Case Teaching Notes *for* "A Case of Spinal Cord Injury"

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Introduction

The spinal cord carries messages between the brain and the rest of the body. Traumatic injury to the spinal cord can result in a condition called acute spinal cord injury (SCI), resulting in motor, sensory, or autonomic dysfunction which may be temporary or permanent. SCI is a common cause of permanent disability and death in both children and adults.

Before attempting to answer the questions associated with this case, students should review the functional anatomy of the spinal cord as well as the normal physiology of spinal reflexes.

Objectives

Upon completion of the case study, students will have learned:

- definitions of the terms *tetraplegia* and *paraplegia,* and the term *neurological level* as it relates to SCI.
- the definition of the term *dermatome,* and how it relates to normal function of the spinal cord as well as the localization of the site of SCI.
- the definition of the term *myotome,* and how myotomes are used to localize the site of SCI.
- the definition of the term *stretch reflex,* and how examination of such reflexes are used to localize the site of SCI.
- how cases of SCI are managed.

This case study has been used in both a sophomore-level course in human anatomy and physiology and a senior-level course in general physiology.

Classroom Management

Students are given a printed copy of the case at least one week prior to the class in which the case will be discussed. They are told which concepts to review before attempting to answer the questions and that reference materials are available in the college library for their use. I ask the students to do their best to complete the questions before the class discussion of the case and encourage them to collaborate with one another. Students are not required to hand in written answers to the questions, but, rather, are called upon at random to answer the questions during the class discussion. Questions from the case study are included on regularly scheduled course examinations. I tell students at the beginning of the term that the more effort they put into each case, the more they will learn, the more fun they will have, and the better they will perform on the examinations.

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

Print

Cotran, R.S., V. Kumar, T. Collins, and S.L. Robbins. 1999. *Pathologic Basis of Disease*. (6th Ed). Philadelphia: W.B. Saunders Co.

Guyton, A.C., and J.E. Hall. 2000. *Textbook of Medical Physiology* (10th Ed). Philadelphia: W.B. Saunders Co.

Martini, F.H. 2005. *Fundamentals of Anatomy & Physiology*. (7th Ed). San Francisco: Benjamin Cummings.

Internet

Myotomes—Northern California Neurosurgery Medical Group, Inc.
http://www.lieberson.com/en/neuro_medical_info/neuro_exam.htm

Spinal Cord Injury: Definition, Epidemiology, Pathophysiology
http://www.emedicine.com/pmr/SPINAL_CORD_INJURY.htm

Physiology of Spinal Cord Injury
http://www.neuro.wustl.edu/sci/physiolo.htm

Reflex Tests
https://www.healthatoz.com/healthatoz/Atoz/ency/reflex_tests.jsp

SCI Classifications and Terminology
http://www.geocities.com/HotSprings/Spa/5325/sci/sciclass.html

Spinal Cord Injury
http://www.cnn.com/HEALTH/library/DS/00460.html

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Image Credit: Detail of *The Injured Mason* by Francisco de Goya, 1786–87. Oil on canvas. Museo del Prado, Madrid, Spain.

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