

administration of fluid begins immediately, although the exact nature of the dehydration and the serum electrolyte values may not initially be known. The solution selected is based on what is known regarding the probable type and cause of the dehydration. This usually involves an isotonic solution such as 0.9% sodium chloride or lactated Ringer solution, both of which are close to the body's serum osmolality of 285 to 300 mOsm/kg and do not contain dextrose (which is contraindicated in the early treatment stages of diabetic ketoacidosis).

Parenteral rehydration therapy has three phases. The initial therapy is used to expand volume quickly to ensure tissue perfusion ([Greenbaum, 2016](#)). During initial therapy, an isotonic electrolyte solution is used at a rate of 20 ml/kg, given as an IV bolus over 5 to 20 minutes, and repeated as necessary after assessment of the child's response to therapy ([Friedman, 2010](#)). Subsequent therapy is used to replace deficits, meet maintenance water and electrolyte requirements, and catch up with ongoing losses. Water and sodium requirements for the deficit, maintenance, and ongoing losses are calculated at 8-hour intervals, taking into consideration the amount of fluids given with the initial boluses and the amount administered during the first 24-hour period. With improved circulation during this phase, water and electrolyte deficits can be evaluated, and acid-base status can be corrected either directly through the administration of fluids or indirectly through improved renal function. Potassium is withheld until kidney function is restored and assessed and circulation has improved.

The final phase of therapy allows the patient to return to normal and begin oral feedings, with a gradual correction of total body deficits. The potassium loss in ICF is replaced slowly by way of the ECF. The body fat and protein stores are replaced through diet. If the child is unable to eat or if feeding aggravates a chronic condition, IV maintenance fluids are provided.

Although the initial phase of fluid replacement is rapid in both isotonic and hypotonic dehydration, it is contraindicated in hypertonic dehydration because of the risk of water intoxication, especially in the brain cells, specifically the central pontine cells. Central pontine myelinolysis may occur with an overcorrection of fluid deficit and an overly rapid correction of serum sodium