

ongoing basis, usually due to persistent gastrointestinal or menstrual blood loss. Parenteral iron use has been increasing rapidly over the past several years with the recognition that recombinant EPO therapy induces a large demand for iron—a demand that frequently cannot be met through the physiologic release of iron from RE sources or oral iron absorption. The safety of parenteral iron has been a concern largely driven by the high adverse reaction rate to high-molecular-weight iron dextran. The newer iron complexes that are available, such as ferumoxytol (Feraheme), sodium ferric gluconate (Ferrlecit), iron sucrose (Venofer), low-molecular-weight (LMW) iron dextran (InFed), ferric derisomaltose (Monoferric), and ferric carboxymaltose (Injectafer), have much lower rates of adverse effects. Ferumoxytol delivers 510 mg of iron per infusion; ferric gluconate 125 mg per infusion; LMW iron dextran up to 1500 mg per infusion; ferric carboxymaltose 750 mg per infusion; ferric derisomaltose 1000 mg per infusion; and iron sucrose 200 mg per infusion.

Parenteral iron is used in two ways: one is to administer the total dose of iron required to correct the hemoglobin deficit and provide the patient with at least 500 mg of iron stores; the second is to give repeated small doses of parenteral iron over a protracted period. The latter approach is common in dialysis centers, where it is not unusual for 100 mg of elemental iron to be given weekly for 10 weeks to augment the response to recombinant EPO therapy. The amount of iron needed by an individual patient is calculated by the following formula:

$$\text{Body weight (kg)} \times 2.3 \times (15 - \text{patient's hemoglobin, g/dL}) + 500 \text{ or } 1000 \text{ mg (for stores)}$$

In administering any intravenous iron preparation, anaphylaxis is a concern. Anaphylaxis is much rarer with the newer preparations. The factors that have correlated with an anaphylactic-like reaction include a history of multiple allergies or a prior allergic reaction to an iron preparation. Generalized symptoms appearing several days after the infusion of a large dose of iron can include arthralgias, skin rash, and low-grade fever. These may be dose-related, but they do