

# Hyperglycemic Emergencies: What Primary Care Providers Need to Know

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Until the discovery of insulin in the early 1920s, the mortality rate from diabetic ketoacidosis (DKA) was virtually 100%. The current overall mortality from DKA in developed countries is now between 2 and 10%, a rate that has not changed in 3 decades.<sup>1</sup>

It is estimated that 2–8% of all hospital admissions are for the treatment of DKA. By contrast, hyperosmolar hyperglycemic state (HHS) accounts for 1 in 1,000 hospital admissions.<sup>2</sup> Published mortality rates for HHS vary, but the trend is that the older the patient and the higher the osmolarity, the greater the risk for death.

Unfortunately, many cases of DKA occur as recurrent episodes, which we often consider a failure of long-term treatment. Too often, these individuals are treated and sent home without dissecting the main problem, which is usually intentional insulin omission. Often, insulin omission is related to a psychological disorder; in adolescent girls and young women, it is often related to an eating disorder.

The treatment of DKA and HHS continues to evolve despite the fact that insulin celebrates its 80<sup>th</sup> birthday this year. It was recently reported, for example, that for children with DKA, those with low partial pressures of arterial carbon dioxide and high serum urea nitrogen levels at presentation and those treated with bicarbonate are at a higher risk of cerebral edema.<sup>3</sup> The use of any bicarbonate in this condition has been controversial for years, and this report suggests that it may be particularly dangerous for children.

On the following pages, we are reprinting from *Diabetes Care* the new position statement from the American Diabetes Association (ADA) titled “Hyperglycemic Crisis in Patients With Diabetes Mellitus.” Physicians who are not endocrinologists may not deal with these emergencies on a regular basis, but when one does arise, they need to be aware of the basic principles and some of the new research. We therefore urge all of our readers to review this position statement.

This is the first ADA position state-

ment to include the ranked scientific evidence for each of the major recommendations. (See Table 3 of the position statement, p. 87.) Starting this year, all ADA clinical practice recommendations will incorporate an evidence grading system. Look for more information about this in future issues of *Clinical Diabetes*.

## REFERENCES

<sup>1</sup>Delaney MF, Zisman A, Kettyle WM: Diabetic ketoacidosis and hyperglycemic hyperosmolar nonketotic syndrome. *Endocrinol Metab Clin North Am* 29:683–705, 2000

<sup>2</sup>Lorber D: Nonketotic hypertonicity in diabetes mellitus. *Med Clin North Am* 79:39–62, 1995

<sup>3</sup>Glaser N, Barnett P, McCaslin I, Nelson D, Trainor J, Louie J, Kaufman F, Quayle K, Roback M, Malley R, Kuppermann N: Risk factors for cerebral edema in children with diabetic ketoacidosis. *N Engl J Med* 344:264–269, 2001

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