

CASE TEACHING NOTES

for

“The Hot Tub Mystery: The Story of a Very HOT Tub”

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INTRODUCTION / BACKGROUND

This interrupted case is designed for freshman and sophomore students in a Human Physiology course or in a combined Human Anatomy and Physiology course. It might be used at the end of the unit on blood pressure regulation or at the end of the course as a way of integrating with other body systems. The goal of this case is to have students explain the components of blood pressure regulation. In reviewing these components students will integrate the various aspects of blood pressure regulation and gain an appreciation of the roles alcohol, heat and Lasix play. The case also gives students a chance to explain these concepts to each other and for the instructor to determine where there is a lack of understanding. Students will need a background into the concepts associated with blood pressure regulation prior to starting the case. The case then serves as the conclusion to the discussion about blood pressure in order to be certain that these difficult concepts are understood.

Objectives

After completion of the case, the students should be able to do the following.

- Identify the factors that affect blood pressure.
- Describe the individual and collective effects of the Lasix, hot water and alcohol on blood pressure.
- Explain how each of the following factors affect blood pressure:
 - peripheral resistance,
 - heart rate,
 - venous return,
 - stroke volume,
 - cardiac output,
 - end systolic and diastolic volumes, and
 - blood viscosity.
- Describe the role of the cardiovascular system, nervous system, kidneys and endocrine system in relation to the above seven factors.
- Explain the physiological processes associated with the decrease in blood pressure.
- Explain the physiological processes associated with the potential recovery of blood pressure.

CLASSROOM MANAGEMENT

This case may be presented to the students as an interrupted case with Parts I and II handed out or placed on the web in advance (we used the class Blackboard site) and Part III handed out at the end of class following discussion of the first two parts.

I have students print out the case and answer all questions in Parts I and II before class. As students come into class, I form them into groups of four to five students so that they can compare their answers to the

questions. I then open discussion to the entire class and put their answers on the board. I next ask the students to determine the effect of heat and alcohol on blood pressure and determine the couple's cause of death. Parts I and II help the students begin to think about the possible factors causing the two deaths and realize the role that Lasix, heat, and alcohol play in affecting blood pressure.

If Part III is handed out at the end of class, the students should be told to answer questions 1–4 before the next class. This out-of-class assignment permits students to search their texts, the library and the Internet for material associated with these concepts of blood pressure. During the next class period, these questions can be discussed in small groups and then as a part of a larger class discussion.

Alternatively, Part III can be handed out following a short discussion of Parts I and II and all questions are discussed in student groups and then summarized on the board. This is particularly effective if the class period is long enough.

Part III provides an opportunity for students to address the specific role of drugs, vasodilation, and alcohol on the specific components of blood pressure regulation. We try to make sure that all aspects of blood pressure regulation are discussed.

It is important that students have read their text in advance about the factors that affect regulation of blood pressure. It is helpful if these factors are discussed in class prior to students working on Part III. Initial instruction on the factors affecting mean arterial blood pressure is usually completed before students come to class for discussion of Parts I and II. Just as with Parts I and II, as students enter class the day Part III is to be discussed, they should assemble into their previously assigned groups or new groups of four to five students. The students should have enough information from lecture and their research to answer questions 1–4 in Part III and begin preparation of the final report. Before leaving class they should have identified what would happen to each of the components and agreed on answers to these questions. I usually go around the room asking leading questions of each group and clarifying concepts until I'm satisfied with the students' understanding of the material. Be sure to leave enough time at the end of the period to summarize student answers. Go from group to group gathering information about each component or concept and summarize it on the board. About 30 to 40 minutes will be needed for the students to complete answers to the questions and 25 to 35 minutes to summarize the information on the board.

A two-page final essay summarizing the role of each of the seven factors associated with blood pressure regulation was assigned and due at the next class period. This essay had to address each of the points indicated at the end of the case. This essay forces students to write out a summary explanation of blood pressure regulation as it applies to this case.

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.

References and Sources of Additional Information

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