allowing earlier detection of the potential for isoimmunization and avoiding further maternal or fetal testing (Liao, Gronowski, and Zhao, 2014). Amniocentesis can be used to test the fetal blood type of a woman whose antibody screen result is positive; the use of polymerase chain reaction may determine the fetal blood type and presence of maternal antibodies. The fetal hemoglobin and hematocrit can also be measured (Moise, 2012). Testing for the presence of cell-free fetal DNA in the maternal plasma of RhD-negative women to detect an RhD-positive fetus has been used successfully (Finning, Martin, and Daniels, 2009; Moise, 2012). Such testing negates the need for amniocentesis for fetal blood type.

Ultrasonography is considered an important adjunct in the detection of isoimmunization; alterations in the placenta, umbilical cord, and amniotic fluid volume, as well as the presence of fetal hydrops, can be detected with high-resolution ultrasonography and allow early treatment before the development of erythroblastosis. Doppler ultrasonography of fetal middle cerebral artery peak velocity has been used to detect and measure fetal hemoglobin and, subsequently, fetal anemia (Moise, 2012). Erythroblastosis fetalis caused by Rh incompatibility can also be monitored by evaluating rising anti-Rh antibody titers in the maternal circulation or by testing the optical density of amniotic fluid (ΔOD450 test) (Moise, 2012).

Hemolysis in the newborn is suspected on the basis of the timing and appearance of jaundice (see Table 8-2) and can be confirmed postnatally by detecting antibodies attached to the circulating erythrocytes of affected infants (**direct Coombs test** or **direct antiglobulin test**). The Coombs test may be performed on umbilical cord blood samples from infants born to Rh-negative mothers if there is a history of incompatibility or further investigation is warranted.

Therapeutic Management

The primary aim of therapeutic management of isoimmunization is prevention. Postnatal therapy is usually phototherapy for mild cases of hemolysis and exchange transfusion for more severe forms. Although phototherapy may control bilirubin levels in mild cases, the hemolytic process may continue, causing significant anemia between 7 and 21 days of life. In some institutions, an IVIG is