



Webinar Series

United Spinal Association

Webinar title: **Know Your Options for Treating Severe Spasticity**

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Acquired Brain Injury Services at Shepherd Center



Today's Agenda

- What is spasticity?
- What are the symptoms of spasticity?
- What are current spasticity treatment options?



What Could You Do if Your Spasticity Was Controlled?

What is Spasticity?

Tight, stiff muscles that make movement difficult or uncontrollable

Spasticity is caused by damage or injury to the part of the central nervous system (brain or spinal cord) that controls voluntary movement

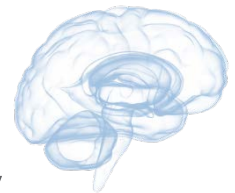
Spasticity of spinal origin

Spinal cord injury
Multiple sclerosis



Spasticity of cerebral origin

Cerebral Palsy
Stroke
Traumatic Brain Injury



Signs and Symptoms of Spasticity

- Increased muscle tone
- Overactive reflexes
- Involuntary movements, which may include:
 - spasms (brisk and/or sustained involuntary muscle contraction)
 - clonus (series of fast involuntary contractions)

WebMD Pain Management Health Center Website. Pain Management: Spasticity.
<http://www.webmd.com/pain-management/pain-management-spasticity>. Accessed February 24, 2015.

Symptoms of Spasticity

- Difficulty with care and hygiene
- Abnormal posture and poor balance
- Contractures (permanent contraction of muscles and tendons due to severe, persistent stiffness and spasms)
- Bone and joint deformities
- Spasticity related pain
- Increased fatigue
- Decreased functional abilities and delayed motor development

WebMD Pain Management Health Center Website. Pain Management: Spasticity.
<http://www.webmd.com/pain-management/pain-management-spasticity>. Accessed February 24, 2015.

Spasticity Can Have an Impact on Your Life

- Limited movement of arms and legs
- Inability to walk properly
- Difficulty using hands to dress, bathe, eat, etc., which can increase caregiver burden
- Painful spasms
- Interference with work, school, and personal relationships
- Development of complications:
 - Painful deformities (contractures)
 - Skin sores

Spinal Cord Injury (SCI) & Spasticity

- Spasticity is a common problem after SCI
- Increased spasticity may also serve as a warning mechanism to identify pain or problems in areas where there is no sensation



Christopher & Dana Reeve Foundation. Paralysis Resource Center.
<http://www.christopherreeve.org/site/c.mtKZKgMWKwG/b.4453419/k.3757/Spasticity.htm> Accessed 23 February 2015.

SCI & Spasticity Statistics

1. https://www.nscisc.uab.edu/PublicDocuments/fact_figures_docs/Facts%202013.pdf . Accessed February 24, 2015.

2. Levi R, Hultling C, Seiger A. The Stockholm Spinal Cord Injury Study: 2. Associations Between Clinical Patient Characteristics and Post-Acute Medical Problems. *Paraplegia* 1995; 33: 585-594.

273,000
INDIVIDUALS IN THE
UNITED STATES HAVE SCI¹

40.6%
INCOMPLETE
TETRAPLEGIA¹

18%
COMPLETE
PARAPLEGIA¹

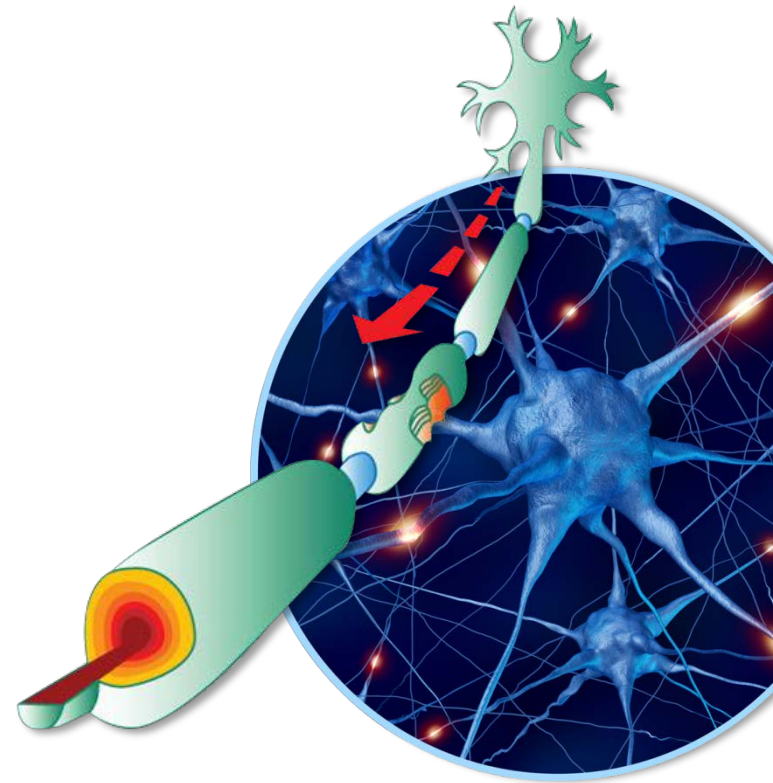
18.7%
INCOMPLETE PARAPLEGIA¹

75,000
LIVING WITH
SEVERE SPASTICITY²



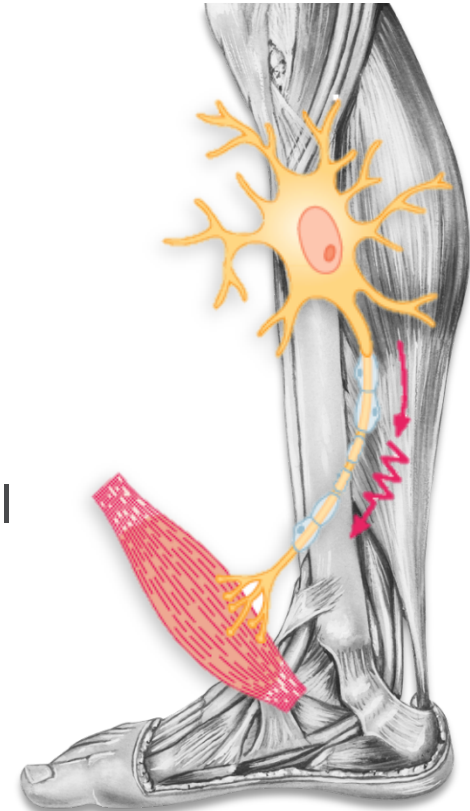
Multiple Sclerosis (MS)

- MS is a chronic disease that attacks the central nervous system (CNS), resulting in damage to the myelin sheath that surrounds and protects nerve fibers
- Nerve impulses traveling to and from the brain can be distorted or interrupted when there is damage to the myelin or nerve fibers
- Patches of scar tissue called plaques may form over the affected areas, further disrupting nerve communication



Multiple Sclerosis (MS) & Spasticity

- Spasticity is one of the more common symptoms of MS
- Although it can occur in any limb, it most commonly occurs in the legs
- If left untreated, spasticity can cause significant complications, including contractures and pressure sores
- Some degree of spasticity can be beneficial for individuals with significant weakness in the legs, as spasticity can be utilized for activities such as standing, transferring, or walking



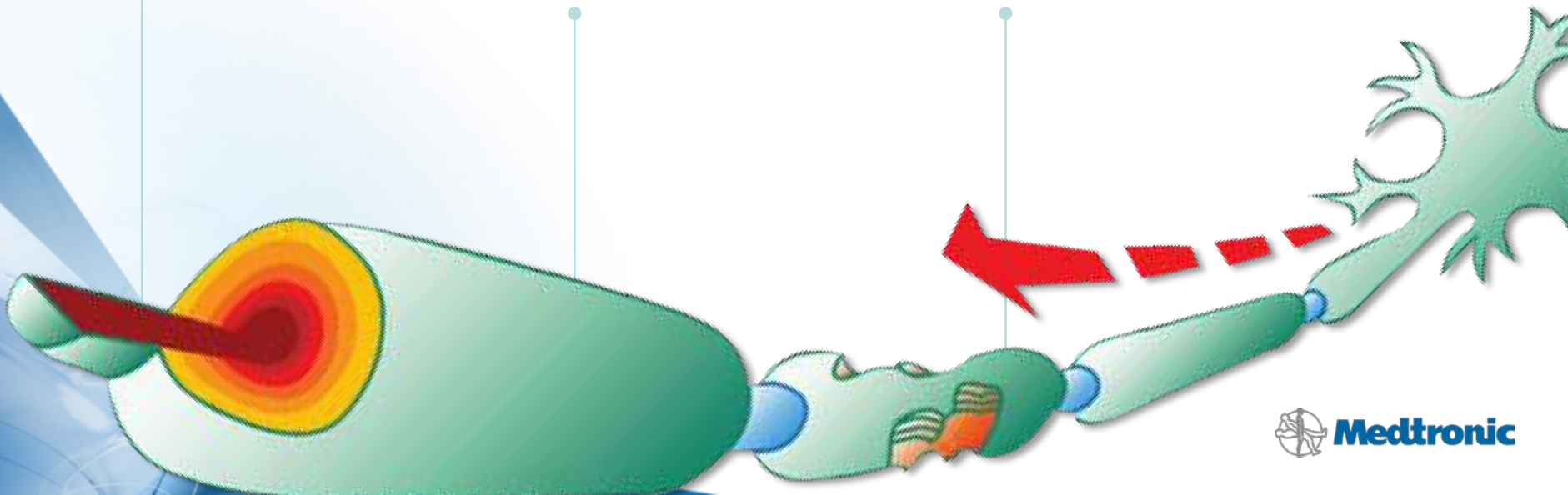
MS & Spasticity Statistics

1. <http://www.nationalmssociety.org/About-the-Society/MS-Prevalence>. Accessed February 2015.
2. Rizzo MA et al. Prevalence and treatment of spasticity reported by multiple sclerosis patients. *Multiple Sclerosis*. 2004;10:589-95.

400,000
PEOPLE IN US
HAVE MS¹

336,000
PEOPLE WITH MS
EXPERIENCE
SPASTICITY²

136,000
INDIVIDUALS WITH MS LIVING WITH
SEVERE SPASTICITY



Can Spasticity Be Treated?

Spasticity Management Options

Oral Medication

Rehabilitation
Therapy

Managing
Spasticity-Related
Pain

Intrathecal
Medication

Motor Point Blocks,
Nerve Blocks,
Injections

Neurosurgery

Orthopedic
Surgery

Rehabilitation Therapy

- Usually done in a clinic, a hospital, or at home
- May include:
 - Physical therapy
 - Occupational therapy
 - Speech therapy

Oral Medications to Treat Spasticity¹

- Drugs that act on central nervous system to relax muscles
 - Oral baclofen
 - Benzodiazepines (i.e. Valium*)
- Drugs that act directly on the muscle by blocking signals that cause muscles to contract
 - Dantrolene sodium (Dantrium*)
- Drugs that reduce activation of spinal (not skeletal) motor neurons via binding to alpha-adrenergic receptors
 - Imidazolines (Tizanidine)



*Valium® is a registered trademark of Roche Products Inc.

*Dantrium® is a registered trademark of Proctor & Gamble.

¹Medivision Website. Spasticity: Research, Treatment & Education. <http://spasticity-info.com/html/treatment.html>. Accessed February 24, 2015.

Additional Therapies

- Effective spasticity management may require use of two or more drugs, or a combination of oral medications with another type of treatment
- Some patients with more severe spasticity may not receive adequate results, or they may experience unacceptable side effects from oral medications
- In this case, they may try alternative therapies

Injection Therapy

- Used for specific muscle groups, such as one hand, one foot, or a shoulder
- Designed to work on the nerve site
 - Blocks communication between nerve and muscle
- May require repeat injections as effectiveness wears off over time
 - Botulinum toxins
 - Phenol and alcohol



National Institute of Neurological Disorders and Stroke Website. Spinal Cord Injury: Hope Through Research. http://www.ninds.nih.gov/disorders/sci/detail_sci.htm. Accessed February 24, 2015.

Selective Dorsal Rhizotomy^{1,2}

- Surgical procedure performed along lower back
 - Surgeon uncovers and tests small nerve roots that make up sensory nerve fibers in the spinal cord
 - Involves cutting certain sensory (dorsal) roots that have abnormal responses to testing
- Not reversible
- General treatment for lower extremity spasticity
- Usually combined with intensive physical therapy

¹McLaughlin J, Bjornson K, Temkin N, et al. Selective dorsal rhizotomy: meta-analysis of three randomized controlled trials. *Dev Med Child Neurol*. 2002;44(1):17-25.

²National Institute of Neurological Disorders and Stroke Website. Spinal Cord Injury: Hope Through Research. http://www.ninds.nih.gov/disorders/sci/detail_sci.htm. Accessed February 24, 2015.

Orthopedic Surgery

- A surgical procedure for treating problems associated with spasticity
- Targets muscles, tendons, or bones
 - Soft tissue
 - Lengthening/releases
 - Tendon transfers
 - Bony procedures
 - Osteotomies
 - Fusions

National Institute of Neurological Disorders and Stroke Website. Spinal Cord Injury: Hope Through Research. http://www.ninds.nih.gov/disorders/sci/detail_sci.htm. Accessed February 24, 2015.

Intrathecal Therapy

- Delivers liquid form of medicine directly to fluid around spinal cord
- Requires less medication (since it does not circulate throughout body)
- May produce fewer or more tolerable central nervous system side effects compared to other antispasticity medications



Penn RD, Savoy SM, Corcos D, et al. *New Eng J Med*. 1989;320:1517-1521.

***Talk to your doctor to
determine what treatment
option might be right for you***



Webinar Series

United Spinal Association

For any follow up questions about Spasticity, related matters or other questions, please feel free to contact United Spinal Associations *Spinal Cord Injury Resource Center* by email or phone:

Spinal Cord Injury Resource Center

Email: ask@unitedspinal.org

Phone: 800-962-9629 M-F, 9am – 5pm Eastern