

CASE TEACHING NOTES

for

“KEEPING UP WITH THE JONES’S: A CASE STUDY IN HUMAN PHYSIOLOGY”

by

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INTRODUCTION / BACKGROUND

This interrupted case study in cardiovascular physiology follows the Jones family over the course of a number of eventful days. The family consists of a mother, father, and two children. Both children are in high school and are athletic. The son, Dave, is a baseball player. As the story opens, he has sprained his ankle during practice. But it is his sister, Suzie, a self-reliant young woman who is training hard for the upcoming figure skating season, who becomes the focus of the case study. She has aspirations of competing in the Olympic Games and getting a college scholarship. Students are presented with a variety of signs, symptoms, and medical data relating to Suzie’s health, which they are asked to interpret by researching and answering a series of guided questions.

The case was developed for use in a one-semester animal physiology course taken by sophomore and junior science majors. It could also be used in an anatomy and physiology course as well as a general biology course.

Objectives

- To understand *female athlete’s triad*.
- To understand basic cardiovascular physiology.
- To understand the effect of anorexia nervosa and malnutrition on the human cardiovascular system.
- To understand tissue microcirculation, involving filtration and reabsorption at the capillaries.
- To understand how malnutrition and low blood protein levels can induce edema Identify the basic elements of a scientific research study.

CLASSROOM MANAGEMENT

The case takes about 75 minutes to fully develop. The class is divided into groups of five or six students.

Board Management

In my class I have a large white board that is divided into four areas. Student responses and input are entered on the board as follows:

- The first area is used to list Dave’s problems.
- The second area is used to list Suzie’s signs and symptoms.
- The third area is used to list Suzie’s social problems and how she copes with them as well as student predictions for blood variables in Part IV of the case.
- The fourth area lists the student speculations for Suzie’s problems.

Entries are made on the first three areas throughout the case as information is provided. Speculations are entered in the fourth area from Part II onwards. If a certain speculation loses favor, the original group is asked if it is reasonable to delete their entry. If they (and the class) agree, an “x” is placed next to the entry. The entry is not erased because it may be reconsidered at a later date.

Case Management

Students are given each part of the case in sequence and are asked to read the passage, discuss the material, and answer the questions. Students are told how much time they have for each part. They are permitted to use books, notes, and the Internet. After the prescribed time period for each part of the case (5 to 15 minutes), the class is called together to share ideas, with the questions forming the basis for discussion. Groups take turns going first, and different members of each group are called upon for input, allowing all students to participate in the case study.

Part I—The Accident

Dave sprains his ankle playing baseball. Students learn about microcirculation at the systemic capillaries including the factors that produce filtration and reabsorption, and the effect of cytokines, temperature changes, and elastic bandages on circulation and inflammation. This information is written on the first panel of the whiteboard.

Part II—The Next Morning

The case turns to Dave's sister, Suzie, who is about to begin a season of competitive skating. She seems serious about her sport and has been training hard to get into shape. She must have a physical prior to the season, but this is delayed for a day so that the doctor can examine Dave's ankle. Students discover that Suzie has physical problems including circulatory anomalies and nutritional problems, and these are written on the second panel of the whiteboard; her social problems are written on the third panel of the board. Any speculations about Suzie's condition are written on the fourth panel.

Part III—Suzie Sees the Doctor

From now on the case study concentrates on Suzie; this part of the case describes Suzie's physical problems, which are added to the second panel of the whiteboard and her social problems, added to the third area of the board. Students are asked if they wish to change or modify their opinions about what is wrong with her, and any modified speculations are written on the fourth panel.

Part IV—Back to the Doctor's Office

My students appear to enjoy hard data. The table included in Part IV of the case gives values for some of Suzie's vital signs. Based on this additional information, any additional ideas the students have about Suzie's symptoms are added to the list in the second panel of the board. The class discussion revolves around cardiovascular physiology. In the last question, students are asked to predict the level of certain blood parameters, which are written in the third area of the board.

Part V—Blood Results

The values given in the table presenting the results of Suzie's blood work should be compared with the student predictions from the previous section. The questions in this part of the case are used as the basis for a discussion of Suzie's cardiovascular and circulatory problems.

Part VI—Conclusion

The case concludes with a discussion of the psychological aspects of Suzie's social problems as well as the pressures, stresses, and concerns of an aspiring athlete. This part of the case can be enhanced if there are athletes in the class who are willing to share their experiences, which is often eye-opening for the non-athlete.

ANSWER KEY

Answers to the questions posed in the case study are provided in a separate answer key to the case. Those answers are password-protected. To access the answers for this case, go to [the key](#). You will be prompted for a username and password. If you have not yet registered with us, you can see whether you are eligible for an account by reviewing our [password policy](#) and then [apply online](#) or write to answerkey@sciencecases.org.

Acknowledgements: This case was developed with support from the National Science Foundation under CCLI Award #0341279. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

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Originally published 03/18/07 at http://www.sciencecases.org/jones/jones_notes.asp

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