

Got blood!

Blood has been recognized as a life giving force from time immemorial. The first recorded attempt at human to human transfusion was recorded in 1492 when Pope Innocent VII succumbed in an attempt at a transfusion. Successful blood transfusion did not occur until over 400 years later in 1901 when we learned about the unique fingerprint proteins on the blood cell surface that would allow blood to be safely matched from donor to recipient, the ABO blood antigen system. Further refinements were made in crossmatching and blood preservation techniques and by 1980 over 14 million units of blood were being transfused annually in this country alone. This changed abruptly in 1981 when the Human Immunodeficiency Virus (HIV) first entered the system and was found to be transmitted by blood transfusion with devastating results. Since that time, we have become much more judicious in our use of blood transfusion.

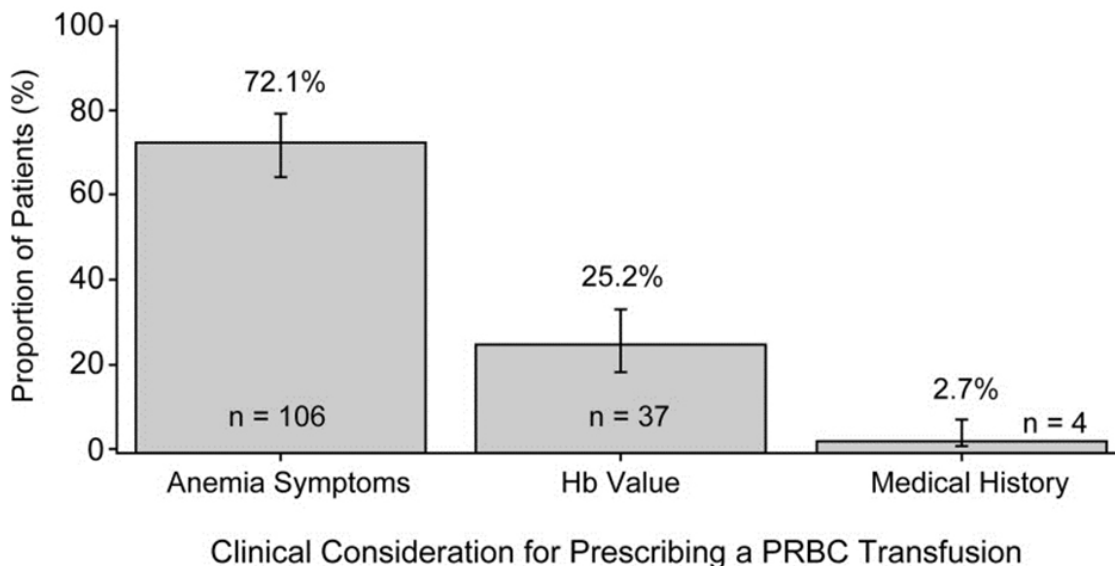


Fig. 1. Clinical consideration for prescribing a PRBC Transfusion.

Although presently the blood supply is 99% safe from infection due to our ability to accurately test for the majority of infectious organisms, we learned from the HIV experience that a blood transfusion was rarely necessary, in the absence of active bleeding, if the oxygen carrying protein in the blood cells, hemoglobin, was above 7 or 8 even though a normal hemoglobin is 13 or 14.

In the 1980s, scientists were able to isolate a natural hormone, erythropoietin that stimulates blood production. This discovery opened the door for a way to improve blood counts without transfusion. This hormone can be given as an injection under the skin. The first major use was in patients with end stage kidney disease. The hormone is made by the kidney cells and therefore deficient in people with advanced kidney failure. By giving erythropoietin, we are able to restore blood production to normal in these patients. The use of this hormone expanded to other uses and, in particular, as a means to maintain the red blood cell counts at a safe level following suppression that occurs with chemotherapy in many cases, avoiding blood transfusion.

Unfortunately, in 2007, data from clinical trials in certain cancer types, showed worrisome trends for accelerated cancer growth in some patients receiving erythropoietin derivatives. Regulatory agencies put strict guidelines in place on use of erythropoietic agents for patients getting chemotherapy for potentially curative cancers. Cancer doctors began to liberalize transfusion use again.

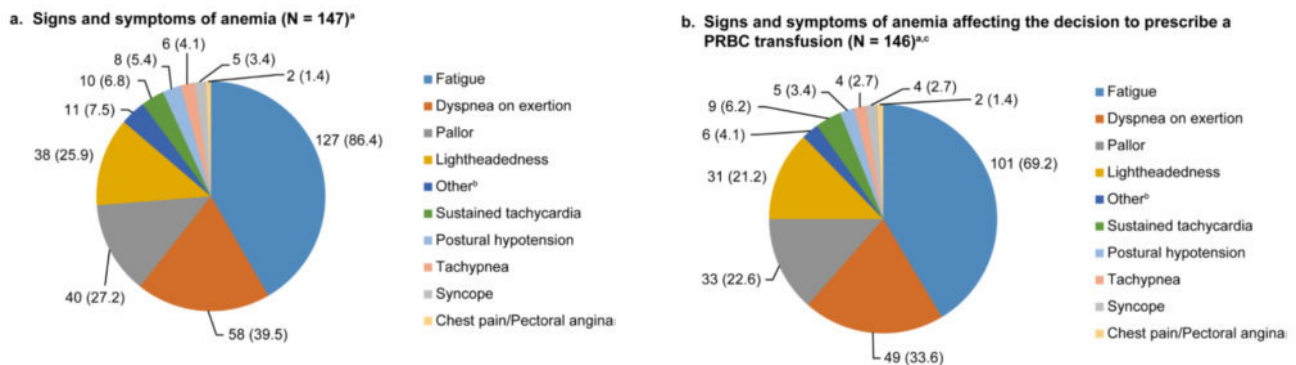


Fig.

2. Signs and symptoms of anemia.

In this context, we were interested in current transfusion patterns in patients receiving blood cell suppressive chemotherapy. What were the patients' main concerns and what were the physicians main concerns when evaluating a patient for blood transfusion? Did the type of cancer matter? Did the chemotherapy regimen matter? Did associated medical conditions influence the decision to transfuse? Were there additional factors that influenced the decision of when to transfuse? We conducted a prospective, observational study of transfusion practice patterns in patients receiving chemotherapy. We observed that no one would wait until the hemoglobin was less than 7 to give a transfusion, especially if the patient was older, but most physicians were more conservative and recommended a transfusion if Hemoglobin was in the 8-9 range and did not follow stricter transfusion guidelines for non-chemotherapy/non-cancer patients, especially when patients were not candidates for erythropoietin. Of interest, the type cancer or the particular chemotherapy regimen were not major determinants in the decision to transfuse. Fatigue, which is quite a subjective complaint, and as likely to be the result of the cancer itself and the chemotherapy treatment, turned out to be a major reason a patient desired a transfusion and a major determinant of whether a physician ordered a transfusion. At the end of the day, patient symptoms trumped absolute Hemoglobin numbers as the main determinant for both physicians and patients as to when a transfusion was appropriate.

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Publication

[Transfusion practice patterns in patients with anemia receiving myelosuppressive chemotherapy for nonmyeloid cancer: results from a prospective observational study.](#)

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