

[CASE STUDY]

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Implementing Bundled Payment: A Case Study of Crozer-Keystone Health System

Prepared for the Centers for Medicare and Medicaid Services



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Foreword

The Centers for Medicare & Medicaid Services (CMS) requested that The MITRE Corporation (MITRE) create three case studies in order to support organizations that want to provide services using bundled payment (BP). CMS selected three sites, each one illustrative of a set of capabilities necessary for an organization to deliver cost-effective care in a setting where it bears financial risk for that care. The Engelberg Center for Health Care Reform at the Brookings Institution (Brookings) worked with MITRE to generate the case studies, conducting interviews with organizational leaders and affiliate experts from the case study sites, as well as performing a comprehensive environmental scan of peer-reviewed journal articles, white papers, and publicly available evaluation reports from past BP pilots to inform the studies.

This case study focuses on Crozer-Keystone Health System, located in suburban Philadelphia, and describes how the system prepared to implement the PROMETHEUS Bundled Payment model.

Brookings and MITRE gratefully acknowledge the valuable contributions of the following experts from Crozer-Keystone Health System and its affiliates in the preparation of this study:

- Elizabeth Jaekle, Vice President, Business Development, Crozer-Keystone Health System
- Dale N. Schumacher, MD, MEd, MPH, Clinical Informatics Officer, Crozer-Keystone Health System; President, Rockburn Institute
- Len Felgner, Chief Operating Officer, Health Management Advisors, Inc.; Board Member and Senior Associate, Rockburn Institute
- Susan L. Williams, MD, Senior Physician for Network Affairs, Senior Physician for Clinical Integration, Crozer-Keystone Health System

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1. Introduction

Crozer-Keystone Health System (CKHS) is a medium-sized, integrated, not-for-profit health system located in the suburbs of Philadelphia. This health system comprises five hospitals, a comprehensive network of primary care and specialty practices, numerous outpatient and specialized care facilities, and the HealthPlex Sports Club. With more than 1,100 physicians and 6,800 total employees, CKHS provides a full spectrum of wellness, prevention, acute care, rehabilitation, and restorative care services. In addition to its staff of employed physicians, CKHS collaborates with affiliated group specialty practices to provide certain services, such as orthopedic surgery.

In partnership with Independence Blue Cross, CKHS is piloting a bundled payment (BP) program for two inpatient procedures—hip and knee replacement. The pilot employs the PROMETHEUS Payment® approach, a publicly available, SAS-based software model that calculates budgets for bundled payments using claims data. CKHS is conducting its BP pilot as a simulation in which bundled payments are calculated and recorded for hip and knee replacement procedures, while actual reimbursement from Independence Blue Cross follows preexisting reimbursement arrangements. Using this simulation pilot, CKHS has been able to deploy, evaluate, and refine numerous initiatives designed to support BP in advance of, and in preparation for, financial risk bearing. The knowledge and experience developed under the BP pilot has prepared CKHS and Independence Blue Cross to move beyond simulation. The two organizations hope to “go live” with BP for these procedures at some point after the pilot concludes in March 2012.

CKHS’s leadership expects to leverage skills, expertise, and programmatic infrastructure developed through this pilot to inform the development of future BP programs for a wide range of procedures and conditions, including chronic diseases. CKHS plans to apply for the Bundled Payment for Care Improvement (BPCI) initiative operated by the Center for Medicare & Medicaid Innovation (CMMI).

This case study reviews CKHS’s approach to and experience with a BP program and the steps CKHS has taken to prepare for wider implementation of episode-based payment. The study also provides a detailed description of CKHS’s initiatives to support BP in the areas of care redesign, health information technology (HIT), and physician engagement. Finally, this study considers best practices and lessons learned from CKHS’s BP experience.

2. Background

CKHS was established in 1990 by the merger of the Crozer-Chester Medical Center and the Delaware County Community Hospital. CKHS is the dominant health system and largest employer in Delaware County. For fiscal year (FY) 2011, CKHS reported 37,673 admissions; 187,859 inpatient days; 691,834 total encounters; total revenues of \$862 million; and total operating expenses of \$853 million.

CKHS’s leadership has recognized that the **future health care market** will demand greater accountability from providers for managing the cost and quality of care. In 2007, CKHS leadership made a strategic commitment to **improving the value of care** delivered by the health system.

CKHS’s leadership has recognized that the future health care market will demand greater accountability from providers for managing the cost and quality of care. CKHS leadership identified several drivers for changing the operations of their health care system: falling rates of reimbursement, increased scrutiny by payers and employers related to the effectiveness of care, and other financial pressures elsewhere in the system. In 2007, CKHS leadership made a strategic commitment to improving the value of care delivered by the health system. By consistently delivering higher-value care, CKHS’s leadership believes it can lead the marketplace with care innovation, ensure the best possible care for its patients, and thrive in a future payment environment that requires and rewards greater accountability.

In response to the new strategic priority, CKHS launched multiple initiatives to explore approaches to enhancing care value. By 2008, CKHS had identified clinical alignment and coordination across the continuum of care as

“critical success factors.” The health system began working toward achieving these critical success factors through initiatives to strengthen CKHS’s foundation of primary care. For example, from 2008 to 2010, CKHS developed a large network of National Committee for Quality Assurance (NCQA) Level 3-certified Patient-Centered Medical Homes (PCMH). As of August 2011, 29 of 32 CKHS primary care practices were certified as NCQA Level 3 PCMHs. A CKHS executive explained that the medical homes were developed “as the cornerstone that would support [CKHS’s] broader efforts toward clinical and physician alignment.” By developing PCMHs, CKHS’s network of employed primary care physicians (PCP) became familiar with the concepts (and practice) of team-based care and population health management—important competencies that CKHS believed were on the critical path toward value improvement.

CKHS recognized that BP aligned with its efforts to integrate and improve care and that it offered an opportunity to engage specialty physicians in clinical transformation. CKHS next focused on engaging its employed and affiliated specialty physicians as it extended the medical home to the “medical neighborhood.”

CKHS understood that BP offered a way to engage specialists in the work of value enhancement and create incentives for all parties to test deeper integration across specialties and sites. As a result, in 2008, CKHS leadership was very open to the potential benefits of BP, when the Health Care Incentives Improvement Institute (HCl3)—a non-profit organization that manages the PROMETHEUS Payment model—approached them about becoming a test site for the PROMETHEUS BP model. In exchange for investing time and resources to test the PROMETHEUS model, HCl3 offered to supply CKHS with a software platform on which to base its BP program and technical assistance during implementation. The offer appeared to be the right opportunity at the right time. CKHS’s organizational leadership decided to accept the test site offer in a manner consistent with Board of Director guidance. The level of familiarity and trust between the two organizations, which drew on the personal relationships among their respective board members, facilitated this.

The pilot also involved Independence Blue Cross, the dominant payer in CKHS’s market. A CKHS executive called the opportunity to partner with Independence Blue Cross to implement a bundled payment pilot for knee and hip replacements “a huge opportunity for competency building” because it allowed health system leadership “to engage with the specialists and demonstrate real numbers” that represented the risk-bearing future that CKHS anticipated. The presence of a payer willing to try bundled payments was instrumental in achieving buy-in for clinical transformation from specialty physicians.

3. Aims and Objectives

In its BP pilot, CKHS sought to encourage continued clinical transformation, distinguish itself from others in the marketplace, and get in front of the payment reform curve. Health system leadership viewed the BP pilot as an opportunity to develop competencies in new models of care delivery, care coordination, and HIT that would prepare CKHS for broader implementation of BP. Going forward, CKHS is interested in leveraging its robust primary care network to develop BP programs for chronic conditions.

4. Approach

CKHS engaged with Independence Blue Cross and a closely affiliated group practice of orthopedic surgeons to develop and implement a BP pilot for knee and hip replacement procedures. The payment simulation will close in March 2012. By July 2012, the 90-day clinical tail of the bundles, along with the 60-day administrative claims tail, will be complete. Results will inform CKHS and Independence Blue Cross of changes needed to the structure and implementation of PROMETHEUS episodes, prepare the organizations to go live with the orthopedic bundles, and help them work together to develop new risk models in 2012 and 2013.

4.1. PROMETHEUS Payment

CKHS and Independence Blue Cross are using the PROMETHEUS Payment software to define the price and content of the care bundles used in knee and hip replacement procedures and to simulate the financial impact of these bundles on CKHS's revenue and Independence Blue Cross's costs. The PROMETHEUS software uses claims data to compute a budget—or evidence-informed case rate (ECR)—for a comprehensive episode of medical care within a defined period. This budget includes the price of all covered services, adjusted for patient severity and complexity, bundled across all providers that would typically treat a patient for a given condition. Although a simplified version of the software is free and downloadable from the HCI3 website, the PROMETHEUS model is complex and requires front-end investment and expertise for effective implementation. A CKHS executive explained that “no one resource in most health care organizations has the skill set, experience, or comprehensive understanding to put something like the PROMETHEUS engine together.”¹

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To validate the early data runs that Independence Blue Cross produced with the PROMETHEUS analytics, CKHS created a dedicated PROMETHEUS team, as described in Table 1, which draws on resources within and outside the organization. CKHS engaged its physician medical informaticist as a core member of the team, and mobilized the support of several senior colleagues whose expertise spanned orthopedic service line delivery, payer relations, quality, and patient safety initiatives. The PROMETHEUS team worked for two years to get the software analytics operational by the summer of 2011. Although members of the implementation team generally worked well together, they had to overcome some barriers to achieve cross-organization communication. For instance, there was some initial confusion about the focus of the team's work. For team members from HCI3, implementation meant developing an operational version of the PROMETHEUS software engine, while CKHS personnel believed implementation meant developing the BP product. The situation improved when all parties realized that a fully functional software engine and a developed bundled product were mutually dependent goals that had to be pursued in parallel.

Table 1. PROMETHEUS Team Membership

PROMETHEUS Implementation Team	
CKHS	
Vice President for Quality (Physician)	
Two Associate Vice Presidents for Quality (1 Physician, 1 Registered Nurse)	
Chief Medical Informaticist (Physician)	
Orthopedic Service Line Leader and Vice President of Supply Chain Management	
Orthopedic Service Line Manager and Associate Vice President (Physical Therapist)	
Two Lead Quality & Implementation Orthopedic Surgeons (Physicians)	
Vice President of Finance	
Vice President of Managed Care (Project Coordinator)	
Vice President of Business Development (Project Coordinator)	
Independence Blue Cross	
Vice President of Provider Relations	
Director of Provider Relations	
IT Manager	
Two IT Analysts	
Health Care Incentives Improvement Institute	
Chief Operating Officer	
Chief Medical Officer (Cardiothoracic Surgeon)	
Director of PROMETHEUS Implementation	

¹ Prometheus Newsletter: Issue 1, December 16, 2008. Retrieved from <http://www.rwif.org/files/research/prometheus2008issue1.pdf>.

4.2. Physician Engagement

From the outset, CKHS leadership believed that the success of the BP pilot depended on buy-in from and active participation of its physicians. A CKHS executive explained that the organization carefully developed and pursued a physician engagement strategy that relied on the following:

1. **Targeted strategies for engagement.** CKHS leadership understood that their physicians were a heterogeneous group and devised engagement strategies that targeted the specific factors for motivating different groups. Given CKHS's history with medical homes, most PCPs were already engaged in efforts to achieve clinical transformation and were likely to support bundled payments as a means to improve care quality. Since these PCPs were feeling like "hamsters on a treadmill," outreach to them centered on achieving improvements to patient care without adding to physician workload.

Specialist physicians—in particular, orthopedists, the group most important to implementing the joint replacement pilot bundles—had no prior experience in bundling and in the value-enhancement strategies necessary to its success. As a result, CKHS anticipated that this group would be less comfortable with the BP innovation. Leadership was able to engage these physicians by emphasizing the potential efficiencies and financial opportunity that this first BP pilot could offer. Although engagement would ultimately require the synergy of several tactics, it was important to show orthopedic surgeons how bundled payment could create additional revenue opportunities for them. To do so, CKHS leadership provided physician groups with results using historical claims and the PROMETHEUS model. CKHS and its physicians then explored the opportunities for savings and how to translate those savings into financial gains both for the system and for the orthopedic group. For example, by illustrating how reductions in potentially avoidable complications (PAC) would improve quality and lead to savings (which would drive additional payments to these specialists), the orthopedists came to understand how the BP strategy aligned with their interest in providing high-quality care and that they had control over the clinical processes essential to achieving positive clinical and financial results. The orthopedists were especially receptive to the risk-adjustment component of the model that would increase BP budgets for sicker patients. An understanding of the clinical basis for the BP offered assurance that, as physicians, they could make it work for them and for their patients.

CKHS leadership provided physician groups with results using **historical claims** and the **PROMETHEUS model**. CKHS and its physicians then explored the opportunities for savings and how to translate those savings into financial gains both for the system and for the orthopedic group.

2. **Education about the changing realities of health care.** CKHS leadership recognized that most practicing physicians do not fully appreciate, or understand, the macroscopic forces that are driving health care, nor the implications of those forces for the organization and delivery of care. While certain tactical efforts to engage specific groups of physicians were critically important (for example, PCMHs, and the financial modeling), CKHS also felt it essential to expose front-line physicians more broadly to the concepts of population health and clinical transformation that represented the new reality of health care. These new value paradigms and related competencies required refocusing on systems, teams, and coordination, not just the individual patient. CKHS made a significant investment in educational programs to introduce these concepts. These programs included a number of formal events, for both their employed and their affiliated physicians, to explain BP and its broader context. As the date for the BP pilot launch approached, these events evolved from large meetings centered on broad recruitment messages to smaller, specialty-specific meetings that focused on implementation issues.

In educating clinicians about the changing realities of health care, CKHS leadership employed a strategy of persistent reinforcement, delivering the same key message to a broad array of hospital personnel at every opportunity. For example, CKHS's chief executive officer has a slide deck entitled, "Reform/Non-Reform Absolutes," which she uses to highlight the inevitable changes in the health care system. The slide deck lays out a simple and straightforward argument for how the future financial viability of the health system depends upon improving the value of delivered care.

In addition to meetings, CKHS relied on contacts by physician leaders to create awareness and support among their peers. The physician leaders were primarily individuals who had expressed special interest in BP and had volunteered to become more involved in the program. These informal physician leaders allowed CKHS to complement existing physician management structures that were less tuned to the BP program. Most of the physicians who emerged as advocates for BP were not part of the formal physician leadership structure. Building on these informal efforts, CKHS has established a small number of more formal physician champions—physician leaders who have dedicated time to assist in BP implementation and other clinical transformation initiatives.

3. **The use of outside experts to lend credibility and validity to the internal message.** Finally, CKHS brought in outside experts to speak with and consult to their physicians and to lend an authoritative, objective perspective on BP and its role in the broader changes in health care. These experts were often specialty specific and could address the detailed concerns of physicians.

For the BP pilot, CKHS invited former executives from Exempla Healthcare to participate in a two-day series of meetings attended by CKHS's chief executive officer, hospital directors, chairs of surgery, and 50–60 physicians and other hospital personnel. They brought the experience of participating in the Acute Care Episode (ACE) demonstration project, a BP program launched by the Centers for Medicare & Medicaid Services (CMS) in 2009. Although Exempla's BP program was for cardiothoracic procedures, these former members of Exempla leadership successfully communicated the overall value of the BP program to its physicians and its health care organization. They conveyed some of the operational detail needed to assure CKHS personnel that such a program could work in their system. The visit from these outside experts may have been most importantly a way to reinforce CKHS's emphasis on clinical integration and the importance of BP to the future success of the system. One CKHS executive said, "You are not always a hero in your own backyard."² She believed her organization obtained considerable value because objective experts from other organizations had helped validate the messages of CKHS's leadership.

4.3. Care Redesign

PROMETHEUS engine architects relied on nationally accepted and available evidence-based medicine protocols to define the nature of the hip and knee replacement bundles. Because the model defined the contents of these bundles, and the model is complex and not easily revised, CKHS made no effort to modify the clinical logic based on local practices. CKHS physicians, however, took the lead role in defining and implementing changes to the processes for delivering joint replacement care, in the context of the guidelines embedded in the model, while remaining sensitive to local practices and conventions.

Analysis of the process established that there was wide variation in the choice of implants: CKHS orthopedic surgeons were using four different hip implants and four different knee implants. They were unaware of the cost (and quality) implications of that variation. Finding no clinical rationale for using such a wide array of devices, the surgeons agreed to **standardize on a smaller set**.

CKHS directed the care redesign efforts toward improving the efficiency of joint replacement and reducing the risk of complication. Analysis of the process established that there was wide variation in the choice of implants: CKHS orthopedic surgeons were using four different hip implants and four different knee implants. They were unaware of the cost (and quality) implications of that variation. Finding no clinical rationale for using such a wide array of devices, the surgeons agreed to standardize on a smaller set. They understood that future standardization created an opportunity for negotiating leverage—and potential savings—with device suppliers. CKHS leadership described this as a "huge leap," which appears to have spread to other specialties.³

² Crozer-Keystone Health System, personal communication (October, 2011).

³ Ibid.

CKHS physicians also took a lead role in solving problems regarding information flow, which had been barriers to best practices for joint replacement. For example, established practice dictated that the attending surgeon would be responsible for all pre-surgical clearances. Physician leaders determined, however, that a patient's primary care physician was often more familiar with the patient's health status and could perform such tasks as medication reconciliation more accurately. To decrease the risk of complications, CKHS redesigned the pre-operative clearance process, and primary care physicians took on the responsibility of reviewing pre-surgical clearances. More recently, a group of cardiologists has approached CKHS leadership with specific ideas about how to make the delivery of select cardiac procedures more efficient in anticipation of future cardiac bundles.

4.4. Health Information Technology

CKHS leadership emphasized both the importance of developing the data and IT systems for the BP program and the "major investment" in time and resources that this development required. Leadership explained that it was especially important to develop systems that provide physicians with credible, accurate, and clinically relevant information. This implies the need for useful and accurate information about both cost and quality of care and the nature of variations in cost and quality. CKHS made its first priority the development of an IT system that could produce comprehensive cost and quality reports at the level of the individual physician or patient. CKHS invested considerable time and attention to ensure the organization and display of results viewed by physicians would be understandable and actionable. After much experimentation, CKHS leadership discovered that there was no "magic formula" for displaying data to physicians. Instead, they sat down with representatives from each orthopedic surgery group and developed a customized dashboard that responded to each group's preferences and aligned with the workflow of the particular group. An example customized dashboard can be found in Appendix B.

The customization of reports led to significant engagement by the physicians. One executive said that the orthopedic surgeons were "fascinated with cost and quality reports for orthopedic implants." Reports were also non-blinded so that physicians could benchmark their performance against that of their colleagues. Transparent benchmarking permitted the identification and rapid diffusion of best practices. For example, analysis of transfusion rates led to the identification of one physician with significantly lower rates. Studying this physician's approach—and spreading the results to his peers—led to a significant decline in the rate of transfusion overall.

5. Conclusion

Crozer-Keystone Health System elected to participate in a BP pilot as part of its broader, strategic efforts to adapt to a changing payment environment and to provide better health care value to its customers. Although the CKHS BP pilot is a simulation, it has helped CKHS leadership identify the following factors that are critical to success:

- Engaging physicians and securing their active participation in care redesign
- Educating physicians and preparing them for change
- Investing in IT to support reliable, useful reporting on cost and quality

Through its involvement in the PROMETHEUS pilot, CKHS has made significant progress in developing these and other key administrative competencies and is eager to broaden the scope of its BP program.

6. Acronyms

ACE	Acute Care Episode
BPCI	Bundled Payment for Care Improvement
CMMI	Center for Medicare & Medicaid Innovation
CMS	Centers for Medicare & Medicaid Services
CKHS	Crozer-Keystone Health System
ECR	Evidence-informed Case Rate
FY	Fiscal Year
HCI3	Health Care Incentives Improvement Institute
HIT	Health Information Technology
MSO	Managed Services Organization
NCQA	National Committee for Quality Assurance
PAC	Potentially Avoidable Complications
PCMH	Patient-Centered Medical Home
PCP	Primary Care Physician
PROMETHEUS	Provider Payment Reform for Outcomes, Margins, Evidence, Transparency Hassle-reduction, Excellence, Understandability, and Sustainability

Appendix A: PROMETHEUS Payment

Supported by grants from the Robert Wood Johnson Foundation, the Commonwealth Fund, and other philanthropies, the Health Care Incentives Improvement Institute (HCI3) developed the PROMETHEUS bundled payment model. The term PROMETHEUS is an acronym for Provider payment Reform for Outcomes, Margins, Evidence, Transparency, Hassle-reduction, Excellence, Understandability, and Sustainability.

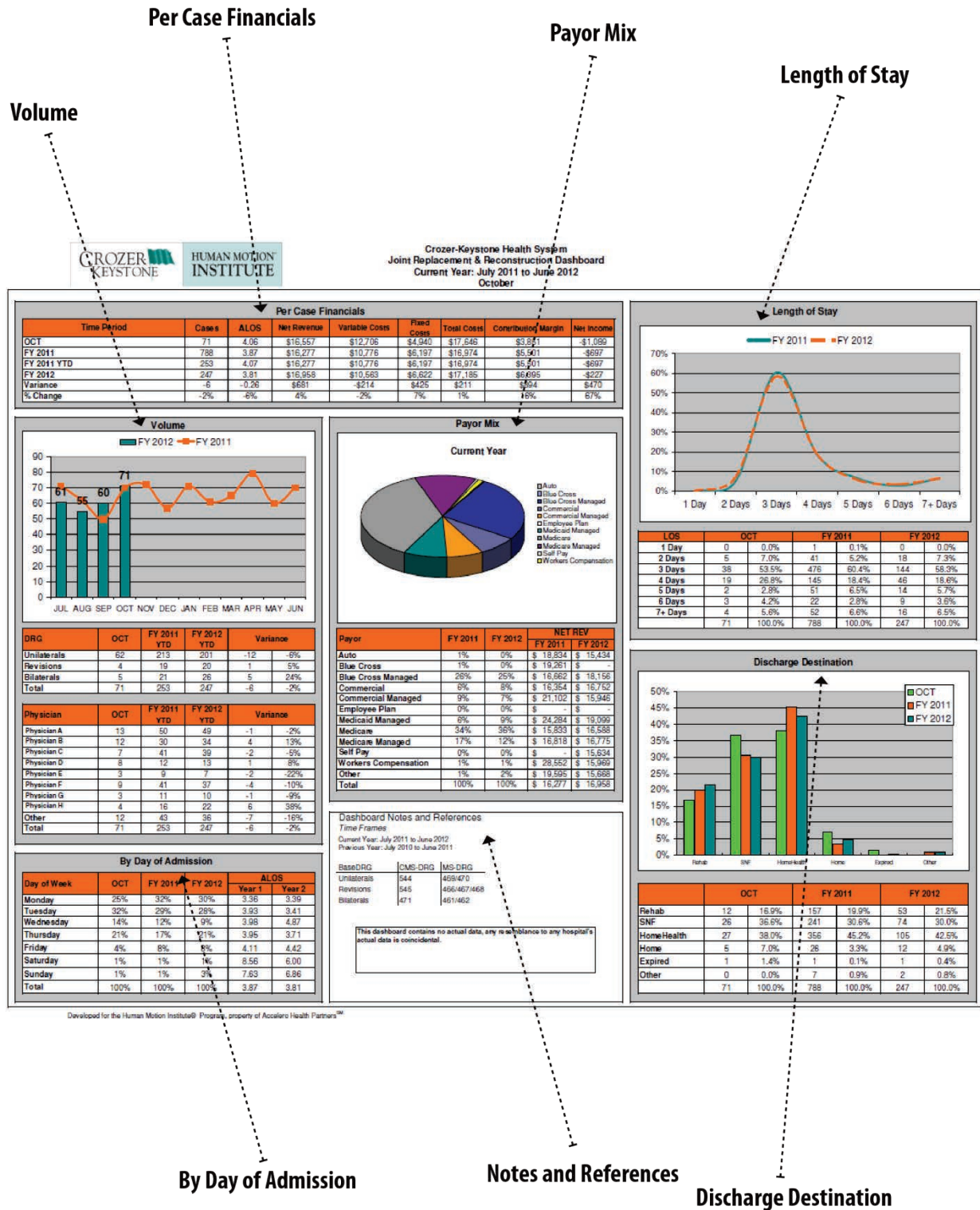
According to information from the HCI3 website,⁴ the PROMETHEUS payment model utilizes a SAS-based software engine to package payment around a comprehensive episode of medical care that covers all patient services related to a single illness or condition. Covered services are based on clinical guidelines or expert opinions. The PROMETHEUS software produces a single budget for an entire episode of care, which is referred to as an Evidenced-Informed Case Rate (ECR).

The PROMETHEUS model is designed to separate two kinds of risk: probability risk and technical risk. Probability risk, the classic form of insurance risk, is caused by the likelihood that a random event will occur and is outside the control of the health care provider. Technical risk is related to care production and is responsive to the provider's clinical skills and the system of care he or she uses. Technical risks include potentially avoidable complications (PAC) and other variations. HCI3 defines PACs as deficiencies in care that cause harm to the patient and might have been prevented with more effective treatment.

ECRs are calculated using the following factors: covered services, practice pattern variation, severity-adjustment, a margin, and PAC allowance. The weights of these factors can be adjusted by the user. If PACs occur, the allowance offsets costs of corrective treatment. However, if providers are successful in reducing the actual PAC rate below the PAC allowance, the unused portion of the allowance is distributed among the providers as a bonus. The PROMETHEUS Payment software can be used to develop ECRs for a number of different acute medical conditions, inpatient and outpatient procedures, and chronic conditions. HCI3 is currently working with several pilot sites throughout the country to implement the software.

⁴ www.hci3.org

Appendix B: Joint Replacement & Reconstruction Dashboard



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