Unit 2.3 Learning Targets

Preface

Over the past twenty five years, medical science has made great strides in helping people with diabetes live productive lives. A wider variety of resources, management tools, and treatment options are available to diabetics; however, diabetes continues to cause serious health effects. Whether a person has Type 1 or Type 2 diabetes, the disorder has a substantial impact on not only the individual with the disease, but also the individuals' close family and friends. In this lesson students will explore how this disease impacts the human body as well as the day-to-day life of a diabetic.

In Lesson 2.3 students will explore the personal side of life with diabetes. In the first activity, they will design a "What to Expect" guide for patients confronted with a new diagnosis. The guide should offer insight into a typical day in the life of a diabetic and should highlight daily routines, restrictions, lifestyle choices and modifications, as well as tips for coping and acceptance. Students will further examine what happens inside the body of a diabetic as they simulate how the body reacts to varying blood glucose concentrations. Students design an experiment to simulate osmosis in body cells and attempt to match details about diabetic emergencies in Anna Garcia's life with simulated blood serum from the time of these incidents. Students relate the movement of water in model cells to the symptoms that Anna experienced in each emergency situation. Students begin to understand how rapid shifts in blood sugar can have severe consequences. While most of these complications are short term if addressed quickly, there are many long term consequences of diabetes, especially if the disease is not well-controlled. Students will explore the impact Type 1 and Type 2 diabetes can have on human body systems and visualize this impact on a graphic organizer. They will read additional information from Anna's autopsy report and analyze findings to brainstorm possible causes of death.

Continued research and increased awareness are required to help diabetics see a brighter tomorrow. Student groups will come up with an idea that they feel will greatly improve the life of a diabetic. They will design an innovation that helps diabetics treat, manage, or even cure their disease and present their idea to a panel offering a research grant.

Understandings

1. Diabetes affects the overall health of the individual as well as aspects of daily life.
2. Blood glucose concentration affects osmosis, the movement of water in and out of body cells.
3. Type 1 and Type 2 diabetes can cause significant complications in many human body systems.

4. Scientists need to make sure that what they present is accurate and is communicated in a way that keeps interest and focus.

Knowledge and Skills

It is expected that students will:

- Recognize that a wide variety of treatment and management medical interventions are available to diabetics.
- Recognize that regulation of blood sugar is necessary to avoid severe and life-threatening diabetic emergencies.
- Be able to advise a patient newly diagnosed with diabetes on treating and living with the disease.
- Compare Type 1 and Type 2 diabetes.
- Demonstrate how water moves across a cell membrane to balance the level of dissolved solutes on either side.
- Diagram complications of diabetes on a human body graphic organizer.
- Assess the qualities of a successful oral and visual presentation.

Essential Questions

1. What are several ways the life of someone with diabetes is impacted by the disorder?
2. How do the terms hyperglycemia and hypoglycemia relate to diabetes?
3. What might happen to cells that are exposed to high concentrations of sugar?
4. How do Type I and Type II diabetes differ?
5. What are the current treatments for Type I and Type II diabetes?
6. What is the importance of checking blood sugar levels for a diabetic?
7. How can an insulin pump help a diabetic?
8. What are potential short and long term complications of diabetes?
9. What innovations are available to help diabetics manage and treat their disease?