INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

Roundtable on Value & Science-Driven Health Care

March 20, 2013

The National Academies of Sciences Building
Lecture Room
2101 Constitution Avenue, NW
Washington, DC 20418

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Agenda and Membership

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

IOM Roundtable on Value & Science-Driven Health Care

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Members Meeting

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March 20, 2013
The National Academy of Sciences, Lecture Room
2101 Constitution Avenue NW, Washington, DC

Meeting Goals

1. Generate suggestions on priorities and approaches in developing a core set of measures to assess progress toward better care, lower costs, and better health at national, state, local, institutional levels.
2. Consider current health and health care integration initiatives for high value care in the Defense Department, exploring relevant issues and lessons for broader national efforts with similar goals.
3. Identify dissemination priorities and strategies on emerging lessons in the creation of ACOs and the High Value Health Care Consortium.
4. Explore next steps in fostering patient-driven involvement in care decision-making, clinical research, and health care value.

8:30 am Coffee and light breakfast available

9:00 am	**Welcome and introductions**

Opening remarks
Mark McClellan, The Brookings Institution and Roundtable Chair
Michael McGinnis, Institute of Medicine

9:15 am	**Core metrics for better health at lower costs**

Panel to consider needs and approaches in developing core metrics for measuring overall progress in health, care quality, and lowering costs at national, state, community, and organizational levels.

Perspectives on developing core measures
Mark McClellan, The Brookings Institution
Craig Jones, Vermont Blueprint for Health
Kate Goodrich, Centers for Medicare & Medicaid Services
Kevin Larsen, Office of the National Coordinator for HIT

10:30 am	**Break**

10:45 am	**Health care integration and focus: Military Health System example**

This session will consider the Military Health System initiative to move the culture toward integration, coordination, and health orientation, and the implications for leadership. Discussion will lead off with observations on lessons for and from the civilian sector.

Overview of Military Health System initiatives
Jonathan Woodson, Department of Defense Health Affairs
Michael Dinneen, Military Health System Strategy Management
Brian Masterson, Office of the Surgeon General/U.S. Air Force

Comments
Gary Gottlieb, Partners HealthCare
George Halvorson, Kaiser Permanente

12:00 pm	**Lessons and insights from work in patient and family engagement**

Conversation on new strategies for motivating patient and family leadership as advocates for a stronger focus on evidence, shared decision making, and care quality and value.

Lyn Paget, Health Policy Partners
Sally Okun, PatientsLikeMe

1:30pm	**Experience at the cutting edges of high value care: case studies**

Panel to reflect on new strategies for transforming the delivery of health care and moving to a focus on evidence, value, and health. The first presentation will focus on work to establish ACO's and the second on the High Value Health Care Collaborative.

New directions in accountable care organizations
Bruce Bodaken, Blue Shield of California
Kristen Miranda, Blue Shield of California

The High Value Health Care Collaborative
Brent James, Intermountain Healthcare

3:00 pm	**Summary and next steps**

Comments from the Chair
Mark McClellan, The Brookings Institution and Roundtable Chair

Comments and thanks from the IOM
Michael McGinnis, Institute of Medicine

3:30 pm **Adjourn**

The Roundtable

Chair

Mark B. McClellan, MD, PhD
Director, Engelberg Center
The Brookings Institution

Members

David Blumenthal, MD, MPP
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Blue Shield of California

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Head, Global Medical Affairs & CMO
Sanofi SA

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General and Endocrine Surgeon
Brigham and Women's Hospital

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Chairman & CEO
Kaiser Permanente

James Heywood
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SVP, Clinical Evaluation Sciences
GlaxoSmithKline

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Chief Quality Officer
Intermountain Healthcare

Michael M.E. Johns, MD
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Emory University

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Director
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UnitedHealth Group

Debra B. Whitman, PhD, MA
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Agency for Healthcare Research and Quality
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Farzad Mostashari, MD, ScM, National Coordinator

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General Background and Overview

THE WALL STREET JOURNAL
March 5, 2013

The Real Promise of 'Accountable Care'

New ACOs reward health providers for outcomes, not for cost cutting.

By ELLIOTT FISHER, MARK MCCLELLAN AND STEPHEN SHORTELL

For decades, the inexorable rise in health-care costs has been accompanied by growing evidence of large variations in care and widespread gaps in quality and efficiency. Almost daily, new developments come along that in other industries would improve quality and access—such as Web- and phone-based services, electronic transactions and more-convenient facilities. In health care, however, innovative technologies and services seem to increase costs and complexity.

This may be changing, largely because there is an emerging pathway for health-care providers to use such innovations to improve health and reduce costs—and to avoid being punished financially for their investments. Accountable care organizations at their heart are about aligning provider financial incentives with patient needs for better health and lower-cost care. Unlike traditional third-party, fee-for-service insurance, which pays more for doing more, the payment models underlying accountable care pay providers more for achieving better care at a lower cost.

This is not a return to 1990s-style HMOs, which put the focus largely on reducing costs, so that patients and their physicians worried about stinting on care. Under the ACO payment model, the health-care providers aren't eligible to keep the savings from lowering costs unless they achieve measurable quality improvements. Such quality measures weren't available in the 1990s and can't come primarily from insurance companies.

They are generally derived from surveys of patients and the providers' own clinical data systems—augmented by data from insurers—which are used to track and improve patient care. The emphasis is on reducing costs through new provider organizations that are better able to coordinate and improve care for patients and thereby eliminate unnecessary tests, emergency-department visits and hospital readmissions.

We have identified more than 320 ACOs across the country, with diverse organizational forms. Some are prominent and well-established integrated-delivery systems, such as Cedars-Sinai in Los Angeles or Partners HealthCare in Boston. Many others are forming out of well-established physician networks, such as Hill Physicians in Northern California, or Atrius Health in Boston.

But a substantial fraction of ACO activity is coming in newer forms. About half of the Medicare ACOs we have tracked are novel networks led by physicians. For example, Optimus Healthcare Partners is a New Jersey network of 550 primary-care physicians, many in single-physician practices. They have joined the ACO because it offers them additional technical and clinical support that will allow them to provide better, more coordinated care—and to receive a substantial share of the savings from keeping their patients healthy.

Walgreens is sponsoring three physician-led ACOs that include pharmacies to serve as low-cost, convenient alternatives to emergency rooms and physicians' offices, whether for treating the flu or for the management of chronic diseases. Still other ACOs have been formed by coalitions of community or rural health centers, including federally qualified health centers.

Based on our surveys and interviews, what these ACO manifestations have in common is an ability to innovate in how care is provided, supported by the new approach to payment. The innovations include replacing office visits with in-home monitoring tools and smartphone applications, the use of "patient coaches" to help at-risk patients avoid complications, and greater involvement of patients in managing

their own care and making important decisions. Many ACOs in the private sector are passing the savings on to patients in the form of lower premiums and copays.

The ACO model is not just a new class of health-care organization. It is also flexible, evolving approach to payment reform that is creating a market for creative approaches to health care. As new types of ACOs, such as Optimus or the groups that involve community clinics, learn effective ways to meet the needs of patients poorly served by current high-cost providers, these organizations may be able to compete successfully against traditional health-care organizations.

Some ACOs are likely to fail—change is hard. Clearly, too, making these innovations pay off will require other reforms, including a regulatory environment that focuses competition in local markets on better health and lower costs, and more transparent data regarding cost, price and quality. There is also a need for patients to share in the savings when they choose their providers, ACOs and health plans wisely.

The early evidence from private and public ACOs suggests that real savings are possible. The right direction for health-care policy is to build on ACO successes through further steps to reward low-cost innovation, while steering support away from health-care providers who are unwilling to change.

Dr. Fisher, director for population health and policy at the Dartmouth Institute, is professor of medicine at the Geisel School of Medicine at Dartmouth. Dr. McClellan is director of the Engelberg Center for Health Care Reform at the Brookings Institution. Mr. Shortell is professor of health policy and management and dean of the School of Public Health at the University of California, Berkeley.

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THE WALL STREET JOURNAL
February 19, 2013

Christensen, Flier and Vijayaraghavan: The Coming Failure of 'Accountable Care'

The Affordable Care Act's updated versions of HMOs are based on flawed assumptions about doctor and patient behavior.

By CLAYTON CHRISTENSEN, JEFFREY FLIER AND VINEETA VIJAYARAGHAVAN

Spurred by the Affordable Care Act, hundreds of pilot programs called Accountable Care Organizations have been launched over the past year, affecting tens of millions on Medicare and many who have commercial health insurance.

The ACOs are in effect latter-day health-maintenance organizations—doctors, hospitals and other health-care providers grouped together to provide coordinated care. The ACOs assume financial responsibility for the cost and quality of the care they deliver, making them accountable to patients. With President Obama's re-election making it certain that the Affordable Care Act will begin taking full effect next year, the number of ACOs will continue to increase.

We believe that many of them will not succeed. The ACO concept is based on assumptions about personal and economic behavior—by doctors, patients and others—that aren't realistic. Health-care providers are spending hundreds of millions of dollars to build the technology and infrastructure necessary to establish ACOs. But the country isn't likely to get the improvements in cost, quality and access that it so desperately needs.

The first untenable assumption is that ACOs can be successful without major changes in doctors' behavior. Many proponents of ACOs believe that doctors automatically will begin to provide care different from what they have offered in the past. Doctors are expected to adopt new behavior that reduces the cost of care while retaining the ability to do what's medically appropriate. But the behavior of doctors today has been shaped by decades of complicated interdependencies with other medical practices, hospitals and insurance plans. Such a profound behavior shift would likely require re-education and training, and even then the result would be uncertain.

To give one example, if ACOs are to achieve their cost-saving goals and improve medical care, most doctors will need to change some of their approaches to treating patients. They'll need to employ evidence-based protocols more often to determine optimal treatment—for instance, in prescribing medication or deciding whether certain kinds of surgery are necessary. Doctors will also have to find ways to move some care to lower-cost sites of service, such as more surgery in ambulatory clinics instead of a hospital. ACOs aren't designed or equipped to transform physician behaviors on the scale that will be needed.

The second mistaken assumption is that ACOs can succeed without changing patient behavior. In reality, quality-of-care improvements are possible only with increased patient engagement. Managed care, as formulated in the 1990s by the HMO model, left consumers with a bad taste because the HMOs acted as visible gatekeepers to patient access to care. ACOs, seemingly wary of stirring a similar backlash, allow Medicare patients to obtain care anywhere they choose, but there is no preferential pricing, discounting or other way for ACOs to steer patients to the most effective providers.

The Everett Clinic in Washington state has taken steps to plug this hole by deciding not to become a full-fledged ACO. Last year, the clinic told patients that to remain with Everett, they must shift to Medicare Advantage—which encourages preventive care and supports disease-management programs. Those who want to remain on regular Medicare were required to obtain their care elsewhere.

Accountable Care Organizations are also on the hook for patients who don't comply with recommended treatment or lifestyle changes. Patients can even decide not to share their claims data or medical history with the ACO. If a woman from, say, Massachusetts, spends half the year in Florida and receives care there, the Massachusetts ACO is still responsible for managing the patient's medical costs, though it in no way was able to manage the Florida care. The seems to be unfair both to the responsible ACO provider and to the patient, who will likely not receive optimal care in these transitions.

In other words, ACOs hold caregivers accountable without requiring patient accountability. How can this work?

The third and final flawed assumption of the Affordable Care Act is that ACOs will save money. Even if the pilot Medicare Pioneer ACOs—as the 32 most advanced Medicare ACOs are called—achieve their full desired impact, the Congressional Budget Office estimates that the savings would total $1.1 billion over the next five years. This is insignificant in a total annual Medicare budget of $468 billion. As for the commercial and Medicare ACOs that are operating outside these pilot programs, even the most optimistic assumptions come up with relatively small reductions to annual health-care spending nationally.

The architects of the ACO initiative somehow assume that making the existing system more efficient will make health-care affordable. But slowing the rise of health-care costs can't address the challenge of adding 50 million uninsured to the system while keeping expenditures the same or even somewhat lower than the unsustainable percentage of national wealth that they already represent. No dent in costs is possible until the structure of health care is fundamentally changed.

How can that level of change be achieved? We beseech policy makers in Washington to study a range of reform approaches that aren't burdened by as many untenable assumptions as Accountable Care Organizations, and go well beyond them in their aspirations.

• Consider opportunities to shift more care to less-expensive venues, including, for example, "Minute Clinics" where nurse practitioners can deliver excellent care and do limited prescribing. New technology has made sophisticated care possible at various sites other than acute-care, high-overhead hospitals.

• Consider regulatory and payment changes that will enable doctors and all medical providers to do everything that their license allows them to do, rather than passing on patients to more highly trained and expensive specialists.

• Going beyond current licensing, consider changing many anticompetitive regulations and licensure statutes that practitioners have used to protect their guilds. An example can be found in states like California that have revised statutes to enable highly trained nurses to substitute for anesthesiologists to administer anesthesia for some types of procedures.

• Make fuller use of technology to enable more scalable and customized ways to manage patient populations. These include home care with patient self-monitoring of blood pressure and other indexes, and far more widespread use of "telehealth," where, for example, photos of a skin condition could be uploaded to a physician. Some leading U.S. hospitals have created such outreach tools that let them deliver care to Europe. Yet they can't offer this same benefit in adjacent states because of U.S. regulation.

These and other innovative approaches have potentially large payoffs in how health care is delivered and what it will cost. By contrast, Accountable Care Organizations over the long haul may ease the path to slightly lower reimbursements or redistribute physician compensation among specialties. But what ACOs most assuredly will not do is deliver the disruptive innovation that the U.S. health-care system urgently needs.

Mr. Christensen is a professor of business administration at Harvard Business School and co-founder of Innosight Institute, a think tank focusing on disruptive innovation. Dr. Flier is dean of the faculty of medicine at Harvard University and professor of medicine at Harvard Medical School. Ms. Vijayaraghavan is a senior research fellow at Innosight Institute.

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A NEW VISION

FOR CALIFORNIA'S HEALTHCARE SYSTEM:

Integrated Care with Aligned Financial Incentives

Diabetes group visit
Nutrition counseling
Palliative care
Medication management
Daily exercise
Home health aide visit

GLOBAL BUDGETS

School of Public Health
UNIVERSITY OF CALIFORNIA, BERKELEY

Berkeley Forum
for Improving California's Healthcare Delivery System

PARTICIPANT LIST

Anthem Blue Cross
Pam Kehaly, President

Blue Shield of California*
Bruce Bodaken, Chairman, President and Chief Executive Officer

Blue Shield of California*
Paul Markovich, President and Chief Executive Officer

California Department of Insurance**
Dave Jones,
Insurance Commissioner

California Health and Human Services Agency**
Diana S. Dooley, Secretary

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Thomas M. Priselac, President and Chief Executive Officer

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Jay M. Gellert, President and Chief Executive Officer

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Robert J. Margolis, Managing Partner and Chief Executive Officer

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Barry Arbuckle, President and Chief Executive Officer

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Sutter Health
Patrick E. Fry, President and Chief Executive Officer

U.S. Department of Health and Human Services**
Herb K. Schultz, Regional Director (Region IX)

*** During 2012, Bruce Bodaken retired as President and CEO of Blue Shield of California, and Paul Markovich replaced him.**

**** These individuals' participation in the Forum meetings/discussions does not represent any formal endorsement of the Report by their state or federal Department/Agency nor in their official individual capacities as elected or appointed public officials at the aforementioned Departments/Agencies.**

LEADERSHIP TEAM

Stephen M. Shortell, PhD, MPH, MBA
Chair of the Berkeley Forum,
Blue Cross of California
Distinguished Professor and
Dean of School of Public Health,
University of California, Berkeley

Richard M. Scheffler, PhD
Vice Chair of the Berkeley Forum,
Distinguished Professor of Health Economics and Public Policy
and Director of the Nicholas C. Petris Center on Health Care Markets and Consumer Welfare,
School of Public Health,
University of California, Berkeley

Ian Morrison, PhD
Consultant and Facilitator,
Berkeley Forum

Liora G. Bowers, MBA, MPH
Director of Health Policy and Practice,
Nicholas C. Petris Center on Health Care Markets and Consumer Welfare,
School of Public Health,
University of California, Berkeley

Brent D. Fulton, PhD, MBA
Assistant Adjunct Professor of Health Economics and Policy,
Associate Director, Nicholas C. Petris Center on Health Care Markets and Consumer Welfare,
School of Public Health,
University of California, Berkeley

LEAD AUTHORS

Richard M. Scheffler and Liora G. Bowers

CO-AUTHORS*

Brent D. Fulton
Clare Connors**
Stephen M. Shortell
Ian Morrison

**With assistance from the following at the Petris Center, School of Public Health, University of California, Berkeley:*

Sue Kim, PhD
Research Associate in Health Economics

Christopher Whaley
Doctoral student in Health Services and Policy Analysis

Evan Gallagher
MPP Candidate

Thanh-Tien Pham
Forum Coordinator and Project Manager

**Clare Connors, MPH, Research Associate

Pictured on next page:

Standing (left to right): Clare Connors, Evan Gallagher, Tien Pham, Michael Kass, Anthony Barrueta, Sue Kim, Robert Reed, Pam Kehaly, Paul Markovich, Diana Dooley, Bart Asner, George Halvorson, Barry Arbuckle, Wade Rose, Mike Murphy, Patricia Clarey, Bonnie Preston, Thomas Priselac, Yumna Bahgat, Ian Morrison, Brent Fulton

Sitting (left to right): Stephen Shortell, Liora Bowers, Richard Scheffler

PHOTO BY PEG SKORPINSKI

Inset at top (left to right): Bruce Bodaken, Dave Jones, Lloyd Dean, Herb Shultz, Jay Gellert, Robert Margolis, Patrick Fry

Berkeley Forum

for Improving California's Healthcare Delivery System

The Berkeley Forum, established in January 2012, includes select CEOs of California's health systems, health insurers and physician organizations, along with state regulators and policymakers, that are collaborating to improve the affordability and quality of healthcare for all Californians. The University of California–Berkeley's School of Public Health serves as a neutral facilitator for discussions and the analytic staff for this effort.

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EXECUTIVE SUMMARY

In a typical day, Californians spend over $850 million on healthcare. In a typical year, 53% of the state's healthcare expenditures are spent by just 5% of the population. More alarming is the fact that by 2022, total employer-based insurance premiums for a family are projected to consume almost a third of median household income. Similarly, the share of the Gross State Product consumed by healthcare continues to grow; it is projected to rise from 15.4% in 2012 to nearly 17.1% in 2022, reducing our ability to invest in other crucial areas. We also face a continuing obesity epidemic that results in growing rates of chronic diseases skewed to the lower end of the socioeconomic ladder. Additionally, the state's healthcare system will be stressed even further due to several million additional Californians gaining insurance coverage via the Affordable Care Act. These are just some of the reasons it is critical that we address the financial sustainability of the state's healthcare system without delay. It is time for fundamental change. It is time for action.

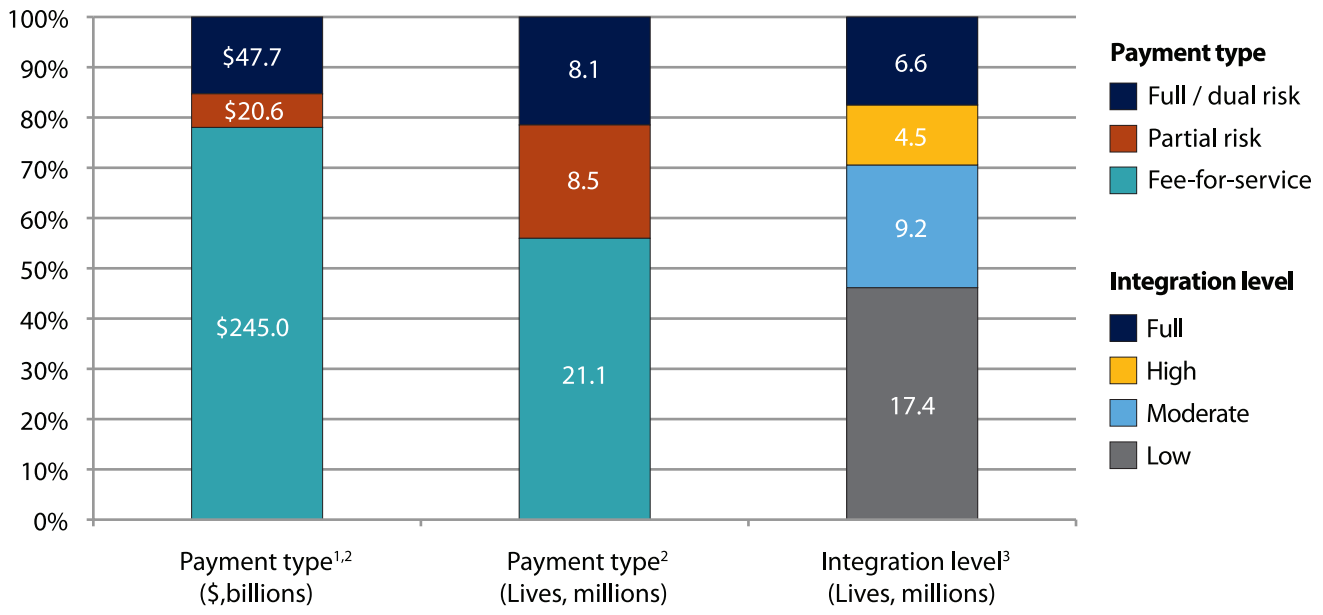
Recognizing this, California private and public sector leaders came together in an unprecedented collaborative effort, with academic expertise and analytic support provided by the University of California, Berkeley's School of Public Health, to address these challenges. Determined to avoid solutions divorced from societal, regulatory and political realities, the Forum has devised a transformational, bottoms-up approach to creating a more affordable, cost-effective healthcare system that would, at the same time, improve Californians' health and well-being.

These are ambitious goals. To attain them, the Forum supports a flexible approach to payment reform, including shared-savings as well as bundled and episode-based payments that can facilitate the transition towards broader implementation of risk-adjusted global budgets.

FORUM VISION

In response to our healthcare challenges, the Forum Vision calls for a rapid shift towards integrated systems that coordinate care for patients across conditions, providers, settings and time, along with risk-adjusted global budgets that encompass the vast majority of an individual's healthcare expenditures. Specifically, the Forum endorses two major goals for California to achieve by 2022: 1) Reducing the share of healthcare expenditures paid for via fee-for-service from the current 78% to 50%; and 2) Doubling, from 29% to 60%, the share of the state's population receiving care via fully- or highly-integrated care systems. The Berkeley Forum also calls for greater emphasis on population health, including lifestyle and environmental factors that promote good health.

FIGURE 1E: BREAKDOWN OF PAYMENT MECHANISMS AND DELIVERY SYSTEM INTEGRATION IN CALIFORNIA, BY LIVES AND DOLLARS, 2012



Notes: 1) Expenditure estimates are reported in 2012 dollars. 2) Full / dual risk refers to a payment arrangement in which providers accept risk for both professional services and hospital services. Partial risk refers to a payment arrangement in which providers accept professional services risk only. 3) There are various factors that are relevant in assessing care integration; for the purposes of this analysis, we estimate lives by integration level based on medical group size in California given that size has been shown to be associated with use of more integrated care processes. Only Kaiser Permanente physicians are considered to be fully-integrated. Medical groups of greater than 100 physicians are considered highly-integrated, while Independent Practice Associations (IPAs) are considered moderately-integrated. Lives receiving care from medical groups with 100 or fewer physicians are allocated into either moderate or low integration based on both medical group size and a physician's likelihood of being in an IPA.

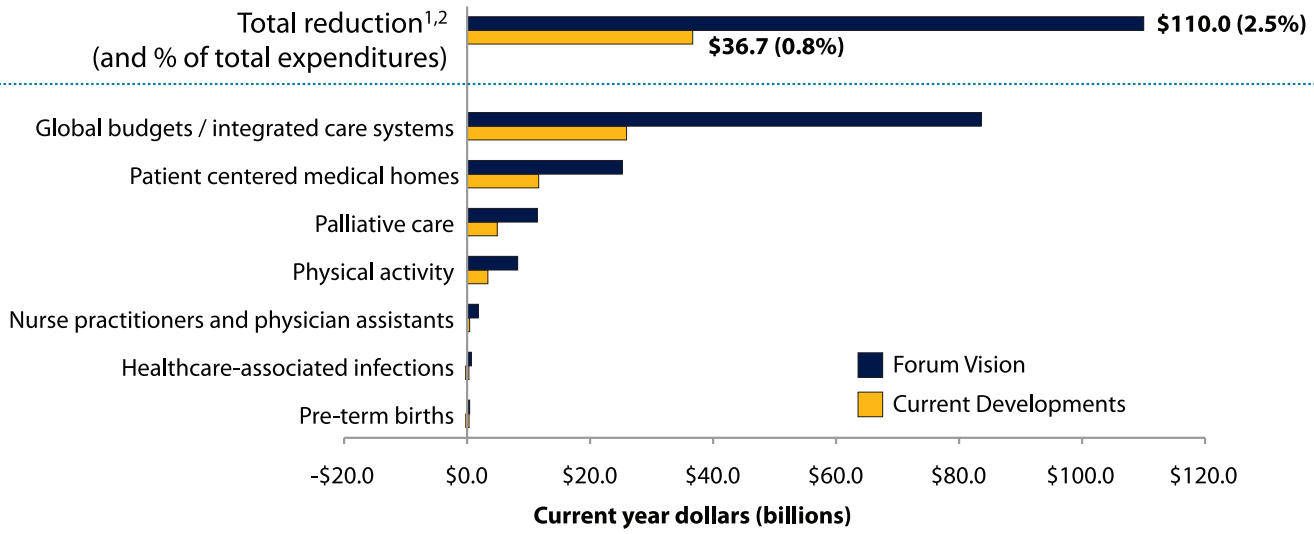
SOURCE: Berkeley Forum analysis. See Appendix II: "California's Delivery System Integration and Payment System (Methodology)" for more detail on methodology, assumptions and sources.

The Forum Vision was developed considering the characteristics of California's unique healthcare system, namely:

- Californians already have relatively low utilization of healthcare services – including rates of **hospital admissions and inpatient days at 79% and 74%, respectively,** of the rest of the U.S.
- California has the **9th lowest per capita personal healthcare spending** among states in the country.
- Health maintenance organizations (HMOs) with providers under full or partial risk insure 44% of California's population, about double the U.S. share. However, fee-for-service reimbursement still accounts for about $245 billion (or 78%) of healthcare expenditures, and only about 11 million Californians (or 29%) receive care in fully or highly-integrated systems (see Figure 1E).

To assess the potential of the Forum Vision to create a more affordable healthcare system, we estimated the potential expenditure reductions associated with seven different initiatives, most of which target populations with the highest healthcare expenditures. We did so under two scenarios: 1) "Current Developments," which considers unfolding market forces, policies and regulations and is distinct from the status quo, which is based on historical trends; and 2) the "Forum Vision," which calls for aggressive changes, such as increased reliance on integrated care systems, risk-adjusted global budgeting, and population health practices (see Figure 2E).

FIGURE 2E: HEALTHCARE EXPENDITURE REDUCTIONS IN CALIFORNIA FROM INITIATIVES UNDER CURRENT DEVELOPMENTS AND FORUM VISION SCENARIOS, TOTAL REDUCTIONS, 2013–2022



Notes: 1) Total projected healthcare expenditures in California from 2013 – 2022 are $4,387 billion (in current-year dollars). 2) The "total reduction" is adjusted for savings overlap among the individual initiatives.

SOURCE: Berkeley Forum analysis. Refer to Appendices IV-XI for expenditure reduction estimates for each initiative as well as to Appendix III: "California Cost Curve, Healthcare Expenditures, and Premium Projections (Methodology)" for projections of California's healthcare expenditures under the status quo from 2013-2022.

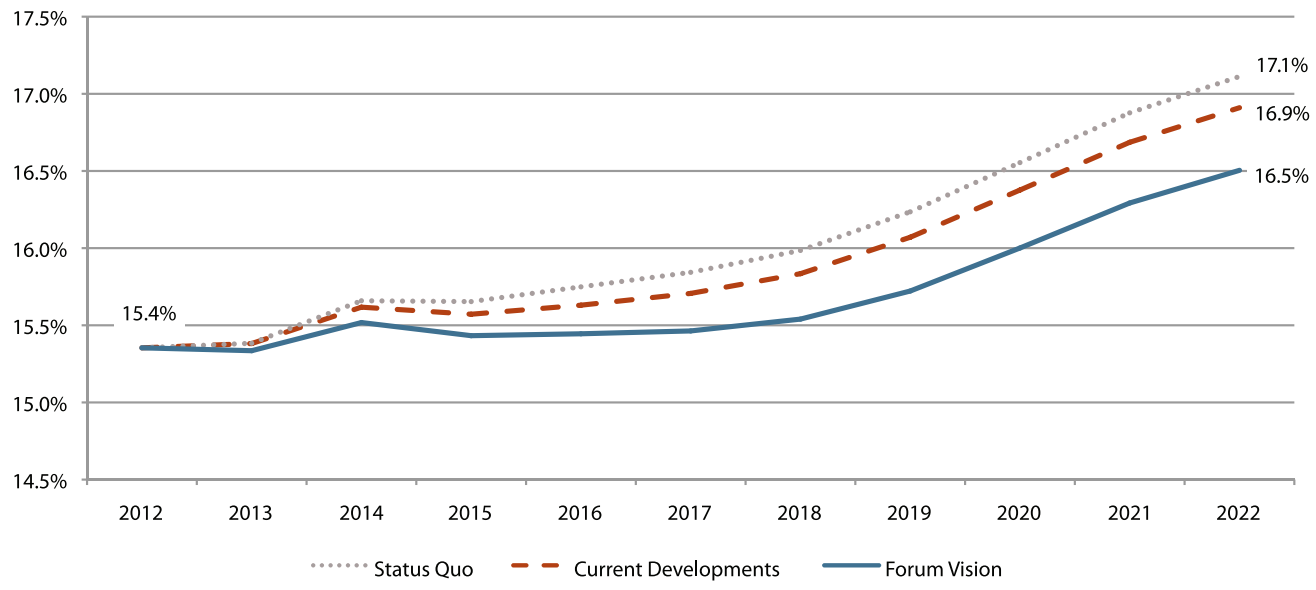
Under the Current Developments scenario, these initiatives are expected to reduce healthcare expenditures by $37 billion between 2013 and 2022. This reduction represents 0.8% of the $4.4 trillion in total healthcare expenditures projected under the status quo (see Figure 2E).

Under the Forum Vision, we estimate:

- **A $110 billion** reduction in healthcare expenditures from 2013 to 2022, representing **2.5% of the total $4.4 trillion in projected healthcare expenditures** under the status quo during these 10 years (see Figure 2E).
- An average reduction of **$802 per California household per year** over this period, and **$1,422 per household in 2022.**
- A reduction of the projected 2022 "Cost Curve," or healthcare expenditures as a share of GSP, from **17.1% to 16.5%** (see Figure 3E).

The above initiatives represent great opportunities for improving the health and healthcare of Californians. Additional initiatives, not explored here would also complement the Forum Vision, and could lower expenditures beyond the 2.5% projected under the Forum Vision. The Berkeley Forum participants endorse the above seven initiatives and support their implementation to help achieve the Forum Vision. Furthermore, Forum participants believe that two of these initiatives warrant additional attention and have a significant potential for reducing expenditures while improving health and healthcare quality. First, the Forum calls for a statewide effort to increase the rates of physical activity among all Californians. Secondly, the Forum supports increased palliative care access for seriously ill patients, as a means of providing fully-informed, person- and family-centered care, and an enhanced quality of life for this population.

FIGURE 3E: COST CURVE: PROJECTED HEALTHCARE EXPENDITURES AS A SHARE OF GROSS STATE PRODUCT, 2012–2022



SOURCE: Berkeley Forum analysis. See Section VI "Addressing the Affordability Crisis: Bending the Cost Curve" and Appendix III: "California Cost Curve, Healthcare Expenditures, and Premium Projections (Methodology)".

The Forum recognizes several significant challenges to implementing the Forum Vision. One is the need for a new regulatory framework that allows for the development of more integrated care systems, both incentivizes and promotes efficiency and quality, and ensures market-based competition. Other challenges to the Forum Vision include growing rates of employer self-insurance and government policies and market forces that are contributing to a decline in HMO enrollment among those with employer-sponsored insurance.

Forum participants remain committed to working together and with others in establishing new policies, regulations, approaches and shared practices that would help facilitate implementation of competing integrated care systems and adoption of risk-adjusted global budgets. Forum members additionally support Medicare and Medicaid patients receiving care from coordinated settings, and their providers engaging in deeper and broader risk-based contracting. Forum members also recognize that for their Vision to be achieved, various policy and regulatory changes will be necessary at the state and federal level, including changes to Medicare's reimbursement and benefit structure and to the existing state-federal Medicaid financing approach. Finally, the Forum reinforces the need for continued efforts by stakeholders in the healthcare delivery, public health, education, housing, labor, transportation, and social services sectors, along with the employer community, and supports the goal of Governor Brown's "Let's Get Healthy California" report to make California the healthiest state in the nation by 2022.

Core Metrics for Better Health at Lower Cost

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

CORE METRICS FOR BETTER HEALTH AT LOWER COST

Measuring progress toward better care, better health, and lower cost in the learning health system

Activity: Identify issues, options, and approaches to assess progress toward achieving better care for individuals, lower costs, and better health for populations as the natural outcomes of a continuously learning and improving health system.

Compelling aim: *Acceleration of the nation's progress toward better care, better health, and lower costs in each aspect of health and health care.* Achievement of this aim is expected through the identification of core health and cost measures which are accurate, actionable, real-time, and continuous; can be comparably and seamlessly collected through efforts at the national, state, local, and institutional levels; and are readily accessible to guide priority decisions by individuals, clinicians, health care organizations, payers, employers, public health policy decision makers and related community stakeholders.

Issue: America has embarked on its journey toward health care change, and there is a compelling urgency to identify and implement reliable and consistent approaches for assessing progress toward the quality of care, its costs, and health outcomes. Currently, the US is not meeting its potential along those three dimensions. Despite the fact that more than 25,000 new clinical trials are published each year, Americans receive only about 50% of recommended care and have worse population health indicators—among them, life expectancy and preterm birth—than other comparable nations. The profound disconnect between information and care exists despite people's best efforts to close the gap.

Approach: A consensus committee will be convened by the National Academies to engage expert stakeholders in exploring measurement of individual and population health outcomes and costs, identifying fragilities and gaps in available systems, and considering approaches and priorities for developing the measures necessary for a continuously learning and improving health system. The committee will: 1) consider candidate measures suggested as reliable and representative reflections of health status, care quality, and care costs for individuals and populations; 2) identify current reporting requirements related to progress in health status, health care access and quality, costs of health care, and public health; 3) identify measurement and data systems currently used to monitor progress on these parameters at national, state, local, and institutional levels; 4) propose a slate of core metrics to track progress in care, costs, and health at national, state, local, and organizational levels; 5) identify needs, opportunities, and priorities for developing and maintaining the measurement capacity necessary for progress on these candidate metrics; and 6) recommend an approach to continuously refining and improving the metrics and the associated measurement capacity at all levels.

Deliverable(s): A report will be produced that fully explores the issues, options, and approaches to the core metrics for tracking progress toward better care, lower costs, and better health at all levels; proposes a set of such core metrics; and recommends a roadmap for development of the capacity needed to implement the core metrics tracking as a function of a continuously learning health system.

Related IOM work: *Best Care at Lower Cost (2012), The Learning Health System Series (2007-2013), Child Health and Health Care: Measuring What Matters (2011), State of the USA Health Indicators (2008), Performance Measurement: Accelerating Improvement (2005), Crossing the Quality Chasm (2001), To Err is Human (1999)*

IOM contact: Robert Saunders, PhD (rsaunders@nas.edu)

March 5, 2013

The National Academy of Sciences

The National Academy of Sciences (NAS) is a non-governmental organization comprised of the nation's leading scientists. Chartered by Congress and President Abraham Lincoln in 1863, NAS is called upon to serve as the adviser to the Government and to the nation on matters of scientific research and policy. Presidential Executive Orders have defined the special relationship of the Academy to Government and cited its unique capacity to marshal scientific expertise of the highest caliber for independent and objective science policy advice. As matters of health and medicine became more compelling and specialized, the Institute of Medicine (IOM) was established under the charter of the NAS in 1970 as the nation's adviser on health, health science, and health policy. Like its sister organizations, the National Academy of Sciences and the National Academy of Engineering, IOM members (65 each year) are elected by the current membership and drawn from nation's leading authorities in medicine, health, the life sciences, and related policies.

The Institute of Medicine

The National Academies, including the IOM, work outside the framework of government, although often at the request of Congress or government agencies. The IOM is charged with ensuring that objective and scientifically informed analysis and independent guidance are brought to bear on the most difficult and challenging health issues facing the nation. Working together in consensus committees, public forums, and collaborative efforts, invited experts carry out the technical and policy studies commissioned to produce advice on compelling health challenges, meetings and symposia convened on matters of widespread interest, and projects to catalyze recommended action. Each year, more than 2000 national experts—members and nonmembers—volunteer their time, knowledge and expertise to advance the nation's health through the IOM.

Rights and responsibilities under the Congressional Charter

The three National Academies have a long tradition of providing national advice and leadership, which rests on their ability to convene experts and other diverse stakeholders charged with considering important issues of science, engineering, and health policy in an objective, independent, and trusted environment that assures rigorous analysis. Because the National Academies provide the Federal Government with a unique service, activities are accorded a special status by charter and the implementing Executive Orders of the President. Specifically, *"when a department or agency of the executive branch of the Government determines that the Academy, because of its unique qualifications, is the only source that can provide the measure of expertise, independence, objectivity, and audience acceptance necessary to meet the department's or agency's program requirements, acquisition of services by the Academy may be obtained on a noncompetitive basis if otherwise in accordance with applicable law and regulations."* (Executive Order 12832)

Health Care Integration and Focus: Military Health System Example






2012

MHS STAKEHOLDERS' REPORT

The MHS: Healthcare to Health

Table of Contents

1.1

Assistant Secretary of Defense for Health Affairs

The United States military produces leaders for American society like no other organization in the world. The Military Health System is a unique microcosm of this world.

This leadership is developed in a very special culture forged from core values of duty, honor and commitment to our nation. A leadership which promotes an ethos of teamwork and loyalty to mission and members of our team—no one gets left behind. A culture which is self-critical and invites criticism and acts to improve. And, we are a culture that reflects the best values of the military and medical professions. Values that begin with an ethic of healing and extend to the highest values of personal courage and sacrifice for a larger purpose.

In this 2012 Stakeholders' Report, we provide a window into how military medicine has performed over the last several years—where we have succeeded and where we have fallen short. What we have learned and where we are headed.

After ten years of war, we have learned a great deal, and we have substantively contributed to the advancement of medicine worldwide. Yet, our combat experience continues; thousands of wounded, injured and ill service members and their families continue to rely on us every day for their care. Millions more rely on us to keep them well.

In 2012, our challenges extend from the battlefield to the budget. Simple, and simplistic, cost-cutting exercises will not suffice. Our readiness mission has always required that we maintain a fit and healthy fighting force. Now, we are focused on maintaining fitness and health for all 9.7 million people we serve.

We are an organization on the move – from healthcare to health.

Dr. Jonathan Woodson

"We are an organization on the move—from healthcare to health."

1.2

Surgeon General of the Air Force

Readiness: "Trusted Care Anywhere" is the AFMS mantra. Readiness remains our number one priority. We know our patients and embrace our heritage of innovation to optimize health and improve care at home and deployed. It all starts with RAPPORT – being trustworthy.

Access: Continuity of care is our promise to beneficiaries. We strive to always be available to enrolled patients and to recapture care to our hospital systems. One million patients in patient-centered medical homes in 2012. Our clear focus is to activate patients as full partners in enhancing their health.

Partners: Shared ideas and services are instrumental to building and sustaining health systems. Our affiliations with civilian institutions, Veteran's Affairs, joint and coalition partners promise sustained currency, better health, better care and best value for all our beneficiaries.

Precision: Leveraging data leads to a culture of visible outcomes for our beneficiaries. Medical informatics transforms data to decision quality information for patients and healthcare teams. Decision support accelerates change in practice patterns and behavior. We create the setting for "right" behaviors by measuring and rewarding outcomes to inspire trust and confidence within our system.

Organized: We are now able to fit a highly capable, modular hospital with sustainable operating support into two C-17 aircraft. Upon arrival, we provide patient care capabilities within 30 minutes and full surgical/intensive care within three hours.

Respect: Research creates knowledge. Continuous improvement in global air evacuation over 10 years safely returned >92,000 patients from theaters of operation. We protect privacy and ensure medical information is safe as we generate new health literacy and improve efficiency and effectiveness of care.

Trust: The foundation of our military health system. Execution of the Quadruple Aim ensures world class care for our beneficiaries. "Trusted Care Anywhere" requires RAPPORT with patients and partners to let them know we will always be there to guarantee their success.

Lt. Gen. Charles B. Green

"Execution of the Quadruple Aim ensures world class care for our beneficiaries."

1.3

Surgeon General of the Navy's Bureau of Medicine and Surgery

Navy Medicine is a thriving, global health care network of 63,000 Navy Medical personnel around the world who provide high quality health care to more than one million eligible beneficiaries. Navy Medicine personnel deploy with Sailors and Marines worldwide, providing critical mission support aboard ship, in the air, under the sea and on the battlefield. I am proud to report that the current state of Navy Medicine is strong, but numerous challenges abound in the future of military medicine and health care in our nation as a whole.

Recently I laid out my strategic objectives for my tenure as the 37th Surgeon General of the Navy to meet these challenges head on. They include continuing to provide support to the warfighter, a focus on readiness and a consistent level of global engagement across the Navy Medicine spectrum. There are three more objectives though that I believe warrant further discussion as they apply to all of military medicine and arguably all health care providers. As we move forward in this new year and beyond, we must look at several key areas.

First is ensuring we are looking intently at the value of what we provide to our beneficiaries. It is imperative that we consider value in all strategic and tactical decision making.

We must also enhance our healthcare informatics capability. We will not make true headway on the cost or access to health care without continued leverage of information management and information technology at all levels of care.

I am also committed to working with my fellow Surgeons General in the spirit of jointness. The synergy of creating efficiencies, removing redundancies and allowing transparency will elevate care and reduce costs. Joint command-and-control cannot happen overnight and must grow from the deck plates with coordinated efforts from the Services and those best informed to provide input so that more light than heat is generated.

I am excited about the future! I am encouraged by the opportunities and the shaping that will occur as we find our equilibrium in a dynamic and evolving environment.

Vice Adm. Matthew L. Nathan

"The synergy of creating efficiencies, removing redundancies and allowing transparency will elevate care and reduce costs."

1.4

Surgeon General/Commander U.S. Army Medical Command

Army Medicine is comprised of a vast network of diverse professionals focused on the current war, the readiness of the joint force, national security, and the immediate and future health of our beneficiaries. Every member of our team, from clinical specialists to administrative support personnel, strives to perfect the patient experience—independent of location or conditions. We are an integrated health enterprise—a system of interdependent systems supporting soldiers and families in all aspects of life. Through innovation, superior training and an unmistakable "Warrior Spirit," Army medics have saved thousands of lives in combat while simultaneously promoting medical readiness and health across hundreds of camps, posts and stations in the United States and abroad.

We are a learning organization with an unwavering commitment to perpetual improvement and a collaborative partner focused on collective health. Army Medicine is a responsible steward of our treasured resources and will earnestly face fiscal realities by reducing variation and increasing efficiency while maintaining our documented effectiveness. We believe in the unity of command as a proven Principle of War and will diligently promote the Military Health System through transparency, common performance objectives and measures, standardized business and clinical practices, robust analytics, and the ability to synchronize across time and distance.

Despite unparalleled success over the past decade, we have a significant amount of work ahead to meet the demands of the future—known and unknown. Success is dependent upon the continued service and perseverance of the entire team in a highly coordinated fashion. We are proud of our role within the Military Health System and we are leading change in the era of possibilities.

Army Medicine: Serving To Heal...Honored To Serve

LTG Patricia D. Horoho

"We are an integrated health enterprise—a system of interdependent systems supporting soldiers and families in all aspects of life."

1.5 Commander Joint Task Force National Capital Region Medical

The National Capital Region (NCR) provides the world's best care and rehabilitation for our nation's most severely injured Warriors leveraging the Military's first Integrated Health Care System. Our number one priority is care for our Wounded Warriors and their family members. It is our sacred trust. With new and enhanced infrastructure, new technologies, and best clinical and business practices, we will meet the congressional mandate for world-class care in the MHS.

The Walter Reed National Military Medical Center (WRNMMC) and Fort Belvoir Community Hospital (FBCH) have over three million square feet of new and renovated medical and administrative space. In addition, both campuses have Warrior Complexes with double-occupancy suites that can accommodate up to 594 Wounded Warriors and non-medical attendants. These enhanced medical and support facilities represent a new beginning for health care delivery in the NCR. The NCR Integrated Delivery System (IDS) provides DoD the unique opportunity to achieve an integrated system that supports patients and families while meeting Service readiness requirements. The NCR IDS is based on a patient-centric model that brings together the best of Army, Navy and Air Force clinical practices and cultures. By integrating practices, capabilities, technologies and resources, health care services in the NCR are able to be greater than the sum of their parts and further expand already world-class services.

The NCR has achieved significant advances in support services for amputees, traumatic brain injuries and post-traumatic stress disorders. The National Intrepid Center of Excellence, located on the Bethesda campus, provides the most advanced services for diagnostics, inter disciplinary treatment planning and family education and support services for Warriors with traumatic brain injuries, and/or complex psychological health issues. The Military Advanced Training Center helps Warriors with orthopedic trauma build their strength, skills and confidence.

Patients in the NCR benefit from the new capabilities, technologies and practices made possible by integrating services. Benefits include a centralized appointment and referral process that eliminates redundancies and matches patients quickly with a primary and/or specialty care provider. NCR hospitals incorporate evidence-based design principles to decrease patient stress, increase social support, provide ample light, improve privacy and improve sleep and rest. The WRNMMC Comprehensive Cancer Center is the only peer-partner-in-care center with the National Cancer Institute, in addition to becoming an NCI designated Cancer Center. This Center provides patients with the most effective approaches to cancer prevention, diagnosis and treatment. It includes new and enhanced services including gynecological, prostate, breast, medical and surgical oncology.

Vice Adm. John M. Mateczun

"Our number one priority is care for our Wounded Warriors and their family members."

1.6 Coast Guard Director of Health, Safety and Work-Life

"When gales blow and others seek safe harbor, Coast Guard crews get underway to save lives; our cutter, aviation and deployable forces interdict smugglers on the high seas; our marine inspectors crawl through hot, filthy ballast tanks to ensure commercial ships safety; our boarding teams climb aboard wave-lashed trawlers to protect our marine resource from foreign encroachment and depletion. We stand with U.S and allied services in defense of freedom." This quote from the USCG Commandant's Direction forms the trackline for the professionals of the USCG Health, Safety, Work-Life/Family Service (HSWL) Directorate. The HSWL program serves as the health, safety and family service resource for CG beneficiaries through its delivery of primary care, family services, hazard prevention, and its partnership with the Military Health System and TRICARE.

The Commandant's guiding principles provide clarity regarding how we will move forward in 2012:

- Steady the Service – ongoing focused commitment to the Quadruple Aim and the National Prevention Strategy as the strategic compass to guide all HSWL programs toward success. Implementation of Patient-Centered Wellness Home is key.
- Honor our profession – Strive for professional excellence. Implementation of our Integrated Health Information System will provide us a critical tool.
- Strengthen partnerships – Integration of our HSWL mission sets internally and a continued focus on external partnerships are vital to supporting our mission. Our joint participation in the Military Health System represents a vital strategic partnership for the Coast Guard.
- Respect our shipmates – Be passionate about preventing, protecting, and providing HSWL services while also creating a richly diverse and continual learning-focused technical workforce.

Successful implementation of our key initiatives will serve us well as we enter an austere budget environment that will challenge the Coast Guard to prioritize and focus on those activities that are clearly best practices and evidence-based.

Our program envisions a healthy, safe and thriving total Coast Guard force that is Always Ready.

We prevent, we protect and we provide.

We are the Health, Safety and Work-Life/Family Service team professionals of the United States Coast Guard.

This is what we do.

RADM Maura Dollymore

"Our program envisions a healthy, safe and thriving total Coast Guard force that is *Always Ready.*"

2.0

What We Did: A Snapshot of a Dynamic Organization in 2011

The Military Health System (MHS) is a complex organization with a $52B budget that provides health services to 9.7 million beneficiaries across a range of care venues, from the forward edge of the battlefield to traditional hospitals and clinics at fixed locations. To get a better sense of the size, complexity and services delivered by the MHS, we offer the following:

Readiness

321,751 - Service Members Deployed

17,476 - Medical personnel deployed

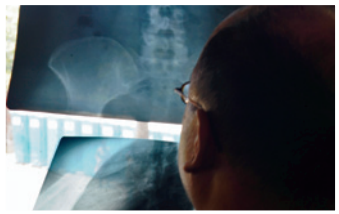
589,573 - Medical encounters in theater

6,943 - Medical Evacuations

221 - Number of amputees with major limb amputations from OEF/OIF

16,270 - Service members currently in the Integrated Disability Evaluation System

Healthcare



1,169,003 - Inpatient admissions

129,152,879 - Outpatient visits

124,729 - Births

142,126,856 - Prescriptions

Health

2,281,669 - Beneficiaries getting care from a patient-centered medical home

2,938 - Enrolled in Train2Quit smoking cessation program

235,304 - Post-Deployment Health Assessment and Post-Deployment Health Reassessments through third quarter of 2011

669,149 - Service members who used the Global Assessment Tool to increase resilience

Learning & Growth

24,000 - Medical Education and Training Campus (METC) graduates

3,600 - Active Research Protocols

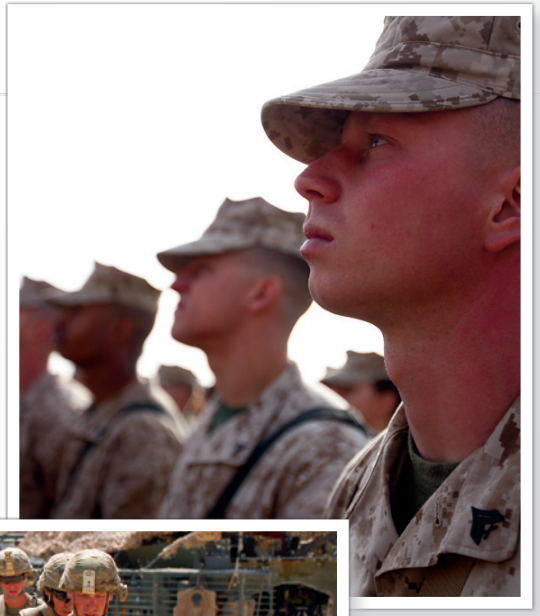
233 - Accredited military graduate medical education programs

731 - Lean Six Sigma and Continuous Process Improvement Projects

3.0

What We Face: Operating In Challenging Times

We live in challenging times. The unprecedented length of two wars has tested our resilience in providing operational medical support and caring for returning wounded warriors with complex, long-term health care needs. The slow recovery from a severe global recession coupled with a growing number of seniors beginning to receive promised entitlements has created a daunting federal fiscal challenge that will impact both the military and health care. Military medicine will undergo major changes in the years to come, possibly having to respond to reduced end strength, closure of some medical facilities, budget constraints, changes to the health benefit, and new missions and medical threats. There will be more emphasis on healthy living to reduce the chronic disease burden and there will be changes in the delivery of care, emphasizing teamwork, continuity and accountability for producing value. Successfully navigating these challenges will require flexibility in our thinking and organization, and a culture of innovation.

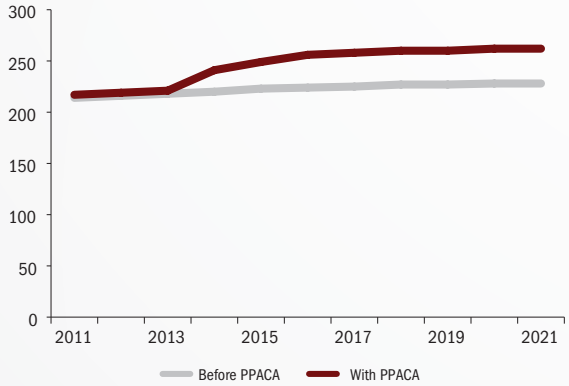


3.1 The Changing Nature of Supply and Demand

Increasing Demand for Primary Care Physicians

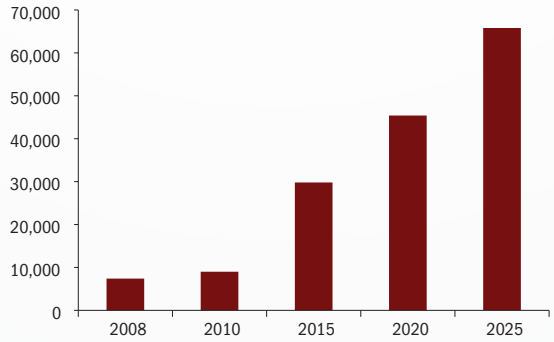
The Patient Protection and Affordable Care Act (PPACA) will ensure that many more Americans will have access to health insurance beginning in 2014. All of these newly insured people will be seeking a primary care provider at a time when there will be a growing shortage of physicians. In addition, the number of MHS enrollees using private sector care is rising. In order to ensure that all of our beneficiaries have access, we will need to expand primary care and continue to explore new models of care delivery.

Insured Americans Under 65



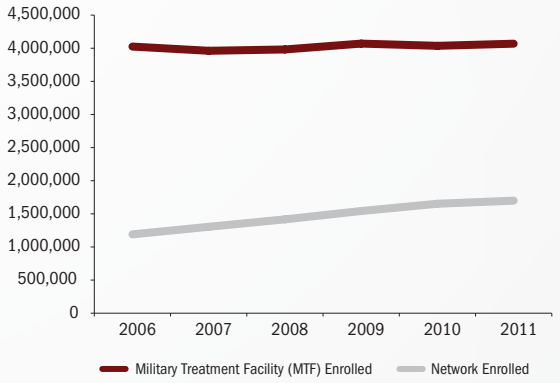
Beginning in 2014, over 30 million additional people will have access to health insurance.

Expected U.S. Primary Care Physician Shortage



The country will face an increasing shortage of both primary and specialty physicians.

MHS Enrollees



Over the past five years, 500,000 more people have enrolled in TRICARE Prime with almost all of the increase occurring in network care.

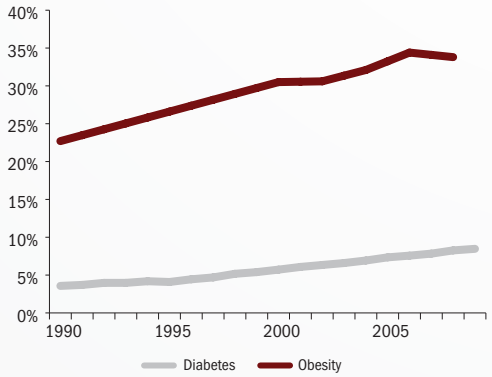
Source: Congressional Budget Office 2011, Association of American Medical Colleges Center for Workforce Studies, June 2010 Analysis

3.1 The Changing Nature of Supply and Demand

Increased Individual Demand Due to Increased Illness Burden

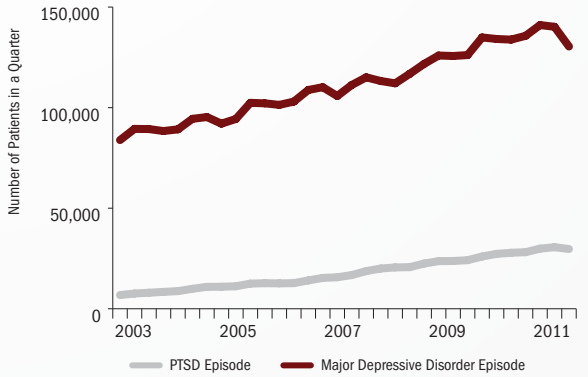
The country has experienced an epidemic of obesity that has been accompanied by a rise in chronic illnesses like diabetes. This will put a strain on the health system for years to come. In addition to this challenge, the MHS has had to adapt to a rise in depression and other mental illness that may be related to the effects of ten years of war.

U.S. Prevalence of Diabetes and Obesity



Over the past 20 years, the proportion of obese Americans has increased by nearly 50%. The prevalence of diabetes has increased in a similar fashion.

MHS Prevalence of Diagnosed Depression and PTSD in Adult Beneficiaries



Over the past six years the diagnosis of depression and post traumatic stress disorder has increased by nearly 100% in the total MHS beneficiary population. Part of this may be attributed to increased awareness and reduced stigma.

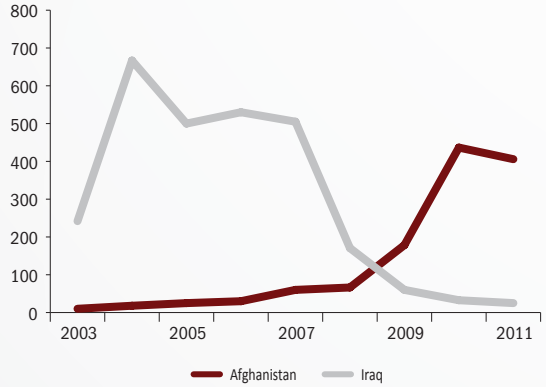
Source: Centers for Disease Control 2010

3.1 The Changing Nature of Supply and Demand

The Enduring Medical Effects of Ten Years of War

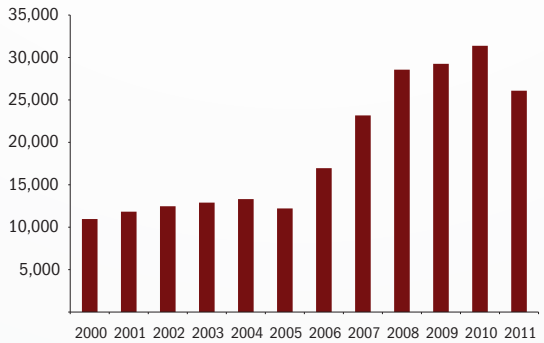
In addition to the growing prevalence of chronic disease that we confront in the U.S., we face increased and unique demands from the casualties of war. Although combat operations have ended in Iraq and have leveled off in Afghanistan, ten years at war may have a long-term impact on demands for health services in the MHS, particularly in mental health.

Average Number Wounded in Action Per Month



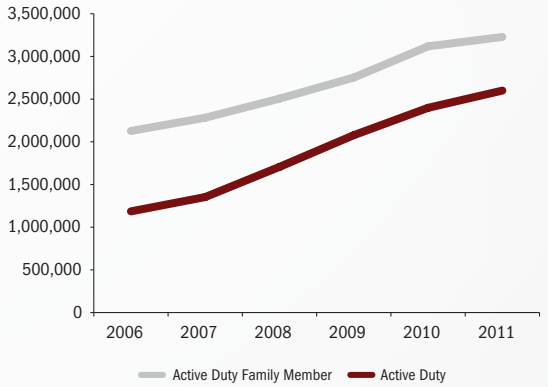
We are fighting one less war, but the MHS continues to see significant numbers of combat trauma cases.

Diagnosed Cases of TBI



The diagnosis of Traumatic Brain Injury began to decline in 2011 but still accounted for approximately 25,000 new cases.

Behavioral Health Outpatient Encounters



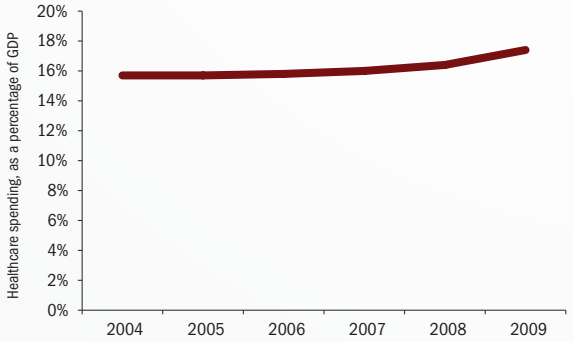
The cumulative effects of ten years of war, as well as successful anti-stigma campaigns, have driven demand for behavioral health services to new highs for active duty service members and their families.

3.2 Escalating Costs

Healthcare Cost Inflation is Unsustainable

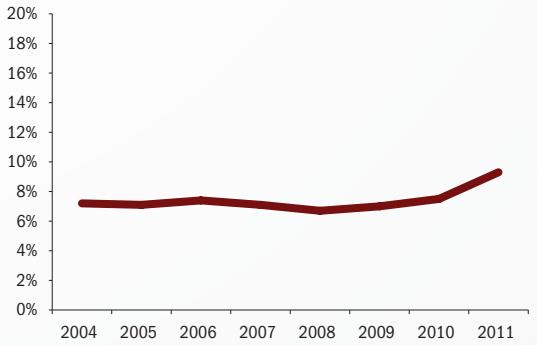
The slow but inexorable growth in health care costs in the United States and in the Department of Defense (DoD) continues. Recent upticks in the percentage of health care costs relative to GDP and the DoD budget reflect overall economic conditions and slowdowns in federal spending, rather than recent spikes in health spending. Yet, these external circumstances further highlight the trade-offs between health spending and other national …and national security…priorities.

U.S. Spending on Healthcare, as a Percentage of GDP



Since 2004, the cost of healthcare as a percentage of GDP has risen from less than 16% to nearly 18%.

Unified Medical Program as a Percentage of DoD Budget



In 2004, the cost of healthcare was approximately 7% of the total DoD budget. It is now nearly 10%, a rate of growth that is unsustainable.

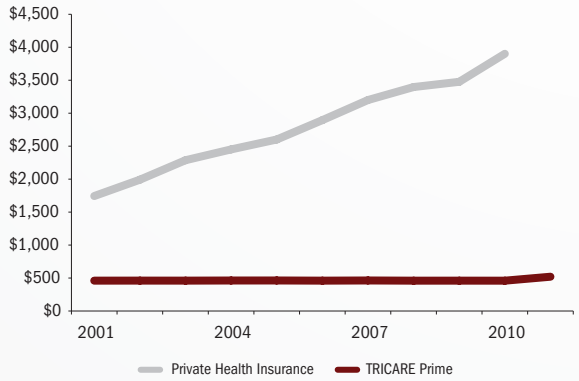
Source: Organization for Economic Cooperation and Development 2011, TRICARE Publication FY2011 Report to Congress

3.2 Escalating Costs

More MHS Beneficiaries are Relying on TRICARE for Their Health Care

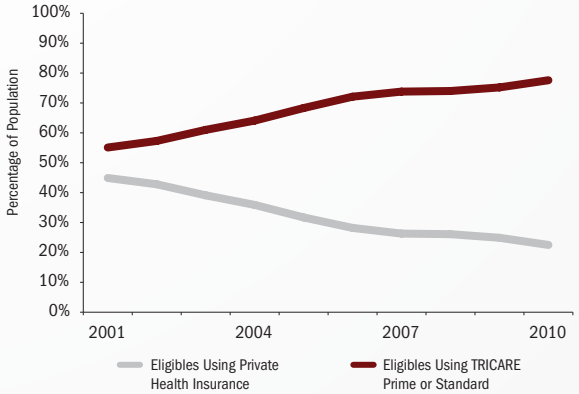
As the costs for private sector health insurance continue to grow, most employers have shifted a significant amount of the cost burden to employees. In 2011, DoD introduced very modest increases in TRICARE Prime enrollment fees for retirees and their families—but the increases were well below the private insurance cost growth. The trend of the last ten years—in which retirees drop their private insurance and return to TRICARE as their primary insurance—is likely to continue.

Private Insurance Premiums Vs. TRICARE Enrollment Fee (Family)



Over the past ten years, private insurance premiums have increased by over 100%; TRICARE fees remained unchanged until a modest increase was implemented in 2011.

Retiree (<65) Health Insurance Coverage



Since 2001, more and more eligible beneficiaries have decided to rely on TRICARE for their health needs, contributing to escalating costs for the DoD.

Source: TRICARE Publication FY2011 Report to Congress

4.0 How We're Doing: Assessing Progress in Achieving our Strategic Goals

MHS Leadership is committed to delivering value to all we serve. The Quadruple Aim represents our strategic goals and value proposition: improved readiness, better care, better health and responsibly managed costs.

The MHS Quadruple Aim:

Readiness

Ensuring that the total military force is medically ready to deploy and that the medical force is ready to deliver health care anytime, anywhere in support of the full range of military operations, including humanitarian missions.

Population Health

Reducing the generators of ill health by encouraging healthy behaviors and decreasing the likelihood of illness through focused prevention and the development of increased resilience.

Experience of Care

Providing a care experience that is patient and family centered, compassionate, convenient, equitable, safe and always of the highest quality.

Per Capita Cost

Creating value by focusing on quality, eliminating waste and reducing unwarranted variation; considering the total cost of care over time, not just the cost of an individual health care activity.

Measuring Performance:

Over the next few pages we will describe our strategic goals and show some of the indicators that we use to determine our success in achieving the Quadruple Aim.

4.1

How We're Doing: Readiness

We maintain an agile, fully deployable medical force and health care delivery system so that we can provide state-of-the-art health services anytime, anywhere. We use this medical capability to treat casualties and restore function, and to support humanitarian assistance and disaster relief around the world.

We partner with commanders and individual service members to create a healthy, fit, resilient and medically-prepared fighting force.

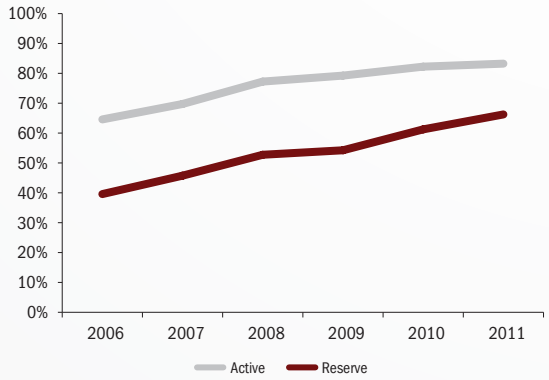
We support the larger DoD effort to ensure that families and the military community are resilient and prepared for the stress of deployment.

4.1 How We're Doing: Readiness

Improving Individual and Family Readiness and Resilience

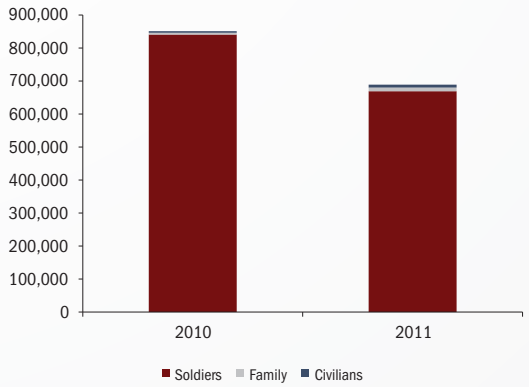
Despite the extraordinary demands of supporting two wars over the past decade, a partnership between line commanders and the medical community has resulted in a steady increase in the rate of individual medical readiness, but there is still room for improvement, particularly in the reserve and guard community. The recognition that many service members and their families will face repeated deployments resulted in the unprecedented development of resilience programs such as Comprehensive Soldier Fitness. These programs are building the capacity of the Force and families to thrive in the face of the stress of military life.

Individual Medical Readiness (IMR)



Recent efforts to increase periodic health assessments and dental readiness have increased overall rates of individual medical readiness, particularly in the guard and reserve.

Resiliency Assessments for Active Duty, Families and Civilians



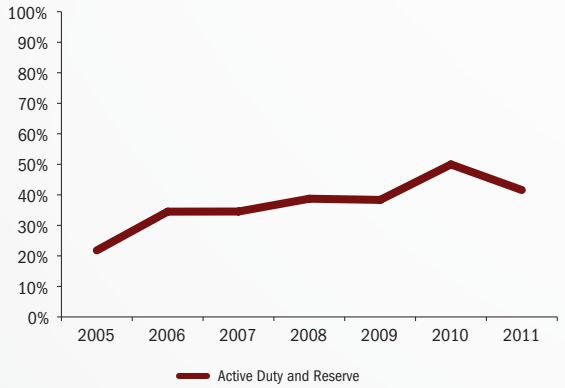
The Global Assessment Tool (GAT) is administered as part of the Army Comprehensive Soldier Fitness program and helps individuals track and improve emotional, social, spiritual and family strength. The program is now being expanded to include family members.

4.1 How We're Doing: Readiness

Assessing and Improving Psychological Health

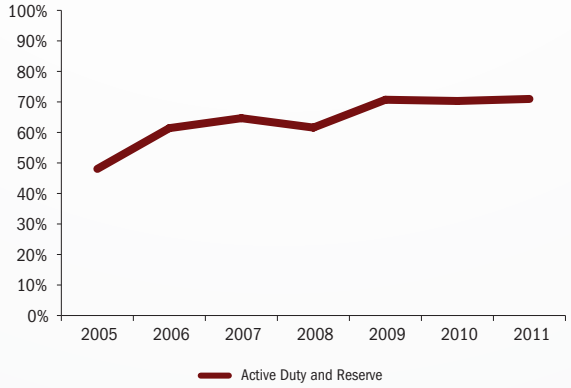
Combat operations can result in psychological trauma. The DoD has addressed this risk through a comprehensive program of screening, early detection and improved access to psychological health services. We have also implemented innovative programs to address psychological health issues in primary care settings. Despite this effort, we continue to face a growing demand for services and a recognition that service members will be contending with the psychological consequences of war for years to come. The MHS is committed to meeting these long-term needs.

Post Traumatic Stress Disorder Referral Rate



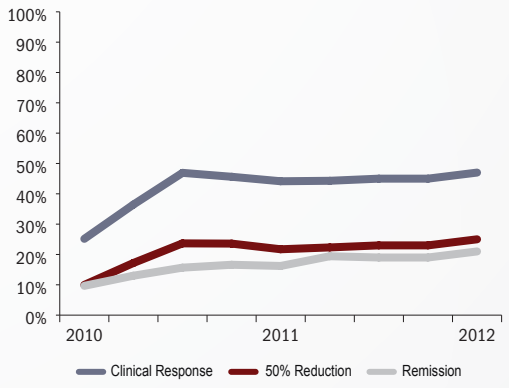
If a service member screens positive indicating a risk for PTSD, they are now referred for further evaluation about 50% of the time. Early in the war the rate was significantly lower possibly due to a lack of provider awareness or willingness to refer.

Post Traumatic Stress Disorder Engagement Rate



We have observed a steady increase in the rate at which service members follow through with a recommendation to seek mental health services. This may represent success in overcoming stigma.

Post Traumatic Stress Disorder Remission Rate



A number of primary care sites have implemented a comprehensive program to identify and treat Post Traumatic Stress Disorder. These sites are achieving improved rates of treatment response over time.

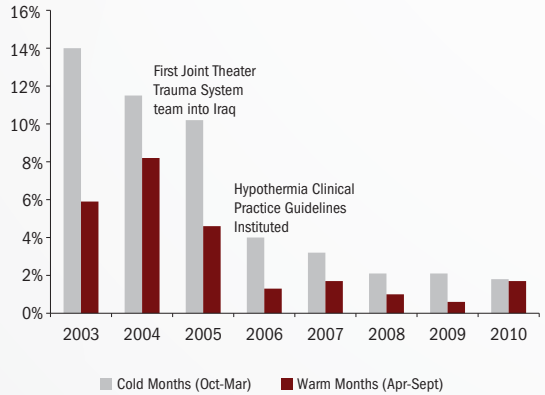
Source: RESPECT.MIL

4.1 How We're Doing: Readiness

Casualty Care is Achieving Superior Outcomes at all Stages of Care

The changing nature of combat operations required the MHS to function as an agile learning organization. Early in the war, the care team recognized that if patients arrived with hypothermia, they were less likely to survive. Rapid implementation of clinical protocols resulted in a reduction of hypothermia. This, along with many other improvements, has allowed battlefield care to save close to 100% of those who make it to a treatment team. Once care is initiated, it never stops; our shared goal is the restoration of maximal function.

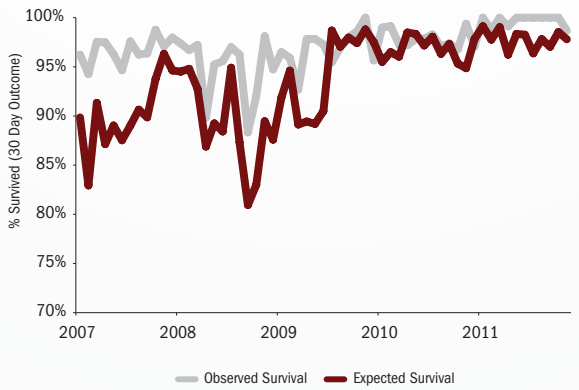
Percentage of Patients Admitted Hypothermic Iraq 2003-2010



The rate at which combat casualties experience hypothermia has dropped by over 80% since 2003.

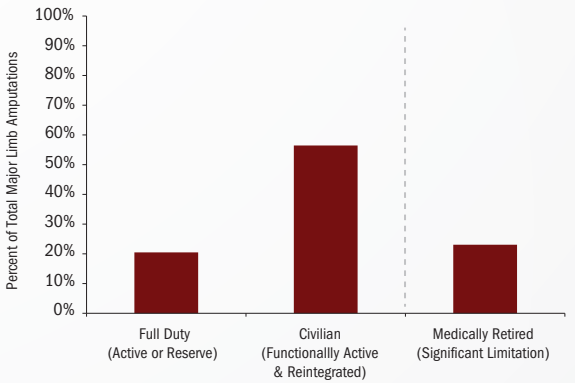
Observed vs. Predicted Survival Rate

(Battle Wounds in Operations Enduring Freedom and Iraqi Freedom)



Since 2007, the actual survival of combat casualties in Iraq and Afghanistan has exceeded results obtained in the leading trauma centers in the U.S.

Amputee Functional Reintegration 2002-2011



Two years after injury, nearly 80% of total limb amputees are either still on Active Duty or are functioning as a full time student or parent.

4.2

How We're Doing: Population Health

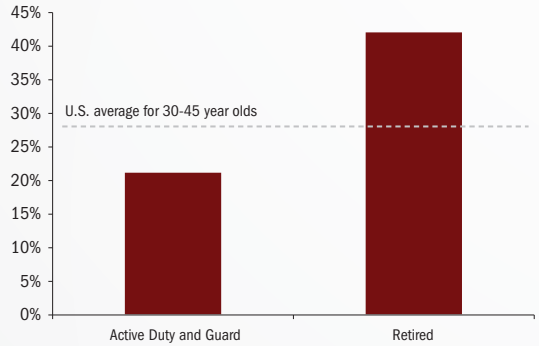
Improved health is the result of an effective partnership between a health system and a person. Healthy behaviors improve quality of life; alternatively, unhealthy behaviors, such as smoking, over-eating, a sedentary lifestyle, alcohol abuse and family violence reduce well-being and readiness. The MHS strives to engage with all beneficiaries and enable them to take control of their health, so that together we create a more robust and resilient military community.

4.2 How We're Doing: Population Health

Encouraging Healthy Behavior – Curbing Obesity

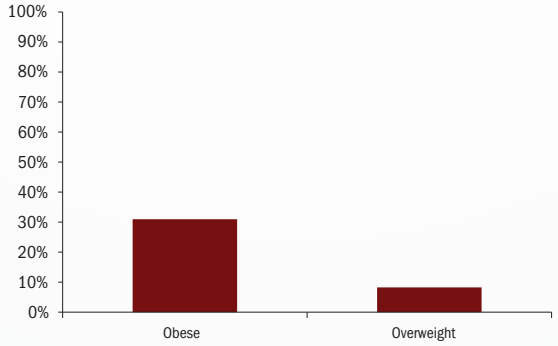
The MHS—similar to the U.S. health system—faces challenges with obesity that require a combination of health system interventions, behavioral changes and policy innovations. While we are now able to monitor levels of obesity in our beneficiary population, we do not have a comprehensive program to work with our patients and help them make the changes needed to achieve a healthy weight. This is a high priority issue for the coming year.

Prevalence of Obesity in MHS Beneficiaries (Ages 40-49)



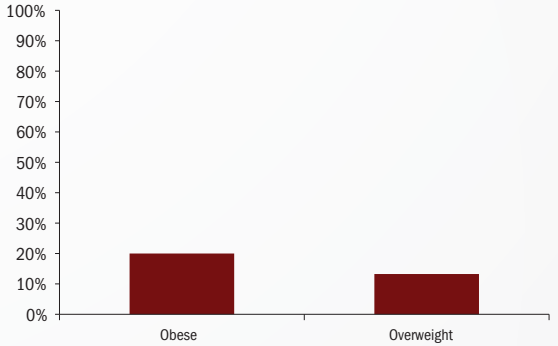
The rate of obesity in active duty service members is significantly lower compared to retirees of the same age. There may be an opportunity to intervene to prevent waistline growth with retirement.

Diagnosis Rate of Obese/Overweight Beneficiaries, FY2011



Less than a third of obese patients and less than 10% of overweight patients have a weight condition documented in their medical record.

Counseling Rate of Beneficiaries Diagnosed as Obese/Overweight, FY2011



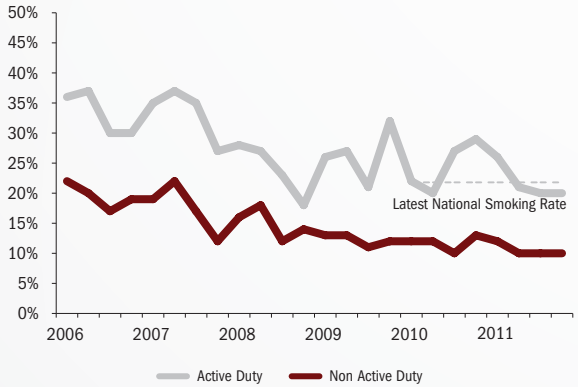
Of those beneficiaries diagnosed as being overweight or obese, only 10% and 20%, respectively, are counseled on ways to manage their weight.

4.2 How We're Doing: Population Health

Encouraging Healthy Behavior – Tobacco Cessation

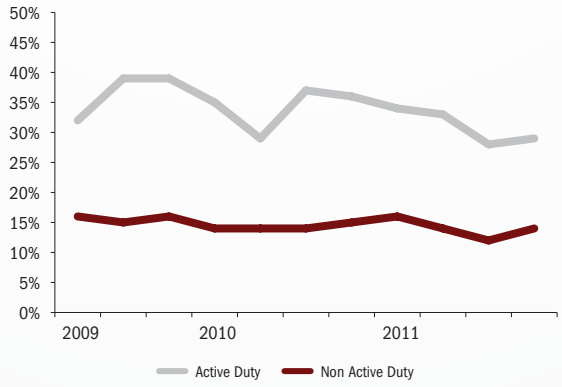
In support of the National Prevention Strategy, one key focus is tobacco cessation among our beneficiaries. Our efforts have shown a decrease in smoking rates but we still have room for improvement in reducing the use of all tobacco products. It is important to reach out and educate beneficiaries early in life to reduce and eliminate unhealthy behaviors down the road. Our younger service members are using tobacco at higher rates than their peers not in Service. We need to change that.

Smoking Rate 18-24 Year Olds



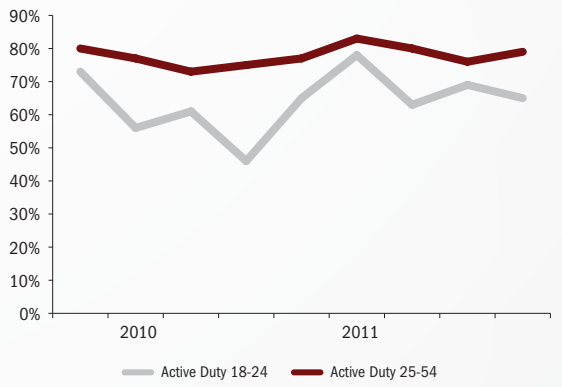
Historically the smoking rate of active duty service members has been one and a half times higher than their non active duty peers. Over the last five years, the MHS has seen a decrease in the rate of smoking in both populations.

Tobacco Use Rate, 18-24 Year Olds



Recently we have expanded our measurement to consider all types of tobacco use. Nearly one third of young service members report that they use some form of tobacco product.

Tobacco Cessation Counseling Rate Active Duty



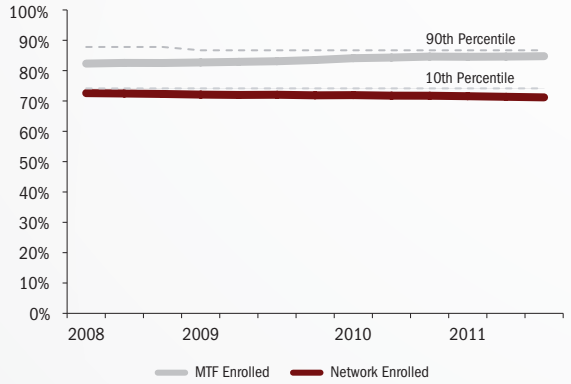
18-24 year-old active duty members are less likely to be counseled to quit smoking than older active duty members; this is a pattern we are looking to change.

4.2 How We're Doing: Population Health

Ensuring that our Beneficiaries Have Wellness and Prevention Services

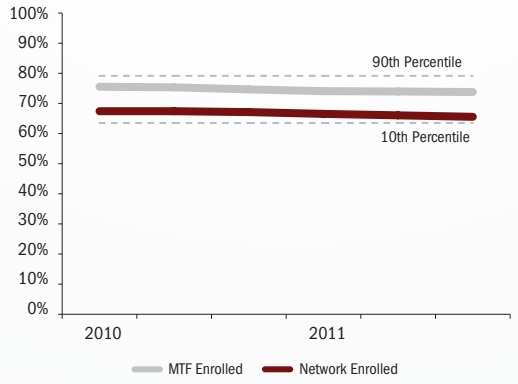
For the past several years, we have been focusing our efforts on ensuring that our enrollees receive optimal preventive services. We have performed better than 90% of U.S. health systems on colorectal cancer screening, but we still have room to improve on cervical and breast cancer screening. In addition, we are aiming to improve adherence to guidelines for early childhood health visits.

Cervical Cancer Screening Rate



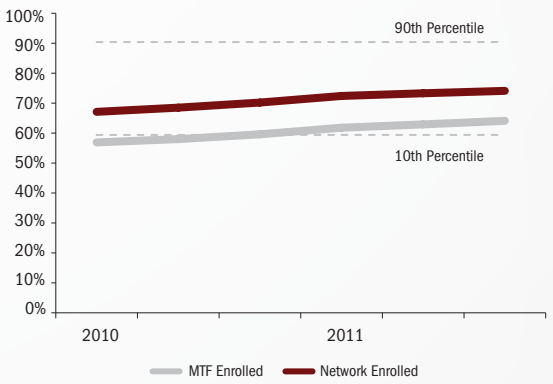
Women are more likely to have a documented cervical cancer screening if they are enrolled in one of our military treatment facilities.

Breast Cancer Screening Rate



The rate of screening for breast cancer is higher for women enrolled to an MTF compared to network enrollees.

Children with Six Well-Child Visits in First 15 Months



We recently added this measure of well-child visits; early data suggest steady improvement for enrollees to both MTFs and the TRICARE network.

4.3

How We're Doing: Experience of Care

Our beneficiaries deserve an excellent experience of care across all six dimensions identified by the Institute of Medicine. Care must be: safe, effective, patient-centered, timely, efficient and equitable.

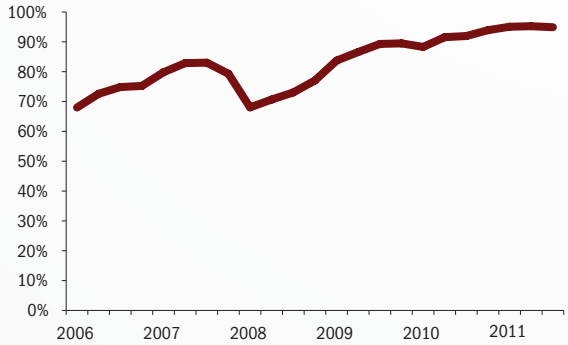
We strive to see the care experience through the eyes of our beneficiaries in order to design our systems to meet their expectations. We must demonstrate that our quality compares favorably with the best of civilian health care.

4.3 How We're Doing: Experience of Care

Employing Evidence-Based Practices to Improve Safety

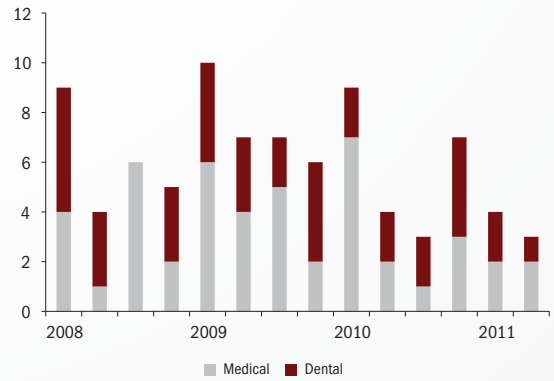
One of the keys to improving safety is the consistent use of evidence-based practices. We are beginning to see major benefits from this approach; over the past several years we have instituted guidelines to reduce post-surgical infections by ensuring that patients receive antibiotics before surgery when warranted. In addition, we are expanding use of protocols or bundles to reduce harm events in hospitals like wrong site surgery, ventilator-associated pneumonia and pressure ulcers. Our goal is a 40 percent reduction in hospital-acquired infections by the end of 2013.

Antibiotics Administered Within One Hour of Surgical Procedure



In 2006, patients received prophylactic antibiotics 60 minutes before surgery only 70% of the time; now it is over 93%.

Number of Wrong Site Surgeries



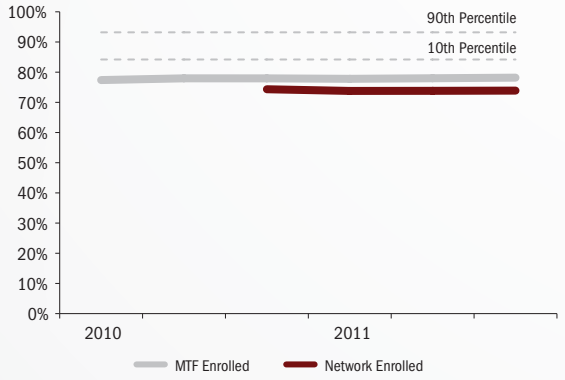
Across the entire MHS there are approximately 14 wrong site surgeries per year along with a similar number of dental procedures.

4.3 How We're Doing: Experience of Care

Improving Adherence to Evidence-Based Treatment Guidelines

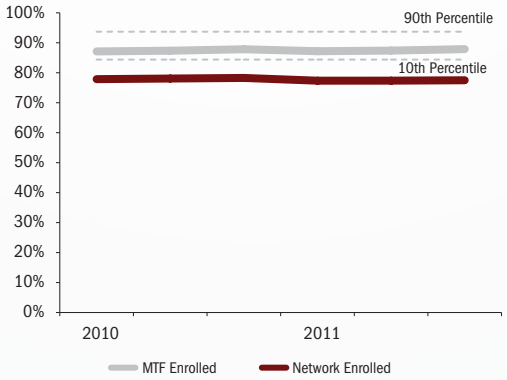
We know that our patients will have better health outcomes if they receive the appropriate evidence-based interventions for chronic illnesses like diabetes and cardiovascular disease. We also know that patients fail to get recommended treatment when there are faulty "handoffs" between providers. In some cases this can even lead to a readmission. By integrating care across time and space, we intend to improve adherence to guidelines and reduce errors.

Screening Rates for Low Density Lipoprotein (LDL) in Patients with Cardiovascular Disease (CVD)



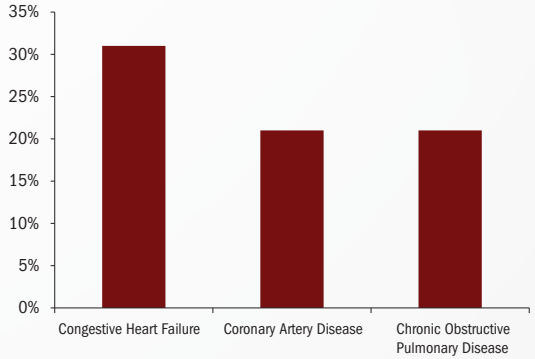
About 80% of enrollees with CVD receive recommended monitoring of their lipids. We strive to increase both the level of screening and the appropriate management of lipids to prevent the progression of illness.

Screening Rates for Hemoglobin A1c (HbA1c) in Diabetics



The HbA1c test checks the long-term control of blood glucose levels in people with diabetes. This screening test is more likely to be documented for enrollees to an MTF as compared with Network enrollees.

Conditions with Highest Direct Care Hospital Readmission Rates



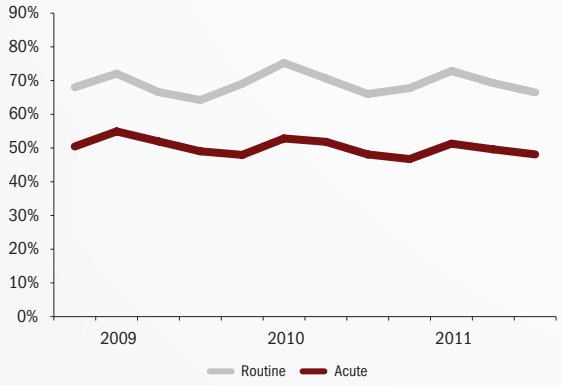
The MHS has joined the National Partnership for Patients. As part of this effort, we will focus on reducing hospital readmissions by improving care transitions.

4.3 How We're Doing: Experience of Care

Improving Access and Reducing Waiting Time

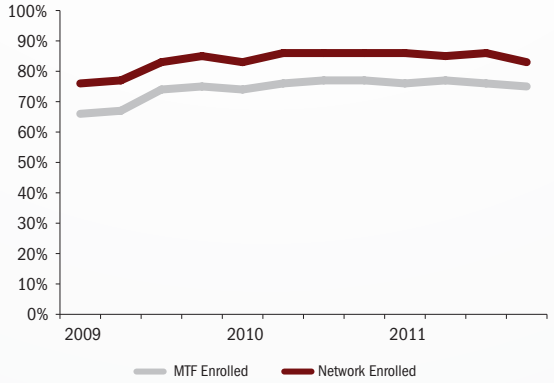
Patients should not have to face lengthy waits for primary care. And once patients have entered care, they should be offered a rapid evaluation and efficient treatment so they can return to health and to their normal routine. One area where it has been particularly challenging to coordinate care and reduce waiting times has been disability evaluation for wounded, ill and injured service members.

Third Available Primary Care Appointments



At over 50% of MTF primary care clinics, if a beneficiary calls for an acute appointment they will be offered at least three options within 24 hours. Two-thirds of patient-centered medical home teams are meeting this same standard.

Satisfaction with Getting Timely Care



Overall satisfaction with healthcare has remained relatively flat for the last year, but we are seeing improved satisfaction in patient-centered medical home settings.

Medical Evaluation Boards (MEBs) Completed Within 35 Days

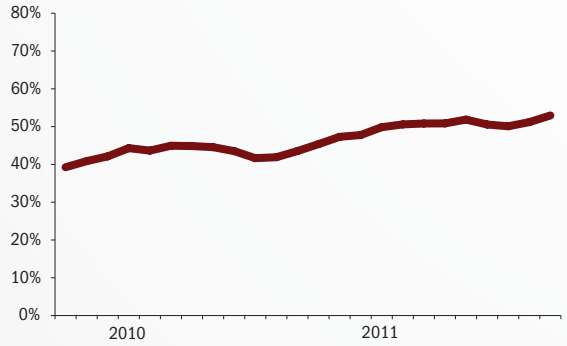
Less than half of the time, MEB processing meets our timeliness standard of 35 days. Delays in the disability process can lead to dissatisfaction.

4.3 How We're Doing: Experience of Care

Improving Continuity of Care and Patient Centeredness

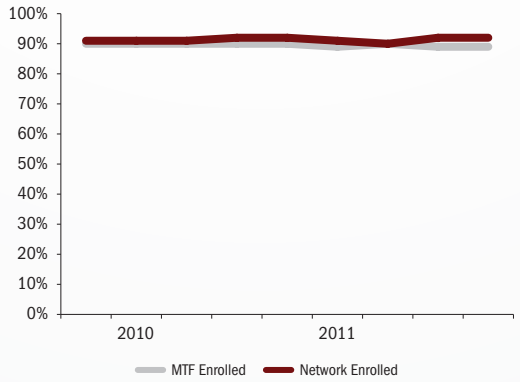
The MHS is in the process of implementing the patient-centered medical home, ensuring that every enrollee has access to a primary care manager and care team. We have placed much greater emphasis on linking patients with their doctor and we are seeing objective evidence of success. Over time, we predict that improved continuity will result in improved satisfaction and better outcomes.

Primary Care Manager (PCM) Continuity



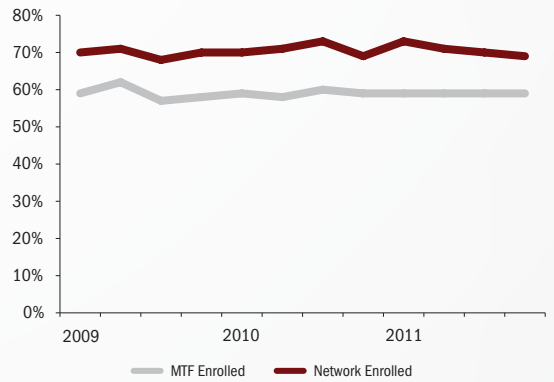
On average, enrollees to military treatment facilities see their assigned primary care manager just over half of the time, but many MHS patient-centered medical homes are achieving rates above 65%.

Satisfaction with Provider Communication



One of the strongest drivers of overall satisfaction with healthcare is provider communication. Over the past two years, this measure has not changed and remains at 90%.

Satisfaction with Healthcare



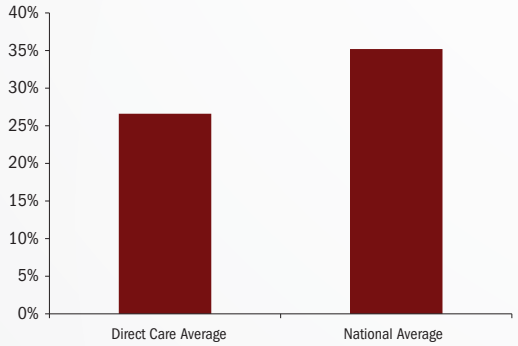
Patients enrolled to TRICARE network providers report higher satisfaction with health care. With the continued expansion of patient-centered medical homes within MTFs, we expect to see this gap narrow.

4.3 How We're Doing: Experience of Care

Improving the Birth Experience

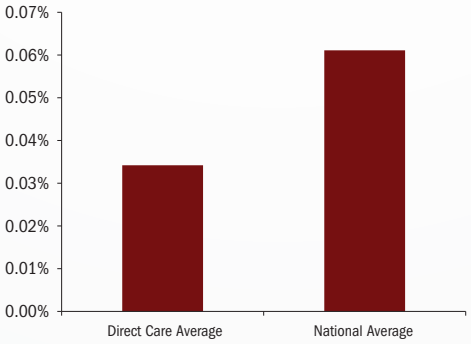
Approximately 40% of the inpatient care we provide in military treatment facilities is related to childbirth. MTF quality outcomes compare favorably to national norms, but enrollees' satisfaction with the birth experience in military hospitals is 10% to 15% below the civilian hospital rate. We must address the entire experience of care as we seek to be provider of choice.

Cesarean Delivery Rate, 2010



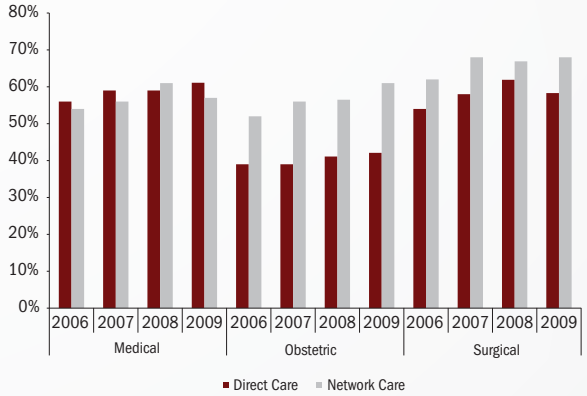
The rate of Cesarean delivery in MTFs is significantly less than the national average.

Major Complication Rate of Newborns Born in the Hospital, 2010



The rate of major complications during childbirth in MTFs is about one half of the national average.

Satisfaction with Inpatient Care (Overall Hospital Rating)



Patients receiving obstetrical care at TRICARE network hospitals report higher satisfaction with health care.

4.4

How We're Doing: Per Capita Cost

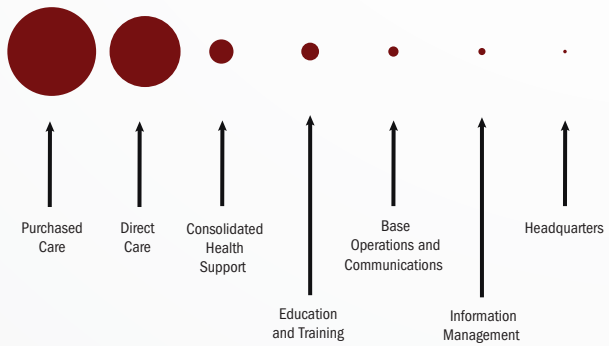
We create value by enhancing readiness, improving population health and enhancing the experience of care. We reduce the total cost of health services by optimizing our investments in health promotion, prevention and the development of resilience, ensuring access to full spectrum primary care, focusing on quality, and reducing unwarranted variation.

4.4 How We're Doing: Per Capita Cost

Understanding Our Costs

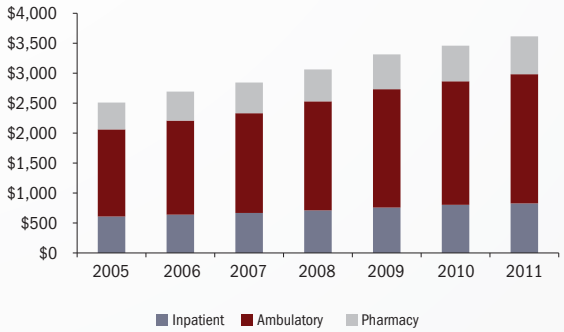
The overwhelming majority of MHS resources are used to deliver care. The cost of delivering care to an MHS enrollee has risen from $2,500 per year in 2005 to just over $3,500 in 2011. The increase in cost is being driven both by an increase in the cost of individual health services and in the rate of utilization of services. Three significant contributors to rising costs include increased demand for emergency services, mental health care and care for musculoskeletal injuries.

MHS Budget by Budget Activity Group



The MHS has a total operating budget of just over $52B, most of which is used to provide care through military treatment facilities and the TRICARE Network.

Enrollee Per Year Costs



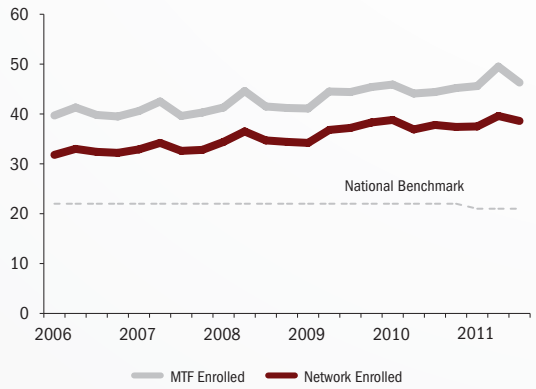
The annual cost of providing care for an average MHS enrollee is just over $3,500, almost two-thirds of which is for ambulatory services including laboratory and radiologic procedures.

4.4 How We're Doing: Per Capita Cost

Focusing on the Drivers of Increased Costs

Reducing emergency room (ER) use and improving care management represent two ways to reduce costs while improving outcomes. As we implement enhanced access and patient-centered medical homes, we are confident that we will be able to reduce ER visits and provide more comprehensive care management for those with complex needs.

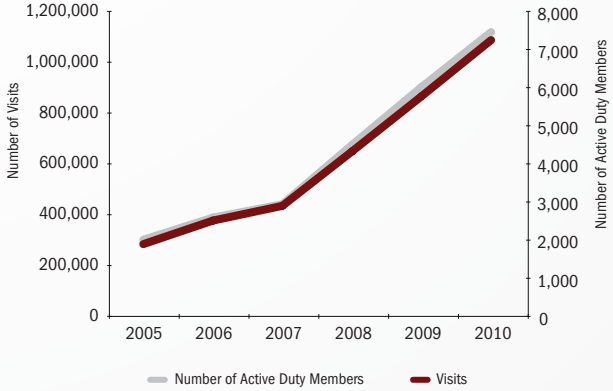
Emergency Room (ER) Utilization per 100 Enrollees



Emergency room utilization for Prime enrollees continues to climb and ismore than double the rate of insured individuals in the United States.

Active Duty Members > 100 Visits in Fiscal Year

Cost and Volume (Direct and Purchased Care)



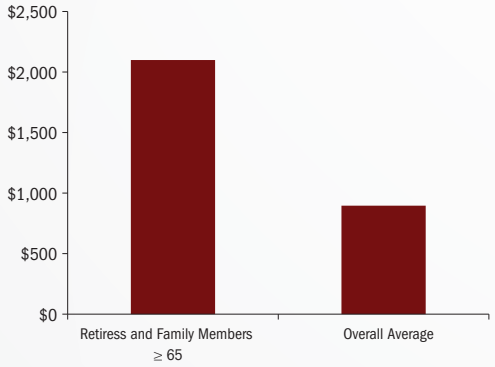
The number of active duty members with greater than 100 visits in a year has more than tripled over the last five years; care associated with those patients now accounts for more than one million visits per year.

4.4 How We're Doing: Per Capita Cost

Encouraging Pharmacy Home Delivery to Improve Quality While Reducing Cost

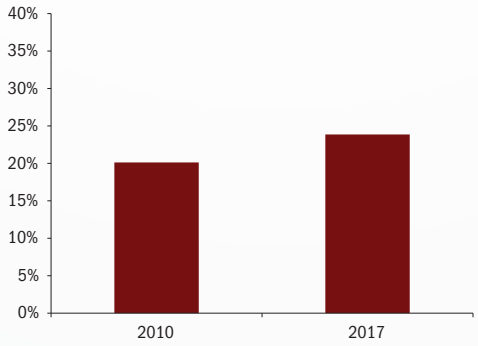
MHS pharmacy costs were close to $7B in 2011. Much of that was for beneficiaries over the age of 65 who require more medicines, often for chronic conditions. As our population ages, this cost pressure will increase. One way for us to reduce costs and improve quality is to encourage beneficiaries to use home delivery. When patients get their medications in the mail, they are more likely to take them regularly and the government is able to benefit from discounted prices.

Average Annual Prescription Costs Per Beneficiary



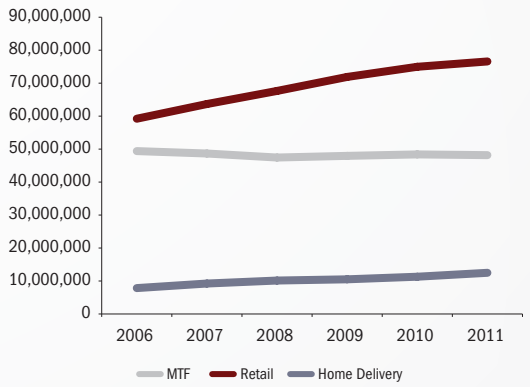
The MHS spends over $2,000 per year per Medicare-eligible DoD beneficiary.

Projected Growth in the MHS Over 65 Population



Currently one in five MHS beneficiaries is over the age of 65; by 2020 that number could be one in four.

Home Delivery Trend



Savings from home delivery prescriptions have been significant, and the use of this venue for delivery continues to increase.

Source: TRICARE Publication FY2011 Report to Congress

5.0 Where We're Going: An Integrated Military Health Delivery System that Consistently Delivers Quadruple Aim Performance

Although it is generally accepted that rising health care costs pose a threat to the economy, to national security and to the personal pocketbook, we have not agreed as a country on an effective strategy to combat this very real challenge.

MHS leadership believes that effective and integrated care coordination, greater patient engagement and awareness, and timely dissemination of best practices represent the long-term strategies needed to bend the cost curve while increasing quality and health outcomes.

Where We Are Going

- We will operate our MTFs at full capacity to support readiness and the backbone of our clinical systems – our GME programs.
- Shifting our focus from healthcare to health will deliver value to our Force and to our system.
- A relentless focus on process improvement will decrease variation, decrease waste and increase productivity in our care system.
- A shifted focus on population health is the keystone to the rest of the Aims. In previous years, the MHS has worked to improve patients' Experience of Care. This year, it will focus energy and resources on maintaining a healthy population—the key to the other three Aims.

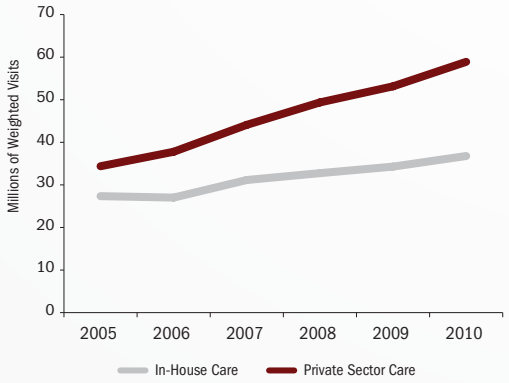
This is not a change of direction, but rather a new focus on our journey to a healthier, more resilient military force.

5.1 Bringing Care Back into our MTFs

Optimizing the Use of Our Hospitals and Clinics to Support both Readiness and Graduate Medical Education (GME)

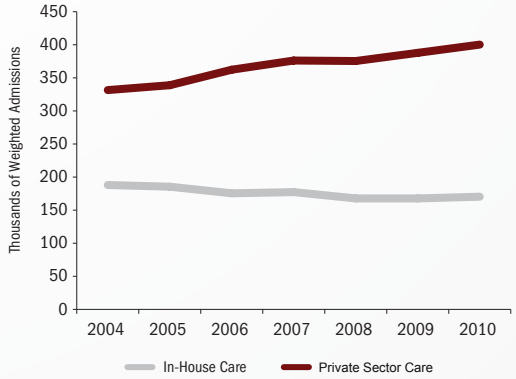
Over the past five years, the amount of care provided to DoD beneficiaries has continued to increase, but the majority of that increase has occurred in the private sector. There is an opportunity to pull some of that additional workload back into military treatment facilities so that our providers can remain current in the skills they need for readiness and so that our trainees can have a rich clinical experience.

Outpatient Weighted Workload



Between 2005 and 2010 the proportion of total ambulatory care provided by our MTFs declined from 44% to 38%.

Inpatient Weighted Workload



Between 2005 and 2010 the proportion of total inpatient care provided by our MTFs declined from 36% to 30%.

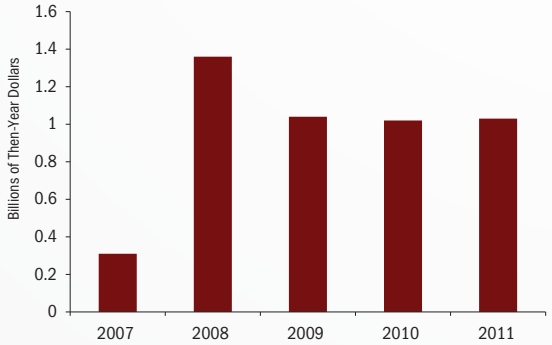
Source: TRICARE Publication FY2011 Report to Congress

5.1 Bringing Care Back into our MTFs

Operating Our World Class Facilities at Full Capacity

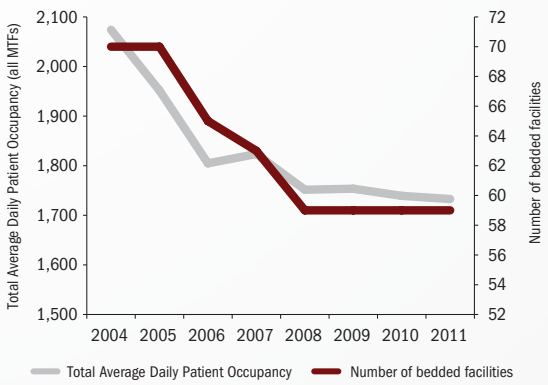
Over the past four years we have seen unprecedented investment in medical facilities for the MHS, but we have also seen a reduction in the occupancy of our hospitals. We intend to reverse that trend and operate at full capacity in support of both graduate medical education and the readiness of our healthcare team.

Amount Spent on Military Health Construction



Prior to 2008, the DoD invested approximately $300 million in military medical construction per year. From 2008-2011 that investment increased to over $1 billion per year. As a result, the MHS now has an increased number of truly state-of-the-art hospitals and clinics.

Average Daily Patient Occupancy Across the MHS

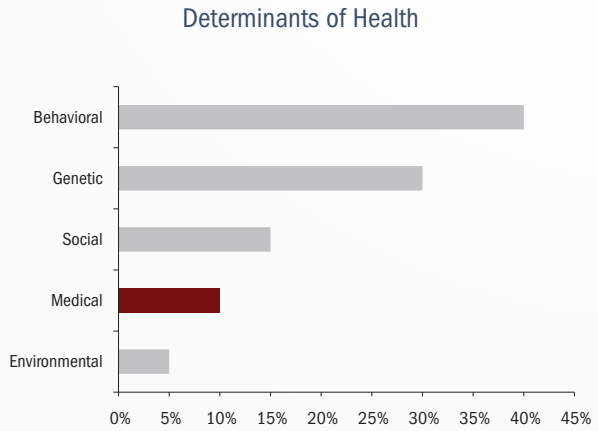


Since 2004, the average number of patients per day in all MHS hospitals has gone from nearly 2,100 to about 1,700. During this same period we closed over ten hospitals as part of base realignment and closure.

Source: TRICARE Publication FY2011 Report to Congress

5.2 Transforming from Healthcare to Health

Focusing on the Major Contributors to Health Outcomes



The actual causes of illness and death in the United States often relate to personal behaviors that the health care system fails to address. To achieve our transformation from healthcare to health, we will have to learn better ways to help people adopt a healthier lifestyle. In the near term, we will focus on ways to reduce obesity and reduce tobacco use.

Source: Schroeder, Steven A., We Can Do Better -- Improving the Health of the American People, N Engl J Med 2007 357: 1221-1228

5.3 Performing the Role of the Integrator

There are 9.7 million Americans who rely on us to ensure their health care needs are met – whether through delivery of care, coordination of care with the civilian sector or coverage of care through an exceptional health insurance product.

Regardless of who delivers the care, the MHS has to tie the pieces together. We are the integrator.

Here are the five elements of integration in which every world-class health system must excel, and which we will place added emphasis on in 2012:

- Making patients and families part of the care team
- Re-designing how primary care is delivered
- Ensuring population health management
- Aligning financial systems and incentives across the MHS
- Integrating systems of care – and information systems – into an enterprise-wide model

5.4 Partnering to Achieve the Quadruple Aim

The MHS is a learning – and teaching – organization. We are going to engage with federal health partners and thought leaders in the private sector in a targeted and disciplined manner to create more opportunities for interaction, sharing and collaboration. These are just a few examples now underway:

- Closer integration and sharing with the Department of Veterans Affairs
- Formal engagement with the High Value Health Collaborative – led by Dartmouth and joined by six other leading health organizations in the United States, we will securely share our data to collaboratively understand existing care delivery models and export best practices across our system
- Participation as a member in the Innovation Learning Network – led by Kaiser and joined by 16 other health systems, we will engage with these institutions to share system-wide improvements that advance military and civilian medicine

6.0 Turning Strategy to Action: Our 2012 MHS Strategic Initiatives

Readiness

- Operate our MTFs at full capacity to support readiness and graduate medical education
- Implement policies, procedures and partnerships to meet individual medical readiness goals
- Integrate and optimize psychological health programs to improve outcomes and enhance value
- Implement DoD/VA joint strategic plan for mental health to improve coordination

Population Health

- Improve the measurement and management of population health to accelerate the shift from healthcare to health

Experience of Care

- Implement evidence-based practices across the MHS to improve quality and safety
- Implement patient-centered medical homes to transform and improve primary care
- Optimize pharmacy practices to improve quality and reduce costs
- Create alternative strategy for purchasing care to improve Quadruple Aim performance

Per Capita Cost

- Implement alternative payment mechanisms to pay for value

Learning & Growth

- Implement modernized EHR to improve outcomes and enhance interoperability
- Improve governance to achieve better Quadruple Aim performance
- Improve enterprise clinical intelligence to improve quality and reduce waste
- Promote a culture of innovation to achieve breakthrough performance

The MHS: Healthcare to Health

Experience at the Cutting Edges of High Value Care: Case Studies

By Paul Markovich

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NO. 9 (2012): 1969–1976

INNOVATION PROFILE

A Global Budget Pilot Project Among Provider Partners And Blue Shield Of California Led To Savings In First Two Years

Paul Markovich (paul.markovich@blueshieldca.com) is president and chief operating officer of Blue Shield of California, in San Francisco.

ABSTRACT **Health care plans and providers in the private sector are developing alternative payment and delivery models to reduce spending and improve health care quality. To respond to intense competition from other organizations, Blue Shield of California created a partnership with health care providers to use an annual global budget for total expected spending and to share risk and savings among partners for providing health care. The patient population consisted of certain members of the California Public Employees' Retirement System in Northern California. Launched in 2010, the pilot accountable care organization in Sacramento provided a framework for operations and established goals and financial risk arrangements. The model shows early promise for its ease of implementation and effectiveness in controlling costs. During the two-year period, the total compound annual growth rate for per member per month cost was approximately 3 percent, or less than half the rate at which premiums rose over the past decade. Some of the savings stemmed from declines in inpatient lengths-of-stay and thirty-day readmission rates. Results suggest that the approach can achieve considerable financial savings in as little as one year and can gain wide acceptance from reform-minded providers.**

Public and private payers have made numerous attempts to alter the methods by which providers are paid, with the goal of creating incentives for providers to deliver health care more efficiently and effectively. Federal and state policy makers have focused their payment reform efforts primarily on Medicare and Medicaid.

However, alternative payment and delivery models are proliferating in the private sector to test how best to change the prevailing fee-for-service reimbursement method and get better value for dollars spent. These models include patient-centered medical homes, in which a personal physician coordinates a team of people to provide comprehensive and integrated care; bundled payments, which reimburse multiple providers for clinically defined episodes of care; and, more recently, accountable care organizations, which are alliances of physicians, hospitals, and other providers that agree to be accountable for the quality, cost, and overall care of a defined group of patients.

Blue Shield of California has adopted an approach to effectively aligning incentives among health plan and provider partners by using a global budget with shared risk layered atop existing payment mechanisms. This approach involves establishing a global per member per

month target amount for the cost of health care without changing the underlying payment mechanisms to physicians and hospitals.

The global target and shared risk among partners for achieving the target aligns incentives by giving all partners a financial stake in ensuring that expenses do not exceed the target. At the end of the year, if costs exceed that amount, the health plan, hospital, and physician group or individual physicians each write off those expenses. If expenses are below the target, the partners share in the savings.

To ensure financial integration, the partners agree to share savings as well as risks for each category of health care service within the per member per month target. This approach drives the clinical and technological integration needed to coordinate evidence-based care across care settings. It also provides a strong incentive to shed costs instead of shifting them from one provider to another or maximizing fees.

Blue Shield took this approach involving global payments and shared risks with its partners Dignity Health—formerly Catholic Healthcare West, the largest hospital system in California—and Hill Physicians Medical Group. Together, the partners launched a pilot accountable care organization in the greater Sacramento area in January 2010 for 41,000 California Public Employees' Retirement System (CalPERS) employees and dependents enrolled in a Blue Shield health maintenance organization.

Background

The main impetus for the pilot Sacramento accountable care organization was the need to address quickly the risk to the three partners' collective price for services and, by extension, market share. The partners collectively face strong competition from a more tightly integrated health system operating in the same market, Kaiser Permanente, which has 3.2 million members in Northern California alone.

The partners began talking about the collaboration in 2007 and signed an agreement in April 2009. Because all 41,000 members of the system that participated in the pilot accountable care organization are assigned to Hill Physicians Medical Group, and about 70–75 percent of their spending for services in health care facilities goes to Dignity Health, the parties had the critical mass that they needed to work together on the pilot organization.

Creating A Partnership

The first step was to establish mutual trust among the partners. For Blue Shield, this meant convincing Dignity Health and Hill Physicians Medical Group that the health plan was genuinely interested in sharing risk, not merely shifting it. Blue Shield had a fee-for-service arrangement with Dignity Health's hospitals, and the medical group used a capitation payment methodology with Blue Shield. All of the partners were accustomed to bargaining fiercely with each other over what payment rates were acceptable, with no financial integration to control utilization.

Because of this radically new approach, it was imperative that senior leaders from each of the three partners were personally involved in the effort to forge the partnership. For the development of the accountable care organization, a governing board was created, consisting of executive leaders from each partner. Members of the board included executive leaders from each organization, including a CEO, chief operating officer, senior vice president of networking, and chief medical officer. The board formulated strategy, made key decisions about funding and contracting, and, at times, broke deadlocks among the partners.

Agreeing On An Integration Framework

Once the partners had established a common agenda, the next step was to formalize their alignment in a contract that provided a framework for tight clinical and financial integration. The agreement specified membership, cost of health care, and utilization goals.

To develop the agreement, the partners formed a "cost of health care" team whose members were drawn from across the breadth of the three organizations, including clinical operations, finance, data analytics, marketing, contracts, and legal—which had to ensure that the collaboration complied with all laws and regulations, including those related to antitrust and privacy. As shown in Exhibit 1, the team concentrated on initiatives related to the following five key strategies: to improve information exchange, coordinate processes such as discharge planning, eliminate unnecessary care, reduce variation in practice and resources, and reduce pharmacy costs.

These strategies emerged from an exhaustive review of the target population to identify who and what were driving costs. The review focused on chronically ill patients, especially the 5,000 who accounted for 75 percent of total health care costs in the population for the pilot accountable care organization. The partners also classified hospital cases to identify heavy users and to establish benchmarks for improved care.

EXHIBIT 1

Strategies And Sample Initiatives To Improve Quality And Reduce Costs In A Pilot Accountable Care Organization In California

Strategy	Initiative
Facilitate the exchange of patient medical information through integrated electronic health information	Allow physicians to "push" electronic health records to hospitals with scheduling of patient admissions Build a tool on the Mobile MD platform to share clinical information
Reduce physician clinical and resource variation through quantitative analysis and targeted interventions	Reduce emergency department costs and use by shifting nonemergency visits to urgent care clinics or primary care providers Optimize outpatient surgery use and reimbursement; shift ambulatory surgery from partner facilities Develop programs to include preauthorization, clinical pathways, care planning, and adherence; educate and monitor physicians on accepted protocols
Manage utilization through coordinated operational infrastructure and clinical processes	Develop presurgical checklists for patient calls prior to procedures Build a process to identify, review, and correct causes of variation, providing opportunities to modify processes and change behaviors of physicians, hospitals, and support teams Coordinate pre- and postdischarge planning processes to avoid delays and readmissions Define and implement evidence-based guidelines (including those on the use of ineffective and marginal procedures) for surgeries in high-volume, high-cost hospital stays
Personalize care and disease management to eliminate unnecessary utilization and noncompliance with evidence-based care	Develop a comprehensive palliative care program across hospital, physicians, and care managers to engage patients and their families in end-of-life decisions Implement home-based medical care for high-risk, frail, elderly patients to improve their quality of life Identify centers of excellence in physical therapy so that chronic pain patients will learn new behaviors and explore underlying issues related to pain
Reduce pharmacy costs through directed member outreach, drug purchasing, and contracting strategies	Provide support to physician offices to implement processes and workflows that support oncology case rate methodologies to reduce injectable medication costs Increase use of generic medications through evaluation of primary care provider and specialist prescribing patterns

SOURCE Blue Shield of California.

The global per member per month target superseded the underlying capitation payment methodology for Hill Physicians Medical Group and the fee-for-service payment methodology for Dignity Health. All three partners assumed financial risk for meeting cost targets while maintaining or improving quality.

Goals For The Pilot Organization

The accountable care organization pilot had four goals. The first was to deliver cost savings and an immediate premium credit to CalPERS by reducing the growth in the cost of health care from 10 percent to 0 percent in the first year. The second was to grow the organization's membership by attracting new public agencies to contract with CalPERS for health benefits and increasing enrollment for the partners in the pilot.

The third goal was to maintain or, if possible, improve the quality of health care provided by the three partners. According to the agreement signed by the partners, no cost containment initiative could be launched if it was expected to have a negative impact on quality. In addition, several initiatives were designed to improve quality.

The fourth goal was to create a sustainable model for expansion to other geographic areas. In other words, the partners wanted to develop a model that would allow them to work together in the drive for continuous improvement in cost, quality, and service. The model needed to be financially sustainable for all three partners and to be applicable to other regions.

Sharing Financial Risk

As a result of the partners' agreement to reduce the growth in the cost of health care to 0 percent in the first year, CalPERS received an immediate premium credit of $15.5 million that came from all three partners, according to their agreement. The partners then had an urgent need to identify initiatives that would achieve savings.

Because all partners had both upside and downside financial risk for total health care expenditures, they had a powerful incentive to help each other. This imperative applied to all of the cost categories, which were divided as fol-

lows: facility costs, professional costs, mental health costs, pharmacy costs, and ancillary costs (Exhibit 2).

Each partner's degree of risk depended on its ability to influence per member per month costs in a particular category. As Exhibit 2 shows, Dignity Health carried more of the risk for facility costs; Hill Physicians Medical Group and Blue Shield assumed more risk for professional services; pharmacy cost risks were spread evenly across the partners; and Blue Shield assumed the greatest risk for ancillary services. In addition to developing the overall program structure and providing advanced analytics to help the accountable care organization coordinate care more effectively, Blue Shield oversaw information technology integration and provided guidance on legal issues.

The global budget approach is not a one-size-fits-all solution. The effectiveness of a global budget can be diluted in a broad network with no preassigned members—such as the current Medicare accountable care organization model. The reason is that a broad network greatly increases the complexity and number of provider relationships that need to be managed to effectively coordinate care. In addition, without preassigned members, it is difficult to perform the deep analyses necessary to understand a population's cost drivers and develop interventions based on clinical best practices to address those costs. A global budget is best suited for narrow networks with predefined populations.

First-Year Results

The first-year results of the pilot Sacramento accountable care organization have been positive. Blue Shield of California engaged Milliman, an actuarial and consulting firm, to conduct a rigorous analysis of the pilot organization's costs and savings in 2010, its first year of operation. Milliman concluded that the pilot program savings were $15.5 million, with per member costs 10 percent lower than those for Northern California CalPERS members not in the pilot.[1]

Health care costs for CalPERS members in the pilot accountable care organization were $393.08 per person per month in 2010, a 1.6 percent decrease from the 2009 baseline amount. For members not in the organization, costs were $435.94 per person per month, which was a 9.9 percent increase from 2009 for that group.

Half of the savings for the accountable care organization population came from reductions in health care resource use. The remainder came from slowing the rate of increase in unit cost reimbursement.

Milliman found that inpatient days for CalPERS members in the accountable care organization fell from 9,697 days in 2009 to 8,520 days in 2010—a decrease of 12.1 percent. At the same time, the number of members increased by about 2.5 percent from 2009 to 2010, meaning that the number of days spent in hospital per thousand members declined by about 15 percent.

Hospital days were also down for Blue Shield's members in the Sacramento area who were not in the accountable care organization, and for members statewide. However, those declines were only 5.9 percent and 4.9 percent, respectively.

In addition, hospital readmissions within thirty days of discharge for the CalPERS members in the accountable care organization also fell 15 percent, from an already low 5.4 percent of cases to 4.3 percent. And Blue Shield data showed that extended hospital stays—those of twenty days or longer—fell by 50 percent. Some

EXHIBIT 2

Allocation Of Risk For Three Partners In A Pilot Accountable Care Organization In California

Cost category	Per member per month target cost	Allocation of risk if actual costs fall above or below target cost		
		Dignity Health	Hill Physicians Medical Group	Blue Shield
Total facility				
Partner hospital	$180	50.0%	25.0%	25.0%
Out-of-area nonpartner hospital	25	25.0	25.0	50.0
Other nonpartner hospital	45	30.0	30.0	40.0
Professional	125	30.0	35.0	35.0
Mental health	10	0.0	0.0	100.0
Pharmacy	55	33.3	33.3	33.3
Ancillary	10	25.0	25.0	50.0

SOURCE Blue Shield of California. **NOTES** Total facility target cost is $250. Total target cost is $450.

of this decline appears to be random variation, however, because large claims for such extended hospital stays appear to have risen to a more normal level in 2011.

Most of the first-year savings from lower utilization could be attributed to reducing the average length-of-stay. According to Milliman, the pilot accountable care organization "experienced a larger reduction in inpatient length of stay than other areas in Northern California."[1(p5)] However, Milliman found an unexplained increase in emergency department utilization for CalPERS members in the pilot organization, something the three partners have sought to manage through interventions such as shifting nonurgent emergency department visits to care clinics.

Milliman's analysis confirmed the partners' belief that data sharing was key to their success in reducing the escalation of costs and premiums: "By sharing data, the three partner organizations have been able to identify where costs were unnecessarily high and implement solutions to bring those costs down. These insights would not have been possible without the collaboration required under the accountable care organization model."[1(p6)]

Overutilization, preventable readmissions, and out-of-network services were identified as the three areas ripest for bringing costs down further. For example, overuse of elective surgeries drove costs higher. "Hysterectomies and elective knee surgeries were revealed to be the biggest cost drivers," noted Milliman.[1(p6)] Costs and variation from evidence-based approaches for bariatric surgery for weight loss also stood out.

The accountable care organization saved CalPERS $15.5 million through the immediate premium credit delivered in 2010, and the three partners shared an additional $5 million in savings that were realized by managing to keep health care expenses below the budgeted target. This was in accordance with the global budget and risk share agreement.

Second-Year Results

The pilot organization continued to show positive results in its second year. For the two-year period 2010–11, it delivered $37 million in savings to CalPERS, based on the growth in the cost of health care in the pilot compared to what that growth would have been without the pilot in place. The partners beat the 2011 cost of health care target by $8 million, which was shared by the partners according to their agreement.

The thirty-day readmission rate continued to decline, from 4.3 percent in 2010 to 4.1 percent in 2011. Average length-of-stay, which decreased from 4.05 days in 2009 to 3.53 in 2010, increased to 3.74 in 2011 because of a considerable increase in catastrophic cases. But it remained below 2009 levels and was well below that of Northern California CalPERS members who were not in the pilot accountable care organization.

During the two-year period, the compound annual growth rate for per member per month cost was approximately 3 percent, which was markedly lower than the increase Blue Shield experienced elsewhere in the region and state. That level of increase—projected to remain roughly the same for 2012—is less than half the rate at which premiums rose over the past decade, as health care costs increased unsustainably and those costs were increasingly shifted to private payers.

Discussion

The global budget approach has worked for the pilot accountable care organization for four main reasons. The approach effectively aligned incentives, was easy to implement, enabled rapid identification of opportunities to deliver cost and quality improvements, and established incentives to achieve short-term process improvements and keep patients healthy over the long term.

ALIGNED INCENTIVES In developing the pilot accountable care organization, the three partners sought to address shortcomings in the existing reimbursement structure. Specifically, they sought to reward efficiency and quality rather than quantity. Although cost growth needed to be restrained, simply reducing provider reimbursements was not a sustainable long-term approach because it would not provide the financial incentive needed for all of the partners to coordinate care more efficiently.

Health plan and employer incentives generally affect one component of health care delivery without reinforcing a long-term, systemwide approach. For example, benefit changes affect member cost and behavior but don't address the lack of coordination between providers and the health plan. In addition, incentives that health plans give to providers do not generally reward hospitals for being more efficient. The existing reimbursement structure provided no incentives for the three partners—a health plan, a hospital, and a medical group—to work together to improve care delivery.

The global budget and risk sharing elements of the pilot accountable care organization created financial alignment and ensured that all partners would pursue only those care delivery and cost containment strategies that were tied directly to

agreed-on metrics for membership, cost of health care, and utilization while maintaining or improving quality.

This arrangement provided a powerful way to tie providers directly to the premium that the customer (in this case, CalPERS) pays and to see how the price they charge compares to that of the competition (Kaiser Permanente). Largely because of the risk sharing agreement and the partners' commitment to working together, the pilot program turned a traditional adversarial relationship into a model in which everyone was on the same side.

EASY IMPLEMENTATION A macro-level budget approach can be deployed quickly because it is a simple approach to introduce. There is no change in day-to-day reimbursement levels, and therefore there is no need to perform complicated analytics to understand whether the new payment method is budget-neutral. Once the partners determined how to work together and decided on the global budget approach, it took less than three months to agree on the details for global budgets and risk sharing.

An alternative approach that other groups have adopted is payment bundling. This is a very complex undertaking, as is shown by the years required to address administrative, technical, and communication challenges by the providers and payers participating in the PROMOTHEUS payment program, an initiative of the Health Care Incentives Improvement Institute.[2] Any bundled payment approach involves defining the bundle of services to be covered; developing new contracts; retooling information systems; training staff members to bill, disburse, and collect payments; developing the actuarial and financial skills necessary to figure out how to split the payment into its appropriate pieces; and tracking and managing costs.

EASILY IDENTIFIED IMPROVEMENTS The global budget approach facilitates a high-level perspective and lets partners quickly identify clinical and cost "hot spots" where opportunities exist for the greatest improvement. Partners can then agree on what changes to make and can create value by reengineering the clinical process.

For instance, the three partners in the pilot accountable care organization spent considerable effort developing a new integrated discharge planning process that was instrumental in reducing readmissions in the first year of the organization. Key elements of the new process included creating a summary of the essential medical issues in each case within forty-eight hours of admission and conducting a post-discharge needs assessment.

The new process also included analyzing the clinical course and major events of the hospitalization; integrating lab results into confirmations of diagnoses; and identifying principal and relevant secondary clinical diagnoses on discharge. And the new process involved medication reconciliation to check for errors and interactions and a component that ensured that follow-up appointments were scheduled within appropriate periods.

The partners also redesigned the patient education process to improve patient and family or caregiver understanding of the discharge plan and self-care requirements. Patients were provided with a discharge plan written in nontechnical language. That discharge plan was also forwarded to the patient's medical group.

ESTABLISHED INCENTIVES One problem with solutions like bundled payments is that they pay providers to care for patients who are already ill. In contrast, a global budget model with risk sharing encourages all parties to keep patients healthy, use clinical interventions only when necessary, and work closely together to ensure that patients receive the most appropriate and timely care.

It takes more than a few years to achieve cost savings by sustainably improving the health of a population. Although these savings are essential to the long-term success of this global budget approach, the three partners achieved shorter-term success by identifying changes they could make to administrative and clinical processes to streamline care and reduce unnecessary utilization by patients. The fact that CalPERS received an immediate premium credit from the partners according to their risk sharing agreement provided a powerful incentive for them to collaborate to deliver cost savings.

EXPANDING THE GLOBAL BUDGET APPROACH The pilot accountable care organization has attracted national attention. On a visit to Dignity Health's Saint Francis Memorial Hospital in San Francisco on September 16, 2011, health and human services secretary Kathleen Sebelius was briefed on the partners' collaboration. At that event, she said, "This program is on our radar screen as one of the best examples of patient care in the country, and the kind of care that people elsewhere hope to enjoy in the future."[3]

The global budget model is showing promise elsewhere, too. Researchers from Harvard Medical School studied the first two years of data from Blue Cross Blue Shield of Massachusetts's Alternative Quality Contract, that health plan's global budget program. The researchers found that the program slowed the underlying growth in medical spending and improved quality of care, compared to control groups, by shifting procedures to facilities that charged lower fees; reducing utilization among some groups of patients;

and delivering improvements in chronic care management, adult preventive care, and pediatric care.[4]

As shown in the online Appendix,[5] Blue Shield of California is applying the global budget approach in a total of eight accountable care organizations serving 130,000 members across California. The aim is to establish at least twenty accountable care organizations by 2015. In addition, to strengthen the model, the three partners are adding quality and efficiency incentives, and patient satisfaction goals and measures are under development.

Conclusion

The partners' experience to date suggests that a global budget approach can gain wide acceptance from reform-minded providers eager to make changes that can yield savings and improvements in clinical care. At the same time, providers may be wary of what a completely new payment method would mean for them. Blue Shield now has eight accountable care organizations across California that use global budgets and has received requests to establish more than a dozen other such organizations.

A global budget aligns incentives effectively, is easier to implement than bundled payments, enables the participants to immediately focus on improving care delivery, and rewards providers if patients stay healthy. For all of these reasons, it also has the potential to be quickly expanded.

A large majority of Americans do not have ready access to fully integrated networks such as Kaiser Permanente, Mayo Clinic, or Geisinger Health System. Integration like that of the three partners in the pilot accountable care organization described here is one way to provide improved, more tightly coordinated, and more effective care in markets lacking such networks.

Working with a variety of provider partners, Blue Shield of California is demonstrating how this risk sharing model improves care delivery by aligning physicians and hospitals with the payer. The rapid early expansion of this approach suggests that the model is replicable and easy to expand.

After decades of unchecked growth in health care costs and difficulty in trying to rid the payment system of perverse incentives, this model provides an example of a system that brings providers and payers together to share the savings from better coordinated care, and to pay a price if there are no savings. This innovative model may help Americans get the care they need at a price they can afford. ■

This article is an enhancement of a presentation delivered at America's Health Insurance Plans' Summit on Shared Accountability, Washington, D.C., October 18, 2011. *Health Affairs* was a media partner for this event.

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5 To access the Appendix, click on the Appendix link in the box to the right of the article online.

ABOUT THE AUTHOR: PAUL MARKOVICH

Paul Markovich is president and chief operating officer of Blue Shield of California.

In this month's *Health Affairs*, Paul Markovich, president and chief operating officer of Blue Shield of California, reports on a partnership that his organization created in 2010 with local providers to provide care for certain members of the California Public Employees' Retirement System in Northern California. Based on an annual global budget for total expected spending, and with shared risk and savings among the partners, adoption of the model has so far resulted in considerable financial savings from such factors as declines in inpatient lengths-of-stay.

At Blue Shield of California, a 3.3 million member not-for-profit health plan that serves the commercial, individual, and government markets, Markovich oversees health care services, network management, e-business, marketing, product development, customer operations, and all three of Blue Shield's business units that offer medical and specialty benefits coverage. He was appointed president of Blue Shield and a member of its board of directors in June 2012, and he will assume the position of CEO in January 2013.

This is Markovich's second tour of duty with Blue Shield. In the late 1990s he led the company's product development unit, and he introduced such products and services as the first California health maintenance organization to allow self-referrals to specialists. He went on to found a consumer-driven health plan, mywayhealth.com, and joined Definity Health, a consumer-driven health plan based in Minneapolis, before returning to Blue Shield of California.

Markovich has a bachelor of arts degree in international political economics from Colorado College and was a Rhodes Scholar. He serves on the board of directors of the Bay Area Council and the California Association of Health Plans.

By Ivan M. Tomek, Allison L. Sabel, Mark I. Froimson, George Muschler, David S. Jevsevar, Karl M. Koenig, David G. Lewallen, James M. Naessens, Lucy A. Savitz, James L. Westrich, William B. Weeks, and James N. Weinstein

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INNOVATION PROFILE

A Collaborative Of Leading Health Systems Finds Wide Variations In Total Knee Replacement Delivery And Takes Steps To Improve Value

ABSTRACT Members of a consortium of leading US health care systems, known as the High Value Healthcare Collaborative, used administrative data to examine differences in their delivery of primary total knee replacement. The goal was to identify opportunities to improve health care value by increasing the quality and reducing the cost of that procedure. The study showed substantial variations across the participating health care organizations in surgery times, hospital lengths-of-stay, discharge dispositions, and in-hospital complication rates. The study also revealed that higher surgeon caseloads were associated with shorter lengths-of-stay and operating time, as well as fewer in-hospital complications. These findings led the consortium to test more coordinated management for medically complex patients, more use of dedicated teams, and a process to improve the management of patients' expectations. These innovations are now being tried by the consortium's members to evaluate whether they increase health care value.

Ivan M. Tomek is an orthopedic surgeon at Dartmouth-Hitchcock Medical Center and an assistant professor of orthopedic surgery at both the Geisel School of Medicine at Dartmouth and the Dartmouth Institute for Health Policy and Clinical Practice, in Lebanon, New Hampshire.

Allison L. Sabel is director of biostatistics and clinical data warehousing at Denver Health Medical Center and an assistant professor in the Department of Biostatistics and Informatics at the Colorado School of Public Health, University of Colorado, in Denver.

Mark I. Froimson is an orthopedic surgeon at Cleveland Clinic and is president and CEO of Euclid Hospital, in Euclid, Ohio.

George Muschler is vice chair of the Orthopedic and Rheumatologic Institute at Cleveland Clinic and director of its Orthopedic and Rheumatologic Research Centers, in Cleveland, Ohio.

David S. Jevsevar is the medical director of orthopedic clinical program development, medical director of surgical services, and chair of the clinical council for the southwest region of Intermountain Healthcare, in St. George, Utah.

The Affordable Care Act of 2010 has left an indelible mark on the face of American medicine, regardless of what happens with respect to its implementation. The conversation is no longer dominated by organizations attempting to spread the high fixed costs of health care by increasing the amount of care provided. Instead, incentives are being provided for quality of care and opportunities to reduce costs.[1–3] Avoiding unnecessary health care is a central component of this new effort.

The High Value Healthcare Collaborative is a consortium of health care systems that was formed with the intent of accelerating the process of improving quality of care while reducing cost (see the online Appendix for more details).[4] The collaborative's six founders are Cleveland Clinic; Denver Health; Dartmouth-Hitchcock Medical Center; the Dartmouth Institute for Health Policy and Clinical Practice; Intermountain Healthcare; and Mayo Clinic. In pursuit of these goals of improving quality and reducing cost, members of the consortium compiled a list of nine health conditions and procedures to examine, beginning with primary total knee replacement. The nine conditions were selected because of their national prevalence as well as the societal expense of treating patients affected by them.

The collaborative draws on the sharing and analysis of clinically enhanced administrative data to examine variation in health services delivery among the member systems; compare institutional processes of care delivery and identify opportunities to improve health care value; mea-

Karl M. Koenig is an orthopedic surgeon and an assistant professor in the Department of Orthopaedic Surgery, and leads the Joint Replacement Program at Dartmouth-Hitchcock Medical Center.

David G. Lewallen is a professor of orthopedic surgery and a consultant in the Department of Orthopedic Surgery at Mayo Clinic, in Rochester, Minnesota.

James M. Naessens is a health services researcher and an associate professor of health services research and biostatistics at Mayo Clinic.

Lucy A. Savitz is director of research and education at the Intermountain Healthcare Institute for Health Care Delivery Research, in Salt Lake City, Utah.

James L. Westrich is the senior statistical analyst at the High Value Healthcare Collaborative, Dartmouth Institute for Health Policy and Clinical Practice.

William B. Weeks is medical director of the High Value Healthcare Collaborative at the Dartmouth Institute.

James N. Weinstein is president and CEO of the Dartmouth-Hitchcock Health System and founding member of the High Value Healthcare Collaborative executive committee. He is a member of the Institute of Medicine and holds the Peggy Y. Thomson Chair in the evaluative clinical sciences at Dartmouth College.

sure the effectiveness of alternative practices; and develop replicable and exportable innovations to spread best practices and thereby increase health care value.

In this article we summarize efforts by the collaborative to improve value in the provision of primary total knee replacement.

Background

The collaborative chose total knee replacement as its first condition to examine, for several reasons.

First, knee osteoarthritis is a common condition whose treatment is expensive. The lifetime risk of symptomatic knee osteoarthritis is estimated to be nearly 50 percent, and the two major risk factors are aging and obesity.[5] In 2008, total knee replacement inpatient costs exceeded $9 billion—the highest aggregate cost among the ten procedures for which demand is growing the fastest.[6] Between 2005 and 2030, the demand for primary knee arthroplasty in the United States is projected to grow by 673 percent, or 3.48 million procedures annually. More resource-intensive total knee revisions—a procedure that repairs or replaces a previous replacement—are projected to grow by 601 percent between 2005 and 2030.[7] In 2005, medical expenditures for the treatment of arthritis were $353 billion, and they are expected to rise because of increases in the number of people with osteoarthritis.[8]

Second, total knee replacement is one of the most successful surgical procedures ever studied and is highly effective at restoring mobility and reducing pain where nonsurgical options fail.[9] Current evidence suggests that medical management, although reasonably effective in treating mild to moderate osteoarthrosis, is much less effective than surgery in treating severe knee disease.[10]

Third, there are few population-level data on total knee replacement procedures and outcomes in the United States, and collecting such data and using them to derive best practices should improve joint replacement outcomes. Although efforts are again under way to start a national joint replacement registry, the United States remains the only major industrialized country that does not have a national effort to track outcomes after knee arthroplasty. In contrast, Sweden has had a registry in place since the 1970s that has helped improve knee replacement outcomes by identifying underperforming implants and practices.[11] Medicare data, which include mainly patients age sixty-five or older, are limited in the information they provide and are not representative of the increasingly younger population of patients undergoing primary total knee replacement.[12]

Finally, data from the Dartmouth Atlas Project[13] show that there is wide variation in knee arthroplasty rates among Medicare enrollees based on geographic location as well as sex and race. This has led some analysts to question whether total knee replacement is overused in some populations or underused in others. Enthusiasm among orthopedic surgeons for knee replacement may be a contributor to high rates of use in some areas.[14] Therefore, lack of decision support for most knee osteoarthritis patients may also contribute to the variation observed.

As a first step toward identifying ways to improve the value of health service delivery, the High Value Healthcare Collaborative's five founding member institutions examined total knee replacement cases to identify variations in care, processes, resource consumption, and outcomes. Review and analysis of the collective data identified several potential innovations that warranted further investigation or implementation. Plans are under way to evaluate the widespread adoption of three unique care processes believed to be associated with improved health care value for total knee replacement patients: inpatient care comanagement, establishment of dedicated surgical teams, and a patient expectations management process.

Study Data And Methods

DATA SET In 2010 the founding members of the collaborative initiated a collective study of the characteristics of total knee replacement delivery in their respective systems. Each health care system contributed at least one investigator to a team that developed data definitions for the identification of total knee replacements and comorbidities. The team used the *International Classification of Diseases*, Ninth Revision, Clinical Modification (ICD-9-CM), diagnosis and procedure codes, as well as Medicare severity diagnosis-related group codes, which were collected from billing and administrative data. For this analysis, health care delivery organization members were randomly designated as A through E.

The analysis was limited to single (left or right) primary total knee replacements (ICD-9-CM procedure code 81.54). Revision total knee replacements—repairing or replacing a previous replacement—were omitted from the analysis. Patients were included if they were ages 18–89 as of January 1, 2008; were discharged after total knee replacement in 2008 or 2009; and had a principal diagnosis of osteoarthritis, defined using the Healthcare Cost and Utilization Project Clinical Classifications Software for ICD-9-CM.[15]

Patients were excluded if procedure codes indicated that additional orthopedic procedures were completed on the same day as the total knee replacement. Generally, these were procedures done on the opposite knee (arthroscopy or arthroplasty), but they also included other types of procedures indicative of an atypical total knee replacement such as hardware removal or osteotomy.

We collected information for all subsequent health system encounters—inpatient, outpatient hospital, ambulatory surgery center, or emergency department—for patients included in the total knee replacement cohort from time of surgery through 365 days after surgery. The data set included information about the hospital stay—including the day of the week on which the procedure was performed, length of hospitalization, and type of admission; patient demographics; source of admission; payer; diagnosis codes; procedure codes; charges; discharge disposition; and the operating surgeon.

COMORBIDITY We used ICD-9-CM diagnosis codes to calculate measures of comorbidity using both the Deyo-modified Charlson[16,17] and Elixhauser[18] methodologies. The former indicates mortality risk, and the latter indicates chronic disease burden. We also used these data to calculate the rate of complications as defined by a technical expert panel, convened by the Yale New Haven Health Services Corporation Center for Outcomes Research and Evaluation.[19] These included acute myocardial infarction; pneumonia; sepsis or septicemia; surgical site bleeding with related procedure; wound infection with related procedure; pulmonary embolism; mechanical complications; periprosthetic joint infection with related procedure; and death.

COMPLICATIONS For several reasons, complication rates were calculated only for complications that occurred during the index admission. The reasons included the following: the inconsistent collection of follow-up outpatient data across member health care systems; loss of patient follow-up within the particular system of care; and the fact that some organizations had voluntary medical staff whose billing data were not captured by the hospital system.

PATIENTS' CLINICAL PROFILES Finally, a clinical profile of the inpatient stay was obtained for all patients. Data included height; weight; the patient's American Society of Anesthesiologists score, which is a global score that assesses a patient's physical status before surgery; and operating time, defined as the number of minutes between opening incision and closing suture for the total knee replacement. Correlation coefficients were used to examine the relationship between the number of total knee replacements performed by individual surgeons during the study period and length-of-stay, operating time, and complication rate.

ANALYSIS Analysis of variance was used to examine mean differences in continuous variables, and the chi-square test was used to examine frequency distribution differences in categorical variables across health care organizations. In addition, stepwise multiple linear regression was used to examine the relationship between length-of-stay and patient age, sex, body mass index, and comorbidities.

We also assessed pay source, discharge disposition, operating time, day of week on which the surgery occurred, and the individual surgeons' number of total knee replacements performed during the study period. Logistic regression was used to model the development of complications. Because they were not normally distributed, length-of-stay and operating time were log-transformed for statistical analysis, and nonnormalized data were presented for ease of interpretation.

The study was approved by Dartmouth College's Committee for the Protection of Human Subjects.

LIMITATIONS The major limitations of the study were those related to the use of administrative-level data for clinical research, as well as the limitations of a retrospective study design. It was impossible to examine several critical outcomes related to total knee replacement about which administrative data were not collected, such as functional status of the knee at different postoperative intervals, patient outcomes such as quality of life and satisfaction, and costs of care provided. Because processes of care and coding practices varied considerably across organizations, random chart review to assure data comparability was sometimes required. In the future, we anticipate the integration of supplemental data on costs, health status, and outcomes, collected from the diverse data systems at each site.

Furthermore, as a retrospective observational study, all findings were associative and did not confirm causation. Although information was collected regarding postoperative complications, the calculation of complication rates was limited to events that occurred during the index admission, as noted above. This was because collaborative organizations differed in the extent of follow-up outpatient care captured by their information systems.

Finally, the five member organizations had somewhat different missions—varying from purely academic to primarily private practice—which might explain some of the observed variation.

Study Results

For total knee replacement delivery, we found substantial differences in surgeon caseload, patient age and weight, and medical comorbidity scores across member health care systems (Exhibit 1). In the entire sample of total knee replacement patients, 45.6 percent were ages 45–64, and 59.7 percent were female. Almost 90 percent of patients were classified as overweight, obese, or morbidly obese. The majority of patients had a Charlson score of 0, indicating no medical comorbidities predictive of mortality, and a relatively low Elixhauser-determined burden of illness.

Unadjusted hospital lengths-of-stay varied by health care system, individual surgeons' total number of knee replacements performed, and day of the week on which the surgery occurred ($p < 0.001$) (Exhibit 2). Across organizations, surgeons who had performed more total knee replacements generally had shorter lengths-of-stay ($r = -0.24$; $p < 0.001$). Generally, lengths-of-stay were longer if the surgery occurred later in the week ($p < 0.001$).

Similarly, operating time varied across health care delivery organizations, with System E having the shortest operating time (80 minutes) and System D having the longest (105 minutes) ($p < 0.001$). Overall, longer operating time was associated with longer length-of-stay ($r = 0.25$; $p < 0.001$), and operating time trended lower with higher surgeon caseloads ($r = -0.38$; $p < 0.001$).

Inpatient complication rates were variable as well but were generally low across member systems (mean 0.8 percent; range 0.2–1.6 percent). Surgeon caseload was associated with a lower complication rate during the index admission ($r = -0.03$; $p < 0.001$). Discharge disposition varied considerably across sites: Patients who received care in Systems B and D were much more likely to be discharged to home and self-care than those receiving care at the other sites. Those two systems also reported a slightly higher-than-average rate of hospital readmission in the thirty-day period after surgery.

We found that longer lengths-of-stay were associated with patients who were older, were male, had more comorbidities, were morbidly obese, and were Medicare enrollees (Exhibit 3). Patients who were older, had more comorbidities, were morbidly obese, and were treated by surgeons who had performed fewer total knee replacements were more likely than others to

EXHIBIT 1

Characteristics Of Patients Receiving A Single Total Knee Replacement, By Health Care Delivery System

	Health care delivery system					
Characteristic	**A (*n* = 581)**	**B (*n* = 175)**	**C (*n* = 1,225)**	**D (*n* = 2,345)**	**E (*n* = 6,584)**	**Total (*n* = 10,910)**
Female	60.1%	64.0%	58.3%	56.9%	60.8%	59.7%
AGE (YEARS)						
45–64	51.8	67.4	46.9	34.8	48.0	45.6
65–74	25.5	22.3	29.6	36.2	32.7	32.6
75 and older	18.2	8.0	21.6	27.3	17.0	19.7
BMI CATEGORY						
Healthy weight	15.0	6.2	9.6	9.7	12.1	11.3
Overweight	29.5	29.7	27.1	29.6	28.9	28.9
Obese	22.9	33.1	30.1	31.0	28.0	28.7
Morbidly obese	32.2	30.3	33.1	29.5	30.5	30.7
ELIXHAUSER SUMMARY SCORE						
0	26.0	24.0	23.0	30.3	34.2	31.5
1	27.9	36.6	31.5	32.4	32.1	31.9
2	24.0	22.3	24.8	19.4	19.6	20.4
3–4	17.4	17.1	18.4	14.5	12.4	13.9
5–8	4.7	0.0	2.5	3.5	1.7	2.3
CHARLSON SUMMARY SCORE						
0	59.6	79.4	62.0	62.9	61.7	62.2
1	13.1	1.7	13.6	12.9	17.0	15.3
2	15.7	12.0	13.7	13.2	13.4	13.5
3–4	7.2	5.7	8.0	7.3	6.1	6.6
5 or higher	4.5	1.1	2.7	3.7	1.7	2.4

SOURCE Authors' analysis. **NOTES** The five health care systems providing data were assigned letters A–E to maintain confidentiality. BMI is body mass index.

EXHIBIT 2

Characteristics Of Single Total Knee Replacement Admissions, By Health Care Delivery System

	Health care delivery system					
Characteristic	**A**	**B**	**C**	**D**	**E**	**Total**
LENGTH-OF-STAY (DAYS)						
Mean	3.6	4.2	3.9	3.3	3.0	3.2
Standard deviation	1.5	1.8	1.9	1.1	0.9	1.2
Median	3	4	3	3	3	3
MEAN LENGTH-OF-STAY (DAYS), BY PHYSICIAN'S ANNUAL NUMBER OF PROCEDURES						
0–99 procedures	3.6	3.8	4.4	3.5	3.3	3.5
100–199 procedures	3.6	4.2	4.1	3.4	3.0	3.3
200+ procedures	—[a]	—[a]	3.4	3.0	2.8	2.9
MEAN LENGTH-OF-STAY (DAYS), BY PROCEDURE DAY OF WEEK						
Monday	3.6	4.2	3.7	3.2	2.9	3.1
Tuesday	3.5	4.5	3.7	3.1	2.8	3.1
Wednesday	3.6	4.0	4.5	3.3	3.1	3.3
Thursday	3.5	4.0	3.7	3.5	3.2	3.4
Friday	3.6	—[a]	4.3	3.4	3.0	3.3
OPERATING TIME (MINUTES)						
Mean	100	102	97	105	80	89
Standard deviation	21	21	36	37	27	32
Median	96	101	92	101	73	81
OPERATING TIME (MINUTES), BY PHYSICIAN'S ANNUAL NUMBER OF PROCEDURES						
0–99 procedures	95	99	96	118	98	99
100–199 procedures	102	103	103	106	80	94
200+ procedures	—[a]	—[a]	93	101	66	78
OTHER FACTORS						
Complications during index admission	0.9%	1.1%	1.6%	0.2%	0.8%	0.8%
All-cause readmissions	2.4	4.6	2.9	3.2	2.2	2.4
DISCHARGE DISPOSITION						
Self-care	5.2%	88.6%	13.8%	65.8%	7.7%	22.0%
Home health care	67.8	1.7	47.5	2.6	58.9	45.1
Hospital	11.4	1.1	13.1	2.6	4.5	5.4
Nursing facility	15.5	8.0	25.1	29.1	28.8	27.4

SOURCE Authors' analysis. **NOTES** The five health care systems providing data were assigned letters A–E to maintain confidentiality. Sample sizes are presented in Exhibit 1. Complications are those defined by the technical expert panel (see Note 19 in text). [a]Operations were not performed within these parameters.

have a complication during the index surgery hospitalization. Overall, those obtaining care in System D were less likely to have an in-hospital complication than those obtaining care in the other four organizations.

Discussion

This initial report from the High Value Healthcare Collaborative highlights considerable variation across the five health care systems in number of surgical procedures, inpatient stays, operating times, discharge dispositions, and inpatient complication rates for patients undergoing total knee replacement.

Surgeons who performed more total knee replacements tended to have shorter lengths-of-stay, shorter operating times, and fewer complications. After adjusting for differences in patient populations served, we found that total knee replacements in older and sicker patients, those with longer operating times, and those done later in the week had longer lengths-of-stay and higher complication rates during the index surgery hospitalization, compared to other patients. These key findings are consistent with previously reported data indicating that higher surgeon and institutional volumes are associated with lower complication rates in total joint arthroplasty.[20] Similarly, increased medical comorbidity has been shown to have an association with increased complication rates.[21]

KEY FINDINGS One of the collaborative's goals was to identify variations in total knee replacement delivery that might lead to improved clinical outcomes or reduced costs. The collaborative partners decided to focus their subsequent efforts on three key findings.

EXHIBIT 3

Results Of The Stepwise Regression Analyses Regarding Lengths Of Hospital Stay And Surgical Complications Of Total Knee Replacement Surgery

Patient characteristics	Longer length-of-stay	Postoperative complication during index admission
Older age	<0.001	0.028
Female sex	<0.001	—[a]
Higher Charlson score	<0.001	—[a]
Morbidly obese	0.02	0.004
Medicare patient	<0.001	—[a]
OPERATION CHARACTERISTICS		
Longer operating time	<0.001	—[a]
Performed by surgeon with lower annual knee replacement caseload	<0.001	0.002
Done Monday (as opposed to Tuesday)	0.039	—[a]
Done Wednesday (as opposed to Tuesday)	<0.001	—[a]
Done Thursday (as opposed to Tuesday)	<0.001	—[a]
Done Friday (as opposed to Tuesday)	<0.001	0.043 (fewer complications occurred on Fridays)
DISCHARGE DISPOSITION		
To an inpatient setting	<0.001	—[a]
To a rehabilitation hospital	<0.001	—[a]
To a skilled nursing facility	<0.001	—[a]
COMPARED TO CARE IN SYSTEM E		
Care in System A	<0.001	—[a]
Care in System B	<0.001	—[a]
Care in System C	<0.001	—[a]
Care in System D	<0.001	<0.001 (fewer complications occurred in system D)
Adjusted R^2	0.216	0.091

SOURCE Authors' analysis. **NOTES** The five health care systems providing data were assigned letters A–E to maintain confidentiality. Complications are those defined by the technical expert panel (see Note 19 in text). Only statistically significant results are shown. [a]These results had *p* values that were 0.05 or greater.

▶**COORDINATED MANAGEMENT OF PATIENTS:** First, we found that the health system with the lowest in-hospital complication rate had successfully developed and implemented an outpatient preoperative approach that emphasized multispecialty evaluation of potential arthroplasty candidates, followed by an inpatient comanagement approach involving anesthesia, internal medicine, and orthopedic surgery. This differed from other institutions, where the orthopedic surgery team was generally responsible for medical management.

Because several of the other collaborative partners had already begun working on initiatives to comanage medically complex patients, this innovation was chosen to be replicated in the other health systems. And because our initial analyses confirmed the relationship between greater comorbidity and higher inpatient complication rates, we anticipate that more coordinated management of medically complex patients should reduce complication rates and total knee replacement costs across the participating systems.

▶**DEDICATED OPERATING ROOM TEAM:** The second identified practice variation was derived from our finding that longer surgery times were associated with higher inpatient complication rates. From the collective discussions after the data analysis, we discovered that the fastest operations occurred at the only hospital where total knee replacement surgeons were consistently matched with the same teams of specialized arthroplasty scrub technicians and nurses.

The benefit of a dedicated operating room team seems logical, given that total knee replacement is a procedure that requires staff to be familiar with with multiple pans of instruments, machinery, and other technologies that are used to implant the knee prostheses. The total knee replacement surgeons agreed that working with an experienced arthroplasty team led to a smoother and faster workday; however, only one system regularly used such a team.

Subsequent to this observation, several hospitals are now considering specialized arthroplasty operating room teams, and downstream analysis will reveal whether this reduces surgery time and patient complication rates.

▶**MANAGEMENT OF PATIENTS' EXPECTATIONS:** Third, after having examined its data, one member health care system implemented a patient expectations management process, whereby patients were activated and engaged in the process of discharge planning before admission. The result was an initial reduction in length-of-stay, without a change in complication rates. Therefore, materials to aid in managing patients' expectations were shared with other members of the collaborative, several of which are implementing a similar process.

OTHER FEATURES We found that collaboration and vigorous examination of shared outcomes proved to be an attainable goal. However, it was an intensive effort. It took months to agree on standard operating procedures and data definitions and to address the legal issues involved in sharing data across entities.

The effort resulted in a data set with unique features. Unlike Medicare data, which include information primarily on patients age sixty-five and older, the collaborative includes patients of all ages. Whereas national arthroplasty registries focus on implant-specific outcomes such as revision surgery, the collaborative data focused on the processes of total knee replacement delivery and the impact on clinical outcomes and resource consumption. Although the newly formed American Joint Replacement Registry[22] is a much-needed source of population-based data, the data fields collected by that effort will focus on hip and knee implant outcomes, not

delivery processes.

Another important feature of the collaborative is that it allowed surgeons, administrators, and academic experts to sit side by side to evaluate the data, identify the need for additional analysis, and then decide which significant differentiators of performance might provide opportunities for new initiatives. In contrast, arthroplasty registries were designed to longitudinally monitor implant performance, collect information from member health care systems, and report outcomes publicly.

Conclusion

The initial findings of the High Value Healthcare Collaborative regarding primary total knee replacement provide benchmark data against which other health care systems might measure themselves, demonstrate opportunities for learning and improvement within and across the health care delivery organizations, and identify further opportunities to improve delivery of total knee arthroplasty. Indeed, since this work began, eleven other health care systems (Baylor Health Care System, Beaumont Health System, Beth Israel Deaconess Medical Center, North Shore–LIJ Health System, MaineHealth, Providence Health and Services, Scott and White Healthcare, Sutter Health, UCLA Health System, University of Iowa Health Care, and Virginia Mason Medical Center) have joined the collaborative. Subsequent reports will detail the effectiveness of such efforts; the first one, to be initiated in May 2012, will include data collected from these additional systems.

Also, further work examining the influence of physician compensation models, academic orientation, and hospital type on patterns of care delivery is warranted, because the academic literature suggests that these factors can also help explain variations in volumes of procedures, care patterns, and outcomes. ■

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ABOUT THE AUTHORS: IVAN M. TOMEK, ALLISON L. SABEL, MARK I. FROIMSON, GEORGE MUSCHLER, DAVID S. JEVSEVAR, KARL M. KOENIG, DAVID G. LEWALLEN, JAMES M. NAESSENS, LUCY A. SAVITZ, JAMES L. WESTRICH, WILLIAM B. WEEKS & JAMES N. WEINSTEIN

Ivan M. Tomek is an orthopedic surgeon at Dartmouth-Hitchcock Medical Center.

In this month's *Health Affairs*, Ivan Tomek and colleagues describe how a consortium of leading US health care systems is working to identify opportunities to improve the value of the health care its members deliver. Pooling their data to examine differences in primary total knee replacements, they found substantial variations in such metrics as hospital lengths-of-stay and complication rates. The organizations have used the findings to alter the care provided, including more coordinated management for complex patients, and they will continue to evaluate those results.

Tomek is an orthopedic surgeon at Dartmouth-Hitchcock Medical Center and an assistant professor of orthopedic surgery at both the Geisel School of Medicine at Dartmouth (formerly Dartmouth Medical School) and the Dartmouth Institute for Health Policy and Clinical Practice. His research interests include hip and knee replacement outcomes, shared decision making, health care delivery, and health care economics. Tomek holds a medical degree from Dalhousie University, in Canada. He completed his residency at McGill University and a fellowship in adult hip and knee reconstruction at Cornell University.

Allison L. Sabel is director of biostatistics and clinical data warehousing at Denver Health Medical Center.

Allison Sabel is director of biostatistics and clinical data warehousing at Denver Health Medical Center and an assistant professor in the Department of Biostatistics and Informatics at the Colorado School of Public Health, University of Colorado, in Denver. She received her medical degree from Tulane University, along with a doctorate in biostatistics and a master's degree in epidemiology.

Mark I. Froimson is president and CEO of Euclid Hospital.

Mark Froimson, an orthopedic surgeon at Cleveland Clinic, was recently appointed president and CEO of Euclid Hospital, a Cleveland Clinic hospital. He is a two-time recipient of the Cleveland Clinic Innovator Award. Froimson earned his medical degree from Tulane University and a master's degree in business administration from Case Western Reserve University.

George Muschler is vice chair of the Orthopedic and Rheumatologic Institute at Cleveland Clinic.

George Muschler serves as vice chair of the Orthopedic and Rheumatologic Institute at Cleveland Clinic and is director of its Orthopedic and Rheumatologic Research Centers. He holds a medical degree from Northwestern University.

David S. Jevsevar is the medical director of orthopedic clinical program development for the southwest region of Intermountain Healthcare.

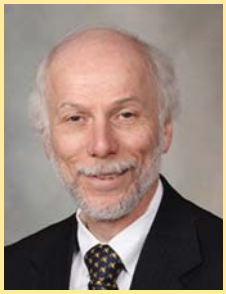
David Jevsevar is medical director of orthopedic clinical program development, medical director of surgical services, and chair of the clinical council for the southwest region of Intermountain Healthcare. He received his medical degree from Georgetown University and a master's degree in business administration from Auburn University.

Karl M. Koenig leads the Joint Replacement Program at Dartmouth-Hitchcock Medical Center.

Karl Koenig leads the Joint Replacement Program at Dartmouth-Hitchcock Medical Center. He earned his medical degree from the Baylor College of Medicine and received a master's degree from the Dartmouth Institute.

David G. Lewallen is a professor of orthopedic surgery at Mayo Clinic.

David Lewallen is a professor of orthopedic surgery and a consultant in the Department of Orthopedic Surgery at Mayo Clinic. He holds a medical degree from the University of Minnesota, and he completed his orthopedic surgery residency at Mayo Clinic. He also received a master's degree in orthopedics from the University of Minnesota.



James M. Naessens is an associate professor of health services research and biostatistics at Mayo Clinic.

James Naessens is a health services researcher and an associate professor of health services research and biostatistics at Mayo Clinic. He received a doctorate in health systems management from Tulane University and a master's degree in public health, focusing on biostatistics, from the University of Michigan.

Lucy A. Savitz is director of research and education at the Intermountain Healthcare Institute for Health Care Delivery Research.

Lucy Savitz is director of research and education at the Intermountain Healthcare Institute for Health Care Delivery Research. She also has numerous roles at the University of Utah School of Medicine, including associate professor in epidemiology and adjunct faculty appointments in pediatrics, nursing, and family and preventive medicine. She received her doctorate in health policy and administration from the University of North Carolina at Chapel Hill and a master's degree in business administration from the University of Denver.

James L. Westrich is the senior statistical analyst at the High Value Healthcare Collaborative.

James Westrich is the senior statistical analyst at the High Value Healthcare Collaborative at the Dartmouth Institute. He has worked as deputy director of purchasing strategy at the Office of Medicaid in Massachusetts as well as holding various analyst positions at other academic research centers. Westrich received a master's degree in economics from the University of Massachusetts at Amherst.

William B. Weeks is medical director of the High Value Healthcare Collaborative.

William Weeks is medical director of the High Value Healthcare Collaborative. He is a professor at the Geisel School of Medicine at Dartmouth and the Dartmouth

Institute. Weeks received his medical degree from the University of Texas Medical Branch and his master's degree in business administration from Columbia University.

James N. Weinstein is CEO and president of the Dartmouth-Hitchcock Health System.

James N. Weinstein is CEO and president of the Dartmouth-Hitchcock health system and founding member and chair of the High Value Healthcare executive committee. He is a member of the Institute of Medicine and holds the Peggy Y. Thomson Chair in the evaluative clinical sciences at Dartmouth College.

He is an orthopedic surgeon and founding chair of the Departments of Orthopedics at Dartmouth-Hitchcock and the Geisel School of Medicine at Dartmouth. He received his medical degree from the Chicago College of Osteopathic Medicine and a master's degree in health services research from the Dartmouth Institute.

Errata

TOMEK ET AL., JUNE 2012, P. 7 (WEB FIRST EDITION) In note 3, the citation details should be: Science. 1973;182 (4117):1102–8. In note 8, the citation details should be: J Rheumatol. 2009; 36(11):2531–8. The article has been corrected online.

BERENSON ET AL., MAY 2012, PP. 973 AND 981 The biography of lead author Robert A. Berenson should read as follows. On page 973: Robert A. Berenson is a senior consulting researcher at the Center for Studying Health System Change and an Institute Fellow at the Urban Institute, in Washington, D.C. On page 981, paragraph 2: Berenson is a senior consulting researcher at the Center for Studying Health System Change and an Institute Fellow at the Urban Institute. His research focuses on payment policy and options for delivery system reform, especially in Medicare. In addition to his research activities, Berenson is vice chair of the Medicare Payment Advisory Commission. He served as head of payment policy for Medicare in the Clinton administration, helped organize and manage a successful preferred provider organization, and practiced medicine for more than twenty years. The article has been corrected online.

MAKAROV ET AL., APRIL 2012, P. 733 In the second paragraph below "Study Results," final sentence, the registry with the odds ratio of 3.12 was New Jersey, not Utah. The article has been corrected online.

Lessons and Insights from Work in Patient and Family Engagement

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

ROUNDTABLE ON VALUE & SCIENCE-DRIVEN HEALTH CARE

PARTNERING WITH PATIENTS TO DRIVE SHARED DECISIONS, BETTER VALUE, AND CARE IMPROVEMENT

A project of the IOM Roundtable on Value & Science-Driven Health Care

Activity: Identify and explore issues, attitudes, and approaches to increasing patient engagement in and demand for: (1) shared decision-making and better communication about the evidence in support of testing and treatment options; (2) the best value from the health care they receive; and (3) use of the data generated in the course of their care experience for care improvement.

Compelling aim: *Delivering better care for lower costs and creating a health care system that learns and improves continuously.* To accomplish this aim, this project will address one of the most essential preconditions for the progress needed—building awareness and demand from patients and consumers. The information and insights developed in the course of exploring patients' attitudes, beliefs, and motivations on the issues will be used to develop multi-sectoral strategies to better engage patients in the changes necessary.

Issue: Patient-centeredness—the idea that all features of the health care enterprise, including evidence generation, care delivery, and financing should be designed around achieving optimal patient outcomes, satisfaction, and well-being—is a central tenet of health care delivery. Involving patients in their own health decisions yields better adherence to testing and treatment recommendations, higher satisfaction, and better health outcomes. Increasing patient concern about costs offers the opportunity to promote value-oriented care. And engaging patients in support of the use of their clinical and outcomes data can yield care improvements that benefit all patients. On the other hand, there are numerous challenges to centering the system's efforts around patient needs and preferences. Patients are unaware of evidence and quality gaps, and the public is reluctant to engage questions of cost, waste, quality, and value in the health care system. The specter of unintended sharing of personal health information has led to regulations that limit the flow of clinical data and patient hesitancy in accepting the use of their clinical data to accelerate learning. Candid communication between patients and clinicians is strained by patient perceptions that evidence might restrict their options or prevent personalized care, and by clinician perceptions that acknowledging evidence shortfalls will undermine patient confidence. This workshop seeks to identify strategies to build patient engagement in—and demand for—a more robust research enterprise, evidence-based shared decision-making, and high value health care.

Approach: Operating under the auspices of the IOM *Roundtable on Value & Science-Driven Health Care*, an IOM expert workshop will be convened, planned by an IOM-appointed stakeholder committee, to identify and discuss what is known about patient attitudes, behaviors, and motivations related to evidence, shared decision making, costs and prices in care, privacy, and use of data to improve the effectiveness and science-base for care. It will explore issues and strategies for improvement.

Deliverables: An IOM workshop summary will be published, reviewing challenges, defining key questions, and exploring options to accelerate progress on the issue of engaging patients in all aspects of a continuously learning health system.

Related IOM work: *Patients Charting the Course: Citizen Engagement and the Learning Health System (2011); The Healthcare Imperative: Lowering Costs and Improving Outcomes (2010); Value in Health Care: Accounting for Cost, Quality, Safety, Outcomes, and Innovation (2010); Crossing the Quality Chasm: A New Health System for the 21st Century (2001); Patient-Clinician Communication: Principles & Expectations (2011); Learning What Works: Infrastructure Required for Comparative Effectiveness Research—Workshop Summary (2011); Clinical Data as the Basic Staple for Health Learning—Workshop Summary (2011); Health Literacy, eHealth, and Communication: Putting the Consumer First. Workshop Summary (2009); Speaking of Health: Assessing Health Communication Strategies for Diverse Populations (2002); Science and Risk Communication: A Mini-Symposium Sponsored by the Roundtable on Environmental Health Sciences, Research, and Medicine (2001); Redesigning the Clinical Effectiveness Research Paradigm (2010)*

IOM Staff Contacts: Claudia Grossmann (cgrossmann@nas.edu)

The National Academy of Sciences

The National Academy of Sciences (NAS) is a non-governmental organization comprised of the nation's leading scientists. Chartered by Congress and President Abraham Lincoln in 1863, NAS is called upon to serve as the adviser to the Government and to the nation on matters of scientific research and policy. Presidential Executive Orders have defined the special relationship of the Academy to Government and cited its unique capacity to marshal scientific expertise of the highest caliber for independent and objective science policy advice. As matters of health and medicine became more compelling and specialized, the Institute of Medicine (IOM) was established under the charter of the NAS in 1970 as the nation's adviser on health, health science, and health policy. Like its sister organizations, the National Academy of Sciences and the National Academy of Engineering, IOM members (65 each year) are elected by the current membership and drawn from nation's leading authorities in medicine, health, the life sciences, and related policies.

The Institute of Medicine

The National Academies, including the IOM, work outside the framework of government, although often at the request of Congress or government agencies. The IOM is charged with ensuring that objective and scientifically informed analysis and independent guidance are brought to bear on the most difficult and challenging health issues facing the nation. Working together in consensus committees, public forums, and collaborative efforts, invited experts carry out the technical and policy studies commissioned to produce advice on compelling health challenges, meetings and symposia convened on matters of widespread interest, and projects to catalyze recommended action. Each year, more than 2000 national experts—members and nonmembers—volunteer their time, knowledge and expertise to advance the nation's health through the IOM.

Rights and responsibilities under the Congressional Charter

The three National Academies have a long tradition of providing national advice and leadership, which rests on their ability to convene experts and other diverse stakeholders charged with considering important issues of science, engineering, and health policy in an objective, independent, and trusted environment that assures rigorous analysis. Because the National Academies provide the Federal Government with a unique service, activities are accorded a special status by charter and the implementing Executive Orders of the President. Specifically, *"when a department or agency of the executive branch of the Government determines that the Academy, because of its unique qualifications, is the only source that can provide the measure of expertise, independence, objectivity, and audience acceptance necessary to meet the department's or agency's program requirements, acquisition of services by the Academy may be obtained on a noncompetitive basis if otherwise in accordance with applicable law and regulations."* (Executive Order 12832)

HealthAffairs | Robert Wood Johnson Foundation

Health Policy Brief

FEBRUARY 14, 2013

Patient Engagement. People actively involved in their health and health care tend to have better outcomes—and, some evidence suggests, lower costs.

WHAT'S THE ISSUE?

A growing body of evidence demonstrates that patients who are more actively involved in their health care experience better health outcomes and incur lower costs. As a result, many public and private health care organizations are employing strategies to better engage patients, such as educating them about their conditions and involving them more fully in making decisions about their care.

"Patient activation" refers to a patient's knowledge, skills, ability, and willingness to manage his or her own health and care. "Patient engagement" is a broader concept that combines patient activation with interventions designed to increase activation and promote positive patient behavior, such as obtaining preventive care or exercising regularly. Patient engagement is one strategy to achieve the "triple aim" of improved health outcomes, better patient care, and lower costs.

This Health Policy Brief summarizes key findings on patient engagement published in the February 2013 issue of *Health Affairs*.

WHAT'S THE BACKGROUND?

Modern health care is complex, and many patients struggle to obtain, process, communicate, and understand even basic health information and services. Many patients lack health literacy, or a true understanding of their medical conditions. What's more, the US health care system often has seemed indifferent to patients' desires and needs. Many practitioners fail to provide the information that patients need to make the best decisions about their own care and treatment. And even when patients do receive detailed information, they can be overwhelmed or lack confidence in their own choices. Those with low levels of health literacy find it difficult to follow instructions on how to care for themselves or to adhere to treatment regimens, such as taking their medicines.

Recognizing these problems, the 2001 Institute of Medicine report, *Crossing the Quality Chasm: A New Health System for the 21st Century*, called for reforms to achieve a "patient-centered" health care system. The report envisioned a system that provides care that is "respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions." Out of this recognition, in part, the field of patient engagement has emerged.

FRAMEWORKS FOR ENGAGEMENT: There are many aspects to patient engagement. Kristin Carman of the American Institutes for Research and coauthors propose a framework that conceptualizes patient engagement taking place on three main levels (Exhibit 1).

The first level is direct patient care, in which patients get information about a condition and

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answer questions about their preferences for treatment. This form of engagement allows patients and providers to make decisions based on the medical evidence, patients' preferences, and clinical judgment. In the second level of engagement, organizational design and governance, health care organizations reach out for consumer input to ensure that they will be as responsive as possible to patients' needs. In the third level, policy making, consumers are involved in the decisions that communities and society make about policies, laws, and regulations in public health and health care.

SHARED DECISION MAKING: One strategy consistent with the first level of engagement described by Carman and coauthors is shared decision making, in which patients and providers together consider the patient's condition, treatment options, the medical evidence behind the treatment options, the benefits and risks of treatment, and patients' preferences, and then arrive at and execute a treatment plan. The strategy is often used with patients who have "preference-sensitive" conditions or treatment options—that is, they may or may not choose particular treatments, or to be treated at all, depending on their own feelings about the risks versus the benefits of treatment, their ability to live well with their conditions, or other factors.

For example, although one patient with knee pain may wish to have knee replacement surgery, another may worry about the risks that the surgery may not completely relieve pain or restore mobility and may choose to forgo it in favor of managing the pain with medication and weight loss. In such cases, there are multiple, reasonable treatment options, each with their own risks and benefits, and the "correct" path forward should be guided by a patient's unique needs and circumstances.

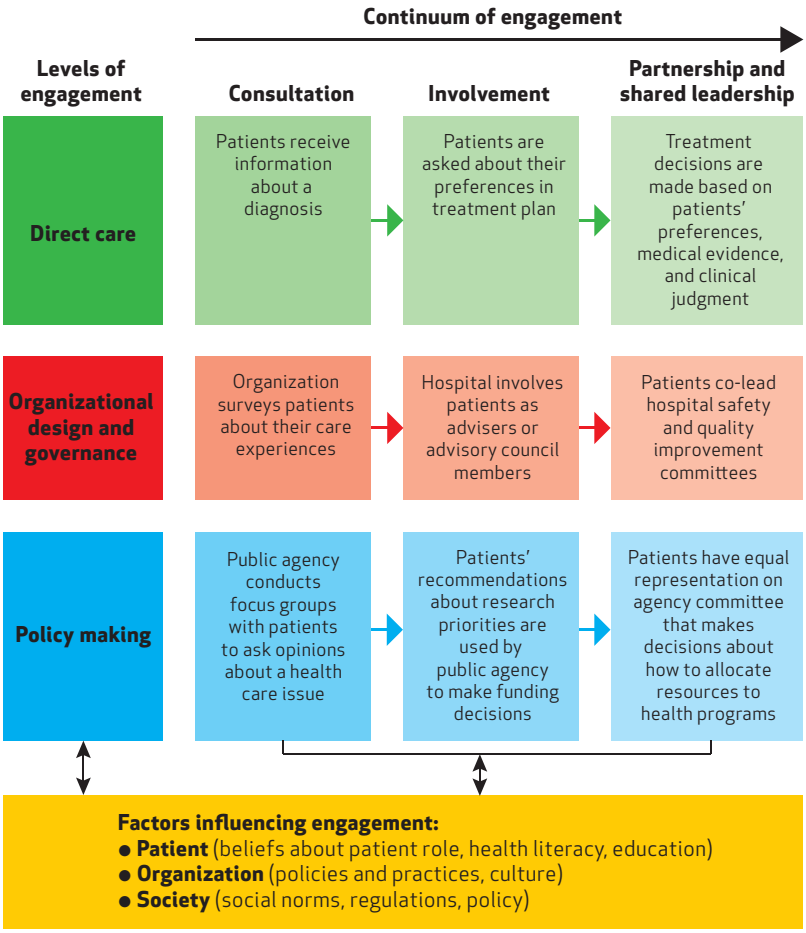
France Légaré and Holly Witteman at the Université Laval in Quebec note that shared decision making involves several essential elements. First, providers and patients must recognize that a decision is required. Next, they must have at their disposal, and understand, the best available evidence. Finally, they must incorporate the patient's preferences into treatment decisions.

There are various modalities through which shared decision making can be conducted. A typical process is to use decision aids—leaflets, books, videos, websites, and other interactive media—that give patients information on the risks and benefits of various treatment options and help them make the choice that most reflects their personal values. Some organizations, such as the Informed Medical Decisions Foundation and the private company Health Dialog, have developed balanced, expert-reviewed decision materials. Using these decision aids, shared decision making can be conducted in person between providers and patients, or remotely, as described below.

David Veroff at Health Dialog and coauthors conducted a large randomized study involving patients with one or more of six different preference-sensitive conditions: heart conditions, benign uterine conditions, benign prostatic hyperplasia, hip pain, knee pain, and back pain. One group of patients received enhanced decision-making support by trained

EXHIBIT 1

A Multidimensional Framework for Patient and Family Engagement in Health and Health Care



SOURCE Kristin L.Carman, Pam Dardess, Maureen Maurer, Shoshanna Sofaer, Karen Adams, Christine Bechtel, and Jennifer Sweeney, "Patient and Family Engagement: A Framework for Understanding the Elements and Developing Interventions and Policies," *Health Affairs* 32, no. 2 (2013): 223–31. **NOTE** Movement to the right on the continuum of engagement denotes increasing patient participation and collaboration.

health coaches over the phone, by mail, and via the Internet. The other group received only a usual level of support from these coaches. In both cases, the coaches gave patients knowledge and awareness of their treatment options, helped them to sort out their treatment preferences, and encouraged them to communicate those preferences to their health care providers. The primary difference between the groups was the proportion of participants receiving health coaching was higher in the enhanced support group.

Patients who received enhanced decision-making support ultimately had overall medical costs that were 5.3 percent lower than for those receiving only the usual support. They also had 12.5 percent fewer hospital admissions and 20.9 percent fewer preference-sensitive heart surgeries. The authors concluded that shared decision making through these relatively low-cost, remote models can extend the benefits of patient engagement to broad populations.

PATIENT ACTIVATION: Many studies have shown that patients who are "activated"—that is, have the skills, ability, and willingness to manage their own health and health care—experience better health outcomes at lower costs compared to less activated patients. In an effort to quantify levels of patient engagement, Judith Hibbard of the University of Oregon has developed a "patient activation measure"—a validated survey that scores the degree to which someone sees himself or herself as a manager of his or her health and care.

Hibbard and coauthors studied the relationship between patients' activation scores and their health care costs at Fairview Health Services, a large health care delivery system in Minnesota. In an analysis of more than 30,000 patients, they found that those with the lowest activation scores, that is, people with the least skills and confidence to actively engage in their own health care, incurred costs that averaged 8 to 21 percent higher than patients with the highest activation levels, even after adjusting for health status and other factors (Exhibit 2). And patient activation scores were shown to be significant predictors of health care costs.

BROADER PATIENT ENGAGEMENT: Consistent with the second and third levels of engagement that Carman and coauthors describe are programs in which health care organizations structure themselves to meet patients' needs and preferences—and in which those preferences help to shape broader responses on a societal scale. An example is the Conversation Project and the Conversation Ready Project—two efforts to elicit patients' attitudes and choices about end-of-life care and predispose providers to give care consistent with those choices.

The Conversation Project, initiated by Boston-based journalist Ellen Goodman and colleagues, is a grassroots public campaign that encourages people to think about how they want to spend their last days and to have open and honest discussions with their families and health care providers. By having these important conversations before a crisis occurs, patients can consider and clearly communicate their wishes and forestall situations in which those decisions are made by others and not fully aware.

The Conversation Ready project, initiated by Maureen Bisognano, president and chief executive of the Institute for Healthcare Improvement, and IHI colleagues, is an effort to make certain that the nation's health systems and providers have the skills to elicit and receive patients' and families' views about end-of-life care, document them, and carry them out. Ten "pioneer" health care organizations working with the institute have committed to being "Conversation Ready" within one year—and to developing replicable and scalable models of change that others can adopt as well.

For example, one of the systems, Gundersen Lutheran, which is based in LaCrosse, Wisconsin, has created Respecting Choices—a 501(c)3 not-for-profit aimed at engaging individuals in end-of-life decision making. Among other actions, the health care system prompts all patients at the age of 55 to discuss their wishes with their primary care provider.

21%

Increased medical costs
Patients with the lowest activation scores—having the least skills and confidence to actively engage in their own health care—incurred costs up to 21 percent higher than patients with the highest activation levels.

EXHIBIT 2

Predicted Per Capita Costs of Patients by Patient Activation Level

2010 patient activation level	Predicted per capita billed costs ($)	Ratio of predicted costs relative to level 4 PAM
Level 1 (lowest)	966**	1.21**
Level 2	840	1.05
Level 3	783	0.97
Level 4 (highest)	799	1.00

SOURCE Judith H. Hibbard, Jessica Greene, and Valerie Overton, "Patients with Lower Activation Associated with Higher Costs; Delivery Systems Should Know Their Patients' 'Scores,'" *Health Affairs* 32, no. 2 (2013): 216–22. **NOTES** Authors' analysis of Fairview Health Services billing and electronic health record data, January–June 2011. Inpatient and pharmacy costs were not included. PAM is Patient Activation Measure. **$p < 0.05$

WHAT ARE THE ISSUES?

Researchers have identified a number of common factors and obstacles that may need to be overcome to carry out effective patient engagement and activation strategies. Some are attributable to patients and their characteristics and proclivities and others to those of providers.

FACTORS INVOLVING PATIENTS: For patients to engage effectively in shared decision making, they must have a certain degree of health literacy. Howard Koh, assistant secretary for health at the Department of Health and Human Services, and his coauthors propose a new Health Literate Care Model that assumes that all patients are at risk of not understanding their health conditions or how to deal with them. Health care organizations adopting this model would work to increase health literacy and patient engagement over the entire care span.

Koh and colleagues propose, for example, that health care organizations first adopt the Care Model, formerly known as the Chronic Care Model, a mode of delivering health care that draws on clinical information systems, decision support, and self-management support to provide comprehensive care for chronically ill patients. Then, health literacy strategies would be incorporated into the model, such as the "teach-back" method, in which providers ask patients to explain back to them what the patients have learned, their own understanding of their condition, the options available to them, and their intentions to act on the information.

DIVERSE BACKGROUNDS: Elizabeth Bernabeo and Eric Holmboe of the American Board of Internal Medicine examined shared decision making and concluded that it is "patient specific." Specifically, they said, a patient's degree of engagement may be affected by such factors as cultural differences, sex, age, and education, among others. As a result, specific competencies, such as language skills or an awareness and understanding of religious beliefs, may be required on the part of clinicians and delivery systems to effectively engage patients with diverse cultural backgrounds and socioeconomic status.

COGNITIVE ISSUES: Robert Nease and colleagues of Express Scripts have noted that there are well-known limitations to human decision-making skills and the ability to maintain attention that serve as barriers to patient engagement. They argue that there may be better ways to influence patients' decision making, such as through "choice architecture," in which decisions to be made are structured so as to "nudge" a patient toward a particular choice. For example, in a pilot study by Express Scripts, patients were required to use preferred, lower-cost drugs before they could "step up" to other options. They were given information about the step-therapy program and given 60 days in which to "opt out" if they wanted to switch to a nonpreferred medication. The opt-out rate was only 1.5 percent, indicating that choice architecture is a potential alternative to other patient engagement approaches.

AVERSION TO CONSIDERING COSTS: One area in which it may be especially hard to engage patients is considering costs in the context of making decisions about their health care. Roseanna Sommers, a Yale Law School student, and coauthors convened 22 focus groups of insured people and asked them about their willingness to weigh costs when deciding among nearly comparable clinical options—for example, to receive a computed tomography scan or undergo a more expensive magnetic resonance imaging after having had a severe headache for three months. Most participants were unwilling to consider costs and generally resisted the less expensive inferior options.

The authors identified a number of factors that lead patients to ignore cost. These factors include patients' preference for care they perceive to be the best, regardless of expense; an inclination to equate cost with quality; inexperience in considering trade-offs among cost and quality; disregard for costs borne by insurers or society as a whole; and the impulse to act in one's own self-interest even though resources are limited.

One antidote to consumers' aversion to considering costs might be giving them cost and quality information that they find most useful and relevant to their concerns. Jill Matthews Yegian of the American Institutes for Research and coauthors found that consumers want to be able to compare information about individual physicians and to obtain cost data that reflect their own out-of-pocket expenses for an entire episode of care, not for individual procedures and services. Therefore, the authors contend, state and federal policy makers should look for ways to assemble such infor-

1.5%

Opt-out rate
After being enrolled by default in a program to receive preferred medications, only 1.5 percent of patients opted out when given the chance.

"Patient activation scores were shown to be significant predictors of health care costs."

mation and make it clear and accessible for consumers.

FACTORS INVOLVING PROVIDERS: A recurring theme in the February 2013 issue of *Health Affairs* is the need for significant changes in the culture and operations of medical practice to implement patient engagement strategies. Studies have identified numerous barriers, including time constraints, insufficient provider training, a lack of incentives, and information system shortcomings.

In one study, Grace Lin of the University of California, San Francisco, and coauthors explored the use of decision aids—DVDs and booklets about colorectal cancer screening and treatment for back pain—at five primary care clinics in Northern California that expressed a willingness to use them. Despite that support, the actual distribution rates for these items remained low, even after staff training sessions and other promotional activities. Some physicians felt that patient input was not warranted, although others had difficulty moving away from traditional physician-directed decision making. Most physicians cited a lack of time as a major barrier.

That perspective echoed a finding in the systematic review of 38 studies by Légaré and Witteman, which was that clinicians pointed most frequently to time constraints as the primary barrier, even though there was "no robust evidence that more time is required to engage in shared decision making in clinical practice than to offer usual care."

Mark Friedberg of the RAND Corporation and coauthors evaluated a three-year demonstration project on shared decision making conducted at eight primary care sites in different parts of the United States. They discovered three main barriers to implementing shared decision making: overworked physicians, insufficient provider training, and clinical information systems that failed to track patients throughout the decision-making process. The researchers note that payment reforms and incentives may be needed for shared decision making to take hold.

3

Barriers to shared decision making
Overworked physicians, insufficient provider training, and clinical information systems that failed to adequately track patients.

"More research will be needed to determine best practices for engaging patients."

WHAT ARE THE POLICY IMPLICATIONS?

Federal and state policy makers have embraced patient engagement as a strategy to address health care costs and improve quality. Here are some of the ways.

The Affordable Care Act identifies patient engagement as an integral component of quality in accountable care organizations (ACOs) and in patient-centered medical homes. Shared decision making is so valued in the law that a separate section (3506) calls for new Shared Decision-Making Resource Centers to help integrate the approach into clinical practice. No funds have yet been appropriated to implement this section, however.

Patient engagement is also central to Section 3021 of the law, which creates the Center for Medicare and Medicaid Innovation. Under the law, the center is to examine how support tools can be used to improve patients' understanding of their medical treatment options. The health care law also created the Patient-Centered Outcomes Research Institute, charged with funding research that will assist patients, caregivers, clinicians, payers, and policy makers in making informed health decisions.

Because patient activation can be directly linked to improved outcomes, a measurement of patients' level of activation could be adopted as an intermediate measure for ACOs, patient-centered medical homes, and other new and emerging delivery and payment structures, Hibbard and her coauthors observe. The need for additional measures of patient engagement is discussed further below.

STATE POLICY: In 2007 Washington became the first state to enact legislation encouraging shared decision making and decision aids to address deficiencies in the informed consent process. The legislation also required a pilot project to study shared decision making in clinical practice. Massachusetts is also incorporating patient engagement into its health policies. Now, to be certified by the state, ACOs and medical homes must include shared decision making. Patient engagement and consumer choice will also be fundamental to health insurance exchanges, where as of October 2014 people and small businesses will be able to shop for coverage.

So-called "navigators" and federally supported, state-run consumer assistance agencies will be able to assist consumers with their purchasing, as well as with issues that arise with their health coverage. Rachel Grob of National Initiatives and coauthors reviewed state efforts to meet the law's consumer assistance goals and found that in fewer than half the states, consumers are getting the assistance they need to navigate a rapidly chang-

ing health insurance marketplace. Other states are much further behind, suggesting that more will have to be done to ensure that consumers across the country are getting adequate assistance.

WHAT'S NEXT?

Despite evidence that has been compiled to date of the importance of patient engagement, experts in the field agree that more research will be needed to determine best practices for engaging patients, as well as to more fully demonstrate the relationship of patient engagement to cost savings. In the meantime, considerable efforts are under way to hold health care organizations accountable for engaging patients.

For example, the National Committee for Quality Assurance, a nonprofit organization that tracks the quality of care provided by health plans and health care organizations, requires a variety of assessments to determine how actively patients are being engaged in their health and care. Organizations wishing to be certified as meeting requirements for patient-centered medical homes, for example, must undertake surveys of patients that ask about whether clinicians engage them in shared decision making or provide support for them to manage their conditions. But there is wide agreement that even more could be done to measure how and how well health care organizations engage patients, and help to realize individuals' full potential to maintain and improve their health.■

About Health Policy Briefs

Written by
Julia James
(James previously worked on Capitol Hill and as a consultant in Washington, D.C., and Oregon.)

Editorial review by
Judith Hibbard
Senior Researcher
Institute for Sustainable Environments
Professor Emerita
University of Oregon, Eugene

Ted Agres
Senior Editor
Health Affairs

Rob Lott
Deputy Editor
Health Affairs

Susan Dentzer
Editor-in-Chief
Health Affairs

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Biographies and Meeting Logistics

Member Biographies

Mark B. McClellan, MD, PhD (Chair) became the Director of the Engelberg Center for Healthcare Reform at the Brookings Institution in July 2007. The Center studies ways to provide practical solutions for access, quality and financing challenges facing the U.S. health care system. In addition, Dr. McClellan is the Leonard D. Schaeffer Chair in Health Policy Studies. Dr. McClellan has a highly distinguished record in public service and in academic research. He is the former administrator for the Centers for Medicare and Medicaid Services (2004-2006) and the former commissioner of the Food and Drug Administration (2002-2004). He also served as a member of the President's Council of Economic Advisers and senior director for health care policy at the White House (2001–2002). Dr. McClellan was also an associate professor of economics and associate professor of medicine (with tenure) at Stanford University, from which he was on leave during his government service. He directed Stanford's Program on Health Outcomes Research and was also associate editor of the *Journal of Health Economics,* and co-principal investigator of the Health and Retirement Study (HRS), a longitudinal study of the health and economic status of older Americans. His academic research has been concerned with the effectiveness of medical treatments in improving health, the economic and policy factors influencing medical treatment decisions and health outcomes, the impact of new technologies on public health and medical expenditures, and the relationship between health status and economic well being. Dr. McClellan is a Member of the Institute of Medicine of the National Academy of Sciences and a Research Associate of the National Bureau of Economic Research. A graduate of the University of Texas at Austin, Dr. McClellan earned his M.P.A. from Harvard's Kennedy School of Government in 1991, his M.D. from the Harvard-MIT Division of Health Sciences and Technology in 1992, and his Ph.D. in economics from MIT in 1993.

David Blumenthal, MD, MPP became President and CEO of the Commonwealth Fund, a national health care philanthropy based in New York City, in January, 2013. Previously, he served as Chief Health Information and Innovation Officer at Partners Health System in Boston, MA, and was Samuel O. Thier Professor of Medicine and Professor of Health Care Policy at Massachusetts General Hospital/ Harvard Medical School. From 2009 to 2011, Dr. Blumenthal was the National Coordinator for Health Information Technology under President Barack Obama. Prior to that, Dr. Blumenthal was a practicing primary care physician, director of the Institute for Health Policy, and professor of medicine and health policy at Massachusetts General Hospital/Partners Healthcare System and Harvard Medical School. As a renowned health services researcher and national authority on health IT adoption, Dr. Blumenthal has authored over 250 scholarly publications, including the seminal studies on the adoption and use of health information technology in the United States. Dr. Blumenthal received his undergraduate, medical, and public policy degrees from Harvard University and completed his residency in internal medicine at Massachusetts General Hospital.

Bruce G. Bodaken, MPhil is chairman, president and chief executive officer of Blue Shield of California, a 3.3 million member not-for-profit health plan that serves the commercial, individual and government markets in California. Bodaken joined Blue Shield in 1994 as president and chief operating officer. Previously, he served as senior vice president and associate chief operating officer of FHP International Corporation in Southern California. Prior to embarking on a career in health care, he taught philosophy at the college level at the University of Colorado. Bodaken serves on the board of directors of the California Business Roundtable, WageWorks, and the University of California, Berkeley's Health Services Management Program. He is co-author of *The Managerial Moment of Truth*, published by Simon & Schuster in 2006. Bodaken received his bachelor's degree from Colorado State University, and earned a masters degree in philosophy and was A.B.D. in the doctoral program at the University of Colorado.

Paul Chew, MD is Senior Vice-President, Chief Science Officer, Chief Medical Officer at Sanofi-Aventis, US. Between 2007 and 2009 Dr. Chew held the position of President, U.S. Research & Development and Vice President, Therapeutic Department Head, Metabolism, Diabetes and Thrombosis in which role he was responsible for Lovenox, Lantus, and the therapeutic development portfolio. In addition, he is currently a member of the PhRMA Science & Regulatory Affairs Executive Committee and the Institute of Medicine Value & Science-Driven Healthcare Roundtable. Prior to sanofi-aventis, Dr. Chew was Vice-President, Global Head of Metabolism and Diabetes at Aventis Pharmaceuticals, 2001-2004. Prior to joining Aventis, Dr. Chew was at the Bristol-Myers Squibb Company, starting in 1992 as Medical Director of Clinical Cardiovascular Development. Dr. Chew held numerous positions of increasing R&D responsibility at BMS; Dr. Chew was Vice President, U.S. Medical Affairs from 1999-2001 where he was responsible for Plavix, Avapro, Glucophage, and Pravachol. Prior to industry, Dr. Chew was Assistant Professor of Medicine at The Johns Hopkins Hospital, Attending Physician in Radiology, Director of the Pacemaker Clinic and a member of the Interventional Cardiology staff. Research interests included acute interventional cardiology, cardiac biomechanics, and statistical modeling of pericardial biomechanics. Dr. Chew obtained his medical education at The Johns Hopkins School of Medicine, serving his internal medicine training and cardiology fellowship at The Johns Hopkins Hospital. Dr. Chew is board-certified in Internal Medicine and Cardiovascular Diseases.

Carolyn M. Clancy, MD was appointed Director of the Agency for Healthcare Research and Quality (AHRQ) on February 5, 2003 and reappointed on October 9, 2009. Prior to her appointment, Dr. Clancy was Director of AHRQ's Center for Outcomes and Effectiveness Research. Dr. Clancy, a general internist and health services researcher, is a graduate of Boston College and the University of Massachusetts Medical School. Following clinical training in internal medicine, Dr. Clancy was a Henry J. Kaiser Family Foundation Fellow at the University of Pennsylvania. Before joining AHRQ in 1990, she was also an assistant professor in the Department of Internal Medicine at the Medical College of Virginia. Dr. Clancy holds an academic appointment at George Washington University School of Medicine (Clinical Associate Professor, Department of Medicine) and serves as Senior Associate Editor, *Health Services Research*. She serves on multiple editorial boards including the Annals of Internal Medicine, *Annals of Family Medicine*, *American Journal of Medical Quality*, and *Medical Care Research and Review*. She is a member of the Institute of Medicine and was elected a Master of the American College of Physicians in 2004. In 2009, was awarded the 2009 William B. Graham Prize for Health Services Research. Her major research interests include improving health care quality and patient safety, and reducing disparities in care associated with patients' race, ethnicity, gender, income, and education. As Director, she launched the first annual report to the Congress on health care disparities and health care quality.

Francis S. Collins, MD, PhD is the director of the National Institutes of Health (NIH). Dr. Collins, a physician-geneticist noted for his landmark discoveries of disease genes and his leadership of the Human Genome Project, served as director of the National Human Genome Research Institute (NHGRI) at the NIH from 1993-2008. With Dr. Collins at the helm, the Human Genome Project consistently met projected milestones ahead of schedule and under budget. This remarkable international project culminated in April 2003 with the completion of a finished sequence of the human DNA instruction book. On March 10, 2010, Dr. Collins was named a co-recipient of the Albany Medical Center Prize in Medicine and Biomedical Research for his leading role in this effort. In addition to his achievements as the NHGRI director, Dr. Collins' own research laboratory has discovered a number of important genes, including those responsible for cystic fibrosis, neurofibromatosis, Huntington's disease, a familial endocrine cancer syndrome, and most recently, genes for type 2 diabetes and the gene that causes Hutchinson-Gilford progeria syndrome. Dr. Collins received a B.S. in chemistry from the University of Virginia, a Ph.D. in physical chemistry from Yale University, and an M.D. with honors from the University of North Carolina at Chapel Hill. Prior to coming to the NIH in 1993, he spent nine years on the faculty of the University of Michigan, where he was a Howard Hughes Medical Institute investigator. He is an elected member of the Institute of Medicine and the National Academy of Sciences. Dr. Collins was awarded the Presidential Medal of Freedom in 2007. In a White House ceremony on October 7, 2009, Dr. Collins received the National Medal of Science, the highest honor bestowed on scientists by the United States government.

Patrick Conway, MD, MSc is Chief Medical Officer for the Centers for Medicare & Medicaid Services (CMS) and Director of the Office of Clinical Standards and Quality. This office is responsible for all quality measures for CMS, value-based purchasing programs, quality improvement programs in all 50 states, clinical standards and survey and certification of Medicare and Medicaid health care providers across the nation, and all Medicare coverage decisions for treatments and services. The office budget exceeds $1.5 billion annually and is a major force for quality and transformation across Medicare, Medicaid, CHIP, and the U.S. health care system. Previously, he was Director of Hospital Medicine and an Associate Professor at Cincinnati Children's Hospital. He was also AVP Outcomes Performance, responsible for leading measurement, including the electronic health record measures, and facilitating improvement of health outcomes across the health care system. Previously, he was Chief Medical Officer at the Department of Health and Human Services (HHS) in the Office of the Assistant Secretary for Planning and Evaluation. In 2007-08, he was a White House Fellow assigned to the Office of Secretary in HHS and the Director of the Agency for Healthcare Research and Quality. As Chief Medical Officer, he had a portfolio of work focused primarily on quality measurement and links to payment, health information technology, and policy, research, and evaluation across the entire Department. He also served as Executive Director of the Federal Coordinating Council on Comparative Effectiveness Research coordinating the investment of the $1.1 billion for CER in the Recovery Act. He was a Robert Wood Johnson Clinical Scholar and completed a Master's of Science focused on health services research and clinical epidemiology at the University of Pennsylvania and Children's Hospital of Philadelphia. Previously, he was a management consultant at McKinsey & Company, serving senior management of mainly health care clients on strategy projects. He has published articles in journals such as *JAMA, New England Journal of Medicine, Health Affairs*, and *Pediatrics* and given national presentations on topics including health care policy, quality of care, comparative effectiveness, hospitalist systems, and nurse staffing. He is a practicing pediatric hospitalist, completed pediatrics residency at Harvard Medical School's Children's Hospital Boston, and graduated with High Honors from Baylor College of Medicine. He is married with three children.

Helen B. Darling, MA is President of the National Business Group on Health, a national non-profit, membership organization devoted exclusively to providing practical solutions to its employer-members' most important health care problems and representing large employers' perspective on national health policy issues. Its 318 members, including 66 of the Fortune 100 in 2010, purchase health and disability benefits for over 55 million employees, retirees and dependents. Helen was the 2009 recipient of WorldatWork's Keystone Award, its highest honor in recognition of sustained contributions to the field of Human Resources and Benefits. She received the President's Award by the American College of Occupational and Environmental Medicine in 2010. She was given a lifetime appointment in 2003 as a National Associate of the National Academy of Sciences for her work for the Institute of Medicine. Helen serves on: the Committee on Performance Measurement of the National Committee for Quality Assurance (Co-chair for 10 years); the Medical Advisory Panel, Technology Evaluation Center, (Blue Cross Blue Shield Association); the Institute of Medicine's Roundtable on Value and Science-Driven Health Care, the Medicare Coverage Advisory Committee, and the National Advisory Council of AHRQ. She is on the Board of Directors of the National Quality Forum and the Congressionally-created Reagan-Udall Foundation. Previously, she directed the purchasing of health benefits and disability at Xerox Corporation for 55 thousand US employees. Darling was a Principal at William W. Mercer and Practice Leader at Watson Wyatt. Earlier in her career, Darling was an advisor to Senator David Durenberger, on the Health Subcommittee of the Senate Finance Committee. She directed three studies at the Institute of Medicine for the National Academy of Sciences. Darling received a master's degree in Demography/Sociology and a bachelor's of science degree in History/English, cum laude, from the University of Memphis.

Susan DeVore is President and CEO of the Premier healthcare alliance, the nation's leading alliance of hospitals, health systems and other providers dedicated to improving healthcare performance. An alliance of more than 2,600 hospitals and health systems and more than 90,000 non-acute care sites, Premier uses the power of collaboration to lead the transformation to high quality, cost-effective healthcare. Premier's membership includes more than 40 percent of all U.S. health systems. With the ultimate goal of helping its members improve the health of their local communities, Premier builds, tests and scales models that improve quality, safety and cost of care. Through successful initiatives such as the Hospital Quality Incentive

Demonstration with CMS, and QUEST: High Performing Hospitals collaborative, the alliance has driven improvements in evidence-based care and safety, as well as significant reductions in mortality, harm and cost. Premier is a leader in the accountable care movement and recently announced a joint-venture with IBM to develop industry-leading population analytics tools. Under DeVore's leadership, Premier has built an industry leading code of ethics, has been named five times as one of the World's Most Ethical Companies by Ethisphere and has won the Malcolm Baldrige National Quality Award. DeVore is an industry-leading thinker who was named to Modern Healthcare's top 100 most influential people in healthcare. She is on the Board of the Healthcare Leadership Council, National Center for Healthcare Leadership as well as the Medicare Rights Center.

Judith R. Faulkner is CEO and founder of Epic Systems Corporation. With a BS in Mathematics from Dickinson College, an MS and an honorary doctorate in Computer Science from the University of Wisconsin, she taught computer science for several years in the UW system and then worked as a healthcare software developer, creating one of the first databases organized around a patient record. She founded Epic in 1979 and guided it from its modest beginnings as a clinical database company to its current place as a leading provider of integrated healthcare software. Epic was rated the #1 overall software vendor by KLAS and is in the Leaders Quadrant of Gartner's Magic Quadrant for U.S. Enterprise CPR Systems. Judy was honored by HIMSS as one of the "50 in 50" memorable contributors to healthcare IT throughout HIMSS's 50-year history. She currently serves on the HIT Policy Committee, the Privacy and Security sub-committee, the University of Wisconsin Computer Science Board of Visitors, and the Institute of Medicine's Roundtable.

Thomas R. Frieden, MD, MPH is the Director of the Centers for Disease Control and Prevention (CDC) and Administrator of the Agency for Toxic Substances and Disease Registry (ATSDR). Dr. Frieden has worked to control both communicable and noncommunicable diseases in the United States and around the world. From 1992-1996, he led New York City's program that rapidly controlled tuberculosis, including reducing cases of multidrug-resistant tuberculosis by 80 percent. He then worked in India for five years where he assisted with national tuberculosis control efforts. As Commissioner of the New York City Health Department from 2002-2009, he directed one of the world′s largest public health agencies, with an annual budget of $1.7 billion and more than 6,000 staff. A physician with training in internal medicine, infectious diseases, public health, and epidemiology, Dr. Frieden is especially known for his expertise in tuberculosis control. Dr. Frieden previously worked for CDC from 1990 until 2002. He began his career at CDC as an Epidemiologic Intelligence Service (EIS) Officer at the New York City Health Department. Dr. Frieden received both his medical degree and master's of public health degree from Columbia University and completed infectious disease training at Yale University. He has received numerous awards and honors and has published more than 200 scientific articles.

Patricia A. Gabow, MD is CEO of Denver Health, one of the nation's most efficient, highly-regarded integrated healthcare systems. Dr. Gabow joined the medical staff at Denver Health in 1973 as Renal Division chief, and is known for scientific work in polycystic kidney disease, and now health services research. Author of more than 150 publications, Dr. Gabow is a Professor of Medicine, University of Colorado School of Medicine. She received her MD degree from the University of Pennsylvania School of Medicine, trained in Internal Medicine at University of Pennsylvania Hospital and Harbor General Hospital in Torrance, California, and in Nephrology at San Francisco General Hospital and University of Pennsylvania School of Medicine. She has received numerous awards including the AMA Nathan Davis Award for Outstanding Public Servant, election to the Colorado Women's Hall of Fame, and the National Healthcare Leadership Award. She received a Lifetime Achievement Award from the Denver Business Journal and from the Bonfils-Stanton Foundation; the Innovators in Health Award, New England Healthcare Institute; and the David E. Rogers Award from the Association of American Medical Colleges. Dr. Gabow was awarded honorary degrees by the University of Denver and the University of Colorado and is a Master of the American College of Physicians. She is active in numerous health care organizations including the National Association of Public Hospitals, the Commonwealth Commission for a High Performing Health System and she is a commissioner to the Medicaid and CHIP Payment and Access Commission (MACPAC).

Atul Gawande MD, MPH is a surgeon, writer, and public health researcher. He practices general and endocrine surgery at Brigham and Women's Hospital in Boston. He is also Associate Professor of Surgery at Harvard Medical School and Associate Professor in the Department of Health Policy and Management at the Harvard School of Public Health. His research work currently focuses on systems innovations to transform safety and performance in surgery, childbirth, and care of the terminally ill. He serves as lead advisor for the World Health Organization's Safe Surgery Saves Lives program. He is also founder and chairman of Lifebox, an international not-for-profit implementing systems and technologies to reduce surgical deaths globally. He has been a staff writer for the New Yorker magazine since 1998. He has written three New York Times bestselling books: COMPLICATIONS, which was a finalist for the National Book Award in 2002; BETTER, which was selected as one of the ten best books of 2007 by Amazon.com; and THE CHECKLIST MANIFESTO. He has won two National Magazine Awards, AcademyHealth's Impact Award for highest research impact on health care, a MacArthur Award, and selection by Foreign Policy Magazine and TIME magazine as one of the world's top 100 influential thinkers.

Gary L. Gottlieb, MD, MBA serves as President and CEO of Partners HealthCare, assuming the position January 2010. Dr. Gottlieb comes to this role with a deep and rich history with Partners. He served as President of Brigham and Women's/ Faulkner Hospitals since March of 2002. He is also a Professor of Psychiatry at Harvard Medical School. Dr. Gottlieb was recruited by Partners to become the first chairman of Partners Psychiatry in 1998 and he served in that capacity through 2005. In 2000, he added the role of President of the North Shore Medical Center where he served until early 2002. Prior to coming to Boston, Dr. Gottlieb spent 15 years in positions of increasing leadership in health care in Philadelphia. In 1983, he arrived at the University of Pennsylvania as a Robert Wood Johnson Foundation Clinical Scholar. Through that program, he earned an M.B.A with Distinction in Health Care Administration from Penn's Wharton Graduate School of Business Administration. Dr. Gottlieb went on to establish Penn Medical Center's first program in geriatric psychiatry and developed it into a nationally recognized research, training and clinical program. Dr. Gottlieb rose to become Executive Vice-Chair and Interim Chair of Penn's Department of Psychiatry and the Health System's Associate Dean for Managed Care. In 1994, he became Director and Chief Executive Officer of Friends Hospital in Philadelphia. In addition to his noteworthy academic, clinical and management record, Dr. Gottlieb has published extensively in geriatric psychiatry and health care policy. He is a past President of the American Association of Geriatric Psychiatry. Dr. Gottlieb received his BS cum laude from the Rensselaer Polytechnic Institute and his M.D. from the Albany Medical College of Union University in a six-year accelerated biomedical program. He completed his internship and residency and served as Chief Resident at New York University/Bellevue Medical Center. Now, as a recognized community leader in Boston, Dr. Gottlieb also focuses his attention on workforce development and disparities in health care. He was appointed by Mayor Thomas Menino as Chairman of the Private Industry Council, the City's workforce development board, which partners with education, labor, higher education, the community and government, to provide oversight and leadership to public and private workforce development programs. In 2004-2005, he served as co-chair of the Mayor's Task Force to Eliminate Health Disparities. Dr. Gottlieb believes Partners HealthCare mission is its compass – to inspire, to nurture, to challenge the best and the brightest to step forward and care for the sickest and neediest in our community and around world.

James A. Guest, JD became President and Chief Executive Officer of Consumers Union (CU) in February 2001 after a long career in public service and the consumer interest, including 21 years as Chair of CU's Board of Directors. CU publishes *Consumer Reports* and ConsumerReports.org. The organization was founded in 1936 when advertising first flooded the mass media. Consumers lacked any reliable source of information they could depend on to help them distinguish hype from fact and good products from bad ones. Since then CU has filled that vacuum with a broad range of consumer information and a succession of presidents serving as passionate and outspoken consumer champions. Mr. Guest continues that tradition, fighting on Capitol Hill and in the media for the consumer's right to know about, and be protected from, unsafe and misleading products and services. Under his leadership, the organization is currently pursuing a high-profile campaign to improve the safety, quality, accessibility, and value of the health-care marketplace. This has included the successful launch of several new initiatives such as ConsumerReportsHealth.org and the Consumer Reports Health Ratings Center, which serve to educate and empower consumers to make more informed health-care

decisions and to help change the market. Mr. Guest also is the President of Consumers International, a global federation of 250 organizations from 115 countries. Mr. Guest's public service career has spanned more than three decades. After graduating from Harvard law school and completing a Woodrow Wilson fellowship in economics at MIT, he worked as legislative assistant to Senator Ted Kennedy. In the early 1970s, Mr. Guest moved to Vermont where he served as Banking and Insurance Commissioner, Secretary of State, and Secretary of Development and Community Affairs. Over the last 20 years, he has headed several public policy and advocacy groups including Handgun Control Inc. and the Center to Prevent Handgun Violence, as well as Planned Parenthood of Maryland. He was also the founding Executive Director of the American Pain Foundation, a national consumer information, education, and advocacy organization for pain prevention and management. Mr. Guest credits his very first job for introducing him to one of his biggest influences in consumer advocacy. He worked as the paperboy for Dr. Colston Warne—the first Chair of CU's Board of Directors and a leader in the consumer movement.

George C. Halvorson was named chairman and chief executive officer of Kaiser Permanente, headquartered in Oakland, California in March 2002. Kaiser Permanente is the nation's largest nonprofit health plan and hospital system, serving about 8.6 million members and generating $42 billion in annual revenue. George Halvorson has won several awards for his commitment to health technology and for his leadership and achievements in advancing health care quality. The development, implementation, and maintenance of Kaiser Permanente's information technology infrastructure represent a multi-billion dollar strategic investment that provides comprehensive care coordination and continually improving quality of care and service to members. He is the author of five comprehensive books on the U.S. health care system including the recently released *Health Care Will Not Reform Itself: A User's Guide to Refocusing and Reforming American Health Care.* Mr. Halvorson lends his time and expertise to a number of organizations, including the Institute of Medicine, the American Hospital Association, and the Commonwealth Fund. He serves on the boards of the America's Health Insurance Plans and the board of the Alliance of Community Health Plans. Halvorson chairs the International Federation of Health Plans and co-chairs the 2010 Institute for Healthcare Improvement Annual National Forum on Quality Improvement in Health Care. In 2009, he chaired the World Economic Forum's Health Governors meetings in Davos. Prior to joining Kaiser Permanente, Mr. Halvorson was president and chief executive officer of HealthPartners, headquartered in Minneapolis. With more than 30 years of health care management experience, he has also held several senior management positions with the Health Central Hospital System, Health Accord International, and Blue Cross and Blue Shield of Minnesota.

Margaret A. Hamburg, MD is the Commissioner of the Food and Drug Administration (FDA). Dr. Hamburg graduated from Harvard Medical School, and completed her residency in internal medicine at what is now New York Presbyterian Hospital-Weill Cornell Medical Center, one of the top-ten hospitals in the nation. She conducted research on neuroscience at Rockefeller University in New York, studied neuropharmacology at the National Institute of Mental Health on the National Institutes of Health campus in Bethesda, Md., and later focused on AIDS research as Assistant Director of the National Institute of Allergy and Infectious Diseases. In 1990, Dr. Hamburg joined the New York City Department of Health and Mental Hygiene as Deputy Health Commissioner, and within a year was promoted to Commissioner, a position she held until 1997. Dr. Hamburg's accomplishments as New York's top public health official included improved services for women and children, needle-exchange programs to reduce the spread of HIV (the AIDS virus), and the initiation the first public health bio-terrorism defense program in the nation. Her most celebrated achievement, however, was curbing the spread of tuberculosis. Dr. Hamburg's innovative approach has become a model for health departments world-wide. In 1994, Dr. Hamburg was elected to the membership in the Institute of Medicine, one of the youngest persons to be so honored. Three years later, at the request of President Clinton, she accepted the position of Assistant Secretary for Policy and Evaluation in the U.S. Department of Health and Human Services (HHS). In 2001, Dr. Hamburg became Vice President for Biological Programs at the Nuclear Threat Initiative, a foundation dedicated to reducing the threat to public safety from nuclear, chemical, and biological weapons. Since 2005, and until her confirmation as Commissioner of the FDA, Dr. Hamburg served as the Initiative's Senior Scientist.

James Allen Heywood, is the Co-Founder and Chairman of PatientsLikeMe and the d'Arbeloff Founding Director of the ALS Therapy Development Institute. An MIT engineer, Jamie entered the field of translational research and medicine when his brother Stephen was diagnosed with ALS at age 29. His innovations are transforming biotechnology and pharmaceutical development, personalized medicine, and patient care. As co-founder and chairman of PatientsLikeMe, Jamie provides the scientific vision and architecture for its patient-centered medical platform, allowing patients to share in-depth information on treatments, symptoms and outcomes. In 1999, he founded the ALS Therapy Development Institute, the world's first non-profit biotechnology company and largest ALS research program. Jamie's work has been profiled by the *New Yorker, New York Times,* 60 Minutes, NPR, *Science*, and *Nature.* He and Stephen were the subjects of Pulitzer Prize winner Jonathan Wiener's biography, *His Brothers Keeper* and the Sundance award-winning documentary, "So Much So Fast."

Ralph I. Horwitz, MD, MACP is Senior Vice President for Clinical Evaluation Sciences and Senior Advisor to the Chairman of Research and Development at GlaxoSmithKline, and Harold H. Hines, Jr. Professor Emeritus of Medicine and Epidemiology at Yale University. Dr. Horwitz trained in internal medicine at institutions (Royal Victoria Hospital of McGill University and the Massachusetts General Hospital) where science and clinical medicine were connected effortlessly. These experiences as a resident unleashed a deep interest in clinical research training which he pursued as a fellow in the Robert Wood Johnson Clinical Scholars Program at Yale under the direction of Alvan R.Feinstein. He joined the Yale faculty in 1978 and remained there for 25 years as Co-Director of the Clinical Scholars Program and later as Chair of the Department of Medicine. Before joining GSK, Dr. Horwitz was Chair of Medicine at Stanford and Dean of Case Western Reserve Medical School. He is an elected member of the Institute of Medicine of the National Academy of Sciences; the American Society for Clinical Investigation; the American Epidemiological Society; and the Association of American Physicians (he was President in 2010). He was a member of the Advisory Committee to the NIH Director (under both Elias Zerhouni and Francis Collins). Dr. Horwitz served on the American Board of Internal Medicine and was Chairman in 2003. He is a Master of the American College of Physicians.

Brent C. James, MD, MStat is known internationally for his work in clinical quality improvement, patient safety, and the infrastructure that underlies successful improvement efforts, such as culture change, data systems, payment methods, and management roles. He is a member of the National Academy of Science's Institute of Medicine (and participated in many of that organization's seminal works on quality and patient safety). He holds faculty appointments at the University of Utah School of Medicine (Family Medicine and Biomedical Informatics), Harvard School of Public Health (Health Policy and Management), and the University of Sydney, Australia, School of Public Health. He is the Chief Quality Officer, and Executive Director, Institute for Health Care Delivery Research at Intermountain Healthcare, based in Salt Lake City, Utah. (Intermountain is an integrated system of 23 hospitals, almost 150 clinics, a 700+ member physician group, and an HMO/PPO insurance plan jointly responsible for more than 500,000 covered lives serving patients in Utah, Idaho, and, at a tertiary level, seven surrounding States). Through the Intermountain Advanced Training Program in Clinical Practice Improvement (ATP), he has trained more than 3500 senior physician, nursing, and administrative executives, drawn from around the world, in clinical management methods, with proven improvement results (and more than 30 "daughter" training programs in 6 countries) Before coming to Intermountain, he was an Assistant Professor in the Department of Biostatistics at the Harvard School of Public Health, providing statistical support for the Eastern Cooperative Oncology Group (ECOG); and staffed the American College of Surgeons' Commission on Cancer. He holds Bachelor of Science degrees in Computer Science (Electrical Engineering) and Medical Biology; an M.D. degree (with residency training in general surgery and oncology); and a Master of Statistics degree. He serves on several non-profit boards of trustees, dedicated to clinical improvement.

Gail R. Janes, PhD, MS is a Senior Health Scientist in health policy, with the Office of Prevention Through Healthcare (OPTH) in the Centers for Disease Control and Prevention (CDC), in Atlanta, GA. Her area of concentration is health data policy, and evidence based processes, as they relate to public health practice and policy. Since joining CDC in 1992, she has held various positions including Senior Scientist with the CDC

Guide to Community Preventive Services, and Lead Scientist for Guideline Development with the Division of HIV Prevention, where she developed a protocol for applying evidence-based methodologies to the development of programmatic guidelines. She has recently worked closely with the Center for Medicare and Medicaid Services, on the application of value-based purchasing and public reporting to efforts to reduce hospital-associated infections, using CDC's National Healthcare Safety Network. She has also worked on comparative effectiveness methodologies with AHRQ's Center for Outcome Effectiveness, and served as a CDC liaison to the U.S. Preventive Services Task Force. Dr. Janes received her undergraduate degree from the University of Maryland and her doctoral degree in cell biology from Georgetown University. She also received a MS in biostatistics from the University of Illinois. Prior to joining CDC, she served as Senior Statistician with the Department of Veterans Affairs Multicenter Clinical Trial Program, and as Head of the Rotterdam Regional Cancer Registry, in the Netherlands.

Michael M.E. Johns, MD assumed the post of chancellor for Emory University in October 2007. Prior to that, beginning in 1996, he served as executive vice president for health affairs and CEO of the Robert W. Woodruff Health Sciences Center and chair of Emory Healthcare. As leader of the health sciences and Emory Healthcare for 11 years, Dr. Johns engineered the transformation of the Health Sciences Center into one of the nation's preeminent centers in education, research, and patient care. He previously served as dean of the Johns Hopkins School of Medicine and vice president for medicine at Johns Hopkins University from 1990 to 1996. In addition to leading complex administrative and academic organizations to new levels of excellence and service, Dr. Johns is widely renowned as a catalyst of new thinking in many areas of health policy and health professions education. He has been a significant contributor to many of the leading organizations and policy groups in health care, including the Institute of Medicine (IOM), the Association of American Medical Colleges (AAMC), The Commonwealth Fund Task Force on Academic Health Centers, the Association of Academic Health Centers, and many others. He frequently lectures, publishes, and works with state and federal policy makers, on topics ranging from the future of health professions education to national health system reform. Dr. Johns was elected to the Institute of Medicine in 1993 and has served on many IOM committees. Dr. Johns received his bachelor's degree from Wayne State University and his medical degree with distinction at the University of Michigan Medical School.

Craig A. Jones, MD is the Director of the Vermont Blueprint for Health, a program established by the State of Vermont, under the leadership of its Governor, Legislature and the bi-partisan Health Care Reform Commission. The Blueprint is intended to guide a statewide transformation resulting in seamless and well coordinated health services for all citizens, with an emphasis on prevention. Prior to this he was an Assistant Professor in the Department of Pediatrics at the Keck School of Medicine at the University of Southern California, and Director of the Division of Allergy/Immunology and Director of the Allergy/Immunology Residency Training Program in the Department of Pediatrics at the Los Angeles County + University of Southern California (LAC+USC) Medical Center. He was Director, in charge of the design, implementation, and management, of the Breathmobile Program, a program using mobile clinics, team based care, and health information technology to deliver ongoing preventive care to inner city children with asthma at their schools and at County clinics. The program evolved from community outreach to a more fully integrated Pediatric Asthma Disease Management for the Los Angeles County Department of Health Services, and spread to several other communities across the country. He has published papers, abstracts, and textbook chapters, on topics related to health services, health outcomes, and allergy and immunology in Pediatric Research, Pediatrics, J Pediatrics, Pediatrics in Review, Journal of Clinical Immunology, Journal of Allergy and Clinical Immunology, Annals of Allergy, Asthma and Immunology, CHEST, and Disease Management. Dr. Jones was an Executive Committee and Board Member for the Southern California Chapter of the Asthma and Allergy Foundation of America, as well the chapter President. He is a past president of the Los Angeles Society of Allergy Asthma & Immunology, and a past President and a member of the Board of Directors for the California Society of Allergy Asthma & Immunology. Dr. Jones received his undergraduate degree at the University of California at San Diego and his MD at the University of Texas Health Science Center in San Antonio, Texas. He completed his internship and residency in pediatrics at LAC/USC Medical Center, where he also completed his fellowship in allergy and clinical immunology.

Gary Kaplan, MD, FACP, FACMPE has served as Chairman and CEO of the Virginia Mason Health System since 2000. Dr. Kaplan received his medical degree from the University of Michigan and is board-certified in internal medicine. Since Dr. Kaplan became Chairman and CEO, Virginia Mason has received significant national and international recognition for its efforts to transform health care. The Leapfrog Group named Virginia Mason "Top Hospital of The Decade" for patient safety and quality, a distinction shared with only one other hospital. For the fifth consecutive year, The Leapfrog Group also named Virginia Mason as one of 65 U.S. hospitals to be designated as a "Top Hospital". In addition, Virginia Mason has received HealthGrades' "Distinguished Hospital Award for Clinical Excellence" for five consecutive years. Virginia Mason is considered to be the national leader in deploying the Toyota Production System to health-care management. In addition to his patient-care duties and position as CEO, Dr. Kaplan is a clinical professor at the University of Washington and has been recognized for his service and contribution to many regional and national boards, including the Institute for Healthcare Improvement, the Medical Group Management Association, the National Patient Safety Foundation, the Greater Seattle Chamber of Commerce and the Washington Healthcare Forum. Dr. Kaplan is a founding member of Health CEOs for Health Reform. In 2007, Dr. Kaplan was designated a fellow in the American College of Physician Executives. In 2011, he was named the 12th most influential U.S. physician leader in health care by *Modern Healthcare* magazine, and the same publication ranked Dr. Kaplan 33rd on its list of the "100 Most Influential People in Healthcare." In 2012, he was named the 2nd most influential U.S. physician leader in health care by the same publication. In 2009, Dr. Kaplan received the John M. Eisenberg Award from the National Quality Forum and The Joint Commission for Individual Achievement at the national level for his outstanding work and commitment to patient safety and quality. Additionally, he was recognized by the Medical Group Management Association (MGMA) as the recipient of the Harry J. Harwick Lifetime Achievement Award. Each year, the MGMA and the American College of Medical Practice Executives honor one individual who has made outstanding nationally recognized contributions to health-care administration, delivery, and education in his career, advancing the field of medical practice management.

Darrell G. Kirch, MD is president and CEO of the Association of American Medical Colleges (AAMC), which represents the nation's medical schools, teaching hospitals, and academic societies. A distinguished physician, educator, and medical scientist, Dr. Kirch speaks and publishes widely on the need for transformation in the nation's health care system and how academic medicine can lead that change across medical education, medical research, and patient care. Prior to becoming AAMC president in 2006, Dr. Kirch served as the dean and academic health system leader of two institutions, the Medical College of Georgia and the Penn State Milton S. Hershey Medical Center. He has co-chaired the Liaison Committee on Medical Education, the accrediting body for U.S. medical schools, and now serves as a member-at-large of the National Board of Medical Examiners and as chair of the Department of Veterans Affairs Special Medical Advisory Group. Dr. Kirch also is a member of the Institute of Medicine of the National Academies. A psychiatrist and clinical neuroscientist by training, Dr. Kirch began his career at the National Institute of Mental Health, becoming the acting scientific director in 1993 and receiving the Outstanding Service Medal of the United States Public Health Service. A native of Denver, he earned his B.A. and M.D. degrees from the University of Colorado.

Richard C. Larson, PhD is MIT Mitsui Professor in the Engineering Systems Division and a member of the NAE. He is founding director of MIT's Center for Engineering System Fundamentals. He has focused on operations research as applied to services industries, primarily in the fields of disaster preparedness, technology-enabled education, urban service systems, queueing, logistics and workforce planning. He is Past-President of INFORMS, Institute for Operations Research and the Management Sciences. He is an INFORMS Founding Fellow, and a recipient of the INFORMS President's Award, Lanchester Prize and Kimball Medal. He has served on a variety of NAE and IOM panels and committees. From 1995 to mid 2003, Dr. Larson served as Founding Director of MIT's CAES, Center for Advanced Educational Services. Dr. Larson's position at CAES focused on bringing technology-enabled learning to students living on the traditional campus and to those living and working far from the university, perhaps on different continents. With Elizabeth Murray, he recently started BLOSSOMS, Blended Learning Open Source Science or Math Studies http://blossoms.mit.edu, focused on high school STEM education (STEM = Science, Technology,

Engineering and Mathematics). This is an international collaboration with Jordan, Pakistan, Lebanon, Saudi Arabia, Brazil and Malaysia. His current MIT research includes disaster preparedness, especially pandemic influenza; K-12 STEM education as a complex system; home energy management; and Ph.D.-level workforce planning for the NIH.

Peter Lurie, MD, MPH is Acting Associate Commissioner for Policy and Planning in the Office of the Commissioner at the Food and Drug Administration. Prior to that he was Senior Advisor in the Office of Policy and Planning, where he worked on a number of policy issues, including antimicrobial resistance, drug shortages and the international dimensions of tobacco control. Before coming to the FDA, he was Deputy Director of Public Citizen's Health Research Group in Washington, DC, where he addressed a variety of FDA regulatory policies, a number of specific drug and device issues, efforts to reduce worker exposure to hexavalent chromium and beryllium and excessive medical resident work hours. He had an earlier academic career at the University of California, San Francisco and the University of Michigan in which he studied needle exchange programs, ethical aspects of mother-to-infant HIV transmission studies and the economic and public health aspects of a number of HIV policies domestically and abroad.

James L. Madara, MD, serves as executive vice president and chief executive officer of the American Medical Association (AMA), the nation's largest physician organization. Dr. Madara, prior to joining the AMA, served as Timmie Professor and chair of pathology and laboratory medicine at the Emory University School of Medicine before assuming the Thompson Distinguished Service Professorship and deanship at the University of Chicago Pritzker School of Medicine. During his deanship at Chicago, which also extended to the university's renowned Biological Sciences Division, Dr. Madara also served as CEO of the University of Chicago Medical Center, bringing together the university's biomedical research, teaching and clinical activities. As CEO, he engineered significant new affiliations with community hospitals, teaching hospital systems, community Federally Qualified Health Centers on Chicago's South Side, as well as with national research organizations. While at the University of Chicago from 2002 to 2009, Dr. Madara oversaw a significant renewal of the institution's biomedical campus, including the opening of the Comer Children's Hospital, the New Hospital Pavilion for adults, the Gordon Center for Integrative Science and the Knapp Center for Biomedical Discovery. Dr. Madara is a noted academic pathologist and an authority on epithelial cell biology and on gastrointestinal disease. He has published more than 200 original papers and chapters, making important contributions to understanding the biology of the cells that line the digestive tract. His work has garnered both national and international awards. Dr. Madara has served as president of the American Board of Pathology and as editor-in-chief of the *American Journal of Pathology*. A past recipient of a prestigious MERIT Award from the National Institute of Health, he recently received the Davenport Award for lifetime achievement in gastrointestinal disease from the American Physiological Society. Most recently, Dr. Madara served as senior advisor with Leavitt Partners, a highly innovative health care consulting firm started by former Secretary of Health and Human Services Mike Leavitt. Dr. Madara earned his medical degree from Hahnemann Medical College in Philadelphia. He completed his internship and residency at New England Deaconess Hospital in Boston. He subsequently completed a fellowship in anatomy and cell biology at Peter Bent Brigham Hospital in Boston (now Brigham and Women's Hospital). Following his fellowship, Dr. Madara joined the faculty of Harvard Medical School where he rose to a full tenured professor and served as director of the Harvard Digestive Diseases Center. Dr. Madara and his wife Vicki have two children: Max and Alexis.

Farzad Mostashari, MD, ScM, serves as National Coordinator for Health Information Technology within the Office of the National Coordinator for Health Information Technology at the U.S. Department of Health and Human Services. Farzad joined ONC in July 2009. Previously, he served at the New York City Department of Health and Mental Hygiene as Assistant Commissioner for the Primary Care Information Project, where he facilitated the adoption of prevention-oriented health information technology by over 1,500 providers in underserved communities. Dr. Mostashari also led the Centers for Disease Control and Prevention (CDC) funded NYC Center of Excellence in Public Health Informatics and an Agency for Healthcare Research and Quality funded project focused on quality measurement at the point of care. Prior to this he established the Bureau of Epidemiology Services at the NYC Department of Health, charged with providing epidemiologic and statistical expertise and data for decision making to the health department. He

did his graduate training at the Harvard School of Public Health and Yale Medical School, internal medicine residency at Massachusetts General Hospital, and completed the CDC's Epidemic Intelligence Service. He was one of the lead investigators in the outbreaks of West Nile Virus and anthrax in New York City, and among the first developers of real-time electronic disease surveillance systems nationwide.

Mary D. Naylor, PhD, RN, FAAN is the Marian S. Ware Professor in Gerontology and Director of the NewCourtland Center for Transitions and Health at the University of Pennsylvania School of Nursing. Since 1989, Dr. Naylor has led an interdisciplinary program of research designed to improve the quality of care, decrease unnecessary hospitalizations, and reduce health care costs for vulnerable community-based elders. Dr. Naylor is also the National Program Director for the Robert Wood Johnson Foundation program, Interdisciplinary Nursing Quality Research Initiative, aimed at generating, disseminating, and translating research to understand how nurses contribute to quality patient care. She was elected to the National Academy of Sciences, Institute of Medicine in 2005. She also is a member of the RAND Health Board, the National Quality Forum Board of Directors and the immediate past-chair of the Board of the Long-Term Quality Alliance. She was appointed to the Medicare Payment Advisory Commission in 2010.

William D. Novelli, MA is a professor in the McDonough School of Business at Georgetown University. In addition to teaching in the MBA program, he is working to establish a center for social enterprise at the School. From 2001 to 2009, he was CEO of AARP, a membership organization of over 40 million people 50 and older. Prior to joining AARP, Mr. Novelli was President of the Campaign for Tobacco-Free Kids, whose mandate is to change public policies and the social environment, limit tobacco companies' marketing and sales practices to children and serve as a counterforce to the tobacco industry and its special interests. He now serves as chairman of the board. Previously, he was Executive Vice President of CARE, the world's largest private relief and development organization. He was responsible for all operations in the U.S. and abroad. CARE helps impoverished people in Africa, Asia and Latin America through programs in health, agriculture, environmental protection and small business support. CARE also provides emergency relief to people in need. Earlier, Mr. Novelli co-founded and was President of Porter Novelli, now one of the world's largest public relations agencies and part of the Omnicom Group, an international marketing communications corporation. He directed numerous corporate accounts as well as the management and development of the firm. He retired from the firm in 1990 to pursue a second career in public service. He was named one of the 100 most influential public relations professionals of the 20th century by the industry's leading publication. Mr. Novelli is a recognized leader in social marketing and social change, and has managed programs in cancer control, diet and nutrition, cardiovascular health, reproductive health, infant survival, pay increases for educators, charitable giving and other programs in the U.S. and the developing world. He began his career at Unilever, a worldwide-packaged goods marketing company, moved to a major ad agency, and then served as Director of Advertising and Creative Services for the Peace Corps. In this role, Mr. Novelli helped direct recruitment efforts for the Peace Corps, VISTA, and social involvement programs for older Americans. He holds a B.A. from the University of Pennsylvania and an M.A. from Penn's Annenberg School for Communication, and pursued doctoral studies at New York University. He taught marketing management for 10 years in the University of Maryland's M.B.A. program and also taught health communications there. He has lectured at many other institutions. He has written numerous articles and chapters on marketing management, marketing communications, and social marketing in journals, periodicals and textbooks. His book, *50+: Give Meaning and Purpose to the Best Time of Your Life, was updated in 2008*. His newest book, *Managing the Older Worker: How to Prepare for the New Organizational Order* (with Peter Cappelli) was published in 2010. Mr. Novelli serves on a number of boards and advisory committees. He and his wife, Fran, live in Bethesda, Maryland. They have three adult children and seven grandchildren.

Samuel R. Nussbaum, MD is Executive Vice President, Clinical Health Policy, and Chief Medical Officer for WellPoint, Inc. He is the key spokesperson and policy advocate for WellPoint. He oversees corporate medical and pharmacy policy to ensure the provision of clinically proven effective care. Dr. Nussbaum collaborates with industry leaders, physicians, hospitals and national policy and health care organizations to shape an agenda for quality, safety and clinical outcomes and to improve patient care for WellPoint's 34 million medical members nationwide. In addition, Dr. Nussbaum works closely with WellPoint business units to advance international and innovative health care services strategy and development. In the decade

that Dr. Nussbaum has served as Chief Medical Officer at WellPoint, he has led business units focused on care and disease management and health improvement, clinical pharmacy programs, and provider networks and contracting with accountability for over $100B in health care expenditures. He has been the architect of models that improve quality, safety and affordability, and was instrumental in developing an innovative contracting approach linking hospital reimbursement to quality, safety and clinical performance. In addition, he guided an extensive set of public and private sector partnerships which have improved community health. Under his leadership, WellPoint's HealthCore subsidiary has built partnerships with Federal agencies, including CDC and FDA, and with academic institutions to advance drug safety, comparative effectiveness and outcomes research. Dr. Nussbaum currently serves on the Boards of the National Quality Forum (NQF), the OASIS Institute, and BioCrossroads, an Indiana-based public-private collaboration that advances and invests in the life sciences. Dr. Nussbaum is a Professor of Clinical Medicine at Washington University School of Medicine and serves as adjunct professor at the Olin School of Business, Washington University. Dr. Nussbaum has served as President of the Disease Management Association of America, Chairman of the National Committee for Quality Health Care, as Chair of America's Health Insurance Plan's (AHIP) Chief Medical Officer Leadership Council, as a member of the AHIP Board, and on the Secretary of Health and Human Services Advisory Committee on Genetics, Health, and Society. Dr. Nussbaum received the 2004 Physician Executive Award of Excellence from the American College of Physician Executives and Modern Physician magazine and has been recognized by Modern Healthcare as one of the "50 Most Influential Physician Executives in Healthcare" in 2010 and 2011. Prior to joining WellPoint, Dr. Nussbaum served as executive vice president, Medical Affairs and System Integration, of BJC Health Care, where he led integrated clinical services across the health system and served as President of its medical group. He earned his medical degree from Mount Sinai School of Medicine. He trained in internal medicine at Stanford University Medical Center and Massachusetts General Hospital and in endocrinology and metabolism at Harvard Medical School and Massachusetts General Hospital, where he directed the Endocrine Clinical Group. As a professor at Harvard Medical School, Dr. Nussbaum's research led to new therapies to treat skeletal disorders and new technologies to measure hormones in blood.

Jonathan B. Perlin, MD, PhD, MSHA, FACP, FACMI is President, Clinical and Physician Services and Chief Medical Officer of Nashville, Tennessee-based HCA (Hospital Corporation of America). He provides leadership for clinical services and improving performance at HCA's 163 hospitals and more than 600 outpatient centers and physician practices. Current activities include implementing electronic health records throughout HCA, improving clinical "core measures" to benchmark levels, and leading patient safety programs to eliminate preventable complications and healthcare-associated infections. Before joining HCA in 2006, "the Honorable Jonathan B. Perlin" was Under Secretary for Health in the U.S. Department of Veterans Affairs. Nominated by the President and confirmed by the Senate, as the senior-most physician in the Federal Government and Chief Executive Officer of the Veterans Health Administration (VHA), Dr. Perlin led the nation's largest integrated health system. At VHA, Dr. Perlin directed care to over 5.4 million patients annually by more than 200,000 healthcare professionals at 1,400 sites, including hospitals, clinics, nursing homes, counseling centers and other facilities, with an operating and capital budget of over $34 billion. A champion for implementation of electronic health records, Dr. Perlin led VHA quality performance to international recognition as reported in academic literature and lay press and as evaluated by RAND, Institute of Medicine, and others. Dr. Perlin has served on numerous Boards and Commissions including the National Quality Forum, the Joint Commission, Meharry Medical College, and he chairs the HHS Health IT Standards Committee. Broadly published in healthcare quality and transformation, he is a Fellow of the American College of Physicians and the American College of Medical Informatics. Dr. Perlin has a Master's of Science in Health Administration and received his Ph.D. in pharmacology (molecular neurobiology) with his M.D. as part of the Physician Scientist Training Program at the Medical College of Virginia of Virginia Commonwealth University (VCU). Perennially recognized as one of the most influential physician executives in the United States by *Modern Healthcare*, Dr. Perlin has received numerous awards including Distinguished Alumnus in Medicine and Health Administration from his *alma mater*, Chairman's Medal from the National Patient Safety Foundation, the Founders Medal from the Association of Military Surgeons of the United States, and is one of nine honorary members of the Special Forces Association and Green Berets.

Dr. Perlin has faculty appointments at Vanderbilt University as Adjunct Professor of Medicine and Biomedical Informatics and at VCU as Adjunct Professor of Health Administration. He resides in Nashville, Tennessee, with his wife, Donna, an Emergency Pediatrics Physician, and children, Ben and Sarah.

Robert A. Petzel, MD was appointed Under Secretary for Health in the Department of Veterans Affairs (VA) on Feb. 18, 2010. Prior to this appointment, Dr. Petzel had served as VA's Acting Principal Deputy Under Secretary for Health since May 2009. As Under Secretary for Health, Dr. Petzel oversees the health care needs of millions of veterans enrolled in the Veterans Health Administration (VHA), the nation's largest integrated health care system. With a medical care appropriation of more than $48 billion, VHA employs more than 262,000 staff at over 1,400 sites, including hospitals, clinics, nursing homes, domiciliaries, and Readjustment Counseling Centers. In addition, VHA is the nation's largest provider of graduate medical education and a major contributor to medical research. More than eight million veterans are enrolled in the VA's health care system, which is growing in the wake of its eligibility expansion. This year, VA expects to treat nearly six million patients during 78 million outpatient visits and 906,000 inpatient admissions. Previously, Dr. Petzel served as Network Director of the VA Midwest Health Care Network (VISN 23) based in Minneapolis, Minn. In that position, Dr. Petzel was responsible for the executive leadership, strategic planning and budget for eight medical centers and 42 community-based outpatient clinics, serving veterans in Iowa, Minnesota, Nebraska, North Dakota, South Dakota, western Illinois and western Wisconsin. Dr. Petzel was appointed Director of Network 23 (the merger of Networks 13 and 14) in October 2002. From October 1995 to September 2002, he served as the Director of Network 13. Prior to that position, he served as Chief of Staff at the Minneapolis VA Medical Center. Dr. Petzel is particularly interested in data-based performance management, organization by care lines, and empowering employees to continuously improve the way we serve our veterans. He is involved in a collaborative partnership with the British National Health Services Strategic Health Authority. In addition, he co-chairs the National VHA Strategic Planning Committee and the VHA System Redesign Steering Committee. Dr. Petzel graduated from St. Olaf College, Northfield, Minn., in 1965 and from Northwestern University Medical School in 1969. He is Board Certified in Internal Medicine and on the faculty of the University of Minnesota Medical School.

Richard Platt, MD, MSc is a professor and chair of the Department of Population Medicine at Harvard Medical School and the Harvard Pilgrim Health Care Institute. He is principal investigator of the FDA's Mini-Sentinel program, of contracts with FDA's Center for Drugs Evaluation and Research (CDER) and Center for Biologics Evaluation and Research (CBER) to conduct post-marketing studies of drugs' and biologics' safety and effectiveness. He chaired the FDA's Drug Safety and Risk Management Advisory Committee, is a member of the Association of American Medical Colleges' Advisory Panel on Research and the Institute of Medicine Roundtable on Value & Science-Driven Health Care. Dr. Platt was co-chair of the Board of Scientific Counselors of the Centers for Disease Control and Prevention's (CDC) Center for Infectious Diseases. Additionally, he has chaired the National Institutes of Health study section, Epidemiology and Disease Control 2, and the CDC Office of Health Care Partnerships steering committee. Dr. Platt is also principal investigator of a CDC Center of Excellence in Public Health Informatics, the Agency for Healthcare Research and Quality (AHRQ) HMO Research Network Center for Education and Research in Therapeutics, the AHRQ HMO Research Network DEcIDE Center, the CDC Eastern Massachusetts Prevention Epicenter, and FDA contracts to conduct post-marketing studies of drugs' and biologics' safety and effectiveness.

John W. Rowe, MD is a Professor in the Department of Health Policy and Management at the Columbia University Mailman School of Public Health. Previously, from 2000 until his retirement in late 2006, Dr. Rowe served as Chairman and CEO of Aetna, Inc. Before his tenure at Aetna, from 1998 to 2000, Dr. Rowe served as President and Chief Executive Officer of Mount Sinai NYU Health, one of the nation's largest academic health care organizations. From 1988 to 1998, prior to the Mount Sinai-NYU Health merger, Dr. Rowe was President of the Mount Sinai Hospital and the Mount Sinai School of Medicine in New York City. Before joining Mount Sinai, Dr. Rowe was a Professor of Medicine and the founding Director of the Division on Aging at the Harvard Medical School, as well as Chief of Gerontology at Boston's Beth Israel Hospital. He has authored over 200 scientific publications, mostly on the physiology of the aging process, including a

leading textbook of geriatric medicine, in addition to more recent publications on health care policy. Dr. Rowe was Director of the MacArthur Foundation Research Network on Successful Aging and is co-author, with Robert Kahn, Ph.D., of *Successful Aging* (Pantheon, 1998). Currently, Dr. Rowe leads the MacArthur Foundation's Network on An Aging Society and chairs the Institute of Medicine's Committee on the Future Health Care Workforce for Older Americans. He has served as president of the Gerontological Society of America and recently chaired the Committee of the Institute of Medicine of the National Academy of Sciences on The Future Health Care Workforce Needs of An Aging Population. Dr. Rowe was elected a Fellow of the American Academy of Arts and Sciences and a member of the Institute of Medicine of the National Academy of Sciences where he is involved in the Evidence Based Roundtable. Dr. Rowe serves on the Board of Trustees of the Rockefeller Foundation and is Chairman of the Board of Trustees at the Marine Biological Laboratory in Woods Hole, Massachusetts. Dr Rowe is a former member of the Medicare Payment Advisory Commission (MedPAC).

Joe V. Selby, MD, MPH, is the first Executive Director of the Patient-Centered Outcomes Research Institute (PCORI). A family physician, clinical epidemiologist and health services researcher, Dr. Selby has more than 35 years of experience in patient care, research and administration. He is responsible for identifying strategic issues and opportunities for PCORI and implementing and administering programs authorized by the PCORI Board of Governors. Dr. Selby joined PCORI from Kaiser Permanente, Northern California, where he was Director of the Division of Research for 13 years and oversaw a department of more than 50 investigators and 500 research staff working on more than 250 ongoing studies. He was with Kaiser Permanente for 27 years. An accomplished researcher, Dr. Selby has authored more than 200 peer-reviewed articles and continues to conduct research, primarily in the areas of diabetes outcomes and quality improvement. His publications cover a spectrum of topics, including effectiveness studies of colorectal cancer screening strategies; treatment effectiveness, population management and disparities in diabetes mellitus; primary care delivery and quality measurement. Dr. Selby was elected to membership in the Institute of Medicine in 2009 and was a member of the Agency for Healthcare Research and Quality study section for Health Care Quality and Effectiveness from 1999-2003. A native of Fulton, Missouri, Dr. Selby received his medical degree from Northwestern University and his master's in public health from the University of California, Berkeley. He was a commissioned officer in the Public Health Service from 1976-1983 and received the Commissioned Officer's Award in 1981. He serves as Lecturer in the Department of Epidemiology and Biostatistics, University of California, San Francisco School of Medicine, and as a Consulting Professor, Health Research and Policy, Stanford University School of Medicine.

Susan B. Shurin, MD is the Acting Director, National Heart, Lung, and Blood Institute (NHLBI). She joined NHLBI in 2006 as the Deputy Director, and has been Acting Director since December 2009. She is responsible for the scientific and administrative management of the intramural and extramural activities of the NHLBI, and oversight of the Institute's clinical research portfolio. Dr. Shurin represents the NHLBI in activities across the National Institutes of Health (NIH) and the Department of Health and Human Services. The NHLBI, third largest of the 27 Institutes and Centers at NIH, has an annual budget of over $3.1 billion, and manages a complex portfolio of basic, clinical, translational and epidemiologic research. The bulk of the Institute's resources are allocated to support extramural research across the US and across the globe. Dr. Shurin is engaged in multiple trans-NIH research and administrative activities, and in global health research on non-communicable diseases. Before joining the NHLBI, Dr. Shurin was professor of Pediatrics and Oncology at Case Western Reserve University; director of Pediatric Hematology-Oncology at Rainbow Babies and Children's Hospital; director of Pediatric Oncology at the Case Comprehensive Cancer Center; and vice president and secretary of the Corporation at Case Western Reserve University in Cleveland, Ohio. Dr. Shurin received her education and medical training at Harvard University and the Johns Hopkins University School of Medicine. Her laboratory research focused on the physiology of phagocyte function, recognition and killing of pathogens; mechanisms of hemolysis; and iron overload. She has been active in clinical research in many aspects of pediatric hematology-oncology, including participation in the Children's Cancer Group, Children's Oncology Group, multiple studies in sickle cell disease and hemostasis.

Mark D. Smith, MD, MBA has been President and Chief Executive Officer of the California HealthCare Foundation since its formation in 1996. The Foundation is an independent philanthropy with assets of more than $700 million, headquartered in Oakland, California and dedicated to improving the health of the people of California through its program areas: Better Chronic Disease Care, Innovations for the Underserved, Market and Policy Monitor, and Health Reform and Public Programs Initiative. A board-certified internist, Smith is a member of the clinical faculty at the University of California, San Francisco and an attending physician at the Positive Health Program (for AIDS care) at San Francisco General Hospital. He has been elected to the Institute of Medicine and serves on the board of the National Business Group on Health. Prior to joining the California HealthCare Foundation, Smith was Executive Vice President at the Henry J. Kaiser Family Foundation. He previously served as Associate Director of AIDS Services and Assistant Professor of Medicine and of Health Policy and Management at Johns Hopkins University. He has served on the Performance Measurement Committee of the National Committee for Quality Assurance and the editorial board of the *Annals of Internal Medicine*. Smith received a Bachelor's degree in Afro-American studies from Harvard College, a Medical Doctorate from the University of North Carolina at Chapel Hill, and a Master's of Business Administration, with a concentration in Health Care Administration, from the Wharton School at the University of Pennsylvania.

Glenn D. Steele Jr, MD, PhD is President and Chief Executive Officer of Geisinger Health System. Dr. Steele previously served as the dean of the Biological Sciences Division and the Pritzker School of Medicine and as vice president for medical affairs at the University of Chicago, as well as the Richard T. Crane Professor in the Department of Surgery. Prior to that, he was the William V. McDermott Professor of Surgery at Harvard Medical School, president and chief executive officer of Deaconess Professional Practice Group, Boston, MA, and chairman of the department of surgery at New England Deaconess Hospital (Boston, MA). Widely recognized for his investigations into the treatment of primary and metastatic liver cancer and colorectal cancer surgery, Dr. Steele is past Chairman of the American Board of Surgery. He serves on the editorial board of numerous prominent medical journals. His investigations have focused on the cell biology of gastrointestinal cancer and pre-cancer and most recently on innovations in healthcare delivery and financing. A prolific writer, he is the author or co-author of more than 476 scientific and professional articles. Dr. Steele received his bachelor's degree in history and literature from Harvard University and his medical degree from New York University School of Medicine. He completed his internship and residency in surgery at the University of Colorado, where he was also a fellow of the American Cancer Society. He earned his PhD in microbiology at Lund University in Sweden. He is a member of the Institute of Medicine of the National Academy of Sciences and served on their Committee on Reviewing Evidence to Identify Highly Effective Clinical Services (HECS), the New England Surgical Society, a fellow of the American College of Surgeons, the American Surgical Association, the American Society of Clinical Oncology, and past president of the Society of Surgical Oncology. He was a member of the National Advisory Committee for Rural Health, the Pennsylvania Cancer Control Consortium and is presently a member of the Healthcare Executives Network, the Commonwealth Fund's Commission on a High Performance Health System, and served as a member of the National Committee for Quality Assurance's (NCQA) Committee on Performance Measurement. Dr. Steele serves on several boards including Bucknell University's Board of Trustees, Temple University School of Medicine's Board of Visitors, Premier, Inc (Vice Chair), Weis Markets, Inc., and Wellcare Health Plans, Inc. Dr. Steele was recently appointed to serve on The Hospital & Healthsystem Association of Pennsylvania (HAP) Board of Directors, the Harvard Medical Faculty Physicians Board at Beth Israel Deaconess Medical Center and Cepheid's Board of Directors. Dr. Steele previously served on the American Hospital Association's Board of Trustees, Executive Committee, the AHA Systems Governing Council (Chair), and the AHA Long-Range Policy Committee. He will serve as a member on the AHA Committee on Research. Dr. Steele is currently Honorary Chair of the Pennsylvania March of Dimes Prematurity Campaign, served on the Healthcare Financial Management Association's Healthcare Leadership Council, the Northeast Regional Cancer Institute, the Global Conference Institute, and previously served on the Simon School of Business Advisory Board (University of Rochester) 2002 - 2007. In 2006 Dr. Steele received the CEO IT Achievement Award, given by *Modern Healthcare* and the Healthcare Information and Management Systems Society (HIMSS) for promoting health information technology. In 2007, Dr. Steele received AHA's Grassroots Champion Award and was named to Modern

Healthcare's 50 Most Powerful Physician Executives in Healthcare. He was recognized by "Modern Healthcare's 100 Most Powerful People in Healthcare" in 2009 and 2010. Dr. Steele received the 8th Annual 2010 AHA Health Research & Education Trust Award. The HRET award honors individuals who exhibit visionary leadership in healthcare and who symbolize HRET's mission of leveraging research and education to make a dramatic impact in policy and practice. Dr. Steele was awarded the HFMA Board of Directors' Award in 2011.

Marilyn Tavenner, MHA, RN is currently the Acting Administrator for the Centers for Medicare & Medicaid Services. Previously, Ms. Tavenner was Principal Deputy Administrator for the Centers for Medicare & Medicaid Services (CMS). As the Principal Deputy Administrator, Ms. Tavenner served as the agency's second-ranking official overseeing policy development and implementation as well as management and operations. Ms. Tavenner, a life-long public health advocate, manages the $820 billion federal agency, which ensures health care coverage for 100 million Americans, with 10 regional offices and more than 4,000 employees nationwide. CMS administers Medicare, and it provides funds and guidance to all states for their Medicaid and Children's Health Insurance (CHIP) programs. With the passage of the Affordable Care Act in March of 2010, Ms. Tavenner is also responsible for overseeing CMS as it implements the insurance reforms and Affordable Insurance Exchanges included in the health reform law. Prior to assuming her CMS leadership role, Ms. Tavenner served for four years as the Commonwealth of Virginia's Secretary of Health and Human Resources in the administration of former Governor Tim Kaine. In this top cabinet position, she was charged with overseeing 18,000 employees and a $9 billion annual budget to administer Medicaid, mental health, social services, public health, aging, disabilities agencies, and children's services. Before entering government service, Ms. Tavenner spent 25 years working for the Hospital Corporation of American (HCA). She began working as a nurse at the Johnson-Willis Hospital in Richmond, Va., in 1981 and steadily rose through the company. By 1993, she began working as the hospital's Chief Executive Officer and, by 2001, had assumed responsibility for 20 hospitals as President of the company's Central Atlantic Division. She finished her service to HCA in 2005 as Group President of Outpatient Services, where she spearheaded the development of a national strategy for freestanding outpatient services, including physician recruitment and real estate development. Ms. Tavenner holds a bachelor's of science degree in nursing and a master's degree in health administration, both from the Virginia Commonwealth University. She has worked with many community and professional organizations, serving as a board member of the American Hospital Association, as president of the Virginia Hospital Association, as chairperson of the Chesterfield Business Council, and as a life-long member of the Rotary Club. Her contributions also include providing leadership in such public service organizations as the March of Dimes, the United Way and the Juvenile Diabetes Research Foundation. In addition to numerous business awards, Ms. Tavenner has been recognized for her volunteer activities, including the 2007 recipient of the March of Dimes Citizen of the Year Award.

Reed V. Tuckson, MD, FACP is a graduate of Howard University, Georgetown University School of Medicine, and the Hospital of the University of Pennsylvania's General Internal Medicine Residency and Fellowship Programs. He is currently the Executive Vice President and Chief of Medical Affairs at UnitedHealth Group, a Fortune 25 diversified health and well-being company. As the most senior clinician, Dr. Tuckson is responsible for working with all the company's diverse and comprehensive business units to improve the quality and efficiency of the health services provided to the 75 million members that UnitedHealth Group is privileged to serve worldwide. Formerly, Dr. Tuckson served as Senior Vice President, Professional Standards, for the American Medical Association (AMA); is former President of the Charles R. Drew University of Medicine and Science in Los Angeles; and he is a former Commissioner of Public Health for the District of Columbia. He is an active member of the prestigious Institute of Medicine of the National Academy of Sciences. Recently, he was appointed to the National Institute of Health's Advisory Committee to the Director and the Department of Health and Human Services' Health Information Technology (HIT) Policy Committee - Enrollment Workgroup. He is immediate past Chair of the Secretary of Health and Human Services' Advisory Committee on Genetics, Health and Society. Dr. Tuckson has also held other federal appointments, including cabinet level advisory committees on health reform, infant mortality, children's health, violence, and radiation testing. Dr. Tuckson currently serves on the Board of Directors for several national organizations including the National Hispanic Medical Association; the Alliance

for Health Reform; the American Telemedicine Association; the National Patient Advocate Foundation; the Macy Foundation; the Arnold P. Gold Foundation; Project Sunshine and Howard University.

Mary Wakefield, PhD, RN was named administrator of the Health Resources and Services Administration (HRSA) by President Barack Obama on February 20, 2009. Dr. Wakefield joins HRSA from the University of North Dakota (UND), where she was associate dean for rural health at the School of Medicine and Health Sciences, a tenured professor, and director of the university's Center for Rural Health. Dr. Wakefield brings experience on Capitol Hill to her post at HRSA. In the 1990s, she served as chief of staff to two North Dakota senators: Kent Conrad (D) and Quentin Burdick (D). She also has served as director of the Center for Health Policy, Research and Ethics at George Mason University in Fairfax, Va., and worked on site as a consultant to the World Health Organization's Global Programme on AIDS in Geneva, Switzerland. Dr. Wakefield is a fellow in the American Academy of Nursing and was elected to the Institute of Medicine (IOM) of the National Academies in 2004. She served on the IOM committee that produced the landmark reports *To Err is Human* and *Crossing the Quality Chasm*. She also co-chaired the IOM committee that produced the report *Health Professions Education*, and chaired the committee that produced the report *Quality through Collaboration: Health Care in Rural America*. In addition, she has served on the Medicare Payment Advisory Commission, as chair of the National Advisory Council for the Agency for Healthcare Research and Quality, as a member of President Clinton's Advisory Commission on Consumer Protection and Quality in the Health Care Industry, and as a member of the National Advisory Committee to HRSA's Office of Rural Health Policy. At UND, Dr. Wakefield also was director of the Rural Assistance Center, a HRSA-funded source of information on rural health and social services for researchers, policymakers, program managers, project officers and the general public. In addition, the Center for Rural Health administered a $1.6 million award from HRSA under the Critical Access Hospital Health Information Technology Implementation program. Dr. Wakefield is a native of Devils Lake, N.D. She has a bachelor of science degree in nursing from the University of Mary in Bismarck and master's and doctoral degrees in nursing from the University of Texas at Austin.

Debra Bailey Whitman, PhD, MA is AARP's Executive Vice President, Policy and International. She is an authority on aging issues with extensive experience in national policymaking, domestic and international research, and the political process. She oversees AARP's Public Policy Institute, Office of Policy Integration, Office of International Affairs and Office of Academic Affairs. She works closely with the board and National Policy Council on a broad agenda to develop AARP policy priorities and make life better for older Americans. An economist, she is a strategic thinker whose career has been dedicated to solving problems affecting economic and health security, and other issues related to population aging. As staff director for the U.S. Senate Special Committee on Aging, she worked to increase retirement security, preserve a strong system of Social Security, lower the cost of health care, protect vulnerable seniors, safeguard consumers, make the pharmaceutical industry more transparent and improve our nation's nursing homes. She has sought bipartisan, fact-based solutions to these and other challenges facing older Americans. She previously worked for the Congressional Research Service as a specialist in the economics of aging. In this capacity, she provided members of Congress and their staff with research and advice, and authored analytical reports describing the economic impacts of current policies affecting older Americans, as well as the distributional and intergenerational effects of legislative proposals. From 2001 to 2003, she served as a Brookings LEGIS Fellow to the Senate Health, Education, Labor and Pensions Committee, working as a health policy adviser to Sen. Edward M. Kennedy. Earlier in her career, she conducted research on savings and retirement for the Social Security Administration, helping to establish the Retirement Research Consortium and serving as the founding editor of the Perspectives section of the Social Security Bulletin. She holds a master's and doctorate in economics from Syracuse University and bachelor's in economics, mathematics and Italian from Gonzaga University.

Jonathan Woodson, MD is the Assistant Secretary of Defense for Health Affairs and director, TRICARE Management Activity. In this role, he administers the more than $50 billion Military Health System (MHS) budget and serves as principal advisor to the Secretary of Defense for health issues. The MHS comprises over 133,000 military and civilian doctors, nurses, medical educators, researchers, healthcare providers, allied

health professionals, and health administration personnel worldwide, providing our nation with an unequalled integrated healthcare delivery, expeditionary medical, educational, and research capability. Dr. Woodson ensures the effective execution of the Department of Defense (DoD) medical mission. He oversees the development of medical policies, analyses, and recommendations to the Secretary of Defense and the Undersecretary for Personnel and Readiness, and issues guidance to DoD components on medical matters. He also serves as the principal advisor to the Undersecretary for Personnel and Readiness on matters of chemical, biological, radiological, and nuclear (CBRN) medical defense programs and deployment matters pertaining to force health. Dr. Woodson co-chairs the Armed Services Biomedical Research Evaluation and Management Committee, which facilitates oversight of DoD biomedical research. In addition, Dr. Woodson exercises authority, direction, and control over the Uniformed Services University of the Health Sciences (USUHS); the Defense Center of Excellence for Psychological Health and Traumatic Brain Injury (DCoE); and the Armed Services Blood Program Office. As Director, TRICARE Management Activity, Dr. Woodson is responsible for managing all TRICARE health and medical resources, and supervising and administering TRICARE medical and dental programs, which serve more than 9.6 million beneficiaries. Dr. Woodson also oversees the TRICARE budget; information technology systems; contracting process; and directs TRICARE Regional Offices (TRO). In addition, he manages the Defense Health Program (DHP) and the DoD Unified Medical Program as TRICARE director. Prior to his appointment by President Obama, Dr. Woodson served as Associate Dean for Diversity and Multicultural Affairs and Professor of Surgery at the Boston University School of Medicine (BUSM), and senior attending vascular surgeon at Boston Medical Center (BMC). Dr. Woodson holds the rank of brigadier general in the U.S. Army Reserve, and served as Assistant Surgeon General for Reserve Affairs, Force Structure and Mobilization in the Office of the Surgeon General, and as Deputy Commander of the Army Reserve Medical Command. Dr. Woodson is a graduate of the City College of New York and the New York University School of Medicine. He received his postgraduate medical education at the Massachusetts General Hospital, Harvard Medical School and completed residency training in internal medicine, and general and vascular surgery. He is board certified in internal medicine, general surgery, vascular surgery and critical care surgery. He also holds a Master's Degree in Strategic Studies (concentration in strategic leadership) from the U.S. Army War College. In 1992, he was awarded a research fellowship at the Association of American Medical Colleges Health Services Research Institute. He has authored/coauthored a number of publications and book chapters on vascular trauma and outcomes in vascular limb salvage surgery. His prior military assignments include deployments to Saudi Arabia (Operation Desert Storm), Kosovo, Operation Enduring Freedom and Operation Iraqi Freedom. He has also served as a Senior Medical Officer with the National Disaster Management System, where he responded to the September 11th attack in New York City. Dr. Woodson's military awards and decorations include the Legion of Merit, the Bronze Star Medal, and the Meritorious Service Medal (with oak leaf cluster). In 2007, he was named one of the top Vascular Surgeons in Boston and in 2008 was listed as one of the Top Surgeons in the U.S. He is the recipient of the 2009 Gold Humanism in Medicine Award from the Association of American Medical Colleges.

Other Participant Biographies

Terry Adirim, MD, MPH, is the director of the Office of Special Health Affairs (OSHA) of the Health Resources and Services Administration (HRSA) in the U.S. Department of Health and Human Services. Previously she worked in various capacities in the Office of Health Affairs at the Department of Homeland Security (DHS). She started at DHS as an American Association for the Advancement of Science (AAAS) Policy Fellow and also served as the Associate Chief Medical Officer for Medical Readiness and Senior Advisor to the Assistant Secretary for Science and Public Health. From 2004 to 2006, Dr. Adirim was associate professor of Emergency Medicine and Pediatrics at Drexel University College of Medicine and director of Emergency Medicine at St. Christopher's Hospital for Children in Philadelphia Pennsylvania. From 1997 to 2004, she was associate professor of Pediatrics and Emergency Medicine at the George Washington University School of Medicine and attending physician at Children's National Medical Center in Washington, DC. While in academic clinical medicine, she was awarded over 3 million dollars in grant funding from the CDC and the Maternal and Child Health Bureau/HRSA to support her research and project work and has over 60 publications. Dr. Adirim received her B.A. degree from Brandeis University, her medical degree with research distinction from the University of Miami School of Medicine, and her master's degree in public health from the Harvard School of Public Health. She completed pediatric residency training at the Children's Hospital of Philadelphia, fellowship training in pediatric emergency medicine at Children's National Medical Center in Washington, DC and primary care sports medicine at the Uniformed Services University of the Health Sciences in the Washington, DC area.

Raymond J. Baxter, PhD, is Kaiser Permanente's senior vice president for Community Benefit, Research and Health Policy. Dr. Baxter leads the organization's activities to fulfill its social mission, including care and coverage for low income people, community health initiatives, health equity, environmental stewardship and support for community-based organizations. He also leads Kaiser Permanente's work in research, health policy and diversity, and serves as President of KP International. Dr. Baxter has more than 35 years of experience managing public health, hospital, long-term care and mental health programs. Dr. Baxter holds a doctorate from the Woodrow Wilson School of Public and International Affairs, Princeton University. He serves on the Advisory Board of the UC Berkeley School of Public Health, the Technical Board of the Milbank Memorial Fund, the Global Agenda Council on Health of the World Economic Forum, the Board of Archimedes, Inc., and is a member of the Institute of Medicine's Roundtable on Population Health Improvement.

Christine Bechtel is the vice president of the National Partnership for Women & Families where she is responsible for strategic direction and oversight of the organization's multi-faceted health care programs. She was appointed by the Government Accountability Office (GAO) in 2008 to the federal Health IT Policy Committee, where she represents patients and families, and also serves as a consumer representative on the Measure Applications Partnership, providing input to the federal government on the selection of performance measures for national improvement programs. Bechtel was previously vice president of the eHealth Initiative, and has a background in quality improvement from her work with Quality Improvement Organizations (QIOs). She began her career as a legislative associate for United States Senator Barbara A. Mikulski (D-MD).

Joyce Dubow is Senior Health Care Reform Director in AARP's Office of the Executive Vice- president for Policy and Strategy. She has responsibility for a portfolio related to AARP's health care reform initiatives with a special focus on health care quality, HIT, and consumer decision making, as well as private health plans in the Medicare program. Her multi-faceted professional career in health care spans diverse experiences in health plan leadership, government service, public policy, and consumer advocacy. Dubow serves on several external multi-stakeholder groups that focus on improving the quality and delivery of health care services. She is a member of the board of the National Quality Forum (NQF), was recently co-chair of the NQF Patient-reported Outcomes Expert Panel. She is a member of: the Coordinating Committee of the Measure Application Partnership; the National Committee for Quality Assurance's Committee on Physician Programs and its Measurement Panel on Geriatrics; and the National Advisory Committee for Aligning Forces for Quality of the Robert Woods Johnson Foundation. Previously, Ms. Dubow was the executive vice-president of the Georgetown University Community Health Plan, a university-sponsored prepaid group practice plan. She was also the Director of Policy and Legislation in the federal Office of Health Maintenance Organizations. Ms. Dubow holds a B.A. in Political Science from the University of Michigan and a Masters in Urban Planning from Hunter College of the University of the City of New York.

Kathy Gans-Brangs, PhD leads AstraZeneca's scientific interactions with the HHS Agency for Healthcare Research & Quality and develops strategic collaborations with academia, business and government on initiatives including those related to healthcare quality and comparative effectiveness. She currently participates in work groups of the Institute of Medicine's Value & Science Driven Health Care Roundtable, the National Pharmaceutical Council Research Committee and PhRMA. She previously held a founding leadership role with the Coalition Against Major Diseases, a coalition founded by the Critical Path Institute in collaboration with the Engelberg Center for Health Care Reform at Brookings. Since joining AstraZeneca in 1996, Dr. Gans-Brangs has held several roles including Regulatory Affairs Director for AstraZeneca's Oncology portfolio. Prior to joining AstraZeneca, Dr. Gans-Brangs held various positions at the DuPont Merck Pharmaceutical Company in regulatory affairs, research management, and drug discovery. She has published and lectured on issues related to regulation of pediatric clinical trials, medication error reporting and proprietary drug names, preparing labeling information, and the regulatory framework clinical of and non-clinical aspects of the US IND. Dr. Gans-Brangs holds MS and PhD degrees in Pharmacology from the Philadelphia College of Pharmacy & Science and a BA in Biology and French from the University of Delaware. She pursued post-doctoral training in pharmacology at New York Medical College.

Jim Gerber is Senior Advisor in the Policy and Programs Group at the Center for Medicare and Medicaid Innovation. He spent much of his career as the senior health care analyst and global head of research at the Bernstein Value Equities unit of AllianceBernstein, an investment management firm. He also was a business consultant, corporate attorney, and CEO of a family business. He is a graduate of Harvard College, Harvard Law School, and Harvard Business School.

Kate Goodrich, MD joined the Center for Medicare and Medicaid Services in September of 2011 where she serves as Acting Director of the Quality Measurement and Health Assessment Group in the Center for Clinical Standards and Quality (CCSQ). In this role, she oversees the implementation of 8 quality measurement and public reporting programs and partners with other CMS components on 11 other programs. She co-leads a CMS-wide task force to align measures across programs and with the private sector as well as a companion HHS-wide committee. She also co-leads an agency wide work group to develop the agency's strategy for quality improvement. Previously, Dr. Goodrich served as a Senior Advisor to the Director of CCSQ and the CMS Chief Medical Officer. From 2010 – 2011 she served as a Medical Officer in the office of the Assistant Secretary for Planning and Evaluation (ASPE) at DHHS where she managed a portfolio of work on comparative effectiveness research and quality measurement and improvement. Dr. Goodrich is a graduate of the Robert Wood Johnson Clinical Scholars Program at Yale University where she received training in health services research and health policy from 2008-2010. From 1998 to 2008, Dr. Goodrich was on faculty at the George Washington University Medical Center and served as Division

Director for Hospital Medicine from 2005-2008. She continues to practice clinical medicine as a hospitalist and associate professor of medicine at George Washington University Hospital.

Bruce H. Hamory, MD, FACP is Executive Vice President, Managing Partner, Geisinger Consulting Services for Geisinger Health System. He leads Geisinger's efforts to extend its innovations in healthcare delivery and payment to other groups and health systems. He is a nationally known speaker on care redesign for value and improved quality. As Geisinger's System Chief Medical Officer from 1997 to 2008, he led the growth of a 535-physician multi-specialty group practice to 750 physicians in 40 locations serving 41 counties and the three Geisinger hospitals. He oversaw the installation of an advanced EHR, led the development of a physician compensation model incorporating pay for performance, and a reorganization from discipline-based departments to a service line operating structure. Other responsibilities included compensation, quality and performance improvement, credentialing, clinical operations, capital planning, as well as education and research for the health system. Before joining Geisinger, Dr. Hamory was Professor of Medicine and Associate Dean for Clinical Affairs at Penn State. He was Executive Director of Penn State's University Hospitals and Chief Operating Officer for Penn State's Milton S. Hershey Medical Center. Dr. Hamory currently serves on the Board of Blue Cross Blue Shield of Massachusetts and the Board of Presence Health in Illinois. He also serves on several national committees and panels concerned with improving the quality of medical care and use of information technology in healthcare. He has served on the Board of Directors for AMGA.

Sheila Hanley is currently Director of Policy and Programs at the CMS Innovation Center. Established under the Affordable Care Act, the mission of the Center is to design, test and spread new payment and delivery system models that lower cost and improve care. As Director, Sheila is responsible for the development and management of the Center's portfolio of initiatives as well as the implementation of the Health Care Innovation Awards, a set of 107 cooperative agreements originating in the field and testing promising care and reimbursement innovations. She has also assisted in the development and implementation of several of the other Innovation Center's new care delivery and payment models including Bundled Payments for Care Improvement and the Comprehensive Primary Care (CPC) initiative. She also has extensive private sector experience in the design and implementation of new payment, care management and data and reporting systems within Commercial, Medicare and Medicaid managed care plans and has held senior positions in acute care hospitals, She holds Masters Degrees in Public Health from the Harvard School of Public Health and in Economics from the Maxwell School for Citizenship and Public Affairs, Syracuse University.

Michael Johnson is the Public Policy Director for Blue Shield of California, and in this role manages analysis of public policy issues and the development of the company's position on healthcare reform and other policy issues. Prior to joining Blue Shield, Michael served in a variety of public policy-related positions. In the late 1980s and early 1990s, he worked in Washington, D.C.,as a consumer advocate on civil justice and insurance issues and in California as an aide to Insurance Commissioner John Garamendi. He has also worked as an activist or consultant on nearly a dozen California ballot initiative campaigns. Immediately prior to joining Blue Shield in 2003, Michael was a vice-president at a crisis communications management firm in Los Angeles.

Kevin L. Larsen, MD is Medical Director of Meaningful Use at the Office of the National Coordinator for Health IT. In that role he is responsible for coordinating the clinical quality measures for Meaningful Use Certification and overseas the development of the Population Health Tool http://projectpophealth.org. Prior to working for the federal government he was Chief Medical Informatics Officer and Associate Medical Director at Hennepin County Medical Center in Minneapolis, Minnesota. He is also an Associate Professor of Medicine at the University of Minnesota. Dr. Larsen graduated from the University of Minnesota Medical School and was a resident and chief medical resident at Hennepin County Medical Center. He is a general internist and teacher in the medical school and residency programs. His research includes health care financing for people living in poverty, computer systems to support clinical decision making, and health

literacy. In Minneapolis he was also the Medical Director for the Center for Urban Health, a hospital, community collaboration to eliminate health disparities. He served on a number of state and national committees in informatics, data standards and health IT.

Peter M. Loupos has been responsible for providing the vision, strategy, and leadership for innovation and technology initiatives in the pharmaceutical and healthcare industries. Peter began his career in Health Information Technology where he led the development of clinical, financial, and physician services in the US, Europe, and Japan. He joined Rorer Pharmaceutical to lead the R&D Information Technology organization, growing in responsibility through successive mergers until the creation of Sanofi-Aventis. During this time he was recognized for his achievements in the design and delivery of industry leading solutions to support the life sciences. He then joined the R&D Strategic Initiatives group focusing on trends shaping the Pharmaceutical industry. He was a co-author of a PhRMA white paper anticipating the impact and opportunities through ehealth and contributed to the launch of numerous national and international breakthrough initiatives. He played a leading role in the development of the corporate digital strategy and led the eHealth working group. Peter is currently a member of *Partners in Patient Health* at Sanofi, where he is responsible for the development of strategies and partnerships with patient groups to accelerate science and innovation, supporting key platforms such as patient centered research, translational and personalized medicine, improving clinical development, and open innovation collaboration models.

Peter Lurie, MD, MPH is Acting Associate Commissioner for Policy and Planning at the Food and Drug Administration, where he has worked on a number of policy issues, including antimicrobial resistance, drug shortages, prescription drug abuse and the international dimensions of tobacco control. Prior to that, he was Deputy Director of Public Citizen's Health Research Group in Washington, DC, where he addressed a variety of FDA regulatory policies, a number of specific drug and device issues, efforts to reduce worker exposure to hexavalent chromium and beryllium and excessive medical resident work hours. He had an earlier academic career at the University of California, San Francisco and the University of Michigan in which he studied needle exchange programs, ethical aspects of mother-to-infant HIV transmission studies and the economic and public health aspects of a number of HIV policies domestically and abroad.

Nancy E. Miller, PhD serves as Senior Science Policy Analyst in the Office of Science Policy, Office of the Director, NIH, where she serves as principal staff advisor to the Director, NIH, on health care reform policy issues, and programmatic activities related to the agency's Comparative Effectiveness Research (CER) portfolio. She coordinates NIH Institute and Center (IC) efforts for the purpose of organizing meetings to address major programmatic and science policy research issues, conceptualizes the needs of ICs in cross-cutting health care reform activities; prepares reports on ARRA-supported CER advances, and coordinates and provides senior level expert policy advice on development of complex collaborative CER activities with multiple organizations, senior NIH staff, and sister federal agencies. Dr. Miller serves as principal staff advisor to the Director, NIH on activities related to the Patient-Centered Outcomes Research Institute, (PCORI) a private, non-profit corporation, established by the Patient Protection and Affordable Care Act, to develop and fund CER. She supports the Director, NIH, in his role as a member on the Board of Governors (BOG) and on the Program Development Committee (PDC), and tracks PCORI Methodology Committee Subcommittee activities. She provides advice regarding research policy issues affecting both NIH and the national biomedical research community, coordinates with OD offices, and makes recommendations for establishing precedents and/or resolving technical and procedural problems. Dr. Miller directs activities of the Trans-NIH Comparative Effectiveness Coordinating Committee (CER CC) where she serves as the Committee's Executive Secretary. A high-level committee established by the Director, NIH, and co-chaired by the Director, National Institute on Aging, and NHLBI, the CER CC is tasked with reviewing and prioritizing CER spending decisions for the NIH Director, shaping and supporting the next generation of CER studies, integrating the promise of personalized medicine with CER, and advancing research methods and science to benefit health care reform. In addition to coordinating trans-NIH initiatives, Dr. Miller advises OD offices regarding the development of agency and DHHS-wide collaborative policy related to CER and

health-care reform related research; provides monthly IC briefings; oversees policy development pertaining to ethical, legal, societal and health implications raised by CER, and facilitates collaboration on CER and health reform research activities with DHHS, and among sister federal agencies. She oversees requests for information on CER from Congress, DHHS, OMB, GAO, PCORI, federal contractors and from IC Directors. Dr. Miller has served as Executive Secretary of the Common Fund initiative on the "Science of Behavior Change," helped initiate the NIH Common Fund program on the "Patient-Reported Outcome Measurement Information System (PROMIS)", and contributes to the Common Fund "Health Economics Initiative to Advance Healthcare Reform."

Sally Okun, RN, MMHS is the Vice President for Advocacy, Policy and Patient Safety at PatientsLikeMe in Cambridge, MA. She is responsible for the company's patient advocacy initiatives; she participates and contributes to health policy discussions at the national and global level; and she is the company's liaison with government and regulatory agencies. Sally joined the company in 2008 as the manager of Health Data Integrity and Patient Safety overseeing the site's medical ontology including the curation of patient reported health data and an ever-evolving Patient Vocabulary. Okun developed and manages the PatientsLikeMe Drug Safety and Pharmacovigilance Platform. Prior to joining PatientsLikeMe Sally, a registered nurse, practiced as a palliative and end-of-life care specialist and contributed to multiple clinical, research, and educational projects in that specialty area. She received her nursing diploma from the Hospital of St. Raphael School of Nursing; Baccalaureate degree in Nursing from Southern Connecticut State University; and Master's degree from The Heller School for Social Policy & Management at Brandeis University. She completed study of Palliative Care and Ethics at Memorial Sloan-Kettering Cancer Center and was a fellow at the National Library of Medicine Program in Biomedical Informatics. Okun is a sought after speaker on patient engagement, team based care, patient reported outcomes, and health data sharing in social media and contributes frequently to peer-reviewed publications, discussion papers and book chapters on these topics.

Christopher Papagianis is the Deputy to the President and COO of the Peterson Foundation. Previously, he was Managing Director of the think tank e21: Economic Policies for the 21st Century (a.k.a. Economics21). He was also a weekly columnist for Reuters, writing on the intersection of markets and policy. Prior to helping found the think tank in 2009, Mr. Papagianis was a Special Assistant for Domestic Policy to President George W. Bush. In this role, he guided the collaborative process within the White House to develop and implement policies, legislation, and regulations across numerous agencies, including the Department of Treasury, the Department of Housing and Urban Development, and the Department of Health and Human Services. He has also testified several times before Senate and House committees. Earlier in his career, he served as a policy adviser on Capitol Hill, managing a portfolio of economic policy issues for U.S. Senator Jim Talent. Mr. Papagianis was a Peabody Fellow at Harvard University, where he received his B.A.

Murray N. Ross, PD, is Vice President, Kaiser Foundation Health Plan, and directs the Kaiser Permanente Institute for Health Policy in Oakland, California. Before joining Kaiser Permanente in 2002, Dr. Ross served as executive director of the Medicare Payment Advisory Commission (MedPAC), which advises Congress on issues affecting the Medicare program. Previously, he was a policy analyst at the Congressional Budget Office and later led the team charged with assessing the budgetary impact of legislative proposals affecting federal health programs. Dr. Ross earned his doctorate in economics at the University of Maryland, College Park. He enjoys running, writing, and traveling.

Modena Wilson, **MD, MPH** is an academic pediatrician with additional expertise in public health, joined the American Medical Association as a Senior Vice President in 2004. She currently serves as AMA's Chief Health & Science Officer with a wide range of related responsibilities. Dr Wilson came to the AMA from the American Academy of Pediatrics. She joined the executive staff of the Academy in January 2000 as Director of the Department of Committees and Sections. Dr Wilson was a full time faculty member of the the Johns Hopkins University School of Medicine for more than twenty years where she attained the academic rank of Professor of Pediatrics. At Johns Hopkins, Dr. Wilson directed the Division of General Pediatrics and

Adolescent Medicine and General Academic Pediatrics Fellowship Program, Co-directed the Robert Wood Johnson Clinical Scholars Program, and held a joint appointment in the School of Public Health's Department of Health Policy and Management. In her research activities, Dr Wilson was affiliated both with the Center for Injury Research and Policy and with the Center for Immunization Research at Johns Hopkins. She is the first author of a book on childhood injury control. Dr Wilson graduated summa cum laude from McPherson College. She holds a Master's Degree in Biology from Wichita State University. She studied medicine at the University of Kansas. Her pediatric residency training took place at the University of Wisconsin Hospitals in Madison. She received both a Masters of Public Health degree and a certificate in the Business of Medicine from Johns Hopkins University. She was a member of the inaugural class of the US Public Health Service's Primary Care Policy Fellowship. Dr Wilson's national activities have included service on the Council on Graduate Medical Education, the US Preventive Services Task Force, the Advisory Council of the National Injury Prevention Center, and the Board of Directors of the American Board of Pediatrics. Before joining the Academy staff, she served an Associate Editor of the *Archives of Pediatrics and Adolescent Medicine*. With colleagues from general internal medicine and family medicine, Dr Wilson Co-directed the Interdisciplinary Generalist Clerkship Project and the Genetics in Primary Care Project. She was also one of the directors of the Ambulatory Pediatric Association's national Faculty Development Scholars Program. Dr Wilson is a Past-President of the Academic (formerly Ambulatory) Pediatric Association.

Eric Xanthopoulos received a combined law degree from Stanford University and medical degree from Columbia University in 2003. After graduation, he practiced as an intellectual property litigator at Weil Gotshal & Manges LLP. After deciding to return to medicine, he spent two years as an oncology research fellow at the University of Pennsylvania. He will begin his clinical residency training in radiation oncology in July 2013. He has spent the last two months interning under Peter Lurie, MD, MPH, the acting Associate Commissioner for the Office of Policy and Planning at the Food and Drug Administration.

John Yee, MD, MPH serves as Vice President, and U.S. Head Medical Officer at AstraZeneca Pharmaceuticals. In this role, he is responsible for leading all medical affairs and strategic development activities in the U.S. Prior to joining AstraZeneca, John served as Vice President and Global Head, Evidence-Based Medicine at Genzyme as well as the head of Global, US, and European medical affairs for Genzyme's rare genetic disease business. John has also served in leadership roles at a major academic medical center, at health care technology start-up companies, and as a clinical research consultant to pharmaceutical, biotechnology, and medical device companies. Prior to joining industry, John was a member of the faculty at Harvard Medical School and Children's Hospital Boston. He is a graduate of Harvard College, and earned his medical degree from Harvard Medical School in addition to a master's degree in public health from the Harvard School of Public Health. He completed a residency in pediatrics and fellowships in immunology/rheumatology and health services research at Children's Hospital Boston.

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

ROUNDTABLE ON VALUE & SCIENCE -DRIVEN HEALTH CARE

Roundtable on Value & Science-Driven Health Care
Meeting Logistics

The National Academy of Sciences
2101 Constitution Avenue, NW | Washington, DC
Lecture Room
March 20, 2013

We are looking forward to your participation in the March 20th meeting of the IOM Roundtable on Value & Science-Driven Health Care. If you have any questions regarding meeting logistics, please contact our office at bzimmermann@nas.edu or 202-334-3963.

MEETING LOCATION

The meeting will take place from 8:30am to 3:30pm on March 20, 2013 in the Lecture Room of the National Academy of Sciences Building at 2101 Constitution Avenue, NW in Washington, DC. These times provide an accurate estimation for travel planning purposes. Breakfast will be served starting at 8:30am, with the meeting's agenda commencing at 9:00am.

HOTEL ACCOMODATIONS

Should you require lodging, previous guests have enjoyed their stays at the hotels listed below. Depending upon availability and the date of booking, Julia may be able to assist with obtaining the government per diem room rate of $224. Please contact her by March 5th at jcsanders@nas.edu if you would like assistance.

State Plaza Hotel / 2117 E Street, NW / 202-861-8200 (7 minute walk)
Hotel Lombardy / 2019 Pennsylvania Avenue, NW / 202-828-2600 (12 minute walk)
One Washington Circle Hotel / 1 Washington Circle, NW / 800-424-9671 (16 minute walk)
The River Inn / 924 25th Street, NW / 202-337-7600 (16 minute walk)

DIRECTIONS AND TRANSPORTATION

Airports: The meeting site is approximately 5 miles from Washington National Airport (a 20-minute cab ride depending on the time of day) and approximately 25 miles from Dulles International Airport (a 45-minute cab ride).

Metro: The Foggy Bottom metro stop (Orange/Blue Line) is located at 23rd and I Streets NW. Walking from the metro to the NAS building takes approximately 12 minutes. A map is on page 2 of this memo.

Parking: The parking garage for the National Academy of Sciences is located on 21st Street NW, between Constitution Avenue and C Street. However, space is very limited, so you may want to use an alternate mode of transportation.

Detailed driving and Metro directions to the National Academy of Sciences may be found at:
http://www.nationalacademies.org/about/contact/nas.html

MAP OF FOGGY BOTTOM METRO TO NAS BUILDING