Blood Management and Utilization

Presenter

Michael Veri, MLS (ASCP), MS, CPT (US Army)

Opinions expressed in this presentation are those of the speaker and do not express the views or opinions of Cardinal Health or the United States Military

Blood Basics

Why is blood management important?

- Red Blood Cell usage costs $4.4 billon a year in the United States[1]
  - 21 million units, $210 per unit
- 1.1% of transfusions have adverse reaction, more than 200,000 adverse reactions a year[2]
- Transfusion-Related Acute Lung Injury (TRALI) occurs in 0.08% of transfusions (~16,500 cases per year)[2]

1) Toner, R.W., Pizzi, L., Leas, B. et al. (2011). Costs to hospitals of acquiring and processing blood in the US. *Appl Health Econ Health Policy*, 9. 29.
2) Strauss, R.G., et al. (2016). Incidence of transfusion reactions: a multi-center study utilizing systematic active surveillance and expert adjudication. Transfusion, 56(10). 2587-2596.

Blood Basics

Can blood management be impactful?

- Blood usage in the United States declined by 13.9% from 2013 to 2015 and has continued this downward trend[3,4]
- 2015: 11,349,000 RBC transfused
- 2017: 10,654,000 RBC transfused[5]

3) Basavaraju, S., et al. (2017). Continued decline in blood collection and transfusion in the United States – 2015. Transfusion. 57(2). 1588-1598.
4) Stussi, G., et al. (2012). Significant reduction of red blood cell transfusion requirements by changing from a double-unit to a single-unit transfusion policy in patients receiving intensive chemotherapy or stem cell transplantation. Haematologica. 97(1). 116-122.
5) https://www.statista.com/statistics/1204079/number-blood-tranfusions-us/

Blood Management and Utilization (BMU)

Advantages of focusing on transfusion reduction:

- Reduction of unnecessary transfusions will:
  - Protect patients
  - Reduce costs
  - Reduce stress on staff

Blood Management and Utilization (BMU)

How can a BMU achieve reduction?

- Reduction is achieved by:
  - Improving/enforcing transfusion trigger criteria
  - Education
  - Changing lab orders
    - Default to 1, not 2
    - Checking HGB between transfusions
  - Medical Staff involvement in the form of a functional **Blood Review Committee (BRC)**

Blood Review Committee (BRC)

What is a BRC and what does it do?

- Blood Review Committees[6]:
  - Provide educational content to practitioners within the facility
  - Establish best-practice standards for transfusion within the facility
  - Monitor and correct transfusion practices falling outside of the established best practices

Note: The proposed is “a way,” not the way.

6) Torella, F., et al. (2004). The role of hospital transfusion committees in blood product conservation. *Transfusion Medicine Reviews*. 18(2). 93-104.

Blood Review Committee (BRC)

Who should be involved in the BRC?

- Composition of the BRC[6]:
  - Lab Medical Director is generally the chair
  - Blood bank manager/supervisor, generally to act as information gatherer/secretary
  - A provider and a nurse champion from each of the major transfusing departments
  - Facility CMO if possible, CNO if not

6) Torella, F., et al. (2004). The role of hospital transfusion committees in blood product conservation. *Transfusion Medicine Reviews*. 18(2). 93-104.

Data Collection

What data can guide us to a more effective BRC?

- Transfusions:
  - Number of units transfused in prior year(s)
  - Where those units were transfused (department usage)
  - Which physicians are transfusing (physician usage)

Data Collection

What data can guide us to more effective BMU?

- Necessity:
  - Average HGB Trigger point
    - Must be recent enough (<4 hours) to be useful
    - If addressing PLT or FFP usage, average PLT count or average INR respectively
  - Blood utilization white papers
    - Review them with your medical director

Blood Review Committee (BRC)

Data collection is key to an impactful BRC!

- Categorize all transfusions into buckets:
  - <7 g/dL – Appropriate transfusion, no investigation needed
  - 7-8 g/dL – Check diagnosis/notes for active bleed or other mitigating factors
  - 8-10 g/dL – Extensive investigation/committee review recommended
  - >10 g/dL – There are few instances in which this should occur and should be investigated and reported every time

Blood Review Committee (BRC)

Data collection is key to an impactful BRC!

- Facility/Department/Physician average HGB trigger point
- Crossmatch to transfusion ratio by department and physician
- Number of transfusions per physician by physician

Blood Review Committee (BRC)

How to obtain HGB average trigger point:

- Average hemoglobin at which transfusion order is given
- HGB should be <4 hours old
- HGB should be taken after every unit is given if patient condition permits
  - This can be defaulted into the lab transfusion order in most LIS

- Recent studies indicate that only transfusing <7 g/dL leads to better 30-day post outcomes than more liberal programs[7,8]

7) Buelvas, A. (2013) Anemia and transfusion of red blood cells. *Colomb Med (Cali)*. 44(4). 236-242.
8) Habler, O., et al. (2009). Clinical Evidence of blood transfusion effectiveness. *Blood Transfus*. 7(4). 250-258.

Blood Review Committee (BRC)

Can average HGB trigger point be reduced?

- Average HGB should be distilled to lowest level
  - Which department is challenged?
  - Which physician is challenged?
  - Is this consistent month after month, or was it just an outlier?

Blood Review Committee (BRC)

Using this information:

- Best physician example:
  - Had two ICU docs that worked 7 on and 7 off alternating
  - Similar patient outcomes
  - One physician transfused 3x as many units as the other
- At the department level:
  - Don’t expect ED or Transfuse to conform to rest of the facility, especially XM/Transfuse ratio

Blood Review Committee (BRC)

Physician education:

- Grand Rounds
  - Transfusions are physician driven processes
  - Some just don’t know the best practice
  - Physicians are more likely to attend if CEU’s are available for them

Blood Review Committee (BRC)

How to address non-compliance?

- Following BRC review and consensus (get low-hanging fruit)
  - 1st offense: Letter to the physician from the committee with white papers
  - 2nd offense: Discussion with key physician leaders
  - Continued offense: Remove physician's ability to order blood products
- Truly egregious practices may skip steps

Blood Review Committee (BRC)

How can the lab help?

- In addition to data collection:
  - Adjust the default transfusion order to 1 unit
  - Auto-order an H&H with every transfusion order
  - Reduce the critical value
    - Critical call results in ordering units
    - Review and educate deltas to avoid physician push-back
    - Recommend using a delta of >2.0 g/dL within a 24-hour period
    - Recommend a critical value of <6.7 g/dL
  - Develop a Transfusion Review/Utilization order (TRU test)

Blood Review Committee (BRC)

What is a TRU test?

- TRU tests allow real time review of all transfusions
- The TRU test should be rolled into the T&S/crossmatch order
- Auto-pull latest HGB
- Pull the “reason” for the transfusion (drop down when ordering the unit) if HGB >7.0 g/dL
- Tech reviews this real-time
- Transfusions outside criteria are flagged for path review
  - Criteria determines if this review is real-time or post-transfusion
- **Similar TRU tests can be set for PLT and FFP orders**

Blood Review Committee (BRC)

Examples:

- 1) Crossmatch is ordered on a patient with HGB 7.2 g/dL
  - Physician entry shows that patient is actively bleeding
  - True test is passed, units are crossmatched and issued

Blood Review Committee (BRC)

Examples:

- 1) Crossmatch is ordered on a patient with HGB 7.2 g/dL
  - Physician entry shows that patient is actively bleeding
  - True test is passed, units are crossmatched and issued
- 2) Crossmatch is ordered on a patient with HGB 9.1 g/dL
  - In accordance with policy, tech consults medical director/pathologist in real-time
  - Following MD to MD discussion, pathologist approves order
  - Blood is crossmatched and ready to go
  - Crossmatch flagged for BRC review

Blood Review Committee (BRC)

Examples:

- 1) Crossmatch is ordered on a patient with HGB 7.2 g/dL
  - Physician entry shows that patient is actively bleeding
  - True test is passed, units are crossmatched and issued
- 2) Crossmatch is ordered on a patient with HGB 9.1 g/dL
  - In accordance with policy, tech consults medical director/pathologist in real-time
  - Following MD to MD discussion, pathologist approves order
  - Blood is crossmatched and ready to go
  - Crossmatch flagged for BRC review
- 3) Crossmatch is ordered on a patient with HGB 7.4 g/dL
  - Physician entry shows that patient is stable
  - Per policy, event is flagged for BRC review

Blood Review Committee (BRC)

Quick Review:

- Transfusions are expensive and can result in patient harm
- Transfusions have been on the decline in the US for almost a decade
- Formation of a Blood Review Committee can help
- The lab can directly impact transfusions through
  - Data collection
  - Reducing critical values
  - Changing default orders
  - Auto-ordering HGB’s
  - Developing a TRU test

Blood Management and Utilization

PRESENTER

Michael Veri, MLS (ASCP), MS, CPT (US Army)