



The Case of Billy Bob

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Suggestions for Teachers

Purpose:

To utilize the scientific method to problem-solve a medical condition, namely diabetes.

Objectives:

1. Students will be able to utilize the scientific method to problem-solve a medical condition.
2. Students will be able to complete a case history on a patient and utilize some tests to aid in a diagnosis.
3. Students will be able to use technology to gather accurate information in order to arrive at a diagnosis.
4. Students will be able to develop an understanding of the complexity of the diagnosis and treatment of diabetes.
5. Students will be able to present information gained by research and problem-solving in an organized, clear way.

Materials:

- 500ml water
- 4.25 g NaCl
- 10 drops yellow food color
- Computer with Internet access
- Computer with Power Point/Corel
- Specimen cups
- Glucose test strips designed for testing urine
- Sphygmomanometer
- Glucose
- Temperature strips

Before you begin:

1. Gather the materials and prepare the solutions as directed below.
2. Students will need specimen cups containing 40ml of “urine” to represent the patient’s urine and one urine test strip and the color chart for interpreting the results.

To Prepare Urine:

Mix 400mg glucose to every 100ml of stock solution.

Stock Solution: 500ml water
 4.25g NaCl
 10 drops yellow food color

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Student Information

Introduction:

Being a medical doctor is a difficult and challenging task, especially in this day and age where there are so many disorders to diagnose. You along with your team members, will get an opportunity to see just how difficult it can be. As a team of three members, you will assume the role of a family physician. You will have an adolescent patient (someone like you) presenting certain medical complaints. You will view the medical record and history with the patient. From this information, along with Internet resources listed and a few simple tests, your team will make a diagnosis of the patient's illness and plan a course of treatment. Good luck! Your team can do it!

Task Activity:

Your team will take the patient's health history, health habits, and symptoms. You will have access to medical tests that can be used to aid in your diagnosis. With this information, along with your Internet information, you will make a diagnosis of the medical illness and develop a course of treatment for the patient.

Process:

You will be placed in teams of three. The teams will take histories and pertinent information. Following this step you will then discuss the patient's medical history, health habits, and subsequently order appropriate medical tests. The medical tests include testing the patient's urine, taking patient's blood pressure, pulse, respiration and temperature. You will then research possible disorders through the Internet links that are provided. Students will then complete a medical form that gives the diagnosis of the illness and its treatment. The team will also develop a five-minute Corel presentation on assigned complications of the disorder.

Student Task Sheet

Please check off items as you go.

1. Team members divide up tasks. One member takes patient history using the medical history sheet. Another member records answers on the patient chart. The third member takes the role of the patient giving the rest of the team the presenting symptoms.
2. After history is complete, team members will discuss/brainstorm ideas about diagnosis.
3. Members will use the Internet sites listed for various disorders that may help with diagnosis. Members should take notes and discuss possibilities.
4. The team orders appropriate tests to assist with the diagnosis. The tests may include temperature, blood pressure, respiration, pulse, urine specimen (provided for you).
5. Once tests are completed and results compiled, a team member should make note of lab results in the patient chart. Team members should now discuss the possibilities of the diagnosis and come to a conclusion about the diagnosis. Record the diagnosis on the Patient Medical Report Form and reasons to support your diagnosis.
6. Team members should discuss treatment plan for the patient and one member should record the patient treatment plan in the Patient Medical Report Form and include reasons to support your treatment plan. Keep in mind the assessment rubric and make sure that the team is fulfilling parts A, B, and C of the rubric.
7. Team members will prepare a five-minute Corel presentation on one of the assigned complications of this particular disorder. In your group presentation, you must include a “futuristic” set of recommendations on how the health of Americans can be improved. This could include better health education, diet, exercise, and better diagnosis for example. Check evaluation rubric part D to make sure that the team has met the requirements.

Assessment Rubric

There are four major parts that you need to complete for this activity.

1. Teams will complete the medical chart for a patient. This chart will include a complete medical history and symptomology of the patient. Teams will identify the connection between symptoms and the disorder.
2. Teams will select appropriate medical lab tests to assist in diagnosis and arrive at a conclusion about the diagnosis based on data gathered and give reasons for supporting the diagnosis.
3. Teams will identify an adequate treatment plan and give reasons why the treatment plan will assist the patient.
4. Teams will prepare a five-minute informative presentation using Corel Presentations or PowerPoint that covers one of the complications of the disorder. The presentation will also include a “futuristic” set of recommendations on how the health of Americans can be improved. For example, this could include diet, exercise, health education etc.

Scoring Rubric

Showned Some Results	=	4 points
Average	=	6 points
Very Good	=	8 points
Excellent	=	10 points

A

Understands human response to disorder, able to identify symptoms and make connection to medical chart with history and symptoms.

B

Medical diagnosis involves problem-solving. Selects appropriate lab tests. Arrives at conclusion that is supported by data.

C

Understands that medical disorder can/cannot be treated. Adequate treatment plan based on patient.

D

Multimedia presentation is logical, clear, complete. Includes “futuristic” component.

Total

Patient Chart

Patient Name: Billy Bob

Team Members: _____

Medical History

Patient Name: _____

Medical History Questionnaire

Date: _____

Address: _____

Phone Number: _____

Sex Male: _____ Female: _____

Age: _____ Race: _____

Height: _____ Weight: _____

Marital Status Single: _____ Married: _____ Divorced: _____

Occupation: _____

Hobbies/Sports: _____

Chief Complaint/Concern:

Any Pain?

Any Effect on Patient's Function?

Do you have or have you had any of the following: (If patient answers yes, ask him/her to explain and record in chart what patient says).

Heart Failure	Yes	No	Emphysema	Yes	No	Kidney Trouble	Yes	No
Heart Attack	Yes	No	Chronic Bronchitis	Yes	No	AIDS	Yes	No
Chest Pain	Yes	No	Tuberculosis	Yes	No	Hepatitis	Yes	No
High Blood Pressure	Yes	No	Asthma	Yes	No	Liver Disease	Yes	No
Heart Murmur	Yes	No	Hay Fever	Yes	No	Blood Transfusion	Yes	No
Rheumatic Fever	Yes	No	Cancer	Yes	No	Drugs/Alcohol	Yes	No
Artificial Heart Valve	Yes	No	Diabetes	Yes	No	Hemophilia	Yes	No
Mitral Valve Prolapse	Yes	No	Thyroid Disease	Yes	No	Epilepsy	Yes	No
Heart Pacemaker	Yes	No	Chemotherapy	Yes	No	Bruise Easily	Yes	No
Artificial Joint	Yes	No	Arthritis	Yes	No	Ulcers	Yes	No
Stroke	Yes	No	Glaucoma	Yes	No	Pain in Jaw	Yes	No

Provide explanations, date of occurrence, and duration of any of the above problems if patient answers yes.

Have you been a patient in the hospital during the last year? Yes No

Are you taking any medicine or drugs now?
Please list if answer is yes. Yes No

Are you allergic or made sick by any drugs or medications?
Please list. Yes No

Do you have any condition or problem not listed that you
think the doctor should know about? Yes No

Please explain.

Today's Date: _____

Blood Pressure: _____

Pulse: _____

Respiration: _____

Temperature: _____

Urine--Glucose: _____

Family History

Is there a family history of:

Heart Disease Explain.	Yes	No
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Cancer Explain.	Yes	No
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Thyroid Disorder Explain.	Yes	No
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High Blood Pressure Explain.	Yes	No
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Hemophilia Explain.	Yes	No
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Asthma Explain.	Yes	No
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Patient Medical Report Form

Patient's Name: _____

Diagnosis Results: _____

Name of Diagnosed Disease: _____

Cause/s:

Should special precautions (like isolation) be taken?

Yes: _____ No: _____ Explain:

Reason/s for Diagnosis:

Treatment Plan for Disease:

What is your planned course of action if patient doesn't respond within a week to treatment?

Expected Outcome from Treatment:

Team Members Names: _____

(Answer questions on other sheets of paper and attach to this form.)

Internet Sites for Disorders

AIDS/HIV

<http://www.cdc.gov/hiv/bscience.htm>

CHICKEN POX

<http://lib-sh.lsumc.edu/fammed/pted/chknpox.html>

CHOLERA

<http://www.bact.wisc.edu/Bact330/lecturecholera>

HEPATITIS

<http://www.cdc.gov/ncidod/diseases/hepatitis/b/fact.htm>

INFLUENZA

<http://www.cdc.gov/ncidod/diseases/flu/fluvirus.htm>

LYME

<http://www.lymediseaseinformation.com/topper.htm>

MENINGITIS

<http://www.musa.org/whatis.htm>

PNEUMONIA

<http://www.lungusa.org/diseases/lungpneumoni.html>

SHINGLES

http://www.rxmed.com/illnesses/herpes_zoster.html

TUBERCULOSIS

<http://www.umdj.edu/~ntbcweb/tiddiag.htm>

TYPHOID FEVER

http://www.cdc.gov/ncidod/dbmd/diseaseinfo/typhoidfever_g.htm

CONGESTIVE HEART FAILURE

<http://www.healthanswers.com/Centers/Disease/disease.asp?id=heart>

ARTHRITIS

<http://www.healthanswers.com/centers/body/overview.asp?id=bone+muscle+joint&filename=2596.htm>

ANOREXIA

<http://www.healthanswers.com/Centers/Disease/disease.asp?id=eating+disorders>

WHOOPING COUGH

<http://www.newss.ksu.edu/WEB/News/NewsReleases/listwhoopingcough.html>

Lab Tests

- Temperature of patient may be taken with the temp strips. 97.8-99.1° F is normal for children age 13 years-adult.
- Pulse can be taken by placing index finger on the inside of wrist and taking count for one minute. Normal range for pulse is 55-90 beats per minute for children age 10-adult.
- Respiration can be taken by counting the number of breaths a person takes in one minute. Normal range for children age 12 years-adult is 14-18 breaths per minute.
- Blood pressure can be taken using the sphygmomanometer. Detailed directions follow on a separate sheet. Normal range for children age 14-16 is between 112/64-117/67.
- Urine may be tested using the strips designed to check levels of glucose in the urine. Match colors for values.

Blood Pressure Measurements

Method:

1. Student patient should extend arm on table with palm up.
2. Place blood pressure cuff above the bend in the arm. The cuff should be snug but yet have enough room to insert two fingers.
3. Check to see if valve is open or closed. It should be closed.
4. Place stethoscope eartips into ears.
5. Position stethoscope on arm to hear pulse.
6. Pump pressure up to 180mm.
7. Release valve slowly.
8. The first pulse sound you hear as you release the valve is the systolic pressure. Have the patient put his/her finger on the number of the first sound to mark the spot.
9. Continue to release the valve slowly. Approximately 40mm down from the first sound, you will hear the second sound. The second sound you hear is the diastolic pressure.
10. Record the systolic and the diastolic pressure on the patient medical history chart.

References:

Physiology of Fitness LOT Unit. The American Physiological Society. Page 15.

Presenting Symptoms for Billy Bob

Billy Bob is a 15-year old student in the local high school. He lives at home with his parents and two sisters. Billy Bob has noticed that he feels very thirsty at almost any time of the day. He also notices that he can hardly stay awake in class and has trouble finishing homework.

He has been playing some sports but often finds that he has to stop and rest while other kids keep on going. In spite of the fact that he is losing weight, he just can't seem to get enough to eat. He also has noticed that he has a rash but is not sure if it has anything to do with the other stuff that seems to be going on with him.

Billy thought that if he ate more foods containing sugar maybe he would have more energy but so far that doesn't seem to be working. He feels a little embarrassed but he also is urinating a great deal. At least he thinks he is going more often than most students in class. He often has to be excused from class to use the rest room.

As far as he knows his heart is working fine and he has never been treated for anything serious before. He has not been admitted to the hospital for any disorders in the past. Prior to this problem he had been feeling fine.