Case Study 1: Patient N.B. **Stacy Werner**
Diabetic Ketoacidosis

Patient Profile

N.B., a 34-year-old Native American man, was admitted to the emergency department after he was found unconscious by his wife in their home.

Subjective Data (Provided by Wife)

- Was diagnosed with type 1 diabetes mellitus 12 mo. ago
- Was taking 50 U/day of insulin: 5 U of lispro insulin with breakfast, 5 U with lunch, and 10 U with dinner Plus 30 U of glargine insulin at bedtime
- States a history of gastroenteritis for 1 wk with vomiting and anorexia
- Stopped taking insulin 2 days ago when he was unable to eat

Objective Data

Physical Examination

- Breathing deep and rapid
- Fruity acetone smell on breath
- Skin flushed and dry

Diagnostic Studies

- Blood glucose level 730 mg/dL (40.5 mmo1/L)
- Blood pH 7.26

Discussion Questions

1. Briefly explain the pathophysiology of the development of diabetic ketoacidosis (DKA) in this patient.

This patient's lack of effective insulin resulted in severe hyperglycemia and metabolic acidosis. The intracellular environment in his body wasn't able to receive the necessary glucose for oxidation and energy production without insulin to facilitate transport of glucose from the bloodstream across the cell membrane. The impairment of glucose uptake resulted in him becoming hyperglycemic. Glucagon secretion increased in which the fat metabolism resulted in production of ketones altering his blood pH resulting in metabolic acidosis.

2. What clinical manifestations of DKA does this patient exhibit?

Type 1 diabetes mellitus, acetone breath (fruity scented breath), profound dehydration and electrolyte imbalance (vomiting and dry skin), infection (gastroenteritis), inadequate insulin dosage resulting in hyperglycemia with a blood glucose level of 730 mg/dL, metabolic acidosis caused by ketosis (blood pH 7.26), Kussmaul respirations (rapid and labored breathing)

3. What factors precipitated this patient's DKA?

Gastroenteritis (infection), inadequate insulin dosage for two days (hyperglycemia), vomiting (electrolyte imbalance)

4. Priority Decision: What is the priority nursing intervention for N.B.?

Establish IV access and begin fluid and electrolyte replacement

5. What distinguishes this case history from one of hyperosmolar hyperglycemic syndrome (HHS) or Hypoglycemia?

In this case history, the patient has hyperglycemia and ketoacidosis. There are no severe ketoacidosis symptoms in HHS or hypoglycemia

6. Priority Decision: What is the priority teaching that should be done with this patient and his family?

Continue taking normal doses of insulin even when N.B. is ill and not feeling well

7. What role should N.B.'s wife have in the management of his diabetes?

His wife needs to make sure he is staying on top of his dosage at all times, even if he is sick.

8. Priority Decision: Based on the assessment data presented, what are the priority nursing diagnoses? Are there any collaborative problems?

Dehydration due to failure of regulatory mechanisms and decreased circulating volume occurring with hyperglycemia

Potential for delirium/seizures due to altered cerebral function occurring with dehydration associated with DKA

Need for health teaching due to the unfamiliarity with the cause, prevention, and treatment of Diabetic Ketoacidosis

9. Evidence-Based Practice: N.B.'s wife asks you if she should have given her husband insulin when he got sick? How would you respond?

"Yes, it is important for N.B. to continue to take his insulin even when he is sick and not feeling well."