

CSM INTRODUCTORY PHYSIOLOGY

DIABETIC KETOACIDOSIS

You are working in the Emergency department at a local hospital. The ambulance brings in a young male patient who is barely conscious. The patient, whose name is Russ, has an emergency medical bracelet on his arm indicating he is a Type 1 diabetic. The EMTs who brought him in say that he is 16 years old, and was at school when staff noticed he seemed confused, dizzy, and



slurring his words. Staff quickly called for an ambulance, and notified his mother, who will be coming to meet her son at the hospital from her work.

The ER doctor orders lab tests including arterial blood gases, complete blood count with differential, urinalysis, blood glucose, blood urea nitrogen, serum (blood levels) creatinine, electrolytes. Also an ECG, and chest X ray is ordered. Nurses administer 1L of 0.9% saline by IV per hour. You suspect Russ has diabetic ketoacidosis.

CASE ANALYSIS

1. Identify the potential issues and major topics in the case. What is this case about? Underline terms or phrases that seem to be important to understanding this case. Then list 3 or 4 physiology related topics or issues in the case.

2. What specific questions do you have about these topics? List what you already know about this case in the “What Do I know?” column. List questions you would like to learn more about in the “What Do I Need to Know?” column.

What Do I Know?	What Do I need to Know?

3. Put a check mark by one to three questions or issues in the “What Do I Need to Know?” list that you think are most important to explore.

4. What kind of references or resources would help you answer or explore these questions? Identify two different resources and explain what information each resource is likely to give that will help you answer the question(s). Choose specific resources.

CORE INVESTIGATIONS

I. Critical Reading

- a. Marieb A and P,
- b. Kitabchi AE, Wall BM, *Management of diabetic ketoacidosis*. American Family Physician 1999 Aug;60(2):455-464 from <http://www.aafp.org/afp/990800ap/455.html>

II. IP Acid/ Base balance

- a. Fluids and Electrolytes System, Acid/Base Homeostasis topic (60 pages) with worksheet

III. PhysioEx Exercise 10 Acid-Base Balance

- a. www.physioex.com

IV. Acid Base worksheet (see UA's)

V. Questions

1. What purpose do the indicated diagnostic tests have? Explain the purpose of each test with regard to the physiological process they elucidate. What would be a normal result for each test, and what might a person with diabetic ketoacidosis show as far as test results.
2. What signs and symptoms are associated with diabetic ketoacidosis. Explain how these signs and symptoms relate to the altered physiology of the patient.
3. What is the preferred treatment for diabetic ketoacidosis? Explain the rationale behind each intervention.
4. What are the long term complications in Diabetes type 1. Explain the causes of these complications.
5. What is known of the cause of diabetes type 1? Research and present your findings.
6. Metabolic acidosis is one of four types of acid/base disruption. What are the four acid/base disruptions? What are their causes? Describe the diagnostic tests used to determine the type of disruption.

References

Kitabchi AE, Wall BM. *Management of diabetic ketoacidosis*. American Family Physician 1999 Aug;60(2):455-464 from <http://www.aafp.org/afp/990800ap/455.html>