Optimizing Blood Administration to Enhance Patient Safety

Session #224, February 23, 2017

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Speaker Introduction

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Conflict of Interest

Meg Furukawa MN, RN-BC
Has no real or apparent conflicts of interest to report.
Agenda

• Blood transfusion overview and guidelines
• Pre-optimization state
• Optimization of blood product administration
• Optimization of blood product ordering
• Outcomes
• Challenges
• Lessons learned
Learning Objectives

• Summarize the patient safety outcomes resulting from the optimization of the blood administration process

• Identify three benefits for clinicians gained from optimizing blood administration

• List two outcomes of using embedded clinical decision support to guide ordering of blood product
Learning Objectives

• Discuss challenges faced when optimizing blood administration and strategies to overcome them

• Describe methods to use during training and implementation to enhance the user experience
An Introduction of How Benefits Were Realized for the Value of Health IT

650-750 units of blood administered weekly without errors

Increase in guideline-indicated transfusions

Decrease in 2+ unit transfusions

Increase in provider and staff satisfaction with optimization and safety features
Blood Administration

• Transfusions are generally beneficial to the patient

• Risks
  – Transfusion reactions
  – Disease transmission
  – Volume overload
  – Increased length of stay
  – Death
Red Blood Cell Transfusion Guidelines

• AABB clinical practice guidelines
  – More restrictive approach for transfusions
  – Lower threshold for hemoglobin levels
    • 7 g/dl – hemodynamically stable hospitalized adults
    • 8 g/dl – orthopedic/cardiac surgery, preexisting CV disease
  – Standard practice to initiate transfusions with 1 unit of blood

Current Practice

• Approximately 30,000 units of blood transfused annually
• Hybrid blood administration process with multiple systems
• Orders based on hemoglobin (hgb) level or provider’s ordering habits
  – Blood Bank order sets
  – One-off or panel orders
• No checks and balances between various systems
• Difficult to determine the amount of blood a patient received
Optimization Goals

• Ensure correct unit of blood is administered to the correct patient
• Streamline the blood administration process to promote patient safety
• Ensure there was an order for every unit transfused
• Create an easy way for clinicians to see a transfusion summary
• Assist providers with appropriately ordering red blood cells (RBC)
  • Standardize transfusion practice
  • Reduce routine orders for 2 units of RBCs
  • Increase % of guideline-indicated transfusions
Optimizing Blood Administration

- Blood Administration Module
  - Barcode scanning
    - Verify patient identification at the bedside
    - Match a blood product dispensed from Blood Bank to the order
  - Release of blood products
  - Dual verification
  - Transfusion documentation
  - Comprehensive blood transfusion report
Blood Administration Project Planning

• Multidisciplinary team
  – Members from each application team
    • Inpatient, Ambulatory, ED, OR, Anesthesia, Radiology, Lab
  – Interface experts

• Subject Matter Experts
  – Nursing
  – Blood Bank
  – Providers
Blood Administration Project Planning

**In Scope**
- Inpatient units
- ED
- Pre-op and PACU
- Labor and Delivery
- Dialysis
- Apheresis
- Perfusion

**Out of Scope**
- Massive transfusions
- Anesthesia
- Cath Lab
- Ambulatory
Blood Administration Project Planning

• Educate group on module features and functionality
• Identify current and new workflows for blood administration
• Analyze current and new build for blood administration
• Identify resources needed, roles and responsibilities
• Obtain approval from various governance groups
• Establish timeline
Blood Administration Project Planning

• Decisions needed
  – Configuration of scanning window
  – Flowsheet documentation
  – Blood release form
  – Blood administration workflow
  – Blood transfusion report
Blood Administration Module Build

• Update transfusion orders
• Update nursing tasks for transfusion
• Update blood administration flowsheet
• Update Transfusion policy
Blood Administration Module Build

- Create the barcode scanning window
- Create the Blood Bank release form
- Create blood transfusion report
- Create scanning compliance report
Blood Administration Testing

- Prepare orders
- Transfuse orders
- Blood release form
- Scanning
- Documentation

- Interfaces
- Blood Bank system
- Order sets
- Clinical users
Blood Administration Training

- Classroom training
- Mobile Skills Lab
  - Competency Checklist
- Focused inservices
  - Blood Bank
  - Perfusion
  - Dialysis
  - Apheresis
Blood Administration Implementation

• SuperUsers on each unit
• SuperUsers in Blood Bank
• Rounding on the units
• Blood Administration FAQs

• Standard Operating Procedure
• Triage Desk tickets
• Issues list
• Optimization list
Blood Administration Issues

• Lost ability to enter nurse’s phone number on release form
• Nurses forgot to complete flowsheet group
• Incorrect flowsheet documentation
Blood Administration Outcomes

- Successfully scanning 650-750 units of blood per week
- All blood administered has an active transfusion order
- Warnings appear if there is a barcode or order mismatch
- 13 less clicks to request a unit of blood from Blood Bank
- Simplified transfusion ordering
- Easy to see the patient’s transfusion history for the hospitalization
- Nurses appreciate the additional safety that scanning provides
Optimizing Blood Product Ordering

• Create a best practice advisory (BPA) to drive providers to an order set

• Embed real-time clinical decision support into the ordering process
  – Display the patient’s most recent hemoglobin result in the RBC order
  – Display verbiage with the transfusion guidelines based on the patient’s hemoglobin result
  – Default the RBC order to 1 unit unless hgb < 7 or > 10 g/dl
  – Add an order to draw a hgb level 15 minutes after the transfusion of the first unit of RBCs is completed
Blood Ordering Project Planning

• Multidisciplinary team
  – Members from the orders and clinical decision support teams
  – Interface experts

• Subject Matter Experts
  – Providers
  – Blood Bank
  – Quality
Blood Ordering Project Planning

• In scope
  – Red blood cell product orders
  – Adult inpatients

• Out of scope
  – Oncology order sets
  – ED
  – Pediatric/NICU inpatients
  – Massive transfusions
Blood Ordering Project Planning

• Educated group on functionality
• Identify resources needed, roles and responsibilities
• Obtained approval from various governance groups
• Established timeline
Blood Ordering Project Planning

• Decisions needed
  – Build solution to use
  – Verbiage to include
  – Order defaults
Clinical Decision Support Build

• Add the patient’s most recent hemoglobin result to the order view
• Add default hemoglobin lab order if no result in past 48 hours
• Configure logic so that the correct verbiage appears based on the patient’s latest hemoglobin result
• Update RBC orders and order sets with logic, guideline verbiage and order defaults
• Create best practice advisory to send the provider to the order set
• Create BPA firing report
RBC Orders

CONSIDER RESTRICTIVE TRANSFUSION STRATEGY. Your patient’s hemoglobin (Hgb) is between 7.0 and 7.9 g/dL which is well tolerated by most hospitalized, stable patients even in the presence of pre-existing cardiovascular disease.

Limit transfusions to:

1. Patients with clinical significant signs or symptoms of anemia or ongoing active bleeding

2. Patients with pre-existing cardiovascular disease AND symptoms of chest pain, orthostatic hypotension, tachycardia unresponsive to fluid or CHF

3. Postoperative surgical patients, or s/p PCI
RBC Orders

CONSIDER TRANSFUSION ONLY IN SPECIFIC CIRCUMSTANCES. Your patient’s hemoglobin (hgb) is between 8.0 and 10.0 g/dL.

Limit transfusions to:

1. Patients with clinically significant signs or symptoms of anemia or ongoing bleeding.
2. Patients with pre-existing cardiovascular disease AND symptoms of chest pain, orthostatic hypotension, tachycardia unresponsive to fluid, or CHF
RBC Orders

CONSIDER TRANSFUSION ONLY IN EXCEPTIONAL CIRCUMSTANCES. Your patient’s hemoglobin (Hgb) is > 10.0 g/dL. Red blood cell transfusion is NOT generally indicated.
Blood Ordering Testing

• Clinical scenarios
• Various and multiple hemoglobin results
• BPA firing appropriately
Blood Ordering Training and Implementation

• E-learning for providers and nurses
• Demonstrations at department meetings
• Roaming trainers
• SuperUser support
Blood Ordering Issues

• Hemoglobin result did not display for one rarely used component
• RBC order not available for some patients
Outcomes: Guideline-Indicated Transfusions

- Pre-optimization – 25%
- Post-optimization – 49% (range 42.7% to 51.5%)
Outcomes: Transfusion orders with 2+ units transfused

- Pre-optimization – 43%
- Post-optimization – 28%
Blood Optimization Challenges

• Blood is administered everywhere
• Workflow discovery
• Resistance to change
• Technology takes more time
• Separate Blood Bank system
• Educating staff
Blood Optimization Lessons Learned

• Start early
• Include the world
• Find and involve operational and clinical champions
• Testing is crucial
• Train as close as possible to the implementation
• Bring training and support to the staff
• Regular meetings
A Summary of How Benefits Were Realized for the Value of Health IT

- Decrease in 2+ unit transfusions
- Increase in guideline-indicated transfusions
- 650-750 units of blood administered weekly without errors
- Increased provider/staff satisfaction with optimization and safety features
Questions

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