

overheated environment, which increases the risk of hyperthermia.

Hematopoietic System

The blood volume of the newborn depends on the amount of placental transfer of blood. The blood volume of a full-term infant is about 80 to 85 ml/kg of body weight. Immediately after birth, the total blood volume averages 300 ml, but depending on how long umbilical cord clamping is delayed or if the umbilical cord is milked, as much as 100 ml can be added to the blood volume ([Rabe, Jewison, Alvarez, et al, 2011](#)).

Fluid and Electrolyte Balance

Changes occur in the total body water volume, extracellular fluid volume, and intracellular fluid volume during the transition from fetal to postnatal life. At birth, the total weight of an infant is 73% fluid compared with 58% in an adult. Infants have a proportionately higher ratio of extracellular fluid than adults.

An important aspect of fluid balance is its relationship to other systems. An infant's rate of metabolism is twice that of an adult in relation to body weight. As a result, twice as much acid is formed, leading to more rapid development of acidosis. In addition, immature kidneys cannot sufficiently concentrate urine to conserve body water. These three factors make infants more prone to dehydration, acidosis, and possible overhydration or water intoxication.

Gastrointestinal System

The ability of newborns to digest, absorb, and metabolize food is adequate but limited in certain functions. Enzymes are adequate to handle proteins and simple carbohydrates (monosaccharides and disaccharides), but deficient production of pancreatic amylase impairs use of complex carbohydrates (polysaccharides). Deficiency of pancreatic lipase limits absorption of fats, especially with ingestion of foods with high saturated fatty acid content, such as cow's milk. Human milk, despite its high fat content, is easily digested because the milk itself contains enzymes (such as lipase), which assist in digestion.

The liver is the most immature of the gastrointestinal organs. The