Cost Savings and Efficiency Realized by Decreasing Orders for Type and Crossmatching

Jefferson
HOME OF SIDNEY KIMMEL MEDICAL COLLEGE

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Clinical Problem

High Blood Bank Costs Secondary to a High Crossmatch (CXM) to Transfusion (C/T) Ratio*

- C/T ratio as high as 7 for spine, other individual service lines as high as 20 with an overall ratio as high as 5
- Red blood cell (RBC) units crossmatched and not transfused are aged an extra day (by sitting in the refrigerator specified for one patient)
- RBC units are out of circulation, either stored in the operating room (OR) or sequestered in the blood bank (BB) when they may be needed for acutely ill or bleeding patients
- Risk expiration by mishandling in the OR
- Greater acquisition necessary to cover "just in case" needs straining the community and American Red Cross (source of blood products)
- No ownership for ordering blood day of surgery

Background

- Thomas Jefferson University Hospital (TJUH) is a Tertiary, Level 1 Trauma Center and the Regional Spinal Cord Injury Center of the Delaware Valley with 900+ beds
- C/T Ratio is the ratio of RBC units crossmatched for potential transfusion to the number of units actually transfused
- The American Association of Blood Banks (AABB) recommendation for C/T ratio is < 2
- TJUH blood bank, on periodic review by AABB and the College of American Pathologists (CAP) was cited as deficient in C/T ratio quality indicators
- Cost to crossmatch RBC units is on average $71 with the charge to patient $210
- Cost is built into the Diagnosis-Related Group (DRG), not reimbursed, even when transfused
- Maximum Surgical Blood Ordering System (MSBOS) dictates the RBC units prepared for each surgery. Last revised 2006
- An extra blood bank technician was hired to work 6am to noon to cover the add on CXMs, day of surgery

Strategy

Key Stakeholders Identified

- Vice President of Surgery
- Anesthesia
- Blood Bank
- OR Staff
- Surgeons
- Clinical Specialists

Data gathered

- BB tracked day of surgery add on units and utilization rate
- Haemonetics database was utilized to get historical data of RBC usage by DRG and Current Procedural Terminology (CPT) codes
- Analysis of pre-operative blood ordering flow
- Queried Physicians to elicit MSBOS ordering practice
- Called best practice hospitals to identify new processes

Hired a patient blood management (PBM) director

Practice Change

Formal protocol developed

- Emphasis on high blood loss surgeries
- To optimize management of resources
- To maximize patient safety

MSBOS was revised

- Implemented with highest C/T ratio services initially
- Collaborated with surgeons, PBM and anesthesia to reflect actual usage
- BB staff educated regarding case specifics, and units needed
- Eliminated Type and Screen (T/S) on low use cases

Eliminated the use of coolers in the OR
Minimized turn-around-time for availability of RBCs

- Electronic crossmatch instituted, turn around now 10 minutes for blood product
- BB now prioritizes OR cases

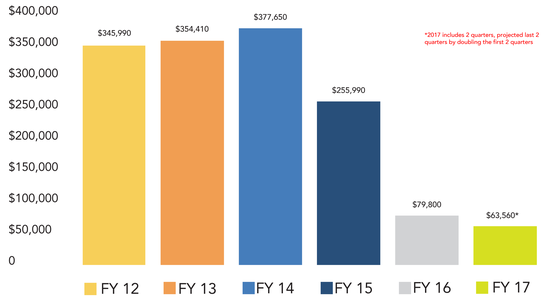
Nursing education

- CXM status included in time out
- No need to add on units intra-operatively

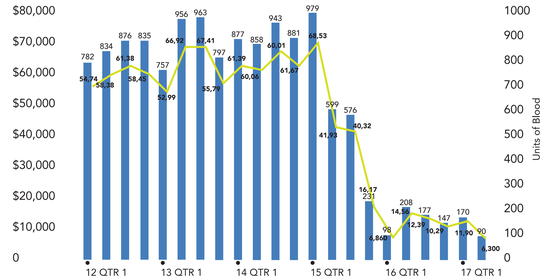
Evaluation

- C/T ratio reduced to 1.4 – sustained
- Compliant with regulatory guidelines
- Improved teamwork and communication between nursing, anesthesia, surgeons and blood bank
- Increased compliance with in-house policies for transfusion services
- No adverse patient outcomes over 1.5 years

Yearly Cost of Unused Crossmatched RBCs in Spine Surgery



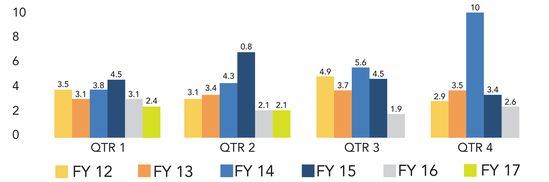
Crossmatch Reduction Cost Savings at Jefferson Hospital for Neuroscience



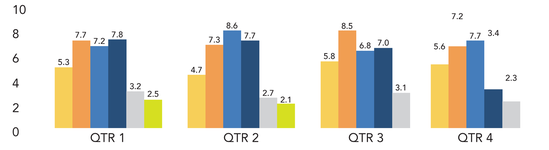
Results

FY 12, 13 and 14 cost = $1,079,050
FY 15, 16, and 17 cost = $ 399,350
A savings in one service line of $679,700 over 3 years

C/T Ratio of RBCs in Gibbon Spine



C/T Ratio of RBCs at Jefferson Hospital for Neuroscience



Recommendations / Lessons Learned

- Nursing/MD ownership of RBC ordering and responsibility, improved with open dialogue at time out
- Increased awareness for potential reduction of harm or near miss by being prepared with RBC plan of care
- Employ a continuous improvement model
- Future Needs Identified
  - In-house pre-admission testing for future surgeries
  - Send blood products to the OR via the pneumatic tube system, for better use of resources and improved processes
  - Need to be careful with transition to EPIC, so gains are not lost

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