

# Will I Ever Be Able to Run Again, Doc?: Instructor Guide

**Title:**

Will I Ever Be Able to Run Again, Doc?

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**Discipline:**

Biological Sciences

**Target Audience**

Advanced, majors

**Keywords**

Anatomy, neuroanatomy

**Length of Time/Staging**

Two class sessions (approximately twenty minutes in class for each session) as well as four to six hours of out-of-class research



## Abstract

Bob is a 53-year-old college professor. He is a regular runner, averaging between 25-35 miles per week. During the academic year he runs with one or two fellow professors during the noon hour. In the summer he prefers to run at sun up when it is cooler. It is Saturday, and Bob has met up with his regular weekend running bunch. By approximately mile 10 Bob is comfortable with his pace, and the conversation has settled onto the topic of the day—politics. In mid-stride Bob experiences a sudden and severe shooting pain in his back, and he immediately falls to the ground, causing several in the running pack to trip and fall as well. As the running group comes to a halt, Bob is the only runner unable to regain his feet. After a few minutes, the back pain has subsided somewhat, but Bob notices that he has a significant weakness affecting his lower extremities, and a general 'weird' feeling to his entire body. One of the running group heads to a nearby house and calls an ambulance. Students are asked, through this two-part problem, to arrive at a diagnosis for the patient as well as answer other related questions.

## Date Submitted

11/26/2004

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## Format of Delivery



Image courtesy of [www.runnersweb.co.uk/](http://www.runnersweb.co.uk/)

The problem is delivered to the students in two parts. Part 1 presents the students with a story line for the problem, as well as patient history and initial findings from a physical examination. A list of tests ordered by the physician is also given.

Part 2 presents the students additional information in the form of results from the neurological examination, as well as a few other pieces of information embedded within the problem.

## Student Learning Objectives

This problem was written with the following summative objectives in mind:

1. Develop a 3-dimensional understanding of the cross-sectional anatomy of the spinal cord.
2. Develop an understanding of the extent, course and function of the ascending and descending tracts of the spinal cord.
3. Develop an understanding of the location and extent of abnormalities that develop following a lesion within the ascending and descending tracts of the spinal cord.
4. Develop a 3-dimensional understanding of the vascular supply of the spinal cord.

This problem was written with the following formative objectives in mind:



1. Increase overall problem solving skills, including the ability to define problems, gather and evaluate information, and develop solutions.
2. Develop effective knowledge acquisition skills.
3. Develop better team skills.
4. Increase communication skills.
5. Increase self-assessment skills.
6. Increase ability to assess the work of others.
7. Increase ability to identify, find and use appropriate resources.

## **Student Resources**

*McGraw Hill Encyclopedia of Science & Technology* REF Q 121 .M3 2002

Various Medical Dictionaries found at REF R 121

*Gray's Anatomy* REF QM 23.2 .G73 1995

*Professional Guide to Signs and Symptoms* REF RC 69 .P77 2001

*Atlas of Human Anatomy* REF QM 25 .N46 1997

*The Merck Manual* REF RC 55 .M4 1999

*Magill's Medical Guide* REF RC 41 .M34 2002

## **Instructor Resources**

Specific information about this neurological problem may be found at the following web site: Hogan, H. Spinal cord infarction. In eMedicine. Retrieved 20 August, 2003, from eMedicine website: [http:// www.emedicine.com/neuro/topic348.htm](http://www.emedicine.com/neuro/topic348.htm).

## **Teaching Notes**

The problem has been utilized in a junior-level neuroanatomy class (enrollment averaging thirty) two or more times. The problem is presented in two parts.

Both parts contains both essential and extraneous information. The progressive disclosure of the problem forces students to assess information and determine its applicability to the solution.

[Additional information](#)

## **Assessment Strategies**

This problem has been utilized in Neuroanatomy classes with an enrollment ranging from twenty to forty students. Assessment has been both formative and summative.

### ***Summative Assessment:***

Summative assessment has been broken down into two formats. One format involves evaluation of both the group and individuals within the group. The following procedure is followed in evaluating individual and group progress on the PBL:

On the day the PBL is assigned the class will break up into PBL groups and do some preliminary work on the problem. By the next class session each PBL group member must turn in an individual hard-copy preliminary report. The preliminary report must contain the following:

- Possible hypothesis of what is wrong with the patient.
- What you will need to find out in order to prove or disprove your preliminary hypothesis, and where you will look to find this information.
- Any terminology that is not understood must be listed and defined, and the source of the definition cited.
- It is expected that each member of the group will review all of the group's preliminary hypotheses prior to coming to class the day the preliminary reports are due.

On the day the preliminary report is due the second part of the problem will be handed out. The class will again break into PBL groups and do further preliminary work on the problem. In this session the group will now:

- Determine how the additional information has changed any or all of the preliminary hypotheses, and why.
- Determine the course of action the group will take in order to solve the problem.
- Divide up the work that needs to be completed in order to solve the problem. The group leader will then post, in the group's Public Folder, a listing of what task is to be accomplished by what group member.

At the next class session (after distribution of part 2 of the PBL) each group member will turn in an individual hard-copy secondary preliminary report. (A copy will also be posted in the Public Folder). This secondary report must contain the following:

- Statement as to how your preliminary hypothesis of what is wrong with the patient has changed, and why.
- What you will need to find out in order to prove or disprove your newly formed hypothesis, and where you will look to find this information.
- Any new terminology that is not understood must be listed and defined, and the source of the definition cited.

As published in the course schedule, each group is required to submit a final report at the state of the appropriate class period. (It would be advisable for the group to keep at least one backup copy on computer disc.) The group report is to contain at least the following:

- Hypothesis of the solution to the problem.
- Sound anatomical reasoning to substantiate your hypothesis.
- Citations for any and all sources utilized, including your textbook.
- PBL reports will be graded on the anatomical accuracy of the final solution to the problem, as well as the anatomical logic utilized to arrive at the final solution.

A second form of summative evaluation is inclusion of material covered in the PBL on a "standard" lecture examination. The anatomical objectives may be assessed in the form of objective or essay questions.

***Formative Assessment:***

Formative assessment is accomplished two times during the course: at midterm and at the end of the course. Students are asked to fill out a form that assesses team and individual performance twice during the term. Individual growth throughout the term is assessed only at the end of the term.

**Solution Notes**

Solution removed.