care, coordinate providers and services, facilitate communication (especially during transitions), and help educate patients and providers. A comprehensive health IT system supports the entire program, which includes electronic health records, patient tracking, and monitoring from home. Since the program's inception, additional patients were added at MGH, and the program was extended to Brigham and Women's Hospital and North Shore Health System.

### RESULTS

- Return on investment: \$2.65 for every \$1 spent
- 20 percent reduction in admissions and 13 percent reduction in emergency department visits
- Total gross savings among enrolled patients of 12 percent (7 percent after accounting for the management fee paid by the Centers for Medicare and Medicaid Services)

### FOR MORE INFORMATION

Please contact: Tim Ferris, MD ([tferris@partners.org](mailto:tferris@partners.org))

## CARE DELIVERY PRIORITIES

TARGETED SERVICES—TAILORED COMMUNITY AND CLINIC INTERVENTIONS FOR RESOURCE-INTENSIVE PATIENTS

### CASE Intensive Outpatient Care Program at Virginia Mason

In order to reduce costs and improve quality for high-cost patients, Virginia Mason (VM), in partnership with Regence Blue Shield of Washington and other health organizations, launched an Intensive Outpatient Care Program (IOCP) in 2007. Patients eligible to be part of the IOCP represented the top 10 percent of predicted spending. VM worked with Regence and the Boeing Company to design, test, and implement the program. Under the program, Boeing aimed to improve quality of care and substantially reduce total spending for the predicted highest-cost quintile of its Puget Sound employees and their adult dependents who participated in Boeing’s self-funded, non-HMO medical plans. In addition to Regence, several health care consulting and management groups participated. Boeing incentivized the groups via a monthly per-patient fee to test a new, intensified chronic care model—the “ambulatory intensive caring unit” (A-ICU). Designed to both lower per capita spending and improve quality, the A-ICU model development was based on the experiences of successful primary care innovators. Patients were invited to enroll in the IOCP if they had a severe chronic illness and would likely benefit from intensified primary care. The pilot enrolled more than 740 eligible non-Medicare Boeing patients, approximately 300 of whom were VM patients. The patients were connected to a care team that included a dedicated RN care manager and an IOCP-participating primary care provider. Each IOCP-enrolled patient received a comprehensive intake interview, physical exam, and diagnostic testing. A care plan was developed in partnership with the patient. The plan was executed through intensive in-person, telephonic, and email contacts, including frequent proactive outreach by an RN, education in self-management of chronic conditions, rapid access to and care coordination by the IOCP team, and direct involvement of specialists, including behavioral health specialists when feasible.

## RESULTS

- 33 percent reduction in annual per capita claims
- 14.8 percent improvement in patients’ physical function; 16.1 percent improvement in mental function
- 17.6 percent improvement in timeliness of care
- 56.5 percent reduction in patients’ work-days missed

## FOR MORE INFORMATION

Please contact: Ingrid Gerbino, MD ([ingrid.gerbino@vmmc.org](mailto:ingrid.gerbino@vmmc.org))

## CARE DELIVERY PRIORITIES

### TARGETED SERVICES—TAILORED COMMUNITY AND CLINIC INTERVENTIONS FOR RESOURCE-INTENSIVE PATIENTS

#### CASE HIV Care at Kaiser Permanente

To improve care and reduce disparities among its 20,000 patients with HIV, Kaiser Permanente (KP), in conjunction with the President’s Advisory Council on HIV/AIDS, the VA, and NCQA, developed and piloted a series of performance measures that will be incorporated into the National HEDIS measures by NCQA. Additionally, early in 2012, KP issued the “HIV Challenge” to all care systems in America in an attempt to stimulate other health care organizations to adopt these practices and to assist them in their efforts. As part of its HIV Challenge effort, KP is sharing best practices and tools for private health care providers and community health clinics to replicate: quality-improvement programs that measure gaps in care; testing, prevention, and treatment guidelines; how to set up multidisciplinary care team models that emphasize the “medical home” so HIV specialists, care managers, clinical pharmacists, and providers work together; and education for both the provider and patient.

#### RESULTS

Kaiser Permanente demonstrated excellence in HIV clinical care outcomes with:

- 89 percent of its HIV-positive patients are in HIV-specific care within 90 days (compared to 50 percent within 1 year in the United States)
- 94 percent median treatment adherence among patients regularly in care and on antiretroviral therapy
- No disparities among Black and Latino HIV-positive patients for both mortality and medication rates
- 69 percent of all HIV-positive patients have maximal viral control (compared to 19-35 percent nationally)
- HIV mortality rates that are half the national average

#### FOR MORE INFORMATION

Please contact: Michael Horberg, MD ([michael.horberg@kp.org](mailto:michael.horberg@kp.org))

## RELIABILITY AND FEEDBACK

✓ **Embedded Safeguards**—supports and prompts to reduce injury and infection

### CASE Reducing Surgical Site Infections at Cincinnati Children's Hospital Medical Center

To reduce the incidence of surgical site infections (SSIs), Cincinnati Children's implemented a bundle of interventions, each designed for reliability and error reduction. Each surgical division developed a list of procedures for which antibiotic prophylaxis was required. To ensure timely and appropriate administration of prophylactic antibiotics, a pediatric-specific list of appropriate antibiotics was developed. Pediatric dosing time frames, limits, and parameters for re-dosing were also established. A computerized forced-function was developed to attach required antibiotics to all procedures within the division-specific list of evidence-based need for antibiotic prophylaxis. A new file was added to the computer screen used by surgical schedulers to identify procedures for which antibiotics are required. This reminder was also printed on the operating room schedule for nurses, surgeons, and anesthesiologists to see. For same-day surgery patients, the complete preoperative antibiotic orders were due before 10:00 a.m. the day before surgery, and an “identify and mitigate” process was established to identify potential failures. On the day of surgery, a medication nurse was required to confirm the antibiotic order and the accuracy of the dose, and to put an orange “antibiotic required” bracelet on the child as a reminder to the anesthesiologist. Daily data concerning potential failures at any step critical for success were collected, and team leaders discussed any failures the next day with the critical providers. Additionally, a bundle compliance-monitoring form, designed to be completed by nurses, helped to build quality improvement into daily work.

### RESULTS

- Reduced average length of stay per case to 10 days, resulting in an average savings of \$27,000 per case
- Six-year savings of \$6.3 million
- An estimated 233 surgical site infections were prevented in the past 6 years

### FOR MORE INFORMATION

Please contact: Uma Kotagal, MBBS, MSc ([uma.kotagal@cchmc.org](mailto:uma.kotagal@cchmc.org))

CASE **Reducing Central Line-Associated Bloodstream Infections at HCA**

To reduce central line–associated bloodstream infections, HCA conducted a multi-year effort that incorporates the latest evidence-based recommendations, including insertion and maintenance practices, supply standardization of central line kits, and competency training for all HCA physicians as part of their biannual credentialing. By developing and implementing evidence-based central line insertion and maintenance bundles, HCA reduced variation in clinical practice and improved quality and patient outcomes.

**RESULTS**

- \$44,000 in savings per case—\$17.5 million saved system-wide annually
- 57.4 percent decrease in hospital-acquired bloodstream infections within the ICU since 2006
- Up to 200 lives saved
- More than 400 fewer infections annually since 2006
- 80 HCA facilities with zero hospital-acquired bloodstream infections

**FOR MORE INFORMATION**

Please contact: Jason Hickok, RN, MBA ([jason.hickok@hcahealthcare.com](mailto:jason.hickok@hcahealthcare.com))

CASE Sepsis Treatment Protocols at Kaiser Permanente

To better diagnose and treat community-acquired sepsis, in July 2009, Kaiser Permanente established early-intervention protocols through its Sepsis Care Performance Initiative. The findings from the Initiative dramatically demonstrated the importance and impact of early intervention on clinical patient outcomes. Kaiser Permanente nursing, physician, informatics, and quality leaders translated existing guidelines into specific competencies, practices, and roles for the care delivery staff. Changes in patient care protocols in the ED and ICU provided early recognition and treatment intervention opportunities. The clinical teams became more proficient in inserting central lines and utilizing hemodynamic monitors for continual monitoring of central venous pressure, oxygenation, and mean arterial pressure through training and simulation. Patients in the early stages of sepsis were identified more quickly through EMR decision support, allowing for targeted therapy to be administered within an hour of diagnosis using resuscitation bundles of broad spectrum antibiotics, fluids, and hemodynamic support during a 6-hour period.

RESULTS

- Sepsis mortality reduced by over half (26 percent to 10 percent)
- ~3-fold increase in the number of sepsis cases diagnosed (now 119.4/1,000 admissions)
- ~3-fold increase in the number of admitted patients with blood culture who had serum lactate drawn in ED (now 97 percent)
- 3.5-day decrease in the length of stay for patients with a principle diagnosis of sepsis
- 93 percent of patients with sepsis treated within 1 hour of diagnosis (19 percent increase)

FOR MORE INFORMATION

Please contact: Ruth Shaber, MD ([ruth.shaber@kp.org](mailto:ruth.shaber@kp.org))

CASE Reducing Pharmacy Errors at Partners

To reduce serious medication errors, in 2003 Brigham and Women's Hospital (BWH), a member of the Partners HealthCare System, implemented pharmacy barcoding, in which pharmacists barcode-scan all medications dispensed from the pharmacy to ensure that the medications match physicians' orders (which are entered electronically via computerized physician order entry [CPOE]). In addition, in 2005, BWH implemented electronic medication-administration records (EMAR)/barcoding at the bedside, in which nurses scan medications prior to administration to patients, and are alerted about possible errors.

RESULTS

- \$3.3 million in cumulative 5-year savings (costs recouped within first year)
- 31 percent reduction in serious medication-administration errors
- An annual savings of \$2.2 million from decreased adverse drug events
- Increased on-time medication availability on nursing units

FOR MORE INFORMATION

Please contact: Tejal Gandhi, MD, MPH ([tgandhi@partners.org](mailto:tgandhi@partners.org))

CASE Reducing MRSA at VHA Hospitals

In response to growing concerns about methicillin-resistant *Staphylococcus aureus* (MRSA) health care–associated infections (HAIs), in 2007 the VHA implemented a MRSA Prevention Initiative to decrease MRSA HAIs in acute care VA hospitals nationwide. The focal point of this initiative consisted of a bundle of evidence-based practices known as the “MRSA Bundle”—universal nasal surveillance for MRSA, implementation of “contact precautions” for patients infected and/or colonized with MRSA, renewed emphasis on hand-hygiene practices, and an institutional culture change in which infection prevention and control became everyone’s responsibility. Furthermore, management support was provided for a newly recognized position at each medical center known as the MRSA Prevention Coordinator (MPC), who coordinates local medical center implementation efforts of the initiative with the national MRSA project office. Currently, the MRSA Prevention Initiative is being expanded to become the Multidrug-Resistant Organisms (MDROs) Prevention Initiative and will target other MDROs that contribute to health care–associated infections.

RESULTS

- From October 2007 to June 2010, MRSA HAI rates declined by 62 percent in VHA ICUs nationwide
- During this same period, non-ICU MRSA HAI rates fell by 45 percent
- Approximately 1,000 MRSA HAIs were prevented during this period
- Currently, more than 70 percent of VHA facilities report zero MRSA HAIs monthly

FOR MORE INFORMATION

Please contact: Martin Evans, MD ([martin.evans@va.gov](mailto:martin.evans@va.gov))

## RELIABILITY AND FEEDBACK

✓ **Internal Transparency**—visible progress in performance, outcomes, and costs

### CASE Chronic Disease Patient Registries at Denver Health

To improve population health and reduce variation in practice among primary care providers, in 2006, Denver Health began developing preventive health and chronic disease patient registries for the 100,000 users of their community health center network. A prerequisite for this work is the use of a single-patient identifier to link care from multiple sites to a single patient. Step 1 in the registry development was the selection of high-impact and high-opportunity areas of focus: diabetes care, hypertension care, and cancer screening. Step 2 was the creation of an assignment algorithm so that each user of the primary clinics is assigned to a medical home and a primary care provider (PCP) based on services utilization in the prior 3 years. Step 3 was the development of outreach tools for individual clinicians to manage patients between visits. Step 4 was the creation of performance report cards aggregated across patients and time and populated by nearly real-time data. An essential feature of the report cards is the transparent display (i.e., without blinding) of performance by site of primary care and by PCP, which has driven reduced variation and improved overall performance.

### RESULTS

- Colorectal cancer screening rates nearly doubled in 3 years after starting at 32 percent
- Breast cancer screening rates increased by 20 percent in 3 years after many years of flat performance
- Hypertension control rates increased from 60 percent to 72 percent in 3 years

### FOR MORE INFORMATION

Please contact: Tom MacKenzie, MD ([thomas.mackenzie@dhha.org](mailto:thomas.mackenzie@dhha.org))

CASE **Internal, Non-Blinded Performance Transparency at Cleveland Clinic**

To engage providers in quality improvement and waste reduction, Cleveland Clinic implemented web-based business intelligence tools to collect and display provider performance data for a wide variety of metrics. By giving providers transparent access to metrics that identify variations in practice, utilization rates, and performance against internal and external benchmarks, Cleveland Clinic saw dramatic reductions in waste, improved quality, and a sustained change in culture, as practitioners take pride when they do well and foster the desire to change when they recognize the need to improve.

**RESULTS**

- >40 percent reduction in ICU central line–associated bloodstream infections (CLABSIs)
- 50 percent reduction in ICU urinary tract infections per 1,000 patient days
- Cost avoidance of \$30,000 for each CLABSI and \$5,000 for each urinary tract infection
- Increased compliance in administration of pneumonia vaccinations to a sustained level near 100 percent
- 13 percent increase in operating room on-time first starts
- 10 percent improvement in transferred patients assigned to a receiving bed within 12 hours or less
- 10 percent reduction in blood units used per 1,000 patient days

**FOR MORE INFORMATION**

Please contact: Robert Wyllie, MD ([wyllier@ccf.org](mailto:wyllier@ccf.org))

## Identifying Unnecessary Services

The Checklist addresses the systems-level issues central in transitioning to high-value care—care that improves outcomes while reducing costs. Part of the systems-level change necessary requires identifying unnecessary services and engaging individual practitioners to be better stewards of limited resources. Summarized below are examples of recent analyses and inventories that have been developed to identify services that are often overused, unnecessary, or were otherwise wasteful.

### National Physicians Alliance<sup>1</sup>

Members of the National Physicians Alliance’s Good Stewardship Working Group identified common clinical activities that could lead to higher-quality care and better use of finite clinical resources. These are presented as “top 5” lists for primary care, internal medicine, and pediatrics.

#### • Primary care

1. Don’t do imaging for low back pain within the first 6 weeks unless red flags are present
2. Don’t routinely prescribe antibiotics for acute mild to moderate sinusitis
3. Don’t order annual ECGs for asymptomatic, low-risk patients
4. Don’t perform Pap tests on patients younger than 21 years
5. Don’t use DEXA screening for osteoporosis for women under 65 or men under 70 with no risk factors

#### • Internal medicine

1. Don’t do imaging for low back pain within the first 6 weeks unless red flags are present
2. Don’t obtain blood chemistry panels or urinalysis screenings for asymptomatic, healthy adults
3. Don’t order annual ECGs for asymptomatic, low-risk patients
4. Use generic statins when initiating lipid-lowering drug therapy
5. Don’t use DEXA screening for osteoporosis for women under 65 or men under 70 with no risk factors

#### • Pediatrics

1. Don’t prescribe antibiotics for pharyngitis unless the patient tests positive for streptococcus
2. Don’t obtain diagnostic images for minor head injuries without loss of consciousness or other risk factors
3. Don’t refer OME early in the course of a problem
4. Advise patients not to use cough and cold medications
5. Use inhaled corticosteroids to control asthma appropriately

<sup>1</sup> The Good Stewardship Working Group. 2011. The “Top 5” lists in primary care: Meeting the responsibility of professionalism. *Archives of Internal Medicine* 171(15):1385-1390. Reproduced with permission from the American Medical Association.

## American College of Physicians<sup>2</sup>

A working group of the American College of Physicians convened a workgroup of physicians to identify common clinical situations in which screening and diagnostic tests are used in ways that do not reflect high-value care. The 37 situations identified are listed below.

1. Repeating screening ultrasonography for abdominal aortic aneurysm following a negative study
2. Performing coronary angiography in patients with chronic stable angina with well-controlled symptoms on medical therapy or who lack specific high-risk criteria on exercise testing
3. Performing echocardiography in asymptomatic patients with innocent-sounding heart murmurs, most typically grade I to II/VI short systolic, midpeaking murmurs that are audible along the left sternal border
4. Performing routine periodic echocardiography in asymptomatic patients with mild aortic stenosis more frequently than every 3 to 5 years
5. Routinely repeating echocardiography in asymptomatic patients with mild mitral regurgitation and normal left ventricular size and function
6. Obtaining electrocardiograms to screen for cardiac disease in patients at low to average risk for coronary artery disease
7. Obtaining exercise electrocardiograms for screening in low-risk asymptomatic adults
8. Performing an imaging stress test (echocardiographic or nuclear) as the initial diagnostic test in patients with known or suspected coronary artery disease who are able to exercise and have no resting electrocardiographic abnormalities that may interfere with interpretation of test results
9. Measuring brain natriuretic peptide in the initial evaluation of patients with typical findings of heart failure
10. Annual lipid screening for patients not receiving lipid-lowering drug or diet therapy in the absence of reasons for changing lipid profiles
11. Using MRI rather than mammography as the breast cancer screening test of choice for average-risk women
12. In asymptomatic women with previously-treated breast cancer, performing follow-up complete blood counts, blood chemistry studies, tumor marker studies, chest radiography, or imaging studies other than appropriate breast imaging
13. Performing DEXA screening for osteoporosis in women younger than 65 years in the absence of risk factors
14. Screening low-risk individuals for hepatitis B virus infection
15. Screening for cervical cancer in low-risk women aged 65 years or older and in women who have had a total hysterectomy (uterus and cervix) for benign disease
16. Screening for colorectal cancer in adults older than 75 years or in adults with a life expectancy of less than 10 years
17. Repeating colonoscopy within 5 years of an index colonoscopy in asymptomatic patients found to have low-risk adenomas

<sup>2</sup> Qaseem, A., et al. 2012. Appropriate use of screening and diagnostic tests to foster high-value, cost-conscious care. *Annals of Internal Medicine* 156:147-149. Reproduced with permission from the American College of Physicians.

18. Screening for prostate cancer in men older than 75 years or with a life expectancy of less than 10 years
19. Using CA-125 antigen levels to screen women for ovarian cancer in the absence of increased risk
20. Performing imaging studies in patients with nonspecific low-back pain
21. Performing preoperative chest radiography in the absence of a clinical suspicion for intrathoracic pathology
22. Ordering routine preoperative laboratory tests, including complete blood count, liver chemistry tests, and metabolic profiles, in otherwise healthy patients undergoing elective surgery
23. Performing preoperative coagulation studies in patients without risk factors or predisposing conditions for bleeding and with a negative history of abnormal bleeding
24. Performing serologic testing for suspected early Lyme disease
25. Performing serologic testing for Lyme disease in patients with chronic nonspecific symptoms and no clinical evidence of disseminated Lyme disease
26. Performing sinus imaging studies for patients with acute rhinosinusitis in the absence of predisposing factors for atypical microbial causes
27. Performing imaging studies in patients with recurrent, classic migraine headache and normal findings on neurologic examination
28. Performing brain imaging studies (CT or MRI) to evaluate simple syncope in patients with normal findings on neurologic examination
29. Routinely performing echocardiography in the evaluation of syncope, unless the history, physical examination, and electrocardiogram do not provide a diagnosis or underlying heart disease is suspected
30. Performing predischarge chest radiography for hospitalized patients with community-acquired pneumonia who are making a satisfactory clinical recovery
31. Obtaining CT scans in a patient with pneumonia that is confirmed by chest radiography in the absence of complicating clinical or radiographic features
32. Performing imaging studies, rather than a high-sensitivity D-dimer measurement, as the initial diagnostic test in patients with low pretest probability of venous thromboembolism
33. Measuring D-dimer rather than performing appropriate diagnostic imaging (extremity ultrasonography, CT angiography, or ventilation–perfusion scintigraphy), in patients with intermediate or high probability of venous thromboembolism
34. Performing follow-up imaging studies for incidentally discovered pulmonary nodules >4 mm in low-risk individuals
35. Monitoring patients with asthma or chronic obstructive pulmonary disease by using full pulmonary function testing that includes lung volumes and diffusing capacity, rather than spirometry alone (or peak expiratory flow rate monitoring in asthma)
36. Performing an antinuclear antibody test in patients with nonspecific symptoms, such as fatigue and myalgia, or in patients with fibromyalgia
37. Screening for chronic obstructive pulmonary disease with spirometry in individuals without respiratory symptoms

## ABIM Foundation's Choosing Wisely® Campaign<sup>3</sup>

The American Board of Internal Medicine (ABIM) Foundation has worked with various physician specialty societies to identify common tests and procedures that may be overused or unnecessary. Each society developed a list of “5 Things Physicians and Patients Should Question,” which contains evidence-based recommendations for physicians and patients to consider when making care decisions. Below are the lists for the initial nine specialty societies. Eight more societies are expected to contribute lists in Fall 2012.

- **American Academy of Allergy, Asthma & Immunology (AAAAI)**

1. Don't perform unproven diagnostic tests, such as immunoglobulin G (IgG) testing or an indiscriminate battery of immunoglobulin E (IgE) tests, in the evaluation of allergy.
2. Don't order sinus computed tomography (CT) or indiscriminately prescribe antibiotics for uncomplicated acute rhinosinusitis.
3. Don't routinely do diagnostic testing in patients with chronic urticaria.
4. Don't recommend replacement immunoglobulin therapy for recurrent infections unless impaired antibody responses to vaccines are demonstrated.
5. Don't diagnose or manage asthma without spirometry.

- **American Academy of Family Physicians (AAFP)**

1. Don't do imaging for low back pain within the first six weeks, unless red flags are present.
2. Don't routinely prescribe antibiotics for acute mild-to-moderate sinusitis unless symptoms last for seven or more days, or symptoms worsen after initial clinical improvement.
3. Don't use dual-energy x-ray absorptiometry (DEXA) screening for osteoporosis in women younger than 65 or men younger than 70 with no risk factors.
4. Don't order annual electrocardiograms (EKGs) or any other cardiac screening for low-risk patients without symptoms.
5. Don't perform Pap smears on women younger than 21 or who have had a hysterectomy for non-cancer disease.

- **American College of Cardiology (ACC)**

1. Don't perform stress cardiac imaging or advanced non-invasive imaging in the initial evaluation of patients without cardiac symptoms unless high-risk markers are present.
2. Don't perform annual stress cardiac imaging or advanced non-invasive imaging as part of routine follow-up in asymptomatic patients.
3. Don't perform stress cardiac imaging or advanced non-invasive imaging as a pre-operative assessment in patients scheduled to undergo low-risk non-cardiac surgery.
4. Don't perform echocardiography as routine follow-up for mild, asymptomatic native valve disease in adult patients with no change in signs or symptoms.

<sup>3</sup> Available at [http://choosingwisely.org/?page\\_id=13](http://choosingwisely.org/?page_id=13). Reproduced with permission from the American Board of Internal Medicine Foundation.

5. Don't perform stenting of non-culprit lesions during percutaneous coronary intervention (PCI) for uncomplicated hemodynamically stable ST-segment elevation myocardial infarction (STEMI).

• **American College of Physicians (ACP)**

1. Don't obtain screening exercise electrocardiogram testing in individuals who are asymptomatic and at low risk for coronary heart disease.
2. Don't obtain imaging studies in patients with non-specific low back pain.
3. In the evaluation of simple syncope and a normal neurological examination, don't obtain brain imaging studies (CT or MRI).
4. In patients with low pretest probability of venous thromboembolism (VTE), obtain a high-sensitive D-dimer measurement as the initial diagnostic test; don't obtain imaging studies as the initial diagnostic test.
5. Don't obtain preoperative chest radiography in the absence of a clinical suspicion for intrathoracic pathology.

• **American College of Radiology (ACR)**

1. Don't do imaging for uncomplicated headache.
2. Don't image for suspected pulmonary embolism (PE) without moderate or high pre-test probability.
3. Avoid admission or preoperative chest x-rays for ambulatory patients with unremarkable history and physical exam.
4. Don't do computed tomography (CT) for the evaluation of suspected appendicitis in children until after ultrasound has been considered as an option.
5. Don't recommend follow-up imaging for clinically inconsequential adnexal cysts.

• **American Gastroenterological Association (AGA)**

1. For pharmacological treatment of patients with gastroesophageal reflux disease (GERD), long-term acid suppression therapy (proton pump inhibitors or histamine<sub>2</sub> receptor antagonists) should be titrated to the lowest effective dose needed to achieve therapeutic goals.
2. Do not repeat colorectal cancer screening (by any method) for 10 years after a high-quality colonoscopy is negative in average-risk individuals.
3. Do not repeat colonoscopy for at least five years for patients who have one or two small (< 1 cm) adenomatous polyps, without high-grade dysplasia, completely removed via a high-quality colonoscopy.
4. For a patient who is diagnosed with Barrett's esophagus, who has undergone a second endoscopy that confirms the absence of dysplasia on biopsy, a follow-up surveillance examination should not be performed in less than three years as per published guidelines.
5. For a patient with functional abdominal pain syndrome (as per ROME III criteria) computed tomography (CT) scans should not be repeated unless there is a major change in clinical findings or symptoms.

- **American Society of Clinical Oncology (ASCO)**

1. Don't use cancer-directed therapy for solid tumor patients with the following characteristics: low performance status (3 or 4), no benefit from prior evidence-based interventions, not eligible for a clinical trial, and no strong evidence supporting the clinical value of further anti-cancer treatment.
2. Don't perform PET, CT, and radionuclide bone scans in the staging of early prostate cancer at low risk for metastasis.
3. Don't perform PET, CT, and radionuclide bone scans in the staging of early breast cancer at low risk for metastasis.
4. Don't perform surveillance testing (biomarkers) or imaging (PET, CT, and radionuclide bone scans) for asymptomatic individuals who have been treated for breast cancer with curative intent.
5. Don't use white cell stimulating factors for primary prevention of febrile neutropenia for patients with less than 20 percent risk for this complication.

- **American Society of Nephrology (ASN)**

1. Don't perform routine cancer screening for dialysis patients with limited life expectancies without signs or symptoms.
2. Don't administer erythropoiesis-stimulating agents (ESAs) to chronic kidney disease (CKD) patients with hemoglobin levels greater than or equal to 10 g/dL without symptoms of anemia.
3. Avoid nonsteroidal anti-inflammatory drugs (NSAIDs) in individuals with hypertension or heart failure or CKD of all causes, including diabetes.
4. Don't place peripherally inserted central catheters (PICC) in stage III–V CKD patients without consulting nephrology.
5. Don't initiate chronic dialysis without ensuring a shared decision-making process between patients, their families, and their physicians.

- **American Society of Nuclear Cardiology (ASNC)**

1. Don't perform stress cardiac imaging or coronary angiography in patients without cardiac symptoms unless high-risk markers are present.
2. Don't perform cardiac imaging for patients who are at low risk.
3. Don't perform radionuclide imaging as part of routine follow-up in asymptomatic patients.
4. Don't perform cardiac imaging as a pre-operative assessment in patients scheduled to undergo low- or intermediate-risk non-cardiac surgery.
5. Use methods to reduce radiation exposure in cardiac imaging, whenever possible, including not performing such tests when limited benefits are likely.