



YOUNG VOICES:

Life With Diabetes

Lesson 5: Living with Diabetes

Inquiry Focus: How does diabetes affect people?

Student Learning Objectives: By the end of the lesson, students will be able to do the following

- Describe how someone with diabetes manages their blood sugar with diet, insulin, and blood glucose testing
- Describe symptoms of hyperglycemia
- Describe symptoms of hypoglycemia and what a person with diabetes needs to do when their blood glucose is low
- Explain how people with diabetes manage their diabetes when doing activities such as exercising and going to a party
- List several myths about diabetes

Time Frame: 1 – 2 class periods

Materials:

- Web site:
http://www.dlife.com/dLife/do/ShowContent/inspiration_expert_advice/famous_people
- Benedict's Solution or glucose test strips; sugar water, water, small containers (multiple sets if you wish to have students conduct the tests)
- Video segments from the web site:
 - "Insulin" from *Greatest Inventions with Bill Nye: Medicine*
 - "Controlling and Monitoring Diabetes" from *Biologix: The Pancreas*
 - "Reflections of A Diabetic: Life After Diagnosis" from *Biologix: The Pancreas*

Teacher Background Information:

- In people with both types of diabetes, the body needs assistance to keep blood glucose in balance.

- People with Type 1 diabetes have a pancreas that does not make enough insulin on its own, and so they take insulin shots. People with Type 1 diabetes have individualized plans to manage their blood glucose that include:
 - taking insulin shots to get the glucose in the blood to where it needs to be
 - planning meals to anticipate blood sugar levels, and take into account snacks
 - exercising and playing sports just like everyone else, though they may take extra snacks before exercise
 - when they become a little hypoglycemic, eating some simple sugars like fruit juice because they are quickly absorbed into the blood
- How do people with Type 1 diabetes know how much insulin to take to balance the seesaw? They have to measure their blood sugar and take enough insulin to bring down the blood glucose to a good level without taking too much. They also watch the amount of sugar in foods they eat so they can anticipate the insulin they will need.
- Measuring blood sugar involves using a special needle to get a drop of blood. This drop of blood is put onto a little machine that tells how much glucose is in your blood called a “blood glucose monitor.” People with Type 1 diabetes usually do this many times a day. They then give themselves an insulin injection with the right amount of insulin for them. There are also new machines to monitor blood sugar all the time and small insulin pumps that make managing blood glucose easier.
- People with Type 2 diabetes can have very different treatments. Although people with Type 1 diabetes need insulin to keep their blood glucose under control, people with Type 2 diabetes may be able to control blood sugar in other ways.
 - The first treatment is usually planning meals to control blood glucose, losing weight, and increasing exercise
 - People who need more than this may be on medications to help keep down blood glucose
 - Insulin may also be used
- What people with diabetes do the same: Everything! People with diabetes need to do all the things everyone else must do to be healthy, e.g. exercise, eat healthy, etc.

For more information on common myths and misconceptions about diabetes visit the Juvenile Diabetes Research Foundation International (JDRF) web site at http://www.jdrf.org/index.cfm?page_id=105381.

Instructional Activities:

On the overhead or a chart, display just the following names (not the reason they are famous). Cover the names with paper and reveal them in order. Ask students to raise their hands when they can tell what a person is known for:



Sean Busby	(Champion Snowboarder)
Kris Freeman	(Olympic Cross-Country Skier)
Sherri Turner	(LPGA Golfer)
Bobby Clarke	(NHL – Philadelphia Flyers)
Sugar Ray Robinson	(World Champion Boxer)
Billie Jean King	(World Champion Tennis Player)
Thomas Edison	(Inventor)
James Cagney	(Actor – <i>Public Enemy</i> , <i>Angels with Dirty Faces</i> , et al)
Randy Jackson	(<i>American Idol</i> judge, musician)
Larry King	(Talk show host)
Jean Smart	(Actor – <i>Designing Women</i>)

(More names can be found at the web site. You may wish to locate and substitute other names – for example, football players)

http://www.dlife.com/dLife/do/ShowContent/inspiration_expert_advice/famous_people)

As students identify these people, have them relate any of these individuals' achievements. If you have taught the other lessons in this series, the students will probably realize that what these people all have in common is that they have (or had) Type 1 Diabetes. Students should recognize that while Type 1 Diabetes does require some lifestyle adjustments, those affected by the condition lead otherwise normal, healthy lives and can accomplish extraordinary things. Stress to the students the importance of treating them in the same way they would anyone else, and showing them the same respect they would expect in return.

Review with the group the two types of diabetes and the different causes of diabetes. Use the video clip, "Insulin" from *Greatest Inventions with Bill Nye: Medicine*. By now students should understand that diabetes is a condition, not a disease in the way that many people think of diseases. It is serious, but treatable. It is not contagious.

Demonstrate a simple test for glucose sugar, using Benedict's solution or glucose test strips. Or you may wish to have students conduct the test. Ask if this would be an effective way to test for sugar in the blood. (Note the color that the solution turns when in the presence of sugar is similar to the color of blood.)

Review the difficulty with which they tried to maintain a balance with the weight sets last time. Write the terms hyperglycemia, and hypoglycemia on the board. If students recognize the slang term "hyper" they can associate it with high activity level. Hyperglycemia means the blood sugar level is high. Hypoglycemia is just the opposite: low blood sugar. Show students the video program, "Controlling and Monitoring Diabetes." Because they have done the sugar test, you may wish to fast forward to the discussion on how blood glucose is actually tested. Discuss why it is important for people with diabetes to monitor their blood sugar and balance it with insulin injections.

Have students watch the video, "Reflections of A Diabetic: Life After Diagnosis" in which a talk show host explains how he knows the challenge of regulating his blood sugar. Discuss with students the challenges that the people on the list might have in maintaining their blood glucose levels and how they maintained an active lifestyle regardless of this challenge.

Review the symptoms for diabetes that the person experienced. Explain that this is different from a diabetic emergency. When blood sugar levels get out of bounds, the person may become dizzy, drowsy or unresponsive. The emergency treatment for both is to provide sugar to the person. A non-dietetic fruit drink or other sugar laden food usually is enough. It is not a replacement for insulin, which is the enzyme required by the body to produce the normal amount of sugar in the blood.

Lesson Assessment:

Ask students to:

Explain the condition known as diabetes

Explain the two types of diabetes

Define hyperglycemia and hypoglycemia

Explain the emergency treatment for either imbalance of blood sugar

Vocabulary

- Blood glucose monitor- a computerized machine that allows a person with diabetes to quickly check their blood glucose level

NSES Standards Addressed:

Scientific Inquiry: Formulate and revise scientific explanations and models using logic and evidence.

Life Science: The Cell: Most cell functions involve chemical reactions. Food molecules taken into cells react to provide the chemical constituents needed to synthesize other molecules. Both breakdown and synthesis are made possible by a large set of protein catalysts called enzymes.

Life Science: Matter, Energy, and organization in living systems: The chemical bonds of food molecules contain energy. Energy is released when the bonds of food molecules are broken and new compounds with lower energy bonds are formed.

Personal and Community Health: Personal choice concerning fitness and health involves multiple factors; selection of foods and eating patterns determine nutritional balance; many diseases can be prevented, controlled, or cured; Some diseases . . . result from specific body dysfunctions and cannot be transmitted.

Historical perspectives: Usually, changes in science occur as small modifications in extant knowledge; scientific knowledge evolves by changing over time, almost always building on earlier knowledge.





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