

Spasticity

Understanding spasticity

Spasticity is a common secondary condition following a spinal cord injury (SCI) due to increased reflex activity and can be defined as a velocity dependent increase in muscle tone or muscle stiffness. Spasticity can occur in any part of the body that is affected by the SCI e.g. legs, trunk and/or arms.

Spasticity can cause:

- involuntary muscle contractions or muscle spasms such as sudden jerky movements of your limbs
- stiff or tight muscles when trying to move the limbs
- clonus (repetitive up and down movement e.g. of the foot on the footplate)
- pain and weakness.

Spasticity presents in different ways and can range from mild to severe. Spasticity can begin to present any time after injury, from a few hours to weeks, or even months after the initial injury.

Other Resources

QSCIS Spasticity fact sheet

- [Spasticity following spinal cord injury \(health.qld.gov.au\)](https://www.health.qld.gov.au/health-topics/spasticity)

Queensland Clinical Networks: Rehabilitation

Position Statement: Recommendations for Establishing and Providing Hypertonicity/Spasticity Services in Queensland 2022

- [Recommendations for Establishing and Providing Hypertonicity / Spasticity Services in Queensland | Clinical Excellence Queensland](#)

Assessment

Assessment can be used to quantify spasticity, such as the spasticity angle, to help guide treatment and to assess the effectiveness of anti-spasticity medications.

Ashworth and Modified Ashworth Scale

This scale measures resistance during passive stretching and is used as a measure of spasticity in patients with upper motor neuron lesions.

Position

The assessment is completed in a supine position.

Scoring

Scoring	Modified Ashworth Scale
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V1 Effective: August 2022 Review: August 2023

0	No increase in muscle tone
1	Slight increase in muscle tone
1+	Slight increase in muscle tone, with a catch, followed by minimal resistance
2	More marked increase in muscle tone, but affected part(s) are easily moved
3	Considerable increase in muscle tone and passive movement is difficult
4	Affected part(s) are rigid in flexion or extension

Video

- [SCIREproject.com - Ashworth & Modified Ashworth Test - YouTube](#)

Tardieu and Modified Tardieu Scale

This scale is used to quantify spasticity by assessing the muscle response to stretch at different velocities, and to determine the spasticity angle.

Position

The assessment is completed in a supine position.

Velocity of movement

V1	As slow as possible
V2	Speed of the limb segment falling
V3	At a fast rate (> gravitational pull)

Scoring

Scoring	Tardieu
0	No resistance throughout passive movement
1	Slight resistance throughout, with no clear catch at a precise angle
2	Clear catch at a precise angle followed by release
3	Fatiguable clonus (<10 seconds) occurring at a precise angle
4	Unfatiguable clonus (>10 seconds) occurring at a precise angle
5	Joint immobile

Calculating the Spasticity Angle

R1	Angle of catch seen at V2 or V3
R2	Full range of motion achieved at V1

Spasticity Angle = R2 – R1

A small difference between R1 & R2 in the inner to middle range indicates predominantly fixed contracture, and a large difference in the outer to middle range of normal length indicates a large dynamic component.

Video

- [Tardieu Spasticity Scale - YouTube](#)

Other Resources

QSCIS Spasticity Assessment Form

- [Spasticity Assessment Form \(health.qld.gov.au\)](https://health.qld.gov.au)

Conservative/Physiotherapy Management

Physiotherapy intervention that may help to reduce spasticity in the short term.

This includes:

- Passive movement (e.g., lower limb cycling)
- Prolonged positioning eg prone lying
- Electrical stimulation (e.g., active assisted FES cycling)
- Standing/weight bearing
- Hydrotherapy

Reference

Reznik, J., Simmons, J. (2020). Rehabilitation in spinal cord injuries (1st ed.). Elsevier Health Sciences.