Figure 1. Protocol for management of adult patients with DKA or HHS (modified from reference 3, 5 and 47).

Correction is to replace half of the estimated water deficit over the first 12-24 hours. In hypotensive patients, aggressive fluid resuscitation with isotonic saline should be continued until blood pressure normalizes.

Hyperglycemia can reduce serum sodium by causing an osmotically driven shift of water from intracellular to extracellular compartments. Although previous prediction models estimated that each 5.5 mmol/L (100 mg/dL) increment in glucose above normal resulted in an expected decrease of 1.6 mmol/L (1.6 mEq/L) in measured serum sodium, a subsequent study suggests that 2.4 mmol/L (2.4 mEq/L) per 5.5 mmol/L (100 mg/dL) glucose increment is more accurate.

The initial fluid of choice is isotonic saline, generally given for the first 4 hours of therapy, to expand interstitial and intravascular volume (Table 3). Subsequent fluid replacement depends upon the state of hydration, serum electrolytes and urine output. Fluid resuscitation should be individualized according to the patient’s degree of dehydration, mental status and underlying diseases such as congestive heart failure. Glucose, an osmotic diuretic, may produce a high urine output even in severely dehydrated patients. The threshold for glycosuria in healthy adults occurs at plasma glucose concentration of approximately 9.99 mmol/L (180 mg/dL), though adults with long-standing diabetic nephropathy may have considerably higher thresholds; hence, urine output should not be considered a reliable predictor of volume status in hyperglycemic states. When patients are hypernatremic or eunatremic, 0.45% sodium chloride infusion is an appropriate replacement for free water lost by glycosuric diuresis. Dextrose, 5%