Implementation of MEDITECH's Client Server Transfusion Administration Record (TAR) to Enhance Transfusion Safety

John Saulenas, Senior Consultant, MEDITECH Practice

The American Association of Blood Banks (AABB) reports that each year more than 4 million people require blood transfusions. A great deal of time and effort has been spent in the last three decades to ensure that our nation's blood supply is safe. However, transfusion mistakes cause between 50 -100 preventable patient deaths annually in the United States.

Infectious Risks

Steps have been taken to ensure that the infectious risks (those associated with transfusion mediated disease) are significantly reduced. In the United States, each unit of donated blood is tested for several different infectious diseases. According to the American Society of Anesthesiologists, the risk of contracting HIV, hepatitis C, hepatitis B or HTLV-1 from a blood transfusion is about one in 34,000 transfused units. Hepatitis B and hepatitis C account for 88 percent of this risk. Most of the risk of a blood transfusion is a result of non-infectious risks or mis-transfusion events. Blood transfusion is a complex and multi-step process that has long been recognized as a significant patient-safety issue.

Non-Infectious Risks (Mis-Transfusion Events)

The FDA reported that the number of transfusion related deaths increased steadily from 16 in 1976 to 105 in 2005. The number of transfusion related deaths in 2007 was 52. After careful review of the data it was determined that mistakes were made during blood collection, specimen labeling, blood storage and patient wristband verification. Some of the causes for these mistakes were due to distraction, fatigue, or inattention.

Why Use a New Technology?

In his abstract "Technology for Enhanced Transfusions" Dr. Walter Dzik stated:

> *Medical errors are common and can be classified as either "cognitive" or "lapse" errors. Cognitive errors are defined as errors caused by health care providers either lacking knowledge or misapplying knowledge. Lapse errors also known as "slip-ups" are those errors caused when a repetitive action is performed incorrectly because the healthcare provider is distracted, tired, or negligent.*

The labeling of a patient sample or the patient identification checks performed at the bedside prior to transfusion are repetitive tasks that are subjective to lapse (slip-up) errors.

Bar Code Technology

Bar code technology was first used in 1960 by the railroads to identify their railcars. It was introduced in 1973 to the supermarkets, and in 1992 it finally caught on in the healthcare sector. The Veterans Administration Health was the first healthcare organization to utilize bar code technology with the

development of the Bar Code Medication Administration System. It has proven to reduce medication errors and enhance patient safety. It only makes sense to utilize this same technology to enhance patient safety for blood transfusions.

MEDITECH's Transfusion Administration Record

MEDITECH's Transfusion Administration Record (TAR) provides many benefits to care providers. Some of the benefits are: a method of positive patient identification for blood transfusion, the ability to include bar code verification, the ability to monitor and document patients throughout the transfusion, and integration with MEDITECH's Blood Bank. TAR provides the following benefits for Blood Bank: automatic entry of transfusion information into the Enter/Edit Transfusion Data Routine, access to all transfusion and reaction information in the patient's Blood Bank History, access to all unit transfusion information in the Unit Inquiry Routine, and access to all pertinent transfusion information on the Nursing Transfusion Report.

TAR helps healthcare organizations to achieve their patient safety initiatives. The electronic transfusion verification system utilizes bar code technology. The nurse scans the patient's bar coded wristband, the blood product's bar coded label, and the user ID bar code at the bedside using either tethered or wireless scanners. The system verifies that the patient and blood product are both correct and allows the nurse to proceed with the transfusion. The nurse has the ability to document vital signs, the start and end time, as well as any transfusion reactions. The TAR application is fully integrated with MEDITECH's Blood Bank application, Electronic Medical Record (EMR) and Patient Care System Module.

Implementation of MEDITECH Transfusion Administration Record

TAR record is a component of the MEDITECH Bedside Verification functionality that is part of MEDITECH's Patient Care and Patient Safety Module. Bedside Verification functionality allows caregivers to utilize bar code scanning technology prior to administering blood products to confirm patient identity, ensure the right unit is transfused to the right person, and verify information that is available in the Transfusion Administration Record.

Hardware Considerations

The biggest challenge is to find a bar code scanner that is capable of reading both Coda Bar and ISBT128 and is compatible with MEDITECH's Bedside Medication Verification (BMV) application. Otherwise, users will have to use two different scanners, one for BMV and another for TAR.

Another thing to consider is whether or not to use tethered or wireless scanners. Wireless scanners work very well because they do not pose a safety hazard. No tripping over the cord or draping the cord over the patient. The Code CR 2500 Scanner has worked well for both BMV and TAR. The scanner is wireless and utilizes Bluetooth Technology.

How to Set Up TAR

The set up is fairly easy and quick. The TAR functionality is available starting in the 5.5 SR5 version of the C/S software. Some key features, such as the ability to put a transfusion on hold and use of I&O intervention, are not available until 5.6. Your MEDITECH NUR/PCS specialist will need to set a few parameters in the NUR/PCS Toolbox. Those parameters are:

Transfused Display Period –This is how many hours the unit will continue to display on the routine after the transfusion ends. This information will always be in the EMR.

Vital Signs Intervention –This is where the intervention number is entered that is used to take vitals in the TAR. It is very important that you do not use repeatable labels because TAR does not support the use of "repeatables."

I&O Intervention –This indicates the intervention the system will look to, which includes the Intake Blood Queries, so the information recorded in the TAR routine will be brought to the I&O panel of the EMR. This functionality is available in 5.6 and higher.

Other Intake Query –This indicates the Query where other intake that is infused into the patient when administering blood is recorded (such as saline solution). This query should have the Other Intake EMR ID associated to it so the amount recorded will go to theI&O Panel in the EMR. This is available in 5.6 and higher.

E-signature Enabled –This requires that the user must e-sign when verifying the unit. (UNV pw/pin settings apply).

Minimum Care Provider Type –This looks to the Minimum Care Provider Type indicated by the "Rank" prompt in the CP Type Dictionary, to determine if a nurse is allowed to administer blood or not. If not, a message will pop up, and the user will be required to have a co-sign (set up in the Product Dictionary). This functionality does not work until 5.6.

Pre-Transfusion checklist –Be sure to group responses for "unique" products when verifying the unit (unique products have a specific blood type). Please note that the group response is created in the MIS Group Response Dictionary.

Non-Unique checklist –Be sure to group responses for "non-unique" products when verifying the unit (non-unique are those that do not have a specific blood type). Please note that the group response is created in the MIS Group Response Dictionary.

Max Time –This is the maximum amount of time the bag should hang. If hung past that time period the Transfusion Item Type on the Status Board will turn red, indicating that the user should end the transfusion. The user will also receive a warning message upon entry into the TAR.

Warning Time –In the TAR routine, the system will warn the user when the bag is near the maximum time for hanging. Enter the times that the warning should display to the user here. The user will receive a warning message upon entry into the TAR.

Default VS Directions –This dictates the frequency the vital signs will be due once the transfusion has started. It displays on the status board under the transfusion item type. This is overridden in the Product Dictionary.

How to Set Up BBK-PCS

Your MEDITECH Blood Bank Specialist will need to set the following Laboratory Information System Toolbox parameters. Please note BBK-PCS Interface must be set to YES. It is very important that this parameter be set to 'Y''. If it is not set, Vitals Sign information, along with any other documentation, will not flow from PCS to the Transfusion Record in BBK.

Patient Wristband –The user will need to scan the patient's wristband. (Account, Unit or Medical Record Number)

Scan BBK Wristband –This is a unique wristband that is particular to LAB, for the blood bank transfusion.

Scan Unit Identifiers –The user will need to scan the unit # on the blood product. Choices:

A = All (Scan this item for all products)

U = Unique products (Scan this item only for unique products)

N = None (Do not scan this item for any products)

Scan Blood Type –The user will need to scan the blood type. Choices: see *Scan Unit Identifiers* choices above.

Scan Expiration Date/Time –The user will need to scan the expiration date on the product label. Choices: see *Scan Unit Identifier* choices above

Scan Verify User –The user can scan their badge. This would verify that the user administering blood is the same user signed onto the PC.

BBK History Fragment –This fragment creates the Blood Product Label that displays at the top of the Transfusion Routine. This label is comprised of patient specific information (i.e. account #, patient name, blood type, antibodies, antigens, marker, etc.). You can create your own fragment in NPR, or use the standard fragment delivered down with the MEDITECH software.

The scanning is separated out into 2 columns:

- Issue - the checklist site would like for a routine transfusion

- Emergency - the checklist the site would like for an emergency transfusion (i.e. it may be less scans)

If nothing is indicated, these parameter prompts will not be utilized for your Verifying checks on the TAR. The only checklist the user would then receive when verifying the blood product would be the Unique or Non Unique Group Response defined in the NUR Parameters.

NUR Dictionaries

NUR Care Provider Type Dictionary –This must have the **Rank** prompt defined. This determines which care provider type can administer blood.

NUR "ACCESS" Dictionary –This must have **Transfusions** listed in order for the care providers to have access to the TAR functionality.

NUR Status Board Dictionary –This is where users can add a 'Transfusion' Item Type to their board, which will display different statuses to the end user as to where they are in the process of blood administration. The statuses are as follows:

1. **Ready** - The Blood Product is ready to be picked up from LAB.
2. **Issued** - The Blood Product has been picked up from LAB by a Care Provider
3. **Trans** - The Blood Product is being administered.

Once the blood is verified and started, this status board item type will display the next time the Vital Signs need to be taken on the TAR.

BBK Product Dictionary

The following Blood Bank Dictionaries must be defined prior to the use of TAR:

Prompt VS Freq –This will override the frequency of Vital Signs that have been defined in the NUR Toolbox parameters.

Display at Order –This causes the Lab Test View Group (associated data) to display when a physician places an order for a blood product.

Auto Transfuse Hours Prompt –If Blood Bank does not hear from the nurse in this number of hours, the system will update the unit to a presumed Transfused Status.

Display at PCS Tx Prompt -If the Lab Test View Group is displaying at the time of transfusing, this would appear on the Transfusion Matrix in the upper right corner.

Test View Group Prompt –This defines the Lab Test View Group that should display at various steps associated to the administration of blood (i.e. order, issue, transfuse). This is similar to associated data. The Lab Test View Group dictionary is where tests are attached that you want the user to view. Multiple tests can be attached.

Display at Issue Prompt –This will appear in the Lab Test View Group display to the Lab Tech at the time the unit is issued.

BBK Transfusion Reaction Dictionary

This where you can attach a customer defined screen, it will display in the Transfusion Routine in PCS when documenting a reaction. Remember that this screen must be created in MIS first.

Testing and Training

Once the dictionary entries are complete it's time to begin testing. Testing should be done on all blood products. Make sure to test Thawed FFP and Pooled Platelets to ensure that the scanner is able to read the bar codes on the label. If the Blood Bank makes a component such a Thawed FFP, ensure that the correct product is ordered on the patient, such as Thawed FFP and not FFP. If FFP is ordered and Thawed FFP is issued, the user will be flagged when they scan the unit that is not ordered on the patient. Also, check with your Blood Bank to ensure they have the capability to print bar coded product labels.

Healthcare Organizations that are live with EMR and Bedside Medication Verification (BMV) have found In-Services on the Nursing Units to be very beneficial. The care providers are used to scanning medications so it is fairly easy to learn the transfusion routine. Sites not live with BMV usually provide a training session within a classroom setting that usually takes an hour or two.

Conclusion:

MEDITECH's Bedside Verification functionality helps ensure that healthcare organizations achieve their patient safety goals. The TAR eliminates the two person verification prior to the administration of blood products. Bar code scanning is utilized to ensure safe blood transfusions. Blood products and unit information, including unit blood type and product, is also bar coded to accurately reconcile the correct unit and correct blood product with the correct blood type being administered to the patient.

For more information on TAR or what VCS can do to help with your MEDITECH applications call us at 610.444.1233 or email us at vcs@getvitalized.com. You can also find more information about VCS at our website www.getvitalized.com.