300 mg/dL) as long as there are no ketones present. The blood sugar level should decrease within 15 minutes of exercise. Type 2 diabetics should not exercise if the blood sugar level is greater than 400 mg/dL. It is important to remember that type 1 diabetes is associated with ketoacidosis. Patients who participate in high-intensity physical activity may experience a transient blood glucose elevation that should fall within several hours. This elevation is a result of hormonal factors, should not be treated with insulin, and should be carefully monitored.

**Evaluation of Outcomes**

Nutritional therapy is a mainstay in the patient’s management of diabetes. The patient with diabetes should be able to maintain glycemic control utilizing their prescribed therapeutic nutritional plan. If the patient is overweight, it is expected that a slow, steady weight loss will be attained using the prescribed nutritional therapy. A reduction in blood pressure may be expected with weight reduction. The patient should be able to demonstrate the selection of healthy food choices in the amounts outlined in their therapeutic nutritional plan.

There may be a localized allergic reaction at the site of the insulin injection. This is manifested as redness, tenderness, swelling, and induration or appearance of a 2- to 4-mm wheal within one to two hours after the injection. These rare reactions will occur early in the course of insulin therapy and will decrease as insulin therapy continues. Local allergic reactions are rare now with the increased use of human insulins.

*The pedagogical features will be a big benefit to students.*

- Maureen Brophy, Montana Tech of University of Montana

**ACUTE COMPLICATIONS OF DIABETES**

Acute complications of diabetes include hyperglycemia from too little insulin and hypoglycemia from too much insulin. In both diabetic ketoacidosis (DKA) and hyperglycemic nonketotic syndrome (HHNS), there is an imbalance among circulating insulin levels and the counter regulatory hormones. The hormones stimulate increased glucose production in the liver and cause decreased utilization of glucose in the peripheral tissues. Infection is one of the most common causes for the development of DKA or HHNS. Medications affecting the metabolism of carbohydrates, such as corticosteroids or thiazides, may also contribute to the development of DKA and HHNS.

The management of both DKA and HHNS is aimed at monitoring and correcting the frequent dehydration, hyperglycemia, and electrolyte imbalances of the patient. Nurses must be able to clinically differentiate the two events. Hyperglycemia can rapidly develop causing serious threat to the patient’s well-being.

**Diabetic Ketoacidosis**

DKA results from a marked insulin deficiency and is manifested by hyperglycemia, ketosis, acidosis, and dehydration. DKA is associated with type 1 diabetes but may also occur in type 2. It is a life-threatening medical emergency associated with a mortality rate of approximately 5% (Figure 57-6). Factors contributing to the development of DKA include illness, infection, inadequate management of the disease, insufficient insulin, and undiagnosed type 1 diabetes. Noncompliance with the therapeutic regimen is the most common causes of recurrent ketoacidosis (McPhee & Papadakis, 2008).

In DKA, there is insufficient insulin to metabolize glucose, and the body begins to break down protein stores for energy. Ketones are by-products of protein breakdown and are acidic in nature. As the ketone level in the blood increases, the pH is altered, and metabolic acidosis develops.

**Assessment with Clinical Manifestations**

The patient often will experience fatigue, polydipsia, and polyuria prior to the development of ketoacidosis. Nausea,