Research Insights

AcademyHealth

Using Evidence to Build a Learning Health Care System

Summary

Rapid changes in complex medical technologies and concerns about skyrocketing U.S. health care costs require a new paradigm for more rapidly generating evidence about the quality, safety, and value of health care. One such paradigm is a learning health care system that relies on an iterative innovation process designed to generate and apply the best evidence for the collaborative health care choices of each patient and provider; to drive the process of discovery as a natural outgrowth of patient care; and to ensure innovation, quality, safety, and value in health care.[1]

Successful learning systems developed by three dissimilar entities that share a commitment to health care innovation and improvement and have developed successful learning health care systems are described in this report:

- Kaiser Permanente Colorado is one of the most aggressively experimental regions in the entire Kaiser Permanente system in terms of using data from enrollees' electronic health records (EHRs) to continuously improve the care it delivers.[2] Kaiser Permanente Colorado's Institute for Health Research, a 120-person research program headed by John Steiner, strives to conduct "rapid research of operational importance." Research conducted by the institute (e.g., on the health effects of parents' delaying or refusing to get vaccinations for their children and the effect of the policy of scheduling primary care appointments with the "next available" physician on hospitalization and emergency department utilization) affects Kaiser Permanente Colorado's operations and is used as the basis for further studies and quality improvement efforts, continuing the virtuous cycle of Kaiser Permanente Colorado's learning health care system.

- The Distributed Ambulatory Research in Therapeutics Network (DARTNet) is a federated network of primary care practice-based networks (PBRNs), a research institute, and a collaborative learning alliance that has the support of the Agency for Healthcare Research and Quality (AHRQ), the American Academy of Family Physicians (AAFP), and many other partners. DARTNet's state-of-the-art software system allows the aggregation of electronic health information from geographically and organizationally separate databases and can extract data from multiple sources to support centralized research activities, as well as local and systemwide quality improvement and learning initiatives.[3]

- The UCLA Health System is a premier academic health system associated with the University of California at Los Angeles that includes a comprehensive network of hospitals, specialists, primary care physicians, and other facilities.[4] The UCLA Health

System began planning for the implementation of an integrated EHR in 2010, and in 2011, it launched the Institute for Innovation in Health, headed by Molly Coye. The charge of the UCLA Institute for Innovation in Health is to foster the identification and widespread implementation of innovations that have the potential to result in transformational changes in the practice and delivery of health care within the UCLA Health System and beyond.[5] The UCLA Institute for Innovation in Health may lead the way in creating a new role for academic health systems in fostering transformational changes in health care.

The Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 authorized investments of billions of dollars to further the development of an interoperable national health information network. The act has given a tremendous boost to the adoption and use of health information technology across the United States.[6] Farzad Mostashari, the National Coordinator for Health Information Technology in the U.S. Department of Health and Human Services, reports that there was as much progress in implementing EHRs in the United States in 2010 and 2011 as there were in the previous 20 years, and Mostashari expects that about half of all U.S. physicians will be using EHRs in 2013. The next big challenge, says Mostashari, will be developing the capacity for widespread exchange of electronic health information among organizations nationwide. Achieving nationwide health information exchange was one of the primary goals of the HITECH Act. A trusted nationwide health information exchange will make it to perform evaluations never before possible and to use the results of such evaluations to change medical and health care practice in recurrent cycles to improve the health of individuals and entire populations. Mostashari sees evidence of the will to move forward across the country and expects to see rapid progress on the building blocks that will promote health information exchange (e.g., aggregating data for analytical purposes while allowing the data to remain behind a health organization's firewalls, thus maintaining privacy and security) in 2012.

Introduction

The rapid changes in complex medical technologies and concerns about skyrocketing U.S. health care costs require a new paradigm for more rapidly generating evidence about the quality, safety, and value of health care. In July 2006, the Institute of Medicine convened a workshop to begin characterizing and exploring the nature, potential, and elements of "a learning healthcare system"[7] that would draw research closer to clinical practice by building on knowledge development and application at each stage of the health care delivery process.[8]

According to the Institute of Medicine, a learning health care system is a health system that relies on an iterative innovation process designed to generate and apply the best evidence for the collaborative health care choices of each patient and provider; to drive the process of discovery as a natural outgrowth of patient care; and to ensure innovation, quality, safety, and value in health care.[9] In a learning health care system, research influences practice and practice influences research. The key elements of a learning health care system are the following:

- Continuous improvement in the value delivered
- Learning in health care as a partnership enterprise
- Developing the point of care as the knowledge engine
- Full application of information technology
- Database linkage and use
- Advancing clinical data as a public utility
- Building innovative clinical effectiveness research into practice
- Patient engagement in the evidence process
- Development of a trusted scientific intermediary
- Leadership that stems from every quarter

This report describes the activities of three dissimilar entities that share a commitment to continuous improvement and have developed successful learning health care systems: Kaiser Permanente Colorado[10], the Distributed Ambulatory Research in Therapeutics Network (DARTNet)[11], and the UCLA Health System.[12] It also gives the perspective of the National Coordinator for Health Information Technology Farzad Mostahari on progress in the adoption and use of health information technology and the electronic exchange of health information since 2009[13], when the Health Information Technology for Economic and Clinical Health (HITECH) Act authorized investments of billions of dollars to further the development of an interoperable national health information network.

Learning Health Care Systems in Action

Donald Berwick, the former administrator of the Centers for Medicare and Medicaid Services and founder of the Institute for Health Care Improvement in Massachusetts, has suggested that the American health care system should be transformed to strive for three things (the "Triple Aim")[14]:

- Improving health care for individuals along six dimensions (safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity);

- Improving the health for populations by attacking causes of ill health such as poor nutrition, physical inactivity, and substance abuse; and

- Reducing, or at least controlling, the per capita cost of care.

Three entities that share a commitment to health care innovation and improvement and have developed successful learning health care systems are Kaiser Permanente Colorado, the Distributed Ambulatory Research in Therapeutics Network (DARTNet), and the UCLA Health System:

- Kaiser Permanente Colorado is part of Kaiser Permanente, an integrated health system that serves more than 8.9 million members throughout the United States[15] and began implementing one of the most advanced electronic health record (EHR) systems in the country in 2002. Kaiser Permanente has a long history of mining data from its internal clinical databases for observational studies.[16] In fact, it was a study of 1.39 million Kaiser enrollees that Kaiser Permanente conducted jointly with the U.S. Food and Drug Administration that first uncovered problems with the arthritis and pain medication Vioxx®.[17] Kaiser Permanente Colorado is one of the most aggressively experimental in the entire Kaiser system in terms of using data to continuously improve the care it delivers and is also one of the highest rated private health plans in the country in terms of quality and member satisfaction.[18] Its website is http://www.elevateyourhealthco.com/.

- The Distributed Ambulatory Research in Therapeutics Network (DARTNet) was created in 2007 with funding from the Agency for Healthcare Research and Quality (AHRQ) as a prototype federated research network of 200+ primary care clinicians who used EHRs.[19] Since then, with support from the American Academy of Family Practice and many other partners, DARTNet has expanded rapidly to become a federated network of primary care practice-based networks (PBRNs), a research institute, and a collaborative learning alliance. DARTNet has a state-of-the art software system that allows the aggregation of electronic health information from geographically and organizationally separate databases at individual practices and health care organizations and can extract data from multiple data sources to support centralized research activities, as well as local and systemwide quality improvement and learning initiatives.[20] DARTNet's website is http://www.dartnet.info.

- The UCLA Health System is a premier academic health system associated with the University of California at Los Angeles that includes a comprehensive network of hospitals, specialists, primary care physicians, and other facilities.[21] UCLA and the UCLA Health System are known for innovations, and the Ronald Reagan UCLA Medical Center is at the cutting edge of biomedical research. In 2011, the UCLA Health System established the Institute for Innovation in Health headed by Molly Coye. The Institute for Innovation in Health has embraced a collaborative model for rapid-response design and evaluation of health system innovation to foster the development and widespread implementation of innovations that have the potential to result in transformational

changes in health care delivery within the UCLA Health System and beyond. The website of the UCLA Institute for Innovation in Health is http://uclainnovates.org.

1. Kaiser Permanente Colorado's Learning Health Care System: A Focus on Rapid Research of Operational Importance

Kaiser Permanente—a working partnership of two organizations, the Kaiser Foundation Health Plan and Hospitals and the Permanente Medical Groups—is an integrated health system with headquarters in Oakland California that serves more than 8.9 million members throughout the United States.[22] Kaiser Permanente provides care throughout eight regions in the United States (Northern California, Southern California, Colorado, Georgia, Hawaii, Mid-Atlantic, Northwest, and Ohio).

Kaiser Permanente places a strong emphasis on prevention and closely coordinates primary, secondary, and hospital care. As an integrated health system that combines insurance and care delivery functions for an enrolled population, Kaiser Permanente has the ability and incentives to strive to improve patients' experience of care, improve the health of populations, and reduce per capita costs of health care.[23]

Kaiser Permanente has the largest, most comprehensive, and advanced private-sector EHR system in the world.[24] Kaiser Permanente's HealthConnect® EHR system has been implemented since 2002 in each of Kaiser's 454 medical offices and 36 hospitals, making it possible to coordinate care between the physician's office, the hospital, radiology, the laboratory, and the pharmacy. This EHR system, in addition to improving the coordination of care for its members, enables Kaiser Permanente to perform internal observational quality improvement studies that involve mining data from its enrollees' EHRs.[25]

Colorado is one of the most aggressively experimental regions in the entire Kaiser Permanente system in terms of using data from enrollees' EHRs to continuously improve the care it delivers.[26] Kaiser Permanente Colorado's Institute for Health Research, a 120-person research program headed by John Steiner, strives to conduct "rapid research of operational importance."

As shown in Figure 1, Steiner and his colleagues at Colorado's Institute for Health Research use a cyclic model for a learning health system that involves the following steps[27]:

- Internal and external scan: Identify problems and potentially innovative solutions.

- Design: Design care and evaluation based on evidence generated at Kaiser Permanente and elsewhere.

Figure 1: Cyclic Model for Kaiser Permanente Colorado's Learning Health Care System
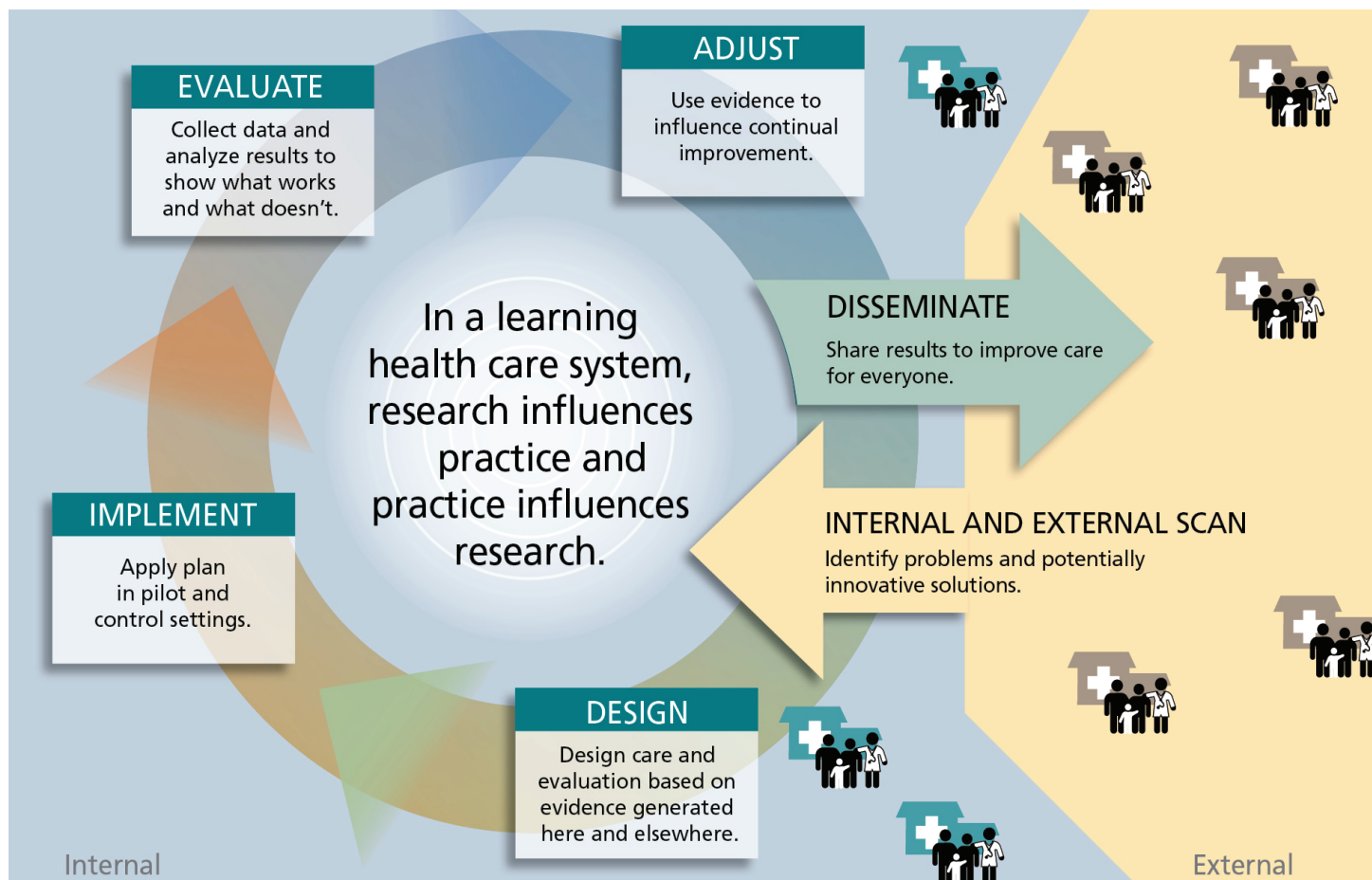
Source: Steiner J, Senior Director, Institute for Health Research, Kaiser Permanente Colorado. The learning healthcare system in action: Translating research into operational decisions in Kaiser Colorado (slide presentation at AcademyHealth's National Heath Policy Conference, Washington, DC, 13 Jan 2012).

- Implement: Apply plan in pilot and control settings.

- Evaluate: Collect data and analyze results to show what works and what doesn't.

- Adjust: Use evidence to influence continual improvement.

- Disseminate: Share results to improve care for everyone.

Two examples of the research conducted by at Kaiser Permanente Colorado's Institute for Health Research are discussed above.[28] The first is research on the health effects of parents' refusing to get or delaying vaccinations for their children. The second is research on the effect of the policy of scheduling primary care appointments with the "next available" physician on hospitalization and emergency department utilization In both cases, the results of the research conducted by have affected Kaiser Permanente Colorado's operations.

Research on vaccine refusal and hesitancy
Despite scientific studies that show vaccines to be highly effective and safe, public support of childhood immunizations has been eroding. Colorado parents rank second in the nation for refusing one or more vaccines for their children. Seven percent of parents in Colorado refuse one or more vaccines for their children.

Using data from Kaiser Permanente Colorado's EHRs, Jason Glanz and his colleagues at the Institute for Health Research conducted a case-control study to examine the clinical consequences of parents' refusals to allow their children to be vaccinated. Their analysis revealed that children enrolled in the Colorado health plan who had not been vaccinated for three vaccine-preventable diseases—pertussis (whooping cough), varicella (chicken pox), and pneumococcal infections—were much more susceptible to infection from these conditions than children who had been vaccinated.

Children in the Colorado health plan who had not been vaccinated for pertussis were at 23-fold greater risk of contracting the disease than children who had been vaccinated. In the case of varicella, unvaccinated children were at a nine-fold greater risk; and in the case of pneumococcal infections, unvaccinated children were at six-fold greater risk. Glanz and his colleagues' findings on pertussis vaccinations for children were published in *Pediatrics* in 2009.[29] In addition, there were several news stories and articles about the research on the clinical consequences of parents' refusals to allow their children to be vaccinated.[30]

Pediatricians at Kaiser Permanente Colorado welcomed the findings about the impact of vaccine refusals but indicated that they would like more help in communicating the risks and benefits of childhood immunizations to parents of young children. Recognizing that parents of young children frequently use online resources to get information, Glanz sought and obtained funding to start a website that would provide an online forum for parents to address their concerns about childhood vaccinations.

Kaiser Permanente Colorado's website on childhood immunizations is being designed and pilot tested with input from parents (both pro- and anti-immunization) and from Kaiser pediatricians who will monitor and add to discussions. The intervention's effectiveness in changing parents' behaviors with respect to allowing their children to be vaccinated will be evaluated in a randomized trial.

Meanwhile, Kaiser is continuing to conduct research about the health effects of vaccine refusals and delays. In other words, the virtuous cycle of the learning health care system at Kaiser Permanente Colorado continues.

Research on primary care continuity

Eight years ago, when Kaiser Permanente Colorado members called to schedule appointments with primary care physicians, their appointments were scheduled with the "next available" physician. This practice was customer friendly, but operational leaders at Kaiser Permanente were concerned that it was jeopardizing continuity of care.

David Magid, director of research at the Colorado Permanente Medical Group, analyzed data from small samples of Kaiser patients using simple evaluation designs to evaluate the potential effects of interruptions in continuity of primary care. In one study, Magid examined the effects of "next available" scheduling on hospitalization and emergency department visits. In another study, Magid examined whether patients' utilization of emergency departments and hospitals services after their physicians left Kaiser Permanente Colorado differed from the utilization of such services among patients served by panels of "matched" physicians who remained at Kaiser.

The findings in these two studies reinforced the importance of continuity of care. In the first study, Magid found that as patients' continuity of care declined, there was a concomitant increase in hospitalizations and emergency department visits. In the second study, he found that patients whose continuity of care was interrupted by their physician's departure from Kaiser Permanente Colorado had 5 percent fewer primary care visits after their physician's departure than did patients of physicians whose physicians remained but 18 percent more emergency department visits, 28

percent more hospitalizations, 18 percent more specialty visits, and 17 percent more lab tests.

Although the results of these two studies were never published, operational leaders at Kaiser Permanente Colorado changed the process for scheduling patients' appointments to reinforce continuity as a primary value in the delivery system—and the patient scheduling process with continuity as a primary value continues at Kaiser Permanente Colorado to this day.

Lessons learned

Kaiser Permanente Colorado's experiences with its learning health care system underscore the importance of embracing the cyclic model of the learning health care system. The patience to get the right answer has to be balanced with the urge to get the answer quickly. The goal of the Institute for Health Research—to conduct "rapid research of operational importance"—reminds Kaiser's research investigators to conduct studies that are both important and fast and reminds Kaiser's operational leaders that the projects must produce generalizable knowledge.[31] Kaiser's interdisciplinary teams with multiple organizational roles help to ensure mutual accountability. Kaiser Permanente Colorado's experiences suggest that data and data analysis are necessary in a learning health care system, but they are not sufficient to improve health care. Clinicians need additional support to improve the care they provide.

2. The Distributed Ambulatory Research in Therapeutics Network (DARTNet): A Primary Care Practice-Based Learning Alliance

DARTNet is a network of practice-based research networks (PBRN). The federal Agency for Healthcare Research and Quality (AHRQ) defines a PBRN as a group of ambulatory practices devoted principally to the primary care of patients and affiliated in their mission to investigate questions related to community-based practice and to improve the quality of primary care.[32]

DARTNet was created in 2007, with funding from AHRQ, as a prototype federated research network of 200+ primary care clinicians who used EHRs.[33] The partners involved in developing the first prototype for DARTNet were the University of Colorado Department of Family Medicine and the University of Colorado School of Pharmacy, the American Academy of Family Physicians' (AAFP) National Research Network, and the Robert Graham Center. Two technical partners that joined in the effort were the University of Minnesota Center for Excellence in Primary Care and Clinical Integration Networks of America, Inc.

Since its founding, DARTNet has grown rapidly. It is now a standalone 501(c)(3) nonprofit organization headquartered in Leawood, Kansas, along with the AAFP National Research Network. Today DARTNet is (a) a research institute; (b) a public/private partner-

ship consisting of nine national or regional research networks and institutes, 13 academic partners, the AAFP, QED Clinical, Inc., and the Advisory Board Company's Crimson Care Registry; and (c) a collaborative learning alliance.[34] DARTNet's director is Wilson Pace, who also directs the AAFP National Research Network.

The current mission of DARTNet's is to improve health and health care through practice-based inquiry and collaborative learning.[35] The organization's vision is to lead and support a data-driven learning health care collaborative based on primary care practices engaged in translational research, collective inquiry, and continuous quality improvement. Its aims include supporting the patient-centered medical home, enhancing the state of the art in effectiveness research, advancing practice-based research capabilities, and enhancing health information technologies within ambulatory care.[36]

The PBRNs participating in DARTNet range from the AAFP's Collaborative Care Research Network (a subnetwork of the AAFP's National Research Network) to the Upstate New York Practice Based Research Network. As shown in Figure 2, DARTNet now encompasses approximately 85 organizations (with 15 EHRs in 25 states); more than 400 physician practices; more than 3,000 clinicians; and about 5 million patients of all ages.[37] Among the 5 million patients, 42 percent are male and 58 percent are female. The distribution of patients in terms of age is age 0 to 17 (12 percent); age 18-24 (7 percent); age 25 to 64 (63 percent), and age 65 or older (18 percent).[38]

DARTNet has a state-of-the-art data collection, standardization, presentation, query and reporting software system that is independent of most EHRs, can extract data from multiple data sources, and supports centralized research activities, as well as local and system-wide quality improvement and learning. Data from DARTNet member practices' EHRs are captured, de-identified, coded, standardized, and stored in a clinical data repository that resides at each individual practice.

Figure 2: DARTNet's Scope and Scale, 2012
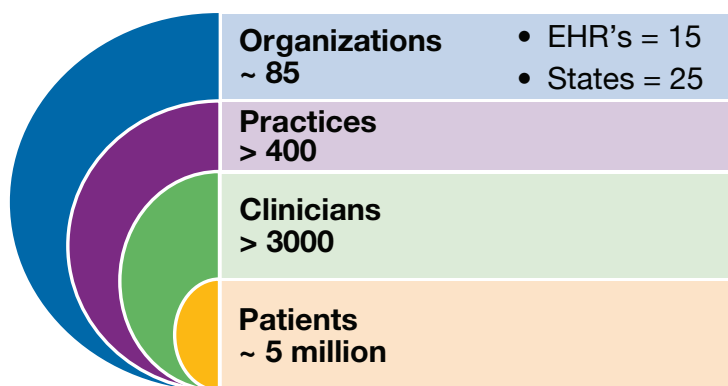
Organizations ~ 85	• EHR's = 15 • States = 25
Practices > 400	
Clinicians > 3000	
Patients ~ 5 million	

Source: Pace WD, CEO, DARTNet Foundation. DARTNet: A data-driven culture (slide presentation at AcademyHealth's National Heath Policy Conference, Washington, DC, 13 Jan 2012).Figure 3: An Example of DARTNet's Blood Pressure Performance Reports: Percentage of Patients ≥ Age 18 with Blood Pressure Not at Goal by Practice

Although members of DARTNet have agreed to standardize data codification and underlying analytical data models, and all DARTNet members' EHRs must have coded problem lists, electronic prescribing, and laboratory interfaces[39], each primary care practice participating in DARTNet retains control of its own patient-level data. A secure Web-based software system links the separate databases so they can be searched and queried as one large database while maintaining the privacy and confidentiality of each organization's information.

For member organizations, DARTNet offers an effective learning community that blends quality improvement, effectiveness, and translational research with a data-driven learning system.[40] The DARTNet learning alliance undertakes the following activities:

• Data synthesis

• Performance reports

• Practice facilitation

• Linkages (self-initiated and facilitated) such as website, listserv, e-newsletter

• Webinars (best practices, case studies, how-to workshops)

Benchmarked data and performance reports for diabetes, hypertension, chronic kidney disease, hyperlipidemia, and Pneumovax® immunizations are made available to DARTNet members on a members-only website.[41] Top performers in the various categories are identified, but others are anonymous. Users can click down from the organization level to the practice level (though not down to individual clinicians and patients). DARTNet's members-only website functions as a portal for peer-to-peer interaction. DARTNet members are able to ask questions and share knowledge and learning and then act on what they learn.

Pace reports that DARTNet's research institute has recently been working with practices through webinars and other means to get them to reconsider their recommendations with respect to the use of aspirin as primary prevention for cardiovascular disease.[42] In addition, as described below, DARTNet is helping its members undertake research to improve the practice of primary care through projects such as the Reducing Cardiovascular-Risk Learning Community.

Research on low-dose aspirin therapy for primary cardiovascular disease prevention

Aspirin is unquestionably indicated for secondary prevention in patients with a history of known coronary artery disease or thrombotic stroke/transient ischemic attack and during acute attacks, but current studies do not clearly or consistently demonstrate a

beneficial effect of low-dose aspirin for the primary prevention of cardiovascular events in high-risk patients (e.g., patients with diabetes, chronic kidney disease, peripheral vascular disease). Aspirin increases the risk of serious adverse bleeding events such as hemorrhagic stroke and gastrointestinal bleeds.

The U.S. Preventive Services Task Force has recommended low-dose aspirin for primary prevention for many years, but its guidelines are ambiguous. The Food and Drug Administration has twice denied labeling for aspirin for primary prevention of cardiovascular events owing to lack of evidence supporting its efficacy. Given this situation, DARTNet has been working with its practices through webinars and other pressure can go to DARTNet's members-only website to see data on the percentage of patients over age 18 whose blood pressure is not at goal for each practice, with practices identified only by a number, as shown in Figure 3.

Lessons learned

PBRNs have the potential to engage clinicians in the research process, provide clinicians with answers to clinically relevant questions, implement quality improvement strategies, and translate research findings back into clinical practice, but much remains to be learned both about PBRNs and the ways they can foster continuous quality improvement in a learning health care system. DARTNet's experiences suggest that the provision of performance data to clinicians is helpful in changing health care practices but not sufficient. Beyond

performance data, most clinicians want synthesized information and recommendations about how to improve the quality of care they provide, as well as other support for quality improvement efforts.

3. The UCLA Health System: An Academic Health System's Blueprint for Innovation and Collaborative Learning in Health Care

The UCLA Health System is a premier academic health system associated with the University of California at Los Angeles that includes a comprehensive network of hospitals, specialists, primary care physicians, and other facilities. It encompasses the Ronald Reagan UCLA Medical Center, Resnick Neuropsychiatric Hospital, Mattel Children's Hospital UCLA, Santa Monica UCLA Medical Center and Orthopedic Hospital, and more than 150 patient care clinics throughout southern California. The mission of the UCLA Health System is to deliver leading-edge patient care, research and education to people in the Los Angeles area and beyond.[43]

In 2011, the UCLA Health System launched its Institute for Innovation in Health, led by Molly Coye. According to Coye, the charge to the Institute by the Office of the Vice Chancellor for UCLA Health Sciences is to bring together innovators from across UCLA and beyond to identify and foster the accelerators that will lead to large-scale innovations in the practice and delivery of health care within the UCLA Health System and in regional, national, and global partnerships.[44]

Figure 3: An Example of DARTNet's Blood Pressure Performance Reports: Percentage of Patients ≥ Age 18 with BloodPressure Not at Goal by Practice
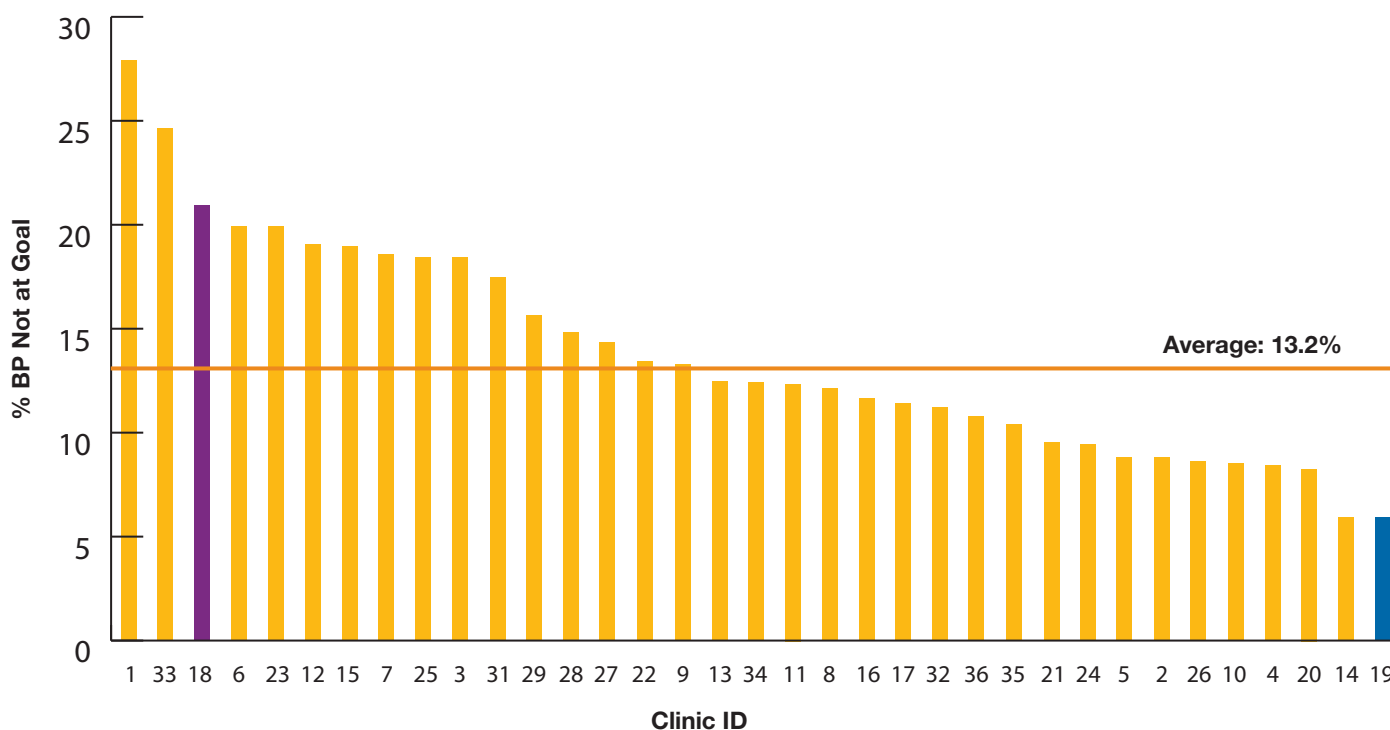
Source: Pace WD, CEO, DARTNet Foundation. DARTNet: A data-driven culture (slide presentation at AcademyHealth's National Heath Policy Conference, Washington, DC, 13 Jan 2012).

The long-term goal of the Institute for Innovation in Health is to distinguish the UCLA Health System as a leader in innovation by the accelerated pace and effectiveness of our transformation to a system offering radically improved value, service and clinical quality. It is hoped that the UCLA Institute for Innovation in Health will lead the way in creating a new role for other academic health systems in rapid-cycle innovation and evaluation in the transformation of health care delivery to improve quality, engage patients, and reduce the net cost of health care.[45]

The UCLA Institute for Innovation in Health has embraced a collaborative model for identifying and fostering large-scale innovations and implementing them in the health care delivery system.[46] The primary initiative of the UCLA Institute for Innovation is the UCLA Innovates HealthCare Initiative, the objectives of which are to do the following[47]:

- Identify and strengthen the coordination of innovations across UCLA and the UCLA Health System that contribute to advances in health care delivery.

- Foster the development and diffusing of promising innovations.

- Identify programs and best practices at other university health systems to support innovation and develop proposals for their adoption by the UCLA Health System.

- Foster collaborative partnerships within the university and with external organizations at the local, state, and national level to advance innovation in the delivery of health care at UCLA, in the region, and nationally.

- Establish new ventures/programs specially related to implementation of recent national health care reform legislation (specifically, the Affordable Care Act of 2010).

Innovators across the UCLA Health System, the UCLA campus, and beyond are invited to submit innovations that provide outstanding patient-centered care across all practice settings, improve access to care, develop and integrated delivery system, maintain the UCLA health system's strength in tertiary and quaternary care, and/or accelerate successful innovators in health care.[48]

A hallmark of UCLA Health System's approach to innovation will be the identification of specific, system-wide objectives for each broad initiative, with accountability for the development and deployment of the initiative in order to advance the goals of the health system.[49] Historically there has not been much close cooperation between health services researchers and the operational leaders of academic health care delivery systems.[50] Many operational leaders who implement health system-level innovations tend to be wary

of evaluations that might slow down implementation or result in segments of the population not being exposed to innovations; and researchers are wary of "real-time" evaluations that require compromises in study design or data quality that would not be tolerated by those who peer review their work.

Two recent developments have provided academic and financial incentives to break down the silos between health services researchers and operational leaders in academic health delivery systems.[51] One is the authorization of Medicare Accountable Care Organizations under the Affordable Care Act of 2010 that will be compensated on the basis of how well they are able to both improve the health of their Medicare patients and lower their health care costs.[52] The other is the National Institutes of Health's focus on moving research from the bedside to the community (type 2 translational research), which is challenging health systems to accelerate innovations that will shift care from acute to primary care medical home settings, reduce hospital stays and readmissions, improve the management of chronic disease, coordinate care across the full spectrum of services, improve quality, reduce waste and duplication, and reduce the cost of care.[53] Substantial federal initiatives will be directing funding to pilots that can innovate, deploy, and conduct research on the impact of redesigned health systems.[54]

To ensure the UCLA Health System leadership's support for and alignment in evaluating and implementing innovations that have the potential for transformational change in health care delivery, the UCLA Institute for Innovation in Health has developed an approach to help ensure that the research and clinical teams performing evaluations at the institute work in close partnership with the operational leaders of the UCLA Health System. Collaboration between the evaluation team and UCLA Health System operational leaders to develop and help execute an evaluation requires understanding what the practice innovation is, and what is likely to improve.

Key elements of the blueprint for collaboration developed by the UCLA Institute for Innovation in Health are (a) a preidentified team experienced in working together that can be mobilized quickly when the opportunity to evaluate innovations comes up; (b) the ability to bring in project-specific expertise on short notice; and (c) the use of a project planning template to guide development of detailed plans for collaborative implementation and evaluation of the innovation by a group that includes the innovation operational leaders (and key clients), the clinical/management team, and the technical assistance/research team.[55]

Figure 4: The UCLA Institute for Innovation's Blueprint for a Collaborative Structure in Evaluating Innovations in Academic Medical Centers

Institute for Innovation in Health
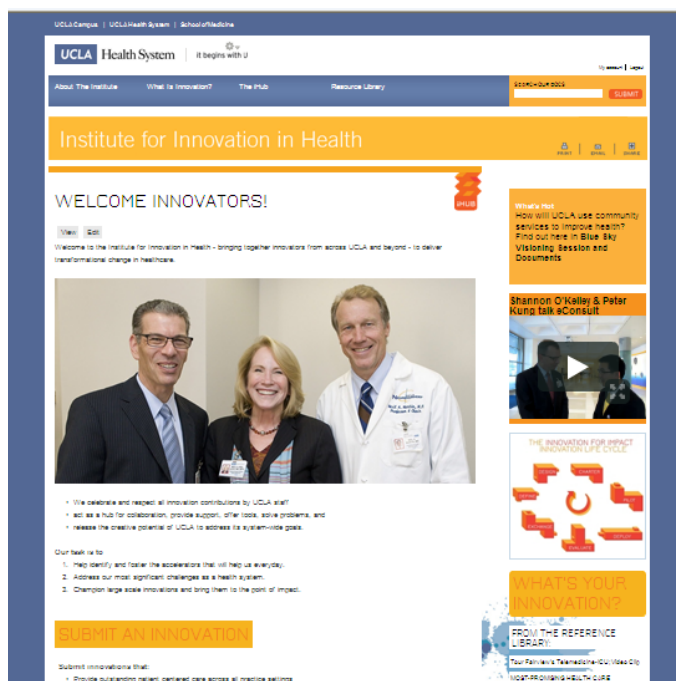
The Institute for Innovation in Health at UCLA leads in the design and dissemination of sweeping advances in healthcare delivery, and creates a new role for academic health systems in rapid-cycle innovation and evaluation.

We welcome collaboration with innovators across the UCLA Health System, the UCLA campus, and beyond!

Visit our website: uclainnovates.org

Or contact us at:
+1 310 267 9320
Suite 1320, RRMC
757 Westwood Plaza
Los Angeles, CA 90095

uclainnovates.org

Source: Goals established by the Office of the Vice Chancellor for UCLA Health Sciences

UCLA Health System   Institute for Innovation in Health

Figure 4: The UCLA Institute for Innovation's Blueprint for a Collaborative Structure in Evaluating Innovations in Academic Medical Centers

Given the huge secular trends in health care delivery, virtually all evaluations will require comparison control groups, often derived from existing observational data. Even if the results of evaluations led by the UCLA Institute for Innovation in Health are not always publishable in academic or professional journals, the results may have major impacts on health care delivery if they are implemented in the UCLA Health System and elsewhere.

Update on Health Information Technology Initiatives at the Federal Level

Farzad Mostashari, the National Coordinator for Health Information Technology in the U.S. Department of Health and Human Services, reports that the HITECH Act of 2009 has given a tremendous boost to the adoption and use of health information technology across the United States.[56] The HITECH Act authorized investments of billions of dollars to further the development of an interoperable national health information network.

According to Mostashari, EHR systems are becoming more capable, and the rate of adoption of EHR systems by health care providers has taken off since 2009.[57] In fact, there has been as much progress in implementing EHRs in the United States since the enactment of the HITECH Act as there was in the previous 20 years.[58] Mostashari expects that about half of all U.S. physicians will be using EHRs in 2013, although the EHR adoption rate among small medical practices may continue to lag behind that of larger practices.[59]

The HITECH Act, enacted as part of the 2009 American Recovery and Reinvestment Act, provided for the creation of two advisory committees (the HIT Standards Committee and the HIT Policy Committee) to guide the Office of the National Coordinator for Health Information Technology in the development and execution of a strategic plan to achieve the goals of the act.[60] The law authorized an estimated $20.8 billion in Medicare and Medicaid reimbursement incentives to assist health care providers and orga-

nizations in the adoption and meaningful use of certified EHRs.[61] The HITECH Act also included $2 billion in direct funding for the Office of the National Coordinator to lay the groundwork for adoption and meaningful use of health information through infrastructure programs.

Eligible professionals can get up to $44,000 in extra Medicare payments for the meaningful use of certified EHRs and up to $63,750 in Medicaid incentives for such use[62] under the Centers for Medicare and Medicaid Services' EHR Incentive Program. Hospitals that demonstrate meaningful use of certified EHRs are eligible for over $2 million in Medicare and Medicaid incentives.[63] Meaningful use includes using EHR technology includes use for tracking key clinical conditions, communicating information in order to help coordinate care, and initiating the reporting of clinical quality measures and public health information.[64]

A key initiative of the Office of the National Coordinator with respect to infrastructure is a network of 62 Regional Extension Centers, modeled on agricultural extension services, to provide on-the-ground assistance to help primary care providers throughout the country adopt and use certified EHRs in a meaningful way to improve care.[65] According to Mostashari, over 140,000 primary care providers—including 70 percent of those in rural areas—are now working with the extension centers to get education and technical assistance related to the adoption and meaningful use of certified EHRs.

Another important initiative of the Office of the National Coordinator is the Beacon Community Program.[66] Under this program, $220 million in grants have been made available to 17 communities throughout the United States to build and strengthen their health information technology infrastructure and exchange capabilities to help achieve meaningful and measurable improvements in health quality, safety, and efficiency in the health of populations in the selected communities.

The next big challenge, says Mostashari, will be developing the capacity for widespread exchange of electronic health information among organizations nationwide. Achieving nationwide health information exchange was one of the primary goals of the HITECH Act. Developing a trusted nationwide health information exchange offers an incredible opportunity to the country to improve the safety and quality of health care and also begin to address the cost challenges in health care.

A trusted nationwide health information network—a set of standards, services and policies that enable secure health information exchange over the Internet—will make it possible to perform evaluations never before possible and to use the results of such evaluations to change medical and health care practice in virtuous cycles to improve the health of individuals and entire populations. The Office of the National Coordinator recently released a request for information on the Conditions of Trusted Exchange for the Nationwide Health Information Network.[67]

Mostashari says one of the challenges related to achieving a learning health care system is figuring out how to provide access to aggregate data for analytical purposes while allowing the data to remain behind a health care organization's firewalls, thus maintaining privacy and security. The Office of the National Coordinator for Health Information Technology launched the "Query Health" project in 2011 to develop standards and services to enable providers to send information requests and questions about population health to a variety of places where it is held.[68]   The larger challenge may be the rapid-cycle implementation of improvement activities, including practice redesign and workflow changes in small practices. Mostashari says that an army of entities like DARTNet is needed to help with this.

Most important in developing trusted nationwide health information exchange is the will to change. Mostashari sees evidence of the will to change across the country and expects to see rapid progress this year on the building blocks that will promote health information exchange—including provider directories, digital certificates to establish identify and authentication, a common set of rules of the road, and mechanisms for aggregating data for analytical purposes while maintaining privacy and security.

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