***Stem-Cell Treatments***

Until recently, scientists thought that  
the central nervous system could not repair  
itself. Damage to this human body system  
was thought to be permanent. New  
research, however, has opened the door to  
treating injuries and diseases of the central  
nervous system. Some of this research  
focuses on embryonic stem (ES) cells.

**Unspecialized Cells**

cells that can develop into many different  
cell types. Scientists have found that ES  
cells from fetal tissue have the potential to  
develop into nearly every kind of cell in  
the human body. They are “unprogrammed”  
cells that can take on the characteristics of  
specialized cells, including nerve or brain  
cells that do not readily repair themselves.  
This means ES cells might be able to repair  
nerves, grow tissues, or grow entire organs.

**A Controversial Treatment**

ES cells that are programmed as nerve  
or brain cells could be used to treat spinal  
cord injuries, which occur to approximately  
11,000 Americans each year. In addition,  
they could potentially be used to treat  
Alzheimer’s and Parkinson’s diseases.  
However, ES cells are often taken from

aborted fetuses or from embryos made in  
test tubes. Thus, use of ES cells raises  
ethical and moral issues.

Scientists have attempted to address  
these issues by using ES cells from the  
embryos of animals such as mice and  
hamsters. For example, using adult rats  
with damaged spinal cords, scientists have  
found that transplanted ES cells triggered  
the production of myelin. Myelin is the  
protective coating that insulates nerves.  
This coating is often damaged or destroyed  
in the nerves of people with spinal cord  
injuries. If the coating were restored, the  
function of the nerve might also be  
restored. For people confined to a  
wheelchair, that could mean regaining the  
movement of a limb or control of bladder  
function.

**Looking Ahead**

Scientists are encouraged by their rapid  
progress with ES cell treatment. However,  
many years of experimentation and  
research lie ahead. Moral and ethical issues  
must be addressed as well. In the meantime,  
people who have sustained damage to their  
central nervous systems continue to hold  
out hope for a long-term cure.

**Applying Critical-Thinking Skills**

**Directions:** *Respond to each statement.*

**1. Explain** which characteristic of stem cells makes them suited to treating injuries or  
diseases of the central nervous system.

**2. Compose** Use of ES cells remains a controversial issue. Write a letter to a newspaper  
editor explaining your views on this issue. Support your letter with facts from the  
article.