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Pay for Performance and Red Blood Cell Transfusion Appropriateness

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Background

Pay for performance (P4P)

P4P is a concept that was originally developed in the business world to help improve efficiency and productivity. In health care, P4P refers to a payment model that offers financial incentives to physicians and hospitals for meeting pre-established clinical performance measures.¹ The goal is to link financial incentives, in part, to the quality and efficiency of health care provided, as opposed to current payment systems that pay providers based only on the volume of services. Many believe that the current fee-for-service payment model leads to overutilization. In P4P systems, portions of reimbursements are added or subtracted depending on performance on specific metrics, which may measure the process or outcome of care.

Despite the potential for P4P to influence provider behavior, evidence regarding its effectiveness is mixed. A systematic review of 17 studies published between 1980 and 2005 conducted by Peterson and others, found that P4P programs were associated with appreciable but small improvements in process of care measures.² However, none of these programs had an impact on patient outcomes or efficiency of care. The ability to generalize is limited by the studies' small sample sizes, short follow-up periods, and variable incentive structures. Further, these studies have mostly focused on primary care and preventive service with none delving into specialty care. Greenberg et al outlines the major challenges of engaging specialists in P4P: 1) finding measures that are specific, relevant and supported by strong evidence to increasingly specialized providers; 2) how to accurately attribute accountability when there is more than one provider caring for a patient, and 3) achieving adequate risk adjustment, especially for outcome measures.³

Despite their uncertain effectiveness, P4P programs have proliferated as payers, both private and public, attempt to reward high quality care, rather than only the volume of services delivered. Future success hinges on collaboration among key stakeholders including patients, physicians, payers, and policymakers.

Red Blood Cell (RBC) Transfusions

RBC transfusions are given to patients with anemia to ensure that they have adequate oxygen carrying capacity in their blood. Patients can become anemic acutely or chronically, due to many causes including bleeding, bone marrow disease, or autoimmune destruction of red cells. According to the most recent literature review in May 2011 in UpToDate, there is no longer any single criterion that should be used as an indication for red cell transfusion and that multiple factors related to the patient's clinical status need to be evaluated.⁴

The evidence in the literature, broadly speaking, supports a more restrictive red cell transfusion strategy. In the TRICC Trial, a randomized controlled trial in a hospital ICU setting, researchers found no significant difference in 30-day survival in non-bleeding patients who were under a restrictive (transfuse if hematocrit <21% or hemoglobin <7 g/dL) versus a liberal (transfuse if hematocrit <30% or hemoglobin <10 g/dL) strategy.⁵ Retrospective reviews of transfusion patients in coronary ischemia also do not show a significant benefit of using a liberal transfusion strategy.^{6,7}

Case

Part I – March 2007

It was almost two years ago that the Heron Bay Physician Organization (HBPO) had identified and approved the goal of reducing of unnecessary inpatient RBC transfusions as an in-house strategic performance metric. While the Heron Bay Medical Center (HBMC) had a number of P4P metrics that were already being measured and scrutinized by the major local payers, the HBPO Executive Committee wanted to develop an internal project to promote efficiency and reduce unnecessary costs. The project would be tied to departmental finances, and would be one of the gates to access reserve funds. The committee identified the importance of RBC utilization to the patient, to society and to the hospital. For patients, RBC transfusions carry risks of volume overload, transfusion reactions, and infections. To society, RBCs are a scarce resource that should be used only when needed. To the hospital, RBCs were a major expense. Last year, HBMC used 50,000 units of RBCs. Only 5,000 units came from donors while the rest were purchased from the regional Red Cross Center at \$250 per unit. Thus HBMC spent over \$11 million on RBCs in a single fiscal year. These costs were not reimbursed, as most admissions were paid as a flat fee through diagnosis related groups (DRGs). According to the HBPO Executive Committee's analysis, HBMC spent an extra \$2.5 million on RBCs that were ordered outside of clinical guidelines according to the most recent evidence in the literature.

Dr. Sam Lloyd was at an impasse. As the Director of the Blood Bank at HBMC, he had to decide how best to implement the board's mandate to help guide clinicians to utilize RBC transfusions more efficiently. Two proposals had been put forth to tie RBC utilization to departmental finances by the task force assigned to study this issue. The first idea was to set a global target of reducing the number of RBC units each year. For example, for the next fiscal year, the HBMC would aim to move from 50,000 units used to 47,000 units. Departmental funding would be impacted based on overall hospital utilization. The second proposal was to measure adherence to clinical guidelines, rather than absolute utilization. Guidelines would be adopted for various clinical scenarios, based on best available evidence. The first proposal was simple, easy, and cheap to implement, and did not face significant resistance from physicians. The second proposal, while perhaps better tailored clinically, would require a large investment of time and money to create clinical guidelines, develop a decision support module with the electronic health record (EHR), and get buy-in from clinical leadership. Furthermore, impacting behavior would require educational outreach to clinicians as well as targeted feedback on performance. The task force identified \$10 million across departments to be withheld as incentives to encourage appropriate RBC utilization.

Questions to consider:

1. Which proposal do you think would be best suited to promote more efficient use of RBCs?
2. If the second proposal is chosen, what could some of the arguments be against such a policy? How valid are they in your opinion?
3. How much autonomy should physicians have in utilizing expensive treatments and tests for their patients? What do you think about the hospital mandated guidelines for RBC transfusions?
4. How, and how much, should physicians consider cost when it making clinical decisions?

Part II – May 2008

A little more than a year later, after countless meetings and talks, the decision was made to go with the second proposal and allow thresholds for blood transfusions to be set by individual departments. Over the course of the year, Dr. Lloyd's task was to meet with the leaders of each service to agree on guidelines, and to work with information services (IS) to create the necessary electronic infrastructure. In addition to supporting real-time decision-making, the decision support module would need to be able to create reports to provide regular feedback to the departments.

The HBPO Executive Committee and Dr. Lloyd knew how vital it was to ensure the data was as accurate as possible. The first attempt to set guidelines over five years ago met with failure. Dr. Lloyd presented data to the OB/Gyn service about their over-utilization of RBCs. To her credit, the chief of the service, Dr. Wu, asked for more specific data, down to the patient level. After reviewing each case, Dr. Wu determined that four out of the 57 "inappropriate transfusion" cases were actually clinically appropriate. Regardless, due the "complete unreliability of the data" according to Dr. Wu, the RBC utilization project had to be scrapped. She said it would be egregious to tie their pay to inaccurate data. It was very frustrating for Dr. Lloyd and much of the task force because the problems were rare and, furthermore, to be expected: no guideline should be appropriate in 100% of patients.

Based on this experience, Dr. Lloyd knew that physicians would be very quick to disregard any data about performance-based incentives that they considered unreliable. So this time around, with the past experience in mind, he worked very closely with the EHR team to create a better system to capture RBC utilization appropriateness.

Dr. Lloyd worked closely with an EHR liaison, Emily, to create a new decision support module for RBC ordering. The goal was to program the inpatient EHR to present the ordering provider with clinical recommendations based on the hematocrit and the clinical indication. What Dr. Lloyd thought would take a couple of weeks turned into months. While HBMC had implemented a robust inpatient EHR in the past few years, Dr. Lloyd soon learned that it had major limitations. Much of the information contained in the EHR was entered as free text, which could not be captured in a meaningful way. While clinicians might clearly state their reasons for needing a transfusion in their daily progress notes, this information could not be extracted by the EHR to use as part of decision support. As a solution, Dr. Lloyd submitted an EHR upgrade request to create structured fields in the RBC transfusion ordering module, so that physicians would check boxes or choose from drop down menus to describe the clinical indication. The system would recognize the selection and launch decision support in response. As Dr. Lloyd waited a few months for the upgrade request to be considered and prioritized among several competing requests from other departments, he kept wondering why HBMC did not just purchase a commercial EHR. While he understood that a home-grown system such as HBMC's was perhaps more cost-effective (although he was not sure when he imagined all the administrative hassles and paperwork that every physician and department had to go through to make an upgrade request) and it offered HBMC more control, he thought companies that did information technology and computing as their primary business would be more efficient and simply have a better overall product. HBMC was a medical center, not a technology company, after all.

When the upgrade request was approved it took another month to get it implemented (Figure 1). Soon after "going live", Dr. Lloyd spent another month placating angry physicians who complained that the new RBC ordering module was slowing them down. Before, they

could order a blood transfusion with just a few clicks. Now, they had to go through several drop down menus to order a transfusion. Eventually, Dr. Carlile, the Chief of Medicine and Dr. Hezel, the Chief of Surgery, ordered all their services to comply with the new module. Grudgingly, physicians began to do so.

Questions to consider:

1. What do you think about Dr. Wu's reaction to the performance data five years ago?
2. Should a health care system/hospital create its own EHR or buy a commercial product? What are the pros and cons each decision? What are the pros and cons of replacing a current EHR with a new one?
3. How should the hospital prioritize EHR upgrade requests (recall the long wait for Dr. Lloyd's request due to a number of other EHR requests)?
4. Consider ranking, in order of importance, the following EHR upgrade requests:
 - a. Generating a monthly summary for cardiologists to show how many of their patients who presented with an acute myocardial infarction, were discharged on an aspirin
 - b. Upgrading the EHR system to comply with new federal mandates on "meaningful use."
 - c. A medication interaction checker (allergies, adverse drug-drug interactions) for the neonatal intensive care unit (NICU)
 - d. Creating a new quality report for Endocrinology and their diabetes patients to show how many of each physician's patients had their diabetes under control (HbA1c level <7% or <53 mmol/mol)

Part III – April 2011

Two years after the EHR system was in place, Dr. Lloyd finally had some data to review with inpatient services. In the meantime, he had been hard at work on other aspects of the project. He had finished making educational presentations to the departments highlighting the data supporting a more restrictive transfusion strategy. He also held several meetings with clinical leadership to emphasize the importance of addressing this issue with their staff physicians and house staff.

Emily worked closely with Dr. Lloyd to give regular feedback reports to the department chairs, departmental administrators, and quality improvement leaders. The data consisted of rates of excess transfusions by service and by individual provider. Service-level performance was available to all (Figure 2) while provider-level data was restricted to individual physicians and their departmental chair. Service liaisons were identified to help address variability and meet with outlying physicians.

Reinvigorated with two years worth of data, Dr. Lloyd began by meeting in earnest with all the departments to review hospital transfusion guidelines (Figure 3). In a few cases, such as with oncology, he was pleasantly surprised by the positive feedback from his efforts and was able to tighten the transfusion guidelines despite a lack of great evidence. With other services, such as the high-volume transfusing departments of thoracic surgery and orthopedics, the reception was not as pleasant and sometimes quite hostile. Thoracic surgery, over the past two years, had argued for a higher transfusion threshold of a 30% hematocrit (hospital guidelines based on best available data was at 21% hematocrit). They argued that their patients were unlike those on other services, extremely sick, and more needing of transfusions. Though Dr. Lloyd pointed to a lack of evidence for their rationale, they did not change their stance. To make things worse, the cardiac surgery service, which had agreed to a transfusion guideline of 21%, argued that if the thoracic surgery division was able to get a threshold of 30%, they should too. “Why should our money be much more at risk when we do such similar things?” asked the cardiac surgeons.

The Chief of Orthopedic Surgery, Dr. Blund, told Dr. Lloyd that his patients needed higher hematocrits in order to participate effectively in post-operative rehabilitation exercises. He wanted his already-liberal transfusion threshold of 24% raised. Dr. Lloyd heard similar things in other departments. “Neurosurgery is unique,” explained Dr. Gunnel and furthermore, he went on to say, “the TRICC study you keep citing did not include neurosurgical patients so those guidelines do not apply to me.” When Dr. Lloyd countered by asking what made a neurosurgical patient different from other ICU patients, Dr. Gunnel explained there were national guidelines that neurosurgeons had to follow. When Dr. Lloyd looked, there were no national guidelines but Dr. Gunnel explained that it was something that “every neurosurgeon knew from residency.”

Despite the push back from many physicians and services, Dr. Lloyd continued outreach to clinical leadership and the generation of regular feedback reports. He scaled back educational outreach as he saw that even with good evidence, education was simply not very effective. He noticed that departments with chairs that had “bought-in” and were engaged in the process had very effective reductions in RBC transfusions with no change in patient outcomes. Further, his meetings with individual providers and their chair were very effective as it was hard to argue against hard data. Dr. Lloyd was very careful never to sound accusatory of outlying physicians but, rather, tried to encourage ways to help the physicians better adhere to the guidelines.

While data from FY2011 is not currently available, thanks to the hard work of the HBMC Executive Committee and Dr. Lloyd, the process of improving RBC utilization appropriateness is well under way.

Questions to consider:

1. What do you think about withholding physician-specific data? Do you think it should be available to the entire department or is it better to keep it private so that only the physician in question and departmental leaders can view them? What are the advantages and disadvantages of each approach?
2. Finding appropriate metrics, in this case, the appropriate hematocrit levels indicating transfusion, is one of the major concerns of P4P models. What do you make of some of the arguments for higher hematocrit thresholds? How might special cases or patients that are truly different than normal be accurately captured so as not to penalize physicians who are doing the appropriate clinical treatment but are technically “violating” guidelines?
3. Think about the evidence that was presented to some of the physicians about the appropriateness of RBC transfusions in certain types of patients such as neurosurgical patients and orthopedic patients. Assuming the evidence Dr. Lloyd presents is true, how would you respond to physicians who disregard studies and hard data?
4. How would you deal with physicians who complain about the extra time needed to use the decision support module, and more robust EHR systems in general? What if new systems do take more time to use?
5. Clinical leadership can be especially important in obtaining physician buy-in. At many academic medical centers, department and division chiefs spend much more time doing research than seeing patients. How can you get them to support quality improvement initiatives? What solutions exist if they are not supportive?

Figure 1: Electronic Decision Support for RBC Transfusions

ViewOrders PtLookup Feedback Help Goodbye

Clinical Indication for Transfusion

Please choose the applicable indications (may check more than 1)

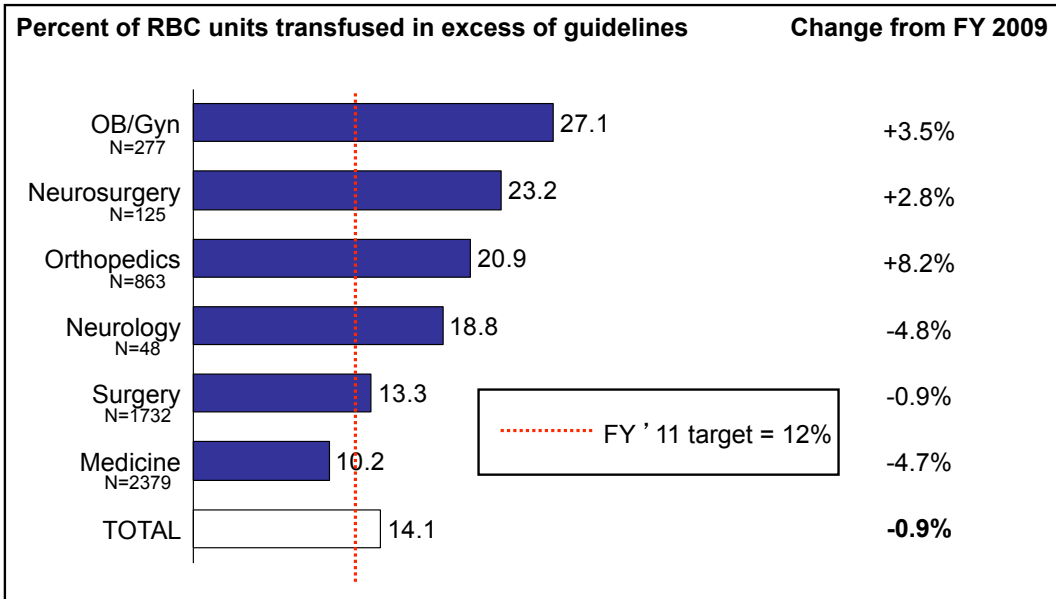
- 1.Active Bleeding
- 2.Acute coronary syndrome(acute MI or unstable angina)(Hct<30)
- 3.Major Thoracic surgery(Hct<30)
- 4.Pre-op anemia and anticipated blood loss > 50 ml(Hct<26)
- 5.Pregnant Patient(Hct<26)
- 6.Oncology/BMT Patient(Hct<24)
- 7.Orthopedic surgery with post-op anemia (Hct<24)
- 8.Post-op Anemia due to blood loss(Hct<21)
- 9.Normovolemic patient, none of the above clinical settings apply(Hct<21)

< Ok > < Cancel >

Type the letter of the field you wish to change.

Figure 2: HBMC Data on RBC Utilization by Department

RBC Appropriateness: HBMC FY 2010 YTD



RBC Appropriateness: HBMC FY 2010 YTD

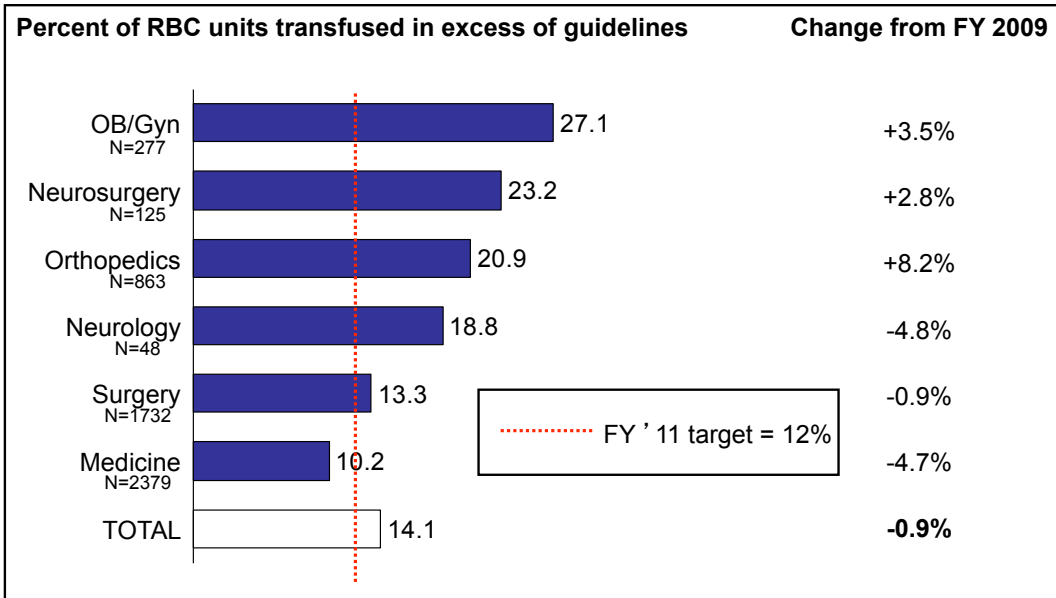


Figure 3: HBMC Transfusion Guidelines

Heron Bay Medical Center's Transfusion Guidelines

Red Blood Cells	
Clinical setting	Transfusion may be indicated for HCT below:
Acute coronary syndrome Thoracic surgery w/ postop anemia	30%
Preoperative anemia Pregnant	26%
Oncology/BMT Orthopedic surgery w/ postop anemia	24%
Normovolemic, nonbleeding patient, none of above apply	21%

Platelets	
Clinical setting	Transfusion may be indicated for PLT below:
Prophylaxis (nonbleeding patient): - Stable patient, no procedure planned - Central line removal	10,000/ [L
- Hem/Onc pt. with recent minor bleeding	20,000/ [L
- Central line placement or paracentesis	30,000/ [L
- Major extracranial surgery - Lumbar puncture, thoracentesis or biopsy	50,000/ [L
- CNS or ophthalmologic surgery	100,000/ [L
Bleeding - Intraop or postop - After cardiopulmonary bypass	50,000/ [L 100,000/ [L

Cryoprecipitate	
Clinical setting	Transfusion may be indicated for fibrinogen below:
Active bleeding or hemostatic challenge	100 mg/dL

Plasma	
Clinical setting:	Transfusion may be indicated for INR above:
Active bleeding or Prior to major surgery or invasive procedure*	1.5

*FFP prophylaxis is not indicated for central line placement/removal.

FFP dosing:
10-15 ml/kg (1 unit of FFP has a volume of ~250 ml)
Urgent warfarin reversal:
- Vitamin K (5 mg IV infused over 10 minutes) is recommended in addition to FFP unless reversal is intended to be transient. - Life-threatening hemorrhage on warfarin: in addition to FFP and vitamin K, prothrombin complex concentrate (Profilnine) is recommended. Profilnine dosing: INR <4.0: Profilnine 25 U/kg slow IV push INR >4.0: Profilnine 50 U/kg slow IV push

Risks per unit	
Human immunodeficiency virus (HIV)	1:2,000,000
Hepatitis C virus	1:2,000,000
Hepatitis B virus	1:200,000
West Nile Virus	Approaching 0
Bacteria (PLT transfusion)	1:75,000
Febrile or allergic reaction	1:100
Circulatory overload	1:400
Transfusion Related Acute Lung Injury (TRALI)	1:5,000

Contacts	
HBMC Blood Bank	617-732-7290
Transfusion Medicine MD on-call	BB# 35110

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