

Choosing Wisely Champions Cut Blood RBC Transfusions, HIT testing

Roxanne Nelson, RN, BSN

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SAN DIEGO — Three clinicians were hailed as *Choosing Wisely Champions* here at the American Society of Hematology (ASH) 2018 annual meeting for their efforts to reduce overuse of treatments and tests.

One clinician describes how his team managed to reduce the inappropriate use of blood transfusions in certain patients with blood cancers, while another describes short-lived success in reducing inappropriate testing for heparin-induced thrombocytopenia (HIT).

A third clinician discussed [reducing inappropriate vancomycin prescribing for febrile neutropenia in cancer patients](#).

The program is run by ASH in cooperation with the American Board of Internal Medicine Foundation (ABIM), which began the Choosing Wisely [initiative](#) in 2012.

The annual *Choosing Wisely Champions* campaign recognizes the efforts of practitioners who are working to eliminate the costly and potentially harmful overuse of tests and procedures.

Reducing Inappropriate Blood Transfusions

Prakash Vishnu, MD, of the Mayo Clinic, Jacksonville, Florida, described his work on reducing inappropriate blood transfusions.

For the larger Choosing Wisely initiative, the American Association of Blood Banks has stated that decisions regarding transfusions should be influenced by symptoms and hemoglobin concentration, he explained.

Single-unit red cell transfusions, Vishnu emphasized, should be the standard for nonbleeding, hospitalized patients, and additional units should only be prescribed after reassessment of the patient and his or her hemoglobin value.



Dr Prakash Vishnu

However, he pointed out that "the use of single-unit [transfusions] is not well established or used in some subsets of hospitalized patients, such as those undergoing transplant or chemotherapy, or those with hematologic malignances who do have significant anemia."

His team embarked on a project to look at these patient populations, starting in 2016. In particular, they focused on hemodynamically stable adult hospitalized patients undergoing myeloablative chemotherapy and autologous hematopoietic stem cell rescue (AHSCR) who have a hemoglobin level of ≥ 7 g/dL.

The team designed and set up an electronic medical record-based restrictive red blood cell transfusion program as part of a quality initiative at their institution's hematopoietic stem cell therapy center. "We changed the ordering from 2 units to 1 unit and additional transfusions were allowed at the discretion of the physician," he said. "Just in the last 6 to 8 weeks we moved to a new system, and we instituted a system for 1 unit."

Clinicians, hematology residents, and nurses were educated about this program with 2 months of weekly didactic sessions, pamphlets, and verbal instruction.

For each patient who was suitable for 1 unit, the total number of red blood cells transfused, the change in hemoglobin pre- and post-transfusion, time to engraftment, length of hospital stay, and the rate of sepsis during the first 30 days following chemotherapy and AHSCR were recorded.

Vishnu explained that in 2017 there were less patients receiving autologous transplants than the previous year. "We had 80 in 2016 and 57 in 2017," he said. "Almost two thirds of the patients were multiple myeloma followed by non-Hodgkin lymphoma."

Patient demographics were similar between the two groups.

The impact of the new initiative was clear: in 2016, only 20% of patients were transfused with a single unit, while for 2017, that number rose to 70%.

"That was a 44% decrease in the use of double units," Vishnu said.

"There was also a significant decrease in the total number of red blood cells transfused," he reported. In 2016, 71 units were transfused compared to only 28 in 2017.

As far as adverse events, Vishnu pointed out that this was a small cohort, but that they did not see any difference in time to engraftment. However, the incidence of sepsis was higher for patients who received red blood cells vs those who did not (70.7% vs 51.5%) plus there was a trend towards a longer hospital stay (16 days vs 14 days).

Vishnu concluded that while giving a single unit appears to be safe, implementation on a larger scale at other Mayo Clinics and institutions is needed in order to determine the benefits to the system and patients.

Inappropriate HIT Testing

Charles Greenberg, MD, from the department of medicine, Division of Hematology/Oncology, Medical University of South Carolina, described the work that led to a reduction — at least for a while — in inappropriate HIT testing. Greenberg spoke on behalf of his colleague Ming Lim, MD, who was given the *Choosing Wisely Champions* honor but could not attend the AHS conference.

HIT is a drug-induced, immune-mediated prothrombotic disorder associated with thrombocytopenia and venous and/or arterial thrombosis, he explained. It is caused by antibodies directed against complexes formed by a platelet protein, platelet factor 4, and heparin (PF4/H).

Diagnosis is generally made with the anti-PF4 test, an immunologic, enzyme-linked immunosorbent assay (ELISA) that detects IgG antibodies against the PF4 heparin complex, and the serotonin release assay (SRA), which measures heparin-dependent platelet activation.

However, Greenberg and his team realized that at their institution, many patients were being tested for HIT despite having a low pretest probability of having the syndrome. This low probability was based on, for example, their results on the 4T score, a risk-predictive model with a high negative predictive value; or on clinical measures such as thrombocytopenia, the timing of platelet count fall, thrombosis or other sequelae, and other causes for thrombocytopenia present.

"We have been working on providing safe and effective anticoagulation therapy for quite some time," said Greenberg. "At baseline, we felt very strongly that we were having a significant problem with excess testing."

They found there was an excess of PF4 ELISA testing in intensive care unit patients with low 4T scores. In addition,

patients were then often placed on direct thrombin inhibitors (DTIs), which were administered for several days until the SRA assay results became available. "In many cases it exposed patients to an agent that wasn't needed and which could have resulted in significant bleeding," he said.

A multidisciplinary HIT task force was put together. One of the issues they identified was a lack of a systematic method of alerting hematologists for patients suspected of having HIT. The other was that there were inconsistencies in the way tests were being ordered and their subsequent management.

"Since we had the expertise to help manage this, we decided to use these two factors as the primary approach to reduce the use of DTIs," said Greenberg.

He noted that they were initially quite successful. A centralized, hospitalwide protocol was implemented that coordinated testing and treatment of patients suspected to have HIT. "We were notified of any PF4 positive test, and then we were asked to review the cases and decided if an ELISA should be sent," he said.

The number of tests dropped from 600 to about 275, the costs of sending tests out decreased by 90%, and there was a 34% decrease in PF4 testing, Greenberg reported. In addition, 100% of patients with positive PF4 results received a consult from the team.

It also led to a 78% reduction in the use of DTIs. "When I first came here," noted Greenberg, "I was shocked by how many patients were on them."

However, the success was short-lived. With the implementation of the Epic system for electronic health record (EHR) in 2014, all their work became obsolete, Greenberg commented. With Epic, anyone could now order the PF4 test electronically without a 4T score, he explained.

"We were horrified that all our good work would go down the drain as soon as Epic was implemented," he said, "And unfortunately it did. And soon as they implemented Epic, we were back to where we were or even worse within a short time."

The team was still able to identify positive tests, but they saw a huge increase in orders for heparin PF4 testing.

The team then implemented new measures to try to curtail the trend once again. These included increased education of the staff and divisionwide lectures, which temporarily decreased PF4 testing in 2016. But despite attempts at education, many ordering physicians still remain unclear about it.

"So this is a second challenge we are facing," Greenberg explained. "We have gotten it back down, but we don't have the calculator built into the Epic system. We are also an academic center and have a constantly changing house staff."

While they have seen that team action can promote safe and cost-effective care for HIT management and reduce DTI use, Greenberg expressed that they still have concerns about the likelihood of success.

"We are really interested if an electronic system with a T4 score will make a difference," he noted. However, he said that "physicians have their practice patterns and they can fudge the test scores to get what they want, so I think this will be a looming problem long term."

American Society of Hematology (ASH) 2018 Annual Meeting: ASH *Choosing Wisely Champions* session, presented December 3, 2018. No abstracts available.

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