



Saint Luke's Regional Laboratories Clinical Laboratory Letter



August 2005

New Transfusion Safety Initiative

Nationally, 1 in 38,000 red cell units is transfused to the wrong patient. When the wrong unit of blood is given, it is ABO-incompatible 1 in 3 times. Two thirds of these erroneous transfusions are caused by a clerical or management error in identifying the patient, blood sample or blood component and one third are due to an error in the transfusion service. Of these ABO-incompatible transfusions, about 10% are associated with a fatal hemolytic transfusion reaction. ABO errors cause more transfusion related fatalities than hepatitis C (HCV) or human immunodeficiency virus (HIV-1). Mis-labeled samples for blood bank testing may also result in the failure to administer Rh Immune Globulin resulting in hemolytic disease of the newborn.

The only way to prevent these errors from happening is meticulous attention to the patient identification protocol and the introduction of technological advances such as bar coded wristbands. Patient safety is a national issue and has been identified as a Performance Improvement initiative at Saint Luke's Hospital.

To improve patient safety, a new blood bank policy will be implemented in September.

1. Each time a specimen is received for a type and screen or a crossmatch, if there is no historical type in Saint Luke's laboratory information system to compare with the current results, a new sample will be drawn from the patient and a second blood type will be performed (whenever possible, by a different technologist).
2. In emergency situations, when time does not permit collecting and verifying the blood type on a second sample, group O red blood cells, group AB plasma products, and group O platelets will be issued until a second specimen/second blood type can be obtained.
3. In non-emergent situations, for blood components that do not require crossmatching (fresh frozen plasma, platelets, cryoprecipitate), there must be two blood types before type

specific blood components will be issued. If a second blood type cannot be obtained, AB plasma will be issued. Platelets will not be issued in a non-emergent situation without a second blood type.

4. For patients with autologous units, if the blood type of the patient sample matches the blood type of the autologous unit (and the unit type has been confirmed at SLH), a second blood type will not need to be performed on the patient.
5. For outpatients who are not going to be transfused (i.e. prenatals), if there is no historical record to compare with the current specimen blood type, a second blood type will be performed on the same sample, by a different technologist whenever possible.
6. For genetic amniocentesis patients, the clinic will FAX us a copy of the blood type on which they are basing their treatment.
7. In March 2005, the OB department at Saint Luke's implemented a policy requiring a blood type to be ordered on all patients on admission. For all obstetrical patients, the following applies:
 - If the current sample matches the historical blood type in Saint Luke's laboratory information system, no further testing is indicated.
 - If there is no historical blood type to compare with the current results, a second sample will be drawn from the patient and a second blood type will be performed (when possible, by a second technologist).
 - On cord blood samples from Rh negative mothers (to determine if mother is a RhoGAM candidate), two blood types will be performed on the cord blood sample, by two different technologists when possible.
8. On infants requiring transfusion, a blood type will be performed on the cord blood specimen and, if a sample has been drawn from the infant for other laboratory testing, this specimen will be used for the confirmatory type. If a second sample is not available, a second blood type will be performed on the cord blood, by two different technologists when possible. If

a second blood type is performed on the same sample, only group O red blood cells will be transfused. In emergency situations, when time does not permit collecting and verifying the blood type on a second sample, group O platelets will be issued until a second specimen/second blood type can be obtained. In non-emergent situations, platelets will not be issued without a second blood type.

STAT Enterovirus Testing

Enterovirus is a leading cause of aseptic meningitis in adults and children that occurs seasonally in the Midwest United States, generally in summer and fall. Enterovirus testing by PCR has been performed in-house by Saint Luke's Regional Laboratories since January 2004.

Last year, a pilot study was undertaken with the Saint Luke's Hospital Emergency Department (ED) to evaluate the effectiveness of performing CSF Enterovirus PCR on a STAT basis. Results were provided within 3-4 hours, so that patients with a typical aseptic meningitis presentation based on clinical findings and other CSF results, and a positive Enterovirus PCR could be discharged from the ED. There were 28 STAT PCR's performed for the ED during the pilot study. Eight specimens tested positive (29%), and the majority of those patients avoided admission to the hospital. Some were discharged from the ED within minutes of the physician receiving the result.

Prior to the pilot study, a survey of aseptic meningitis cases admitted to Saint Luke's Hospital over the preceding three years showed an average length of stay of 2.8 days with average hospital charges of \$14,050. Typically, patients are admitted to await results of bacterial cerebrospinal fluid (CSF) cultures and viral CSF PCR studies, as well as receiving IV antibiotics

Because of the significant impact of the pilot study on patient outcomes, STAT Enterovirus PCR testing has now been extended to include the SLNH, SLS, and SLELS Emergency Departments. The STAT testing protocol is available during the hours of 0500 through 2400, Monday through Friday and 0700-1730 on Saturdays.

FFP Correction of Minimally Elevated INR

Physicians performing invasive procedures want to avoid hemorrhagic complications and often regard a mild elevation of a coagulation test result as an indication to order fresh frozen plasma (FFP). Such decisions fail to take into account the lack of published studies documenting that prophylactic transfusion of FFP to correct a minimally prolonged PT (defined as an INR <2.0) reduces the risk of hemorrhage. Also, no controlled studies have demonstrated at what levels the PT and APTT actually represent contraindications to invasive procedures. Instead, studies during the last 20 years in patients undergoing liver biopsies, bronchoscopic biopsies, renal biopsies, central line placements, thoracentesis and angiography have shown that PT and PTT are not predictive of hemorrhage.

It is important to remember that transfusion of FFP is not free of risk. FFP is the blood component most frequently associated with transfusion-related acute lung injury (TRALI); FFP transfusions account for 600 TRALI cases and 30 deaths annually in the United States. As with any other blood component, the decision to transfuse FFP should be based on predictable benefit and clinical necessity.

Prophylactic transfusion of FFP to correct a mildly elevated INR prior to an invasive procedure may be neither beneficial nor necessary. When the INR is <2.0, transfusion of FFP corrects INR an average of only 0.1 per unit transfused, because the INR of FFP itself ranges between 1.0 and 1.3. The difference in coagulation activity between FFP and the patient's plasma is so small that FFP transfusions produce minimal demonstrable effect on the patient's INR. Thus the efficacy of FFP transfusions for correcting minimally elevated INRs is limited.

In view of this information, the common practice of prescribing FFP to correct a mildly elevated INR prior to an invasive procedure needs to be reevaluated.