

## **Basal Metabolic Rate**

The rate of metabolism in infancy is significantly higher than in adulthood because of the larger BSA in relation to the mass of active tissue. Consequently, infants have a greater production of metabolic wastes that the kidneys must excrete. Any condition that increases metabolism causes greater heat production, insensible fluid loss, and an increased need for water for excretion. The BMR in infants and children is higher to support cellular and tissue growth.

## **Kidney Function**

The infant's kidneys are functionally immature at birth and are therefore inefficient in excreting waste products of metabolism. Of particular importance for fluid balance is the inability of the infant's kidneys to concentrate or dilute urine, to conserve or excrete sodium, and to acidify urine. Therefore, the infant is less able to handle large quantities of solute-free water than older children and is more likely to become dehydrated when given concentrated formulas or overhydrated when given excessive water or dilute formula.

## **Fluid Requirements**

Infants ingest and excrete a greater amount of fluid per kilogram of body weight than do older children. Because electrolytes are excreted with water and infants have a limited ability for conservation, maintenance requirements include both water and electrolytes. The daily exchange of ECF in infants is much greater than that of older children, which leave infants with little fluid volume reserve in dehydrated states. Fluid requirements depend on hydration status, size, environmental factors, and underlying disease.

## **Disturbances of Fluid and Electrolyte Balance**

Disturbances of fluids and their solute concentration are closely interrelated. Alterations in fluid volume affect the electrolyte component, and changes in electrolyte concentration influence fluid