

Official title of the study: Effect of Myofascial Release on Performance in the 20-Meter Speed Test in Wheelchair Rugby Athletes With Spinal Cord Injury

NCT number: NCT ID not yet assigned

Date: July, 11th, 2026.

Objective

The objective of this study is to investigate the acute effect of upper-limb myofascial release on 20-meter sprint performance in wheelchair rugby athletes with spinal cord injury.

Study Protocol

Study Design

A randomized crossover study will be conducted with wheelchair rugby athletes recruited by convenience from a team competing in the first division of the Brazilian Wheelchair Rugby Championship.

- Number of intervention: one (myofascial release).

- Number of study arms: two

(a) Experimental with myofascial release - participants will perform a 20-meter wheelchair sprint test immediately after receiving myofascial release applied to the upper limb muscles involved in wheelchair propulsion.

(b) No intervention - control (with no myofascial release) - participants will perform a 20-meter wheelchair sprint test without any prior intervention.

- Allocation: randomized.

The study was submitted and approved by the Institutional Research Ethics Committee. All participants will provide written informed consent before enrollment.

Primary Outcome Measure

20-Meter Wheelchair Sprint Performance Time required (in seconds) to complete a 20-meter wheelchair sprint using an electronic photocell timing system. Measurements will be taken immediately after each experimental condition (with and without myofascial release).

Eligibility Criteria

Inclusion Criteria:

- Men and women
- Aged 18 years or older
- Cervical spinal cord injury (tetraplegia)
- Practice of wheelchair rugby for at least 12 months
- Participating in team training sessions for at least 3 months prior to the study.

Exclusion Criteria:

- Musculoskeletal pain
- Injury that prevents completion of the study protocol.
- Wounds, pressure ulcers, or skin lesions at the site of myofascial release application
- Recreational athletes
- Medical contraindication to manual therapy
- Infection, fever, or acute illness at the time of assessment

Procedures

Data collection will be conducted over two alternate days separated by a 24-hour interval. All assessments will be performed at the same time of day (between 4:00 PM and 6:00 PM) by the same team of evaluators, who will be previously trained in all study procedures.

On the first day, participants will sign the informed consent form, complete a demographic and training history questionnaire, and undergo anthropometric assessments, including body mass and height measurements. Subsequently, the order of the experimental conditions (myofascial release or control) will be determined by random allocation, and each condition will be performed on a separate day.

Participant Characterization

Participant characteristics will be obtained using a structured questionnaire including demographic information, training history, and spinal cord injury characteristics.

20-Meter Sprint Test

The 20-m sprint course will be marked on a flat, obstacle-free surface at the same indoor facility where the athletes regularly train, under controlled environmental conditions (wind-free environment and ambient temperature of approximately 26°C). Sprint time (s) will be measured using an electronic timing system consisting of three infrared photocell gates, positioned at the starting line, the 10-m mark, and the finish line.

Participants will be instructed to complete the 20-m distance as fast as possible. The test will begin from a stationary position, with the front wheels of the wheelchair

positioned immediately behind the starting line. Two trials will be performed, separated by a three-minute passive recovery period. The fastest time recorded across the two trials will be used for statistical analysis.

All testing sessions will be conducted at similar times of the day to minimize the potential influence of circadian rhythm, residual fatigue, and environmental conditions on performance. Participants will use their own sport wheelchairs, which will be maintained under the same conditions throughout all testing sessions. They will be instructed to refrain from consuming caffeine or alcohol, engaging in strenuous physical exercise, or using recovery strategies such as massage, myofascial release, cryotherapy, or similar interventions during the 24 hours preceding each assessment. In addition, standardized verbal encouragement will be provided by the same evaluator during all testing sessions to ensure consistency in instructions and participant motivation throughout the testing protocol.

Myofascial Release

Myofascial release will be applied to the upper limb muscles involved in wheelchair propulsion, including the biceps brachii, brachialis, and triceps brachii. The intervention will be performed by the same trained physiotherapist throughout all experimental sessions using a myofascial massage stick (45 cm in length and 4.2 cm in diameter). Participants will be positioned in the prone position with their arms extended for treatment of the triceps brachii and in the supine position for treatment of the biceps brachii and brachialis.

The massage stick will be applied in both the distal-to-proximal and proximal-to-distal directions for 90 seconds over each muscle group, resulting in a total intervention time of approximately 6–9 minutes. Pressure will be monitored using a numeric pain rating scale (1 = no pain; 10 = maximal discomfort), and participants will be instructed to maintain a perceived pain intensity between 6 and 8 throughout the intervention. Pain intensity will be continuously monitored, and pressure will be adjusted if necessary to maintain the target range.

Participants will not perform a warm-up before the intervention. The 20-meter wheelchair sprint test will begin 3 to 5 minutes after completion of the myofascial release session. Myofascial release is considered a minimal-risk intervention. Potential adverse effects may include mild muscle soreness or tenderness following treatment, and

participants will be monitored throughout the procedure for any signs of discomfort or adverse events.

Statistical Analysis Plan

Data distribution will be assessed using the Shapiro-Wilk test. Continuous variables will be presented as mean $\pm$ standard deviation if normally distributed or as median and minimum–maximum values if non-normally distributed. Delta values (Δ) will be calculated as the difference between the 20-m and 10-m sprint times ($\Delta = 20 \text{ m} - 10 \text{ m}$). Comparisons of 10-m sprint time, 20-m sprint time, and Δ values between the myofascial release and control conditions will be performed using the paired t -test for normally distributed data or the Wilcoxon signed-rank test for non-normally distributed data. Statistical analyses will be conducted using IBM SPSS Statistics version 21.0 (IBM Corp., Armonk, NY, USA), and statistical significance will be set at $p < 0.05$.