PEARLS OF LABORATORY MEDICINE

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TITLE: Blood Utilization and Transfusion Committee

PRESENTER: Ryan Metcalf

Slide 1:

Hello, my name is Ryan Metcalf. I am an Assistant Professor of Pathology at the University of Utah and Associate Medical Director of University Hospital Transfusion Services and ARUP Blood Services along with Medical Director of ARUP Immunohematology Reference Laboratory. Welcome to this Pearl of Laboratory Medicine on "Blood Utilization and Transfusion Committee."

Slide 2:

Transfusion is a high volume activity that interfaces with many hospital services and thus has many stakeholders, such as complex cardiac surgery, solid organ transplant surgery, trauma, hematology/oncology, high-risk obstetrics, critical care, neonatal critical care, and more. Blood transfusion is not without risk: transfusion is actually the most commonly performed procedure in the US and is often considered one of the most over-performed. Ultimately, the Hospital Transfusion Committee is charged with monitoring transfusion practices and adverse events to improve quality and patient safety. In doing so, HTC helps meet regulatory and accrediting body requirements.

Slide 3:

Transfusion services are regulated by the Food and Drug Administration (FDA), under which the Code of Federal Regulations (CFR) requires hospitals to have a quality assessment and improvement program that includes transfusion practices. CMS requires this for Medicaid reimbursement. CAP and AABB are accrediting bodies, both of which require review of transfusion practices and adverse events. Many hospitals are also accredited by The Joint Commission, which has similar requirements.

Slide 4:

Any formal hospital committee should have a charter to clearly define its purpose, roles & responsibilities, and a framework for accomplishing goals. A typical charter will include the following elements: the committee name, its purpose, members of the committee, definition of a quorum, how often they should meet, committee responsibilities, authorities delegated, criteria for how decisions are made such as voting, measures of success, and approval & reporting to executive committee oversight.

Slide 5:

Because there are many hospital services and personnel involved with the transfusion of blood components, HTC membership can be quite large. The committee needs a chair, which can be a transfusion medicine specialist or other physician with knowledge in transfusion medicine. The former has been defined as including eligibility to sit for the American Board of Pathology examination in blood banking/transfusion medicine and being recognized as having consultation expertise in transfusion medicine. Other physician members might include anesthesiologists, surgeons, transfusion medicine specialists, hematologists, critical care physicians, emergency physicians, and obstetricians. Other members might include nurses, transfusion service management & medical laboratory scientists, hospital administration, hospital quality, and risk management representatives. Experts agree that the members in bold on this slide should be included. I recommend erring on having fewer rather than more members in your committee to increase focus and ability to accomplish tasks & goals.

Slide 6:

When the HTC meets, it should include a standard review of utilization and quality data. Many HTCs will review the number of type & screens performed, components crossmatched & transfused, component wastage and expiry, and transfusion reactions. Additionally, HTCs may often review rejected samples, FDA-reportable Biological Product Deviations, turnaround times for obtaining blood, nursing blood administration policy compliance, surgical blood ordering appropriateness, C:T and sometimes I:T ratios, and massive transfusion protocol activations. Again, the bolded items represent what is considered important by experts.

Slide 7:

Here is a very basic example of a dashboard that might be routinely presented at HTC meetings. Transfusion data are clearly separated by component type. Numbers are tallied each month and throughout the year you can annualize your current data to project how the yearly data will appear. You can then compare this year to previous years.

Slide 8:

HTCs can work to ensure institutional policies are known and being followed. Are patients being consented prior to transfusion and is this being documented consistently? Is there a blood refusal policy? Do physicians know when & how to order pretransfusion testing and blood components for transfusion? Other important policies related to transfusion safety include blood administration, MTPs, knowledge of transfusion indications, knowledge of indications for attributes such as irradiation, and the urgency with which blood should be indicated on the order.

Slide 9:

Patient Blood Management – or PBM -- and avoiding unnecessary transfusions is often considered a key component of transfusion practices. HTCs may be involved with

utilization management, such as prospective clinical decision support alerts to help avoid over-transfusion. The HTC may also oversee preoperative anemia clinic and cell salvage practices. They can discuss and increase awareness surrounding the importance of quickly managing hemorrhaging patients with significant coagulopathy. PBM is broad and may include many other facets including agreed-upon quality metrics and benchmarks.

Slide 10:

HTCs may also discuss important changes in practice – whether national standards or local policies have changed. An example of this might include development of a working group with some key HTC members to develop a transfusion protocol for complex cardiac surgery. A newly FDA-approved drug, such as an antidote for direct thrombin inhibitor reversal, should be discussed at HTC because it may impact practices. At a minimum, including items like these on the agenda will increase awareness that could improve patient care.

Slide 11:

We have discussed the basic elements of what might be included in HTC meetings, but how might a best-in-class HTC operate? It should regularly have active participation from all members. Hospital leadership should be supportive of the HTC and provide necessary resources. Meeting minutes should be accurate above all else. For sensitive liability issues, excuse those who may not need to be present. It should be clear that teams are aware of policies & procedures, which is reflected in compliance audits. Root cause and corrective & preventive action should be mainstays in dealing with nonconformances and other events. Data presented should be in a standard format. When change is needed, there is effective training/education and change control. There is a detailed plan for blood shortages due to major disasters.

Slide 12:

The six sigma philosophy is the belief that we can be error free. Best-in-class HTCs would also regularly employ established quality tools. A quality management approach might include any of the following tools. For example, a Pareto (or 80:20) chart can be a very useful data-driven tool to identify where you should focus your efforts to rectify a problem, such as plasma wastage. In the example here, nearly 80% of wasted units were wasted due to expiration.

Slide 13:

Utilization of most blood components is down over the past several years, particularly for RBCs. If you expect to be in line with national trends of reduced RBCs since we're now in the era of patient blood management, you can track yearly utilization trends. One strategy is to simply track utilization per year as in the top graph. I prefer an alternative strategy, which is to track utilization per year adjusted for any changes in patient volume and case mix index. This way, you can adjust for any major changes in your hospital related to how busy it is and/or how sick your patients are. Sicker patients tend to require more transfusions.

Slide 14:

And finally, we have an example of a nursing blood administration compliance chart. Key elements required by your policies and procedures can be analyzed by hospital service unit. Data in each box would be presented as a percentage compliance and you can define your own benchmark goals. In this example, green is good and red is bad, while yellow is borderline. This hospital should definitely focus on making sure a provider order is present prior to transfusion.

Slide 15:

In summary, HTCs are intended to improve transfusion safety in a collaborative manner. They should have a charter and be highly organized while encouraging active participation. HTCs should be data-driven in monitoring transfusion practices. And best-

in-class HTCs will apply quality management principles and may use established quality tools.

Slide 16: References

Slide 17: Disclosures

Slide 18: Thank You from www.TraineeCouncil.org

Thank you for joining me on this Pearl of Laboratory Medicine on "**Blood Utilization and Transfusion Committee**."

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PEARLS OF LABORATORY MEDICINE

Blood Utilization and Transfusion Committee

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DOI:

CCTC Clinical Chemistry Trainee Council

Purpose and Background

- Transfusion is a high volume activity that interfaces with many hospital services and thus has many stakeholders
- Blood transfusion is not without risk
- Ultimate purpose of a Hospital Transfusion Committee (HTC) is to monitor transfusion practices and adverse events to improve quality and patient safety
- HTC helps meet regulatory and accrediting body requirements

Regulations and Accrediting Body Requirements

- Code of Federal Regulations (CFR)
- Centers for Medicare & Medicaid Services (CMS)

- College of American Pathologists (CAP)
- AABB
- The Joint Commission

Meeting Charter, Standing

- Committee Name
- Purpose (see prior slide)
- Membership
- Quorum
- Frequency – usually monthly to quarterly
- Responsibilities & activities
- Authorities delegated
- Decision making – e.g. voting
- Outcome measures of success
- Charter approval & reporting

Membership and Structure[1]

- Chair: **Transfusion medicine specialist** or other physician with knowledge in transfusion medicine
- Physician members: **Anesthesiologists**, **surgeons**, **transfusion medicine specialists**, hematologists, **critical care physicians**, **emergency physicians**, obstetricians
- Staff members: Nurses, transfusion service medical laboratory scientists
- Other members: Hospital administration, quality, and risk management representatives

Bold = expert consensus

Activities Routinely Performed[1]

- Basic data review
  - Type & screens performed
  - Crossmatched/allocated, issued, and **transfused by component**
  - **Component wastage/expiry, lost components**
  - **Transfusion-related adverse events**
- Other quality metrics
  - **Rejected samples (e.g. mislabeled)**
  - Biological Product Deviations (BPDs)
  - **Turnaround times**
  - **Blood administration policy compliance**
  - Surgical blood ordering practices
  - Crossmatch:transfuse (C:T) and/or issue:transfuse (I:T) ratios
  - **Massive Transfusion Protocols (MTPs)**

Bold = expert consensus

Basic HTC Dashboard Example

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annualized Total
RBCs													
Transfused													
Discarded													
% Wasted													
C:T ratio													
Plasma													
Transfused													
Discarded													
% Wasted													
Platelets													
Transfused													
Discarded													
% Wasted													
Cryoprecipitate													
Transfused													
Discarded													
% Wasted													
Type & Screens													
Rejected Specimens													
Transfusion Reactions													
Massive Transfusion Protocols													

Institutional Policies: Awareness and Compliance[2]

- Consent
- Blood refusal
- Procedure for ordering pretransfusion testing and blood components
- Blood administration policy
- Massive transfusion protocol (MTP)
- Institutional transfusion guidelines
  - Indications and triggers for transfusion
  - Indications for special needs/attributes
- Blood ordering turnaround times based on level of urgency
  - Service Level Agreement (CAP requirement)

Development and Review of Other Patient Blood Management (PBM) Activities[4]

- Examples
  - Utilization management: clinical decision support or concurrent audits and interventions
  - Preoperative anemia clinic
  - Cell salvage practices
  - Manage coagulopathy of bleeding patients
  - Other quality metrics/benchmarks

Discuss Changes in Practice

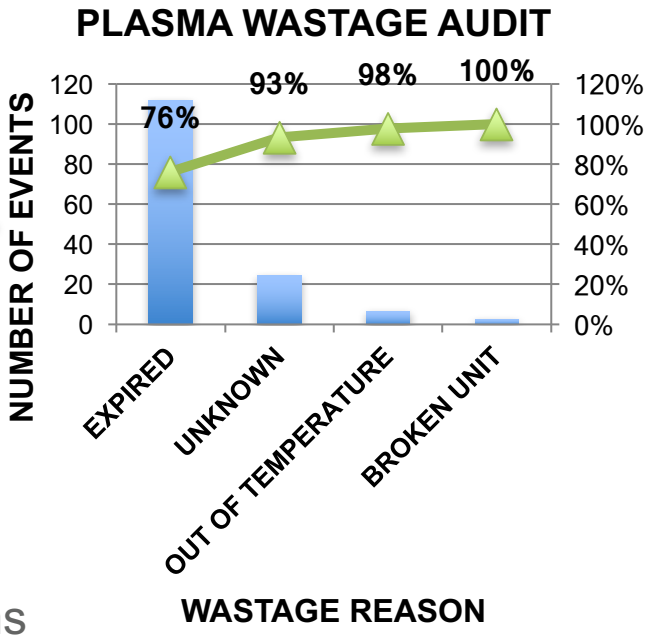
- Hospital transfusion policies & procedures
- Participation in development and implementation of protocols
  - E.g. cardiac surgery. Develop working group of key stakeholders that reports back to HTC.
- Pertinent newly approved drugs
  - E.g. antidote for direct thrombin inhibitor

How Would a Best-In-Class HTC Operate?[2]

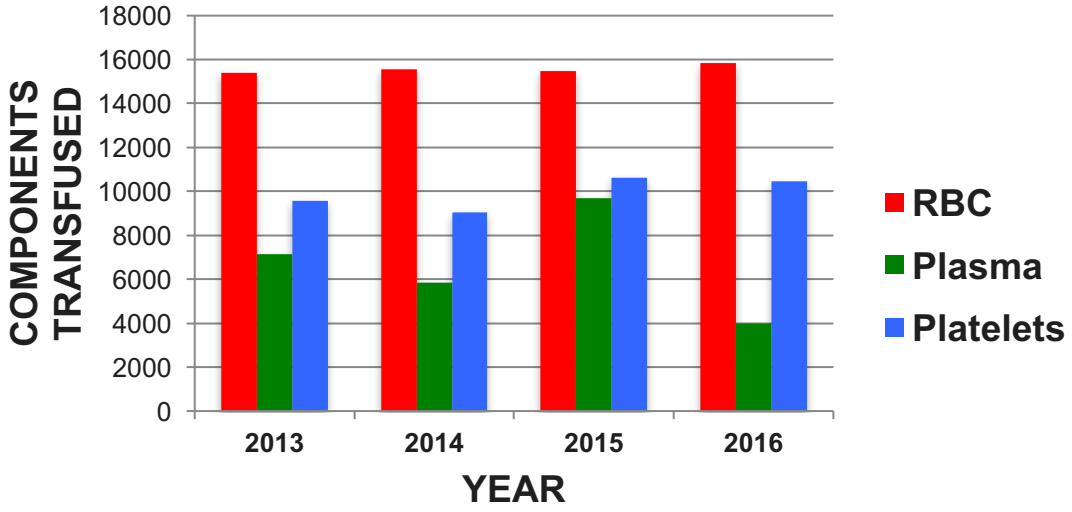
- Multidisciplinary, active participation
- Protected, documented meeting minutes
- Excuse those who do not need to participate when liability issues arise
- Clear awareness of and compliance with policies & procedures
- Perform regular internal compliance audits
- Root Cause Analysis (RCA), Corrective Action & Preventive Action (CAPA)
- Data metrics presented in standardized format
- Process for effective training, performance improvement, and change control
- Detailed disaster plan

How Would a Best-In-Class HTC Operate?[3]

- Six sigma philosophy: belief that it is possible to be error free
  - Quality management approach using established tools & techniques
    - Plan-Do-Check-Act (PDCA/PDSA) Cycle
    - Pareto charts
    - Cause-and-effect diagrams
    - Flowcharts and process mapping
    - Statistical process control charts
    - Scatter diagrams, histograms
    - Failure mode and effects analysis

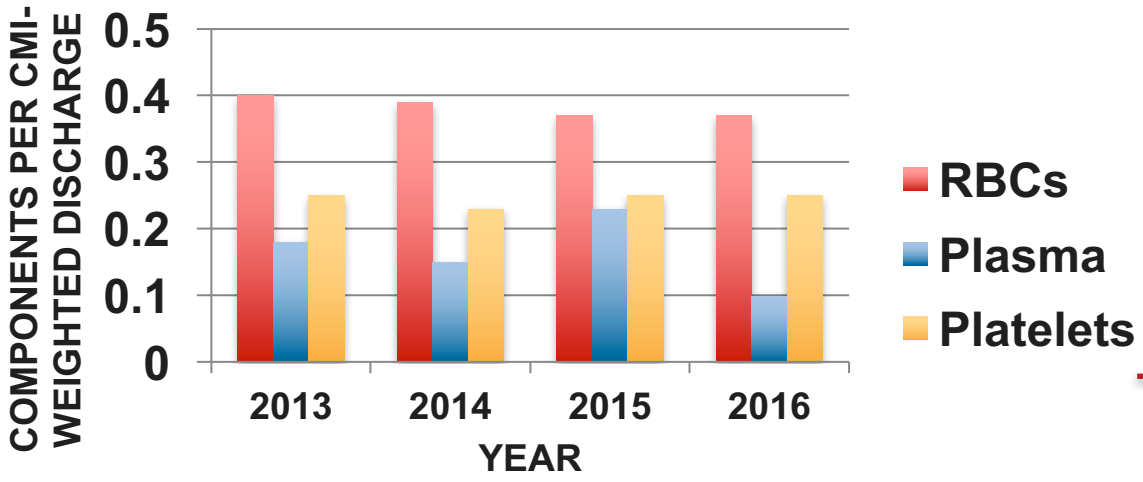


BLOOD COMPONENT UTILIZATION BY YEAR



One strategy is to simply track utilization per year

BLOOD COMPONENTS TRANSFUSED PER CMI-WEIGHTED DISCHARGE



An alternative is to track utilization per year adjusted for any changes in patient volume and case mix

CMI = Case Mix Index

Blood Administration Compliance Dashboard Example

Unit	Transfusions (N)	Patients (N)	Start Time	Stop Time	Witness	Pre Vitals	15min Vitals	Post Vitals	Provider Order	Vol Transfused	Transfusion Reaction	Consent
Heme/Onc												
Stem Cell												
ICU												
SICU												
Obstetrics												
Cardiology												

Green = Compliant
Yellow = Borderline
Red = Not compliant

Summary

- HTCs are intended to improve transfusion safety in a collaborative manner
- HTCs should have a charter and be highly organized while encouraging active participation
- HTCs should be data-driven in monitoring transfusion practices
- Best-in-class HTCs will apply quality management principles and may use established quality tools

References

1. Yazer MH, Lozano M, Fung M, et al. An international survey on the role of the hospital transfusion committee. Transfusion 2017;5:1280-87.
2. Shulman IA and Saxena S. The transfusion services committee—responsibilities and response to adverse transfusion events. ASH Education Program Book. 2005;1:483-90.
3. Russel JP. The ASQ auditing handbook 2013;4th ed:184-264.
4. Meybohm P, Richards T, Isbister J, et al. Patient blood management bundles to facilitate implementation. Transfus Med Rev 2017;1:62-71.

Disclosures/Potential Conflicts of Interest

Upon Pearl submission, the presenter completed the Clinical Chemistry disclosure form. Disclosures and/or potential conflicts of interest:

- **Employment or Leadership**:
- **Consultant or Advisory Role:**
- **Stock Ownership:**
- **Honoraria:**
- **Research Funding:**
- **Expert Testimony:**
- **Patents:**

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QUESTION BANK TEMPLATE

Field	Instructions	
Stem	Hospital transfusion committee may routinely perform many activities. Experts agree by consensus that which of the following should be included in hospital transfusion committee activities?	
Responses	a) Type & screens performed b) Crossmatch:transfuse ratio c) Component wastage d) Biological Product Deviations e) Number of cardiac surgeries performed	
Answer	The correct answer is “C”.	
Discussion	While the other four answer choices may be included routinely in transfusion committee activities, only component wastage achieved consensus by a recent international expert panel. The other data points may be considered important as well, but the key is to perform activities that can lead to process and quality improvements. Reduced component wastage is a common target for improvement.	
Source(s)	Yazer MH, Lozano M, Fung M, et al. An international survey on the role of the hospital transfusion committee. Transfusion 2017;5:1280-87.	
Difficulty	Advanced	
Category	Transfusion Medicine	

Sub-category	Transfusion Medicine-Blood Bank	
Keywords	Quality indicators, expiry, wastage	
Field	**Instructions**	
Stem	Which of the following is an example of how a best-in-class hospital transfusion committee (HTC) might operate?	
Responses	a) Includes all HTC members when discussing liability issues b) The committee chair should do most of the talking c) Reactive rather than proactive approach d) Assumes policies & procedures are being followed e) Encourages standardized effective training and change control when change is needed	
Answer	The correct answer is “E”.	

Discussion	When change is needed, having effective training/education and proper change control are paramount for best-in-class organizations. Only training some individuals, for example, can lead to confusion and potentially dire consequences. Those who do not need to be present during discussion of liability issues should be excused. Active participation from all members should be encouraged. Proactive approach (i.e. preventive action) should not be overlooked. Rather than assuming policies & procedures are being followed, data audits can be used to confirm or identify opportunities to improve compliance.	
Source(s)	Shulman IA and Saxena S. The transfusion services committee—responsibilities and response to adverse transfusion events. ASH Education Program Book. 2005;1:483-90.	
Difficulty	Easy	
Category	Transfusion Medicine	
Sub-category	Transfusion Medicine-Other	
Keywords	Best-in-class, quality, policies, procedures, training, change control	