

Implementing a Successful Patient Blood Management Program

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10/30/2019

Learning Objectives

1. Understand factors that lead to a successful model of a Patient Blood Management program

2. Identify the diverse needs of a PBM program

3. Discuss potential barriers to a successful PBM program and strategies to overcome them

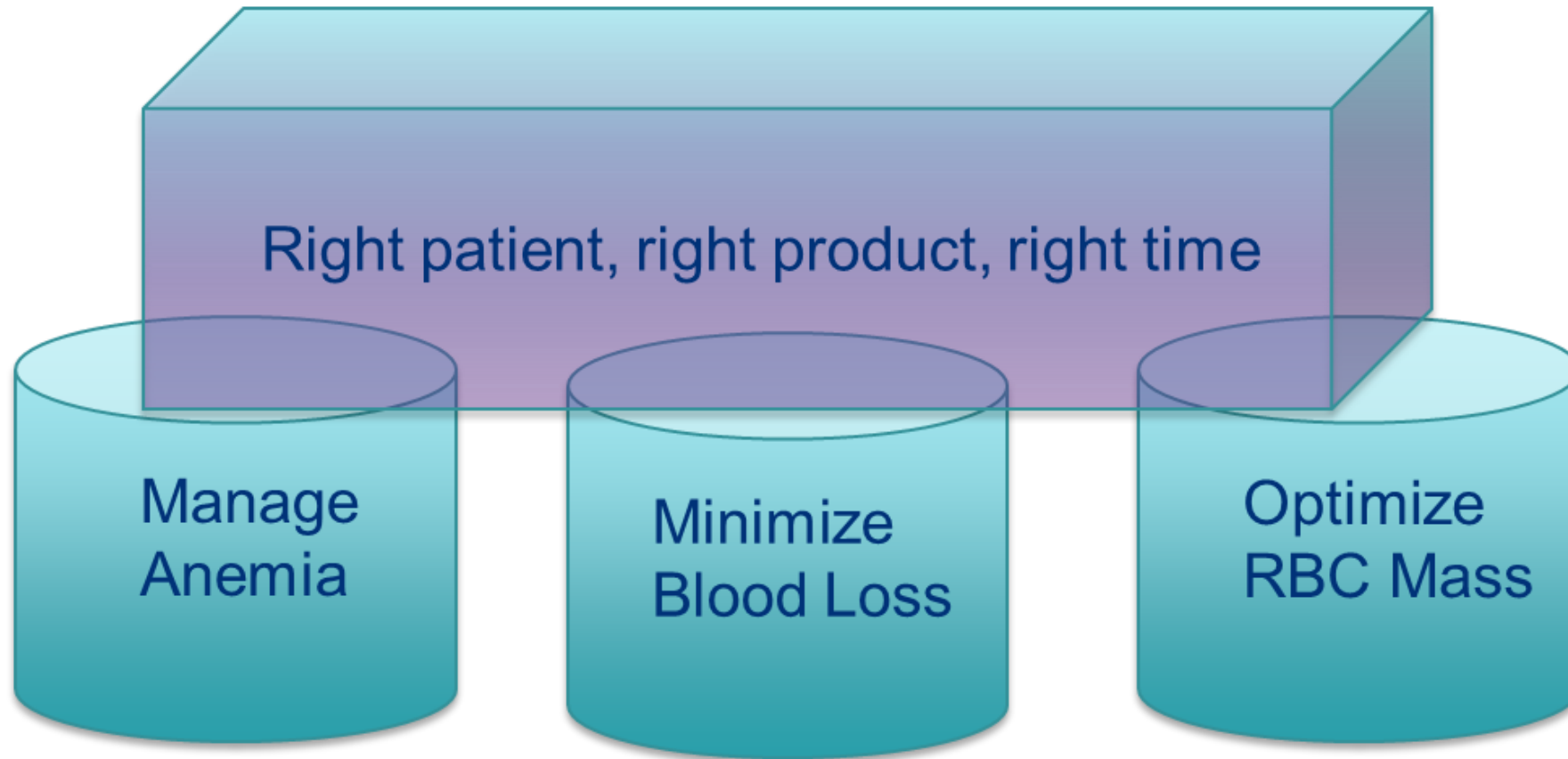
▪ ***Financial disclosures: none***

Patient Blood Management Overview



- Evidence-based, multidisciplinary approach to optimize care of patients who might need transfusions
- Encompasses all aspects of patient evaluation and transfusion decision-making process

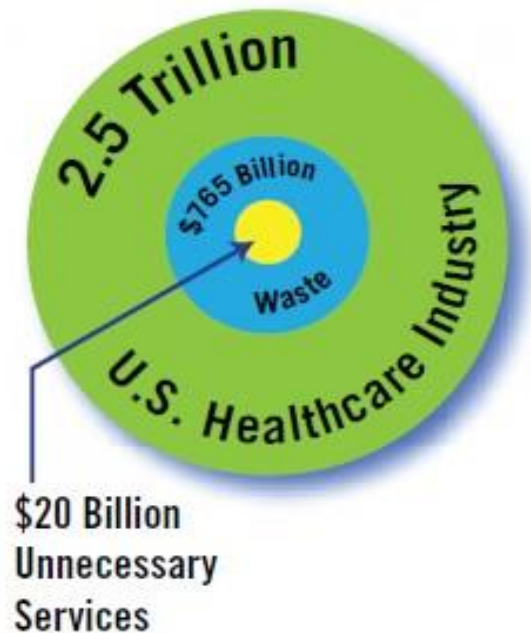
Pillars of Patient Blood Management



The three-pillar matrix of patient blood management – an overview. Best Pract Res Clin Anesthesiol 2013 27:69-84

Blood Transfusion

ONE OF THE TOP 5 OVERUSED THERAPIES IN THE US¹



– Institute of Medicine, *The Healthcare Imperative*

The Joint Commission National Summit on Overuse

Over-transfusion of RBCs

ABIM: The List Challenge

- AABB (Path)
- AASLD (GI)
- ASA (Anesth)
- ASH (Heme)
- CCS (ICU)
 - “Don’t transfuse more than necessary”

Patient Blood Management Resources



- AABB Standards for a Patient Blood Management Program
- AABB/TJC Patient Blood Management Certification
- Society for the Advancement of Blood Management (SABM) Administrative and Clinical Standards for PBM Programs



SABM Standards

- **Leadership and program structure**
 - Physician leadership
 - Program structure P&Ps
 - Monitor outcomes
- **Consent process and patient directives**
- **Blood administration safety**
- **Review and evaluation of the PBM Program**
- **Transfusion Guidelines and Peer Review of Transfusions**
- **Preoperative anemia evaluation and readiness for surgery**
- **Perioperative autologous blood collection**
- **Phlebotomy blood loss**
- **Minimize surgical blood loss/manage coagulopathies**
- **Massive hemorrhage protocol**
- **Manage anemia in hospitalized patients**
- **Manage anemia in non-surgical outpatients**
- **Patient blood management for Pediatric patients**

Society for the Advancement of Blood Management Administrative and Clinical Standards for PBM Programs. 4th Edition. 2017 SABM, Inc.



Introduction – Change Management

Systematic approach to dealing with the transformation of an organization's goals, processes, or technologies



Kotter, JP. *Leading Change*.
Boston: Harvard Business School Press, 1996.

(Source: Adapted from Kotter 1996)

Step #1: Build a Sense of Urgency



Often starts at administrative level

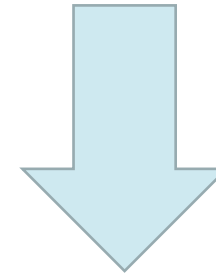
- Evidence-based practice/evolving standard of care/national guidelines
- Financial considerations
- Improved quality of care

WHEN ALL THREE ALIGN = HIGH INCENTIVE/URGENCY

Cost of Transfusions

- Financial cost
 - Hospital cost is ~\$250/unit*
 - Higher if a specialized product
- Donor cost
 - Iron deficiency, adverse reactions
- Community cost
 - Large academic centers have more purchasing power
- Patient cost
 - Transfusion reactions, immunomodulation

Why Patient Blood Management Matters



Accounting for all resources that may be consumed...
Financial cost may be
\$1800–\$2800/unit*

*Bradley A. Boucher, Pharm.D., FCCP, FCCM, Timothy J. Hannon, M.D., M.B.A. Blood Management: A Primer for Clinicians. Pharmacotherapy. 2007;27(10):1394-1411.

Blood Transfusions

Traditional Blood Transfusions

- RBC transfusion strategies have been largely guided by the “10/30” rule initially proposed in 1942 by Adam et al *

* SGO 1942; 74:1011-19. *Anesthesia in cases of poor surgical risk.*

RBC Transfusion Best Practice

- The AABB recommends a restrictive transfusion strategy (Hemoglobin 7-8 g/dL) in hospitalized, stable patients
- Based on a meta-analysis of 19 clinical trials
 - N = 6264
- 30-day mortality was lower in the restrictive vs. liberal transfused group

**QUALITY OF EVIDENCE: HIGH,
STRONG RECOMMENDATION**

Carson et. Al. Red Blood Cell Transfusion: A Clinical Practice Guideline from the AABB. *Annals of Intern Med.* 2012;157:49-58.



Red Blood Cell Transfusion Risks

ARE TRANSFUSIONS OVERALL BAD OR GOOD?

Heuristics of medical practice

- Minimize risk
 - Layers of safety measures
 - **But risks must be known and understood**
- Maximize benefit
 - Pick the right patients to transfuse



UC – Davis Statistics



CALENDAR YEAR 2017

Transfusions and Reactions

Total red blood cell units transfused	20,910
Total platelets transfused	7,439
Total plasma transfused	5,296
Total patients transfused	6,516

- Number of reported, verified transfusion reactions **165**
 - (~5:1000 transfusions)
- Number of severe or life-threatening **22**



FDA Center for Biologics Evaluation and Research (CBER)

TRANSFUSION FATALITY REPORT

FY 2012 – 2016

- 186 patients died from known risks of transfusions
- 5 million patients transfused annually
 - Is this risk a lot? A little? Acceptable? Unacceptable?

	TOTAL NUMBER	TOTAL PERCENT
Anaphylaxis	11	5.9%
Contamination (Infxn)	19	10.2%
ABO - Hemolysis	14	7.5%
Non-ABO - Hemolysis	19	10.2%
Hypotensive Reaction	3	1.6%
TACO	56	30.1%
TRALI	64	34.4%

Fatalities Reported to FDA Following Blood Collection and Transfusion, 2016 Annual Summary. Online at:
<https://www.fda.gov/downloads/BiologicsBloodVaccines/SafetyAvailability/ReportaProblem/TransfusionDonationFatalities/UCM598243.pdf>



What about the unknown risks?

Anemia and Blood Transfusion in Critical Care (ABC)

- Epidemiologic survey
 - 3,534 patients
 - 146 Western European ICUs
 - Matched for age, sex, disease severity, admitting hemoglobin level, recent history of hemorrhage or anemia, and hospital LOS
- 28-day mortality rate was 22.7% in those receiving any transfusion
- 28-day mortality rate was 17.1% in those receiving no transfusions
- Multivariate analysis estimated risk of dying 1.4x if given transfusion

Vincent JL et al. Anemia and blood transfusion in critically ill patients. JAMA 2001 Sep 25;288(12):1499-507



What about the unknown risks?

- Transfusion related immune modulation (TRIM)
- Studies in trauma patients, burns, cardiac surgery, acute coronary syndrome, and pediatric critically ill patients have all suggested increased mortality rates associated with transfusions
- Dose-related:
 - Increased risk of death
 - Increased risk of organ dysfunction
 - Increased risk of infection
 - Increased length of critical care
 - Increased length of hospital stay
 - Independent risk factor for poorer outcome, including mortality
- Any transfusion:
 - Increased risk of cancer recurrence
 - Increased risk of VTE in emergency general surgery
 - Published June 13, 2018 JAMA Surgery

Clevenger & Kelleher. Hazards of blood transfusion in adults and children. *Continuing Education in Anaesthesia Critical Care & Pain* 14(3) 2014.

Vincent et al. Are Blood Transfusions Associated with Greater Mortality Rates? Results of the Sepsis Occurrence in Acutely Ill Patients Study. *Anesthesiology* 108(1) 2008.



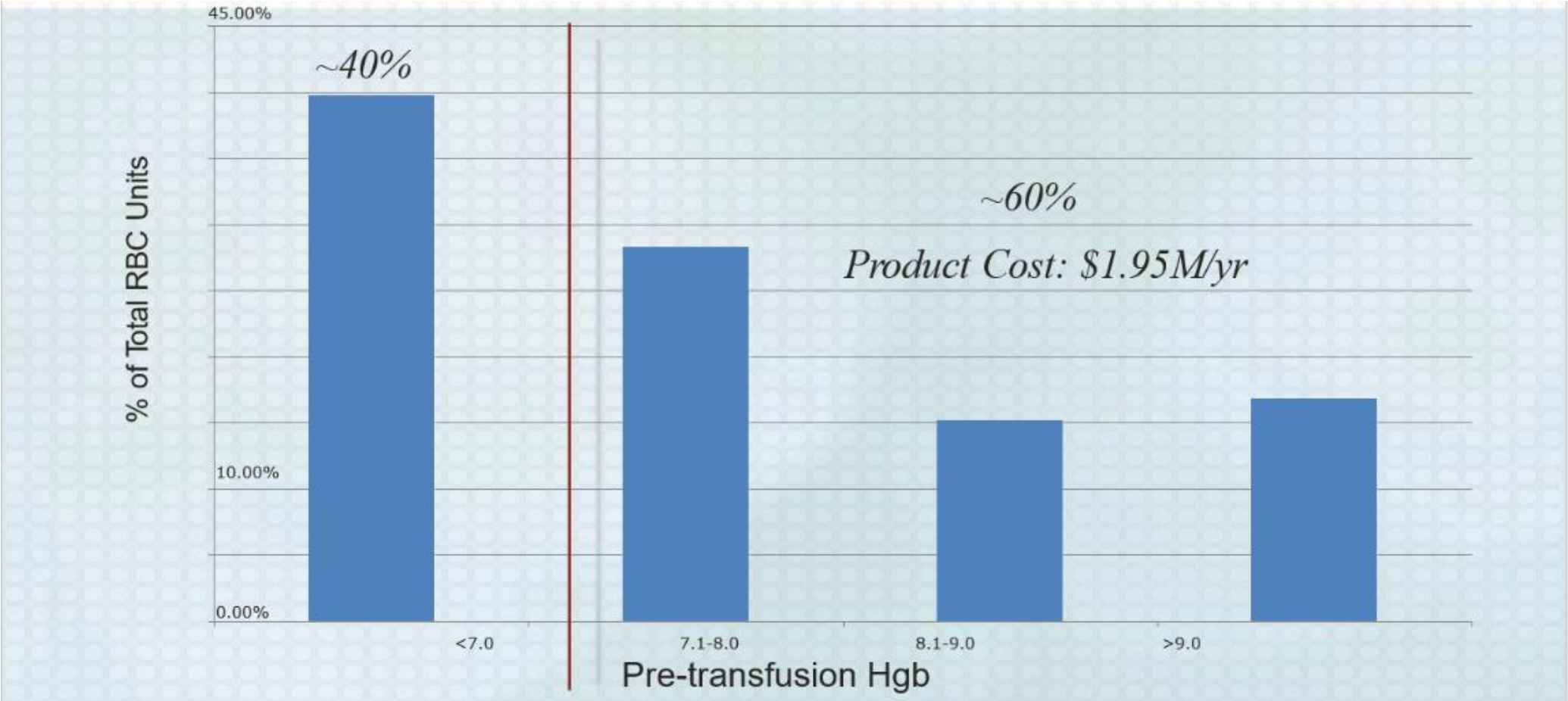
Summary of Risks

- **The ‘signal’ in the literature is extremely convincing that the risks are HIGHER than what we think**
 - New & ongoing prospective randomized trials needed
- **Every blood transfusion causes harm**
 - Some harm is severe
 - Some harm is mild
 - Some harm is unknown
- We can add layers of safety to minimize known mechanisms of harm
- We can investigate unknown mechanisms of harm
- We can choose the right patients to maximize benefit



Building Urgency

RBC TRANSFUSIONS 2014 – 2015



Step #2: Build a Guiding Team

TIMEFRAME ~ 3 MONTHS



- Respected leaders in specialty areas passionate about care standards
- Team represents the practice expecting change
- Small enough to adapt, but large enough for adequate representation

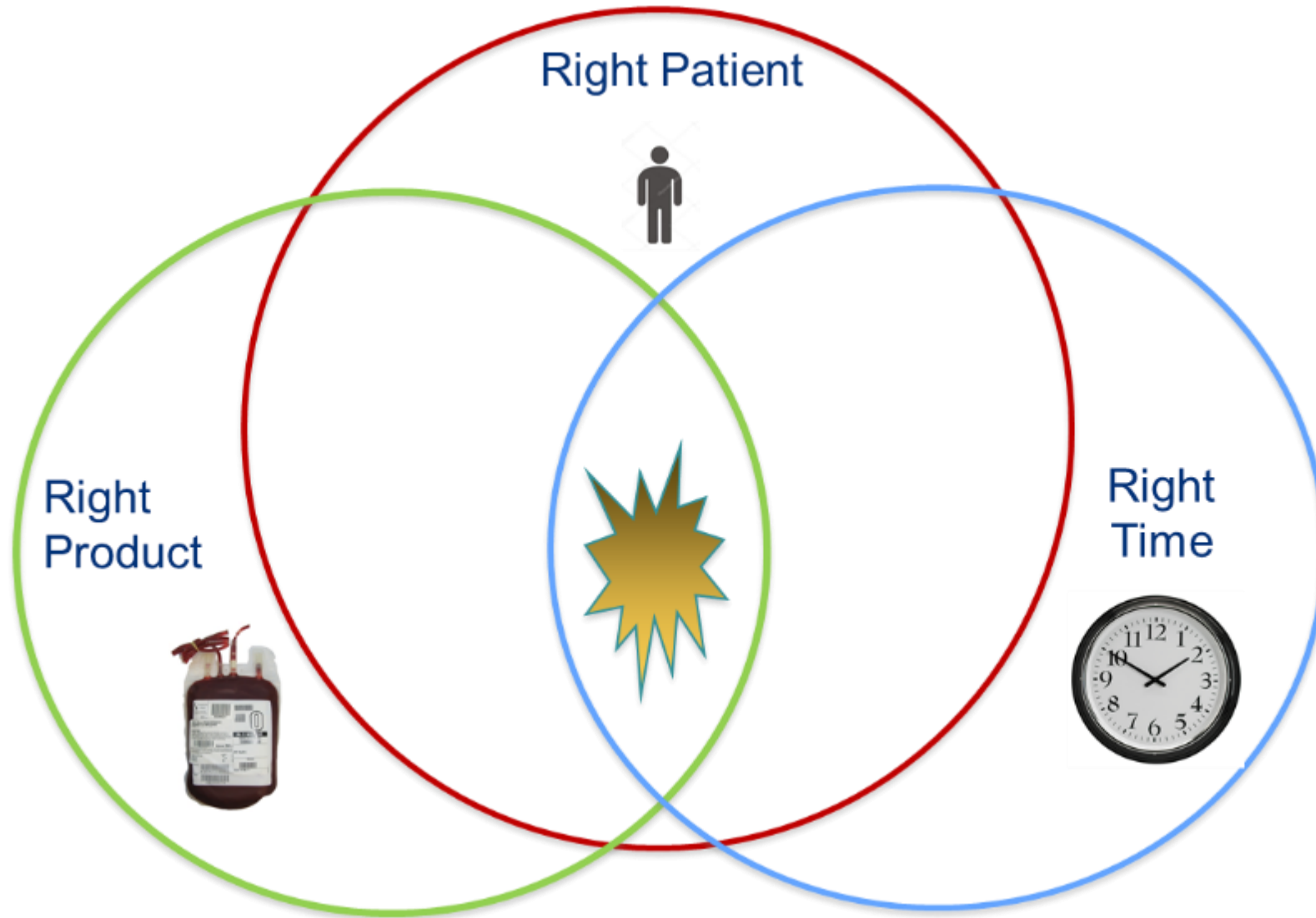
Diverse Representation = Engage Participants, Protect Patient Safety

Transfusing Wisely Committee

2015 – 2016

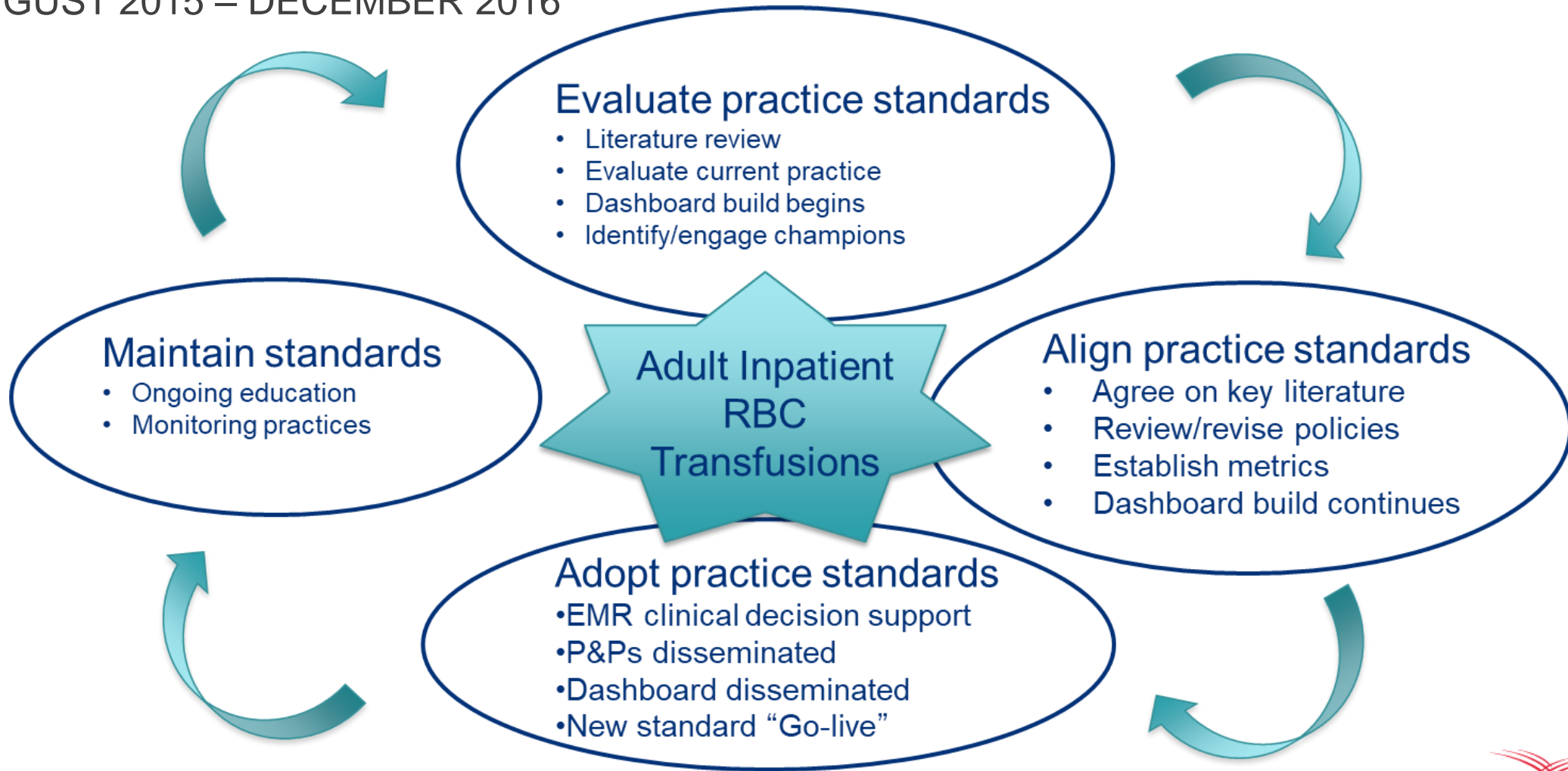
- Chief Quality Officer
 - Chair - Transfusion Services
 - Hospitalist/Internal Med
 - Medical ICU
 - Burn
 - Hematology/Oncology
 - Surgery
 - Anesthesia
 - Nursing Management
- IT Support
 - Transfusion Registry
 - Q&S Dashboard
 - EHR Analyst Team

Committee Charter: Minimize Risk, Maximize Benefit



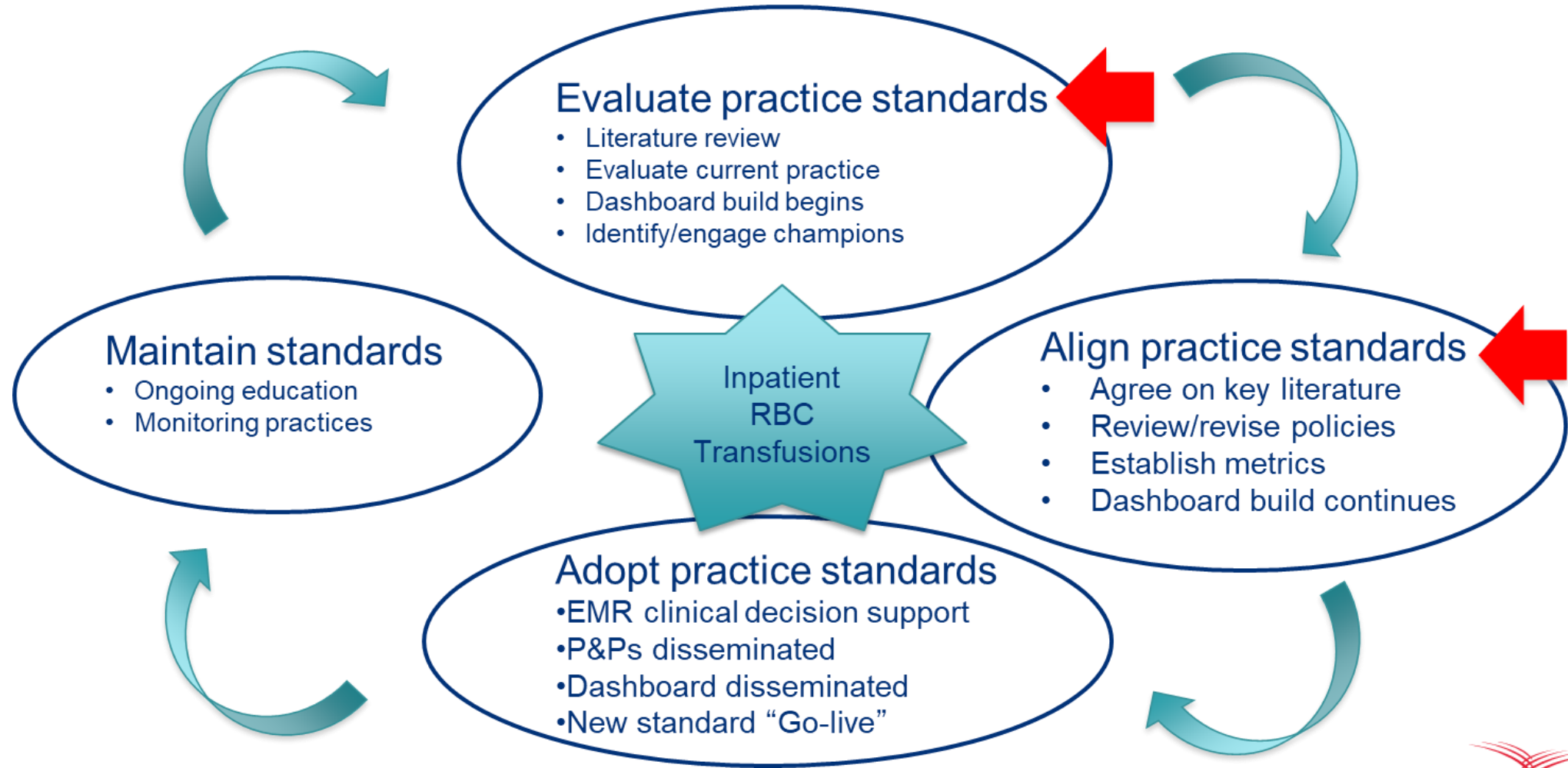
Step #3: Develop a Vision

AUGUST 2015 – DECEMBER 2016



Step #4: Communicate for Buy-In

TIMEFRAME ~ 3 MONTHS



Updated UCDCMC RBC Transfusion Guideline

- In general, transfusions should be based on clinical signs/symptoms rather than on a number.
 - In stable patients that require transfusion, single-unit transfusions with post-transfusion hemoglobin evaluation is the standard of care.
 - When patients are transfused based on a hemoglobin level, any underlying disease processes should be considered.
- Hb < 7 is appropriate for most patients
 - Hb 7.0-7.9
 - Pre-existing cardiovascular disease
 - Post-operative patients
 - Rare others
 - Hb 8-9.9
 - Active bleeding with unstable hemodynamics
 - Select cases:
 - Cardiac surgery
 - ACS
 - Rare others

Key Performance Indicators



- Percent of PRBC Transfusions ≥ 2 units
 - Should decrease
- Percent of PRBC Transfusions < 7 Hgb
 - Should increase
- Transfusion Rate per 1000 days*
- Discharges with PRBC Transfusions*

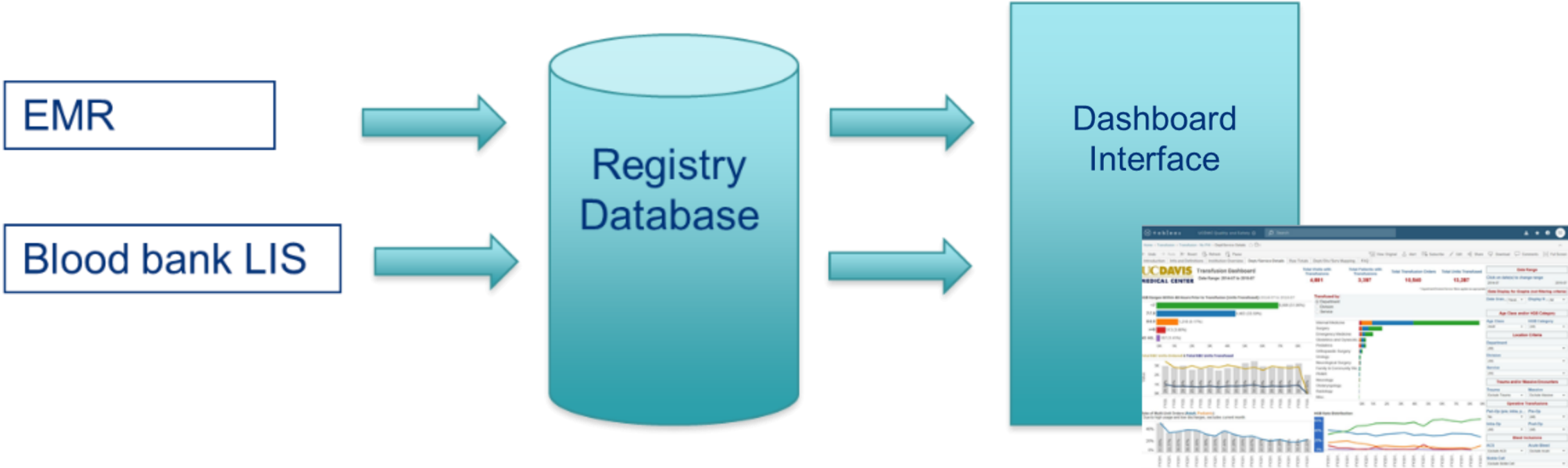
****Denominators to match Vizient Reporting***

Step #5: Empower Action

UCDMC TRANSFUSION DASHBOARD ~5+ YR. DEVELOPMENT



Data Acquisition



NEED FOR INFORMATICS-FOCUSED CLINICAL EXPERTS

Disseminate the Power of Data



- Health system-wide access to institutional overview
- CQI-level administrative access to patient information and ordering provider information
- Straightforward, pertinent metrics
 - Hemoglobin <7 should increase
 - Hemoglobin >9 should decrease
 - Multi-unit transfusions based on a single hemoglobin level should decrease
- Filters applicable to individual services

“Go-live” Education Campaign

SEPT – DEC 2016



- Attend all departmental CQI committees
- Discuss dashboard and meaningful metrics
 - Ensure appropriate user access
- Educate on updates to hospital RBC transfusion guidelines
- CDS in EMR released
 - Series of best practice alerts with interactions that match new hospital guideline
 - “Bypass alert” reasons match policies

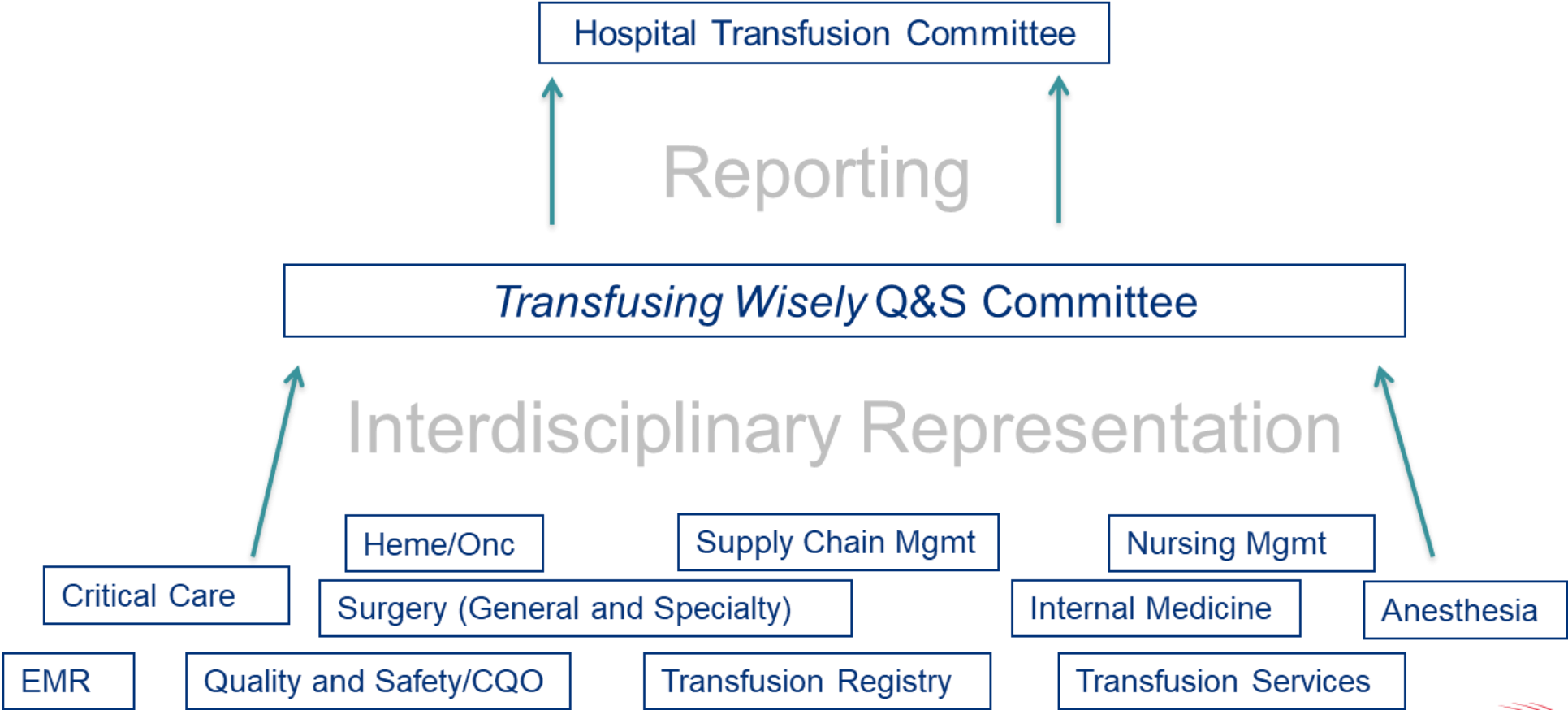
Step #6: Create Short-Term Wins



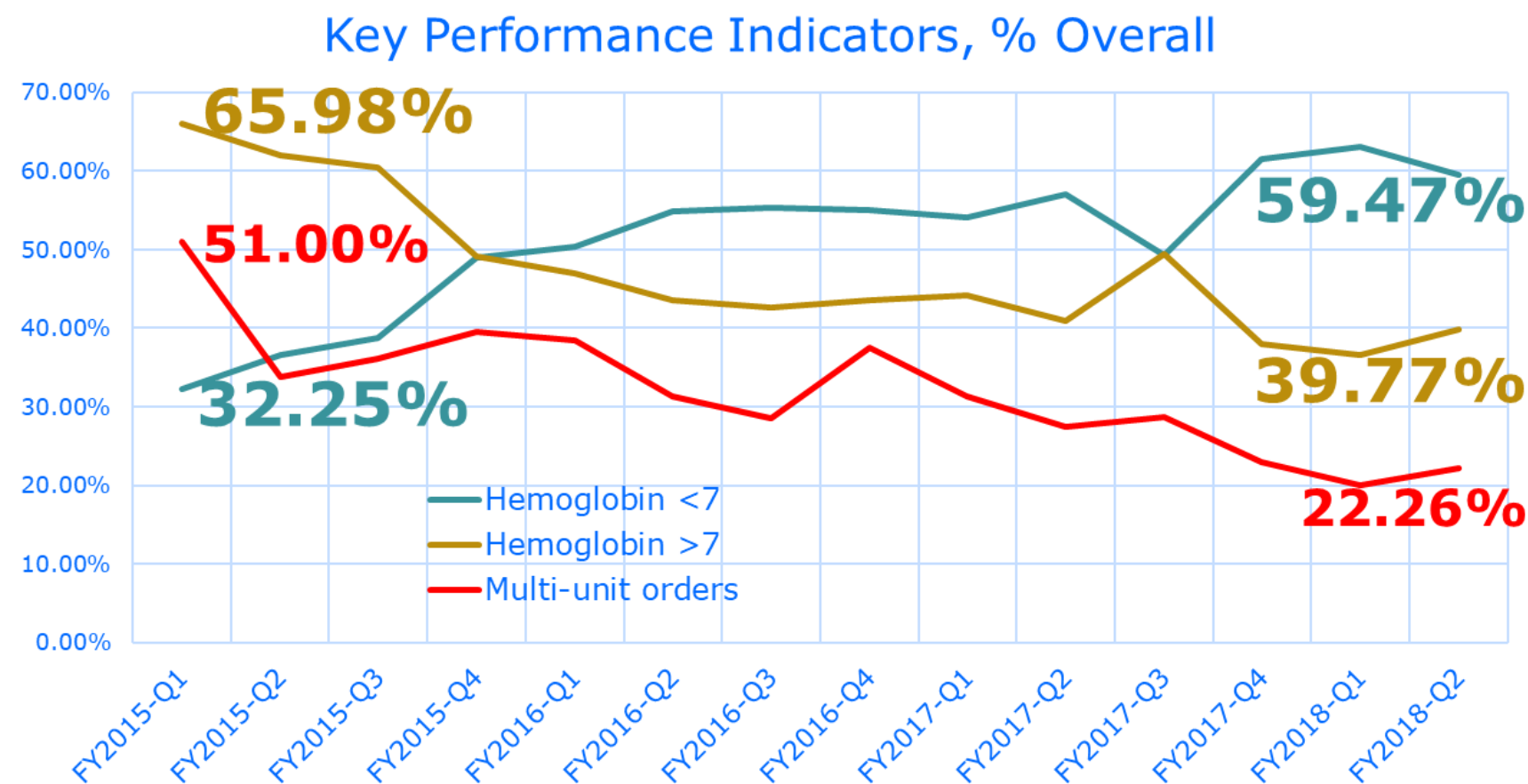
- Recognize physician champions
 - Internal BEST Awards
 - Internal Annual Healthcare Quality Forum
 - ASCP Choosing Wisely Champions
- Report ongoing metrics at each Transfusing Wisely Committee
- Report metrics at CQI Department Meetings
- CEO Cabinet brief on improvements

Step #7: Don't Let Up

PATIENT BLOOD MANAGEMENT INFRASTRUCTURE

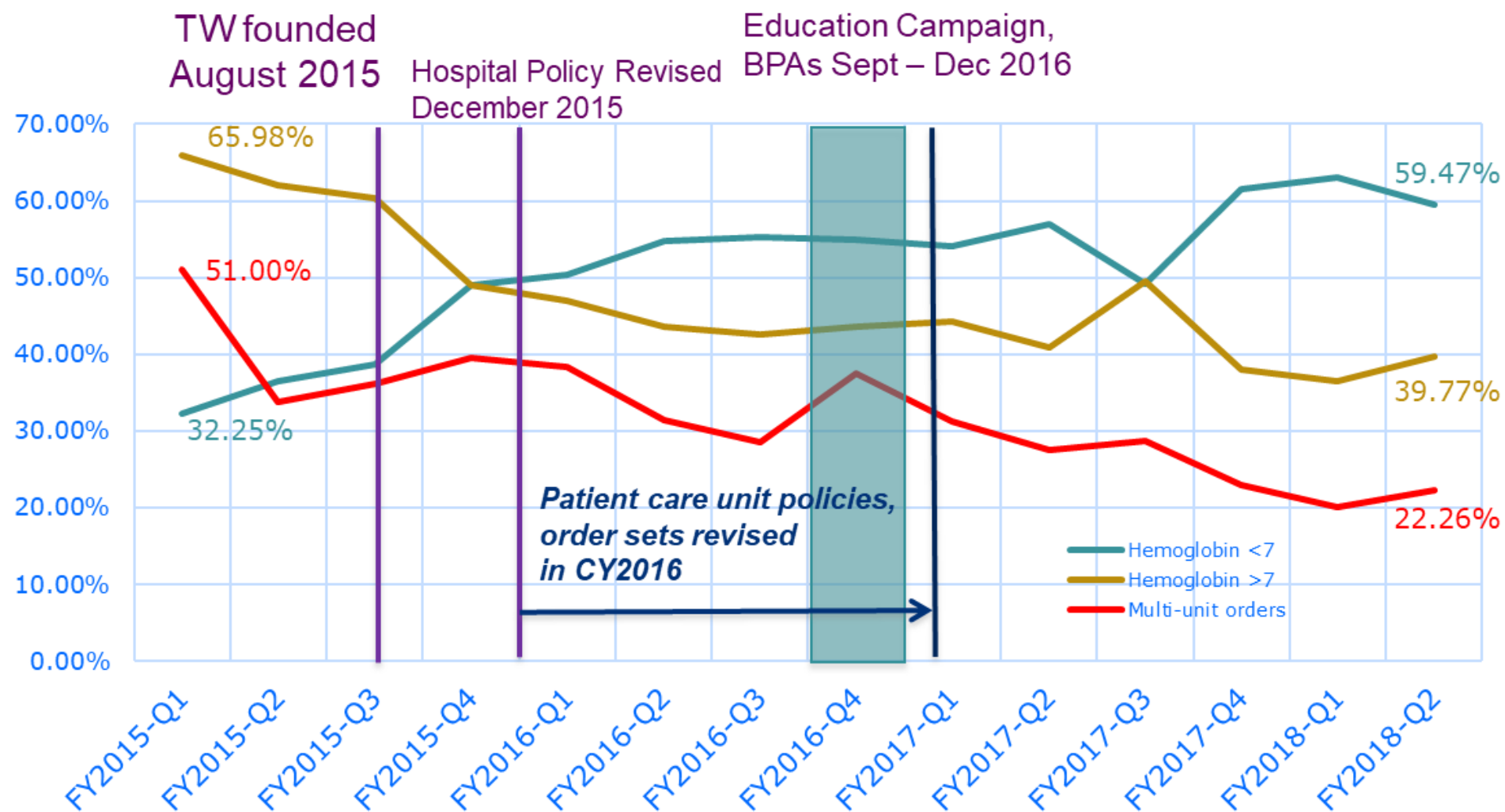


Step #8: Sustainable Change



Exclusion criteria: Periop transfusions, ACS, acute bleed, sickle cell, pediatrics



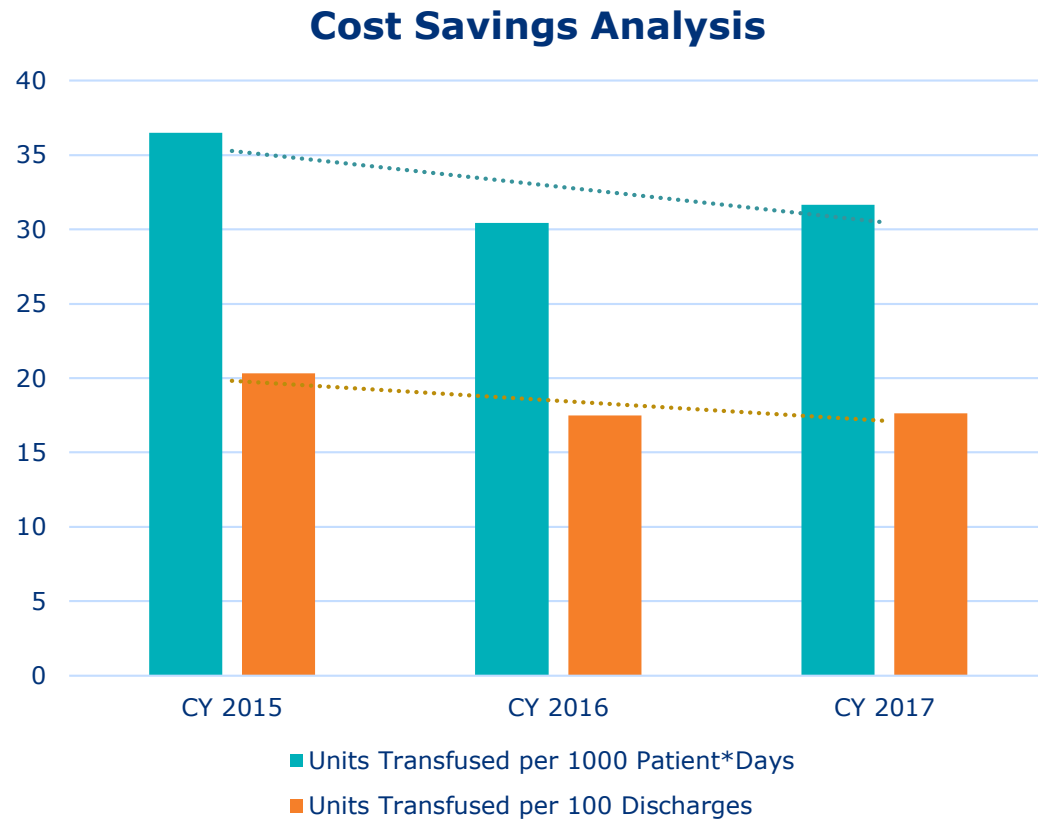


Exclusion criteria: Periop transfusions, ACS, acute bleed, sickle cell, pediatrics

\$1.4MM Cost Averted

CY 2016 → 954 UNITS AVERTED X \$760.82* = \$726,000 COST AVERTED

CY 2017 → 904 UNITS AVERTED X \$760.82* = \$688,094 COST AVERTED



Reduction in Units Transfused per 1000 Patient-Days

- CY 2016 vs CY 2015 baseline: 16.5%
- CY 2017 vs CY 2015 baseline: 15%

*Indirect, direct, and acquisition cost estimate based on literature



Identify the diverse needs of a PBM program

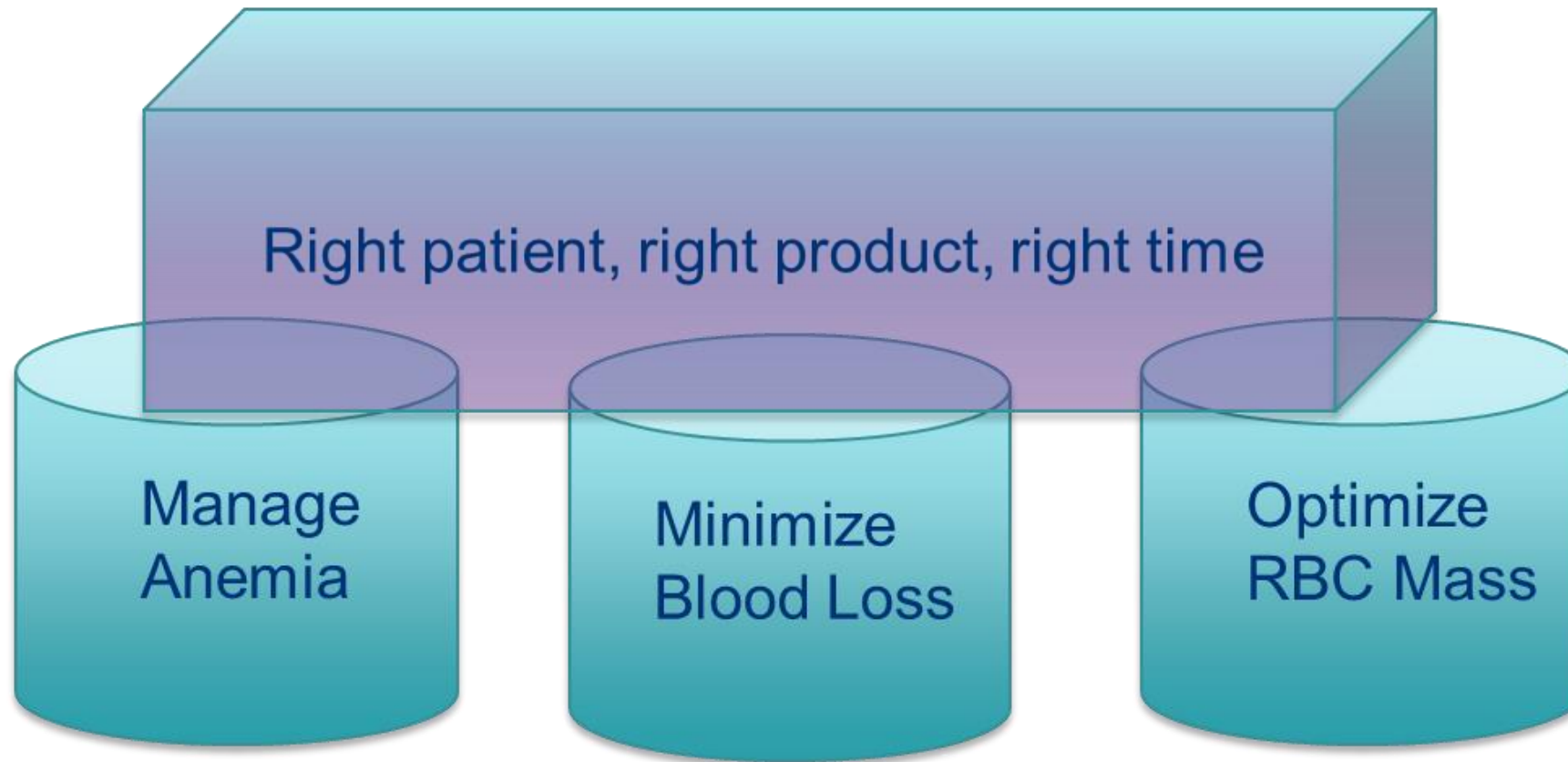
LEARNING OBJECTIVE 2



Patient Blood Management

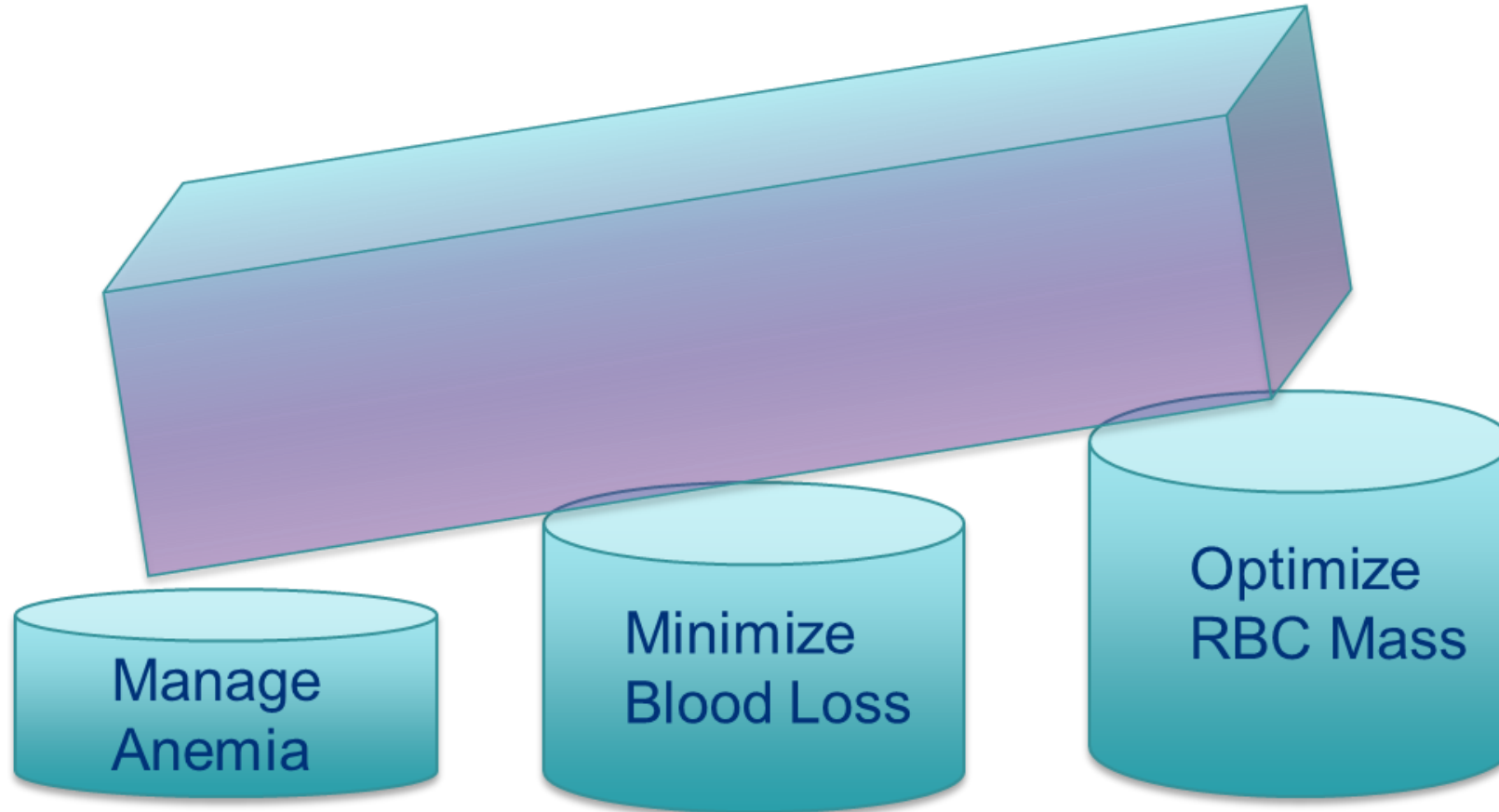
- Many programs across the country
 - Some internal programs in hospitals
 - Some consultative services/companies promising ROI
- Many AABB materials available, including PBM organizational standards
- Organizational Needs
 - Administrative buy-in (CEO/CMO/CQO)
 - Transfusion Safety Officer (or dedicated TM Pathologist!)
 - Review/revise transfusion policies
 - Work closely with clinical teams to evaluate transfusion practices
 - Develop dashboards/data reporting

Pillars of Patient Blood Management



The three-pillar matrix of patient blood management – an overview. Best Pract Res Clin Anesthesiol 2013 27:69-84

Pillars of Patient Blood Management



The three-pillar matrix of patient blood management – an overview. Best Pract Res Clin Anesthesiol 2013 27:69-84

Diverse System Needs

- **Optimize RBC mass**

- Detect and treat anemia including underlying causes
- Time surgery with optimal RBC mass

- **Manage Anemia**

- Anemia and coagulopathy management clinics/services
 - Patient's bleeding history and management plan
 - Estimate patient's tolerance
 - Optimize cardiopulmonary function
 - Pre-op planning with iron replacement strategies

- **Minimize blood loss**

- Identify, manage, and treat bleeding/risk
- Minimize phlebotomy
- Plan/rehearse procedures
- Intraoperative:
 - Hemostasis, cell salvage, avoid coagulopathy/warming, pharmaceutical agents (TXA)

- **Monitor & manage post-op**

UCDMC System Needs

- Infrastructure development
 - Anemia and coagulopathy management clinics/services
- Perioperative services P&Ps
 - Minimize blood loss
- Hospital P&Ps review
 - Minimize phlebotomy
- Additional resources
 - Intraoperative:
 - Hemostasis, cell salvage, avoid coagulopathy/warming, pharmaceutical agents (TXA)

Discuss potential barriers to a successful PBM program and strategies to overcome them

LEARNING OBJECTIVE 3



Obstacles in Change Management

- Leadership identifies ways to address*
 - Complacency, driven by arrogance
 - Self-protective immobilization, driven by fear
 - Defiance, driven by anger
 - Hesitancy, driven by pessimism
- **Personally** rare to encounter in our group
 - Select the physicians passionate about maintaining standards of care
 - Build reputation and credibility
 - Engage administrative leaders early and throughout to align goals
 - “Easier to sail with the wind at your back”

*Kotter, JP. *Leading Change*. Boston: Harvard Business School Press, 1996.

Barriers in Patient Blood Management (PBM)

I. Institutional (Re) organization

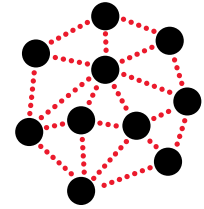
- Who does what?

II. Staff and time constraints

III. Lack of awareness or interest in PBM

I. Funding/resource limitations

Barriers in PBM – Strategies to Overcome



Institutional Reorganization

- Program goals:
 - Start with high-level alignment
 - In academics, can be challenging due to cost-center based hospital billing and numerous affiliated centers/clinics with MOUs across disciplines
 - How small can you make it?
- Drivers:
 - Keep an open mind and find what fits for your organization
 - Remember you need to engage consistent thought leaders wherever they are
 - Trainees are energetic, but transient

Barriers in PBM – Strategies to Overcome



Staff and Time Constraints:

- Q&S Department investment:
 - Q&S RNs
 - Dashboard analysts
- Analytics investment:
 - Registry analysts
- EMR investment:
 - Attend meetings, engage with stakeholders, fulfill enhancement requests
- Pathology Department investment:
 - Faculty time to lead group, attend meetings, maintain focus
- Transfusion Committee investment:
 - Re-direct auditing efforts
 - Monitor outcomes

Barriers in PBM – Strategies to Overcome

Lack of Awareness/Interest in PBM

- Identify clinical leaders passionate about Q&S and engage them early
- CQI groups
- Patients themselves
- Provide educational material

Barriers in PBM – Strategies to Overcome



Funding Limitations

- Some institutions have “re-investment” strategies to invest the savings into program growth
- Discuss with CMO/CQO ultimate institutional goals
- National standards (CMS, TJC) and benchmarking tools (Vizient, etc) incentivize resource allocation

Conclusion



I. Patient blood management is truly multidisciplinary

- Strong incentives exist
 - *Patient safety*
 - *Financial*
 - *Protect resources*

II. Transfusion services cannot do this work alone

- Gratitude for numerous others passionate about blood management!



Thank you!

