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## Goals for Pay for Performance in Hematopoietic Cell Transplantation: A Primer



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### A B S T R A C T

Bundled payments for hematopoietic cell transplantation (HCT) have long been accepted by both commercial health insurance providers and transplant centers, effectively outpacing the use of this payment model elsewhere in health care. As with the rest of health care, interest in payment and health delivery reform has created demand for transplant providers to address value by incorporating quality metrics and strategic changes in network design. The complexity of evaluating performance in HCT complicates the goal of rewarding providers for better performance and penalizing poor results. We provide an introduction to value-based purchasing and address potential considerations in the adoption of incentives to improve quality of care in HCT.

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### INTRODUCTION

Bundled payments, pay-for-performance, and value-based purchasing are examples of terms that broadly describe various arrangements that provide financial incentives to health providers for improving the overall benefit per expenditure on healthcare services. Such programs are not new, with documentation of examples of clearly defined performance-based incentives in health care found as early as 1750 B.C. in a set of laws from ancient Mesopotamia [1]. More recently, momentum has been gathering since the Centers for Medicare & Medicaid Services (CMS; Medicare) began to pay hospitals for publicly reporting their performance on a limited number of indicators in 2004 [2]. The 2010 Patient Protection and Affordable Care Act included a number of provisions designed to improve quality of care, including the Medicare hospital value-based purchasing program, the Medicare physician value-based payment modifier, the Bundled Payments for Care Improvement demonstrations, and the Accountable Care Organization shared savings programs and demonstrations (ACA). In January 2015, US Department of Health and Human Services Secretary Burwell announced the administration's goal of tying 50% of all payments for traditional Medicare

beneficiaries to these structures by 2018 [3]. A parallel and increasing focus on these payment models and networking strategies in the commercial healthcare purchasing sector has created an urgency for all types of providers to understand and participate in this new reimbursement environment (Table 1). This article outlines how bundled payments, pay-for-performance, and value-based purchasing have and will be used within the field of hematopoietic cell transplantation (HCT).

### BUNDLED PAYMENTS

#### Early Model: Medicare Diagnosis-related Groups

For some time, policymakers and healthcare purchasers at all levels have been concerned about the unsustainable trajectory of healthcare costs. Until relatively recently, much of healthcare reimbursement in the United States remained on a fee-for-service or “percent of charges” basis, with little to no adjustment based on patient health status or outcomes after the service was complete. This payment model incentivized physicians and hospitals to focus on volume as the key mechanism for financial performance or growth. Medicare felt this acutely, because the traditional beneficiary populations are frequent users of care: Payments for medical expenses average \$500 billion per year (14.4% of the US federal budget) [4].

To attempt to counteract the incentives of fee for service, CMS began using diagnosis related groups (DRGs) in the inpatient hospital setting in 1983 to create a prospective payment system [5]. DRGs are “prospective payment” in that

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**Table 1**  
Payment Models

Model	Structure	Level of Risk to Providers
Fee for service	Separate payment is made to healthcare provider for each service.	Low
Inpatient DRG	Prospective payment system that assigns relative value to an inpatient hospital episode of care. Level of reimbursement is based on resource intensity of hospital admission.	
Bundled episode	A single predetermined payment to cover all goods and services delivered by healthcare providers for a defined episode of care.	Moderate
Disease-specific capitation	Payment system based on a payment for each person in a population receiving specific services. Nonspecified services are reimbursed as fee for services.	
Accountable care organization	A set of providers that work collaboratively and accept collective accountability for cost and quality of care delivered to a population. Payment may include fee-for-service, episode, and partial or full capitation.	High
Global capitation	Payment system based on a payment for each enrolled person rather than a payment per service. Global capitation covers all services such as professional, facility, pharmaceutical, lab, etc.	

the reimbursement rates for each DRG are set in advance, based on a relative value weighting system, and are not dependent on the charges billed by the provider for that individual transaction. Only 1 DRG is paid per inpatient visit, and the DRG is assigned based on various codes and data that appear on the billed claim submitted by a provider, such as *International Classification of Diseases*, or ICD, diagnosis and procedure codes, age, sex, and discharge status.

DRGs vary in reimbursement for the type of clinical episodes they reflect but remain a bundled payment for the set of smaller services encompassed by the inpatient visit. In some cases, DRG payments are adjusted further for patient complexity or for a hospital's status as an academic health center or Disproportionate Share provider. Medicare followed the Inpatient Prospective Payment System with similar structures and methodology (ie, bundling of Current Procedural Terminology codes) in other environments and continues to move toward episodic preset payment amounts.

#### **Bundled Payments for HCT: Commercial “Case Rates”**

Contracting with commercial health insurance providers for HCT has effectively outpaced the experience elsewhere in health care and is structured similarly to Medicare DRGs, albeit more expansive in time and scope. Since the mid-1990s, many, if not most, patients receive their care under contracts with prenegotiated rates bundled to include inpatient, postcare, and, often, precare. This “case-rate” approach hinges on the ability of providers at a center to assume responsibility for a greater percentage of the total cost of care delivered for the episode defined in the contract (Table 2). Case rates also potentially allow physicians more control over the treatment plan and location of care, thus enhancing value to the purchaser and efficiencies to the provider.

Case rates are complicated structures that need frequent review and modification by both parties because of changes in practice and technology but have been largely accepted for

close to 20 years. Although a full discussion of contracting for HCT is beyond the scope of this article, considerations of certain contractual elements such as time frame, carve-outs for expensive drugs, coverage of donor evaluation, cell acquisition, and stop-loss thresholds may have direct or indirect impact on patient care decisions. HCT is an expensive therapy, and case rates have helped create predictable expenditures attached to catastrophic diagnoses in the lives of commercially covered members. However, as discussed later, further enhancing value by incorporating pay-for-performance metrics and strategic network design is becoming increasingly in demand by healthcare purchasers.

#### **PAY-FOR-PERFORMANCE MEASURES**

Pay-for-performance programs use financial incentives (or disincentives) to motivate quality improvement or maintenance. These programs typically reward providers with bonuses when high marks are achieved on selected quality measures shown to lead to better outcomes. Although such rewards may cause providers to prioritize incented quality measures, care must be applied to ensure this does not occur at the expense of unrewarded behaviors leading to an overall decline in patient care. The direct linkage of reward to performance differentiates pay for performance from public reporting of outcomes that, in theory, motivates through consumer response.

Elements common to all payment-based incentives are (1) defined targets to be evaluated, (2) measures and performance standards for establishing the target criteria, and (3) financial incentives [1]. One of the attractive features of pay-for-performance models is the capacity to compliment almost any payment arrangement. Most arrangements for pay for performance address quality-based measures but could also target costs of care, quantity of services delivered, or patient satisfaction [1,6].

Four types of measures used in pay for performance are clinical outcomes, process measures, structural measures, and patient satisfaction (Table 3). The National Quality Strategy, which created national aims and priorities to guide quality improvement efforts, can provide the framework for the development of quality measures [1,7,8]. The three aims of better care, better health, and lower cost coincide with the structures of new delivery and payment models.

Certain characteristics should be considered in selection of effective metrics chosen for performance measures. For obvious reasons, the metric should be associated with meaningful improvement in quality or efficiency so it is linked with improved value of care. The metric must also be reliably measurable and clearly linked to desired outcome. In measuring the metric, adequate risk adjustment for patient differences is critical to fairly compare performance and avoid unintended consequences, such as avoidance of high-risk patients [7]. The ability to continue to accept appropriate patients who may benefit from HCT is of particular concern because of the potential for cure, even in high-risk populations. Finally, the metric should be actionable and clearly linked to the desired outcomes such that addressing the indicator leads to enhanced value.

#### **VALUE-BASED PURCHASING**

Value-based purchasing is, in theory, the marriage of bundled payment and pay for performance, as operationalized through payer networks and contracting mechanisms. Because neither fee-for-service nor DRG-based reimbursement models provide strong inherent incentives to control

**Table 2**  
Overview of HCT Case-Rate Contracting Structure

Period of Care Description	Begins	Ends
<i>Pretransplant period</i>		
Time period before the transplant period begins	The date patient is accepted by program as a transplant candidate	Day before the first day of the transplant period
Components		
<ul style="list-style-type: none"> <li>• Transplant consult; HLA typing of related and unrelated donors and/or umbilical cord blood unit(s)</li> <li>• Evaluation of disease status (eg, bone marrow biopsy, computed tomography, serum protein electrophoresis)</li> <li>• Evaluation of organ function (eg, liver function tests, echocardiogram, pulmonary function tests)</li> <li>• Psychosocial assessment</li> <li>• Other evaluations to determine recipient suitability (eg, consultation with a specialist, additional tests to evaluate abnormal findings)</li> <li>• Assessments to determine related or unrelated donor suitability and eligibility</li> </ul>		
<i>Transplant period</i>		
Time period during which the transplant procedure and routine follow-up care are provided		
HC allogeneic inpatient/outpatient	First day of preparative therapy	100 days after the first day of HC infusion
HC autologous inpatient/outpatient	First day of preparative therapy	30 days after the first day of HC infusion
Tandem transplants	First day of preparative therapy for each transplant	Time period as defined above for each transplant episode of the tandem transplant
Components		
<ul style="list-style-type: none"> <li>• Mobilization and collection of peripheral blood or bone marrow HCs</li> <li>• Conditioning regimen chemotherapy and/or radiation therapy</li> <li>• Hospitalization and/or outpatient visits associated with administration of conditioning regimen</li> <li>• Infusion of bone marrow, peripheral blood, or umbilical cord blood HCs</li> <li>• Hospitalization and/or outpatient post-transplant supportive care</li> <li>• Management of HCT related complications</li> </ul>		
<i>Post-transplant period</i>		
Time period after the transplant period ends	Day after the transplant period ends	For autologous HC, 60 days after first HC infusion; for allogeneic HC, 1 year after the first HC infusion
Components		
<ul style="list-style-type: none"> <li>• Hospitalization or outpatient supportive care</li> <li>• Management of HCT related complications</li> </ul>		

costs or improve quality, payers are focused on managed care arrangements to reduce unnecessary care through capitation to cover a given set of services. Efforts to enhance the value of health care solely by controlling costs have been constrained by concerns about the impact on quality and access to providers [9].

Value-based purchasing is a strategy to reward providers with superior outcomes and efficiency with enhanced payments through differential reimbursements and increased market share via purchaser, payer, and/or consumer selection. Payers typically require that the transplant facility meet defined criteria for acceptance into a “center of excellence” (COE) network. The requirements usually include certain facility accreditations such as The Joint Commission and the Foundation for the Accreditation of Cellular Therapy (FACT), as well as measures of transplant program infrastructure, volume, and outcomes. Eligibility in the Blue Cross Blue Shield Blue Distinction + network is also based on how “efficiently” care is delivered, as determined by the center’s ability to meet certain cost criteria [10]. Patients seeking to have their transplant performed in a program that is not qualified in a given payer COE network may find they have substantial copays or even no benefits at that facility. For many centers, gaining qualification to participate in a payer network is, in effect, pay for performance. Payers can clearly and easily direct patients away from a center that is out of network based on financial incentives for the patient. The heightened interest on the part of payers and purchasers to develop narrow networks, with the goal of decreasing cost variation and directing patients to centers with increased expertise, is increasingly a concern for both providers and patients, who can often face fewer choices in their home geographic area.

Shared savings programs have attracted interest as a way of enhancing value, especially for programs that already

deliver good outcomes. In the model, the provider is rewarded with a portion of savings realized from reduction of healthcare spending. The major potential problem with this approach is that providers may assume risk without resources or incentives. A second flaw is that shared savings rewards high spenders rather than high performers. Those providers who already have low costs and high quality of care can in effect be penalized. Finally, the approach may not be sustainable once the initial savings have been achieved.

Models of value-based purchasing have most commonly used pay for performance to address quality and efficiency by tying a reserve bonus payment to the achievement of previously determined levels of metric-based quality care. There is less general experience with other models such as payment for episodes of treatment, accountable care organizations, or provider-side capitation.

#### INCENTIVES AND ACCOUNTABILITY

Incentives may be tied to an absolute threshold or relative to the performance of all providers and structured to reward all who meet a threshold, top performers, or those with the greatest improvement. The advantage of tying rewards to achievement of an absolute threshold (eg, the percentage of HCT patients being vaccinated according to established guidelines) [1,11] is there is no uncertainty about whether a standard is met. However, all providers may not be equally incentivized to improve, because those who are well above the threshold may not be motivated to achieve further improvement and those far below the threshold may also be unmotivated because they believe their efforts will be fruitless. Relative standards focus on the ranking of each provider to their peers and have the advantage of being able to recognize improvement (eg, from the third to second quartile). Here again, high achievers may have little opportunity to improve, potentially limiting reward. The relative

**Table 3**  
Types of Measures Used in Pay for Performance

<b>Clinical outcomes</b>
The preferred standard but only selectively used because they are easily confounded by elements beyond the provider's treatment, such as social factors (eg, compliance or access to care) or clinical factors (eg, clinical risk or behavior of referring physicians or other providers). The center-specific outcomes report by the CIBMTR accounts for many of these factors, but the complexities of risk adjustment to accurately predict future center performance can limit the utility for an individual patient or purchaser in the evaluation of the individual provider [20]. Clinical outcomes are likely the most important measure category to HCT patients.
<b>Process measures</b>
Addresses the proper delivery of healthcare services and are often easier to collect than outcome measures. Such measures tend to focus on discrete events in a single setting of care rather than looking across an entire episode of care [7]. Inspection and accreditation by FACT historically addressed process measures by validating the structures and practices of a center. Compliance with process measures does not always ensure good outcomes, however, and the linkage between variations in practice and outcomes remains a subject of investigation [21,22].
<b>Structural measures</b>
Includes experience and level of personnel, staffing, facilities, and equipment. Structural measures have long been used by payers in contracting for HCT COEs and are a component of the American Society for Blood and Marrow Transplant Request For Information used by many payers in center evaluation. A recent survey provided the first data benchmarking program structure of HCT facilities in North America and preliminary correlations with outcomes [23]. Because of the wide variation in program structure and absence of information about process measures in the programs evaluated, this information requires further investigation before we can be confident about extrapolating observations across institutions.
<b>Patient satisfaction</b>
Measures have the advantage of being relatively easy to obtain and can be used to improve communication between patients and providers. The linkage between patient satisfaction and quality, however, is not well established [24]. It will be important to study both patient satisfaction measures with the process and experience with transplant and their long-term satisfaction with their choice to pursue HCT.

differences can also contract over time to the point that they may have little practical significance. Because of the complexities of risk adjusting metrics in HCT, it is less likely that relative standards could be applied in the near term. Nevertheless, the possibility of payers driving to narrow networks as they are in other areas of medicine may foster the development of metrics that facilitate ranking of HCT centers.

Defining who is to be rewarded is fundamental to a successful performance plan. The program should reward the provider responsible for making changes to the standard being evaluated. Accountability for performance without responsibility has the potential to discourage motivation to achieve the goal. Even with clearly defined accountability and responsibility, attribution of improvement may not be straightforward. Healthcare interventions leading to improvement require analysis of multiple factors, are often collaborative, and may not be attributable to a single individual. For example, improvement in the time to first antibiotic for outpatients with neutropenic fever is clearly a goal that is meaningful, measurable, and actionable but not widely met [12]. Improving the process to achieve the goal requires engagement and agreement across several departments in a hospital as well as multiple specialties and disciplines. Determining the marginal contribution of each team member may therefore be difficult.

Although the effect of financial incentives on the behavior of individuals is well studied, how financial incentives change the behavior of complex organizations is less understood [2,13]. To achieve meaningful improvements in HCT potentially requires agreement and coordination across a continuum of providers, including multiple physician specialties, hospitals, outpatient clinics, pharmacy, and home care. Improvements in care may require investments or increase near-term costs that are not equally distributed across the continuum. This may impede the development of aligned incentives, especially if rewards are not distributed proportionate to investment. For example, performing a larger number of HCT as outpatients may require modifications to outpatient facilities and more personnel but may also increase demands on providers, especially after hours. Aligning incentives among the facility and providers is central to the development of a successful program.

If one considers the continuum of care of a patient undergoing HCT, it may be that the most effective way to improve outcomes and reduce cost for patients undergoing HCT would be to develop a program with referring physicians that encourages timely referral of candidate for HCT. Patients that have advanced disease and comorbidities resulting from prolonged therapy clearly have more difficult and more expensive transplant episodes than those patients treated earlier and in better condition.

#### DOES IT WORK?

The rationale that money changes behavior is compelling and likely explains why value-based purchasing was embraced by the Affordable Care Act despite little evidence linking such programs to improvements in quality of care [2,3]. One of the first studies examining this question was a report on the initial results of a 3-year program in which more than 200 hospitals agreed to participate in quality benchmarking databases maintained by Premier, with payments allocated on the basis of quality performance. Hospitals performing in the top decile received a 2% increase in Medicare payments, those in the second decile received 1%, and hospitals landing in the lowest 2 deciles were liable for a 1% to 2% penalty in the third year. Lindenauer et al. [14] matched these hospitals with 406 hospitals that were providing CMS with a subgroup of the same quality-performance data intended for public reporting but not participating in the incentive compensation program. Both groups improved after adjustment for cofounders, but the incremental improvement of the incented hospitals was only 2.9%. Even this improvement was short-lived because there was no significant difference in performance scores after the fifth year of the demonstration project [14]. A similar Hospital Quality Incentive Demonstration was introduced in all hospitals in northwest England in 2008 with initial improvement in mortality among the conditions measured compared with control hospitals [15]. However, by the end of the 42-month follow-up, the reduced mortality in participating hospitals was no longer significant because mortality fell in the control hospitals more than in the participating hospitals.

Although these and several other studies have failed to replicate the early success of pay for performance, they do not disprove the potential of such programs to improve quality for several reasons [16]. Each was performed in a different economic environment, offered different levels of financial incentives, and used different performance measurements [2]. In addition, while the Premier study was

**Table 4**  
Possible Measures for Pay for Performance

	Meaningful	Measurable	Actionable
1-yr overall survival	+	+	+
FACT	+	+	+
100-day overall survival	+	–	+
Readmission	+	–	–
Hospital acquired conditions	+	–	+
cGVHD	+	–	–
Patient-reported outcomes	+	–	+
Marrow vs. peripheral blood	+	+	+
Antibiotic pathway for neutropenic patients	+	+	+
Survivorship measures	+	+	–
Data management	+	+	+

underway, the US Department of Health and Human Services rolled out its Hospital Compare website. Hospitals began to attempt to close the quality gap because of public reporting in anticipation that CMS would implement pay for performance across all hospitals [3]. Similar spillover effects were identified in the English study. In both the Premier and English studies, incentives changed over the course of the study, further confounding analysis of impact.

#### MOVING FORWARD: ENHANCING VALUE FOR HCT

A few validated measures in HCT meet the National Quality Strategy criteria. The Center of International Blood and Marrow Transplant Research's (CIBMTR) Stem Cell Outcomes Database reported 1-year overall survival does allow a facility to compare its patients with a similar group of reported patients, providing assurance that the center is meeting risk-adjusted outcomes. Their risk-adjusted outcomes data do not allow ranking of centers by outcome. FACT/Joint Accreditation Committee ISCT and EBMT (JACIE) accreditation ensures compliance with processes that are viewed as best practice, and a report from JACIE links accreditation with improved outcomes [17]. Another report, however, suggests this beneficial effect may plateau if processes are the sole measure of quality [18]. The inability to use either Stem Cell Outcomes Database reported outcomes or FACT/JACIE accreditation to measure incremental improvement or ranking of programs further limits these as measures for performance rewards.

Even large-volume transplant centers are unlikely to transplant enough patients from a single payer to meaningfully evaluate performance on a given clinical measure. Table 4 displays some possible outcome measures that have potential application to HCT. Most of these lack either uniform reporting standards or validated processes for risk adjustment. Others may not be actionable. An example of a metric that is both difficult to measure and influence is incidence of chronic graft-versus-host disease (cGVHD). Consensus on how to clinically score cGVHD is evolving, and there is little or no information about how to risk-adjust outcomes across centers. Because HCT case rates often end at 100 days for allogeneic HCT, centers may not be in network once patients revert back to primary insurance, thus limiting patient access to transplant centers for long-term care. For this reason, prevention and management of cGVHD may not be a measure that is actionable for the center.

Although the list of measures in Table 4 may not be comprehensive, 3 are worthy of consideration as performance measures. The first is a set of recommendations for screening and prevention for long-term survivors of HCT [11]. These measures are similar to those used for wellness in

other populations and are relatively easy to score. As with cGVHD, however, HCT centers may not be in the patient's insurance network after the transplant episode so that scoring would have to be adjusted for those patients who could be seen at the center. A second measure is the preferential use of bone marrow over peripheral blood as a cell source for HCT in patients with nonmalignant conditions or low risk of relapse [19]. Although overall outcomes are similar between the 2 cell sources for patients undergoing unrelated HCT, the use of peripheral blood is associated with a significantly higher rate of cGVHD and requirement for long-term immunosuppression. A third measure that could be considered for performance incentives is reporting of autologous HCT patients to the CIBMTR. The reporting of allogeneic but not autologous patient data is required by the Stem Cell Outcomes Database so the assessment of a center's risk-adjusted outcomes does not consider all patients treated at the center. The CIBMTR periodically audits data collection and reporting and provides HPC programs with critical error scores and random error scores. HCT programs that have error rates of 3% or more are required by the CIBMTR to present a corrective action plan. Two important concerns to address are that many centers lack sufficient staffing for data management and the CIBMTR is not presently funded to perform outcome analysis.

#### CONCLUSION

Pay-for-performance initiatives are moving into broader use but may not make sense for HCT centers and payers in their current form. The case-rate contracting strategy for inclusion in payer COE is, in effect, already pay for performance. Public reporting of outcomes for allogeneic transplant ensures patients and payers that a center is meeting predicted outcomes. FACT accreditation ensures the center is compliant with standards updated by an international panel of experts every 3 years. To be effective, goals for performance programs need to be clearly defined. Metrics selected to measure achievement must be meaningful and measurable and ones the center can influence. Those that leverage the CIBMTR database are preferable because all centers are required to report allogeneic patients, and reporting autologous patients will be required in the 6th edition of the FACT standards and the data are routinely audited. Finally, incentives need to be aligned with the responsible parties.

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