WOMEN & PHILANTHROPY

2009 Grant Proposal

Specialized Treadmill Training For Spinal Cord Injury

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Program Abstract

Spinal cord injury (SCI) is a devastating medical condition resulting in profound loss of function, excruciating pain, heavy economic burden and extremely low prospects of finding employment. Spinal cord injury most frequently occurs in vital, young adults (age 16-30) who then face a lifetime of coping with these dire consequences. Until recently, treatment to increase function, reduce pain and improve quality of life for people with SCI has been largely ineffective. Recent breakthroughs in basic science laboratories which focus on weight supported treadmill training are now being translated into rehabilitation treatments. The Reeve Foundation Neurorecovery Network Center (NRN) at OSU is an elite clinic, offering cutting-edge treadmill training to people with SCI. The goal of our program is two-fold: to reduce paralysis, eliminate pain and restore health in these people so that they can fully participate in society; and, to generate new knowledge of mechanisms of recovery induced by intensive treadmill training.

Project Narrative

The most common disabilities after SCI are paralysis and severe pain below the injury. People with SCI describe the pain as burning, stabbing, piercing or cruel. This severe pain lasts all day and recurs for more than 10 years. The likelihood that a person with SCI will retain some movement is 50% while the likelihood of developing neuropathic pain is as high as 85%. These disabilities result in lifetime costs reaching ~3 million dollars per person while the likelihood of finding employment is quite low (25-33%). Unfortunately, restrictions in participation and lower economic status predict early mortality in people with SCI.

The OSU NRN center is one of 7 centers in the US providing intensive locomotor training for people with incomplete SCI. The NRN center represents a multi-center clinical program based on recent basic science research showing locomotor improvements in animals. Indeed, work from my own lab has established that treadmill training but not other types of therapy (swimming, standing) eliminates neuropathic pain and restores normal sensation after SCI. A critical component to locomotor training is a computerized bodyweight support system with an integrated treadmill system. Continuous adjustments of weight support

and treadmill speed with this system best approximates normal walking patterns. Treatments require specially-trained personnel and extend well-beyond traditional lengths. As such, we operate at full capacity by treating 7 patients a day and have a substantial waiting list to receive treatment. The focus of this proposal is to secure funding toward an additional computerized treadmill system so that we can increase our ability to deliver more treatments to more people with SCI. Our objective is to teach the spinal cord to relearn walking rather than teaching it to sit in a wheel chair.

Please note that we will seek funding from multiple sources in the event the total cost of the system can't be supported by Women & Philanthropy. The items in the budget are listed in order of priority.

Budget

1. Innoventor Body Weight Support System $97,858.00

2. Bertec Treadmill..... $87,977.00

Total Request $40,000