

August 2018

AABB Choosing Wisely

Choosing Wisely is an initiative of the American Board of Internal Medicine (ABIM) Foundation that seeks to advance a national dialogue on avoiding unnecessary medical tests, treatments and procedures. Various medical specialty societies have issued over 540 recommendations to educate clinicians and patients about overuse of medical resources. These recommendations are supported by current evidence based literature.

AABB, a not-for-profit association representing individuals and institutions involved in the field of transfusion medicine and cellular therapies, published five Choosing Wisely recommendation to reduce unnecessary blood transfusions and laboratory testing performed for blood transfusions.

1. Do not transfuse more units of blood than absolutely necessary

Single unit transfusion of red cells and platelets are often effective and should be the standard default order for non-bleeding, hospitalized patients. One RBC unit increases the hemoglobin in an average-size patient (70-80 Kg) by approximately 1 g/dL and the hematocrit by 3%. One apheresis platelet unit increases platelet count by 20,000-40,000/ μ L in stable non-bleeding patient.

Single unit transfusions coupled with restrictive transfusion thresholds, decreases the exposure of patients to infectious and non-infectious risks associated with blood products. Additional units can be prescribed after re-assessment of the patient and their hemoglobin value or platelet count.

2. Do not transfuse red blood cells for iron deficiency without hemodynamic instability

Iron deficiency in patients should be managed with oral and/or intravenous iron. There is no role for

RBC transfusion in hemodynamically stable patients with iron deficiency, irrespective of hemoglobin levels.

3. Do not routinely use blood products to reverse warfarin

Prothrombin complex concentrates or plasma should only be used for patients with life threatening bleeding or requiring emergency surgery. Vitamin K alone often reverses warfarin effects in most patients.

4. Do not perform serial blood counts on clinically stable patients

Repeat testing in non-bleeding, stable patients leads to excessive phlebotomy, unnecessary transfusions and may contribute to iatrogenic anemia. Transfusion of blood products should be based on the first laboratory value of the day for hemodynamically stable patients.

5. Do not transfuse O-negative blood except to O-negative patients and in emergencies for women of child bearing potential with unknown blood group

O-negative RBCs can be given to any bleeding patient in emergent life threatening situations. Overutilization in such situations has led to chronic short supply of O-negative RBCs. In emergent situations, O-negative red blood cells should only be transfused to women of childbearing potential with unknown blood group to prevent anti-D alloimmunization, which can affect future pregnancies.

Viral Load PCR Update

Saint Luke's Molecular Diagnostics recently acquired new instrumentation for viral load PCR assays, including CMV Quantitative, HCV

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Quantitative, and HIV Quantitative. Effective immediately this testing is performed on the Roche cobas 6800.

This upgrade in instrumentation has necessitated a change in reporting at the lower limit for CMV Quantitative PCR. With the new version of the assay, the lower limit of quantitation (LOQ) is 35 IU/mL. Previously, LOQ was 137 IU/mL. Effective immediately, samples having CMV target detected, but below the quantifiable limit will be reported as '<35 IU/mL.' Samples having no CMV target detected will be reported as 'not detected.' Samples having detectable and quantifiable CMV target will continue to be reported as the numeric value up to or >3,000,000 IU/mL. Additionally, log values will be reported for CMV Quantitative.

HIV quantitative & HCV quantitative testing have been moved to the new instrument, and the assays are comparable to previous. The only reporting change is the upper limit of quantitation for HCV, which is now 25,000,000 IU/mL instead of the previous 50,000,000 IU/mL.

The specimen requirement for HIV Quantitative and CMV Quantitative is 2 mL EDTA plasma (minimum 1 mL). The specimen requirement for HCV Quantitative is 2 mL of serum or EDTA plasma (minimum 1 mL). These specimens must be received within 24 hours of collection or centrifuged for 10 minutes at 4500 rpm, then separated from cells.

Therapeutic Apheresis for Hematological Malignancies

One of the applications of therapeutic apheresis is cellular depletion, which is simply removal of a symptom causing abnormal cellular fraction of blood. *Leukocytapheresis* (white blood cell (WBC) depletion) and *Thrombocytapheresis* (platelet depletion) are the two commonly performed cellular depletion procedures. *Erythrocytapheresis* (Red blood cell depletion) can also be performed via apheresis for certain indications like polycythemia vera or hereditary hemochromatosis but such indications can often be treated effectively by simple therapeutic phlebotomy.

Hyperleukocytosis (WBC count >100 x 10⁹/L) and extreme thrombocytosis (platelet count >1,500 x

10⁹/L) are the usual indications for leukocytapheresis and thrombocytapheresis, respectively. However, not all elevations in WBC and platelet count require cellular depletion. WBC can be elevated in response to infections, steroids, and with many inflammatory conditions. Furthermore, platelets are acute phase reactant; they increase in response to various stimuli, including systemic infections, inflammatory conditions, bleeding, and tumors.

Hyperleukocytosis and thrombocytosis associated with hematological malignancies can lead to symptomatic stasis (headaches, mental status changes, stroke, blurry vision, dyspnea, end organ failure, skin necrosis, etc.) and require cellular depletion. Blasts seen in acute leukemia are large and "sticky" cells, which can lead to leukostasis. Platelets in myeloproliferative neoplasms (including essential thrombocythemia and polycythemia vera) are functionally abnormal and associated with thrombohemorrhagic events.

Leukocytapheresis may also be indicated prophylactically for patients with acute promyelocytic leukemia (APL) or acute monocytic/monoblastic leukemia with WBC in upper 100-200 x 10⁹/L range without symptoms because of high risk for disseminated intravascular coagulation or fibrinolytic syndrome from lysis of blasts after chemotherapy. Leukocytapheresis for CLL, CML or ALL is generally not indicated, as viscosity and leukostasis problems occur only rarely.

Symptomatic hyperleukocytosis and thrombocytosis are a category II (second-line therapy) indication for cellular depletion per American Society for Apheresis (ASFA) guidelines. Prophylactic or secondary hyperleukocytosis and thrombocytosis are a category III (optimum role of apheresis therapy is not established) indication for cellular depletion.

Cellular depletion procedures are well tolerated by patients and symptomatic relief can be seen immediately in many patients. A single cellular depletion can reduce the cell count by 30–60% and usually only 1-2 procedures are needed. At Saint Luke's Health System, Transfusion Medicine Physician are available to provide consultation on therapeutic apheresis, to help identify appropriate indications and establish treatment plan.

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