

to the newborn or father.

Intrauterine Transfusion

Infants of mothers already sensitized may be treated by intrauterine transfusion, which consists of infusing blood into the umbilical vein of the fetus. The need for therapy is based on the antenatal diagnosis of isoimmunization by determining the optical density of amniotic fluid (by amniocentesis) as an index of fetal hemolysis or by serial ultrasonography, which may detect the presence of fetal hydrops as early as 16 weeks of gestation. With the advance of ultrasound technology, fetal transfusion may be accomplished directly via the umbilical vein, infusing type O Rh-negative packed RBCs to raise the fetal hematocrit to 40% to 50%. The frequency of intrauterine transfusions may vary according to institution and fetal hydropic status but are most often done every 2 to 3 weeks until the fetus reaches pulmonary maturity at approximately 36 weeks of gestation ([Sainio, Nupponen, Kuosmanen, et al, 2015](#)). The use of intraperitoneal blood transfusions is used less commonly for isoimmunization because of higher associated fetal risks; however, it may be used when intravascular access is impossible.

Exchange Transfusion

Exchange transfusion, in which the infant's blood is removed in small amounts (usually 5 to 10 ml at a time) and replaced with compatible blood (e.g., Rh-negative blood), is a standard mode of therapy for treatment of severe hyperbilirubinemia and is the treatment of choice for hyperbilirubinemia and hydrops caused by Rh incompatibility ([Fig. 8-19](#)). Exchange transfusion removes the sensitized erythrocytes, lowers the serum bilirubin level to prevent bilirubin encephalopathy, corrects the anemia, and prevents cardiac failure. Indications for exchange transfusion in full-term infants may include a rapidly increasing serum bilirubin level and hemolysis despite intensive phototherapy. The criteria for exchange transfusions in preterm infants vary according to associated illness factors. The [American Academy of Pediatrics, Subcommittee on Hyperbilirubinemia \(2004\)](#) practice parameter guidelines provide recommendations for initiating phototherapy and for exchange transfusion in infants at 35 weeks of gestation or more. An infant born with hydrops fetalis or signs of cardiac failure is a candidate