HIMSS Analytics

HIMSS Analytics Stage 7 Case Study

Centura Health

Profile

Centura Health, founded in 1996, manages the assets of two sponsors under a joint operating agreement. For more than 100 years, Centura Health hospitals and services have been helping people to live healthier, longer lives. Our sponsors, Catholic Health Initiatives and Adventist Health System, have long provided compassionate, leading-edge care to those in need throughout the region. Our mission is to extend the healing ministry of Christ by caring for those who are ill and by nurturing the health of the people in our communities.

Centura Health is focused on providing affordable, world-class care through an integrated network in Colorado and Western Kansas. Over 17,000 of the best hearts and minds in medicine, along with 6,000 physician partners, serve more than one million patients each year.

In 2007 we saw the potential to integrate several clinical systems into a common, secure Electronic Health Record (EHR) system to make patient health information available across all Centura Health facilities while preserving patient privacy and information security. Centura's EHR currently contains approximately 2.4 million patient records, making it the largest integrated health network in the region. Centura Health has fifteen Stage 7 hospitals, with the most recent designation of St. Catherine Hospital in Garden City, Kansas, in September 2015.

The Challenge

Centura facilities and the system as a whole had attempted several times to address blood product management in the past. However, no project had been truly successful or sustainable. With a dyad partnership in place, the CMO could bring to his colleagues convincing evidence that Centura facilities were purchasing more blood than others in our market, and more than our sponsor systems predicted based on hospitals with similar service and size. Our VP of Supply Chain participated in every discussion with the medical leadership and committed resources to supporting an initiative to change our processes and our clinical behavior. We embarked upon a blood product management initiative in 2013 which included addressing the clinical decision making around the use of packed red blood cells in our facilities. At that time, 7.5% of admitted patients received a blood transfusion, and each patient received an average of 2.96 units. To address this, we set a goal during fiscal year 2013 to utilize a massive transfusion protocol and embark on a system-wide educational campaign to bring ED transfusion practices in line with currently accepted guidelines. In 2014, we embarked on a similar project targeting non-trauma, non-emergency related blood utilization. We viewed this as an opportunity to utilize our EHR in a manner that would benefit our patients and clinicians, while at the same time properly managing the use of this very precious resource.

Implementation Overview

Our clinical content development process is governed by a multidisciplinary team comprised of physicians, nurses, informaticists, pharmacists, information technology, and quality and safety leaders. This team meets with the clinical and operational leaders who want to effect change in clinical behavior in order to work out each detail of the EHR support for the clinical change project. In this instance, the content management team worked with the trauma and ED directors to sift through available options in adjusting the EHR and chose the best fit for the problem being addressed. In 2013, our trauma service line directors developed a system-wide consensus on utilization of pRBC during trauma resuscitation. Our ED Directors agreed on a standardized approach to transfusion in non-trauma emergency cases. Acknowledging that these resuscitations are quite fast paced and generally the physician does not spend a lot of time at a computer in the midst of these situations, it was felt that a standard ED transfusion order set, if written well, could facilitate appropriate use of blood products during ED resuscitation. This order set was written and put into production in mid-2013. All other avenues to order transfusions in the ED were removed from the EHR at that time.

To address non-trauma blood product utilization, in 2014 we convened a group of subject matter experts (including blood bank experts, pathologists, hospitalists, orthopedic surgeons, trauma surgeons, and ED physicians) to develop guidelines for safe and appropriate use of pRBCs in non-trauma, non-ED situations, and developed an education campaign for our medical staffs. We confined transfusion ordering to an order set, fixed the quantity to default to one unit, and instituted a new decision support rule in our EHR to support our new guidelines. However, these guidelines had to include a unique aspect that acknowledged the fact that we deliver medical care in some locations that are at elevations above 6500 ft. Only with our ability to acknowledge and validate the medical decisions that are made for transfusion targets at high elevations were we able to reach system-wide consensus on implementation of this new decision support pathway.

The following are identified as generally accepted thresholds for transfusion of pRBCs at Centura Health:

- HGB less than or equal to 7 g/dL
- Acute blood loss: > 20% Estimated Blood Volume
- Hematologic or oncologic diagnosis
- Hgb 7-10 g/dL WITH underlying disease that could cause tissue hypoxia (Acute MI, CVA, CHF, COPD for example)
- Elevation > 6,500 ft

When pRBC transfusion is ordered and the most recent hemoglobin is greater than 7.0 g/dL, the ordering provider will be asked to indicate the reason for transfusion. Also, it is recommended that only one unit of packed red cells be transfused unless the patient is actively bleeding or in an emergency situation so that the hemoglobin and clinical situation can be re-evaluated to determine the need for additional units.

The intended outcome of this 2-year long project was to ensure that we are using this precious resource in clinically appropriate situations and not putting our patients at unnecessary risk by transfusing blood when other means of treatment may be more appropriate.

Changes made in the EHR included:

- We restricted the ability to order a blood transfusion to an order set.
- For the ED order set, we specified the quantity for each blood product to speed order entry.

- For the inpatient transfusion order set, we defaulted the number of pRBC units to transfuse to one.
- For non-trauma patients, we instituted a rule that checks that most recent hemoglobin, looking back 72 hours across encounters. If the most recent hemoglobin was 7.0 or greater, the ordering provider receives the following warning:

Override reasons include one of high elevation of the treatment site or of the patient's home address, in addition to other clinically appropriate reasons for an override. We developed education regarding clinical indications for transfusion including the more restrictive hemoglobin threshold now accepted as reasonable, the 'new' principle of transfusing the least amount needed, and introducing the alert described above. This education was presented to each of the 15 hospitals medical staffs via meetings, conferences and existing local communication methods.

Resulting Value / ROI

Since the inception of the project we have experienced a 58 percent decrease in the utilization of pRBCs compared to 2012. In 2013, 7.5 percent of our admitted patients received transfusions, whereas in 2015 only 6.2 percent received transfusions. This constitutes 2,328 patients who were spared the risks of blood administration as a result of this effort. Additionally, in 2013 our units/patient ratio was 2.96. In 2015 this was reduced to 2.74. All facilities have shown a decrease in both the number of units transfused and the number of patients who received transfusion, despite an overall growth in number of patients treated in our system.

Because transfusion reactions and adverse events are relatively rare and there is poor consensus on incidence, it is difficult to quantify the avoidance of adverse events for patients. However, conservatively, we may have avoided 23 acute febrile reactions, 4 cases of TRALI and one case of TACO. BBGuy.org Reaction Summary Chart; © 2012, Joe Chaffin, MD

Given a cost of $225/unit of pRBC, $40/unit processing cost (does not include complex antibody processing, or nursing administration), and 6,542 avoided units, we estimate our two year cost savings to be approximately $1.5 million.

This change in clinical decision making required approximately 6 months of clinical expert meetings, four months of educational effort and two changes in our EHR. Although our clinical pathology colleagues had worked to change behavior in this area for several years prior, the key factors to the success of this attempt was the involvement of our supply chain colleagues and our newly functional EHR content management process.

Lessons Learned

This project succeeded because our content management process developed strong support from physicians, blood banks, supply chain and analytics. The key difference was the involvement of our supply chain experts who brought an area of expertise to the table that had previously been untapped. These experts were essential in bringing our blood product vendors into the discussions so that we could better understand the supply chain from donation to administration. Their involvement also provided us with comparative data and Centura-specific purchase and waste data that was needed to signify the importance of this project. The creation of the dyad leadership model between supply chain and medical leadership has been invaluable in our successful execution.

Dividing the massive topic of blood product utilization into smaller segments by asking the trauma experts to work together and address their needs, then sequentially asking the ED, then non-trauma medical experts to follow suit, was done as a practical matter originally, but in the end was seen as a smart method to slowly address the culture change that was needed. Discussions with involved or affected physicians in one group cross-pollinated the other groups, so that the non-trauma change management was quite minimal.