

# Health System Reconfiguration

## Bundling Care and Payment: Evidence From Early-Adopters

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# Abstract

Bundling care that rightly belongs as part of a single care pathway is a common-sense approach to optimizing care, cost and outcomes. Payment for bundles of care with a predetermined price has implications for accountability, risk, and performance management. The extent and focus of the implementation of bundled care and payment can vary widely. Best practice recommendations for payers and policy makers to implement bundled care and payment are not available. In this report we outline the range of options for bundling care and payment, describe what early adopters have done and achieved, and highlight lessons to be learned from the early adopters.

We conducted a scoping review to identify the various bundled care programs currently in place and the evidence surrounding them. We selected five programs for detailed review representing a range of bundled care options from procedure-based bundles to more comprehensive capitation-based bundles that also had rigorous evaluative evidence available and in some cases have resulted in widespread implementation. We identified 12 factors for consideration prior to implementing bundled care and payment that were recurring themes from the five case studies, as well as from other bundled care literature. Some key findings:

- The most common types of care bundles focus on diagnostic related groups or specific procedures.
- Transparency between all the parties involved in the creation, pricing, delivery and evaluation of a care bundle is important.
- Successful programs included all components necessary for the treatment in the full episode.
- Bundled payments work best when there are not opportunities for shifting some (e.g. more complex) patients or services and costs outside given bundles to other parts of the health care system.
- Setting up, pricing, performance monitoring and evaluating a bundle requires detailed historical and current administrative data from multiple sources.
- Electronic health records that can be easily shared across providers have been a component of all the successful bundled care and payment initiatives that we reviewed.
- All of the successful models reviewed here included physician payment within the single payment for the bundle of care.
- Bundled payment programs should include a *limited* set of outcomes which extend beyond process measures that are consistently monitored.

Bundling care and payment offers health care payers an opportunity to align incentives and focus clinicians' efforts on improving quality while maintaining control over costs. This is clearly an appealing outcome. However, it is still early in the evolution of these programs with evidence still emerging.

Ontario is one province that is implementing a variety of payment reforms, particularly to institutional providers including integrated and bundled care. This review provides ample evidence to recommend including bundled care and payment as a component of a sophisticated health care system, but after considering 12 important factors for successful implementation.

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# Executive Summary

Bundling care that rightly belongs as part of a single care pathway is a common-sense approach to optimizing care, cost and outcomes that is increasingly common in the United States. The extent and focus of the implementation of bundled care and payment can vary widely. In this report we outline the range of options for bundling care and payment, describe what early adopters have done and achieved, and highlight lessons to be learned from the early adopters.

## IN THE LITERATURE:

- Bundling of services can occur across the continuum of care and can range from including services for a particular procedure to all services related to all health care for a given time period. The most common types of care bundles focus on diagnostic related groups or specific procedures. A number of programs and pilots aim to integrate care from acute care services through to home and community as well as nursing home care, or to coordinate community-based care for specific chronic conditions.
- Bundled payment involves payers transferring a pre-determined payment to providers to deliver all care included in the care bundle, thereby transferring risk to the providers who control the decisions about which services are provided to patients.
- Successful programs included all components necessary for the treatment in the full episode. The Acute Care Episode (ACE) and *ProvenCare* programs succeeded with clearly defined care pathways and full engagement of physicians. It is far easier to ensure that all providers are included when the episode is brief and requires little or no coordination for ongoing care with other providers not included in the bundle. The Dutch program of bundling care for chronic conditions had substantial difficulty coordinating the necessary care with providers who were not included in the bundle. The Program for All-Inclusive Care for the Elderly (PACE) and Accountable Care Organization (ACO) programs overcome these obstacles by providing comprehensive care and payment for all conditions in a global capitation payment.

## KEY CHALLENGES TO BUNDLING CARE AND PAYMENT:

- **Deciding what to include in a bundle.** It can be challenging to determine which services should go in a bundle. For longer term bundles for specific chronic conditions, it is especially difficult to ensure all related care and ongoing patient costs are included in one bundled payment. If all care is not included, the resulting incomplete bundles can reinforce fragmented care for patients with co-occurring conditions and create incentives to shift care and costs to providers outside of the care bundle.
- **Ensuring quality of care.** Bundled payments can create incentives to skimp on care and do not address quality concerns about service provision that extend beyond the time horizon of a given bundle. Quality monitoring is used in all the bundled care programs evaluated in this report and is an important safeguard against reductions in quality.
- **Pricing, risk shifting, and provider participation.** Determining an appropriate price for a bundle of services requires a significant amount of data and involvement from multiple stakeholders. Setting a price too low may result in limited provider buy-in because providers face losses as financial risks are shifted to providers.

- **Data requirements and information technology.** Setting up, pricing, performance monitoring and evaluating a bundle requires detailed historical and current administrative data from multiple sources. Information technology investments are required to ensure this information is shared with providers in a timely manner.
- **Deciding on a fund holder.** A bundled payment involves a payer providing lump-sum compensation for a bundle of services that often crosses multiple care sectors and many providers. This may lead to uncertainty regarding which entity is best suited to hold and distribute funds, especially for bundles that involve services in multiple care settings such as acute and community settings.

## RECOMMENDATIONS FOR BUNDLING CARE AND PAYMENT:

Based on our scoping review of the literature and evidence available to date, we make a number of recommendations that policy-makers should consider before implementing bundled care and payment.

1. **Choose conditions carefully.** Most other recommendations flow from this initial decision. The availability (or development of) specifications on best practice care and agreement of physicians and other care providers on these specifications is essential to: engage physicians with a focus on improving patient care; enable risk-management; set the duration of care; determine and monitor quality indicators; and set appropriate payment levels. Effective bundled care and payments have ranged from short-term procedural episodes (e.g., the ACE program) to ongoing funding models (e.g., the PACE program and ACOs). Short-term bundles related to specific procedures tend to have more clearly defined care pathways, providers and timeframes, which implies more easily measurable outcomes and leads to a better ability to set appropriate prices and hold the appropriate practitioners accountable for care. Long-term bundles can also be successful, noting that severity-adjusted, capitation payments that encompass all related care for an individual have been most successful to date. Regardless of the length of the bundle, it is important that a bundle capture all necessary patient care related to the condition, procedure or population.
2. **The definition of episodes covered by payment should match the duration of the condition.** The duration of the episode should cover the entire duration of treatment for a specific condition. Time-limited conditions are suitable for short episodes with little follow-up care, while chronic conditions are best managed with a capitated model where all care for related conditions is included. In planned procedures, pre-operative care can also be included in the bundle.
3. **Include all providers in a bundled care price.** Effective bundles are inclusive of all payments to all providers within the period (i.e., acute and post-acute, primary care, home care, drugs, etc.) which enables accountability. In many health systems, physicians are remunerated outside of the usual course of care and have a high degree of autonomy and a relatively low degree of affiliation. All of the successful models reviewed here included physician payment within the single payment for the bundle of care. Physicians make most of the decisions about the care that is provided to patients, and including their payment within the bundle increases their partnership with other providers also paid through the bundle. It also ensures both clinical and financial accountability.
4. **Early physician leadership is integral.** The most successful bundles have developed care pathways with physician leadership. Physicians are integral in implementing changes to care delivery, so their involvement in defining care pathways is necessary. Physician involvement in translating evidence-based medicine into clinically meaningful processes was important in ensuring provider buy-in for the reviewed case studies in this report.

5. **Ensure continuing physician engagement through a number of mechanisms.** Physician engagement is an important component of bundling care. Increasing physician engagement was most successful when physicians had leadership roles in the selection and implementation of best practice care. All of the successful examples of bundled care and payment in this review had adopted this approach. Ongoing physician engagement can be achieved through appropriate compensation which includes risk sharing and aligning the incentives of providers and payers with quality assurance stipulations. Compensation, however, is not the only factor in ensuring physician engagement. Clinical governance structures that include payer and provider representatives as well as information technology systems that deliver information to providers in a timely manner are also important ways to engage physicians.
6. **Ensure timely and integrated data.** The receipt of data from multiple sources in a timely manner is required to facilitate the construction, pricing, operation, and evaluation of bundled care programs. Though Ontario has substantial administrative data, integrating this information and delivering it to providers in a timely manner will be necessary to ensure fair pricing, to allow providers to adjust care as necessary, and to monitor quality of care.
7. **Invest in information technology.** Electronic health records that can be easily shared across providers have been a component of all the successful bundled care and payment initiatives that we reviewed. The use of these systems has been integral in facilitating care coordination between stakeholders and the exchange of information, as well as enabling the automation of processes. These systems also play a central role in performance monitoring. For organizations where these systems are not already in place, funding for integrated information technology systems is important.
8. **Monitor quality of care.** Bundled payment programs should include clear quality metrics focused on desired clinical outcomes. In the most successfully bundled care programs, providers must achieve certain quality levels to maximize their payment. One possible way to monitor provider quality is to create a scorecard at the provider level, as in the ACE demonstrations. It should be noted that a *limited* set of outcomes which extend beyond process measures should consistently be monitored to ensure that quality outcomes are being met and that programs are able to meet reporting requirements.
9. **Choose bundles based on provider and cost variation.** The most suitable opportunities to improve care by bundling services occurs when within-provider variation for similar patients is low reflecting the capability of providers to ensure consistent care for patients with similar conditions, but between-provider variation for similar patients is high, suggesting opportunities for better alignment with best practice care and improved efficiencies across providers. Bundling payment holds the most opportunity to impact total costs when variation in outcomes is low, while variation in cost is high.
10. **Ensure transparency of cost and quality data.** Transparency between all the parties involved in the creation, pricing, delivery and evaluation of a care bundle is important. Transparency can help to support partnership between payers and providers. In particular, transparency and accuracy in cost estimates are central to setting an appropriate price for a service bundle that will help to ensure provider engagement. Transparency of quality data was also important in facilitating discussions between physicians and administrators in the early stages of some bundled care programs, and physician report cards were cited as a possible mechanism to facilitate this. Less successful programs cited a lack of transparency with respect to cost arrangements as a major challenge.

11. **Include risk adjustment in prices.** Risk adjustment and the identification of outlier patients is an important tool to incorporate into price setting. There needs to be transparency and agreement when it comes to risk adjustment methodology, as some hospitals and provider groups will have disproportionately sicker and more costly patients. This transparency is important in assuring physicians that the risk adjustment methodology adequately differentiates sicker, more complex patients from healthier patients.
12. **Move towards as much bundling as possible.** Comprehensive patient-centered care should be the goal for bundled care and payment. Bundled payments work best when there are not opportunities for shifting some (e.g. more complex) patients or services and costs outside given bundles to other parts of the health care system. If a bundled payment system operates alongside other payment to providers for the same patients and in the same time period, it can be difficult to ensure that gaming does not occur or that costs are not simply shifted outside of a bundle. In evaluating care bundles, it is important to track total system costs to determine whether costs are being shifted outside of a bundle.

## Conclusion

Bundling care and payment offers health care payers an opportunity to align incentives and focus clinicians' efforts on improving quality while maintaining control over costs. This is clearly an appealing outcome. However, it is still early in the evolution of these programs with evidence still emerging. There are relatively few examples with rigorous evidence of success compared to the number of efforts that have been made to implement care bundles – particularly for programs that include providers from multiple sectors of the health care system. The most successful models reviewed here were implemented in sophisticated environments with robust IT systems, clear quality goals and strong physician engagement, and were inclusive of all related providers. Whether all of these conditions are necessary or sufficient cannot be assured, but they are certainly important enabling factors.

Ontario is one province that is implementing a variety of payment reforms, particularly to institutional providers. Integrated and bundled care is an important component of these reforms, primarily through the introduction of quality-based procedures (QBP). It is notable that while the first few QBPs were all related to procedures, more recent examples for Heart Failure and COPD indicate a shift toward management of chronic conditions. We found international evidence for the success of bundled care and payment for time-limited procedural care and for all-inclusive and comprehensive patient-centered care, but not for episodic management of chronic conditions. Nonetheless, we believe that the opportunities, challenges and recommendations summarized in this report apply to all conditions considered for bundled care and payment. This review provides ample evidence to recommend including bundled care and payment as a component of a sophisticated health care system. It also provides strong support for the engagement of all providers, including physicians, in the development and implementation of bundled care and the incorporation of all costs, including physician remuneration, within care bundles.

# Section 1: Introduction

Health care systems are continuously trying to improve the access, efficiency and quality of care provided to the population. An important approach is to narrow unnecessary variation and shift the system towards best practice care. Better planning and coordination of care within and across multiple health care providers is one of the most relevant and common approaches to achieve these improvements. Creating best practice care pathways and bundling all related services across these pathways with a single payment has the expressed purpose of improving value of health care spending. This approach seeks to replace separate fee-for-service payments for services that, in combination, should truly constitute a care package for individuals with a particular health issue because those individuals need a whole set of care services and not only one component. Like many alternatives in health care, bundled care payment has advantages and disadvantages that may vary depending on the context and specific characteristics of the services to be bundled.

Information on the form, context, and effects of implementing bundled payment is fairly scattered and key summative insights are not readily available. Health care payers and policy makers are beginning to pilot or implement bundled payment based on reports from a small set of examples, often extrapolating to new contexts and conditions. The variety and variability among the examples, and the paucity of programs with published evaluations, makes it difficult to know what types of bundled care and payment are effective for which patients and providers. This paper seeks to synthesize what is known about bundled payment from across a variety of examples to explore the most important features of bundled care and payment interventions as well as the key enablers of and barriers to achieving quality and cost management through this approach to care and payment. The overall goal for this review is to provide advice to payers regarding the most important design and implementation considerations for bundled care and payment.

Bundled care refers to a model of care delivery that defines a package of care and services, generally for a particular condition, and generally pays for these services in a single payment for multiple providers and across multiple settings (Painter, 2012). Fee-for-service reimbursement systems have been criticized for failing to provide incentives for coordinated care and for emphasizing the quantity of services as opposed to quality or value of care (Sood et al., 2011). The resultant care for patients is uncoordinated, often duplicative, and results in avoidable, costly adverse events. It is thought that providing care through bundled payments will encourage collaboration of physicians, hospitals, and other providers while also helping to reduce avoidable complications of care and their associated costs (de Brantes et al., 2009).

The theory behind bundled payments is quite straightforward. Primarily they fix the price for a given set of services, reducing the costs to the payer for monitoring coordinating and paying for what would otherwise be an array of individual services (ie. reducing transaction costs). The care covered by a single payment can range from an episode of care for a specific intervention such as planned cardiac or orthopedic procedures, to global or capitation payment for all needed care. While the former fixes the price, it provides little control over volume and hence less control than global payment which controls the total cost or capitation which controls cost per case. In both episode-based and capitation payment models, risk can be transferred to providers, depending on the structure of the program (Chernew, 2010). The necessary conditions for this theory to be realized may be extensive. Fixing the care bundle and setting a single price requires clearly defined and homogenous patient groups. All constituent services and related providers need to be included within the bundle to ensure that all providers are aware of and make their

contribution in a coordinated approach; this requires a very high degree of cooperation and information sharing. In order for bundled care to achieve clinical and financial objectives, it is necessary that physicians, who make the decisions about the care for patients, be included to align clinical with financial decision-making.

Potential gains arise through bundled care arrangements due to economies of scope and vertical integration. When multiple physicians across different specialties work together, there are opportunities for improved coordination and quality of patient care and in-house or within network referrals. Further, when physicians align with non-physician partners, such as hospitals, this may result in lowered transaction costs and improved efforts to monitor, manage, and coordinate patient care (Sen and Burns, 2014). Bundled payments provide incentives for closer collaboration and evidence-based decisions and may include shared gains and shared risk among providers across the continuum of care. In the case of bundled episodes that include acute and post-acute care, for instance, both physicians and hospitals could experience gains for effective and efficient care or losses for poor performance (Delisle, 2012).

There have been a number of pilot projects and some system-wide programs implemented across North America, Europe, and Asia bundling services across the continuum of care. These programs range from bundling services for single episodes of care to bundling all services for a given patient across the continuum of care for a specified time period. It is important to learn from the successes and challenges that these programs have experienced.

In this report, we consider the evidence to date with respect to bundled payment programs that have been previously implemented. We start by discussing the range of bundled care options that are theoretically possible and where currently operating bundled care models fall on this continuum. We give a broad overview of the different types of bundled care models being implemented and the evidence to date on whether these models have realized the quality improvements and cost savings they aimed to achieve. Next, we provide a more in-depth analysis of five models that bundle services to varying degrees and across different settings. We outline some important considerations when implementing bundled care models, as well as potential enablers for their successful implementation..

## Section 2: Bundled Care Models Overview

### 2.1 CONCEPTUAL FRAMEWORK

Bundling of services can occur across the continuum of care and can range from including services for a particular procedure to all services related to all health care for a given time period. To understand the full range of bundling options, it may be easiest to consider a framework with two dimensions: 1) the number of different types of providers involved in the provision of a care bundle; and 2) the time period over which a patient's care is included in a bundle. In Figure 1, we outline this framework, with examples of how various types of bundling would fit within this framework. There are other possible dimensions such as the number of different conditions covered or the size of the population captured within the bundle, but the first (horizontal) dimension represents these other possible dimensions.

*Episode Duration.* Though an episode bundle can theoretically fall anywhere on the time horizon, in practice bundles tend to be either over a shorter time frame (i.e., up to 90 days), or else over a longer time horizon

(i.e., one year). The short-term bundles tend to relate to specific procedural pathways (e.g. hip and knee procedures), while long-term bundles tend to provide more holistic care for specific diseases or sub-populations (e.g. diabetes management bundles or all-inclusive care for the elderly).

Fee-for-service reimbursements are generally visit-based, with individual practitioners billing for each procedure or consultation they provide. This involves compensating one practitioner providing a one-time service. This is depicted in the lower left corner of Figure 1 as a single provider at one point in time. Global capitation is at the other extreme in terms of provider involvement and the time horizon over which the patient is followed. In this system, a single health care organization is paid over a longer period of time to cover a population of patients. All population health care needs are covered over the course of a specified time period (e.g. a year) (Burton, 2012). Some managed care organizations such as Kaiser Permanente and some Accountable Care Organizations in the United States generally accept global capitation payments and use population-based approaches to manage all care for their enrollees. Others such as the Program for All inclusive Care for the Elderly (PACE), Medicare Advantage plans and Medicare managed care plans (Burton, 2012) have similar coverage but for select populations and therefore might include a slightly smaller set of providers.

Opportunities for bundling care lie along this spectrum of reimbursement systems. We summarize a sampling of different types of care models that are currently being piloted or have already been implemented in Table 1. We later review the evidence regarding these initiatives in Section 3.

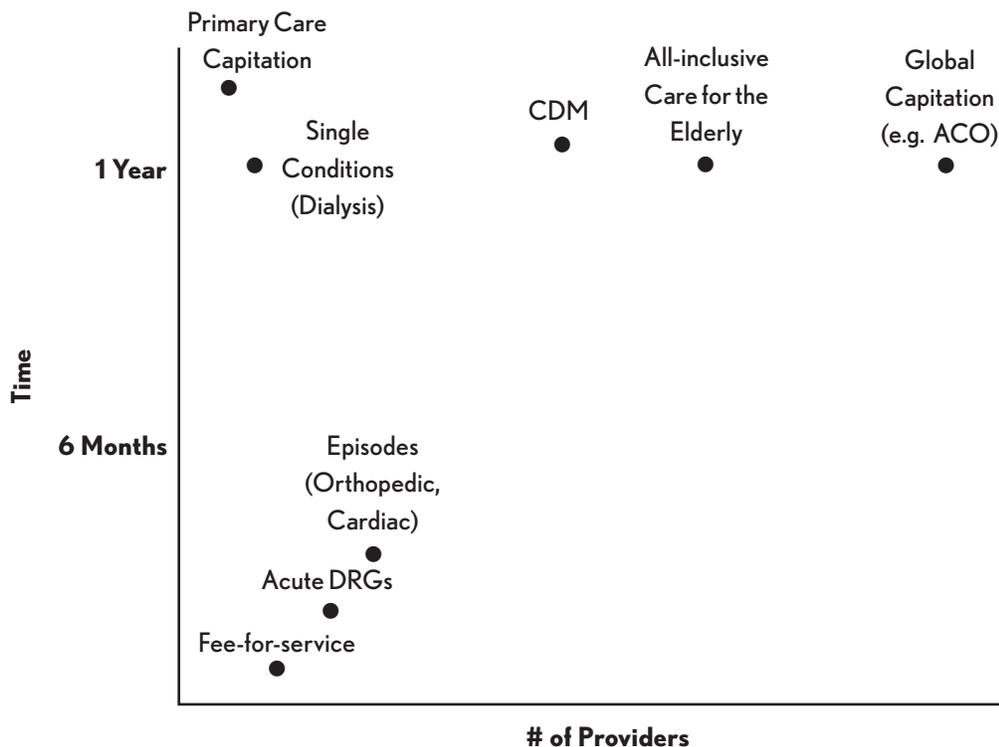


Figure 1: Continuum of Bundled Services

(Note: DRG Diagnostic Related Group payment for inpatient hospital care; CDM Chronic disease management payment for a single condition (e.g. renal disease, COPD); ACO Accountable Care Organizations that assume all or nearly all care required for an individual.)

## 2.2 METHODS

To identify the various bundled care programs currently in place and the evidence surrounding them, we conducted a scoping review. We first conducted title, abstract, and keyword searches of PubMed and Ovid using the search terms “bundled payment,” “bundled care,” “episode-based payment,” and variations of these phrases. There were no time restrictions on the search. We searched the reference lists for relevant articles from this initial search and also searched for grey literature using Google and Google Scholar. The search terms for the grey literature search were specific to each bundled payment program that we identified from the initial search and recorded basic information on the target population, services included, location and dates of the program implementation. We selected five programs for detailed review because they represented the possible range of bundled care options outlined in Figure 1, from procedure-based bundles to more comprehensive capitation-based bundles. They also represented case studies that had rigorous evaluative evidence available and in some cases have resulted in widespread implementation. We then identified 12 factors to explore further. These factors were recurring themes from the five case studies, as well as from other broader reviews of the bundled care literature.

## 2.3 BUNDLED CARE MODELS OVERVIEW

The most common types of care bundles revolve around diagnostic related groups (DRGs), which is a system of grouping patients with similar clinical characteristics and comparable costs. Hospitals are paid a flat fee for each DRG. Bundles for DRGs have been used since the 1980s in the United States and are currently used in a number of countries throughout Europe. These inpatient prospective payment systems range in terms of scope of coverage. Some systems cover hospital costs until the day of discharge (e.g. United States and Sweden), while others extend coverage to a month or more after discharge (e.g. Netherlands, England, France, and Germany) (Quentin et al., 2013). There is also a range in scope with respect to physician fee coverage. Unlike the United States, physician fees are included in the DRG price in England, the Netherlands, Germany, and Sweden, as well as France for public hospitals (Quentin et al., 2013). Bundling services around specific procedures, in particular hip and knee replacements or cardiac bypass surgery, is also quite common. These bundles involve hospital and surgeon fees being combined into a flat price for an operation. Further hospitalization required due to complications within a given time period (e.g. 3 months) is also covered by this fee (Draper, 2011). Geisinger Health System’s ProvenCare, which has been dubbed a “warranty” approach to specific surgical procedures, is an example of this type of care bundle and was implemented in 2006. Medicare’s Acute Care Episode (ACE) demonstration, which includes some post-operative services in care bundles for cardiovascular and orthopedic procedures, is another type of procedure based bundle and was implemented in 2009.

Furthest along the provider continuum, are programs that integrate care from acute care services through to home and community as well as nursing home care. The Program for All-Inclusive Care for the Elderly (PACE) integrates the finance and delivery of all Medicare and Medicaid covered services, including an array of long-term care services. Interdisciplinary care teams provide care management based on the enrollees’ assessed needs. PACE’s financing is integrated through monthly capitated payments from Medicare and Medicaid or private sources (Meret-Hanke, 2011).

Intermediate levels of bundling are also possible. The province of Ontario, for instance, has used capitated reimbursement for the treatment of dialysis patients since 1998 (Mendelssohn et al., 2004), and the Centers for Medicare and Medicaid implemented an expanded bundle for the treatment of end-stage renal disease

in 2011 (Chambers et al., 2013). Such bundles include care for a narrow set of providers over a longer term (e.g. annual). There are also a number of examples of bundles aimed at managing chronic diseases. These models include fewer providers than all-inclusive systems like PACE and often involve yearly capitated payments that cover a full range of chronic disease management services. In the Netherlands, for instance, chronic disease management programs for diabetes, chronic obstructive pulmonary disease (COPD), and vascular risk management were piloted in 2007 and implemented nation-wide in 2010 (Struijs & Baan, 2011). Chronic disease bundles are currently being piloted in the United States under the Prometheus payment model and Uniform Care Packages (Chambers et al., 2013). The greatest difficulty with these is determining which services are included in the bundle and how care from services not in the bundle are coordinated and integrated with those services in the bundle.

**Table 1: Summary of Selected Bundled Payment Programs**

Program	Payer	Date	Treatment	Services Included	Source
<b>Acute Hospital Based Programs</b>					
CardioVascular Care Providers Inc. at the Texas Heart Institute	Texas Heart Institute	Early 1980s	Coronary artery bypass graft (CABG)	Cardiovascular physician and hospital fees and services	Chambers et al., 2013
Medicare Participating Heart Bypass Demonstration	Medicare	1991-1996	CABG	Medicare physician and hospital inpatient services, readmission related to the episode, hospital pass throughs	Chambers et al., 2013
Medicare Bundled Payments for Care Improvement	Medicare	2013-ongoing	Various, including cardiac, orthopedic, and gastrointestinal procedures	Ranges from all Part A services as part of the DRG payment to all non-hospice Part A and B services (hospital and physician) during initial stay and readmission	Dummit et al., 2015
English National Health Service Payment by Results	English National Health Service	2003-ongoing	Hospitals	The majority of acute healthcare in hospitals, including physician fees, inpatient, outpatient attendances, accident and emergency, and some outpatient procedures.	Hussey et al., 2012; Quentin et al., 2013
Netherlands Inpatient Prospective Payment	Not reported	2005 - ongoing	Inpatient hospitals	Includes recurrent costs, physician fees, and capital costs with extended coverage until 42 days after patient discharge	Hussey et al., 2012; Quentin et al., 2013

Program	Payer	Date	Treatment	Services Included	Source
Sweden Inpatient Prospective Payment System	Stockholm County Council	1995 - ongoing	Inpatient hospitals	Includes recurrent costs, physician fees, and capital costs until day of discharge	Hussey et al., 2012; Quentin et al., 2013
Inpatient Prospective Payment System (IPPS)	Medicare	1983-ongoing	467 diagnosis related groups (DRGs)	Payment for multiple services performed in a hospital admission, excluding services unrelated to DRGs	Chambers et al., 2013
Medicare Acute Care Episode (ACE) demonstration	Medicare	2009-2013	Specified cardiovascular and/or orthopedic procedures	Hospital and physician services plus 90 days of post-operative care (excluding complications and post-acute services)	CMS, 2009; Minkin, 2011
<b>Other Hospital</b>					
Medicare Inpatient Rehabilitation Facility Prospective Payment System	Medicare	2002-ongoing	Inpatient rehabilitation	Per-discharge payment for operating and capital costs for 92 case-mix groups	Hussey et al., 2012
Medicare Long-Term Acute Care Hospital Prospective Payment System	Medicare	2002-ongoing	Long-term acute care hospitals	Per-discharge payment for all operating and capital costs for 318 Medicare long-term care diagnosis-related groups	Hussey et al., 2012
<b>Multi-provider Episodic</b>					
Prometheus Payment Model	Various	2009 - ongoing	21 conditions including diabetes, asthma, CABG, hip and knee replacements, and colonoscopy	Inpatient and outpatient provider fees and services	Chambers et al., 2013

Program	Payer	Date	Treatment	Services Included	Source
ProvenCare Program	Geisinger Health System	2006 - ongoing	CABG, hip replacement, pre- and post-natal care, and cataract and bariatric surgery	Hospital and other facility costs, pre-operative care, inpatient services, and post-operative care for 90 days (including complications)	Chambers et al., 2013; AHA, 2010
<b>Disease Management Programs</b>					
Medicare End-Stage Renal Disease Management Demo	Medicare	2006-2010	End-stage renal disease (ESRD)	Varied programs for integrative care, including comorbidity management, nutrition, and preventive care	Chambers et al., 2013
Dutch Bundled Payment for Integrated Chronic Care	Dutch public health insurance	2007 - ongoing	Chronic care management for diabetes, vascular disease, and chronic obstructive pulmonary disease (COPD)	Primary care and outpatient specialist care (consultative) as described in care standards for specific diseases	Busse & Stahl, 2014; Struijs & Baan, 2011
<b>Comprehensive Care Programs</b>					
Alternative QUALITY Contract	Blue Cross Blue Shield of Massachusetts	2009-ongoing	Global budget payment to a number of causes for medical treatment that a patient may need in a given year	All inpatient and outpatient hospital and physician care (including pharmacy and behavioural health costs)	Chambers et al., 2013
Program for All-Inclusive Care for the Elderly (PACE)	Medicare	1997 - ongoing	Community-based care	Comprehensive, including Primary care services, emergency services, hospital care, home care, dentistry, lab/x-ray services, meals, medical specialty services, nursing home care, nutritional counselling, prescription drugs, and occupational or physical therapy	CMS, 2011b

Program	Payer	Date	Treatment	Services Included	Source
Pioneer Accountable Care Organizations	Medicare	2012-ongoing	Various	Various	CMS, 2010
<b>Other</b>					
Medicare Home Health Prospective Payment System	Medicare	2000-ongoing	Home health agencies	Per-discharge payments for all nursing care, therapy, and aide services for 153 Home Health Resource Groups	Hussey et al., 2012
Uniform Care Packages	Fairview Health Services	2010-ongoing	12 care packages including chronic diabetes, coronary heart failure, prenatal care, and knee replacement	Hospital and physician services	Chambers et al., 2013

## Section 3: Overview of Evidence on Bundled Care Effectiveness

Evidence surrounding the effect of newer bundled care pilots on quality of care and cost outcomes is quite limited, as many of these pilots and programs have only recently been implemented and data from many of these programs remain scarce (McClellan, 2011). As noted by Wojtak and Purbhoo (2015) in their recent review of the bundled payment literature, the majority of existing evidence revolves around condition-specific bundles which involve more limited provider types; however, there is growing interest in population-based bundles for patients with multiple complex chronic conditions (Wojtak & Purbhoo, 2015). In this section, we consider evidence from across the continuum of possible care bundles. We provide a brief overview of findings that have been published based on past bundled care demonstrations and preliminary evidence from newer programs with respect to costs, quality, and continuity of care.

Most evidence with respect to cost savings from bundled care demonstrations relates to the use of DRGs in hospital settings in the United States. DRGs have been used in the United States since the 1980s, so there has been substantial opportunity to evaluate their effects on cost and quality. Using DRG payment was found to decrease length of stay and costs per hospitalization, resulting in lower costs within the services included in a care bundle (McClellan, 2011). However, many services were shifted from hospital settings to community settings as a result of this payment approach, making it unclear if overall costs were reduced. Indeed, evidence from the implementation of a prospective payment system for hip fracture treatment in Sweden indicates that cost shifting from hospital to community settings can occur. After changing to a prospective payment system, orthopedic stay was almost halved due to increased discharge to geriatric

wards. This resulted in a total cost increase of 12%, which was not reflected from official health care statistics that did not include a significant portion of geriatric care (Stromberg et al., 1997). Most early DRG studies did not include performance or quality measures; however, studies have generally not found adverse outcome consequences as a result of reducing the intensity of care during a stay (Cutler, 1995 in McClellan, 2011).

Throughout the 1980s and 1990s, there were also a number of surgical bundle demonstration projects. The Texas Heart Institute bundled payments for coronary artery bypass surgery (CABG) in 1984 and found a 13% reduction in Medicare payments by 1987 (Delisle, 2012). In 1987, an orthopedic surgeon in Lansing, Michigan also had promising results with respect to cost reductions when he offered a fixed total price for shoulder and knee surgery, including a warranty for subsequent services over the following two years. An evaluation of this bundled approach found that the payer paid 40% less and the surgeon received more revenue by reducing unnecessary services, complications and readmissions (Miller, 2009). Between 1990 and 1996, the Medicare Participation Heart Bypass Center Demonstration paid a global amount for all Medicare Part A and Part B inpatient services for CABG at seven hospitals across the United States (Cromwell et al., 1998). An evaluation of this program found that overall costs to Medicare were reduced by \$50.3 million (USD 1998) in five years. Three hospitals were able to make changes in physician practice patterns that resulted in ICU and nursing care cost declines ranging from 10% to 40%. The evaluation also found that, net of patient risk factors, there was a significant negative trend in the inpatient mortality rate at demonstration hospitals (Cromwell et al., 2008).

Geisinger Health System's *ProvenCare* provides more recent evidence of a CABG episode-based bundle that includes 90-days of post-operative care. An evaluation of *ProvenCare* during the first year found reductions in most adverse events, including a 10% drop in readmissions, shorter average length of stay, and reduced hospital discharges. More recent data from Geisinger suggests a 44% readmission reduction over the first 18 months after implementation (Mechanic & Altman, 2009). There is also evidence of improved compliance with best practices under *ProvenCare* (Casale et al., 2007), as all organizations participating in *ProvenCare* have used evidence-based medicine as the benchmark for standardizing care protocols and measuring care outcomes. A more in-depth analysis of the evidence surrounding *ProvenCare* can be found in Section 4.

The potential for bundling orthopedic procedures and services has also been the focus of substantial literature. One of the most commonly referenced bundled payment models is the Prometheus Payment Model, which uses evidence-informed case rates for service bundles. Applying the Prometheus proposed case rates to current hip and knee arthroplasties, Rastogi et al. (2009) reported that potentially avoidable complications (PACs) comprised 14% of total costs (\$20.5 million) for (2,076) commercially insured patients. The authors concluded that holding providers clinically and financially responsible for PACs could create opportunities for providers to focus on reducing these complications. Despite substantial enthusiasm for the Prometheus model, Hussey et al. (2011) noted that after three years, no contracts had been executed at the initial pilot sites. One reason for this stagnation was hesitation on the part of payers to share savings and for providers to accept a contract without shared savings. A number of additional reasons for the lack of success were outlined, including the difficulty of defining bundles and applying case rates to organizational data; time and resource requirements of implementing the electronic health record; determining accountability, especially in the face of physicians referring patients to out of network providers (so-called "patient leakage"); and ensuring provider engagement in situations where there is limited clinically actionable information (Hussey et al., 2011).

There have been examples of successful orthopedic bundles on a smaller scale. In the United States, the Connecticut Joint Replacement Institute cited quality improvements and cost savings after adopting a bundled payment approach for total hip and knee arthroplasties. A year after the implementation of bundled care in 2009, the institute reported that it experienced a 17.5% decrease in length-of-stay, improvements in patient satisfaction (as measured through the Hospital Consumer Assessment of Healthcare Providers and Systems survey), and a decrease from 6-7% to 2-3% in readmission rates. There was also a decrease in the average direct cost per case of 9.9% and 5.0% for total hip arthroplasty and total knee arthroplasty respectively (Schutzer, 2015).

Medicare's Acute Care Episode (ACE) Demonstration is also commonly cited as a successful pilot for cardiac and orthopedic procedures. Evaluations of the five participating pilot sites found that Medicare saved an average of \$319 per episode or \$4 million overall when PAC costs were taken into account. The largest aggregate savings were from orthopedic procedures, which will be discussed in more detail in Section 4. These savings did not appear to result from a decrease in the quality of care, as ACE sites maintained quality levels according to these evaluations. Though there were not many significant quality improvements observed in quantitative analyses, qualitative evidence points to enhanced process improvements at the pilot sites.

In light of these findings, CMS has expanded bundled payment demonstrations with the Bundled Care Payment Initiative (BCPI). This initiative was launched in 2013 and is currently underway. It includes four different payment models for services related to an episode of care that is triggered by a hospitalization (Dummit et al., 2015). Though it is too early to determine the results of the initiative, early descriptive evidence indicates that participating organizations tend to be large, non-profit, teaching hospitals in the Northeast enrolled in the bundled payment initiative covering patient conditions with high clinical volumes. Post-acute care tends to explain the largest variation in overall episode-based spending for these organizations, signaling an opportunity to align incentives across providers (Tsai et al., 2015). Preliminary evaluative findings of 15 awardees across three of the payment models in the first year of the program have had mixed findings. Some individual success stories have emerged, including Baptist Health in San Antonio, whose 28 orthopedic and nine cardiovascular bundles led to \$9 million in savings over the three years it participated in the ACE program, prior to transitioning to the BCPI (Hostetter & Klein, 2015). Overall, for BCPI participants, inpatient hospital length of stay and readmission rates within the first 30 days after discharged declined relative to a comparison group; however, for surgical orthopedic episodes, emergency department use for BCPI patients increased relative to the comparison group. The latter finding raises question about quality of care, but overall, it is likely premature to draw any conclusions about the program (Dummit et al., 2015).

As bundled care approaches are being applied beyond episode-based bundles, programs such as PACE, chronic disease management programs, and ACOs have received significant attention in the payment reform literature. We discuss each of these examples in greater depth in Section 4. Overall, the evidence from these programs is mixed. PACE has been largely considered a success because evaluations have found that it has decreased costs and improved some quality outcomes, such as time spent in hospitals and nursing homes. However, despite being in place for over twenty years, its growth has been much slower than anticipated. Meanwhile, demonstration ACOs have shown promising though modest results with respect to cost reduction and some patient experience outcomes. Most recently, McWilliams et al. (2015) have found that Pioneer ACOs resulted in 1.2% savings overall, with the greatest savings experienced by those with higher than average baseline spending. However, significant implementation challenges have been cited as these programs unfold and are discussed in more detail in Section 4. Another capitation

based program, the Dutch bundled care chronic disease management program is still relatively new, and evidence surrounding cost and quality outcomes has not been straightforward, although process of care outcomes do seem to be improving.

The above section provides a general overview of the types of bundles that have been implemented and the potential for cost and quality improvements. Evidence from successful programs is commonly cited in the payment reform literature, and it seems to indicate that bundled care initiatives can lower costs, sometimes with an accompanying increase in the quality of care. However, the evaluations of many of these bundles have often been descriptive in nature, without providing definitive answers with respect to whether any observed quality and efficiency gains could be directly attributed to the bundled payment system alone. A handful of bundled care programs have had more in-depth evaluations conducted, and in the next section, we provide an overview of some of these bundles and the evidence to date surrounding them.

## Section 4: Bundled Care Case Studies

As noted previously, there are a number of possibilities for bundling care services, ranging from bundling services around DRGs or procedures to much broader bundles that follow patients for longer periods of time across multiple settings. In this section, we focus more closely on five specific bundled care programs from across the spectrum of integration. These case studies were selected because they represent the possible range of options outlined in Figure 1, from procedure-based bundles to more comprehensive capitation-based bundles. They also represent case studies that have more rigorous evaluative evidence available, and in some cases have resulted in widespread implementation. We describe these bundles in more detail, with a particular focus on service coverage and payment mechanisms, discuss in more detail the evidence to date for these programs, and then discuss some of the successes and implementation challenges experienced in these pilots. We first focus on five care bundles: 1) an acute care procedure-based care bundle, the Acute Care Episode (ACE) demonstration for inpatient episodes for orthopedic procedures; 2) an acute and post-acute procedure-based care bundle, Geisinger's ProvenCare bundle for CABG; 3) a home and community care based bundle, the Program for All-Inclusive Care for the Elderly (PACE); 4) a chronic disease management bundle, the Dutch Bundled Payment for Integrated Chronic Care; and 5) an alternative population-based risk-sharing model, the Pioneer Accountable Care Organization demonstration.

### 4.1 ACUTE CARE EPISODE DEMONSTRATION (ACE) ORTHOPEDIC PROCEDURES

#### **Program overview**

Orthopedic bundles are commonly selected for inclusion in bundled care demonstrations for a number of reasons. First, these procedures tend to be relatively easy to define. Second, since the costs of care occur mainly during inpatient stay, providers have the ability to exhibit more control over costs. Third, orthopedic procedures and the aftercare can be easily standardized (Painter, 2012). Given these factors, a number of orthopedic services and procedures were selected for inclusion in Medicare's Acute Care Episode (ACE) demonstration in 2009. The three-year ACE Demonstration was implemented across five health care systems. It included 28 cardiac and nine orthopedic inpatient surgical services and procedures

which were selected based on four criteria: 1) historically high volume; 2) sufficient marketplace to ensure participant interest; 3) easily specified services; and 4) the availability of quality metrics (CMS, 2009). The diagnostic related groups (DRGs) included in the orthopedic bundles related to joints (461, 462, 469, and 470) and hips and knees (466-468 and 488-489). Participating hospitals for orthopedic procedures were located in Texas, Oklahoma, and New Mexico (Minkin, 2011). The bundles included all physicians, consulting physicians, and assistant services; postoperative care and procedure; room and board; hospital ancillary services; medical and surgical supplies; medications, laboratories, and X-rays; routine charges; and 90-days of post-procedure care. Any complications, different DRG admissions, or post-acute services were not included in the bundles (Minkin, 2011).

### **Funding overview**

Medicare paid participating hospitals a single payment for both hospital and physician services furnished during an inpatient stay (Centers for Medicare and Medicaid Services (CMS), 2011a). Figure 2 outlines the flow of funds from CMS through to the hospitals, physicians, and Medicare beneficiaries. With this system, hospitals held all funds from CMS and were responsible for paying doctors with these funds. Participants' physician-hospital organizations contracted with physician groups to pay them 100% of the Medicare physician fee schedule. As such, physicians did not assume any downside risk (HFMA, 2012). If there were savings due to efficiencies in care delivery, these were calculated by the hospital. Incentive payments of up to 25% above Medicare fee schedule rates were shared with physicians (Minkin, 2011). CMS also shared savings with Medicare beneficiaries by reducing premiums. CMS paid Medicare beneficiaries 50% of its savings, up to a maximum of the beneficiaries' part B premium (CMS, 2011a).

### **Effectiveness evidence**

Urdapilleta et al. (2013) provide a summary of cost, quality, and severity indicators over the course of the ACE demonstration. First, the authors assessed the dollar value of non-acute hospital services and post-acute care services provided in the demonstration hospitals relative to a control group that did not have bundled care demonstrations. They controlled for individual- and hospital-level characteristics in this assessment. For carrier costs during an inpatient episode, there was a \$400 (2008 USD) increase in the value of services delivered at ACE demonstration hospitals per hip and knee episode. There were no significant differences in the value of services provided in post-acute care. Overall, the authors estimate that the net per episode savings to Medicare for hip and knee procedures were \$265. Due to the high volume of hip and knee procedures (4,363 episodes of care), this amounted to total savings of \$1,155,891 across all the participating sites.

In their descriptive analysis comparing pre- and post-implementation quality metrics, the authors found statistically significant improvements in a number of quality of care indicators (i.e., post-operative physiologic and metabolic derangement, postoperative strokes, 30-day post-surgery mortality, 30-day readmissions, and discharges to acute care hospital transfer or post-acute care facilities). Meanwhile there were declines in other quality indicators (i.e., postoperative hemorrhage or hematoma and postoperative sepsis). When these outcomes were evaluated in a context where individual- and hospital-level characteristics were held constant, there were few significant quality differences between the demonstration group and a control group that did not use a bundled care approach. Evidence from these regression models indicated that patients in bundled care demonstrations for hip and knee had a shorter length of stay and a smaller likelihood of being over age 75, which was a severity measure (Urdapilleta et al., 2013).

Overall, the authors concluded that ACE sites maintained their quality of care levels without any systematic changes in the type of patients that they admitted or clinical outcomes. The lack of significant findings could have resulted from high pre-demonstration quality levels.

The authors also note that qualitative evidence pointed to some process improvements. From interviews with stakeholders at each of the demonstration sites, the authors concluded that there were improvements in coordination of care across the hospital system at ACE sites. These improvements were the result of standardizing operating processes and materials. Stakeholders attributed the bulk of cost savings to this standardization, which enabled managers and physicians to negotiate reduced prices for implants and materials. Stakeholders also mentioned other sources of cost savings, such as central supply, decreased length of patient stay, and utilization of physician consultations. Finally, stakeholders noted that volume and market share were not significantly affected by the demonstration, an observation that was confirmed by Medicare claims data (Urdapilleta et al., 2013).

### **Key lessons learned**

Stakeholders have identified a number of implementation facilitators and challenges experienced during the ACE demonstration. One commonly cited facilitator is physician involvement and leadership early in the design and implementation process (Urdapilleta et al., 2013). To ensure physician support of bundled care systems, appropriately structured gainsharing is important. Further, in early stages, physician may be more willing to participate in these programs if hospitals and health systems are willing to absorb downside risk initially (HFMA, 2012). Transparency of quality and cost data, for instance through physician report cards, was also important in facilitating discussions between physicians and administrators. Finally, patient navigators, or specialized case managers, were instrumental in bridging the gaps in care coordination, monitoring patient progress prices, and identifying outlier patients (Urdapilleta et al., 2013).

There were also a number of implementation challenges identified by ACE stakeholders. Lags in data collections were a key challenge for identifying outlier cases, and the introduction of real-time interactive electronic dashboard systems were important in overcoming this challenge (Urdapilleta et al., 2013). However, the latter raises the important issue of the significant administrative costs of the ACE program. These costs need to be balanced against any expected shared savings from bundled payment arrangements (HFMA, 2012). Issues with respect to gainsharing were also raised. Some physicians were not comfortable with the concept, while non-physician staff who also contributed to cost-savings did not have access to these incentives (Urdapilleta et al., 2013). The introduction of protocols for these arrangements was important in overcoming these issues.

## **4.2 GEISINGER HEALTH SYSTEM'S *PROVENCARE* CARDIAC ARTERY BYPASS GRAFT SURGERY**

### **Program Overview**

Geisinger Health System (GHS) is a physician-led non-profit, integrated delivery system that consists of tertiary and community hospitals, outpatient facilities, and approximately 60 community practices across Pennsylvania (Lee et al., 2012). In 2006, GHS introduced a global episode price for elective CABG surgery that included a 90-day warranty. Under this model, called *ProvenCare*, GHS charges a global episode price for bypass surgery which covers: 1) preoperative evaluation and work-up; 2) hospital and

profession operative fees; 3) routine post-discharge care (e.g., smoking cessation counseling and cardiac rehabilitation); and 4) management of any related complications occurring within 90 days of surgery (Paulus et al., 2008). The choice to apply the *ProvenCare* system to CABG procedures was made due to observed variations in processes of care which could be improved by recently updated evidence-based care guidelines. GHS had enough historical case volume and data to predict the rates of occurrence of adverse events and measure the impact of reengineered care processes (Casale et al., 2007).

GHS began developing *ProvenCare* in 2005. Based on the 2004 *American Heart Association/American College of Cardiology Guidelines for CABG Surgery*, 40 verifiable care processes were created and integrated into GHS's electronic health record (EHR) (Berry et al., 2009). For each case, surgeons must ensure that the surgery is appropriate, document a shared decision-making process with the patient, and initiate post-discharge follow-up to ensure compliance with medication and rehabilitation recommendations (Mechanic & Altman, 2009). The patient role in postoperative care is emphasized through a signed agreement wherein patients commit to communicating with providers, involving caregivers in their health plans, and completing after-surgery care (Community Catalyst Inc., 2008). GHS has developed similar models for hip replacement surgery, cataract surgery, bariatric surgery, spinal surgery, percutaneous coronary interventions, perinatal care, as well as a number of chronic diseases (e.g., diabetes, coronary artery disease, congestive heart failure, and kidney disease), though these do not include the 90-day "warranty" approach.

### **Funding overview**

Figure 3 outlines the funding model for *ProvenCare*. The insurer pays GHS a flat fee based on a two-year historical comparison group. The payment bundle includes the estimated cost of a typical hospitalization plus 50% of the average cost of post-acute care for the 90-days after surgery (Paulus et al., 2008). This discount of 50% from the average postoperative costs reflects GHS's goal to substantially reduce readmissions with process improvements. If GHS is able to reduce post-acute care costs by more than the negotiated rate, then these savings are profits for GHS. However, if GHS does not meet this target, the health system bears the full financial risk of increased or unchanged rates of complications (Paulus et al., 2008). GHS pays physicians a salary, and up to 20% of compensation for physicians is tied to GHS's strategic vision. For instance, 40% of this compensation is linked to quality of care. As such, physicians have incentive goals that are consistent with GHS's strategic aims (Lee et al., 2012).

### **Effectiveness evidence**

Casale et al. (2007) compared financial, process, and clinical outcomes for a group of elective CABG GHS patients in 2005 (i.e., prior to the implementation of *ProvenCare*) to all elective CABG patients treated within GHS in the year following the implementation of *ProvenCare*. With respect to financial outcomes, the authors found that average length of stay decreased by 16% after the program was introduced and that hospital readmission rates fell 15.5%, though these findings were not statistically significant. These changes may have contributed to the 5% decrease in hospital charges observed over the study period.

The evidence surrounding process improvements was more robust. Before the program was introduced, 59% of elective CABG patients received all 40 elements of the *ProvenCare* process. Three months after the program was introduced, 100% of patients were receiving all elements, and this was maintained by the end of the observation period. This trend was statistically significant and was reflected in surgeons

earning 100% of their incentive compensation for quality of care improvements. While these process improvements appeared to translate into improvements in clinical outcomes (e.g. a decrease in patients with complications, intensive care unit re-admittance, and pulmonary complications), the only statistically significant improvement was observed in discharge-to-home rates. Prior to the program, 81% of patients were discharged to home, versus 90% after the program was implemented.

It is important to take some factors into consideration when interpreting these results. First, this study had relatively small sample sizes compared to other bundled care program evaluations (i.e., 137 patients in the control group versus 117 patients in the treatment group). The analysis also did not control for potentially confounding factors, though a comparison of demographic, risk factor, and morbidity characteristics of the two groups did not indicate that there were significant differences with respect to these characteristics. Finally, the study did not use a control group to determine whether observed changes over time were due to unobserved time-varying factors. The lack of a comparison group followed over the same time period makes it difficult to determine whether any improvements in outcomes can be causally linked to the *ProvenCare* program.

### **Key lessons learned**

There are a number of unique features of GHS that have facilitated implementation of *ProvenCare*. One of the key success factors for GHS has been the ability to align incentives – both financial and nonfinancial – of physicians and the health system. Up to 20% of compensation for GHS physicians is predicated on achievement of predefined goals, including measures of clinical care quality. This compensation scheme, along with its group practice model and significant physician involvement, enables GHS to align incentives in ways that traditional health care organizations cannot (Paulus et al., 2008).

Another key feature of GHS was the early adoption of a system-wide electronic health record (EHR). In place since 1995, the EHR is one of the keys to large-scale clinical process redesign (Berry et al., 2009). To facilitate process flow and adherence to process standards, for instance, a document flow sheet is contained within the EHR. This includes a series of questions that facilitate compliance with specific recommendations and generates automatic orders based on clinicians' answers to questions in the process flow (Berry et al., 2009). GHS notes that being an integrated health system has enabled the development of the integrated electronic systems, which would not be possible for many freestanding physician practices and small independent hospitals (Paulus et al., 2008). The EHR also contributes to patient and partner engagement, as both have direct access to some electronic health information (Paulus et al., 2008). Patient engagement is also strongly encouraged during the postoperative phase with the signing of a "Patient Compact". This contract documents the commitment of the system, patient, and caregivers to adhere to established best practices (GHS, 2010).

## **4.3 DUTCH BUNDLED PAYMENT FOR INTEGRATED CHRONIC CARE**

### **Program overview**

In 2007, the Netherlands Ministry of Health, Welfare and Sport implemented a pilot program that bundled payments for diabetes care. Since 2010, the Ministry has implemented this pilot as an ongoing payment program nation-wide and expanded the program to include cardiovascular risk management and chronic obstructive pulmonary disease (COPD) (Busse & Stahl, 2014). This overview focuses on the diabetes

bundle which has been in place for the longest period of time. The basic patient services that are covered in the diabetes care bundle are determined at the national level and codified in the *Dutch Diabetes Federation Health Care Standard* for type 2 diabetes. These guidelines are approved by all national provider and patient associations and outline the activities to be provided for generic diabetes care, though not who is to provide them or by what means they will be provided (Struijs & Baan, 2011).

Care is coordinated by a “care group”, which is a newly formed actor in the health care system consisting of multiple care providers. Care groups are often owned by general practitioners (GPs) who may deliver the care themselves or subcontract to other health care providers (e.g. other GPs, laboratories, dieticians, and specialists) to deliver the necessary services. Care groups are comprised of between three and 250 GPs. As of 2012, there were 97 diabetes care groups across the Netherlands, each caring for between 400 and 22,500 patients (Campmans-Kuijpers et al., 2012). The care groups assume both clinical and financial responsibility for all assigned patients (Struijs & Baan, 2011). Contracts between the insurance company and the care group specify the obligations of the care group to provide performance indicators for both processes and patient outcomes (de Bakker et al., 2012a).

### **Funding Overview**

Figure 5 provides an overview of the funding process for the Dutch chronic disease bundled payment system. In the Netherlands, health insurers are responsible for running the statutory health insurance system. These insurers pay a single fee to the care group, which is the principal contracting agency. Care groups then subcontract with other health care providers to deliver the necessary services. This effectively divides the health care purchasing market into two segments. In the first segment, the price for each bundle is negotiated between the insurer and the care group which can lead to different prices for different care groups. These negotiations between insurers and care groups generate significant price variations between care groups, serving to promote competition-induced quality improvements on the basis of the performance measures outlined in the national standards (Tsiachristos et al., 2013a). In the second segment, the fees for the sub-contracted providers are negotiated between the provider and the care group (Busse & Stahl, 2014).

### **Effectiveness Evidence**

Struijs et al. (2012a) compared the costs of diabetes patients in bundled care payment programs with those who received care as usual. These costs included general practice costs (i.e. nursing, diabetes-specific costs, consultation fees and capitation allowances, and bundling fees), costs of specialist care, and other costs (i.e., non-medical practitioners, pharmacy, medical aids, patient transport, and mental health care). Between 2008 and 2009, the health care costs of patients in the bundled payment group increased by €88 more than those in the usual care group. This difference was statistically significant. Although those in bundled care programs were 25% less likely to see specialists for diabetes-related care (resulting in savings of €6 per patient), total specialist costs increased for bundled care patients (resulting in €42 higher costs than usual care). The authors concluded that it is difficult to ascertain what the cost effects of the program will be in the longer term, as these costs are likely reflective of a “start-up phase”. Indeed Tsiachristas et al. (2014) found that development and implementation costs vary significantly across care groups. For instance, larger organizations that had a high level of care and more patients prior to implementation had relatively low development and implementation costs.

Struijs and colleagues also conducted analyses evaluating quality of care and care processes, finding mixed results (Struijs et al., 2012b). The authors found statistically significant increases in the percentage of patients with systolic blood pressure below 140 mmHg and the proportion of patients meeting cholesterol targets. Meanwhile, there was a small but significant increase in the average HbA1c level, while body mass index remained unchanged. These changes cannot be causally linked to the bundled payment program, as the analysis did not compare the outcomes for individuals within the bundled care program to a similar group of individuals from outside the bundle. The majority of the outcome evidence for this program has focused on process measures, and this evidence points to mild to moderate improvements in guideline adherence. In the second and third years of the program, HbA1c, body mass index, and blood pressure were checked in more than 90% of patients. There were also statistically significant improvements for indicators for foot examinations, kidney function testing, and cholesterol testing between the second and third years, though not for eye examinations (Struijs et al., 2012b). Although these overall process indicators showed overall improvement, there was considerable variation in process measures between care groups.

### **Key lessons learned**

There has been substantial growth in the number of diabetes care groups throughout the Netherlands, and this has been partly attributed to the relatively minimal legal and reporting requirements and low initial levels of investments. Most providers continue to work in small and medium-sized practices once they are part of care groups (de Bakker et al., 2012). However, these minimal reporting standards have resulted in underdeveloped quality reporting for care groups, and there is substantial variation across regions in the reported quality of care (de Bakker et al., 2012). There are also transparency issues with respect to the care group arrangement. Process indicators are provided at the aggregate level and IT systems are relatively underdeveloped (Tsiachristas et al., 2013a). Insurance companies have expressed concerns that due to the lack of individual level data, they are not aware of which services are being provided and whether there is double funding of some services (de Bakker et al., 2012). Further concerns about the potential for cherry picking patients or referring costly patients unnecessarily to hospital settings to protect the care group budget have also been raised (Tsiachristas et al., 2013a).

Within care groups, there are concerns about patients with multi-morbidities. Reimbursing subcontractors for patients who have more than one chronic condition covered under different payment bundles has created administrative difficulties. Some subcontractors have also expressed concerns that there is a conflict of interest for the GPs who commission their services while also providing care themselves (de Bakker et al., 2012). As the care groups continue to grow larger, there is an increased risk that associated health care providers will identify less strongly with the care group. This raises questions about what the optimal care group size is to reap the benefits of economies of scale and whether having too many providers within a region in one care group creates excessively strong negotiating powers for these groups (Struijs et al., 2012b). Indeed evidence points to regions with fewer care groups having higher prices (de Bakker et al., 2012).

## 4.4 PROGRAM OF ALL-INCLUSIVE CARE FOR THE ELDERLY (PACE)

### Program overview

The Program for All-inclusive Care for the Elderly (PACE) is a community-based Medicare program for adults aged 55 and over who would otherwise need nursing home level care (Meret-Hanke, 2011). It is a capitated benefit that was made a permanent entity within the Medicare program in 1997. The aim of the program is to allow individuals to continue living at home while receiving medical and social services. PACE services are coordinated by and organized around an adult day health center. This center functions much like a geriatric outpatient clinic with primary medical care and ongoing clinical oversight and management (Kodner & Kyriacou, 2000). PACE's multidisciplinary teams provide a comprehensive set of services (i.e., preventive, primary, acute and long term care services) and meet regularly to evaluate each enrollee's needs and design a care plan (Mukamel et al., 1998). PACE provides all of the care and services covered by Medicare and Medicaid, as well as additional medically-necessary care and services not covered by Medicare and Medicaid (CMS, 2008). These services include primary care services (i.e., doctor, nurse, and recreational therapy), emergency services, hospital care, home care, dentistry, laboratory/x-ray services, meals, specialty services, nursing home care, nutritional counseling, prescription drugs, and occupational or physical therapy (CMS, 2011b). As of 2015, there were 114 PACE programs operating across 32 states in the United States (National PACE Association, 2014).

### Funding overview

The funding model for PACE is outlined in Figure 4. PACE sponsors are paid monthly capitated Medicaid and risk-adjusted capitated Medicare payments for each eligible enrollee. The majority of PACE enrollees are dually eligible for Medicaid and Medicare (Meret-Hanke, 2011). Medicare-eligible participants who are not eligible for Medicaid pay monthly premiums out-of-pocket equal to the Medicaid capitation amount, but no deductibles or co-insurance (Petigara & Anderson, 2009).<sup>1</sup> CMS pays PACE sponsors, who are responsible for delivering care through their network of providers and for setting targets for the program. Although targets are set by the sponsors, PACE organizations submit clinical and administrative monitoring data to CMS and the State. The sponsors must be not-for-profit organizations and assume all the financial risk for participants' care without limits on the amount, duration, or scope of services (WICHE, 2009).

### Effectiveness evidence

White (1998) evaluated the PACE demonstration project using data collected on PACE participants and a similar group of non-participations between 1995 and 1997. Controlling for individual and site-specific factors, the author found that the Medicare capitated payment was 38% lower in the first six months of enrollment compared to projected fee-for-service costs in the absence of PACE. For the second six months of enrollment, the Medicare capitated payment was 16% lower than the projected fee-for-service costs (White, 1998). Over the full year period, this implied total savings to Medicare of \$6.9 million (USD 1998). In a concurrent quality evaluation, Chatterji et al. (1998) found that these cost reductions were not the result of a decrease in quality. Net of individual and site-specific factors, PACE enrollees reported better health status and quality of life relative to the comparison group, as well as less deterioration in physical

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<sup>1</sup> The Medicaid program contributes approximately two-thirds of the capitated payment per enrollee. Given the high out-of-pocket costs that non-Medicaid recipients would have to cover, the rate of enrollment for these individuals is very low (Petigara & Anderson, 2009).

function. PACE enrollees also had lower nursing home utilization and in-patient hospitalizations than the comparison group. Overall, PACE enrollees were 50% less likely than the comparison group to have had one or more hospital admissions. Enrollees with a high number of Activities of Daily Living (ADL) limitations experienced the most marked decreases in nursing home day and in-patient hospitalization, and the greatest improvements in self-reported quality of life. Subsequent to these evaluations, Meret-Hank (2011) matched PACE enrollees with similar non-enrollees and concluded that PACE effectively controls hospital use, with PACE enrollees spending an average of 0.2 days in the hospital per month alive compared with 0.8 days for the control group.

There have also been a number of studies assessing the association between program-specific factors and participant outcomes. Mukamel et al. (1998) found that more mature programs had a stable average disability level over an 18 month period, while younger plans did not, an indication that younger programs were still learning about the best treatment for enrollees as well as about identifying the types of patients that were best suited for their program. Mukamel et al. (2006) explored the association between team performance and risk-adjusted health outcomes. The authors found that better team performance was associated with better survival and short-term (three month) and long term (12 month) improvements in functional status and urinary incontinence. Mukamel et al. (2007) found that a number of additional program characteristics were associated with functional outcomes (e.g. having a medical director who was a trained geriatrician; having more effective teams; having more aides than professional staff; and having a larger and older program)

### **Key lessons learned**

Despite being in place for over 20 years, PACE is still relatively small, and its growth has been slower than expected. Several reasons for this have been cited. First, PACE remains unaffordable for most middle-income individuals who do not qualify for Medicaid (Petigara & Anderson, 2009). There have been attempts to work with long-term care insurers to classify PACE as a policy benefit, but there are few examples of this approach being successful (National PACE Association, 2013). Second, a lack of marketing has been cited as a reason for many older adults and their families remaining unaware of PACE (Lynch et al., 2008). Third, Medicaid budget shortfalls have led some states to place enrolment caps on existing PACE sites, which has been a further barrier to growth (National PACE Association, 2013). Along similar lines, start-up costs for PACE programs are extremely high. These costs were heavily subsidized initially – more than 70% of start-up funding for the first eight demonstration projects was from national foundations. However, this funding is no longer available, and new programs have become increasingly dependent on sponsoring organizations for their initial funding until enrollment is sufficient to cover operating expenses (Gross et al., 2004). Non-profit providers lack the resources to expand existing and start up new PACE sites, while for-profit providers have chosen not to enter the market, likely due to the tight operating margins experienced by current PACE sites (Lynch et al., 2008).

PACE is still working to find solutions to some of its more common complaints. For instance, some enrollees have complained about the use of the adult day health centres and the perceived loss of autonomy in choosing their primary care provider. PACE has attempted to adapt its services with models that allow care to be provided in individuals' homes and also tries to work with community physicians to integrate them into the multi-disciplinary care team (National PACE Association, 2013). The PACE program is also now able to contract out medical services, so some sites have accommodated member preferences through arrangements with client physicians on a fee-for-service, contract, or partnership basis (Lynch et al., 2008).

## 4.5 PIONEER ACCOUNTABLE CARE ORGANIZATION MODELS

### Program overview

CMS implemented the Pioneer Accountable Care Organization (ACO) model in 2012. An ACO is an organization of health care providers that is accountable for the quality, cost, and overall care of a group of Medicare beneficiaries for whom the professionals in the ACO provide the bulk of primary care services (CMS, 2010). The Pioneer ACO program aims to achieve better coordinated care and lower costs through the use of a shared savings and, for some, shared losses programs (Cassalino, 2014). In the first two years of the program, participating ACOs are compensated using a shared savings payment policy. Providers are still compensated on a fee-for-service (FFS) basis; however, ACOs that lower the growth rate of their health care costs while meeting specified quality of care standards receive a shared savings payment (Department of Health and Human Services (DHHS), 2014). More experienced ACOs can participate in programs with shared losses, which provides the opportunity for a higher share of savings.

ACOs are legal entities that contract with CMS. They can range from physicians and other professionals in group practices/networks of practices to hospitals employing physicians and other professionals (CMS 2010). Each ACO must serve a minimum of 5,000 beneficiaries, have a legal structure in place to receive and distribute shared savings, and have defined processes to promote evidence-based medicine and report on quality and cost measures (CMS, 2010). Initially, 32 organizations across 18 states participated in the Pioneer ACO program, and 19 continue to participate to date (Pham et al., 2014). ACOs have been compared to the Dutch chronic disease management programs because they are practitioner-led legal entities that serve as primary contractors in charge of coordinating and delivering care. However, unlike the Dutch care groups, ACOs are not yet fully accountable financially, and patient selection for ACOs is based on patterns of health care utilization, as opposed to diagnosis (de Bakker et al., 2012).

### Funding overview

The funding overview for the Pioneer ACO Shared Savings Program is outlined in Figure 6. CMS continues to pay ACOs on a FFS basis; however, they also calculate a benchmark for each agreement period using the most recent available three years of per-beneficiary expenditures for Medicare FFS beneficiaries assigned to the ACO (DHHS, 2014). The benchmark is adjusted for beneficiary characteristics, risk adjusted, and updated yearly by the projected national per capita expenditure growth for Medicare services (DHHS, 2014). Based on this projected measure of expenditures, lower Minimum Savings Rates (MSR) are established. If this MSR is exceeded and quality standards are met, the ACO is eligible to share in savings of up to 50% based on quality performance. A similar concept is applied in cases where there are shared losses, although the ACO may earn a sharing rate of up to 60% (DHHS, 2014). These shared savings are then distributed by the ACO to ACO members according to a distribution formula developed by the ACO. Of the original 32 Pioneer ACOs, 12 have qualified for shared savings, one shared in losses, and 19 did not share in savings or losses (McClellan et al., 2014).

### Effectiveness evidence

An evaluation of the first year effects of the program found that average spending was \$20 less per Medicare beneficiary assigned to an ACO relative to a group of FFS beneficiaries, but cost differences varied across ACOs (L & M Policy Research, 2013). For 23 out of 32 ACOs, there were no significant

differences in cost growth between FFS and ACO beneficiaries, while eight ACOs had significantly lower spending growth, and one ACO had significantly higher spending growth. In the first year, the Pioneer ACO model resulted in \$147 million in total program savings (L & M Policy Research, 2013). More recently, McWilliams et al. (2015) found that in the first year there was a 1.2% reduction in spending for ACO beneficiaries relative to a FFS control group. These savings were from acute inpatient, hospital outpatient, and post-acute care. Meanwhile, spending on outpatient care in office settings increased for the ACO group. Savings were greater for ACOs with baseline spending above the local average and for those serving high-spending areas. Savings were similar in ACOs that ultimately withdrew from the program. According to CMS estimates, ACOs achieved 0.45% lower per capita growth than Medicare beneficiaries not attributed to ACOs, resulting in total model savings of \$96 million (CMS, 2014).

CMS also tracks 33 quality metrics pertaining to patient/caregiver experience, care coordination/patient safety, preventive health, and biometric screening for chronic conditions. ACOs showed improvements in 28 of these measures, but these changes were not tested for statistical significance or evaluated relative to a comparison group (CMS, 2014). McWilliams et al. (2014a) addressed these concerns in their analysis focusing on patient experiences. Comparing Medicare ACO beneficiaries' experiences to a control group of FFS beneficiaries, the study found significant improvements in patients' reports of timely access to care and their primary physicians being informed about specialty care. There were no significant improvements in patients' rating of physicians, interactions with physicians, or overall care. Among patients with multiple chronic conditions and high predicted Medicare spending, overall ratings of care differentially improved in the ACO group relative to the control group. The authors concluded that these improvements were in areas that were more readily modified by organizations and among patients more likely to be targeted by ACO efforts to improve care quality and control utilization. More recently, McWilliams et al. (2015) found that changes in performance on quality measures in the ACO group suggested small significant improvements (e.g., for preventive services), or no significant changes.

### **Key lessons learned**

One of the key challenges identified by ACOs was the lack of predictability with respect to the standards to which ACOs are being held accountable. Benchmarks are partly determined based on Medicare trend data which are not available to ACOs as they become operational. Further, these benchmarks reflect national cost growth rates, as opposed to regional rates, raising concerns amongst ACOs in areas with higher intrinsic growth rates (McClellan et al., 2014). Performance measures also place a significant administrative burden on ACOs and require investments in new support technology. Further administrative burdens arise with multi-payer ACOs, as there is poor alignment between Medicare and commercial ACO quality reporting requirements (McClellan et al., 2014). Smaller ACOs especially struggle with costs for these administrative requirements. The average start-up cost for an ACO is estimated to be \$2 million due to the significant upfront costs of practice and infrastructure transformation. While some smaller and rural ACOs have received upfront funding from CMS, this was not the case for all ACO programs. These advance payment ACOs, however, were more likely to achieve shared savings than other physician-led ACOs (McClellan et al., 2014).

ACOs have also had challenges relating to beneficiary engagement. When these individuals seek care outside the ACO, the ACO does not always aware of this and does not have the data to determine how care coordination can be improved. This issue of patient "leakage" is quite substantial in ACOs (McWilliams et al., 2014b) and leads to challenges in achieving organizational accountability for the ACOs. Efforts are being made to engage patients by making them more aware of the benefits of an ACO.

# Section 5: What are the challenges and enablers of care redesign?

In this section, we identify a number of challenges faced by programs that have already been implemented and discuss some of the potential enablers for successfully overcoming these challenges. We draw on the case studies discussed above, as well as literature that focuses on implementation lessons and advice for health systems considering bundled payment programs.

## 5.1 WHICH CONDITIONS SHOULD BE BUNDLED?

### The Challenge

Deciding which conditions to bundle and subsequently defining an episode of care is complicated, and this is evidenced by the diversity of pilot programs underway testing different types of procedure- and disease-based bundles, time horizons, and reimbursement methods. Even for relatively straightforward time-limited, procedure-based bundles, it can be challenging to determine which services should go in a bundle. For example, in a bundle for CABG surgery that includes a post-acute time period, the inclusion of readmissions for a complication that might have occurred in the absence of surgery (e.g. pneumonia or congestive heart failure) is not so straightforward (Birkmeyer et al., 2010). It is even more challenging to determine a clear beginning and end date to define episodes for chronic conditions, with further complications arising due to the high incidence of co-occurring conditions amongst patients with chronic diseases (O’Byrne et al., 2013). These factors make it difficult to incorporate the ongoing costs associated with chronic disease into one bundled payment and may also lead to compartmentalized care for patients with co-occurring conditions (Tol et al., 2013). For instance, in a diabetes bundle, one has to make difficult judgments about the extent to which treatment for circulatory, neurologic, or vision issues should be included in a bundle (McClellan, 2011).

### Enablers for Success

Variability in cost, outcomes, and utilization are important considerations when deciding what services should be bundled. Episode-of-care payment is best applied where there is high variation in the cost between providers but similar costs and outcomes of episodes among similar patients within providers (Miller, 2009). Significant variability in costs that is not associated with patient characteristics or outcomes is an indication of inefficiency and suggests the potential for cost savings without compromising patient outcomes (Sood et al., 2011).

Having widespread consensus on best practices is a key enabler for bundling care and payment. Both the *ProvenCare* CABG bundle and the Dutch diabetes bundle were developed based on recently established national guidelines for CABG surgery and diabetes treatment, respectively. Creating practice protocols based on standardized guidelines developed with multi-stakeholder input was instrumental in ensuring acceptance of what was included in an episode (Casale et al., 2007; de Bruin et al., 2011; O’Byrne et al., 2013). With evidence-based protocols as a foundation, bundled payments can contribute to making services that vary with respect to cost and quality more standardized and predictable. As outlined previously, this is especially the case when there are easily definable cycles of care. However, even when selecting easily

standardized services with high variability there can be substantial random variation in patients' needs which influences costs. For this reason, high volume services have typically been selected for bundling, as random variation is less likely to create unexpected losses or gains for provider groups and payers.

The combination of a high degree of cost variation and available guidelines for standardized care across all patients is one reason why inpatient surgeries have been targeted for inclusion in bundled payment pilots. In a study exploring cost variation for CABG, back surgery, hip fractures, and colectomies in the Medicare population in 2005, Birkmeyer et al. (2010) found substantial differences between the lowest and highest payment quartiles for all procedures. Payments to hospitals accounted for the largest share of variation, with 30-day readmissions and post-acute care payments also varying significantly. Bundled payments could provide an incentive towards quality improvement in these types of cases.

## 5.2 ENSURING A HIGH QUALITY OF CARE

### **The Challenge**

While the intent of bundled care programs is to increase the quality of care for bundle of services, there is the possibility that bundled payment may actually reduce quality. Though we did not identify specific examples of this in the case studies we explored, bundled payments can create incentives to skimp on care within a given bundle of services. Bundled payments also do not address quality concerns about service provision that extends beyond the time horizon of a given bundle. For instance, hospitals could minimize investments associated with safer surgeries (e.g. the quality and quantity of nursing staff) or better long-term outcomes (e.g. higher quality but more expensive joint prostheses) (Birkmeyer et al., 2010). Quality monitoring is important to safeguard against reductions in quality, and as outlined in Section 4, these have been implemented to varying degrees. A further quality concern for bundles that extend into post-acute services revolves around the balance between maintaining versus reducing one's referral network. The potential reduction in the number of providers within a hospital's or provider group's referral network may negatively impact patient experience (Sood et al., 2011). This was cited as an issue with the PACE program in cases where patients were no longer matched with their provider of choice. However, without this reduction, a hospital or provider group would have limited ability to reduce patients' use of more expensive services or less efficient post-acute providers (Sood et al., 2011).

### **Enablers for Success**

When designed to improve value, bundled payment programs should include clear quality metrics focused on desired clinical outcomes that providers must achieve to maximize their payment (Delbanco, 2014). Reporting on quality metrics is a minimum expectation of payers for all the reviewed programs, but there are important considerations with respect to the rigor and type of reporting. Some provider groups have noted that too much emphasis on process, as opposed to clinical, outcomes is not as meaningful for evaluating the success of these programs. For instance, the Dutch chronic care bundle has focused heavily on process measures, making it difficult to assess patient outcomes. ACO participants have also noted that the quality metrics which they must report may not be reflective of appropriate patient care and focus heavily on process measures. It is also important that quality measures address the potential for skimping on care outside a given bundle. Concerns about this have led to the adoption of quality measures that go beyond a particular provider or setting. For instance, quality measures for diabetes might

include how well-controlled blood sugar is and overall patient experience (McClellan, 2011). Given the administrative burden of tracking and reporting quality outcomes, it is important to focus on the most meaningful measures, to be as parsimonious as possible, and, in cases of multiple payers, to align reporting expectations (McClellan et al., 2014).

Quality reporting is often tied to payments for episodes of care. Quality-based adjustments are being used by CMS to calculate the savings shared with ACOs as well as with *ProvenCare's* CABG bundle to reimburse participating physicians and ensure adherence to evidence-based medicine. GHS has built in further quality controls by incorporating care protocols and process flow into its EHR. Standardizing clinical processes helps to ensure improvement and consistency in outcomes, and requiring these standards to be met in order to receive payment is an important safeguard against poor quality (Delisle, 2012). Finally, public reporting on quality measures, particularly for disadvantaged populations, may be another way to ensure quality (Miller, 2009). Currently, outcomes for participating CMS bundled payment demonstrations and ACOs are publicly reported and available on a yearly basis.

## 5.3 PRICING BUNDLES

### **The Challenge**

Determining an appropriate price for a bundle of services requires a significant amount of data and involvement from multiple stakeholders. Competitive pricing will represent a discount from fee-for-service payments and help to ensure saving opportunities; however, providers, have to be convinced that the price is fair. Setting a price too low may result in limited provider buy-in because providers face financial losses or else lead to underutilization of care. Setting a price too high, meanwhile, will reduce incentives for providers to enhance efficiency. For most bundles, the basis is on historical costs, but other factors such as shared savings and putting in place a structure to allocate savings and coordinate care also have to be considered (Delisle, 2012). In particular, the implementation costs for bundled payment programs, especially those without system-wide EHRs in place, can be substantial, and ways to incentivize participation in the face of these costs need to be considered.

### **Enablers for Success**

Transparency and accuracy in cost estimates are central to setting an appropriate price for a service bundle. The best prepared hospitals and provider groups will enter into negotiations with payers after gaining an in-depth understanding of their costs over a typical care episode. Time-driven activity-based costing can be used to measure costs across the full episode of care and involves take a careful inventory of resource needs and usage for each process in a care episode (Witowski et al., 2013). There also needs to be transparency and agreement when it comes to risk adjustment methodology. Some hospitals and provider groups will have disproportionately sicker and more costly patients, and there needs to be consensus that risk adjustment methodology adequately captures these differences across sites (McClellan et al., 2011).

Delisle (2012) outlines four key elements to bundle price setting. First, as outlined previously, high cost outlier patients should be taken into consideration when setting a service bundle price. This can either involve increasing the price to reflect the likelihood of these cases, excluding these cases altogether and making outlier payments for these individuals, or building contingencies such as per diem adjustments for long stay outliers (Sutherland et al., 2012). Second, rewards or penalties based on outcomes of care should

be negotiated when prices are being set, similar to ACOs that receive shared savings based on quality performance. Third, essential services that must be delivered in order for payments to be received should be identified. Fourth, quality measures should be publicly reported. These elements help to ensure both payers and providers are held accountable to each other.

Finally, although average historical costs over a given time period tend to be the basis for setting prices in existing bundled care programs, there are other possibilities for price. For instance, a payer could apply a “best practice” approach to pricing. This would involve determining the expected cost of achieving certain targets and could include additional increments for surpassing these targets (Sutherland et al., 2012).

## 5.4 DATA REQUIREMENTS

### The Challenge

A significant amount of data is required to set an appropriate price for a care bundled and to subsequently track quality and cost outcomes. Setting up a bundle requires detailed historical and administrative data. Further, many bundles require retrospective reconciliation to determine whether all of the patient claims were associated with the bundle, to administer performance adjustments, and to administer risk-adjustments (Painter, 2012). Once a bundle is in place, there are also substantial data requirements to track quality outcomes. The administrative burden associated with these data requirements was a frequently cited challenge for a number of bundled care programs, especially in the implementation phase. As noted previously, the average start-up costs for creating an ACO were estimated to be \$2 million, with a significant portion of this earmarked for IT investments (McClellan et al., 2014). Indeed, GHS attributed the success of *ProvenCare* to its early adoption of a system-wide EHR, which had been in place since 1995 (Berry et al., 2009). Many health systems may not have the benefit of this type of infrastructure.

### Enablers for Success

Comprehensive administrative datasets that capture services across the continuum of care are necessary to create bundles, and as Sutherland et al. (2012) points out, Ontario may be well positioned on this front. Ontario’s health care clinical and administrative databases have the capacity to capture almost all hospital-based care, physician claims, long-term care, and home care for all Ontario residents. This is contrary to more fragmented systems which can suffer from “leakage” of patients who may obtain health care services outside of a given health system (Sutherland et al., 2012). However, ensuring the timely receipt of this data as well as the ability to easily share information from multiple sources with providers may be an issue in the present system. To operate most effectively, provider groups need to understand the spending for which they are accountable during an episode of care, and this entails payers ensuring that providers have the means to track bundle related claims in real time, across multiple settings, including those outside of their purview (Painter, 2012). The receipt of this information in a timely manner is important. Indeed, one of the biggest challenges that ACOs cited was the lagged receipt of information from CMS (McClellan et al., 2014). Payers can keep providers informed by sending reports on a monthly or quarterly basis to help providers get a sense of spending-to-date on the bundle or else through secure websites that display how providers are performing relative to their budgeted bundle rate for processed claims (Painter, 2012).

On the provider side, this data is best processed when there are appropriate IT systems in place. For instance, the use of Admission-Discharge-Transfer notifications that interfaced with patient’s EHR was one

way for ACOs to track patients who had relevant medical events, but not all organizations were equipped with these systems (McClellan et al., 2014). Well-developed EHRs ensure effective communication and coordination between stakeholders, enable the automation of processes, and facilitate the exchange of information (Delisle, 2012). As such, it may be in the payers' best interest to ensure that provider groups have sufficient initial funding to put these programs into place through such initiatives as advance payment models, which provide eligible provider groups with upfront or monthly payments to support their care coordination infrastructure (McClellan et al., 2014). IT systems are discussed in more detail in section 5.5.

## 5.5 INFORMATION TECHNOLOGY

### **The Challenge**

As noted previously, the average start-up costs for creating an ACO were estimated to be \$2 million, with a significant portion of this earmarked for information technology (IT) investments (McClellan et al., 2014). IT plays a central role in bundled payment programs, from the creation of a bundle through to the evaluation of a program. The construction/pricing of bundles, billing and payment distribution, care redesign process, and reporting and quality monitoring of programs are all reliant on IT systems (MITRE, 2011). It is important that appropriate IT strategies be put in place to ensure the optimal performance of a program.

### **Enablers for Success**

To facilitate bundle construction and pricing, there have to be IT structures in place that allow programs to store, manage, and analyze claims data, as well as to ensure data integrity. Existing data warehouses may need to be redesigned to improve the ease and speed with which data can be retrieved and analyzed. GHS provides an example of a health system that has done this successfully by clustering financial, clinical, and billing data together into a single data warehouse (MITRE, 2011). Another way to facilitate bundled care pricing is to use episode groupers. These are specialized software packages that search medical claims and records to determine whether patients meet the criteria of an episode, when the episode began and ended, and whether services were received (American Hospital Association Committee on Research, 2010). To facilitate billing and payments, most hospitals will require billing system adjustments. In many cases, clinical data warehousing tools have been used to combine financial data with data from case management software programs. The most successful systems, such as GHS, have used electronic platforms with computerized physician order entry and clinical decision alerts (MITRE, 2011).

IT systems are especially important for care redesign, and GHS's shared electronic health record (EHR) is a commonly cited reason for its success in implementing evidence based practices. Well-developed EHRs ensure effective communication and coordination between stakeholders, enable the automation of processes, and facilitate the exchange of information (Delisle, 2012). GHS's integration of real-time alerts to inform providers of incomplete steps and flow sheets to track key clinical elements into its EHR helped to automate best practices and ensure consistency of care (MITRE, 2011). EHRs can also be an effective tool in reporting and quality monitoring of bundled care programs. Data pertaining to clinical quality, resource utilization, and practitioner and provider performance are often captured in EHRs, highlighting another critical function of this tool.

## 5.6 RISK SHIFTING AND ITS POTENTIAL EFFECT ON PARTICIPATION

### The Challenge

Bundled payment programs inherently involve shifting financial risk from payers to the recipient of the payment. If a hospital receives bundled payments, its financial risk may increase because it could face increased variation in total costs across patients for new services included in their payment. If provider groups are the recipients of bundled payments, they need to possess the ability to manage the entire risk of an acute care episode (Sood et al., 2011). In either case, this can create disincentives for participation if participation is allowed to be voluntary. A further concern in shifting financial risk from payers to providers is the need for transparency and trust in setting rates of payment and allocating funds. As outlined above, the issue of risk shifting without suitable compensation from the provider perspective was a significant contributor to the Prometheus pilots' inability to execute any bundled payment contracts (Hussey et al., 2011). If the providers do not trust payers to set appropriate rates, providers will not choose to participate in these programs (Burton, 2012).

### Enablers for Success

There are a number of ways in which successful pilot programs have ensured provider buy-in. CMS demonstrations like the ACE demonstrations and the Pioneer ACOs have used a gradual approach to risk shifting, providing options that allow participants to transition from shared savings to shared risk or full risk programs. Shared savings programs enable providers to share in the gains or savings realized from bundling, with the provider bearing no responsibility for costs beyond the bundle price (Painter, 2012). ACOs, for instance, can share up to 50% of savings based on quality performance if they are in the Shared Savings Program. This makes bundled payment programs more attractive to less experienced provider groups while they work through the initial transition phase. Shared risk programs, meanwhile, put the provider at risk for some costs above the negotiated rate and are often paired with higher shared savings rates. The Pioneer ACO program's Shared Savings and Shared Losses program is an example of this and pairs bearing the risk of losses with a higher shared savings rate (i.e., 60%).

Ultimately, shared savings and shared risk arrangements are meant to help transition provider groups to full financial risk models. Under full risk arrangements, the provider takes on all costs above the negotiated rate but also retains all the savings realized (Painter, 2012). Pricing and risk mitigation (e.g. for outlier patients) are key factors to encourage provider buy-in and are discussed in more detail below; however, provider leadership and involvement in the early stages of development are also essential. Physician group involvement in translating evidence-based medicine into clinically meaningful processes was important in ensuring provider buy-in for the Dutch chronic disease management programs as well as Geisinger's *ProvenCare* program. Further, hospital leaders participating in bundled care initiatives in the U.S. indicated that beyond financial incentives, a primary motivation for participation was to be ahead of the learning curve and to be leaders in their market for what many viewed as inevitable payment changes (Draper, 2011).

## 5.7 MITIGATING RISK AND OUTLIERS

### The Challenge

One source of concern for hospitals and provider groups considering participation in bundled payment initiatives is how to deal with complex or co-morbid patients and the potential for associated outlier costs. Indeed, there is good reason to be concerned about taking on these risks without any offsetting policies. In programs where there is not a high volume of cases and where the potential for high cost or outlier cases is not built into the bundle price, random variation in cases can create significant challenges. Hospitals that happen to treat a larger number of high cost outliers in the performance year that were not present in the historical data when a target price was set could lose out significantly (Tompkins et al., 2012). In applying a BPCI model to data from hospitals considering participation in a bundled payment initiative, Tompkins et al. (2012) found that hospitals with fewer than 100 cases could face losses of 17-24% per case (\$4,000-\$6,000) for total joint replacements solely due to random variation. This type of random variation can also work to generate gains for those positively affected by random variation, even if there have not been any efficiency gains. Cram et al. (2014) also found substantial variation in total knee arthroplasty costs in a Medicare population, with cost being highly dependent on patient demographics and comorbidity. The authors note that if similar patients are clustered within hospitals, bundled payments may contribute to certain hospitals being penalized while others disproportionately benefit from bundled payment programs (Cram et al., 2014).

### Enablers for Success

As noted above, outlier cases can have significant implications for hospitals and provider groups partaking in full risk arrangements. Exclusions for some cases based on having complex and costly illnesses (e.g. metastatic cancer) have been suggested as one means of mitigating this risk; however, in an analysis of applicants to the BCPI program, Tompkins et al. (2012) did not find that exclusions meaningfully addressed the problem of random variation. Meanwhile, setting a stop-loss limit at the 90th-95th percentile was found to reduce year-to-year random variation while also reducing the average episode price across participating hospitals (i.e., making this budget neutral for CMS) (Tompkins et al., 2012). Having these types of arrangements in place may help to make full risk arrangements more appealing to those considering participation in bundled care initiatives.

Another important tool is building risk adjustments into price setting. Risk adjustment is commonly used in setting bundled payment prices, and it is important that physicians believe the risk adjustment methodology adequately differentiates sicker, more complex patients from healthier patients. If this is not the case, physicians will have incentives to avoid treating sicker patients (Thomas et al., 2009). For risk adjustments using historical data, there is also the issue of significant changes in the severity of patients between the base period and performance year due to such things as increasing observations stays, introducing new technologies, or expanding specific hospital departments. The impact of these changes can be partly mitigated by including adjustments based on changes in patient severity into the calculation of episode price (Tompkins et al., 2012).

## 5.8 WHO HOLDS THE FUNDS?

### The Challenge

A bundled payment involves a payer providing lump-sum compensation for a bundle of services that often crosses multiple care sectors and many providers. This may lead to uncertainty regarding which entity is best suited to hold and distribute funds, especially for bundles that involve services in both acute and post-acute settings. In some instances, such as the ACE demonstrations, hospitals have been selected to be the fund holders since they control the majority of episode costs, are responsible for the index admission, and have sufficient administrative capacity (Sutherland et al., 2012). However, it may not always be this straightforward. For services provided in post-acute settings, many hospitals lack the ability to track post-acute service costs and care management protocols to guide this care. There may also be concern amongst post-acute providers that their incomes will be subsumed by payments that are managed by hospitals (i.e., that more resources will be allocated to acute care rather than post-acute care) (Goldsmith, 2010). In some instances, such as the Dutch diabetes care management bundle, physician-led groups form legal entities that hold and distribute funds. This can create tensions since some providers' care may be substituted for less costly alternatives. Indeed, this type of substitution is encouraged to decrease costs, but the extent to which quality is affected and the impact on non-physician provider groups has yet to be determined (Tol et al., 2013).

### Enablers for Success

The entity that is ultimately selected to hold and distribute funds must meet some basic requirements. First, they must be able to manage the financial risk associated with a bundled payment (Sood et al., 2011). Second, from an administrative standpoint, there must be mechanisms to collect, allocate, and manage funds. This may involve changes in claims processing procedures that enable the entity to capture bundled payment-appropriate services versus traditional FFS components. These types of changes come with added administrative burdens, and a dedicated staff may be required to sustain operations (Delisle, 2012).

A trusting relationship between payers and providers is integral when considering how funds will be held, and strong clinical governance processes are central to ensuring that this trust is maintained. As noted by Singer and Shortell (2011), historically, payer, physician, and hospital relationships have been strained at times. As such, it is important to ensure that regardless of who is the ultimate fund holder, the interests of hospitals, primary care physicians, and specialists are all balanced when creating governance and management processes to adjudicate differences (Singer & Shortell, 2011). It should be noted that clinical governance and the organization of care processes go beyond simply engaging physicians and should focus on the capacity to improve the overall value of care provided by influencing the quality and types of services provided.

## 5.9 ORGANIZATIONAL STRUCTURE

### The Challenge

The types of organizations that are implementing bundled payments are varied, and certain organizations have been more successful than others at implementing and ultimately sustaining this approach. For instance, the Pioneer ACO demonstration began with 32 demonstration projects, but to date only

19 participants have opted to continue. Along similar lines, although PACE has been a long-standing successful program, it is not nearly as widespread as many would have expected given its outcomes with respect to cost savings, quality of care, and patient experience. The success of GHS's ProvenCare, meanwhile, is widely attributed to its organizational structure. Geisinger has continued to introduce an array of care bundles since the CABG program was first introduced in 2006. It is important to understand the organizational features that differentiate the more successful bundled care programs from those that did not succeed.

### **Enablers for Success**

One of the most commonly cited reasons for the success of *ProvenCare* has been that it was launched in an integrated delivery system. GHS had a competitive advantage with respect to already having in place referral networks and integrated electronic health systems and enabled by a system-wide electronic health record (EHR) (Berry et al, 2011). A further organizational feature that has contributed to the success of *ProvenCare* is the use of salaried physician practices in GHS. This permits the negotiation of the income splits with practitioners and helps to determine who provides which services within a given episode (Goldsmith, 2010). The fact that GHS is a physician-led organization may also have contributed to its success and helped to ensure physician buy-in. The PACE programs provide some evidence that having physicians in leadership positions is important for the success of a program. The most successful PACE programs were those that had practitioners in leadership roles who also spent time in direct patient care. Mukamel et al. (2007) found that PACE programs where the medical director was a trained geriatrician, spent some time in direct patient care, and spent more time at a PACE site had better patient outcomes. The authors also found that better team performance and being part of a larger and older program were associated with better patient outcomes. This was in line with findings from Tsiachristos et al. (2014), which found that larger organizations with a high level of care and more patients prior to implementation had relatively low development and implementation costs in the Dutch diabetes disease management program.

Organizations implementing bundled care programs will have to consider the best ways to coordinate care. PACE is unique in its use of adult day centers around which service provision is centralized. Hiring care managers or hospitalists who are responsible for managing a patient's care during a hospital stay is another possible consideration. In the ACE demonstrations specialized case managers, were instrumental in bridging the gaps in care coordination, monitoring patient progress and prices, and identifying outlier patients. This additional staff can help to implement standard protocols for care management, resolve communication issues, and oversee care handoffs (Goldsmith, 2010).

## **5.10 PHYSICIAN ENGAGEMENT**

### **The Challenge**

All of the cases reviewed in section 4 of this report emphasized the importance of physician engagement. Physicians play a pivotal role in bundling payments because they are responsible for making most treatment decisions and, therefore, directly impact on the costs incurred. Indeed, unless physicians are included in a payment bundle, there is no mechanism to control costs. However, in a recent survey of American physicians, 65% of respondents indicated that they were not enthusiastic about the prospect of bundled payment schemes (Tilburt et al., 2013). Given how reliant these programs are on physician buy-in, strategies have to be put in place to ensure physician engagement in bundled payment programs.

## Enablers for Success

Physicians must be both clinically and financially accountable for a care bundle in order for the program to impact on total costs (Rastogi et al., 2009; Struijs & Baan, 2011). Emphasizing the important role that physicians play in the success of these programs, along with the potential clinical and financial gains from a physician perspective, has been one approach used to engage physicians. For instance, when the Crozer-Keystone Health System (CKHS) began to implement the PROMETHEUS payment approach, CKHS provided physicians with results of applying the PROMETHEUS model to historical claims data (MITRE, 2012). CKHS demonstrated that reductions in potentially avoidable complications (PACs) would improve quality and lead to savings (i.e., additional payments to physicians). From these demonstrations, physicians better understood how bundled payments aligned with their interests of providing high quality care and that they had control over the clinical processes necessary to achieve positive clinical and financial results (MITRE, 2012).

CKHS also organized educational sessions to inform physicians about the importance of improving the value of delivered care, with an emphasis on the importance of systems, teams, and coordination, as opposed to just the individual patient (MITRE, 2012). Other sessions that brought in experts from outside the organization lent credibility and validity to these sessions. For instance, bringing in executives and clinicians from organizations that had previously implemented bundled care programs is an important way to answer physicians' questions regarding operational concerns (MITRE, 2012). Finally, as noted in Section 5.5, physician leaders, both formal and informal, play a central role in ensuring widespread physician engagement (Draper, 2011).

## 5.11 FACTORS WORKING AGAINST COST CONTAINMENT

### The Challenge

Bundled payment arrangements theoretically provide incentives to decrease costs within a given bundle; however, from a health system perspective, they may not necessarily contribute to overall cost containment. For bundles with high economic margins, it is possible that there would be greater incentive for providers to identify an increased number of episodes (Rich et al., 2012). This can have several implications. First, if the initiation of a bundle of care is tied to the diagnosis of an illness or condition, this may result in the overuse of tests or procedures used to diagnose that health condition (Rich et al., 2012). Second, it is possible that episode-based payments could result in gaming or overtreatment of patients to increase the volume of a given episode. This has been a concern of the DRG system in acute care settings, as patients could be “up-coded,” or inappropriately reclassified into a DRG associated with a higher payment rate (Busse et al., 2011). Providers could also engage in “cream-skimming”, or only selecting patients who would be expected to have costs below the payment rate (Busse et al., 2011). For instance, in bundles that include post-acute care, providers could select individuals who are unlikely to require post-acute services (Weeks et al., 2013). The result would be that more complex patients would continue to be treated on a fee-for-service basis, and the costs for treating these less profitable patients would simply be shifted outside of the bundle, either to other parts of the health system or onto the patients and caregivers.

## Enablers for Success

If a bundled payment system operates alongside other payment structures, it can be difficult to ensure that gaming does not occur or that costs are not simply shifted outside of a given bundle. To some extent, the widespread application of robust, evidence-based criteria to an episode definition can help to address some of the risk of overtreatment (Rich et al., 2012). Over-diagnosis and up-coding are somewhat less straightforward. The DRG system, however, provides some important insights into how to avoid some of these potential complications. The U.S. DRG system has a number of instruments in place to help reduce the risk of up-coding. These include careful monitoring with the Hospital Payment Monitoring Program, which measures erroneously allowed payments; the Comprehensive Error Rate Testing program, which monitors allowed payments; the obliged use of grouper software with built-in checks; and a code of ethics and professional standards in education for hospital coders. Regular external and internal audits are also a standard part of other international DRG systems, though the evidence surrounding their effectiveness is mixed (Steinbusch et al., 2007).

## 5.12 TRADEOFF BETWEEN REDUCED TRANSACTION COSTS AND ACCOUNTABILITY

### The Challenge

Transaction costs are costs that are associated with coordinating the production process. These costs can be concrete and observable and fixed or variable, but are also often abstract (e.g., the exchange of information, advice, and comfort) (Stiles et al., 2001). The intent of bundled payment programs is to decrease these costs without diminishing the quality of care by putting processes in place that will transfer information faster and more efficiently, incentivize communication between practitioners, and facilitate the coordination and implementation of medical interventions. For instance, a bundled payment system can reduce transaction costs to the extent that it decreases the need for adjudication of claims and other administrative oversight (Davis & Long, 2013). However, these types of savings need to be weighed against a potential reduction in the ability to track accountability for services. A FFS system allows each service to be tracked to a specific provider and for that provider to be held accountable for the quality of that service. In a context where a group of providers are paid for a bundle of services, it is less clear how to assign accountability and ensure quality for each step in the care process when compensation is provided for an end product (e.g., a year of chronic disease management), as opposed to an individual service. Indeed, the Dutch diabetes management bundle is experiencing this challenge, as its care groups continue to grow larger (Struijs et al., 2012b). With larger care groups, there are concerns that health care providers will not strongly identify with the care group and will, therefore, not feel accountable for the care provided therein.

### Enablers for Success

As noted previously, quality reporting is an important aspect of any bundled care program, and all of the reviewed programs have reporting protocols in place. In particular, there has been an emphasis on process measures as a way of ensuring that the services delivered to achieve the end product do not diminish in quality. An important consideration, though, is that additional reporting requirements create an added administrative burden for provider groups. Because of this added burden, it is important to strike a balance between reporting on process measures that will help payers ensure accountability for each step in the care process and more clinically meaningful outcomes. GHS provides an example of a health system that has

incorporated process flow directly into its EHR as a means of ensuring provider accountability along the spectrum of care. The EHR helps to create a learning health system that enables individual care providers to understand what care has been provided to the patient, the nature of the current patient condition, and the recommendations for next steps. For *ProvenCare* bundles, providers must go through a series of steps based on care protocols, and if they deviate from these protocols they must provide justification for their decisions. Further, the EHR can automatically generate order sets as reminders for providers. Maximizing an EHR in such a way can help ensure accountability throughout the care process.

## Section 6: Conclusions

Bundling care that rightly belongs as part of a single care pathway is a common-sense approach to optimizing care, cost and outcomes. Bundling care and payment offers health care payers an opportunity to align incentives and focus clinicians' efforts on improving quality while maintaining control over costs. This is clearly an appealing outcome. However, it is still early in the evolution of these programs with evidence still emerging.

The extent and focus of the implementation of bundled care and payment can vary widely. In this report we sought to outline the range of options for bundling care, describe what the early adopters have done and achieved, and to highlight lessons to be learned from the early adopters. There are relatively few examples with rigorous evidence of success compared to the number of efforts that have been made to implement care bundles – particularly for programs that include providers from multiple sectors of the health care system. The most successful models reviewed here were implemented in sophisticated environments with robust IT systems, clear quality goals and strong physician engagement, and were inclusive of all related providers. Whether all of these conditions are necessary or sufficient cannot be assured but they are certainly important enabling factors.

Based on the experiences of early adopters, there are a number of important lessons for those considering adopting bundled care programs. Episodes should be chosen carefully and should cover the entire duration of treatment for a specific condition. Bundles should include all payments to all providers within a given time period. In particular, physician payment should be included in a bundle, as physicians make most of the decisions about care provided to patients. Ensuring physician engagement is key to the success of a care bundle, and this has been achieved through financial incentives, early involvement of physicians in the creation of a bundle, and clinical governance systems that take into account both provider and payer perspectives.

The most suitable opportunities to improve care by bundling services occur when within-provider variation for similar patients is low because patients with similar conditions are treated similarly by their provider, but between-provider variation for similar patients is high. Risk adjustment also plays a key role in ensuring physician engagement by helping assure physicians that sicker, more complex patients will be differentiated from healthier patients. These types of nuanced pricing adjustments require a significant amount of data from multiple sources. Timely and integrated data that is transparent to all parties also plays a key role in bundled care programs and will allow more accurate pricing and more efficient quality monitoring of these programs. This will involve heavy investment in information technology systems, especially electronic health records, which have been used effectively in the most successful programs.

Finally, for health systems considering adopting bundled payment programs, it is important that there is movement towards as much bundling of care within the time period for each episode as possible. Bundled payments work best when there are not opportunities for shifting select patients and their costs outside given bundles and to other parts of the health care system. For bundled care programs to be effective, there has to be widespread adoption and full commitment from both payers and providers.”

## Section 7: Application to Ontario

Ontario is one province that is implementing a variety of payment reforms, primarily across institutional sectors of care. In 2012 Ontario’s Ministry of Health initiated a health system funding reform strategy compensating health organizations based on the volume of patient services and the specific needs of the patients using two funding models: Health Based Allocation Model (HBAM) and the Quality-Based Procedures (QBP) model. These models were introduced to ensure that funding is allocated so that procedures are efficiently delivered to achieve high quality patient-centered care. HBAM is used to allocate funding to the Local Health Integration Networks (LHINs) for local health services. It uses basic demographic information such as age, gender and growth projections, socio-economic status, rural geography, as well as indirect measures of disease and health status information. Integrated and bundled care is an important component of these reforms, primarily through the introduction of QBPs. It is notable that while the first few QBPs were all related to procedures, more recent examples for Heart Failure and COPD indicate a shift towards management of chronic conditions. Our evidence indicates that bundled payments may not be suitable for all conditions, especially for conditions with unclear clinical pathways and procedures with low volumes or few providers. Thus, having a population based funding method like HBAM alongside a bundled payment model may be an appropriate approach.

We found international evidence for the success of bundled care and payment for time-limited procedural care and for all-inclusive and comprehensive patient-centered care, but not for episodic management of chronic conditions. Nonetheless, we believe that the opportunities, challenges and recommendations summarized in this report apply to all conditions considered for bundled care and payment. This review provides ample evidence to recommend including bundled care and payment as a component of a sophisticated health care system. It also provides strong support for the engagement of all providers, including physicians, in the development and implementation of bundled care and the incorporation of all costs, including physician remuneration, within care bundles.

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# Figures

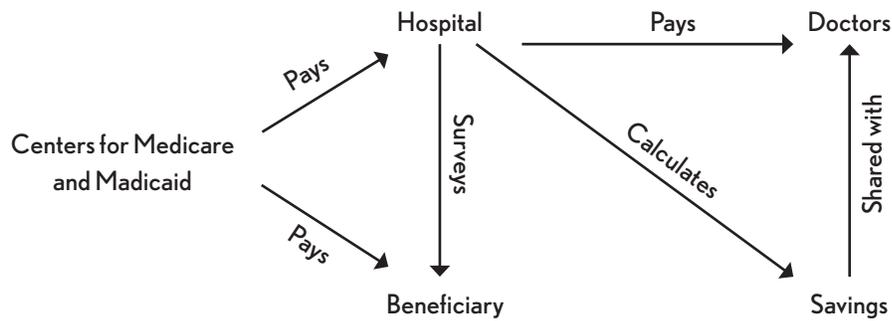


Figure 2: Flow of funds for Medicare’s Acute Care Episode Demonstration

Source: Adapted from Ardent Health Services, 2011

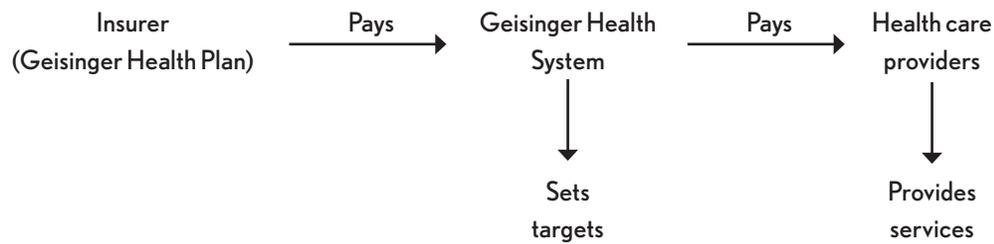


Figure 3: Flow of Funds for Geisinger Health System’s ProvenCare CABG Model

Source: Adapted from Paulus et al. (2008) and Lee et al. (2012)

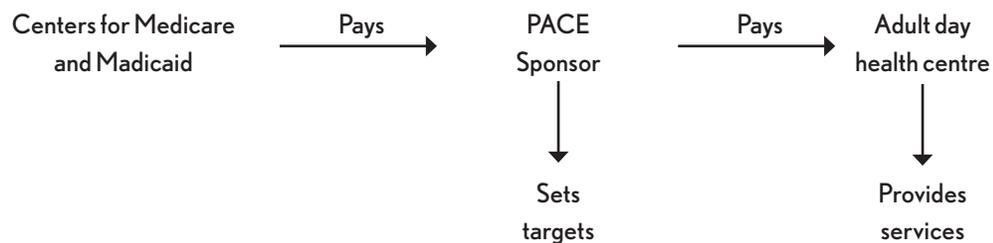


Figure 4: Flow of Funds for Medicare’s Program for All-Inclusive Care for the Elderly

Source: Adapted from National PACE Association (2013)

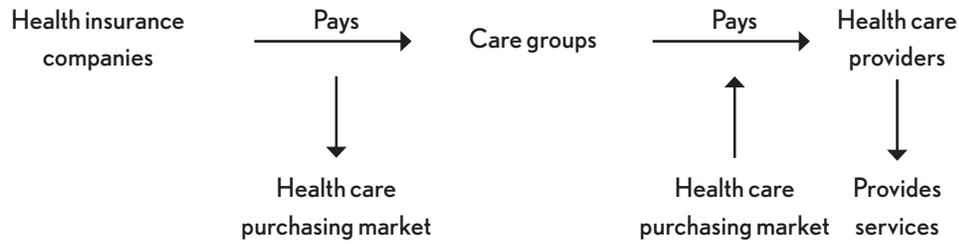


Figure 5: Flow of Funds for the Netherlands Bundled Payment for Chronic Disease Management

Source: Adapted from Struijs et al. (2012)

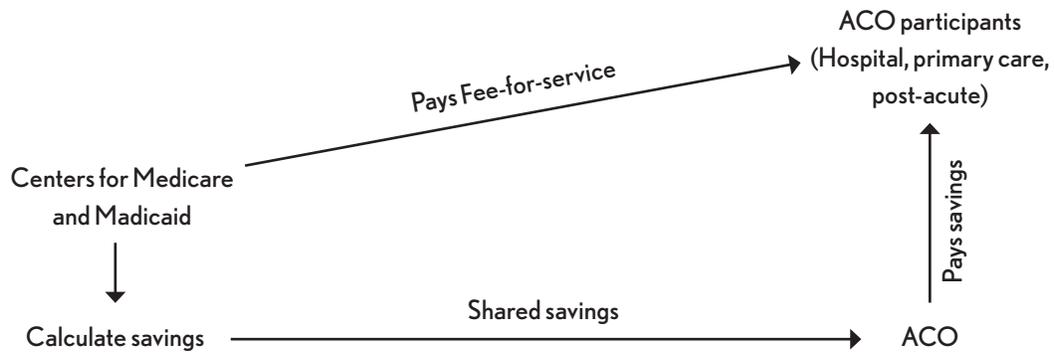


Figure 6: Flow of Funds for Pioneer Accountable Care Organizations Shared Savings Models

Source: Adapted from Universal American (2013)

# Appendices

## APPENDIX 1: CASE STUDY SUMMARIES

Table A1: Acute Care Episode Demonstration (Orthopedic) Overview

<b>Model overview</b>	
Payer	Medicare
Model description	Acute care episode-based bundle
Type of services	<ul style="list-style-type: none"> <li>• Orthopedic bundles included joint, hip, and knee</li> <li>• Cardiac bundles included valves, defibrillators, CABG, pacemakers, stents, and pacer revisions</li> </ul>
Scope of services	<ul style="list-style-type: none"> <li>• Physicians, consulting physicians, and assistant services</li> <li>• Post-operative care and procedures</li> <li>• Room and board</li> <li>• All hospital routine and ancillary services</li> <li>• Medical and surgical supplies, Medications, labs, and X-rays</li> <li>• 90-days of post-procedure care</li> <li>• Not included: any complications, different DRG admissions, or post-acute services</li> </ul>
Location	Implemented across 5 health systems in Denver, CO; San Antonio, TX; Tulsa, OK; Albuquerque, NM; and Oklahoma City, OK.
Historical details	Implemented in 2009 for a three-year period
<b>Funding</b>	
Fund holder	Hospitals
Shared savings/shared risk arrangement	<ul style="list-style-type: none"> <li>• Shared savings only</li> <li>• Up to 25% above FFS shared with physicians</li> <li>• Medicare beneficiaries were paid 50% of CMS savings</li> </ul>
<b>Evidence</b>	
Cost	<ul style="list-style-type: none"> <li>• Per episode savings: \$265</li> <li>• Total savings to Medicare: \$1,155,891</li> </ul>
Quality	<ul style="list-style-type: none"> <li>• Shorter length of stay</li> <li>• Maintained quality of care</li> <li>• Improvements in coordination of care due to standardization</li> <li>• Cost savings from negotiated reductions in prices for implants/materials, as well as central supply, decreases LOS, and utilization of physician consultations</li> </ul>
Lessons Learned	<ul style="list-style-type: none"> <li>• Physician leadership early is key and can be facilitated with gainsharing with appropriate protocols</li> <li>• In early stages, payers' willingness to absorb risk can ensure physician buy-in</li> <li>• Lags in data collection created significant challenges, but partly overcome with real-time interactive electronic dashboard systems</li> <li>• Significant administrative program costs</li> </ul>

Table A2: *ProvenCare* CABG Bundled Payment Program

<b>Model overview</b>	
Payer	Geisinger Health Plan
Model description	Acute and post-acute care bundle
Type of services	<ul style="list-style-type: none"> <li>• Introduced for CABG</li> <li>• Similar models developed for: hip replacement surgery, cataract surgery, bariatric surgery, spinal surgery, percutaneous coronary interventions, perinatal care, and number of chronic diseases (e.g., diabetes, coronary artery disease, congestive heart failure, and kidney disease)</li> </ul>
Scope of services	<ul style="list-style-type: none"> <li>• Preoperative evaluation and work-up</li> <li>• Hospital and professional operative fees</li> <li>• Routine post-discharge care</li> <li>• Management of any related complications within 90 days of surgery</li> </ul>
Location	Pennsylvania
Historical details	<ul style="list-style-type: none"> <li>• Began development in 2005, following 2004 release of national CABG Surgery guidelines</li> <li>• Implemented for CABG in 2006 and ongoing</li> </ul>
<b>Funding</b>	
Fund holder	Geisinger Health System
Shared savings/shared risk arrangement	<ul style="list-style-type: none"> <li>• Full risk arrangement</li> <li>• Up to 20% of physician compensation tied to quality of care</li> </ul>
<b>Evidence</b>	
Cost	<ul style="list-style-type: none"> <li>• 5% decrease in hospital charges in one year following program implementation</li> <li>• Average LOS decreased 16%</li> <li>• Hospital readmission rate fell 15.5%</li> </ul>
Quality	<ul style="list-style-type: none"> <li>• Significant process improvements (from 59% to 100% of patients receiving all elements of process within 3 months)</li> <li>• Decrease in discharge-to-home rates</li> </ul>
Lessons Learned	<ul style="list-style-type: none"> <li>• Ability to align physician and health system incentives due to flexible compensation</li> <li>• Early adoption of system-wide EHR key to large-scale clinical process redesign</li> <li>• Integrated health system enabled development of integrated electronic systems</li> <li>• Patient engagement through contracts with patients and allowing electronic access to health information</li> </ul>

Table A3: Overview of Dutch Diabetes Care Management Bundle

<b>Model overview</b>	
Payer	Insurance companies
Model description	Capitated chronic disease management program
Type of services	Diabetes management
Scope of services	<ul style="list-style-type: none"> <li>• Services codified in the Dutch Diabetes Federation Health Care Standard for type 2 diabetes</li> <li>• Guidelines outlined activities for generic diabetes care but do not specify who is to provide the care or by what means it is to be provided</li> </ul>
Location	97 care groups across most of the Netherlands
Historical details	<ul style="list-style-type: none"> <li>• Implemented initially for diabetes in 2007</li> <li>• Implemented as ongoing payment program in 2010 and expanded to include cardiovascular risk management and COPD</li> </ul>
<b>Funding</b>	
Fund holder	Care group, a newly formed legal entity in the health care system often owned by GPs
Shared savings/shared risk arrangement	Full risk
<b>Evidence</b>	
Cost	<ul style="list-style-type: none"> <li>• Costs for patients in bundle were €88 more than usual care patients in first year of care</li> <li>• Much of cost increase attributed to total specialist cost increases (€42 higher costs than usual care)</li> <li>• Too soon to tell longer-term effects (still in start-up phase)</li> <li>• Significant variation in development and implementation costs</li> </ul>
Quality	<ul style="list-style-type: none"> <li>• Increases in some clinical targets (e.g., blood pressure and cholesterol), but not others (e.g. HbA1c and BMI)</li> <li>• Process measures improving</li> </ul>
Lessons Learned	<ul style="list-style-type: none"> <li>• Minimal legal and reporting requirements have made for easier start-up and rapid growth</li> <li>• Minimal reporting has resulted in difficulty in tracking outcomes and substantial regional variation in quality of care</li> <li>• Underdeveloped IT and limited reporting resulted in payer concerns about services provision, double funding, and cherry picking</li> <li>• Uncertainty about how to deal with multi-morbidities and multiple bundles for multiple chronic conditions</li> <li>• Optimal care group size is uncertain</li> </ul>

Table A4: Program for All-Inclusive Care for the Elderly Overview

<b>Model overview</b>	
Payer	Medicare
Model description	Capitated community-based care
Type of services	Community-based care for adults 55+ in need of nursing home level care
Scope of services	<ul style="list-style-type: none"> <li>• Primary care services (e.g. physician, nurse, recreational therapy)</li> <li>• Emergency services</li> <li>• Hospital care</li> <li>• Home care</li> <li>• Dentistry</li> <li>• Lab/x-ray services</li> <li>• Meals</li> <li>• Medical specialty services</li> <li>• Nursing home care</li> <li>• Nutritional counselling</li> <li>• Prescription drugs</li> <li>• Occupational or physical therapy</li> </ul>
Location	114 programs operating across 32 states in the US
Historical details	<ul style="list-style-type: none"> <li>• Began with On Lok in San Francisco in 1970s</li> <li>• Demonstration projects in place since 1980s</li> <li>• First approved by Balanced Budget Act of 1997 as a permanent entity</li> </ul>
<b>Funding</b>	
Fund holder	PACE sponsor (not-for-profit organizations)
Shared savings/shared risk arrangement	PACE sponsors assume full risk
<b>Evidence</b>	
Cost	<ul style="list-style-type: none"> <li>• Capitated payment was 38% lower than projected FFS costs in the absence of PACE in first 6 months and 16% lower in the second 6 months</li> <li>• Over full year, total savings to Medicare of \$6.9 million</li> </ul>
Quality	<ul style="list-style-type: none"> <li>• PACE enrollees reported better health status and quality of life and less deterioration in physical function than comparison group</li> <li>• PACE enrollees 50% less likely than comparison to have had one or more hospital admissions</li> <li>• Outcomes most pronounced amongst those with a high number of ADL limitations</li> </ul>
Lessons Learned	<ul style="list-style-type: none"> <li>• More mature and team-oriented programs associated with better survival and improvements in patient outcomes</li> <li>• Complaints about adult day center and limited provider networks</li> <li>• Slow growth of PACE due to high costs for those outside of Medicaid, lack of marketing, budget shortfalls, and high start-up costs</li> <li>• Non-profits lack resources to expand existing sites and for-profit providers have chosen not to enter the market</li> </ul>

Table A5: Pioneer Accountable Care Organizations Overview

<b>Model overview</b>	
Payer	Medicare
Model description	Continued FFS payments plus eligibility for additional payments for meeting specified quality and savings requirements
Type of services	<ul style="list-style-type: none"> <li>• All Medicare providers can participate in an ACO to coordinate care</li> <li>• Only physicians in group practice arrangements, networks of individuals practitioners, and hospitals that are partnering with or employ eligible physicians, nurse practitioners, physicians assistants, and specialists can sponsor an ACO</li> </ul>
Scope of services	Varies
Location	32 organizations across 18 states
Historical details	<ul style="list-style-type: none"> <li>• Implemented in 2012 with 32 initial organizations</li> <li>• To date, 19 continue to participate</li> </ul>
<b>Funding</b>	
Fund holder	CMS continues to pay FFS, but then calculates savings/losses to for ACOs, who then distribute amongst providers
Shared savings/shared risk arrangement	Shared savings, with gradual movement towards shared losses and full risk (i.e., capitation)
<b>Evidence</b>	
Cost	<ul style="list-style-type: none"> <li>• Average spending lower for ACO beneficiaries, resulting in a 1.2% reduction in spending overall</li> <li>• Significant variation across ACOs</li> <li>• ACOs with higher baseline spending and serving high-spending areas experienced the greatest savings</li> </ul>
Quality	<ul style="list-style-type: none"> <li>• Significant improvements in some patient experiences (e.g., report of timely access), but not others (e.g. overall care)</li> <li>• Small significant changes observed for some quality measures (e.g. preventive services) or else no changes in quality</li> </ul>
Lessons Learned	<ul style="list-style-type: none"> <li>• A lack of predictability for quality measures, with benchmarks not appropriately adjusted for regional differences</li> <li>• Significant administrative burden associated with ACOs as well as high start-up costs make savings hard to realize initially</li> <li>• Beneficiary engagement is limited and patient leakage issues persist</li> <li>• Multi-payer ACOs are becoming more widespread, with limited alignment with respect to reporting standards between payers</li> </ul>

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