THE
DELIVERY SYSTEM REFORM INCENTIVE PROGRAM:

A Look at
Midcourse Achievements
Across the UC System

Developed by the UC Office of the President
Health Sciences and Services
In Partnership with UC Medical Centers

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Executive Summary

The Delivery System Reform Incentive Program (DSRIP) is a novel, pay-for-performance initiative in which California's 21 designated public hospitals receive essential Medicaid dollars in exchange for meeting pre-set milestones.

The California DSRIP was the first of its kind in the nation. Since its inception, other states have also launched similar programs to drive change and improvement in health care delivery. California's DSRIP provides a potential of $3.3 billion in funding for participating public hospitals based upon achievement of specific milestones related to innovations in care delivery and improved outcomes over a period of five years. The program was created as part of California's Medicaid Section 1115 Waiver, effective from 2010 to 2015, which supports California public hospitals and academic medical centers in recognition of their provision of health services for a "disproportionate share" of low-income patients compared to other hospitals. The DSRIP is aligned with national health reform goals of improving patient: safety, care quality, satisfaction, clinical outcomes and delivery-system efficiencies.

The University of California's (UC) five academic medical centers are active and enthusiastic participants in California's DSRIP efforts. Collectively, UC medical centers set 733 milestones across 60 projects to capture a maximum of $500 million in at-risk funding over five years. While complex in its entirety, the DSRIP is widely viewed across the UC system as a vehicle for accelerating delivery-system transformation within the context of national health reform. This UC systemwide report provides a midpoint summary of select program achievements to date. The report highlights some initial results, challenges and lessons learned. It also includes suggestions that policymakers and participating hospitals might consider as efforts begin on negotiating California's next Medicaid waiver.

The overarching goals of the DSRIP align with UC's commitment to achieving continuous improvement in patient care and the delivery of services that are increasingly patient-centered, innovative, effective and evidence-based. UC medical centers are working locally on their campuses and together across the system to share best practices and to become more responsive, efficient and adaptable. At its core, the DSRIP is a vehicle for transitioning from longstanding systems of care that were often fragmented to increasingly integrated systems of patient-centered care that are better equipped to manage the health of populations. Major DSRIP activities focus on:

- Transforming the delivery infrastructure to become more patient-centered
- Recalibrating the workforce to maximize individual skill sets
- Building bridges to population health management
- Accelerating patient safety and quality initiatives

where UC medical centers are testing new and exciting models that seek to address some of the most entrenched problems in health care today. Among these are challenges related to: shortages of primary care providers; managing access to specialists; limiting unnecessary use of high-cost services; reducing hospital-acquired conditions; and improving chronic disease management and care across the continuum, including transitioning patients safely from acute inpatient settings to

ambulatory clinics and their homes. Across UC's DSRIP projects clinicians, administrators and front-line staff are working together to improve the outcomes and experience of patients.

For example, a project to improve response time to patients with severe sepsis and septic shock has resulted in systematic improvements that were previously not thought possible. As a result, sepsis mortality rates are declining at all UC medical centers. In another case, UC is working to change the culture of primary care by creating patient-centered medical homes to better deliver care in UC's outpatient settings. The patient-centered medical home model aims to integrate and coordinate care through a multidisciplinary approach that leverages the skills of diverse providers. Initial findings suggest that this redesign of primary care is resulting in fewer emergency department visits, reductions in 30-day readmission rates, and improved patient satisfaction.

These and other efforts linked to DSRIP are important elements of UC medical center strategies for achieving the Triple Aim of improving the patient care experience, managing the health of populations and reducing per capita health care spending. DSRIP is proving to be a major catalyst for UC medical centers as they work to improve the health of the populations they serve. The results, thus far, have identified effective interventions in care delivery and creative examples for training future health providers. This focus on change and innovation is one of DSRIP's most significant benefits.

UC has learned much from DSRIP and looks forward to future incentive and collaboration programs that:

- Seize the momentum created by the DSRIP by continuing to tie performance improvement to appropriate funding components
- Build on successful projects emerging from the current DSRIP
- Establish clearer channels of communication between participating health systems and with state and federal partners
- Develop alternative payment models to better align payments with innovative models of care that improve outcomes
- Reassess the varying levels of risk and funding at stake based upon the focus and scope of specific projects
- Ensure that clear, evidence-based measurements are used in establishing/defining processes and outcomes
- Encourage milestone re-evaluation and adaptation where it will lead to enhanced results over time
- Create more shared learning opportunities among participating organizations

UC providers are deeply committed to meeting the challenges and goals of health reform as expressed through UC's DSRIP efforts. The university is grateful for the opportunity to participate in this innovative federal incentive program. This midpoint report has been developed to summarize and share a sample of UC's DSRIP experiences with a desire to inform providers, policymakers and California communities about the shared journey to developing higher-performing health systems and improving patient care.

Introduction

California's Delivery System Reform Incentive Program (DSRIP) is a $3.3 billion pay-for-performance program for the state's 21 designated public hospitals. DSRIP is organized into five major areas of focus:

Category 1: Infrastructure Development
Investing in workforce maximization, inpatient and outpatient facility efficiency, and technology deployment to enable more productive processes

Category 2: Innovation and Redesign
Piloting, testing and replicating new and innovative care delivery models

Category 3: Population-Focused Improvement
Reporting and improving on measures in each of the following areas: patient experience, effectiveness of care coordination, prevention and health outcomes of at-risk populations

Category 4: Urgent Improvement in Care
Finding significant improvements in care delivery quality and patient safety for severe and costly inpatient medical conditions

Category 5: HIV Transitions Projects
Optional effort to develop programs to deliver high-quality, coordinated and integrated care to low-income HIV patients

These categories span the major opportunities of delivery-system reform as related to: expanding access to care, improving care delivery, managing population health and enhancing quality of care through the application of evidence-based practices. This report offers a description and analysis of select DSRIP activities and achievements over the first three program years. This is not an exhaustive inventory of achievements but rather a summary of the significant efforts that have demonstrated value thus far. Reported programs are organized into four sections corresponding to the first four categories listed above. Respectively, these relate to transforming the delivery of healthcare; recalibrating expectations of providers and patients; building bridges to population health management; and accelerating efforts to improve patient safety and quality.

Part 1: Transforming the Delivery Infrastructure

Patient-Centered Medical Homes
Medical homes represent a transformation in outpatient health care delivery – aiming to improve outcomes through a team-based approach to comprehensive care. This is accomplished with a physician leader who works together with other members of the health care team, including nurse practitioners, physician assistants, pharmacists and others, to deliver appropriate care in a timely manner. To succeed, medical homes must utilize: evidence-based quality measures, performance targets and patient satisfaction scores. Modern technology, such as electronic medical records, facilitates the coordination of care across inpatient and outpatient settings and allows providers to offer more efficient and effective panel management. Medical homes engage in population health management and target specific groups of patients for further intervention and education, including individuals with one or more chronic diseases. Medical homes also conduct ongoing self-evaluation for continuous improvement.

All five UC medical centers are transforming some of their primary care practices to medical homes. As part of efforts related to DSRIP, UC clinicians and administrators have moved rapidly over the past two years to re-engineer outpatient practices to achieve the primary goal of the medical home, which is for care to become more patient-centered. When patients walk into the UC San Francisco 5th floor primary care clinic at 1701 Divisadero Street in San Francisco, they will not see any obvious physical changes, except for the quality measures posted in the waiting room. Yet behind the scenes, the clinic's procedures and workflows have been entirely reoriented toward the patient. Dr. Joshua Adler, chief medical officer at UCSF who also sees patients at the Divisadero Street clinic, described the medical home model as transformative. Like many medical center clinics that have implemented the medical home model, changes at the UCSF clinic include:

- Creation of patient "panels" where each patient is assigned to a primary care provider and the provider has access to accurate and timely information on each patient's health status
- Development of up-to-date patient registries that enable providers to more thoroughly assess chronic conditions and better understand the overall health of the population they serve
- Use of improved communication channels between patients and providers, including email, prevention screening reminders and follow-up phone calls
- Engagement of care teams that work with patients under the guidance of a primary care physician

The UC Davis Medical Center is currently implementing the medical home model in all outpatient clinics as part of its DSRIP plan. In 2013, it expanded its chronic disease registry to identify patients already assigned a medical home, allowing for accurate display and use of metrics for hypertension, mammography screening and influenza vaccination coverage. Moving forward, UC Davis plans to incorporate EMR data on chronic disease management into the registry to analyze the effectiveness of case management programs for improving outcomes. This

is being built upon UC Davis' longstanding primary care network, which has been in place for nearly15 years. UC Davis has also had a robust electronic medical record (EMR) system since 2004. UC is thus learning that in addition to having clinical and technology resources in place, it is important to find and leverage efficiency through the coordination and action of many providers.

For example, at UC Davis Medical Center teams organize their approach to preventive care by utilizing standing orders for services such as mammograms and Tdap or influenza immunizations. These orders are built into provider workflows to facilitate adoption, documentation and patient education across the full spectrum of patient interactions. The medical center is also using preventative reminders via phone and Web-based messages to enhance outreach. As a result of these efforts, an estimated 42 percent of UC Davis patients received flu shot education between September 2012 and February 2013.

The UCLA Health System has implemented the medical home model in five initial practices out of 20 practices located on the Westside of Los Angeles and for pediatric patients at one health center. Here, UCLA has added a clinical social worker to join its team-based approach to care, and, like other UC medical home sites, care teams hold daily huddles to review patient needs prior to their appointments. UCLA also is working with urgent care centers to improve access to care. A preliminary analysis indicates that emergency department visits; acute care hospital admissions; and readmission rates fell by 15 percent, 20 percent and 30 percent, respectively, for the cohort of patients assigned to a medical home.

UC San Diego and UC Irvine medical centers are each focused on one clinic to recast as a medical home. (See Appendix I for detail on the "UC San Diego: Providing a medical home for HIV patients.") UC Irvine implemented a patient-centered medical home model in its Senior Health Center. Some 91 percent of patients seen at this center at least twice in the past year have been assigned a primary care provider. As a result of moving to a medical home model at this clinic, UC Irvine has reported a 10 percent reduction in emergency care (from 2011 to 2013) for seniors with chronic conditions.

UC Irvine, UC Davis and UCSF are all seeking accreditation from the National Committee for Quality Assurance, NCQA, as a "recognized practice" for patient-centered medical homes. To achieve this high standard, medical practices must meet specific metrics for infrastructure design and patient care delivery. According to Dr. Tom Balsbaugh, who directs the UC Davis

"It has changed the culture of primary care at UCSF from one in which value was placed only on providing a very high quality doctor to an individual patient, to one that pays attention to the overall performance of a primary care system."

Dr. Joshua Adler, UCSF

project, the NCQA designation aligns with the DSRIP goals of improving population health management, patient access, care coordination and chronic disease management. "It also gives us an opportunity to create an ongoing self-evaluation infrastructure," Balsbaugh said of the NCQA designation. All three medical centers have completed their applications and expect to hear from NCQA later in 2014.

At UCSF, two primary care clinics have moved to the medical home model. With DSRIP funding, UCSF hired a panel manager to establish panels at the clinics and track them over time. One of the early challenges was establishing panel size. The clinics sent letters to patients seen in the past three years asking them to return for an appointment. This allowed the practice to assess "true" patients in each panel. With more up-to-date information, providers can begin to see trends over time (e.g., patients who are receiving various preventative screenings versus those who may need additional reminders).

UCSF sent a clinic team member for training at the headquarters of Epic, UCSF's EMR provider, to gain certification in report writing. This has proven valuable in organizing data into actionable items. "With this model, data about each provider's patients is shared among all providers to improve learning and accountability," said Dr. Brent Kobashi, associate medical director of the general medicine faculty practice at UCSF. The clinics also changed open access schedules to make 30 percent to 50 percent of appointments available one week ahead and began conducting daily huddles with team members. This approach is proving valuable for academic medical centers, where providers often have a variety of responsibilities and may only have scheduled time in clinic one day per week. As a result of the transition to the medical home model, patient satisfaction rates at this clinic rose from 91.9 percent to 94.4 percent from 2012 to 2013; the no-show rate fell from 15 percent to 11 percent; wait times decreased from 14-23 days to 2-13 days; and provider continuity increased from 81 percent to 91 percent.

Care Transitions
In October 2012, as mandated by the Affordable Care Act, the Centers for Medicare and Medicaid Services began reducing payments to hospitals with excess 30-day readmissions for acute myocardial infarction, heart failure and pneumonia. This readmission reduction program may result in all five UC medical centers receiving fewer Medicare dollars. The DSRIP created an opportunity for UC hospitals to enhance, overhaul or introduce care transition programs and thus reduce avoidable readmissions. This in turn improves patient outcomes and predictability with respect to Medicare payments.

At UC San Diego, a care transition effort had been under way since 2003. The DSRIP effort advanced this work through the hiring of much-needed staff and the elevation of the project's status internally. "Care transitions are important," said Dr. Gregory Maynard, director of the UC San Diego Center for Innovation and Improvement Science, because they "touch nearly everyone in the hospital." For many patients returning home or moving to long-term care facilities, there is an opportunity for further education and outreach to reduce the chances of a return to the hospital. UC San Diego has developed a "toolbox" for care transitions that includes:

- Identifying patients upon admission who are at high risk for complications after leaving the hospital

- Assigning patients a "transition nurse specialist" for a personal handoff
- Conducting follow-up calls after the patient leaves the hospital
- Forming strong partnerships with community resources
- Providing medication reconciliation and education

The elements of this toolbox are utilized through an executive steering committee process to manage care transitions. This function brings together the chief medical officer and six project teams focused on various aspects of care. Twice a year, the UC San Diego project teams conduct a learning series that is open to everyone in the health system and community partners. This DSRIP project dovetails with the "Community-based Care Transitions Program," created by the Affordable Care Act and specifically aimed at fee-for-service Medicare patients in San Diego County. The DSRIP support enabled UC San Diego to better participate in the Medicare care transitions program and influence county partners to align for better outcomes.

Both UC San Diego and UCSF are participating in Project BOOST (Better Outcomes by Optimizing Safe Transitions), a national initiative led by the Society of Hospital Medicine. Project BOOST has a risk assessment tool called the eight "Ps" to identify patients upon hospital admission who are at risk for readmission or other adverse events. A patient's BOOST score upon admission may result in early transition preparation to insure patients have adequate support and follow-up resources ready the day they are discharged.

Project BOOST: "The Eight Ps"	
Problem Medications	Psychological Problems
Principal Diagnoses (e.g., heart failure, diabetes)	Polypharmacy (i.e., patients that take more than five medications)
Poor Health Literacy	Poor Patient Social Support
Prior Hospitalizations	Palliative Care

Another promising approach to reducing avoidable readmissions occurs through the formation of care teams that make follow-up calls to recently discharged patients. This has been shown to be a cost-efficient and effective approach to reducing avoidable readmissions (Joint Commission Journal on Quality and Patient Satisfaction, May 2013). As part of the DSRIP program all five UC medical centers have expanded their follow-up communication programs for high-risk patients.

Taking this a step further, with DSRIP funding, UCLA opened a call center for care transitions in late 2011. The center is staffed with five registered nurses and operates seven days per week. The center is currently focused on heart failure patients but plans to expand calls to discharged patients who have had an acute myocardial infarction (or heart attack). Under this program, UCLA screens all patients for heart failure upon admission to Ronald Reagan UCLA Medical Center or UCLA Santa Monica Medical Center. Patients eligible for call center follow up have a diagnosis of heart failure, are not on dialysis (those patients receive separate post-discharge care) and do not have dementia. Patients meeting these criteria are approached while still in the

hospital about receiving post-discharge calls and further education about heart failure. Patients who participate will receive a Bluetooth-enabled home monitoring scale and blood pressure cuff with in-person instruction on their use. Patients are assigned to a call center nurse and are shown a photo of that nurse to facilitate the phone-based relationship. Typically within 72 hours of discharge, the patient receives a call from the designated call center nurse and weekly calls for 30 days. At home, patients log their weight and blood pressure, with results uploaded automatically to their electronic medical records. This information helps during check-in phone discussions and education about self-care at home, including diet, medication and exercise.

Dr. Michael Ong, the UCLA call center project leader, said this model works for an expansive urban region like Los Angeles where in-person home visits can require significant travel time. "In terms of trying to manage this population, we felt it was important to leverage the technology available to us," Ong said. In the first half of 2013, 152 heart failure patients participated in the call center post-discharge intervention, or 32.3 percent of all heart failure patients, exceeding the DSRIP goal of 25 percent. Ong and his team are now collecting outcomes data from the program, with initial results expected in late 2014. In the next phase of this project, UCLA will train certified nursing assistants to conduct in-home visits, with real-time video support from registered nurses. "We know it can't be a one-size-fits-all approach," Ong said. "Some people just need someone to come to their home."

UCSF, UC San Diego, UC Davis and UC Irvine also have post-discharge follow-up programs. UCSF's telephone-based project had previously been extremely time-consuming for nurses. In late 2013, UCSF began a pilot program using Cipher, a voice recognition call technology, which has reduced the time spent on call-backs and "phone tag." UC San Diego also overhauled its discharge care team and now employs eight nurse transition specialists – registered nurses who identify patients at high risk for readmission and conduct both bedside interventions before discharge and follow-up calls once patients return home. UC Davis has expanded the role of pharmacists to help improve medication management for patients with congestive heart failure. (See Appendix I for detail on the UC Davis DSRIP project: "Improving medication management.") Since March 2013, with DSRIP support, UC Irvine has sent mini iPads home with Senior Health Center patients who are at high risk for readmission to conduct face-to-face visits with registered nurses. To assess the effectiveness of this intervention, UC Irvine purchased 20 mini iPads with DSRIP funds. Visits are conducted for approximately 30 days post-discharge, with the first visit scheduled within 48 hours of discharge. Of the 18 patients who participated as of late 2013, none has required readmission to a hospital.

Medication Management
Underuse of prescribed medications is common, as is the overuse and overprescribing of unnecessary medications (Berlowitz, DR et al., NEJM, 1998; Schmittdiel, JA, et al., J. Gen. Intern. Med., 2008). Lack of adherence to instructions for prescription medications is estimated to be responsible for 10 percent of hospital admissions and $8.5 billion in excess medical costs (Foundation for Managed Care Pharmacy). Barriers to medication adherence include the costs of medication; confusion about instructions; taking the incorrect dosage; forgetting to take medications; and/or taking over-the-counter or herbal supplements that interact with prescribed drugs. In addition, many patients leave the hospital without a clear understanding of their medications or without having had a thorough review of other medications they may be taking.

Mindful of the challenges related to medication management, UC health facilities are using DSRIP funds to improve medication adherence for their patients. At UC San Diego, pharmacists are crucial members of care transition teams and work closely with registered nurses and physicians in inpatient and outpatient settings to help patients develop a clear understanding of their medication plan (see Appendix I for additional detail on UC San Diego's DSRIP project: "Providing a medical home for HIV patients."). UC Davis has a comprehensive medication management program that is also resulting in improved patient outcomes and fewer medication errors at the bedside (see Appendix I for detail on UC Davis' DSRIP project: "Improving medication management").

At UCLA, clinical pharmacists are embedded in patient-centered medical homes to improve drug adherence for patients with uncontrolled type 2 diabetes. Referred to as MyMeds, the project identifies diabetic patients with one or more uncontrolled cardiovascular risk factors through discharge reports, primary care referrals and UCLA's diabetes registry. These patients are then referred to a clinical pharmacist, who reviews the patient's most recent blood work and medication list. A consultation, generally in conjunction with a primary care visit, is focused on identifying barriers to medication adherence. Participating pharmacists are trained in motivational interviewing and use an evidence-based screening tool to identify reasons for adherence problems with individual patients. Changing from a brand-name to a generic drug to reduce costs to patients and/or offering more education about how the medication works are among the strategies that can improve adherence.

The MyMeds project began in January 2013 and is already showing promising results. Of the nearly 300 initial participating patients, all experienced an improvement in blood pressure rates regardless of risk factors. The program, which is now in place at 14 of 28 UCLA primary care practices, has been "very, very transformative," said Dr. Carol Mangione, professor of medicine and public health at UCLA and MyMeds project leader.

Care Coordination for Complex Care Patients
Case management and point-of-care interventions for frequent users of the health care system can reduce costs and improve outcomes (California HealthCare Foundation, 2008). It is important to emphasize, however, that care coordination programs for patients with complex medical conditions are extremely challenging to implement and sustain. This is in part due to complex social and psychological needs of some of these patients. DSRIP is helping UC to try new and

"Adding a pharmacist doesn't fragment care, it makes people feel they are listened to, and the literature shows that patients who feel their providers are listening have better outcomes."

Dr. Carol Mangione, UCLA

innovative approaches to improving outcomes and lowering costs for these patient populations. Some of the challenges of these interventions include making sure that resources are aligned to meet regional demands for services and that community partners can meet patient needs outside of the health system.

Comprehensive care coordination for patients with complex conditions requires multiple intersecting efforts. UC Irvine, for example, has seven DSRIP projects that aim to improve care for complex patients. UC Irvine's novel Care Connect patient navigation system, a focused DSRIP project, assigns patients with complex treatment regimens to chronic disease coaches to ensure a high level of coordination between their providers and services across the care continuum. This coached care model follows evidence-based practices and is a component of the primary care team's clinical approach. Coaches work closely with primary care doctors to improve outcomes for high-risk patients who are identified using risk-stratification algorithms. Eligible patients are recruited into the program during in-person clinic visits rather than phone consultations to boost enrollment. Coached patients also have access to secure messaging with providers and a mobile app to complement patient Web portal services.

UC Irvine DSRIP Projects To Manage Care For Complex Patients	
Developing And Utilizing Disease Registries	Redesigning Primary Care
Developing Risk Stratification Capabilities	Increasing the Workforce
Expanding Chronic Care Management	Improving the Patient Experience

By July 2013, nearly 200 diabetes patients were enrolled in the UC Irvine coached care program and another 172 heart failure patients were enrolled in the phone coaching program. For those enrolled, emergency department (ED) and inpatient visits declined in the six months after enrollment. There were 58 inpatient visits post-coaching – a 52 percent reduction from a baseline of 121 visits. There were also 45 ED visits among coached patients six months after enrollment, representing a 60 percent decrease from a baseline of 112 ED visits.

Another evolving tool to identify and support the coordination of services for patients requiring complex care involves the use of patient registries. These databases provide a resource for reducing avoidable high-cost services and improving outcomes for these patients. One such example is seen at UC Davis where an Intensive

"UC DSRIP efforts have forced us to shift our thinking in such a way that we reach beyond the traditional walls of the hospital. We are investing in and evaluating our infrastructure to put the right processes in place to maximize outcomes."

Karen Grimley, UC Irvine

Care Management (ICM) registry was created that includes more than 800 patients who have presented to the ED four or more times over three months. In February 2013, the UC Davis Medical Center launched an early warning alert in the EMR, which notifies clinical case managers when a patient in the ICM registry shows up in the ED. The case manager on duty then assesses the patient and ensures he or she receives appropriate care and a follow-up outpatient plan. UC Davis met its current year target of documenting clinical case manager interventions in 50 percent of identified ICM patients. The medical center is expanding its case management team and hours in order to meet the aggressive goal of intervening in 90 percent of ICM patients who present in the ED for the next reporting year (2013 to 2014).

UCSF also created a registry of 210 frequent encounter patients and formed an interdisciplinary complex care case management team based on a geriatric care model developed at Indiana University. These teams are utilized in primary care clinics to facilitate face-to-face interactions with complex patients. Although this is a fairly new program (launched in April 2013), anecdotal case reports indicate the interventions are helping redirect patients to more appropriate services.

In another example, a UC San Diego DSRIP project has focused on palliative care as an area for enhanced care coordination. Palliative care providers are experts in discussing the goals of care with patients and their families as well as in managing care to provide symptomatic relief from pain. Involvement of palliative care improves the patient experience, utilization of services and patient outcomes. UC San Diego added physician and nursing specialists to its palliative care team, conducted training on appropriate use of palliative care, and established triggers that activate a palliative care consultation. Over the first three years of the program, palliative care visits for eligible patients rose from 500 to nearly 1,000 per year.

Alternative Care Visits
DSRIP is helping UC medical centers to test alternative care visits, including those involving telemedicine, e-consultations, remote monitoring and text messaging. These innovative projects are giving UC providers a head start in the move from traditional fee-for-service to new payment models. New reimbursement models – such as bundled payments, global payments and shared savings arrangements – pay providers based on quality of care, outcomes and total care episodes, rather than on a per visit basis. The Affordable Care Act includes alternative payment model programs, and providers around the country are revamping many of their practices to prepare for this changing reimbursement landscape.

UC Irvine launched a telemedicine program that bridges the care continuum and offers convenience and continuity to geriatric patients as part of its DSRIP efforts. Patients of UC Irvine's Senior Health Center outpatient clinic who reside at either of two local skilled nursing facilities (SNFs) have access to telemedicine visits with their primary care provider. The telemedicine station is set up in a dedicated room in the SNFs to ensure patient privacy. UC Irvine plans to expand this telemedicine program to two other SNFs in 2014.

UC San Diego is ramping up a multifaceted telemedicine program as part of its DSRIP plan, in a spoke-and-wheel model to deliver specialty care to community partners in remote locations. As of 2013, UC San Diego had conducted telemedicine visits in psychiatry, neurology, hepatology, endocrinology and pain medicine. In another important DSRIP project, UC San Diego is

improving access to interpreter services by implementing video and audio links to remote interpreters who collectively speak more than 30 languages and provide support for American Sign Language. Audio and video access to interpreters is boosting capacity to serve San Diego's diverse patient population. In 2013, there was an average of 1,700 total monthly patient interpreter encounters, a 60.7 percent increase over that reported for 2010.

Other DSRIP alternative care visit projects include UCSF's novel eConsult program, which allows primary care physicians to consult with a specialist within 72 hours (see Appendix I for additional detail on UCSF's project: "Expanding access to specialty care"). Within the same category, UCLA has also launched a DSRIP project that is testing text messaging home monitoring with parents of pediatric patients with complex care needs.

Part 2: Recalibrating the Workforce

By 2025, the national shortage of primary care physicians is expected to exceed 52,000 physicians (Petterson SM et al., Ann Fam Med., 2012). The shortage stems from insurance expansion, aging baby boomers, epidemics in obesity and chronic disease, a decline in the number of medical students choosing primary care careers, and the retirement of physicians. Redesigning care to a team-based model, engaging patients and leveraging technology can enable primary care delivery to better balance demand and capacity. (Bodenheimer, TS et al., Health Affairs, 2013.)

UC medical centers are reorganizing their workforces into care teams of clinicians and non-clinicians in new medical home models (see also previous section entitled "Patient-Centered Medical Homes"). This framework empowers clinic staff to work *at the top of their license* or, expressed another way, within the full scope of their capability. This has created new opportunities as the legal scope of practice for some health care workers has recently been expanded. These changes, in turn, are enabling UC medical centers to enhance the roles of various providers, with the benefit of clear work parameters and appropriate supervision.

Pharmacists
In October 2013, California Governor Jerry Brown signed a pharmacist provider status bill, Senate Bill 493. This law creates a new category of pharmacists who are authorized to perform patient assessments, refer patients to other providers and operate across the care continuum. Importantly, these pharmacists are authorized to bill payers directly instead of under a physician. The bill also includes language calling for the inclusion of multidisciplinary providers on care teams. The University of California, through the work of the Office of the President, supported this bill which took effect January 1, 2014. (See Appendix I for additional information about UC Davis' DSRIP project: "Improving medication management.")

Medical Assistants
Medical assistants are individuals who work under the supervision of primary care physicians and provide various support services authorized by state law. Recently, the California Department of Public Health issued a clarification (All Facilities Letter 12-47) that medical assistants may work in approved outpatient clinics of licensed general acute care hospitals. This clarification enables medical assistants to perform certain activities (authorized by law and under the supervision of licensed providers) in some settings where such authorization had not previously been clear. UC DSRIP projects are benefiting from this expansion as medical assistants are now able to play a more active role in care delivery. At UC San Diego for example, medical assistants are key members of the care team structure in the HIV clinic, helping to identify patients in need of services (see Appendix I for detail on the UC San Diego DSRIP project: "Providing a medical home for HIV patients.")

International Medical Graduates
A new state law allows graduates of international medical schools who are participants in the UCLA International Medical Graduate program to work under the supervision of licensed physicians. This is part of an innovative, DSRIP supported "pre-residency" program that increases the competitive eligibility for bilingual international medical graduates to enter

accredited family medicine training programs in California. (See Appendix I for additional information about UCLA's project: "Creating a pathway to practice for international medical graduates.")

Workforce Redesign
Workforce redesign and training is an important aspect of DSRIP. Dozens of DSRIP program milestones are related to hiring and training appropriate health care workers, including physicians, nurse practitioners, registered nurses, pharmacists, social workers, medical assistants and data managers. Many of these workers have new titles and functions, such as "care navigator," "transitional nurse specialist," "chronic disease coach" and "panel manager." This newly calibrated workforce is expected to help alleviate the national primary care shortage. One-fifth of primary care visits involve preventative care, and 60 percent of preventative services can be performed by non-clinicians. An estimated 25 percent of chronic care management can be allocated to non-clinician health coaches, who have better patient outcomes than traditional physician care (Bodenheimer, TS et al., Health Affairs, 2013).

UC Davis offers one example of workforce redesign. In 2012, UC Davis primary care clinics embarked on an expansion of its chronic disease management program. The goal of this DSRIP project is to engage patients who are newly diagnosed with diabetes and other chronic diseases and help them better manage their conditions over time. As part of this effort, care navigators and panel managers took on new referrals, and the UC Davis EMR was updated to accept referrals for newly diagnosed patients to enter care coordination. In the first six months of 2012, 700 patients were newly diagnosed with a chronic condition in seven clinics and more than 100 patients received targeted education. The DSRIP has accelerated UC Davis' transformation to focus on the management of chronic diseases. This includes efforts to develop accountable care organizations that engage patients with a care manager and provide access to self-management tools. "DSRIP has put the UC health system on the path to better management of patients with chronic diseases," said Dr. Allan Siefkin, chief medical officer at UC Davis Medical Center. "We've always been proud of our ambulatory presence, but there haven't been a lot of resources in chronic disease management and population health, DSRIP gave us the imperative to build these out," said Siefkin.

Continuous Quality Improvement Training
A significant portion of health system expenses are unnecessary or wasteful. To improve efficiencies, health care organizations are increasingly turning to Lean, a management strategy most commonly associated with Japanese manufacturing, particularly automaker Toyota. The application of Lean principles to health systems began in 2002 at Virginia Mason Medical Center in Seattle. Since then, health systems across the country have embraced Lean, teaching its key tenets to staff and clinicians (Institute for Healthcare Improvement, *Going Lean in Health Care*, 2005).

UC medical centers are incorporating Lean training and the adoption of Lean principles in DSRIP plans. These DSRIP efforts are aligned with UC's Lean objectives as each aims to accelerate systemwide improvements in care coordination and delivery. Like many DSRIP goals, Lean adoption requires buy-in from the entire organization: administrators, clinicians, information technologists, front-line staff and support staff. Successful adoption of lean

principles requires a culture change that often goes against ingrained routines and procedures. Stated differently, Lean thinking is a move away from "work-arounds" to address the root causes of inefficiencies and mismanagement. Lean also encourages the breaking down of longstanding silos to facilitate communication and change across departments and teams.

UC Davis has two Lean projects each year that are supported by DSRIP. These have included sepsis rapid intervention, intensive case management of complex care patients and a program for geriatric patients sustaining bone fractures. UC Davis is also applying Lean methodology to improve patient flow. This involves identifying patient bottlenecks in the system and developing new efforts to address them in an interdisciplinary fashion. "Lean improves horizontal flow of ideas across the organization and is a silo-buster," said Jared Quinton, director of performance excellence at the UC Davis Medical Center. Each quarter, UC Davis conducts internal trainings in half- or full-day sessions on Lean. These sessions include 20 to 30 staff members, including physicians, registered nurses, administrators, pharmacists and case managers. Participants conduct "value stream mapping" on topics and use role-playing and paper sticky notes to brainstorm about improvements in various areas.

Part 3: Building Bridges to Population Health

Category 3 of the California DSRIP requires reporting on 21 population health measures divided among four areas. The ability to provide accurate clinical data on large patient populations is thus a fundamental foundation and requirement for DSRIP population health management and health care reform based change in general.

DSRIP Category 3 Population Health Reporting Areas	
Patient Satisfaction	Care Coordination Effectiveness
Preventive Health	Health Outcomes For At-Risk Populations

The UC system has met this reporting challenge and exceeded it. It is clear, however, that building databases, collecting baseline information and adding these measures to workflow requires significant ongoing effort. This is especially true at medical centers whose EMR systems are not fully developed or implemented. Today, UC medical centers are applying this data to increase understanding of their patients' health status and outcomes. This information can also be used to improve patient health through outreach. Providers are able to identify patients in need of laboratory or imaging studies, including preventive care and health maintenance – for example, sending reminders to diabetic patients for hemoglobin A1C testing.

At UC San Diego, there is a robust system in place to optimize breast cancer screening. Patients appropriate for mammography screening – mostly women age 50 and over – are identified via electronic medical records. During routine clinic visits, an eligible patient's EMR shows if she is overdue for a mammogram. UC San Diego's EMR system also generates reports on patients overdue for screenings, which are then supplied to clinic and radiology staff for outreach. The EMR generates feedback reports showing provider-level and clinic-level breast cancer screening rates, which are also compared and reviewed. Results are tracked via monthly quality reports and shared at quality meetings.

In a related DSRIP project, UC San Diego is enhancing its patient portal, MyUCSDChart, so that patients overdue for mammography screenings receive tailored messaging. As a result of these efforts, UC San Diego has the highest rate of mammography screening of any public hospital in California, at 87.3 percent, well above the national averages reported by the CDC.

"An important foundation for improving mammography screening is good data. There is confidence in the data and an awareness that the data helps us improve the care we provide for our patients."

Dr. Angela Scioscia, UC San Diego

Part 4: Accelerating Patient Safety and Quality

Patient safety is an important component of payment reform. California's DSRIP is accelerating the standardization of evidence-based best practices for four critical inpatient conditions: severe sepsis, central-line associated bloodstream infections, surgical site infections and hospital-acquired pressure ulcers. Major themes emerging from these projects include:

- Use of evidenced-based standardized practices (with performance measurements) improves results, and

- Shared learning fosters more rapid adoption of process improvements.

While not unexpected, particularly when comparing the safety reform efforts in other industries (e.g., airline pilots), what makes health care unique is the history of individualized responsibility and thus relative independence from performance comparison. Category 4 DSRIP efforts have dramatically changed this paradigm.

Severe Sepsis and Septic Shock
Sepsis – a potentially life-threatening complication from infection – is a leading cause of death in hospitals. Patients with pneumonia, wounds, urinary tract and other common infections can develop sepsis, as chemicals released by the body to fight the initial infection trigger inflammation. This response can rapidly lead to organ failure and death.

Unfortunately, sepsis is often fatal and it is on the rise nationwide. The number and rate of hospitalization nationwide for sepsis doubled from 2000 to 2008. Patients hospitalized with sepsis tend to be more severely ill, have longer stays and are eight times more likely to die in the hospital than those with other conditions. In 2008, an estimated $14.8 billion was spent on sepsis hospitalizations (Centers for Disease Control and Prevention, June 2011).

DSRIP requires all participating hospitals to achieve compliance milestones for a sepsis resuscitation bundle. A sepsis bundle is a set of guidelines/activities designed to identify patients most at risk for sepsis as early as possible and affect an intervention. The "bundle" must be delivered to eligible patients within one hour to count towards the DSRIP milestone. Although hospital bundles are often customized, important elements generally include: measuring a patient's lactate level; obtaining blood cultures prior to ordering antibiotics; administering broad spectrum antibiotics; and administering fluids to patients that meet certain criteria.

Sepsis bundle compliance milestones for DSRIP rise each year over the five-year span of the program – and a failure to meet this milestone results in lost funding. To boost bundle compliance within the crucial 60-minute window, UC medical centers are implementing innovative detection and rapid response protocols, in some cases launched automatically via the EMRs. All UC medical centers recognize that achieving bundle compliance requires a multifaceted, team-based approach. (See Appendix II for additional information about innovations in sepsis rapid response, by campus.)

Central Line-Associated Bloodstream Infections
An estimated 41,000 central line-associated bloodstream infections (CLABSI) occur in U.S. hospitals each year. These infections are usually serious and typically result in prolonged hospital stays and increased costs and risks for mortality (Centers for Disease Control and Prevention, July 2013). Fortunately, most CLABSIs can be avoided through proper insertion techniques and management of central lines.

CLABSI is an important DSRIP patient safety project. All participating hospitals are required to report CLABSI rates as well as central line insertion practices (CLIP), which are evidence-based activities and reporting known to reduce the incidence of infection. Hospitals must achieve compliance targets with CLIP as part of DSRIP. Elements of the CLIP include hand hygiene by line inserters, use of sterile barriers and skin antiseptic application prior to line insertion. UC medical centers have been sharing best practices on CLABSI through a Healthcare Epidemiology Collaborative sponsored by the UC Office of the President (Health Sciences and Services). This group meets in-person quarterly and by phone eight times per year and includes clinicians and administrators from all five UC medical centers. For each of the past three years, the collaborative has set aggressive reduction goals and improved CLABSI rates.

It is important to note, however, that several UC medical centers have struggled to meet their DSRIP milestones on CLIP compliance and CLABSI rates. One challenge in comparing CLABSI rates across institutions relates to the patient populations that each medical center serves. For instance, Ronald Reagan UCLA Medical Center has a particularly high CLABSI rate for its liver transplant unit. "Most of these patients need lines for a longer period of time. Some are here for three to four months and have multiple lines inserted. You can't just pull the lines out," said Dr. Zachary Rubin, infectious disease physician at UCLA and CLABSI project leader. An additional challenge has also been identified with CLIP compliance. This is because CLIP compliance is based on the accurate documentation of the CLIP bundle compliance elements within the medical record. In the past, providers have been known to be inconsistent in this documentation. DSRIP efforts have helped to overcome this through support for construction of specific CLIP compliance documentation tools within UC's EMRs. Though this is both time intensive to develop and maintain this type of integrated data collection and reporting is becoming common.

EMRs offer other important resources for reducing CLABSI rates. For instance, in February 2013, UC Irvine implemented a physician progress note into the EMR. An electronic alert now prompts the attending physician to document that the central line is still medically necessary. The prompt cannot be turned off until the central line is discontinued. UC Irvine believes this automated reminder, a DSRIP project, will help reduce CLABSI rates.

Surgical Site Infections
Surgical site infections (SSI) are infections that occur after surgery in the part of the body where the surgery took place. These infections often result in longer hospital stays, more nursing care, prolonged antibiotic treatment and, at times, return hospital visits. The costs of SSIs can exceed more than $30,000 per case (Urban, JA, Surg Infect, 2006).

Reducing the incidence of SSIs is one of the Category 4 program options in DSRIP's urgent improvement in care requirements and four out of five UC medical centers chose SSI in their DSRIP plans. In this program participating hospitals choose which surgeries to focus on for improvement. UC Irvine instead chose to focus on efforts to reduce venous thromboembolism (see Appendix I for additional information on UC Irvine's project: "Preventing dangerous blood clots.")

UC Davis, for one, has shown remarkable progress on SSIs since the start of its DSRIP project, with SSI rates cut in half over the first three years of the program. UC Davis is tracking eight infections as part of its DSRIP plan – colon, hernia repair, neck, hysterectomy, knee and hip replacement, prostate, and small bowel. For the reporting year of June 2012 to July 2013, the aggregate infection rate for all procedures was 1.3 percent, a 16.2 percent improvement over the prior year. Best practices implemented at UC Davis include:

- Antiseptic skin disinfection up to three days prior to surgery
- Patient temperature checks every 30 minutes
- Warming devices for patients during surgery
- Supplemental oxygen for all patients for at least two hours post-surgery
- Blood sugar test post-op and administration of insulin if needed

One reason for UC Davis' success in reducing SSIs is attributed to the hiring of additional infection control staff supported by DSRIP. Previously, UC Davis had one manager and two infection control specialists. Today, UC Davis has a manager, two analysts and eight infection control specialists. This has enabled the medical center to conduct whole-house surveillance of SSIs, tracking 39 types of procedures. The UC Davis Medical Center provides approximately 1,800 surgical procedures each month, with about 800 of those requiring surveillance for infection. UC Davis has also launched an antibiotic stewardship program to improve the timing and selection of antibiotic administration for surgical patients. "The DSRIP has created an organizational structure to set priorities and monitor risk," said Paul Nelson, assistant director, quality and safety at UC Davis Medical Center.

The medical centers at UCLA, UCSF and UC San Diego are also making progress reducing SSIs. For UCLA, the DSRIP project on SSIs has changed the culture around infection control resulting in the following during 2013:

- Holding orthopedic case review meetings every two weeks to review reasons behind readmissions, extended hospital stays and surgical complications
- Creating a colon and rectal surgery team safety program to identify best practices for patients
- Updating operating room policies, including bans on home-laundered scrubs
- Enhancing operating room cleaning processes, including black light random inspections

One of the challenges of the SSI project involves meeting specified benchmarks as the number of infections drop. With such small numbers, even a single, very sick and complex patient can skew overall results for the reporting period. Hospitals could potentially spend more and more money on fewer and fewer cases to achieve the target results. "SSIs are among the most expensive infections to treat," said Dr. Zachary Rubin of UCLA Health. "It's a good area to put emphasis on, but there's the statistical problem of showing improvement in the way we measure it. Instead of looking at specific procedures, we should look at the general interventions that impact all patients."

Collaboration to reduce SSIs continues to occur across UC locations. Through a grant from the UC Center for Health Quality and Innovation, UC medical centers are developing and implementing standardized peri-operative interventions to reduce the risk of SSIs in orthopedics and colorectal surgeries. Interventions include education, improved use of checklists and improved use of electronic monitors on operating room doors.

Hospital-Acquired Pressure Ulcers
Hospital-acquired pressure ulcers, also known by the acronym HAPU and in lay terms called bed sores, are a growing concern in health care because they are often preventable. In California, hospitals must report stage three and four HAPUs to state regulatory agencies. Additionally, government and private payers in recent years classified severe HAPUs as "never events" and thus restrict reimbursement for their specific care.

HAPU prevention is one of the potential components for participants in DSRIP's urgent improvement in care (Category 4). All UC medical centers chose to focus on HAPU as part of their DSRIP plans. One of the challenges of implementing a HAPU prevention strategy is that such efforts involve nearly all hospital units. Within this broad context, UC medical centers have emphasized peer-to-peer education; deputized unit or "skin" champions to spread best practices; and focused on implementing best practices such as optimal patient nutrition, moisture management intervention and routine repositioning of immobile patients.

UC medical centers are actively leveraging their EMRs to improve the recording and management of pressure ulcers. UC Irvine added pop-up prompts and reminders to nurse and physician notes about how to prevent HAPUs, based on evidence-based practices. UC Davis added a question to its EMR, "Does this patient have a pressure ulcer?" to boost documentation upon admission. As a result, appropriate documentation of pressure ulcers present on admission increased from five per week to 45 to 55 per week. This documentation helps to focus resources and plan for care to best manage these pre-existing conditions. UCSF has developed an EMR process to generate reports on HAPUs to free up unit champions from time-consuming patient record audits and to focus instead on education and patient care at the bedside.

Part 5: Challenges and Lessons Learned

One of the primary benefits of the state's DSRIP efforts is that it has improved and increased collaboration among public hospitals in California including UC's medical centers. In fact, participating hospitals must document and show "shared learning" activities as part of their DSRIP semi-annual and annual reporting to state and federal entities. These collaborations have substantially improved the sharing of ideas among UC medical centers over the past three years.

Dr. Siefkin and others noted that there is further opportunity for shared learning among UC medical centers and to spread knowledge gained from DSRIP projects. A number of clinicians said they would like to have more UC-wide opportunities to work together to improve patient safety, access, chronic care management and the development of medical homes. Improved collaboration and improved outcomes have been a particular benefit of the DSRIP program. As part of these collaborative efforts, senior administrators and clinicians have also identified several major challenges related to the current DSRIP initiatives. Significant among these are those related to: setting accurate performance targets in multiyear projects, providing electronic medical record support, and managing communication challenges.

Setting Accurate Performance Targets in Multiyear Projects
California DSRIP projects were defined, resourced and launched under a very swift timeline – within two months for UC medical centers. Some projects have experienced snags that were not anticipated at the outset due to incorrect assumptions, invalid data or simply unattainable goals. The California DSRIP plan allows for project modifications, and some projects have been redesigned or changed midstream to refocus the opportunity and better prepare for health care reform.

Nearly every UC medical center has at least one project that will not meet the goals set at the outset. UC San Diego's project to reduce wait times for patients being admitted from the emergency department (ED) is one such example. Despite expansion of ED capacity and improvements in efficiency within the ED, the time required for admitted patients to be placed in an inpatient bed has remained high. This is due in part to the fact that UC San Diego has experienced significant inpatient growth, which has created additional challenges in providing inpatient bed availability for transfers from the ED.

In the reporting year June 2012 to July 2013, UC San Diego lost nearly $500,000 in DSRIP funds due to circumstances such as this

"The DSRIP helped form a foundation on which UC medical centers can work together. We used to be competitors for most initiatives and we did not collaborate on best practices, quality and safety improvement."

Dr. Allan Siefkin, UC Davis

one. UC San Diego Chief Medical Officer Dr. Angela Scioscia said she doesn't think this particular milestone is achievable, but that is part of a pay-for-performance process. "We don't want to change a milestone we can't meet," Scioscia said. "That doesn't seem to be in the spirit of the DSRIP project and we will continue our efforts to improve in this area."

Likewise, UCLA's surgical site infection project overestimated the number of infections at the outset due to misclassifications of procedures. In the most recent reporting period, UCLA failed to meet its project plan target of a 4 percent reduction in SSIs across the three selected procedures. Dr. Zachary Rubin, the project lead, said "it is unlikely that UCLA will achieve the milestones for the two years remaining on the project." Instead of focusing on DSRIP milestones, UCLA infection control is working to implement best practices that improve quality of care for surgical patients. "If you emphasize outcomes and you don't get the outcomes you want, then it is going to be hard to maintain motivation," Rubin said. "We are trying to de-emphasize the rates and emphasize process instead." UCLA's chief medical officer, Dr. Tom Rosenthal, said "that while most DSRIP metrics were well thought out and helped drive improvements, a few metrics were not well-conceived."

UC Davis was forced to scrap a project on the collection of race, ethnicity and language data sets (REAL) in year three because it could not substantiate data on REAL patient experience. Since then, UC Davis has tightened controls over DSRIP project review and auditing. The medical center is seeking permission from CMS to change this project to one focused on the collection of data on the LGBT patient populations. UC Davis Chief Medical Officer Dr. Allan Siefkin said he is not worried about meeting all of the DSRIP performance milestones. "That's what pay-for-performance is about," Siefkin said. "Clinical care is not black and white. Many forces affect your ability to meet these targets."

Accommodating For Electronic Medical Record Development
The five participating UC medical centers were in various stages of EMR adoption at the start of the state DSRIP project. This created an uneven playing field with respect to managing processes, reporting results and thus achieving DSRIP project goals. Some clinicians have reported that creating DSRIP processes pre-EMR and then re-working them post-EMR implementation created double the workload. In other instances, DSRIP projects were at a standstill for six months or more during an EMR implementation due to redirected resources and the inability to make system changes. At institutions that already had functional EMRs, some project leaders felt that they could have

"The consequence is that, despite significant and meaningful improvement efforts, we may lose some dollars. That's disappointing, no doubt. But overall the DSRIP initiative was extraordinarily valuable."

Dr. Tom Rosenthal, UCLA

achieved more, yet they were held back on system goals due to capability limitations at other hospitals, without full EMRs, that were partners in defining joint goals. System improvement programs should impart flexibility in goals and solutions as variability in EMR capability will persist for a quite a while.

Building on Deeper Communication Among Program Participants
DSRIP brought together for the first time many hospitals with different means, experiences and capabilities in activities that helped to set program goals and evaluate results. UC clinical leaders found that even among the UC medical centers a single answer to a complex health care issues was not always possible. With DSRIP though many hospitals attempted to find solutions to the same problems, using different efforts, but targeting similar results. This demonstrated to UC that there continues to be opportunity to collaborate among hospitals to find efficiency and improved results where common practice can overcome uncertainty, lack of knowledge, or reluctance to change. Future cross-hospital collaboration efforts should look to deeper communication among health care leaders and their staff. "The DSRIP has been a learning lab," Marci Hoze, R.N., said. "The goal is to figure out how best to do quality improvement."

Part 6: Conclusions and Recommendations

The California DSRIP is helping to set UC medical centers on a course to becoming high-performance health systems that integrate care delivery across the continuum, engage in population health management, embrace innovation and apply evidence-based best practices to improve patient care. Some aspects of DSRIP – including the development of medical homes, innovations involving care delivery, the introduction of population health management strategies and the improvements to severe sepsis response – have been transformational. Other projects have accelerated the pace of change, including efforts to reduce hospital-acquired conditions and improve the development of information systems that support integrated care models.

UC medical centers are enthusiastic participants in this first-of-its kind Medicaid incentive program. UC leadership at all medical center campuses and within the UC Office of the President welcome future dialogue about how best to advance and refine pay-for- performance initiatives within the Medicaid program. As partnering institutions begin discussing the next iteration of California's Section 1115 Medicaid Waiver, UC leaders suggest that stakeholders:

- Seize the opportunity to build on the momentum created by the DSRIP by continuing to tie performance improvement to Medicaid funding
- Build on successful projects emerging from the current DSRIP
- Encourage systemwide projects that break down existing silos
- Establish clearer channels of communication between participating health systems and state and federal partners
- Ensure that clear, evidence-based measurements are used in establishing/defining outcomes and processes
- Reassess the varying levels of risk and funding at stake, with careful attention to the content and scope of major projects
- Encourage milestone re-evaluation and adaptation where it will lead to enhanced results over time
- Include greater emphasis on training the next generation of the workforce
- Develop alternative payment models to better align with innovative care models
- Create more shared learning opportunities among participating organizations

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Appendix I: Campus DSRIP Highlights

UC Davis: Improving medication management

UC Davis Medical Center has enhanced its medication management to reduce medication errors and improve patient care.

UC Davis has focused on four key medication management projects: medication reconciliation for high-risk patients, a black box warning system, smart infusion pumps and bedside barcode scanning.

The medication management projects are part of UC Davis' Delivery System Reform Improvement Program efforts. DSRIP is a novel, pay-for-performance initiative in which California's 21 designated public hospitals receive Medicaid dollars in exchange for meeting pre-set milestones.

In the medication reconciliation project, UC Davis has expanded the role of pharmacists to help improve medication management for high-risk patients, including those with congestive heart failure.

The project ensures that patients are taking the correct medication, particularly as their clinical needs change across the care continuum, from hospital to home or other care facility. Pharmacists, for example, closely review prior and new medications with patients and their families – especially those at high risk of readmission – to make sure all prescriptions are in order and up-to-date before a patient leaves the hospital. Pharmacists also make follow-up calls to patients, focusing on reducing complications from medication errors due to prescription changes that often occur during transitions in care and recovery.

"Having pharmacists play a more active role with the rest of the patient care team clearly enhances quality and safety," said John Grubbs, chief of pharmacy services at the medical center. "It's not just an individual clinician taking care of patients, it's an entire clinical team, including pharmacists, that ensures the best outcomes for patients."

In another medication management DSRIP program, UC Davis embedded a black-box warning system into its electronic medical record system to ensure drugs that carry a high risk for life-threatening or serious adverse events are used safely. The alert includes flags, order instructions, dispensing and administration instructions, and prescribing requirements. A significant number of routine drugs dispensed in hospitals carry black-box warnings required by the U.S. Food and Drug Administration, including fentanyl patches (for managing chronic pain), haloperidol (for treating acute psychosis and schizophrenia) and methadone (also for chronic pain).

DSRIP support also allowed for the final implementation of smart infusion pumps for patient-controlled analgesia and epidural anesthesia and syringe pumps. The smart pump project ensures

the safe infusion of drugs given intravenously by eliminating many opportunities for human error.

Finally, UC Davis embraced bedside barcode scanning as part of its DSRIP efforts. This was a complex technology project involving changes in clinical procedures and protocols, and requiring significant resource investment.

Bedside barcode scanning involves clinicians using a handheld computer, called a Rover, to ensure the right medication is given to the right patient at the right time. The clinician scans his or her badge with the Rover, enters a password and scans the barcode on the medication and then delivers the medication to the bedside. When the patient's wristband is scanned, his or her medications list and prescription history pop up onscreen. The clinician pushes an "accept" button on the Rover, which records the medication, dosage and time, and then administers the medication to the patient. Bedside barcoding has been implemented throughout the medical center (except the emergency department).

"Patient safety is the hallmark of a great hospital," Grubbs said. "Projects that focus on addressing clinical processes such as the proper delivery of medications are the keys to delivering the best care possible. Our medication management initiative is among the most important factors in being able to provide quality care and the highest levels of safety for every patient."

UC Irvine: Preventing dangerous blood clots

UC Irvine Health clinicians have developed novel strategies to screen, detect and intervene to prevent life-threatening blood clots.

Blood clots are a leading cause of preventable deaths in hospitals nationwide and are often overlooked. Among the most deadly of these conditions is venous thromboembolism, VTE, which occurs when a blood clot that develops in a deep vein of the leg or pelvis (called a deep vein thrombosis) dislodges and travels to the lung to form a pulmonary embolism.

A challenge hospitals face is making sure patients receive appropriate screening and treatment for VTEs to reduce risks. In the U.S., about two-thirds of all VTE events result from hospitalization, but only one-third of patients at risk for developing VTEs in the hospital receives adequate prophylactic treatment. Patients over age 40 and on bed rest from surgery or illness are especially at risk for developing VTE. As a result of appropriate screening and interventions, from July 2012 to July 2013, UC Irvine had no preventable cases of VTE out of a total of 114 VTE cases.

UC Irvine Medical Center is one of 13 California public hospitals that chose VTE as a Delivery System Reform Incentive Program project. DSRIP is a novel, pay-for-performance initiative in which California's 21 designated public hospitals receive Medicaid dollars in exchange for meeting pre-set milestones.

While reducing VTE was a focus at UC Irvine prior to the start of the DSRIP, its inclusion gave

providers the green light to accelerate the program and make it a priority, said UC Irvine Medical Center Chief Nursing Officer Karen Grimley. UC Irvine also is participating in a UC-wide collaborative on VTE funded by the UC Center for Health Quality and Innovation.

"It's improving our mortality and improving additional services beyond the walls of the hospital," Grimley said. "It's a win-win for us and for patients."

Pulmonary embolism is the most common preventable cause of hospital-related death. Nationally, there are about 1 million cases of VTE annually and, of those, some 300,000 die from the condition.

UC Irvine is one of the few hospitals nationwide that screens all patients for VTE risk. As of 2012, the hospital's electronic medical record requires a standardized, evidence-based VTE assessment on patients and guides providers to choose appropriate prophylaxis.

Based on this risk assessment, physicians order proper preventative treatment, ranging from getting patients up and walking to wearing graded pressure socks to taking anticoagulant medications. All registered nurses receive training on VTEs and are responsible for implementing prevention strategies.

Another important component of VTE response is improving the safety of anticoagulation care. As of 2013, pharmacists at UC Irvine Medical Center manage all patients who receive the blood-thinning medication warfarin (Coumadin) during their inpatient visits. Pharmacists also verify that patients discharged with warfarin have scheduled follow-up appointments with outpatient providers. This is an important care transition program aimed at improving medication adherence and outcomes while reducing preventable readmissions.

Being able to screen all patients for VTE and monitor and track them over time takes enormous effort that would not be possible without DSRIP, said Dr. Alpesh Amin, UC Irvine Health professor of medicine and leader of the VTE program.

"You constantly have to keep a level of education going because you always have new people coming into the organization," Amin said. "We don't want it to be dependent on the individual but instead should be process-driven."

UCLA: Creating a pathway to practice for international medical graduates

In Tulare County, located inland between Fresno and Bakersfield, 61 percent of the population is Hispanic, and many are monolingual Spanish speakers. And yet, there are only 42 Hispanic physicians out of a total of 486 physicians practicing in the region.

Across California, there is a dearth of Spanish-speaking, culturally adept primary care physicians. Currently, Hispanics account for 38 percent of the state's population yet less than 6 percent of the physician workforce. With support from the Delivery System Reform Improvement Program – a novel, pay-for-performance initiative in which California's 21 designated public hospitals receive Medicaid dollars in exchange for meeting pre-set milestones

– an innovative UCLA project is seeking to address the gap.

The UCLA International Medical Graduate (IMG) program trains Hispanic international medical graduates from medical schools recognized by the Medical Board of California who are legally residing in the United States with permanent residency status. This program prepares these international physicians to become competitive candidates for family medicine residency training positions in the state. Once these IMGs complete a three-year residency program, these newly licensed family physicians will join the primary care physician workforce in this state.

"Before our program, these professionals were sidelined," as the IMGs are considered neither as students or licensed physicians in the U.S., said Michelle Anne Bholat, M.D., M.P.H., executive director of the program and vice chair of the UCLA Department of Family Medicine. "There's been a brain waste."

Physicians residing in the United States but who were educated abroad are classified as IMGs. Nearly 80 percent of IMGs were also born abroad. IMGs represent about 25.8 percent of the U.S. physician workforce and 24 percent in California.

Any physician who is not a graduate of a U.S., Puerto Rican or Canadian medical school (all of which are accredited by the Liaison Committee on Medical Education) are not eligible to practice in the United States without first completing at least two years of residency training and obtaining a U.S. medical license.

Prior to the DSRIP funding, the UCLA IMG program had been a mere pilot project. However, the funding was fortuitous in timing, as new state legislation allowed participants to be more than just observers. UCLA IMGs enrolled in this program can now more fully participate with the health care team in that they can take medical histories and examine the patient – similar to a medical student trainee under supervision of licensed physicians affiliated with the UCLA IMG program. This change, embraced by the California Academy of Family Physicians, allows the IMGs to compete on a more level playing field for a residency position in the state. Signed by Gov. Jerry Brown in 2012, this important legislation, AB 1533, was authored by then-Assemblywoman Holly Mitchell and jointly sponsored by the University of California Office of the President and the Medical Board of California; the bill is effective through 2019.

"The law expanded the opportunity for participants in our program to move from an observer status and go into the exam room without violating strict California Medical Board rules prohibiting IMGs from examining patients," Bholat said.

Patrick Dowling, M.D., M.P.H., chairman of the UCLA Department of Family Medicine and executive co-director of the program, said that keeping IMGs as solely observers was like "being a student driver but only allowed to sit in the passenger seat."

The duration of the IMG pre-residency program varies from three to 21 months, depending on the preparation the applicant has made, if any, to pass any of the three U.S. medical board exams with a competitive score. These tests are a prerequisite for acceptance into a residency training program. The IMG program operates under rolling admissions. A total of 16 graduates of the

program were matched to residency positions in 2014. This graduating class was from the following countries: Cuba, El Salvador, Mexico, Puerto Rico and Venezuela. Graduates have included black and Asian Hispanics, some of whom are trilingual and tricultural. Each of these Latin American countries produces more physicians than they have positions for medical practice employment, and because of this "surplus" they emigrate.

Importantly, graduates of the IMG program are required to commit to two to three years of post-residency employment at a community health center in one of California's more than 500 federally designated shortage areas for primary care. Interest is growing in replicating the program elsewhere, with inquiries coming from other UC medical centers, Texas and Illinois.

DSRIP propelled the growth of the IMG program and "put it on the map as a program of substance," Dowling said.

UC San Diego: Providing a medical home for HIV patients

Though incurable, HIV today is a manageable, chronic condition. With advances in drug therapy, those infected with HIV in North America can expect to live into their early 70s – almost as long as the general population.

However, HIV is a chronic illness that typically requires a complex treatment regimen and has the added layer of social stigma.

At UC San Diego Health System, providers have implemented a novel multidisciplinary approach to HIV care management that is improving outcomes for patients. This approach could be a model for chronic care management in other populations.

UC San Diego's HIV care delivery transformation began under the California HIV/AIDS Research Program and was implemented as a special Delivery System Reform Incentive Program (DSRIP). DSRIP is a novel, pay-for-performance initiative in which California's 21 designated public hospitals receive Medicaid dollars in exchange for meeting pre-set milestones.

California's public hospitals had the option of participating in a fifth DSRIP category focused on HIV care. UC San Diego is one of the state's 10 public hospitals working in this category.

UC San Diego, through DSRIP Category 5, was able to overhaul its outpatient care delivery for HIV/AIDS patients into a medical home model.

"This is what the 'triple aim' is all about," said Dr. Angela Scioscia, chief medical officer at UC San Diego Health System. "This project has been truly transformative. We took a clinic that had lost its way in terms of structure and turned it into a model for care delivery."

Also known as the Owen Clinic, the UC San Diego HIV/AIDS outpatient center is located on the third floor of a medical office building across the street from UC San Diego Medical Center at Hillcrest. The clinic treats about 3,500 patients annually. Last year, 500 new patients joined, with the demand for services growing by approximately 40 percent in the past five years, said Dr.

Amy Sitapati, Owen Clinic director.

About 70 percent of patients served at the clinic are in Medi-Cal managed care plans. DSRIP support enabled the clinic to hire more staff, with a total of 60 personnel, both full- and part-time.

The clinic uses a team-based approach, with four teams, each led by a primary care physician. Two of the teams have Spanish-language fluency.

Each morning, the teams meet in "huddles" and review the patient panel for that day. A computer printout shows patient names, ages and reasons for the visit, status on preventative screenings and viral loads. The printouts also show each patient's Veterans Aging Cohort Study (VACS) score, an evidence-based score that assesses HIV patient risk of mortality. The Owen Clinic may be the only outpatient clinic in the country using patient VACS scores in daily huddles.

Knowing a patient's risk of mortality helps to frame the office visit because providers understand before the patient walks through the door his or her need for additional support services, Sitapati said. A patient with a high VACS score might need more time in the clinic to meet with a staff pharmacist or psychiatrist or social worker, for instance.

Comprehensive, coordinated services are available to all patients. Because of the complexity of many of these patients' treatment regimens (patients take on average seven medications each day), the staff aims to make each visit as productive as possible. For instance, staff pharmacists on site work together with physicians to educate patients about their prescriptions, help them find affordable options, get adequate reimbursement from payers and avoid adverse reactions to drugs.

Eight to 10 drugs are commonly used in HIV treatment, meaning there are between 30 and 50 total drug combinations. Finding the right balance for patients can be a challenge, especially with myriad side effects, co-payments and insurance pre-authorization requirements to fill a prescription.

"There are a lot of barriers to patients taking the right medications," Sitapati said.

Access to health information technology resources has been crucial to the clinic's transformation. UC San Diego assigned a four-person team of health IT specialists – including a physician informaticist, a data analyst, a programmer analyst and a Master of Public Health team member – to work on the clinic's patient-centered medical home innovation projects. Having a clinical informatics team that understands the patient population, is invested in the clinic's success and is aligned with the project's vision and goals has been absolutely critical, Sitapati said.

Ongoing communication with patients is an important component to care. Patients at the clinic are avid adopters of MyUCSDChart, a Web portal that sends reminders for appointments and preventative screenings.

In 2013, there were an average of 1,003 MyUCSDChart patient encounters per month, up from 288 MyUCSDChart encounters in 2012. These patient portal interactions are on par with in-person and phone visits in 2013, which averaged 1,135 office visits and 1,455 average phone calls per month in 2013.

Perhaps one of the most valuable clinic informatics tools is SmartSet – an electronic medical record tool that allows clinicians to order lab tests in batches for patients who haven't received recent laboratory screenings. The Centers for Disease Control and Prevention recommends annual screening for sexually transmitted diseases (STDs) in HIV-positive individuals. The SmartSet allows clinicians to quickly identify patients due for screenings and then order tests without manually ordering each lab for each patient, increasing clinic efficiencies and productivity.

The Owen Clinic focuses on care transitions for its patients. The clinic has a dedicated "nurse transition specialist" skilled in HIV/AIDS care to assist patients moving between inpatient care and the Owen Clinic. The nurse transition specialist program is part of another DSRIP project at UC San Diego.

These proactive, integrated approaches are garnering results. Viral load monitoring rose from a baseline of 63 percent in 2011 to 81.9 percent for the period of January through December 2013. Screening for both chlamydia and gonorrhea increased from 57.4 percent in 2011 to 84.2 percent for the period of January 2013 through December 2013. Wrap-around services for HIV care – including nutrition, substance abuse counseling, pharmacy, psychiatry and case management – increased 34 percent.

UCSF: Expanding access to specialty care

UC San Francisco has implemented a novel consultation program between primary care physicians and specialists that is expanding access, reducing unnecessary in-person appointments, improving patient outcomes and lowering costs.

Called eConsult, the program allows UCSF primary care physicians to send a message electronically to a UCSF specialist about a patient and receive an answer within 72 hours.

"For referral problems of lower clinical complexity, and for those questions that do not require an in-person evaluation of the patient, an eConsult has several potential advantages over a standard referral," said Dr. Nathaniel Gleason, internist at UCSF and eConsult project co-leader.

The eConsult project has been part of UCSF's Delivery System Reform Incentive Program (DSRIP) plan. DSRIP is a novel, pay-for-performance initiative in which California's 21 designated public hospitals receive Medicaid dollars in exchange for meeting pre-set milestones. The eConsult project also has received support from UC's Center for Health Quality and Innovation.

In appropriate cases, clinical questions addressed via an eConsult system provide rapid input

from the specialist and, at the same time, free office visit appointment slots to further improve access. An eConsult maintains relationship continuity with the primary care provider, who will implement the specialist's recommendation and maintain management responsibility.

"We have a number of complex patients in the UC system, and the coordination of multiple specialists is a well-recognized challenge," Gleason said. "For the right clinical question, an eConsult greatly simplifies the experience of care for the patient, averting the need to arrange time off from work, child care, travel, parking and the costs associated with those."

For instance, a patient visits her primary care physician complaining about heart palpitations. The primary care physician does an evaluation. The initial tests lead to a specific question about next steps in the evaluation, and the PCP decides to consult a cardiologist. The physician clicks an "eConsult" button in the electronic medical record and fills out a structured template, sending the secure message to a UCSF cardiologist who has agreed to respond within 72 hours. If the cardiologist deems the clinical question to be too complex for eConsult, the patient is contacted to schedule an in-person visit.

"The program was driven by a need to improve access and we needed a system designed to work in the current fee-for-service environment," Gleason said. "This system supports the providers under the current payment model while facilitating high-value care. It is a stepping stone that will translate easily to the emerging value-based payment models."

As of late 2013, eConsult was available in 12 specialties, including cardiology, endocrinology, gastroenterology, hepatology, pulmonary and nephrology. In the first year of the program, there were 700 eConsults across five specialties. UCSF physicians have mostly embraced the program, Gleason said.

Specialists are paid for eConsults at a small fraction of the cost of an in-person visit.

"DSRIP provided an incentive to let specialists stick a toe in the water and see if it would work for them," Gleason said. "If specialists are oversubscribed, with wait times of weeks to months, it helps everyone if the specialist can manage lower complexity questions via eConsult and see the complex patients in the clinic."

The foundation for eConsult is the eReferral template, a communication platform for primary care physicians that includes guidance on referral appropriateness, consultative questions, pre-referral evaluation expectations, relevant data to include in the eConsult and patient co-management expectations. The eReferral template system cuts down on unnecessary consultations so specialists don't get overwhelmed with questions, and ensures that the specialist has the right information to make a decision. On average, specialists spend about 10 minutes per eConsult. Eighty-four percent of primary care physicians strongly agreed that an eConsult response influenced patient care plans.

The program, which cost about $30,000 to run in 2013, is improving the quality of care and lowering costs. The two-week wait time for an appointment across 10 specialties improved by 52 percent from January 2012 to April 2013. Additionally, there was a 12 percent reduction in new

patient visits to specialists by patients with UCSF PCPs over that same year. Costs for care also are dropping. A standard new patient referral visit costs $232 to $285, while the cost of an eConsult is about $57.

EConsults also are reducing emergency department visits and hospital readmissions, possibly because a long wait time to see a specialist can mean the patient goes to the ED prior his or her appointment date. During the 120 days after an eReferral or eConsult, there is a 10 percent reduction in ED visits and a 9.3 percent reduction in readmissions. This has translated to a 6.9 percent reduction in total professional cost fees for outpatient, ED and inpatient care.

The eConsult journey hasn't ended at UCSF. Additional specialists will soon be added, including orthopedics, psychiatry and neurology.

EReferral and eConsult have greatly enhanced the dynamic between primary care and specialty care at UCSF, said Dr. Ralph Gonzales, project co-leader, internist and associate dean for clinical innovation in the UCSF School of Medicine.

"When primary care providers send referrals, they are engaging in a trusted relationship," Gonzales said. "The eReferral/eConsult platform provides greater clarity and communication of the referring providers' referral question and co-management expectations."

Appendix II: UC Innovations in Sepsis Rapid Response

UC Davis: "Stop Sepsis in 60" Protocol

UC Davis leveraged its mature electronic medical record to go live in July 2011 with real-time sepsis best practice alerts at the bedside. First, UC Davis developed a protocol in the EMR that alerts bedside nurses when patients might be at risk for infection. The nurse answers a series of questions in the EMR about systemic inflammatory response syndrome (SIRS), a serious condition that, if present, can mean the patient is at risk for sepsis. Signs of SIRS include: abnormally high or low body temperature; high heart rate; high respiratory rate; and abnormal white blood cell count. UC Davis was the first hospital in the country to do an EMR-based SIRS checklist at the bedside through UC's vendor Epic. If a patient meets the criteria for SIRS, the EMR prompts the nurse to place orders for further screening for severe sepsis. If these lab results come back consistent with severe sepsis, then a sepsis rapid response team is activated. The physician on duty places pre-established order sets based on the patient's condition, such as pneumonia or an abdominal wound, completing the bundle.

"The beauty of this EMR protocol is that it is completely automated and is happening in real time," said Marci Hoze, R.N., director of patient care services at the UC Davis Medical Center. "Sepsis screening in the EMR is not based on a timeframe," she said. "The system is always screening. It is constant. So if you have surgery and two days later your heart rate goes up, the EMR will trigger a wound evaluation" for risk of severe sepsis.

For California's DSRIP, participating hospitals must report severe sepsis and septic shock mortality rates to the state. UC Davis has one of the lowest mortality rates among participating hospitals, at 14.8 percent for the reporting period July 2012 to June 2013. DSRIP also requires participating hospitals to use coded data, based on billing codes submitted for payer reimbursement (i.e., when calculating bundle compliance rates). Because the clinical and administrative criteria are not consistent, some patients will meet the clinical criteria for sepsis but not the administrative coding requirement or vice versa.

UC Davis has an intranet that allows clinicians to see patient status and their respective risk for infection in real-time. This gives clinicians an advantage in heading off severe sepsis and intervening early in cases. It also provides opportunities to conduct real-time review of practices based on clinical information rather than looking at patient data based on billing codes weeks after discharge. This capability is overcoming one of the large drawbacks of standard performance reporting, which involves the tendency to use administrative billing information – frequently due to the lack of timely electronic access to clinical data.

UC Davis estimates that its bundle compliance based on the real-time clinical data is between 40 percent and 60 percent, at or above its DSRIP target for 2012 to 2013 of 40.6 percent. Based on coded data, UC Davis achieved a sepsis bundle compliance rate of 37.9 percent. These efforts have also positively influenced other efforts to reduce sepsis across the UC Davis Health System. Beginning in early 2013, for example, emergency department nurse champions conducted

targeted education on blood culture draw time, resulting in an initial 2 percent increase in bundle compliance.

UC San Diego and UC San Francisco: "Code Sepsis"

Both UC San Diego and UCSF have a "code sepsis" protocol that has improved rapid response to severe sepsis and septic shock. At UC San Diego, a code sepsis is triggered with a positive severe sepsis screen. A nurse completes the standing orders for the sepsis bundle initiating a series of parallel interventions, including fluid resuscitation, antibiotics and laboratory studies, and then hands a card to the attending physician that includes a list of things to complete within the 60-minute window. UC San Diego has the lowest sepsis mortality rate of all UC medical centers, at 12.6 percent using clinical data and 12.9 percent using coded data.

At UCSF, a "code sepsis" pages an on-call team comprised of a rapid response team member, a critical care nurse practitioner and a pharmacist to the patient's bedside. UCSF uses performance dashboards to track compliance and these data are shared among physicians. The emergency department developed an automated alert system that surveys patient medical records and generates a severe sepsis alert once two or more SIRS criteria and clinical or lab data indicating organ dysfunction have been met. All clinicians on duty see this alert in the patient EMR, and a special icon is activated next to the patient's name on the ED tracking board. UCSF has a bundle compliance rate of 71 percent and a severe sepsis and septic shock mortality rate of 24 percent. Officials describe the gains made in sepsis response since the start of the DSRIP as remarkable. UCSF is planning to adopt an electronic surveillance platform similar to UC Davis in 2014.

At UC San Diego, DSRIP efforts provided the focus to develop clear protocols and order sets, which are improving patient outcomes, said Dr. Peter Fedullo, sepsis project lead and pulmonary and critical care physician at the UC San Diego Health System. The reporting system is still far from perfect and there is more work to be done. "For instance, reporting measures could be refined to make sure that there are clear distinctions made between sepsis (an infection response) and severe sepsis (organ dysfunction)," Fedullo said. Also, the mortality rate for sepsis isn't the best measure for quality of care. "Mortality is a relatively crude outcome measure because the overwhelming number of patients who died of sepsis were going to die anyway," Fedullo said. "The things we need to be looking at are how many patients with severe sepsis end up in the ICU and what is their length of stay?"

UC Irvine: Sepsis and Big Data

UC Irvine implemented severe sepsis intervention protocols as part of its EMR, similar to those at other campuses. Starting in spring 2013, UC Irvine began taking patient monitoring data in one-minute intervals and feeding it back to nurses at the bedside for potential care directions. If a patient's vital signs trigger a sepsis intervention, an alert comes up on the unit, identifying that patient as a candidate for sepsis. "This approach has moved UC Irvine from a reactive to a proactive approach for managing sepsis," said Jim Murry, chief information officer at UC Irvine Health. From June 2012 to July 2013, UC Irvine had a bundle compliance rate of 70 percent and a mortality rate of 22 percent.

UCLA: Sepsis Coordinator and Quality Portal

UCLA's sepsis bundle compliance jumped from 5.6 percent in 2010 to 42.3 percent for the reporting period of June 2012 to July 2013. The adoption of the sepsis bundle at UCLA's two hospitals was the result of improved nursing education and standardization of protocols, all developed as part of the DSRIP plan. UCLA hired a registered nurse as a dedicated full-time sepsis coordinator. She conducts chart reviews, clinician education and project management. In July 2012, the sepsis coordinator began giving a 45-minute talk on sepsis to all newly hired nurses as part of their general orientation. This intervention has raised awareness about sepsis and reinforced the importance of bundle compliance. UCLA also implemented a nurse-led sepsis protocol with standing orders based on sepsis triggers, which helped speed up the process of getting the bundle completed within one hour. As part of these efforts, UCLA also launched a Quality Management Portal in late 2012, which can generate reports on sepsis data and be accessed in one central location.

UCLA's EMR was implemented in 2013. The system intends to have real-time notification of sepsis cases, similar to other UC medical centers, by March 2014. Dr. Daniel Uslan, sepsis project lead and infectious disease clinician at UCLA, agreed with Fedullo that measures on sepsis should be more refined. He suggested measuring bundle compliance for patients who present in the ER only and excluding patients who develop sepsis while in the hospital. Between 70 percent and 80 percent of severe sepsis cases present in the ER. For patients already admitted to the hospital, the start and stop time for treatment rarely happens within an hour. For instance, a patient might have started antibiotics several hours or days before the onset of severe sepsis, yet because those antibiotics weren't started within the hour, that case would be considered a bundle failure. "Clinically those patients got excellent and appropriate care," Uslan said. "That shouldn't be a ding for us."

Acknowledgments