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TODAY'S VETERINARY PRACTICE



YOUR GUIDE TO
**Common Electrolyte
Disturbances**

An Algorithmic Approach to Navigating the Evaluation
and Management of 6 Electrolyte Imbalances

TVP

TODAY'S VETERINARY PRACTICE



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Navigating Care for Common Electrolyte Disturbances

No matter the cause, electrolyte disturbances are frequently encountered in the small animal veterinary clinic. Canine and feline patients can experience a wide range of imbalances, ranging from hypochloremia to hypernatremia. Though common, navigating these conditions can be complex. This book is a collection of algorithms, written by Drs. Audrey Cook and Justin Heinz, to aid in the evaluation and management of 6 of the most common electrolyte disturbances. Use this book to guide your care decisions for these imbalances, and if needed, access an in-depth review of each condition via the link in its introduction. — *The Editors of TVP*



Audrey Cook, BVM&S, DACVIM (SAIM), DECVIM-CA, DABVP (Feline)

Dr. Cook is a graduate of the University of Edinburgh. She completed an internship at North Carolina State University and a residency in internal medicine at University of California, Davis. She is a diplomate of the American and European Colleges of Veterinary Internal Medicine and is one of the few internists with additional board certification in feline practice. After a decade in private practice, Dr. Cook joined the faculty at Texas A&M School of Veterinary Medicine & Biomedical Sciences.



Justin Heinz, DVM, DACVECC

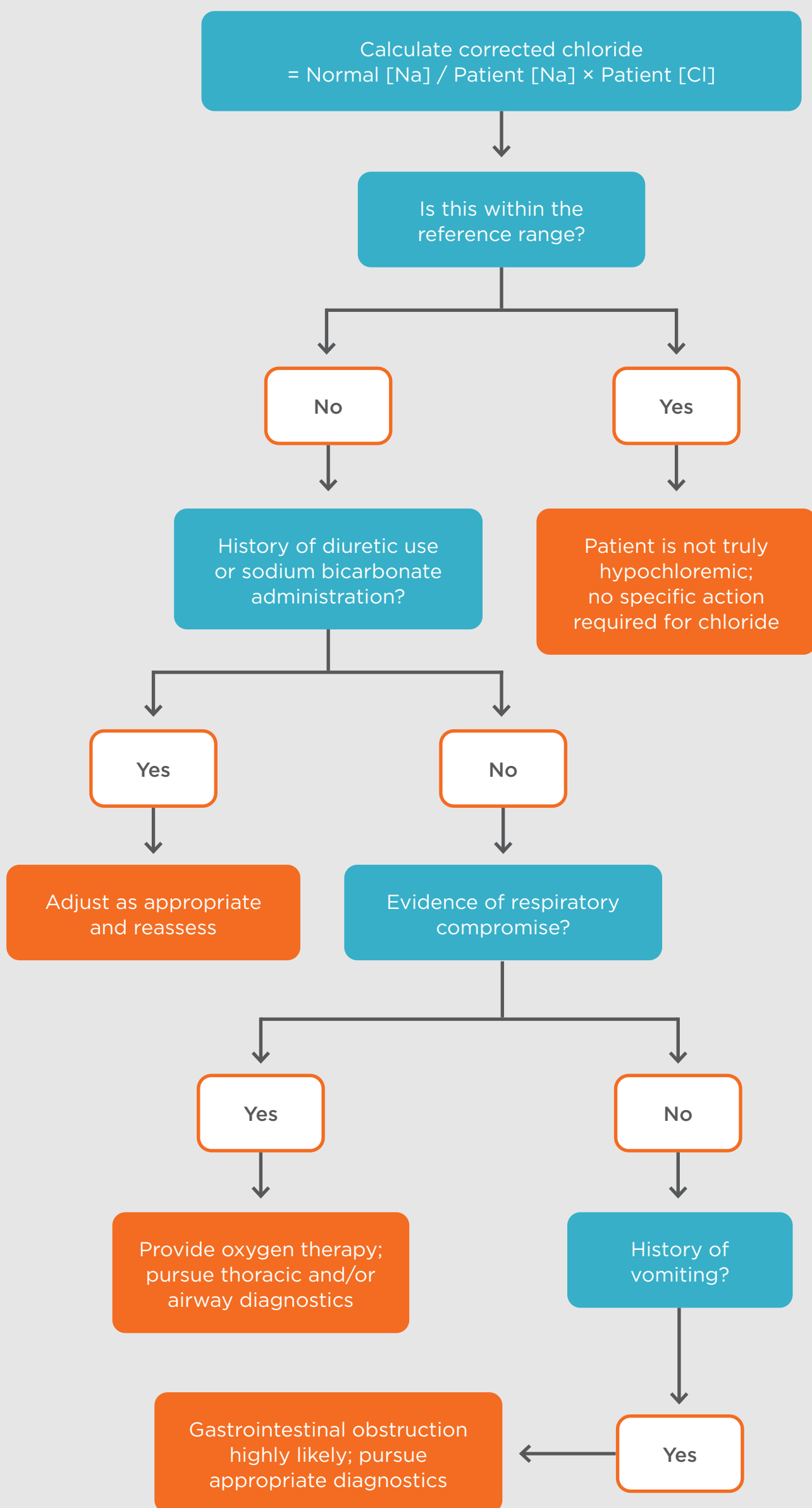
Dr. Heinz obtained his DVM degree from Purdue University. He completed an internship at Louisiana State University and a residency in emergency and critical care at Texas A&M University. He is a diplomate of the American College of Veterinary Emergency Critical Care. After a year in private referral practice, Dr. Heinz joined the faculty at Texas A&M School of Veterinary Medicine & Biomedical Sciences. He is currently a clinical assistant professor and chief of the emergency and critical care service.

Hypochloremia

Subnormal serum [Cl] are often noted in patients with changes in total body water content and are therefore associated with proportional decreases in serum sodium values. Specific evaluation of chloride status is unnecessary, and reasons for a change in serum [Na] should be investigated instead.

Read More About This Condition.

Evaluation of the Hypochloremic Patient

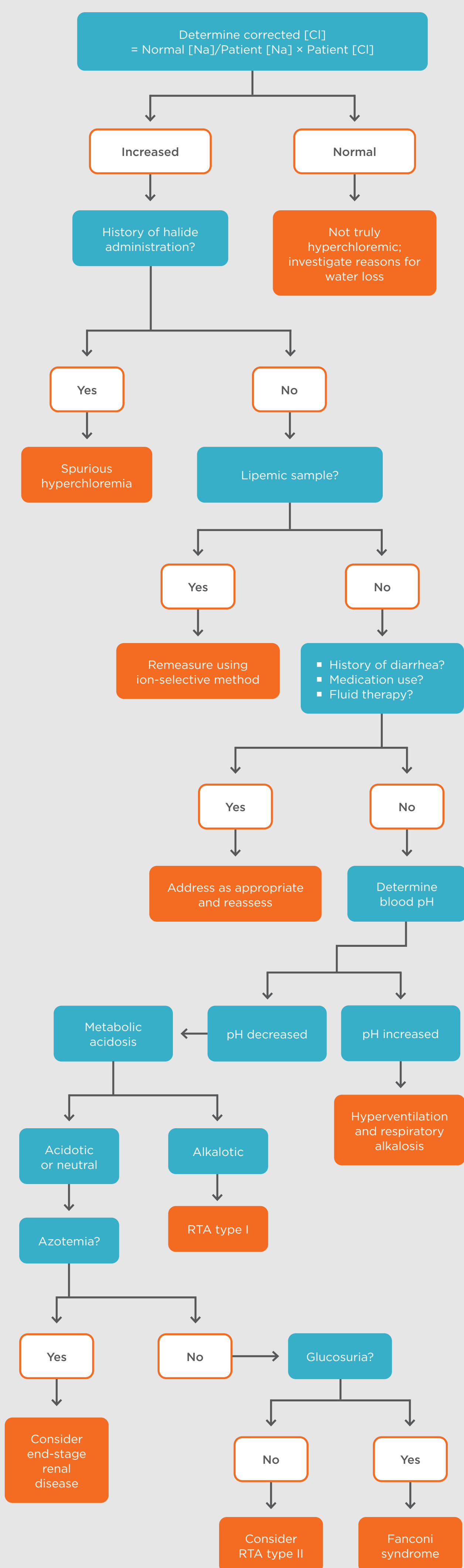


[Cl] = chloride concentration; [Na] = sodium concentration

Hyperchloremia

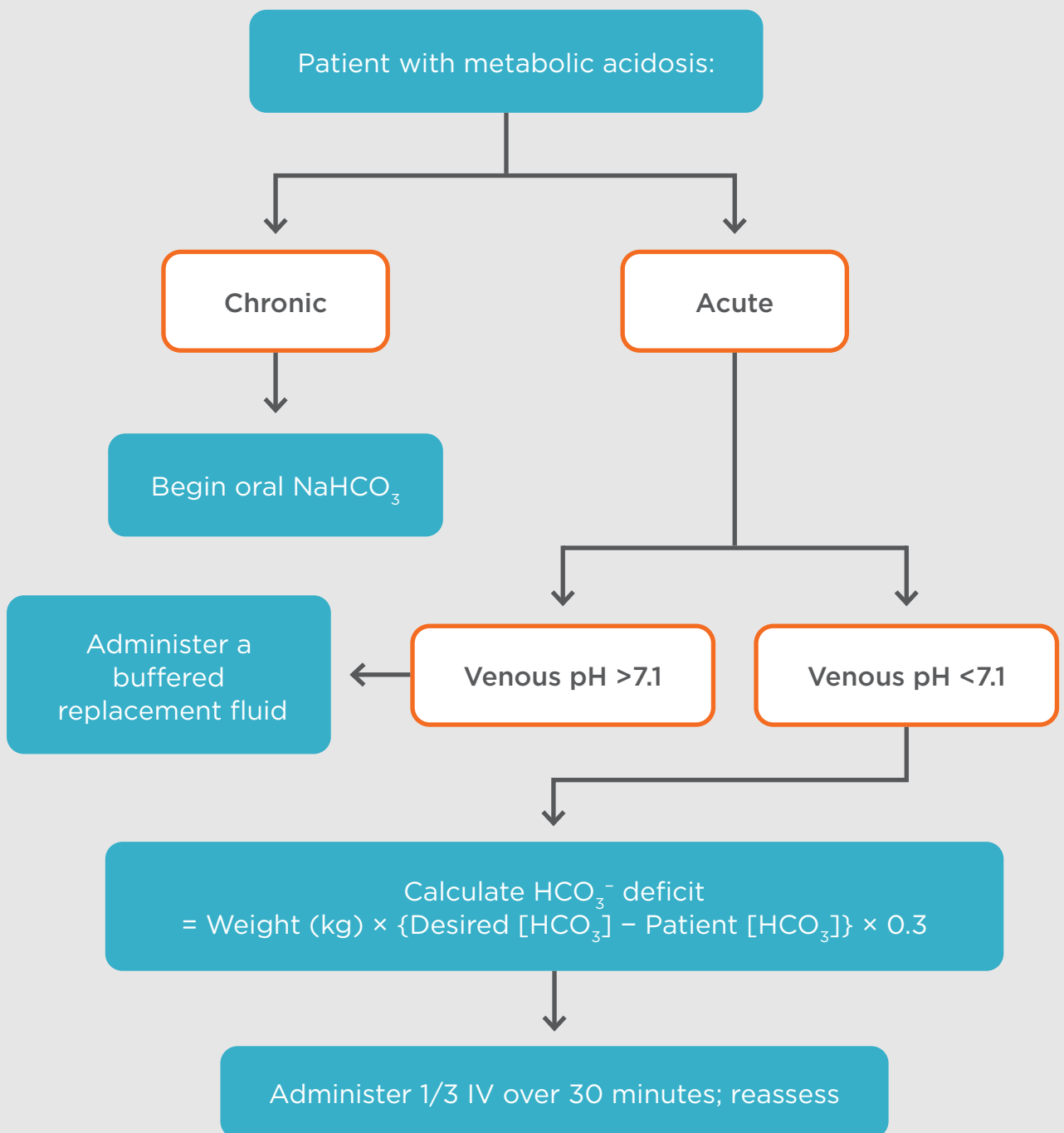
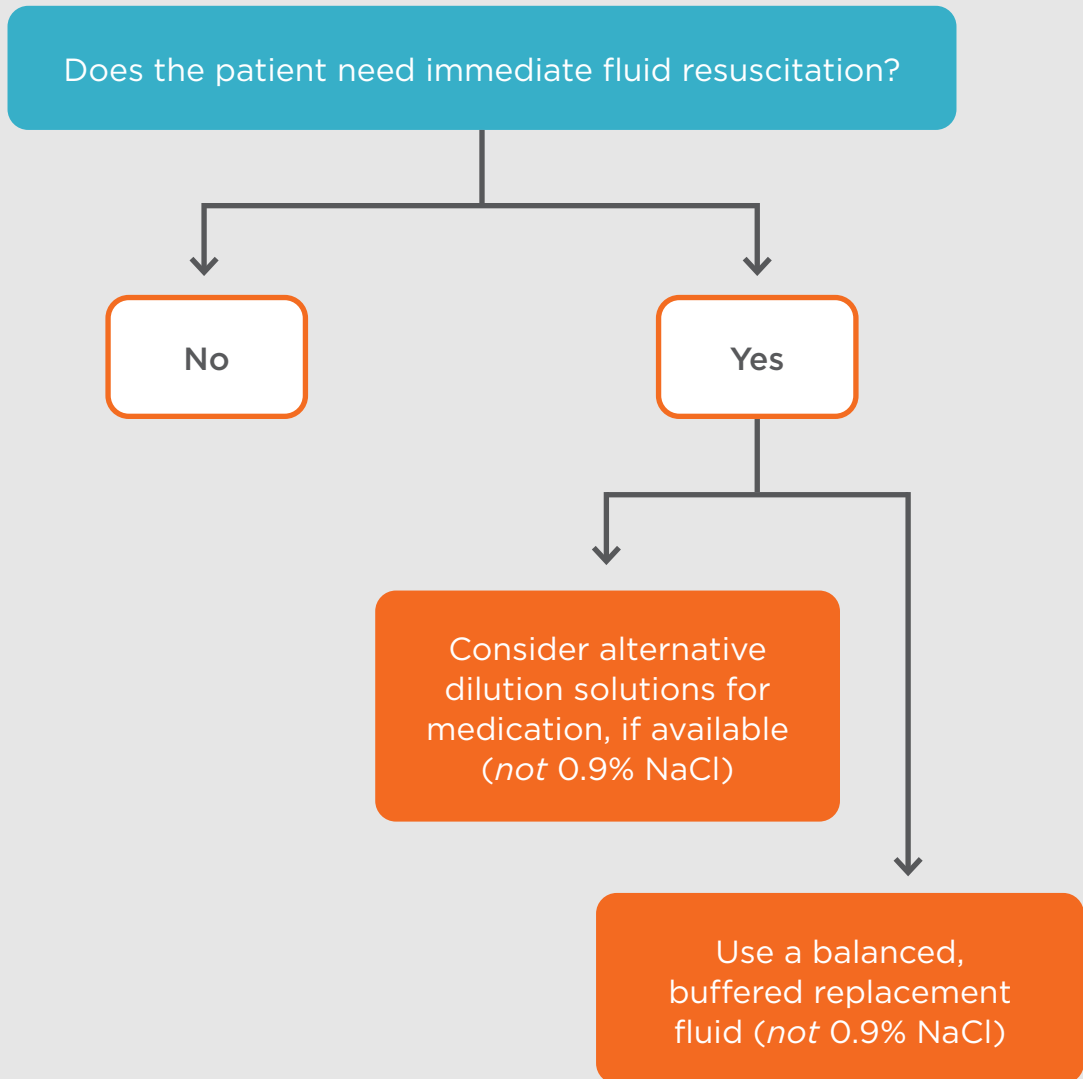
Chloride is the most abundant extracellular fluid anion, and serum [Cl] are closely linked to sodium status. Processes that increase [Na] are expected to drive [Cl] in the same direction; a disconnect between the two therefore has diagnostic and therapeutic implications. [Read More About This Condition.](#)

Evaluation of the Hyperchloremic Patient (Reported [Cl] > Upper End of Reference Range)



[Cl] = chloride concentration; [Na] = sodium concentration; RTA = renal tubular acidosis

Management of the Hyperchloremic Patient

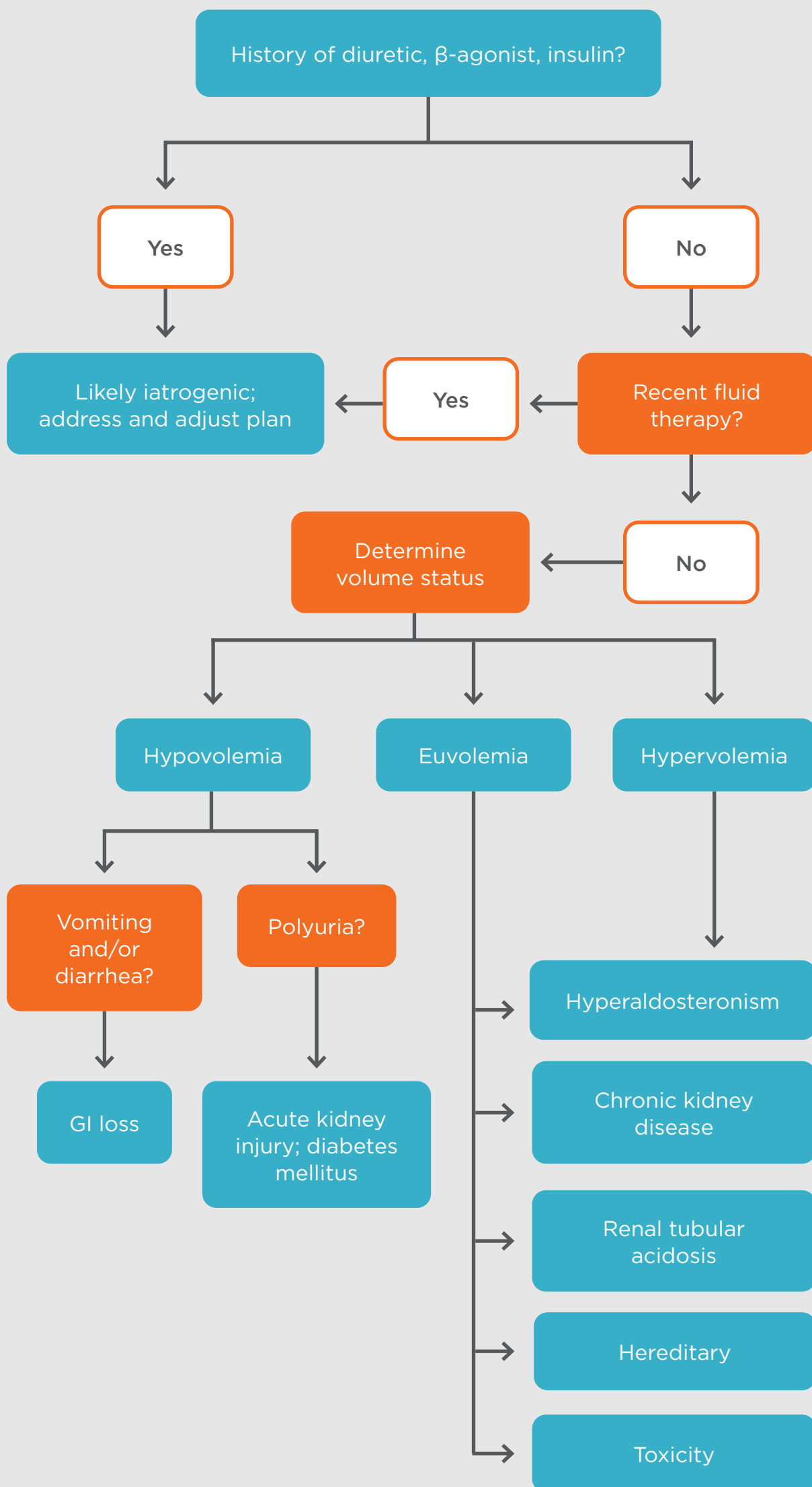


HCO_3^- = bicarbonate; NaCl = sodium chloride; NaHCO_3 = sodium bicarbonate

Hypokalemia

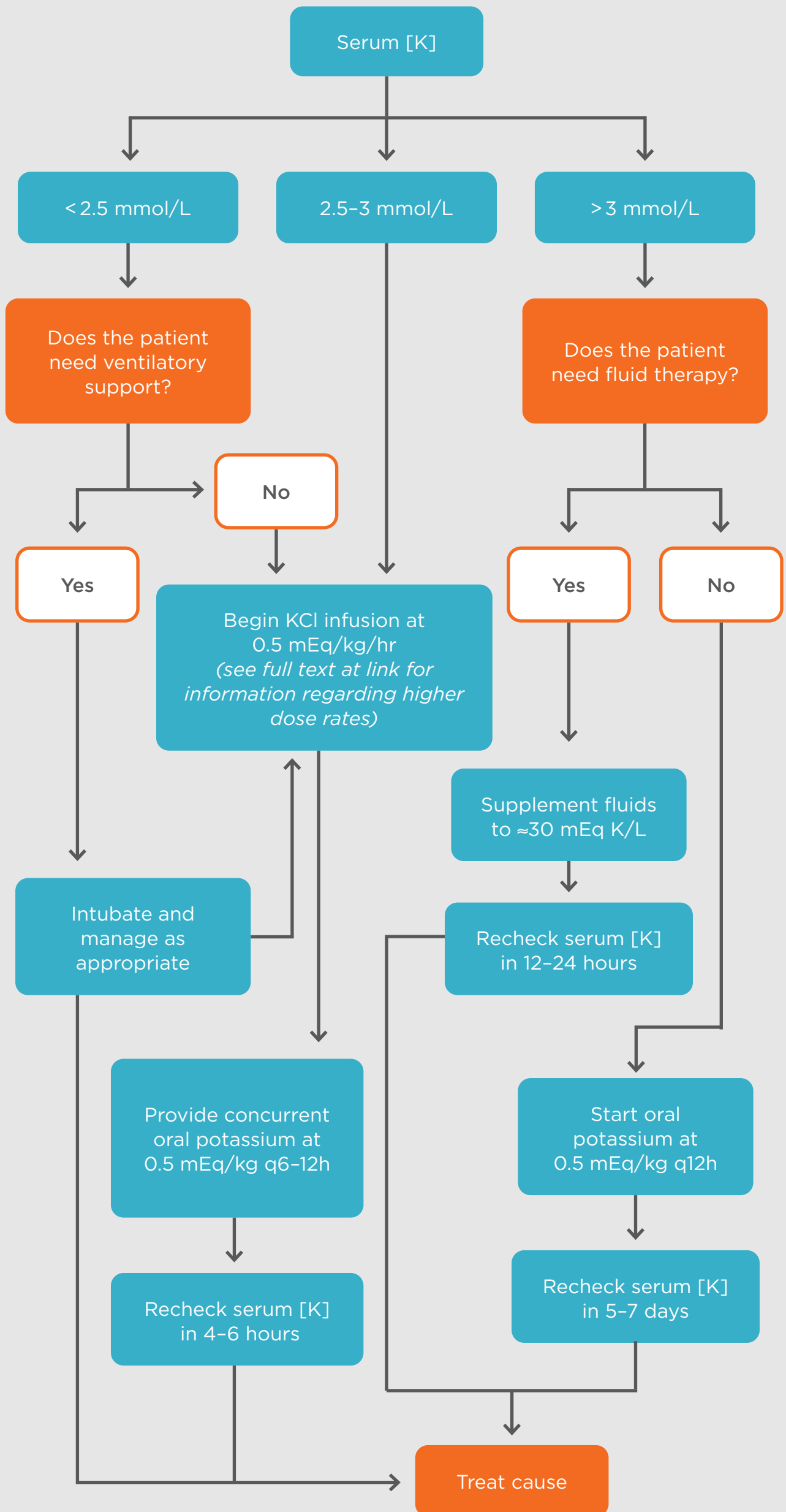
Changes in [K] within the extracellular fluid are a poor reflection of total body potassium content. In most instances, hypokalemia reflects potassium loss (via the kidneys or gastrointestinal tract) or the translocation of potassium into the intracellular compartment. [Read More About This Condition.](#)

Evaluation of the Hypokalemic Patient (Defined as [K] < 3.5 mmol/L)



[K] = potassium concentration; GI = gastrointestinal

Management of the Hypokalemic Patient (Defined as [K] < 3.5 mmol/L)

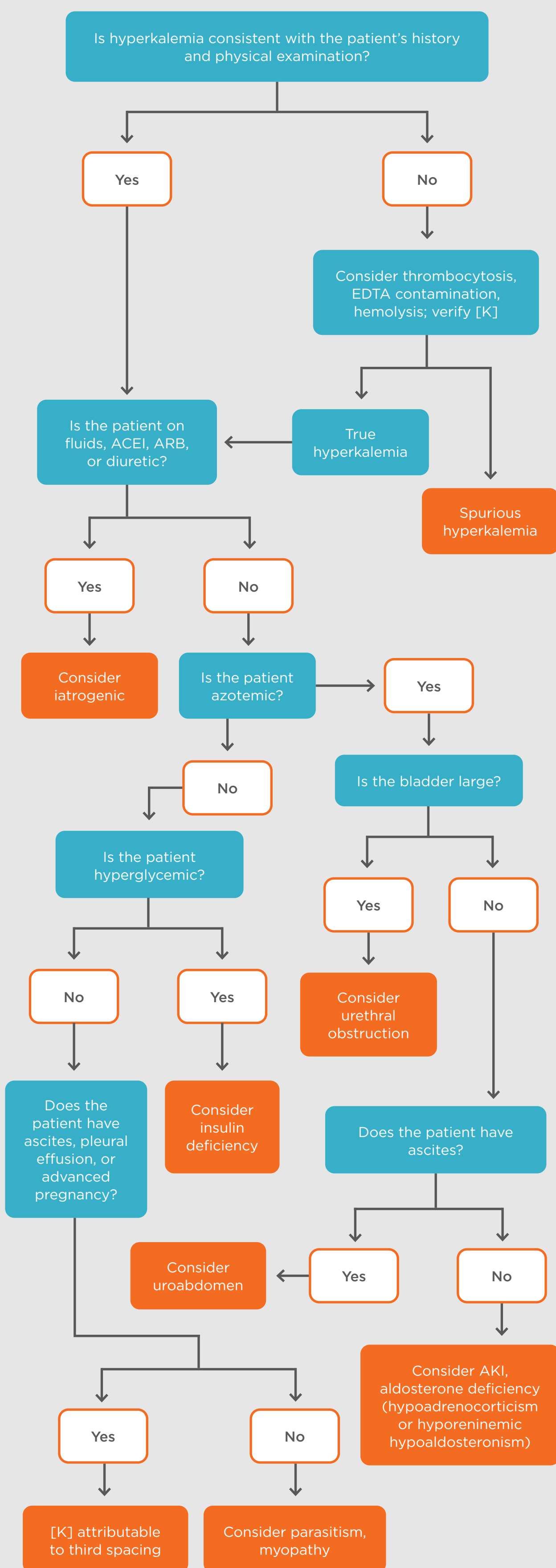


[K] = potassium concentration; KCl = potassium chloride

Hyperkalemia

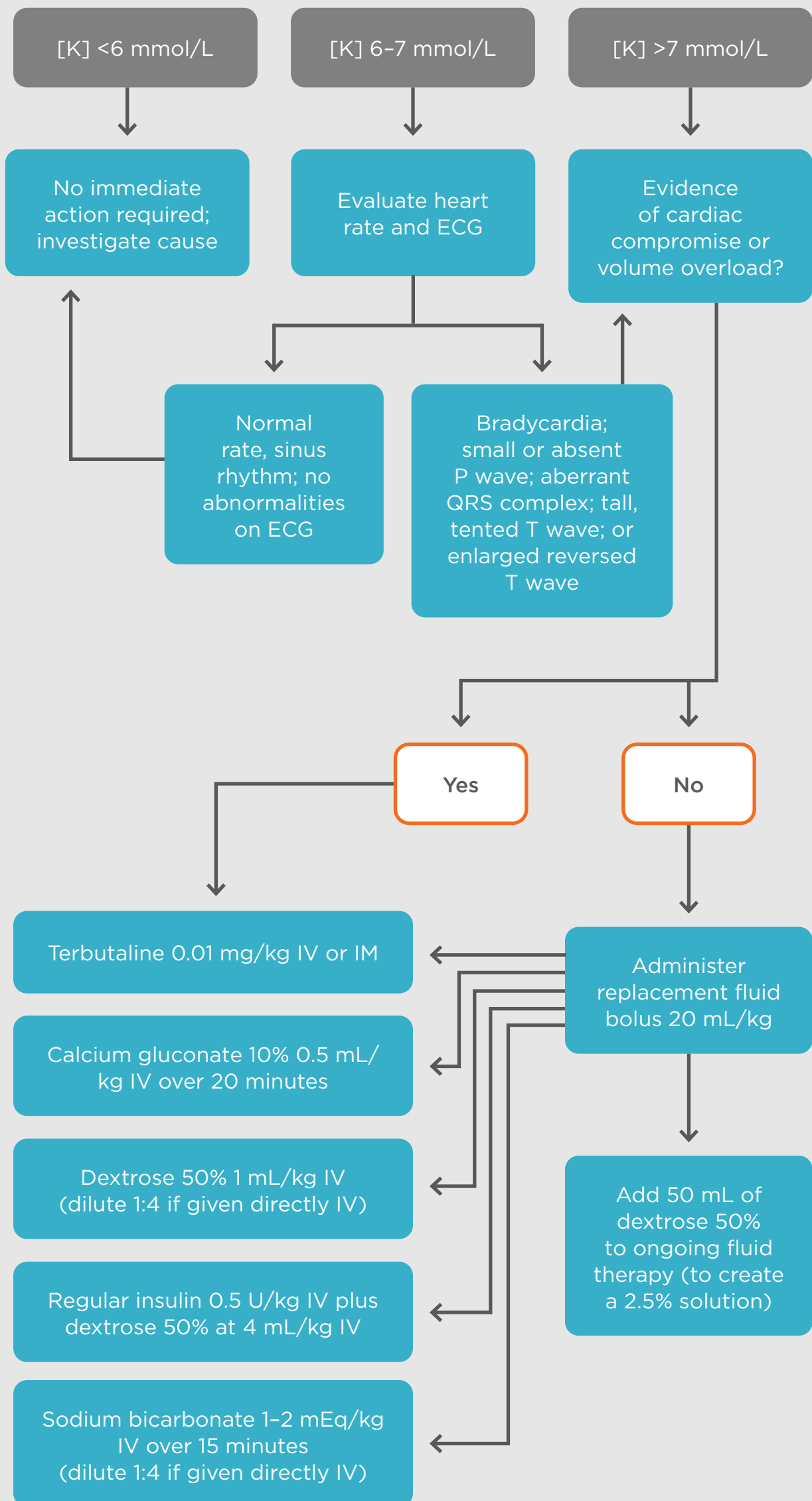
Hyperkalemia is defined as a plasma or serum [K] in excess of the established reference range. The causes of hyperkalemia are generally classified as increased potassium input, decreased potassium excretion, and translocation from intracellular to extracellular compartments. [Read More About This Condition.](#)

Evaluation of the Hyperkalemic Patient



ACEI = angiotensin-converting enzyme inhibitor; AKI = acute kidney injury; ARB = angiotensin receptor blocker; EDTA = ethylenediaminetetraacetic acid; [K] = potassium concentration

Management of the Hyperkalemic Patient



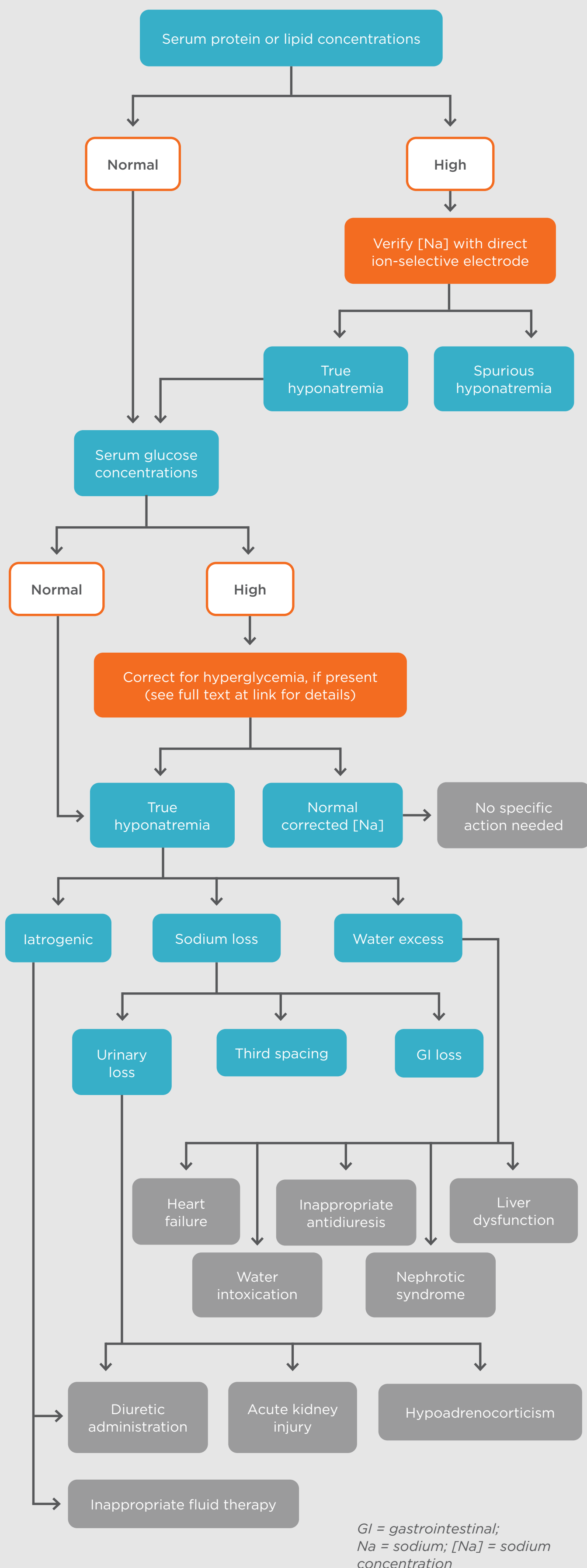
ECG = electrocardiogram; $[K]$ = potassium concentration

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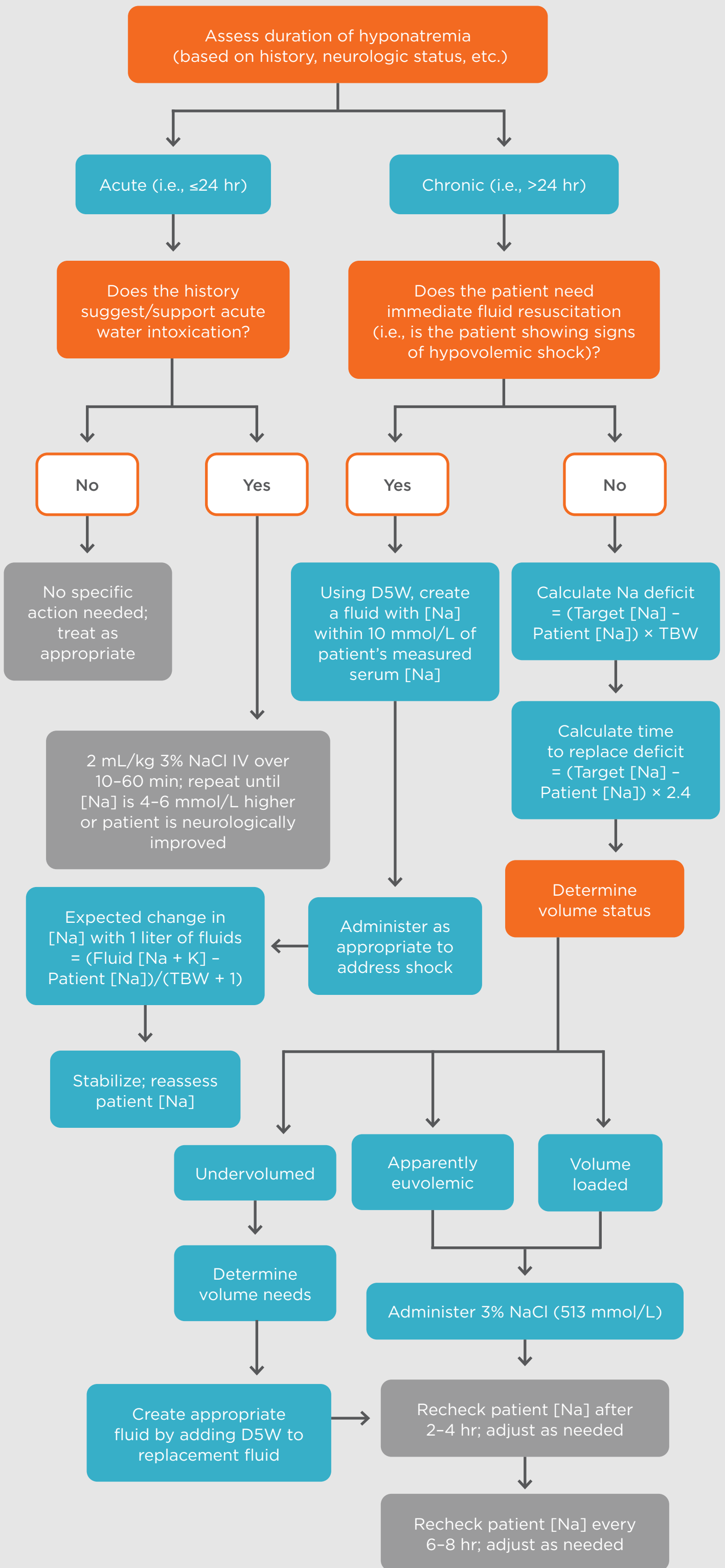
Hyponatremia

Hyponatremia is defined as a plasma or serum [Na] below the reference range and usually reflects the loss of sodium in excess of water or, less commonly, the addition of water in excess of sodium. Mild, acute hyponatremia is of little concern, but elevated serum [Na] merits attention if the clinical history suggests chronicity. [Read More About This Condition.](#)

Evaluation of the Hyponatremic Patient (Defined as [Na] <130 mmol/L)



Management of the Hyponatremic Patient (Defined as [Na] <130 mmol/L)



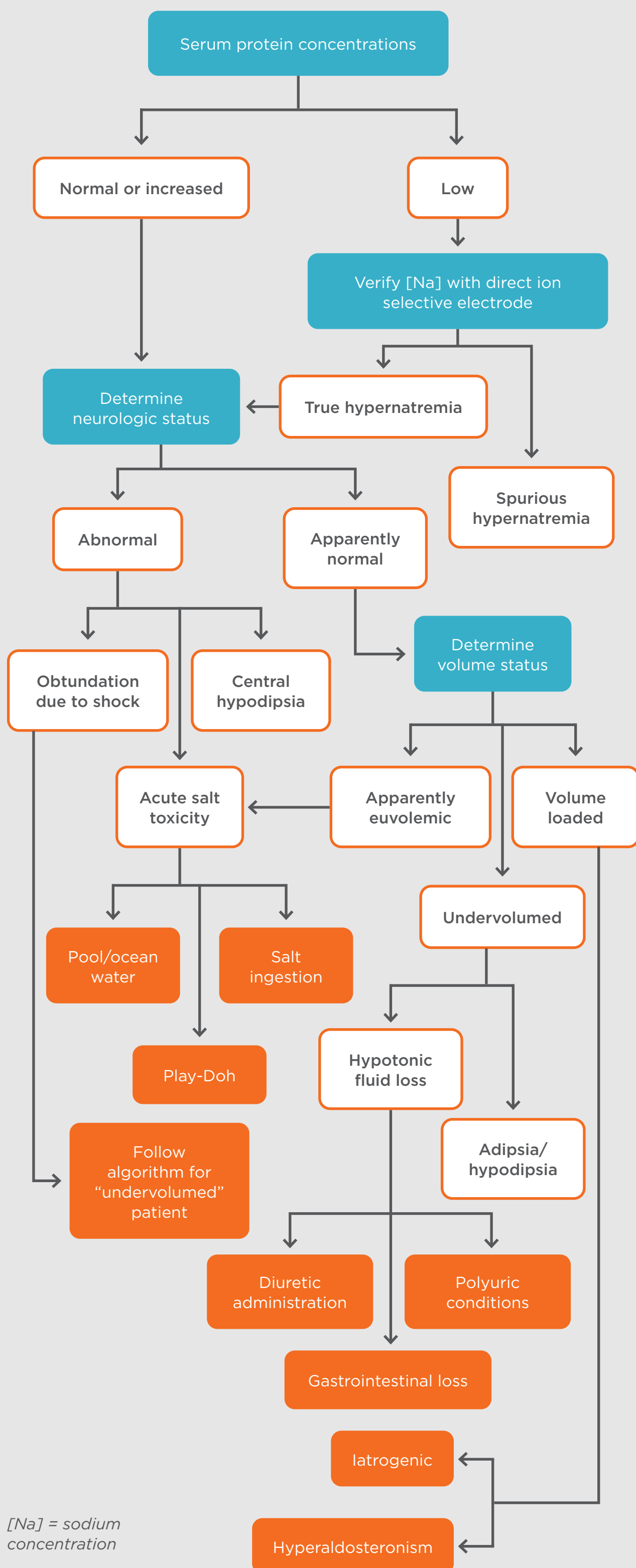
D5W = 5% dextrose in water solution; K = potassium; Na = sodium; [Na] = sodium concentration; NaCl = sodium chloride; TBW = total body water

Hypernatremia

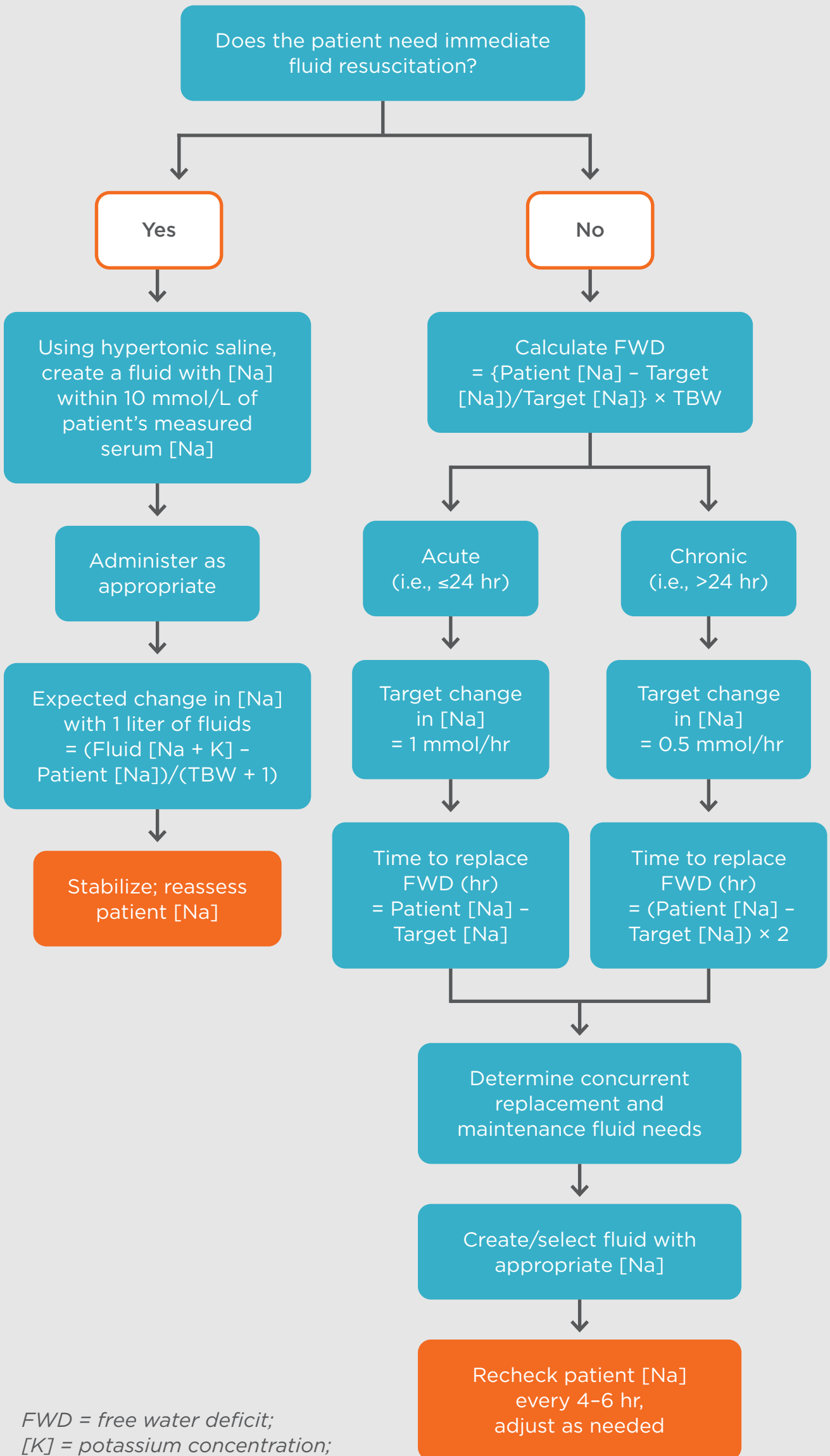
Hypernatremia is defined as a plasma or serum [Na] above the reference range and reflects the loss of water in excess of sodium, or the addition of sodium in excess of water. [Na] is regulated by antidiuretic hormone, thirst, and aldosterone. A patient with hypernatremia therefore must be unable or unwilling to consume adequate amounts of water or unable to retain adequate water.

[Read More About This Condition.](#)

Evaluation of the Hypernatremic Patient (Defined as [Na] >160 mmol/L)



Management of the Hypernatremic Patient (Defined as [Na] >160 mmol/L)



*FWD = free water deficit;
 [K] = potassium concentration;
 [Na] = sodium concentration;
 TBW = total body water*