SPINAL CORD INJURY CASE STUDY 1

THE APPLICATION OF ACTIVE PHYSIOTHERAPY TO CLIENTS WITH SEVERE SPINAL CORD INJURIES & COMPLEX HISTORIES
Propel Physiotherapy provides personal and professional treatment for people of all ages whether you have suffered a stroke or traumatic brain injury; experienced a complex orthopedic injury caused by a motor vehicle accident, workplace accident or sports; are recovering from childbirth, illness, a simple strain or sprain; or you are looking to improve your performance in your daily activities.

Our integrated healthcare team serves the Greater Toronto Area from our two convenient locations in Etobicoke and Pickering, and also provides mobile services that will come to your home, place of business or other location in the community that best suits your needs.
THE APPLICATION OF ACTIVE PHYSIOTHERAPY TO CLIENTS WITH SEVERE SPINAL CORD INJURIES & COMPLEX HISTORIES

By Registered Physiotherapist Alanna Holz

Alanna Holz is a graduate of the University of Toronto’s Masters of Physical Therapy program. She previously graduated with an Honors Bachelor of Health Science with a Specialization in Rehabilitation Sciences from Western University, a competitive program comprised of fewer than 15 students.

She has obtained a Level 1 Manual Therapy certification and continues to pursue additional professional training with courses in acupuncture, vestibular rehabilitation, manual therapy, Bobath neurological rehabilitation and Mulligan courses.

She has hands on experience working with multiple client groups, including clients with diverse neurological and orthopedic conditions, as well as sports injuries. She has a special interest in concussion management and rehabilitation.
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INTRODUCTION

About 1/3 of individuals admitted for a spinal cord injury (SCI) will be the result of a non-traumatic cause. ***
Non-traumatic SCI has various causes, for example:

- spinal stenosis
- tumor
- ischemia
- transverse myelitis
- infection

The most common non-traumatic cause of SCI being spinal stenosis.**

Individuals with non-traumatic SCI tend to be significantly older than those with traumatic etiologies.** Mean age (53.97± 14.48 years).*
Incomplete injuries are significantly more common than complete injuries in the non-traumatic SCI population.* Individuals with non-traumatic SCI are more likely to have a higher Abbreviated Injury Scale (AIS) level, and to spend less time in the hospital than those with traumatic injuries.*

* Cosar 2010
** McKinley 1999
*** Cosar 2010, McKinley 1999
THERAPEUTIC OPTIONS & GOALS

After a spinal cord injury, many people believe that any physiotherapy that takes place would be highly passive and limited in activity, especially when the client has a long history of moderate-severe osteoarthritis or other compounding injuries or conditions.

Other clinicians often assume that what goes on during in-patient care will continue to take place when the person has been discharged and is at home. In reality, this could not be further from the truth. In our professional experience, the client stands to make the best gains being pushed physically, within medical reason and taking into consideration medical precautions.

In this particular instance, the clinician and client set concrete goals and were determined to meet them by a certain timeframe, despite the client reporting issues of fatigue, pain, soreness, or weakness.

- Bed mobility
- Education on positioning and avoiding pressure sores
- Gait aid prescription and training
- Siting and standing balance training
- Transfer training
- Pain management strategies
- Stretching and mobilizations
- Facilitation to improve strength and motor output
- NDT/Bobath techniques to improve postural control
- Non-PT specific treatments may include: Occupational therapy, social work, personal support worker, rehabilitation support worker, nutritionist
CLIENT CASE

C4 QUADRIPLEGIA (AIS D), SEVERE OSTEOARTHRITIS BILATERAL KNEE & LOW BACK PAIN
PATIENT PROFILE

• Retired 63-year old male
• Lives with his wife in a condo
• Insidious onset of weakness in legs and decreased balance
• Diagnosed with spinal stenosis of the central canal due to severe osteoarthritic changes
• Surgery: December 2017, posterior C3-7 decompression, C4-6 instrumentation and fusion
• Post-op he developed new left upper extremity weakness and syncopal episodes
• Uses power wheelchair for mobility at home and in the community
• Able to ambulate for short distances using right knee brace and left dictus with minimum to moderate assist x 1
• Sit to stand from plinth with 2-wheeled walker and moderate assist x 1
• Inpatient rehabilitation: Lyndhurst December - March
• Outpatient rehabilitation: Lyndhurst May - October
• Current plan of care: clinic based physiotherapy 2x/week
Impairments

- Motor incomplete classification – at least half of key muscle functions below the single neurological level of injury having a muscle grade ≥ 3.

- Presents with incomplete quadriplegia, weakness in all 4 limbs and trunk, abnormal tone in left side more than right, sensory abnormalities, neuropathic pain, balance and mobility impairments
THE APPLICATION OF ACTIVE PHYSIOTHERAPY TO CLIENTS WITH SEVERE SPINAL CORD INJURIES & COMPLEX HISTORIES

PROBLEM LIST

• Weakness L>R upper and lower extremity
• Decreased range of motion cervical and lumbar spine, decreased ability to dissociate pelvic from trunk
• Forward head posture, increased thoracic kyphosis, bilateral protracted and anteriorly tipped shoulders
• Increased tone in right upper extremity, particularly finger flexion
• Altered postural control with decreased weight bearing on left side in standing
• Decreased balance in sitting and standing
• Decreased activity tolerance due to pain and fatigue
• Clonus left lower extremity
• Other: severe osteoarthritis bilateral knees, neuropathic pain and paraesthesia, intermittent swelling left lower extremity, and low back pain all impact his ability to participate in therapy
• Additionally, the client can be highly anxious and pain focused at times
GOALS

1. Walk independently with a 2-wheeled walker for short distances on even terrain
2. Complete a home exercise program independently
3. Improve balance and prevent falls
4. Attend a community-based movement & exercise program for individuals with neurological conditions
5. Better manage pain
OUTCOME MEASURES

- Walking distance with 2-wheeled walker, including number of sitting breaks required
- Standing balance duration with no gait aids
- Timed Up and Go
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INTERVENTIONS

The treatment of spinal cord injury requires both specialized training and equipment. At Propel Physiotherapy, we combine our knowledge and passion for working with people with spinal cord injury with cutting-edge treatments and technologies. This enables us to provide high-quality comprehensive care in both our clinics and out in community settings.

- Education regarding pain control strategies
- Sitting balance
- Standing balance with and without perturbations
- Sit to stand and transfer training
- NDT/Bobath strategies to increase postural control and motor output
- Gait education with a 2-wheeled walker, including barefoot walking
- Upper and lower extremity stretching
- NDT and Bobath techniques to increase postural control
- Left upper and lower extremity facilitation and mobilizations to increase range of motion
- Low back mobility exercises
- Prescription of home exercise program to assist with posture, balance, and strength in both upper and lower extremities
- Heat and Biofreeze for pain control, as needed
RESULTS

1. Now able to walk 80m with 2ww and supervision, using no Dictus or right knee support
2. Improved postural control in sitting and standing
3. Able to reach outside base of support with supervision
4. Able to transfer sit to stand independently with 2-wheeled walker
5. Improved ability to weight shift anterior to posterior as well as laterally
6. Improved ability to dissociate pelvis from lumbar spine
7. Improved ambulation tolerance and independence
TAKEAWAYS

Despite having a multitude of neurological and complex orthopaedic issues limiting this client’s mobility, Propel’s registered physiotherapist Alanna Holz was able to use salient goals to make his treatment sessions engaging and productive. Using her skillset, Alanna was able to motivate and push the client to complete portions of physical therapy that are highly active and quite difficult, despite the client reporting pain and soreness.

This client has improved his independence and activity tolerance as a result of the strategies above, and is close to achieving his goal of attending a community-based exercise program.

For this particular client and for clients in similar situations, having a skilled physiotherapist with an understanding of physical and neurological limitations perform a comprehensive assessment is key in shaping physiotherapy sessions. It is encouraging to know and see that an active physiotherapy program can be applied to clients with severe injuries and complex histories, in order to push the client towards their optimal abilities.
The Application of Active Physiotherapy to Clients with Severe Spinal Cord Injuries & Complex Histories

We have set ourselves apart by the quality of care our clinicians provide and the unique setting we provide to meet the individual of these clients. Our comprehensive client-centered approach allows each clinician to spend valuable and meaningful time with each client. This is especially important for people who have sustained a brain or spinal cord injury. To accommodate these complexities, we will see some of our clients for an hour to an hour and a half for assessments and treatment sessions; and there is additional preparation time that goes into each appointment.

All of the physiotherapists at Propel Physiotherapy have training in the Bobath Concept or Neuro-Development Treatment and have completed post-graduate certifications and course work in the specialty area of neurology. We consider current principles of neurophysiology, motor learning and the capacity of the nervous system to change through neuroplasticity when treating each client.

We take a hands-on approach to treatment. Our therapists have specific training required to address the needs for this type of clientele, which includes manual therapy, soft tissue release, NDT/ Bobath assessment and treatment techniques, normal movement, vestibular rehabilitation, acupuncture, massage therapy, chronic pain management, exercise programming, and mindfulness.

After a full assessment, we develop a customized treatment program to meet each client’s specific goals. We work together with Case Managers, Occupational Therapists, Speech Language Pathology, Social Work, Psychology and a number of other healthcare professionals to provide comprehensive care in the clinic and community.
LIFE IN FORWARD MOTION

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