

An AABB White Paper

Building a Better Patient Blood Management Program

Identifying Tools, Solving Problems and
Promoting Patient Safety



APRIL 2015

AABB
8101 Glenbrook Road
Bethesda, MD 20814-2749

Copyright © 2015 AABB

This white paper is provided for educational purposes only and should not be relied upon for clinical advice. AABB will not be responsible or liable for any errors, omissions or consequences arising from use of the white paper's content. This white paper may not be reprinted or modified in any way without the express written permission of AABB.

Table of Contents

Executive Summary	1
Introduction	2
Building the Business Case	3
Transfusion Economics	5
Transforming Challenges into Opportunities: The Saskatoon Experience	7
Taking Advantage of Transfusions Committee Resources	10
Conclusion	12
Acknowledgements	13

Getting Started:

How to Build a Successful Patient Blood Management Program

Executive Summary

A successful patient blood management (PBM) program, grounded in evidence-based medicine, optimizes patient safety and outcomes through measurable improvements. A PBM program also can result in hospital-wide cost savings. However, the creation and implementation of a comprehensive PBM program requires an investment in the right mix of resources — including support at the highest levels, clinical leadership and staff education. While no two institutions are alike, there are many common challenges to overcome. This white paper is intended to help health care professionals demonstrate the tremendous benefits from PBM programs, identify and understand hindrances to creating programs and provide solutions from experts who have successfully implemented PBM programs.

PBM program clinical champions can face resistance from fellow clinicians, as well as resistance stemming from a hospital's "culture." Providing education, creating enthusiasm, and engaging and empowering staff can drive success in overcoming hesitance. Often a successful program starts with small but achievable PBM quality improvement projects that can provide evidence of improved patient outcomes or cost savings in order to secure the resource commitment for a more comprehensive, formal program. Securing resources is a key component of PBM program implementation because successful programs require dedicated personnel. Innovative and successful solutions from one PBM program included here provide real-life examples of how to turn limitations into opportunities.



The critical first step in starting a program is to enlist clinical champions who can build a strong case for educating hospital leadership about the patient care benefits of the program, highlighting improved patient outcomes.



The critical first step in starting a program is to enlist clinical champions who can build a strong case for educating hospital leadership about the patient care benefits of the program, highlighting improved patient outcomes. Developing a clear business case for a program is a necessary step, and doing so provides an early opportunity to build interdepartmental consensus around the goals of the program. Because clinicians and administrators may not always speak the same language, the business plan should be written in a format and use language that decision-makers understand and should contain a number of required elements.

Planning, implementation and maintenance of blood management program components are an important but complex set of tasks that can be achieved with the help of the transfusion committee. The transfusion committee can support programs by providing oversight, such as monitoring practices; creating auditing criteria and transfusion policies; tracking quality indicators; and reviewing adverse events.

Improved patient outcomes lie at the heart of PBM. There is growing evidence to support the effectiveness of this multidisciplinary clinical approach to achieving measurable improvements in the care of patients who may need a transfusion. Studies have shown reductions in length of stay, incidence of infection and re-admission rates for postoperative complications in patients not receiving transfusions.^{1,2} PBM also can optimize the use of blood and blood products, which can translate to hospital-wide cost savings. The benefits of a PBM program fit neatly in the "Triple Aim" — improving the care experience, improving the health of populations and reducing per capita costs of health care. Some useful tools to overcome common program startup problems are outlined in this document. The information is key to the development of a robust PBM program that will grow to become an important foundation in patient care at facilities and within systems worldwide.

Introduction

Transfusion of blood and blood products is one of the most frequently performed procedures during hospitalizations.³ However, with a growing evidence base supporting the use of restrictive transfusion strategies, PBM has emerged as an evidence-based, multidisciplinary approach to optimizing the care of patients who may need a transfusion.

Clinical research has demonstrated that a restrictive transfusion strategy results in patient outcomes similar to those associated with more liberal strategies and may even improve outcomes.^{4,5,6} At the same time, retrospective studies have suggested an association between transfusions and patient morbidity — increased hospital-acquired infections and length of stay. In economic terms, unnecessary transfusions have been shown to translate to poor use of resources and increased costs.⁷



PBM encompasses all aspects of patient evaluation and clinical management surrounding the decision-making process.



PBM encompasses all aspects of patient evaluation and clinical management surrounding the transfusion decision-making process, including the optimization of patient red blood cell volume, the application of appropriate indications and the minimization of blood loss. PBM can reduce the need for

allogeneic blood transfusions and reduce health care costs, while ensuring that blood components are available for the patients who need them.

The principal goal of a PBM program is to optimize patient care by taking steps to reduce the probability of transfusion. A successful program involves:

- Increasing awareness of evidence-based guidelines;
- Reducing the likelihood of peri-operative transfusion;
- Minimizing blood loss;
- Improving blood utilization;
- Continuously educating clinicians; and
- Standardizing clinical PBM-related metrics.

Despite the demonstrated benefits of PBM, those trying to initiate a program often encounter common challenges. Many physicians who order blood may not be familiar with indications for transfusions or with alternative treatments designed to reduce the likelihood that a patient may require a transfusion. A culture of status quo can pervade institutions — reinforced through privileges, procedures, information systems and long-standing practice — that makes the adoption of better blood utilization practices challenging. Even when institutional change takes root, altering the habits of individual practitioners can take time and education.

By anticipating these challenges, PBM advocates can be ready to address these challenges as they arise. It's not possible to foresee all obstacles. However some, such as limited funding, staff and other resources, come up time and again.

Building the Business Case for a PBM Program

A business case is essentially a tool for program planning and for communicating constraints and other important operational parameters. Clinicians and administrators don't always speak the same language, but a business case allows for the development of a common understanding around the purpose of the PBM program. The business case for a PBM program provides leadership with sufficient information about the patient safety, quality and financial benefits of a program to drive a decision. Hospital decision-makers evaluate and must choose from many worthy projects vying for limited resources. A well-crafted PBM business case is an increasingly important means for clinical champions to advocate for transfusion-related quality of care and patient safety. It's also an opportunity for clinicians and administrators to brainstorm and encourage innovation.

A business case for a program is a reasonable expectation and necessary step in advancing the adoption of blood management principles. Producing one can seem a challenging task to clinicians and other stakeholders. It doesn't have to be though; a business case follows a standard format, and in-house experts on finance, project management, quality, risk management and data management can help. While sufficient detail is needed for decision-making, the business case should be limited to pertinent facts.

At its core a business case addresses five basic questions.

- What is a PBM program?
- What is the rationale for a PBM program?
- Who needs to be educated; i.e., who are the key stakeholders?
- What actions are required?
- What are the costs and benefits?

What follows is a discussion of the basic elements of a business case, which can be tailored to position a proposed PBM program in the best possible light.

Executive Summary

The executive summary is considered to be the most important part of any business case because it's the first section — and often the only section — that will be read. Therefore, the executive summary has to be compelling. Brevity is key. In one to two pages, an executive summary should succinctly state the problem, propose a solution,

highlight the benefits and note the risks of not undertaking the program. A successful executive summary can require almost as much time and effort as the entire plan. While the executive summary is the first section to be read, it should be written last, in order to include all pertinent information.



The problem statement or mission statement clearly defines the issues, needs and opportunities.



Problem Statement or Mission Statement

The problem statement or mission statement clearly defines the issues, needs and opportunities. It's the "why." Facilities and systems continually strive to improve patient safety and quality of care. A PBM program provides evidence-based decision-making tools to achieve those goals for transfusion medicine. However, programs provide economic benefits as well. Your own organization has a mission statement that should be tied directly to the program.

Objectives or Expected Benefits

The business case should include specific, measurable goals for the program that will benefit the patients and the hospital. Baseline data should be included in the business case because it both provides a means to measure how well the program meets goals and demonstrates commitment to data-driven reporting. Also, the current state of various measures can help to identify existing gaps that can become program improvement targets. Some baseline measures data should be available to you and can come from a number of sources:

- Medical record reviews;
- Third-party gap assessments;
- Internal or external benchmarking data;
- Blood bank inventory management;
- Financial systems (e.g., patient billing and budget);
- Patient morbidity and mortality data; and
- Observations or supportive statements from key stakeholders.

Even when data are not available, it is still important to spell out the goals of the program and how these will be evaluated. Consider including testimonials from key individuals within the hospital organization (e.g., chief medical or chief nursing officer). Such testimony can demonstrate broad early support for a program.

Preferred Approach and Alternatives

This section should contain a description of the solution best suited to meet the program's objectives. It should include a moderate level of detail. It's important to include a discussion of two to three alternative approaches and reasons why the selected solution is preferred. Including a discussion of alternatives demonstrates due diligence and provides a means to preempt reasonable objections. For example, will the program use internal resources only, or require a combination of internal and external resources over time?

Performance and Progress Measures

A number of benchmarking databases exist that allow comparisons of PBM metrics with member hospitals nationwide or with other similarly sized hospitals. This information can reveal blood management shortcomings and identify opportunities for savings. In some cases, benchmarking information may have already been presented to hospital leadership. In any case, such benchmarking data may be helpful in the process of identifying areas for early targeted small projects. Measurable improvements in pilot activities can drive additional investment. Even when baseline data are not available, include an explanation of the metrics that will be used to measure the performance of the program going forward. Important PBM metrics include:

- Overall transfusion rate compared with that of comparably sized hospitals;
- Transfusion rates for specific cases (e.g., hip replacement, cardiac surgery) compared to national data or data from literature;
- Percentage of transfusions that fall outside of hospital or professional transfusion guidelines;⁸
- Transfusion administration compliance;
- Transfusion reaction rates; and
- Budget (inventory, supply costs, product).

Risks and Mitigation

A business case includes a thoughtful discussion of the risks and potential challenges of program implementation. Offer reasonable mechanisms to meet challenges. Consider using a "SWOT" analysis (Strengths, Weaknesses, Opportunities and Threats), which is one way to organize these ideas in a standardized language. Also, consider identifying internal stakeholders who can support program implementation risks.



A project plan lists major activities and required staff resources and provides a timeline with milestones. It's a good-faith estimate of program requirements and deliverables.



Project Plan and Timeline

A project plan lists major activities and required staff resources and provides a timeline with milestones. It's a good-faith estimate of program requirements and deliverables. Quality management staff can be an important resource to enlist when developing a formal project plan. These experts often have project management experience, are familiar with program design and can help identify the data necessary for the PBM program business case.

Timelines should reflect the length of time expected to be needed to implement a PBM program. In the best-case scenario, the time frame from initial concept to full implementation of a comprehensive PBM program may take two to three years. The timeline should encompass this "program build" period and include major milestones. The timeline should be more specific early in the implementation process — the first six months — and can be less so with time. Gantt charts (a type of bar charts) are commonly used to illustrate major milestones and the start and finish dates of project deliverables.

Cost Estimates and Funding Sources

Two of the more common questions about a business case are “How much will this cost?” and “Where will the funding come from?” A reasonably detailed program budget is a fundamental element of a business case. Seek assistance from a colleague with financial expertise or seek assistance from your organization’s decision support team, which is typically housed within the finance department. This could be a quality manager with finance experience or a colleague in the finance department. Essentially, a budget can be broken down into initial project costs — such as personnel salary, equipment needs and any outside resources — and ongoing project costs. Ongoing project costs should be provided by year. PBM-related cost savings estimates also should be included and can be categorized as “hard” or “soft.” Hard costs are tangible and include the costs of blood products and blood wastage, etc. Soft costs include nursing and lab technician labor, and supplies to dispense and administer blood products. Soft costs also include expenses associated with adverse events. (See the Transfusion Economics section for a more detailed discussion of costs.)

Finding funding sources is a perennial challenge. Health-care and hospital resources are limited and under increasing external pressure. However, there are alternative sources to consider. Explore the possibility of available grants. There also may be other operational funding sources that can be used to start a program. Importantly, programs often can start with a small investment. Estimated cost savings resulting from a PBM program can be another reasonable way to fund a program. However, because savings are considered future funding,

starting a program requires an initial outlay; this can be a difficult argument to make. Programs can start small though and, therefore, require less of an initial outlay.

Return on investment (ROI) is a commonly used measure of an investment’s efficiency. It’s the ratio of the net gain from an investment to the cost of the investment:

$$ROI = \frac{\text{Gain from investment} - \text{Cost of investment}}{\text{Cost of investment}}$$

Some hospitals may use an ROI threshold — a 10 percent ROI for example — to evaluate program investments. In other words, does this investment provide a “payback”?

Consider starting with relatively simple steps that provide a reasonable ROI, such as instituting and/or updating transfusion guidelines, instituting and enforcing blood orders and creating reports to understand patterns of blood usage.

Opposing Arguments and Responses

Objections and opposition to a PBM program should be expected. A good business case should anticipate common objections and counter them. Competing priorities and time and resource constraints are common and reasonable concerns. Offer possible solutions to mitigate these objections. A number of books and Internet sources provide resources for responding to objections to any type of program.

Transfusion Economics

Timothy Hannon, MD, MBA, likens transfusion costs to an iceberg. Hard costs represent the tip of the iceberg and soft costs — labor, supplies, overhead and adverse event costs — comprise its bulk.⁹ The blood bank supervisor can provide current blood costs, which account for 1 to 2 percent of a total hospital budget, says Hannon. However, even that small percentage of a large budget translates into a significant amount of money. Hannon was instrumental in building the blood management program at St. Vincent Hospital in Indianapolis.

Transfusion-associated costs include the cost of labor, processing and supplies to store, test, administer and monitor blood products. These are called direct variable costs, which can be and have been quantified. In 2010, Shander et al.¹⁰ estimated per unit cost of red blood cells (RBCs) at four hospitals using the method developed through the Cost of Blood Consensus Conference (COBCON). This method accounts for the major process steps, staff and consumables required to provide RBC transfusions to surgical patients, including direct and indirect overhead costs. They estimated that total RBC unit

costs were 3.2- to 4.8-fold greater than the cost of blood product acquisition. In addition, the costs of acquiring RBCs accounted for only 21 to 32 percent of transfusion-related expenditures.

However, this analysis did not account for adverse event costs, such as hospital-acquired infections, increased length of stay and transfusion-related acute lung injury (TRALI). Adverse event costs are likely the greatest costs in the transfusion cost iceberg, said Hannon. It is very important to note that these costs are incremental and avoidable through safer transfusion care. In a 2012 study,¹¹ researchers used data from the National Surgical Quality Improvement Program to examine adverse events related to RBC transfusion and the dose-response relationship. In the study, one unit of RBCs increased wound complications by four percent and increased length of stay by 1.5 days. The researchers also found a 0.9 percent increase in propensity-adjusted mortality. The unadjusted mortality and composite morbidity rates increased with increasing number of transfused units. Risk managers at your hospital can be excellent resources and allies in explaining the benefits of reducing adverse events.

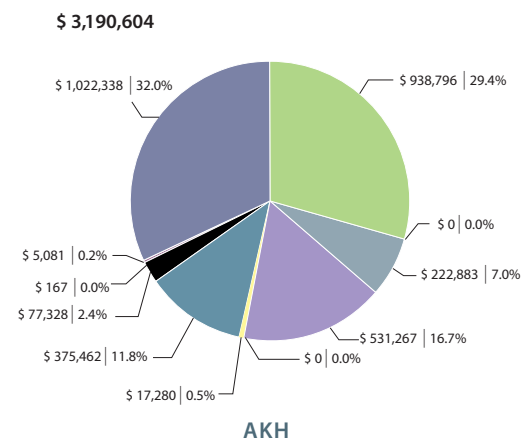
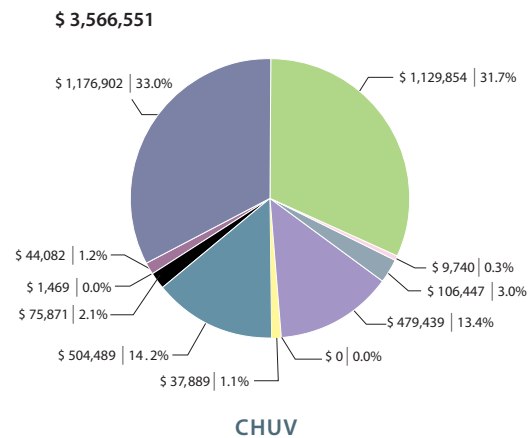
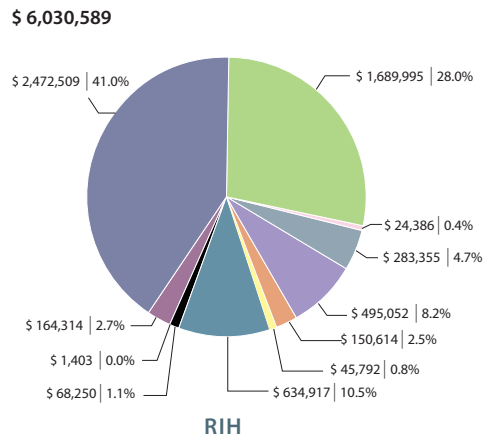
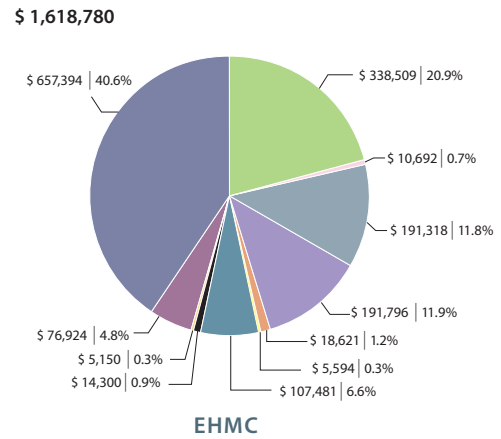
Figure 1:
Activity-based Costs of Blood Transfusions in Surgical Patients at Four Hospitals

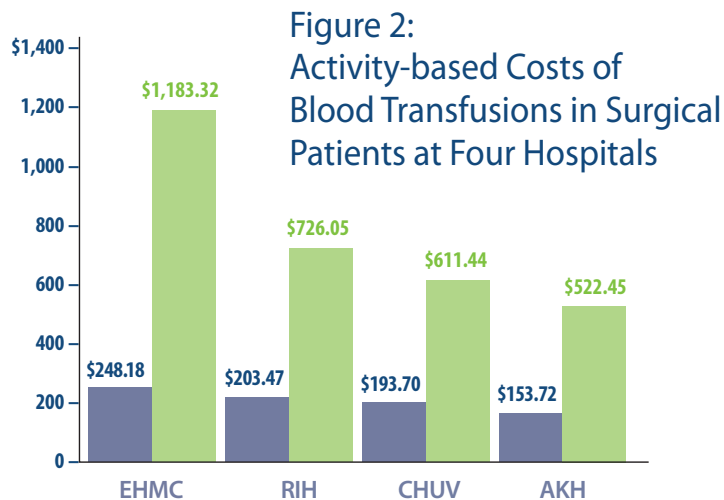
Legend

- Product acquisition cost
- Hospital blood bank supply management
- Pre-transfusion processes
- Patient blood testing processes
- Transfusion-specific consent
- Issuing & delivering components from blood banks
- Administering & monitoring transfusions
- Managing acute transfusion reactions & hemovigilance
- Post-transfusion logistics
- Direct overhead
- Indirect overhead

- AKH** General Hospital Linz
- CHUV** Centre Hospitalier Universitaire Vaudois
- EHMC** Englewood Hospital Medical Center
- RIH** Rhode Island Hospital

Transfusion
Volume 50, Issue 4, pages 753-765, 9 DEC 2009 DOI: 10.1111/j.1537-2995.2009.02518.x
<http://onlinelibrary.wiley.com/doi/10.1111/j.1537-2995.2009.02518.x/full#f3>





Legend

- Mean acquisition costs per unit of blood
- Total activity-based costing model costs per unit of blood

Mean per-unit acquisition costs included units that were wasted and additional services provided (e.g., irradiation, washing, cytomegalovirus testing) as described in the text. European currencies converted from the 1-year mean beginning May 2008 (CHUV conversion of \$1 = SFr 1.12; AKH conversion of \$1 = € 0.72).

- AKH** General Hospital Linz
- CHUV** Centre Hospitalier Universitaire Vaudois
- EPMC** Englewood Hospital Medical Center
- RIH** Rhode Island Hospital

Transfusion
Volume 50, Issue 4, pages 753-765, 9 DEC 2009 DOI: 10.1111/j.1537-2995.2009.02518.x
<http://onlinelibrary.wiley.com/doi/10.1111/j.1537-2995.2009.02518.x/full#ft2>

Transforming Challenges into Opportunities: The Saskatoon Experience

PBM program clinical champions and other advocates face several common barriers to the development and implementation of blood management programs: staff and time constraints; lack of awareness or interest in PBM; and funding. Saskatoon Health Region (SHR) in Saskatchewan provides an example of how these problems not only can be overcome but how challenges can be transformed into novel opportunities.

Staff and Time Constraints

The foremost of the problems associated with starting a PBM program is typically a lack of resources — limited staff with limited time. When Karen Dallas, MDCM, arrived in SHR, the region lacked both a transfusion medical director and physicians trained in transfusion medicine. However, there was a provincial transfusion medicine working group in Saskatchewan, which served as a de facto under-resourced blood office. The working group included laboratory managers from each health region in the province, representation from the Ministry of Health and from the blood supplier (Canadian Blood Services).

Once in Saskatoon, Dallas faced her own time constraints. She could devote only half of her time to transfusion medicine in SHR as the program's medical director; she also served as transfusion medical director for the province of Saskatchewan. Others at SHR had similar time restraints. The transfusion safety officer spent half of her time on reporting transfusion reactions and other information at the federal level. In addition, there were too few medical technologists dedicated to transfusion services. They also supported the bone bank and the stem cell processing facility.

However, there were resources available in other specialties at SHR. Staff perfusionists championed PBM. In fact, the director of the perfusion department chaired the existing transfusion medicine committee.

SHR also had several strong residency programs in specialties including general pathology, anesthesia, surgery and general medicine. Many of the residents were interested in transfusion medicine. In particular, the anesthesia research program was well structured and provided Dallas the opportunity to present potential blood management research projects. Surgery and general medicine required residents to perform research projects, which generated additional resident interest in transfusion medicine research.

Resident Research Identifies Quality Improvement Targets

Improving the quality of blood management provided residents with a rich area for research topics. Not only were residents able to meet their research requirements, but they produced valuable baseline blood utilization data, which could be used to support individual quality initiatives at SHR as well. The following projects all benefited from resident involvement.

Type and Screen (T&S) testing: Hematology staff at SHR routinely repeated T&S tests every 96 hours, ensuring that patients would be ready to receive a transfusion should a physician order one. In a study, SHR researchers found that in a one-month period, 40 percent of patients in the hematology ward who underwent repeat testing were never transfused. In addition, 43 percent received only one transfusion, despite multiple pre-transfusion tests; only 17 percent ever required more than one transfusion. The researchers estimated \$6,000 of wastage in a single month due to unnecessary repeat T&S testing and presented these results to the hematology department. A change in practice was seen almost immediately.

Emergency Department STAT T&S testing: In another project, researchers collected data on emergency department (ED) STAT T&S testing for a seven-week period. They found that 83 percent of ED patients who had been STAT T&S tested had hemoglobin (Hb) levels greater than 10 g/dL. In addition, blood was never requisitioned for 89 percent of patients. Less than half (43 percent) were admitted to the hospital. Using a conservative categorization scheme, the researchers determined that

20 percent of patients had completely inappropriate STAT T&S testing for the ED. In the seven-week study period, they calculated \$11,000 of wastage. Presented with this data, ED staff worked together with transfusion staff to improve requests for testing and blood usage.

Post-operative transfusion: Researchers assessed transfusions associated with total hip replacement surgery. They found that most transfusions occurred during the post-operative period. However, there were no transfusion guidelines or tracking system in place; transfusions were ordered at the discretion of individual clinicians. The researchers found that patients with Hb greater than 10 g/dL were receiving transfusions, despite growing evidence for more restrictive transfusion criteria. In addition, a reason for transfusion was provided in only 2 percent of medical charts. These findings revealed a great need for practitioner education.

Platelet utilization: Researchers examined platelet utilization over a one-year period. Among the 10 patients with the greatest platelet usage, numbers reached more than 100 units. Some patients received multiple platelet transfusions per day. Importantly, the researchers found that very few clinicians ordered post-transfusion complete blood counts (CBCs), which could both prevent unnecessary transfusions and reveal possible platelet refractoriness. The study resulted in a clinical transfusion algorithm and education for practitioners.

Generating Interest in PBM

PBM program champions often face a general lack of awareness about or interest in PBM among staff. In Saskatoon the “Blood Club” — a hematology interest group — not only educated staff about PBM but also identified potential allies. The group met one evening each month and attracted physicians, nurses, technologists and others. “In the end, even though we didn’t have a properly staffed program, we did have a lot of people who were interested in transfusion medicine,” said Dallas.

A physician transfusion medicine utilization subcommittee was added to the transfusion committee. This small group included a surgeon, an anesthesiologist and a physician from ED/ICU, who met to discuss potential projects, algorithms and audit results. “This has been a great venue to try to effect change from within,” said Dallas.

Education, engagement, empowerment and excitement have produced tangible results in Saskatoon. For example, a massive transfusion protocol was in place when Dallas arrived, but had inconsistent activation. The activated protocol was often a false alarm; sometimes the protocol was activated before the patient even arrived at the hospital. In response, Dallas held a multidisciplinary education session targeting the “on-the-ground” providers, including residents, laboratory technicians, nurses and educators. Consequently, “practice changed overnight. People were excited, educated and empowered to make better decisions,” said Dallas. In the six months following the session, there were fewer than five activations of the protocol, and all were appropriate.

Funding Opportunities

Building a PBM program costs money. In an era of tight budgets and very limited financial resources, finding innovative funding sources is essential. “We didn’t have enough money in our health region to start a PBM program. We didn’t have enough money to run a large project,” said Dallas. However, Dallas was able to highlight their small projects at the Saskatchewan provincial transfusion medicine working group, which attracted interest of other members, including the Ministry of Health. With only a small investment in little projects, SHR was able to generate interest in potential patient care improvements and cost savings at a higher level of the health system with the aim of securing more funding and resources.



SHR was able to generate interest in potential patient care improvements and cost savings at a higher level of the health system with the aim of securing more funding and resources.



As an example, resident research on intravenous immunoglobulin (IVIG) utilization suggested a simple avenue for the province to save IVIG money for the blood budget. Dallas and her colleagues participated in a Ministry of Health-led rapid process improvement workshop (RPIW) on IVIG utilization. The workshop ultimately led to a new order form, a new set of provincial guidelines and the structure for a specialist working group to evaluate indications for IVIG orders.

Taking Advantage of Transfusion Committee Resources

At its heart, the transfusion committee provides planning for and maintenance of transfusion safety and blood management. An independent blood safety and management committee or transfusion committee can drive the development of a PBM program or provide needed support for a fledgling program. How is a transfusion committee composed and what does it do?



The greater participation at the highest level, the more global a PBM initiative can become.



Composition

Support from hospital administration is essential, according to Mary Townsend, MD, who is the Senior Medical Director at Blood Systems Inc. She recommends seeking participation from hospital leadership. The administration representative is typically the chief medical officer. However, the greater the participation at the highest level, the more global a PBM initiative can become.

The other essential element is multidisciplinary involvement. A good transfusion committee includes the medical director of the transfusion service; the transfusion safety officer; physicians from all major medical and surgical departments that routinely order blood; pathologists; anesthesiologists; nurses; a blood bank representative; laboratory personnel; representatives from pharmacy, education, risk management and quality teams; and other stakeholders.¹² The emergency department (ED) and operating room (OR) have special needs and should be included in the committee as well. The committee chair should be a physician with extensive knowledge of transfusion medicine. Consider rotating the chair with terms of two to three years to avoid burnout.

Function

A transfusion committee should be responsible for monitoring physician ordering practice; establishing transfusion audit criteria; establishing hospital-wide transfusion policies; reviewing adverse events; and tracking specific quality blood indicators. The transfusion committee needs access to metrics that reflect the ordering and transfusion of many blood products.

Determining the appropriateness of blood product ordering — which is typically assessed through auditing — is a key function of the transfusion committee, because it affects both patient safety and wastage. While retrospective auditing provides valuable information, concurrent auditing can change blood product usage in real time. Electronic ordering can make concurrent auditing more feasible. Useful metrics include crossmatch/transfusion ratio, turn-around-time and transfusion reaction tracking.

Table 1: Model for Transfusion Committee Membership

Department	Position/Specialty	Total No. Representatives
Hospital Administration	Chief Medical Officer	1
Blood Bank	Director Laboratory Manager	2
Blood Vendor	Director	1
Pathology	Director	1
Pathology	Residents	1+
Biomedical Engineering		1
Pharmacy		1
Risk Management		1
Clinical Services		14
(1 physician + 1 nurse from each specialty)	Anesthesia	
	Emergency Medicine	
	Surgery	
	Cardiothoracic	
	Intensive Care Units	
	Trauma	
	Medicine/Hematology	
	Pediatrics/Neonatology	
Nursing	Nursing	3
	Perioperative Nursing	
	Nursing Education	
Total		26+

Adapted from: Saxena, S ed. The Transfusion Committee: Putting Patient Safety First. 2nd ed. (Bethesda, Maryland: AABB Press, 2013)

The crossmatch/transfusion (C/T) ratio reflects over-ordering of blood compared with actual transfusion. Over-ordering wastes staff time and reagents. However, the C/T ratio doesn't always represent appropriate ordering, according to Townsend. For example, a surgeon may order and transfuse three units of RBCs for every surgery. The surgeon's C/T ratio is one metric yet his blood usage may not be appropriate in each case.

Turn-around-time (TAT) reflects customer service to physicians and patients (i.e., delivery of blood components in timely fashion) and can help pinpoint areas for improvement. However, TAT can be a misleading term. Blood may not be transfused to a patient as soon as it is delivered. For example, a patient who is in radiology when blood arrives may not be transfused until later. So, TAT must be defined very carefully in order to be meaningful, according to Townsend.

Transfusion reaction tracking can help to identify under-recognition or under-reporting of transfusion-related adverse events. Once a problem is identified, education can be developed and implemented to improve staff knowledge.

Successful Transfusion Committee Meetings

- A successful transfusion committee depends on successful meetings.
- More frequent meetings will be needed during the implementation of a PBM program but can be decreased once the program becomes established — biweekly vs. quarterly.
- Townsend recommends scheduling meetings and providing the agenda and meeting materials — audits, adverse reaction reports and other routine reports — well in advance. This allows the committee to spend the bulk of the meeting time doing meaningful work.
- The meeting atmosphere should be open, and members should be encouraged to report and discuss errors.
- Following the meeting, the minutes and action items should be distributed as soon as possible to keep the momentum going.

Table 2: Sample Agenda for Transfusion Committee Meeting

Date: _____ Time: _____ Room: _____

Item	Requirement	Description	Responsibility	Documents	Action/Information
1		Call to order	Chair		Action
2	Bylaws	Approval of Minutes	Chair	Minutes	Action
Standard Reports					
3	AABB, TJC	Blood refrigerator maintenance	Refrigeration representative	Quarterly report	Action
4	AABB/TJC	Blood warmer maintenance	Biomedical engineering	Quarterly report	Action
5	Bylaws/ABB/TJC	Component utilization	Blood bank manager	Quarterly report	Information
6	AABB/TJC	Blood product wastage	Blood bank manager	Quarterly report	Information
7	FDA	Blood product deviations	Blood bank manager	Quarterly report	Information
8	AABB/TJC	Transfusion reactions	Blood bank manager	Quarterly report	Information
9	Bylaws/AABB/TJC	Blood product utilization reviews	Clinical service representative	Quarterly report	Action
10	Bylaws/AABB/TJC	Sentinel events, mistransfusions, near misses	Blood bank medical director	Quarterly report	Action
11		Transfusion profiles by clinical service	Chair	Quarterly report	Information
12	Bylaws/AABB/TJC	Blood administering assessment (non-OR)	Nursing representative	Quarterly report	Action
13	Bylaws/AABB/TJC	Blood administering assessment (OR)	OR Nursing representative	Quarterly report	Action
14	Bylaws	Policy/procedure update/approval	Chair	Policy/procedure	Action
New Business					
15		New items	Chair/members		Information/Action
16	Bylaws	TC meeting schedule	Chair	Meeting schedule	Information
17		Open	Members		Information/Action

TJC = The Joint Commission

Adapted from: Saxena, S ed. *The Transfusion Committee: Putting Patient Safety First*. 2nd ed. (Bethesda, Maryland: AABB Press, 2013)

Conclusion

Starting a PBM program can seem a formidable task. The challenges can seem intimidating. But programs don't start overnight nor are they fully functioning in the beginning. Small steps add up. Many successful programs have started with small pilot projects and built upon those successes. Small projects can also serve as excellent education tools.

By teaching physicians, nurses, laboratory technicians and other stakeholders about the patient safety and quality-of-care improvements associated with PBM, larger projects can become possible, ultimately leading to a successful hospital-wide PBM program.

- ¹ Goodnough LT, Maggio P, Hadhazy E, et al. Restrictive blood transfusion practices are associated with improved patient outcomes. *Transfusion*. 2014;54:2753-59.
- ² Rohde JM, Dimcheff DE, Blumberg N, et al. Health care-associated infection after red blood cell transfusion: a systematic review and meta-analysis. *JAMA*. 2014;311:1317-26.
- ³ Agency for Healthcare Research and Quality. Healthcare Cost and Utilization Project Statistical Brief #165. 2013. <http://hcup-us.ahrq.gov/reports/statbriefs/sb165.pdf>. Accessed January 20, 2015.
- ⁴ Hébert PC, Wells G, Blajchman MA, et al. A Multicenter, Randomized, Controlled Clinical Trial of Transfusion Requirements in Critical Care. *N Engl J Med*. 1999;340:409-17.
- ⁵ Carson JL, Terrin ML, Noveck H, et al. Liberal or Restrictive Transfusion in High-Risk Patients after Hip Surgery. *N Engl J Med*. 2011;365:2453-62.
- ⁶ Goodnough LT, et al.
- ⁷ Shander A, Hofmann A, Ozawa S, et al. Activity-based costs of blood transfusion in surgical patients at four hospitals. *Transfusion*. 2010;50:753-65.
- ⁸ Carson JL, Grossman BJ, Kleinman S, et al. Clinical Guidelines: Red Blood Cell Transfusion: A Clinical Practice Guideline From the AABB. *Ann Intern Med*. 2012;157:49-58.
- ⁹ Hannon TJ, Gjerde KA. "Contemporary economics of transfusion." In *Perioperative Transfusion Medicine*, Spiess BD Ed., 2005.
- ¹⁰ Shander A, et al.
- ¹¹ Ferraris VA, Davenport DL, Saha SP, et al. Surgical outcomes and transfusion of minimal amounts of blood in the operating room. *Arch Surg*. 2012;147:49-55.
- ¹² Waters, JH ed. *Blood Management: Options for Better Patient Care*. (Bethesda, Maryland: AABB Press, 2008).

Acknowledgments

Timothy Hannon, MD, MBA
Anesthesiologist
St. Vincent Hospital, Indianapolis

Karen Dallas, MD
Consultant
Transfuse Solutions

Mary Townsend, MD
Senior Medical Director
Blood Systems Inc.
and
Medical Director
BSI Transfusion Safety Officer
Training Program

