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## What do Blood Transfusion and Marriage have in common?

In 1976 Beal stated: "Blood transfusion is like marriage: It should not be entered upon lightly, unadvisedly or wantonly or more often than is absolutely necessary."

Blood product safety has definitely improved over the years. However, patient safety risks regarding transfusion still remain. These include:

- Immunologic risks
  - Hemolytic transfusion reactions most commonly caused by giving wrong unit to wrong patient
  - TRALI (Transfusion Related Acute Lung Injury)
- Infectious Risks
  - Slight risk of HCV, HBV, HIV, HTLV, WNV, Trypanosoma *cruzi*, CMV and variant Creutzfeldt Jakob disease
  - Bacterial contamination
  - Emerging Pathogens
- Metabolic risks such as circulatory overload and citrate toxicity
- Immunomodulation

Research from the TRICC Trial in Canada and the CRIT Study demonstrated better patient outcomes if a restrictive hemoglobin transfusion trigger (7.0 g/dL) was used. Several studies have confirmed that a restrictive transfusion practice decreases 30-day mortality rate, cardiac complications and organ dysfunction.

Based on these and other studies, the published criteria for RBC transfusions at Saint Luke's Hospital are as follows:

- Hemoglobin  $\leq$  7g/dL or hematocrit  $\leq$  21% with symptoms
- Hemoglobin  $\leq$  9 g/dL in patients with acute coronary syndrome
- Acute massive hemorrhage or trauma

- Pre-Surgery hemoglobin  $\leq$  7g/dL or hematocrit  $\leq$  21% or intra-operative/post-operative EBL  $>$  750 mL

In September 2008, a multi-disciplinary PI Team was formed to assess the appropriateness of transfusions at Saint Luke's Hospital. In October, an audit of 854 blood products transfused showed that only 62% of all RBC units met the above criteria in **non-bleeding** patients.

The PI Team is currently working on a process to increase the appropriateness of RBC transfusions at Saint Luke's Hospital. This process will begin in mid April and will be implemented in phases for different physician groups. The first phase will proactively attempt to decrease the need for transfusion by identifying patients at risk for anemia and maintaining or increasing their hemoglobin levels. Various tools such as the anemia risk assessment tool and the anemia management order set will be utilized to attain this goal.

Blood Management will communicate and educate all physicians and nurses in each focus group as the phases are rolled out. The Blood Management team will also be assisting physicians by providing patient education on anemia management strategies.

## Absolute Lymphocyte Count as a Prognostic Factor in Relapsed Diffuse Large B-Cell Lymphoma

Diffuse large B-cell lymphoma (DLBCL) is the most common subtype of non-Hodgkin lymphoma (NHL), accounting for approximately 35% of all NHL cases. Several studies have shown an association between prediction of overall survival (OS) and the absolute lymphocyte count (ALC) for a number of non-Hodgkin lymphomas, including DLBCL. However, none of these studies have specifically examined the relationship between the ALC and increased survival in patients at the time of first relapse.

Researchers from the Division of Hematology, Department of Medicine at Mayo Clinic College of Medicine investigated the peripheral blood ALC at the time of first relapse (ALC-R) as a significant prognostic factor for survival in relapsed DLBCL. In the study, published last month in the American Journal of Hematology (84:93-97, 2009.), the relationship between OS, progression-free survival (PFS) and ALC-R was analyzed in 97 first relapsed DLBCL patients followed at Mayo Clinic, Rochester from February 1987 to March 2006. The age at the time of first relapse ranged from 25-88 years, with a median age of 68 years. The ALC-R ranged from  $0.33-5.99 \times 10^9/L$ , with a median ALC-R of  $1.21 \times 10^9/L$ . Patients were retrospectively divided into two groups: those with an ALC-R  $\geq 1 \times 10^9/L$  (N = 60) and those with an ALC-R  $< 1 \times 10^9/L$  (N = 37).

A statistically significant association between increased OS, PFS and the ALC-R was observed. The median OS/PFS and 5-year OS/PFS rates for the ALC-R  $\geq 1 \times 10^9/L$  and ALC-R  $< 1 \times 10^9/L$  groups are shown in the table below:

	<b>ALC-R <math>\geq 1 \times 10^9/L</math></b>	<b>ALC-R <math>&lt; 1 \times 10^9/L</math></b>
<b>Median OS</b>	28.7 months	10.2 months
<b>5-year OS</b>	39%	14%
<b>Median PFS</b>	14.8 months	6.5 months
<b>5-year PFS</b>	21%	8%

This study showed that the ALC-R, as a surrogate marker for host immunity, is an independent predictor of OS and PFS in DLBCL patients at the time of first relapse. The researchers suggest that the ALC-R may help guide treatment decisions, as well as play a role in predicting survival in first relapsed patients with other types of non-Hodgkin lymphoma. The ALC can be simply and inexpensively ordered as part of a routine CBC with differential count in the hematology laboratory.

### **HLA-B\*1502 as a Genetic Marker for Carbamazepine Induced Severe Cutaneous Reaction Syndrome**

Carbamazepine is used to treat all types of partial seizures and generalized tonic-clonic (grand mal) seizures. Brand names include Tegretol and Carbatrol. Generic versions are also available.

Common side effects include drowsiness, headache, dizziness, blurred vision, difficulty in thinking, double vision, diarrhea, nausea and vomiting. Approximately 10% of patients may develop allergic skin rashes.

Asian patients have more than 1000 times the risk of developing severe cutaneous reaction syndromes (SCARS), which are also known as Stevens-Johnson syndrome and toxic epidermal necrolysis. Complications may include sepsis, multiple organ failure and death.

An allele of the human leukocyte antigen B type, HLA-B\*1502, is a genetic marker for carbamazepine induced SCARS in Asians. In December 2007, the FDA changed the prescribing information for carbamazepine to include screening at risk patients for the presence of HLA-B\*1502 prior to initiation of treatment.

### **Revised Venous Thrombosis Order Profile**

Coagulation request forms from Mid America Comprehensive Coagulation have been updated with a single venous thrombosis order profile that includes all common thrombophilic risk factors that can be measured in the laboratory. The updated profile includes activated protein C resistance, factor V Leiden mutation, prothrombin gene mutation, protein C, protein S, antithrombin, factor VIII, homocysteine, lupus anticoagulant, anticardiolipin antibody and anti-beta-2-glycoprotein.

### **No Swab Collections**

Please note that specimens submitted on swabs, including nasopharyngeal swabs, throat swabs, etc are not collected by any Saint Luke's Regional Laboratories Patient Service Center. These specimens must be collected by the nursing unit or physicians' office placing the test order. Specimen collection swabs are supplied by SLRL on request.

### **Discontinuation of OD450**

Saint Luke's Hospital laboratory has discontinued measurement of OD 450 on amniotic fluid. The introduction of Doppler ultrasonography of fetal cerebral blood flow for noninvasive assessment of fetal anemia due to immune hemolysis has made this test obsolete.