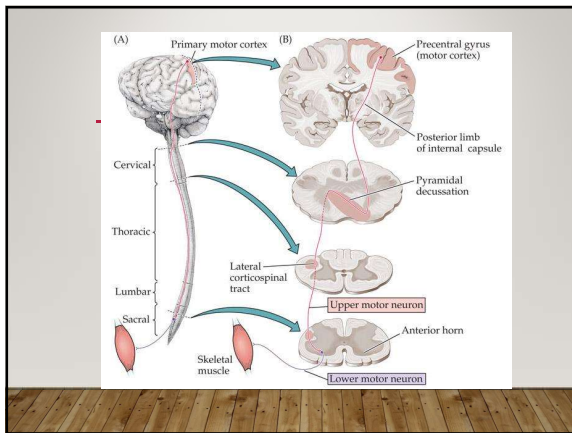


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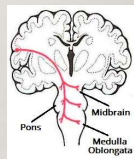
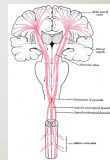
UPPER MOTOR NEURON LESION

- An **upper motor neuron lesion** (also known as **pyramidal insufficiency**) is a **lesion** of the neural pathway above the **anterior horn cell** of the spinal cord and/or **motor nuclei** of the **cranial nerves**.
- Corticospinal and Corticobulbar Tracts
- This is in contrast to a **lower motor neuron lesion**, which affects nerve fibers traveling from the anterior horn of the **spinal cord** or the cranial motor nuclei to the relevant muscle(s)



PYRAMIDAL TRACTS

- **Corticospinal Tracts**
 - Nerve fibres originate from the cerebral cortex and travel down to the anterior horn cells of spinal cord
 - Responsible for movement of limbs
- **Corticobulbar Tract**
 - Nerve fibres from ventral cortex travel to brainstem regions
 - Movement of head and face



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OTHER FORMS OF HYPERTONIA

DYSTONIA

- Patients experience muscle twisting, repetition, and abnormal postures
- Abnormal postures (i.e. cervical dystonia) can be present at rest or only brought on by certain actions (i.e. task specific dystonia or other limb dystonia)
- Causes can be genetic, secondary to drugs or CNS trauma or idiopathic



CONTRACTURE

- A muscle contracture is a permanent shortening of a muscle or joint = A Rigid Joint
- Muscle or tendon too short for too long → Contracture
- Spasticity and spastic dystonia can contribute heavily to contracture development
- Others causes
 - Ischemia (Volkman's)
 - Burns
 - Heterotopic Ossification

Impact and Burden of Spasticity

Patient¹

- Contracture
- Limitation in active function¹ (reaching, grasping, etc)
- Limitations in passive function (e.g., hygiene, positioning, increased in the burden of care)
- Pain
- Dependence on caregiver
- Reduced quality of life
- Poor self-image
- Increased risk of falls



Caregiver²⁻⁴

- Fatigue
- Emotional Stress
- Disruption of social activities
- Work absenteeism
- Loss in work productivity
- Reduced quality of life
- Caregiver disability significantly related to increased disability in hygiene & dressing
 - As disability increased from "none" to "severe", amount of care assistance increased from:
 - 0 to 28.2 hrs/wk in hygiene
 - 3.3 to 32.1 hrs/wk in dressing

1. Shanks BB, Brinkley JE. 2000. Burden of spasticity. J Rehabil Nurs 2001; 18(1):10-3. 2. Brown CT, et al. Drug Aging 1995. Spasticity, Depression and Management. 3. Brown CT, et al. Neuro Rehabil 2011; 27(2):10-20. 4. Brown CT, et al. 2010. The Annual Assembly of the American Academy of Physical Medicine and Rehabilitation. Seattle (WA), 4-7 Nov 2010. 5. Olanoff G, et al. Amer Assoc Phys Rehabil Med 2012; 4:10. 6. Craig S, et al. Spine 1995; 20:933-940. 7. Lundholm K, et al. Spine 2004; 29(24):2520-2524.

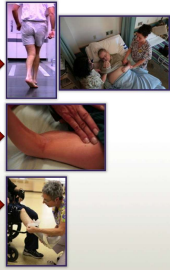
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Assessment of Spasticity



Patient Evaluation

- Does spasticity significantly affect function (gait, dressing, transfer, catheterization)?
- Is there a risk or presence of complication (contractures, skin breakdown)?
- Does spasticity result in pain or discomfort (with brace or footwear)?

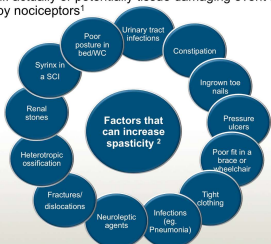


Sakunam LE. CMAJ 2003; 169:1173-9.

Evaluation of the Spastic Patient

Noception

Noxious stimuli: actually or potentially tissue damaging event transduced and encoded by nociceptors¹



1. Loesser JD and Treddle RD. 2008. Pain 137 (3): 473-7.
2. Valerie L, Stevenson, Alan J, Thompson, Louise Jarrett. Text book of Spasticity Management A practical multidisciplinary guide 2006.

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