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Parastep System

There are approximately 20 people in 1 million population that suffer annually from Spinal Cord Injuries. In 2005 the number of people living with SCI was over 1 million. 53 percent of these injuries occur from motoring accidents, 12 percent from sports injuries, and 23 percent from everyday accidents.

The history of rehabilitation for SCI injuries begins with Functional Electrical Stimulation which was first used on a paraplegic patient in 1963. The quadriceps and glutei muscles of a paraplegic were stimulated using surface electrodes, and erect standing was achieved for a few minutes. The Parastep began clinical trials in 1988 and finally received FDA approval in 1994. In April 2003 Medicare and Medicaid Services (CMS) as well as certain other major insurance carriers announced that they will extend coverage for the purchase of the Parastep I System.

The Parastep system is the only FDA approved form of rehabilitation for patients who suffer from T1-T12 paraplegia. The patients must show sufficient muscular force with FNS at the hip and knee, adequate cardiopulmonary reserve, the ability to transfer independently and safely lower him/her self to the ground without the system operating, and hand/finger dexterity to manipulate system controls. Patients who are pregnant, have cardiac or pulmonary disease, severe scoliosis or osteoporosis, invertible contractures or are morbidly obese are not able to use the system.

The major benefits of Parastep are to allow paraplegics the ability to stand up and walk as well as building/maintaining muscles in the legs, slowing osteoporosis, aiding bowel and bladder functions, and improving circulation in the legs. All admissible patients are able to achieve a minimum of 20-30 feet

of ambulation with possibility of achieving as much as a mile of ambulation without sitting down.

Some other devices that are currently being used are the Odstock Dropped Foot Stimulator which elicit dorsiflexion and eversion of the foot by stimulation of the common peroneal nerve, the MICROSTIM2, a dual channel stimulator used for arm stimulation including the hand and forearm, Leg stimulation to improve the affectivity of the Dropped Foot Stimulator facial stimulation general control of spasticity, and the O4CHS which is a 4-channel version of the Microstim 2 used to facilitating a reaching movement of the arm. One of the major future developments related to the parastep system is the WALK system which does much of what the Parastep does but also allows users to ascend and descend stairs. The major problem currently associated with the WALK system is the overall discomfort and the size of the system.

Sources:

Dimiter Prodanov, Enrico marani, Jan Holsheimer; *Biomedical Reviews*, 2003, 14:23-50

<http://www.spinalinjuryhelp.com/Products.htm>

<http://www.sigmedics.com/index.htm>

http://www.vadrs.org/formscabinet/.%5Cdocuments%5CPublic%5CBrochure%20-%20Parastep%AE%20FES%20Walking_WWRC-B020.pdf