

# UTILIZING ORTHOPEDIC MASSAGE TO IMPROVE IN-CHAIR COMFORT DURING MANUAL WHEELCHAIR USE FOR A VETERAN LIVING WITH A SPINAL CORD INJURY (SCI) Wendy Hajik LMT, CPT— Integrated Biomechanic Therapy

## INTRODUCTION

Negligible guidance exists for massage therapy intervention to improve life quality of the wheelchair bound, leaving therapists fearful of advanced cases or unaware of the positive impact they could have. Post-rehab, many SCI clients experience nociceptive pain and overall discomfort from manual wheelchair use.

## OBJECTIVE

Identify the impact of orthopedic massage on nociceptive pain and overall discomfort in a veteran client living with a SCI, in a 12 therapy session series.

## METHODS

The client (consent obtained), a 39-year old male Veteran, fractured his C-5 and C-6 vertebrae in combat, while serving in Afghanistan in 2006. Considered a complete quadriplegic, he has regained some mobility throughout his cervical spine, glenohumeral, scapular, and core areas, through rehabilitation.

At the initial session, the client presented with nociceptive pain and overall discomfort of his upper body using the verbal numeric rating scale (VNRS) at a 6 but could range as high as an 8. He reported his lower body at an 8 with "tightness" throughout his lower back and gluteal muscles.

The client was permitted to dictate the focus between upper or lower body therapy sessions, depending on the level of discomfort experienced that day.

Session duration ranged from 20-45 minutes, depending on the severity of pain or discomfort. The client provided his VNRS rating pre and post treatments on both upper and lower body days.

Upper body focused treatments included range of motion (ROM) visual assessment of scapular travel during glenohumeral abduction/adduction and flexion/extension pre and post treatment.

Upper body treatments focused on improving ROM and overall discomfort pushing his chair. Orthopedic massage techniques utilized included cross-fiber friction, longitudinal stripping, neuromuscular resistance techniques, and trigger point.

These techniques were applied to cervical, glenohumeral, scapular, and spinal musculature. Lower body treatments focused on improving his in-chair comfort.

## <u>Upper Body</u>

#### **Cross Fiber Friction and** Longitudinal Stripping

#### <u>Cervical</u>

- Sternocleidomastoid
- Scalenes
- Upper Trapezius

#### <u>Glenohumeral</u>

- Flexion/Extension
- Abduction/Adduction
- Horizontal Adduction
- Medial Rotation

#### **Trigger Point**

#### <u>Glenohumeral</u>

#### Subscapularis

#### Neuromuscular Therapy

#### <u>Cervical</u>

- Rotation
- Lateral Flexion

#### <u>Glenohumeral</u>

- Flexion/Extension
- Abduction/Adduction
- Horizontal Adduction
- Medial Rotation

## **Posterior Deltoid\***

#### **Cross Fiber Friction and** Longitudinal Stripping

#### <u>Glenohumeral:</u>

- Pectoral Major
- Pectoral Minor
- Anterior Deltoid
- Lateral Deltoid
- Posterior Deltoid
- Biceps Brachii
- Coracobrachialis
- Supraspinatus Latissimus Dorsi

#### Trigger Point

<u>Glenohumeral:</u>

#### Subscapularis

#### **Neuromuscular Therapy**

#### <u>Glenohumeral:</u>

- Flexion/Extension
- Abduction/Adduction
- Horizontal Adduction
- Medial Rotation

#### <u>Spinal:</u>

- Iliacus

#### **Passive Range of Motion**

Coxal:



## Lower Body

#### **Cross Fiber Friction and** Longitudinal Stripping

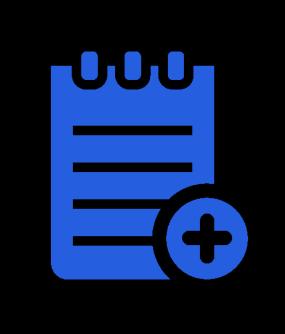
Flexion External Oblique Rectus Abdominis

Psoas Major

Flexion/Extension



The combination of multiple soft tissue manual therapy modalities, applied with the intent of relieving pain conditions throughout the musculoskeletal system.



#### **POSTERIOR DELTOID SESSION\***

In addition to the chronic, nociceptive pain, individuals operating a manual wheelchair are also at risk for acute pain due to repetitive stress injuries.

For one of his sessions, the client presented with acute pain in his right posterior deltoid, in addition to his chronic nociceptive pain at a level of VNRS 8. This pain is intermittent for the client, and he would typically treat with over the counter anti-inflammatories.

The same techniques were utilized as for general upper body sessions focused on nociceptive pain, but with increased dosage to the right side. Post session the client reported his pain level in his right deltoid to be at a level 0.

#### <u>Combat vs Non-Combat</u> <u>Spinal Cord Injuries</u>

Combat associated spinal cord injuries are more likely to involve multiple spinal level, multi-systemic, and polytraumatic injuries. (Traumatic brain injury, amputations)

A 2003-2008 study compared Injury Severity Scores (ISS was classified into mild (1–15), moderate (16–25), severe (26 –50), and critical (51–75)).

Combat related injury had higher instance of reporting ISS scores within the severe (92) and critical (28) ranges than with the noncombat related injuries of severe (18) and critical (5).

# 

#### <u>Veteran Spinal Cord Injuries</u>

The VA treats more than 27,000 veterans with SCI per year, making it the largest health care system providing spinal cord injury care.

Details of a 10 year study compared Spinal Cord Injury Hospitalizations Among U.S. Army Soldiers Deployed to Iraq (Operation Iraqi Freedom) and Afghanistan (Operation Enduring Freedom).

- Total Spinal Cord Injuries:<sup>4</sup>
- Afghanistan: 83, 16% resulted in paralysis (13)
- Iraq: 249, 13% resulted in paralysis (32)

# Individuals with a spinal cord injury are susceptible to secondary medical complications, including chronic and acute pain syndromes.

#### <u>Living with SCI</u>

"After an SCI, chronic musculoskeletal

pain, a type of nociceptive pain may occur with abnormal posture, gait, and overuse of structures such as arm and shoulder."

80% of SCI individuals experience pain, nociceptive being the most common.<sup>2</sup>

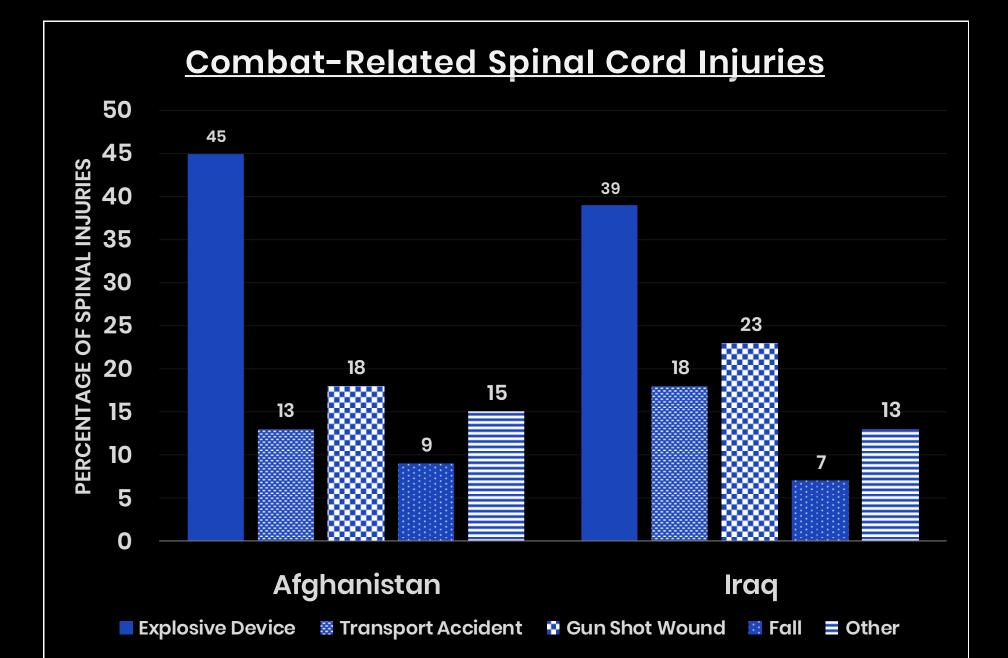
#### **Current Pain Treatment Options:**

- Analgesics
- Non-Steroid Anti-Inflammatories
- **Steroid Injections**
- Opioids

There are approximately **288,000** individuals living in the United States with a spinal cord injury:

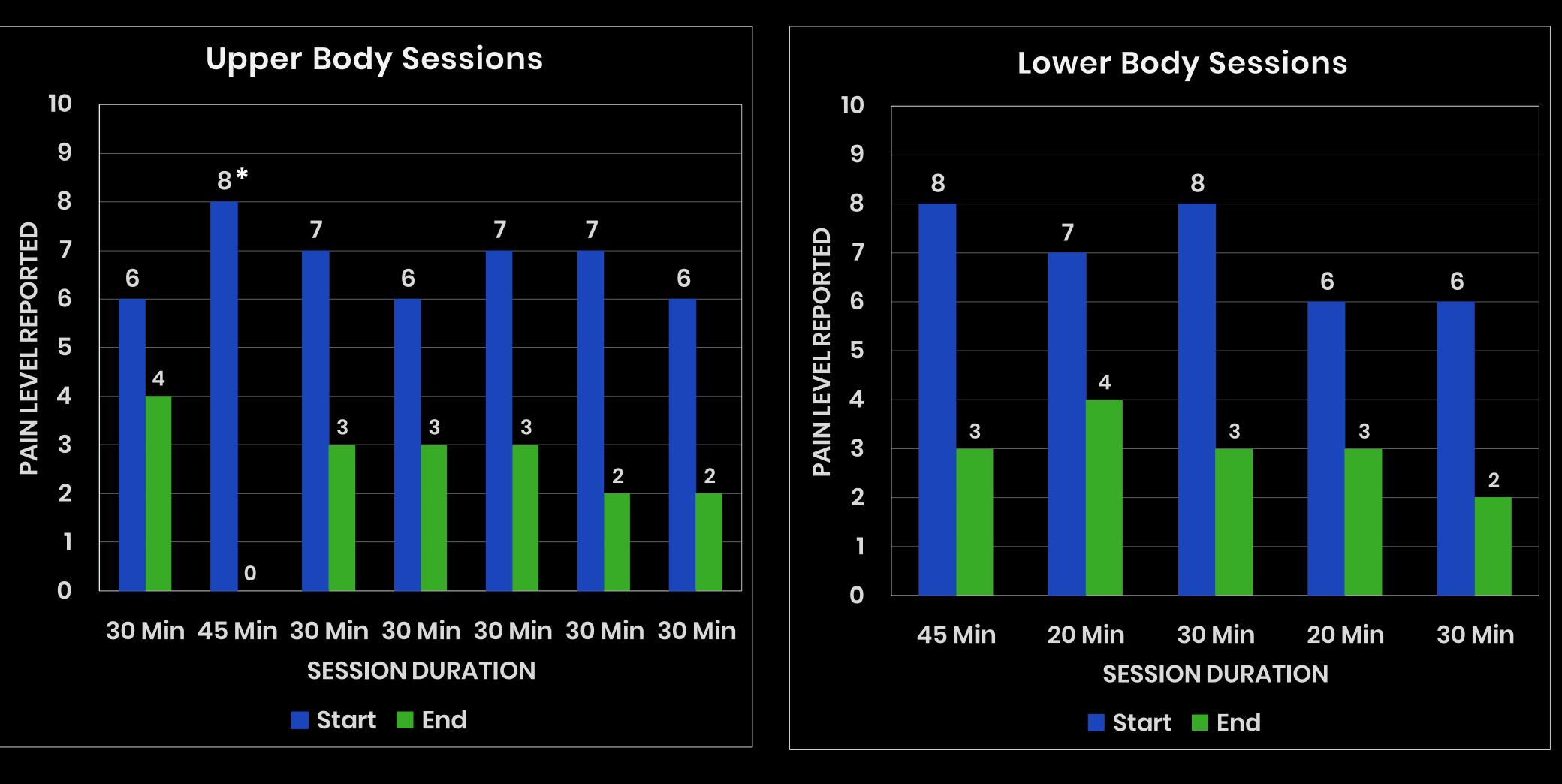
- 58.7% Quadriplegic
- 40.6% Paraplegic

There are over **17,000** new cases of spinal cord injury per year:<sup>3</sup>

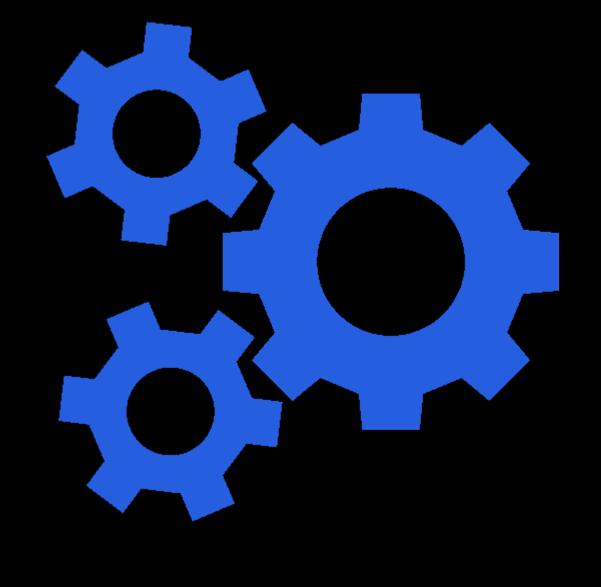


Data collected from: Afghanistan 9/11/01-1/11 and Iraq 9/1/02-1/11

- adduction and flexion/extension.



- bama at Birmingham,



## RESULTS

Seven upper body therapy sessions yielded an average of 4.28 VNRS point reduction. Visual ROM assessment indicated reduced scapular travel during glenohumeral abduction/

The client reported a more comfortable experience pushing his chair.

Five lower body therapy sessions yielded an average of 4 VNRS point reduction.

The client reported feeling "looser" and more comfortable throughout his lower back and gluteal muscles. He also reported improved core movement and increased comfort in his chair.

## CONCLUSIONS

The results demonstrate the potential benefits of orthopedic massage to reduce nociceptive pain, increase range of motion, and improving in chair comfort for this underserved population.

Limitations exist with visual observation only. Future reports should include quantifiable measurements of ROM pre/post session and pre/post series. This would enable more accurate identification of short term and longer term musculoskeletal effects.

Future reports should also include more qualitative data from the client to assess effects orthopedic massage can have on quality of life.

## REFERENCES

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