

Appendix A

The following is the description of BCI technology that was included in each questionnaire.

Before completing the rest of the questionnaire, we would like to provide a quick description of BCI technology.

- How does it work?
 - Brain activity is measured using various types of electrodes. Some electrodes are placed on the scalp, while others require surgical implantation. There are two types of implanted electrodes. The first type is placed on the brain surface, without penetrating the brain tissue. The second type of implanted electrodes are miniature needles that penetrate the brain tissue. Both types of electrodes are used clinically for treatment of pain, Parkinson's disease, and other neurological disorders.
 - BCI technology CANNOT read your thoughts. BCIs can only recognize specific types of activity such as changes that occur in the brain when you imagine moving a specific body part.
 - The brain signals are sent to a computer which translates them into a control signal for an external device, such as a FES system or robotic assistant.

- How could BCI technology benefit me?

Collinger JL, Boninger ML, Bruns TM, Curley K, Wang W, Weber DJ. Functional priorities, assistive technology, and brain-computer interfaces after spinal cord injury. *J Rehabil Res Dev.* 2013;50(2):145–60. <http://dx.doi.org/10.1682/2011.11.0213>

- Your spinal cord injury likely resulted in muscle paralysis, which limits some of your functional abilities. BCI technology could be used to control a number of devices to aid with activities of daily living.
- BCI technology is currently being studied for research purposes. However, researchers are working to develop BCIs to control the following devices:
 - Computers (alternate mouse or keyboard input)
 - Power wheelchairs (driving or seat function access)
 - Functional electrical stimulators (devices that stimulate muscles and nerves that have been paralyzed to restore some degree of function)
 - Robotic arm assistants (to aid with daily tasks that require reaching and grasping).
The robot could be mounted to a wheelchair.