Understanding Iron Overload:
Screening, Monitoring, and Caring for Patients With Transfusion-Dependent Anemias

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Patients receiving recurring blood transfusions as supportive therapy to treat chronic anemias, such as myelodysplastic syndromes, thalassemia, and sickle-cell disease, are at risk of iron accumulation. The clinical consequences of iron overload are progressive liver damage, cardiac disease, and endocrine disorders, which can be fatal. Nurses have a vital role in the initial assessment and monitoring of patients undergoing transfusion therapy and their ongoing care. Iron levels may be managed effectively with iron chelation therapy, and treatment guidelines recommend initiation when serum ferritin levels reach more than 1,000 mcg/L. Deferoxamine has been used effectively in clinical practice for more than 40 years. Newer agents, such as deferasirox, have introduced the option of oral therapy to manage iron overload. Those agents and practical management of patients receiving multiple blood transfusions are discussed.

Many patients with chronic anemias, such as myelodysplastic syndromes (MDS), thalassemia, and sickle-cell disease (SCD), rely on regular red blood cell (RBC) transfusions as supportive therapy to improve hemoglobin levels; particularly patients whose hemoglobin has fallen to less than 8 g/dl (Weiss & Goodnough, 2005). Transfusions help to ameliorate fatigue, decreased mental alertness, physical weakness, and poor concentration (Jansen et al., 2003), improving patients' health-related quality of life and maintaining independence (Erba, 2003). Although transfusions provide a valuable intervention, risks are associated with the procedure. Along with the transmission of infection, development of alloantibodies, and socioeconomic burden, patients receiving regular transfusions are at risk of significant clinical consequences of iron overload (Alessandrino et al., 2002; Hellstrom-Lindberg et al., 2003). Iron has an essential role in many physiologic processes, including respiration and DNA synthesis. In a normal balanced state, 1–2 mg of iron enters and leaves the body every day. Dietary iron is absorbed and circulates in the plasma bound to transferrin, the main iron-transport protein (Andrews, 1999). Most circulating iron is used to generate hemoglobin for RBCs with the excess stored in the liver. Iron overload is an inevitable consequence of multiple RBC transfusions, as transferrin becomes saturated leading to an increase in non-transferrin–bound iron (NTBI).

Because humans have no physiologic mechanism for the excretion of excess iron, ongoing transfusions result in iron accumulation in key organs (Andrews, 1999). Each transfused unit of RBCs contains 200–250 mg of iron, so a patient receiving two RBC units per month will accumulate 5–6 g of iron per year. Therefore, chronically transfused adult patients can become iron overloaded after as few as 10 transfusions, giving two units of RBCs per transfusion (Porter, 2001).

Nurses play an important role in patient screening and monitoring to identify patients at risk of iron overload and provide ongoing support. Importantly, patient care also includes

At a Glance

- Patients receiving chronic transfusions with red blood cells as supportive therapy to treat chronic anemias, such as myelodysplastic syndromes, thalassemia, and sickle-cell disease, are at risk of iron overload and associated organ damage.
- Nurses interacting frequently with those patients have vital roles in assessing and monitoring them for signs of iron overload as well as raising awareness of the life-threatening consequences if left untreated.
- Iron chelation therapies are available and may have significant benefits in maintaining quality of life if taken as recommended with support and advice on adherence to treatment.

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