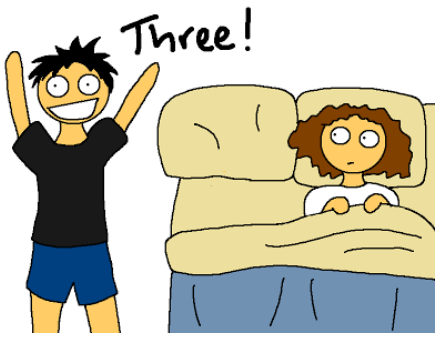
QUESTIONS

Does your spasticity . . .

help or limit your walking?

cause pain?



help or hinder your ability
to get in and out of bed?

make it difficult to breathe or
take a deep breath?

Affect your posture in a good way or
bad way?

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SPASTICITY:
THE GOOD, THE BAD, AND THE NOT SO UGLY

Geralyn Bertellotti MS OTR/L
Amy Icarangal PT, NCS
UW Medicine: Harborview Medical Center
Seattle, WA

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PROS AND CONS OF SPASTICITY

Pros

- Increases function
- Maintains tone/muscle bulk
- Increase in venous return

Cons

- Decreases function
- Poor positioning in wheelchair, in sitting, or in standing
- Impairs respiration
- Pain
- Difficulty with managing hygiene
- Impairs sleep
- Impairs skin

NON PHARMACOLOGIC INTERVENTIONS

- Stretching
- Strengthening
- Weightbearing/Standing
- Whole Body Vibration
- Splinting
- Thermal Modalities
- Electrical stimulation

STRETCHING

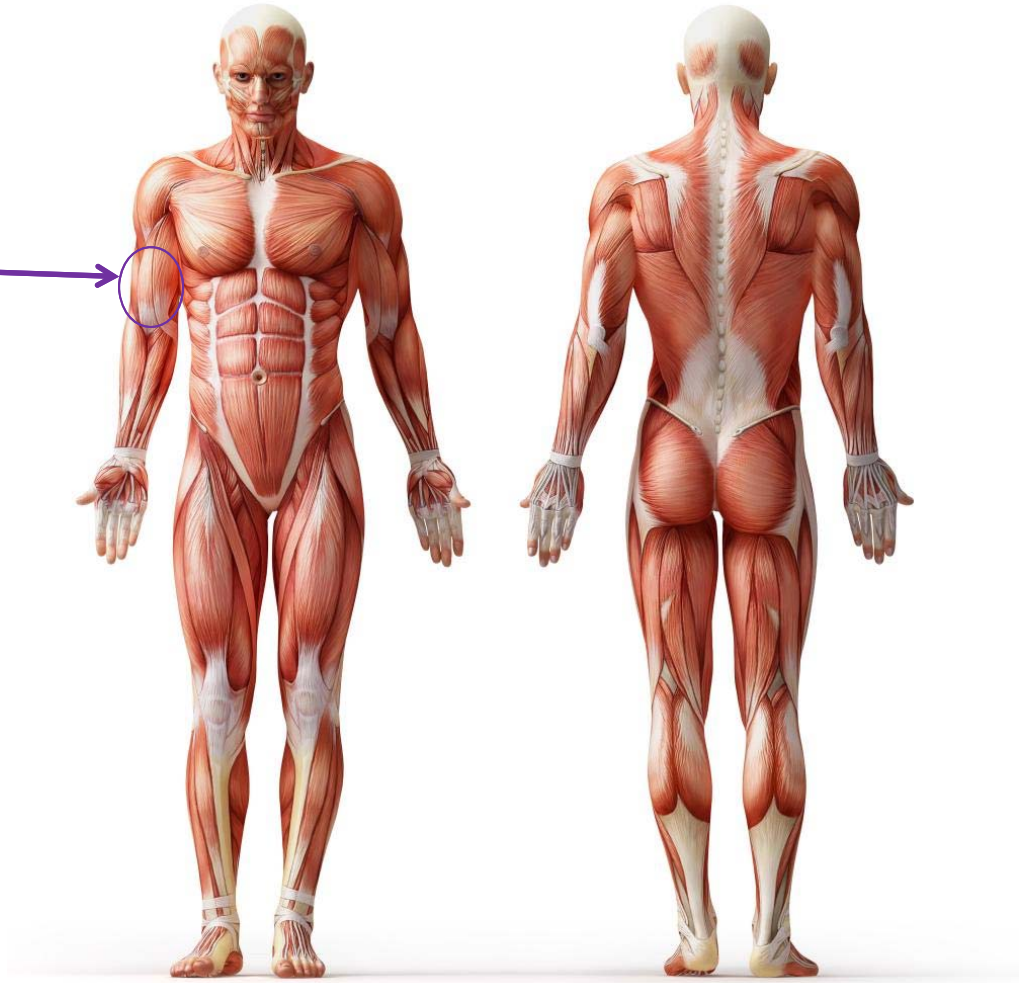
Why it works

- Temporary reduction in muscle tone
- Mechanical changes at the muscles and tendons
- Last several hours

STRETCHING – WHAT TO STRETCH

If you tend to flex when you spasm – stretch your front muscles

- Biceps
- Pectorals
- Abdominals
- Wrist flexors
- Hands
- Hip flexors
- Hamstrings



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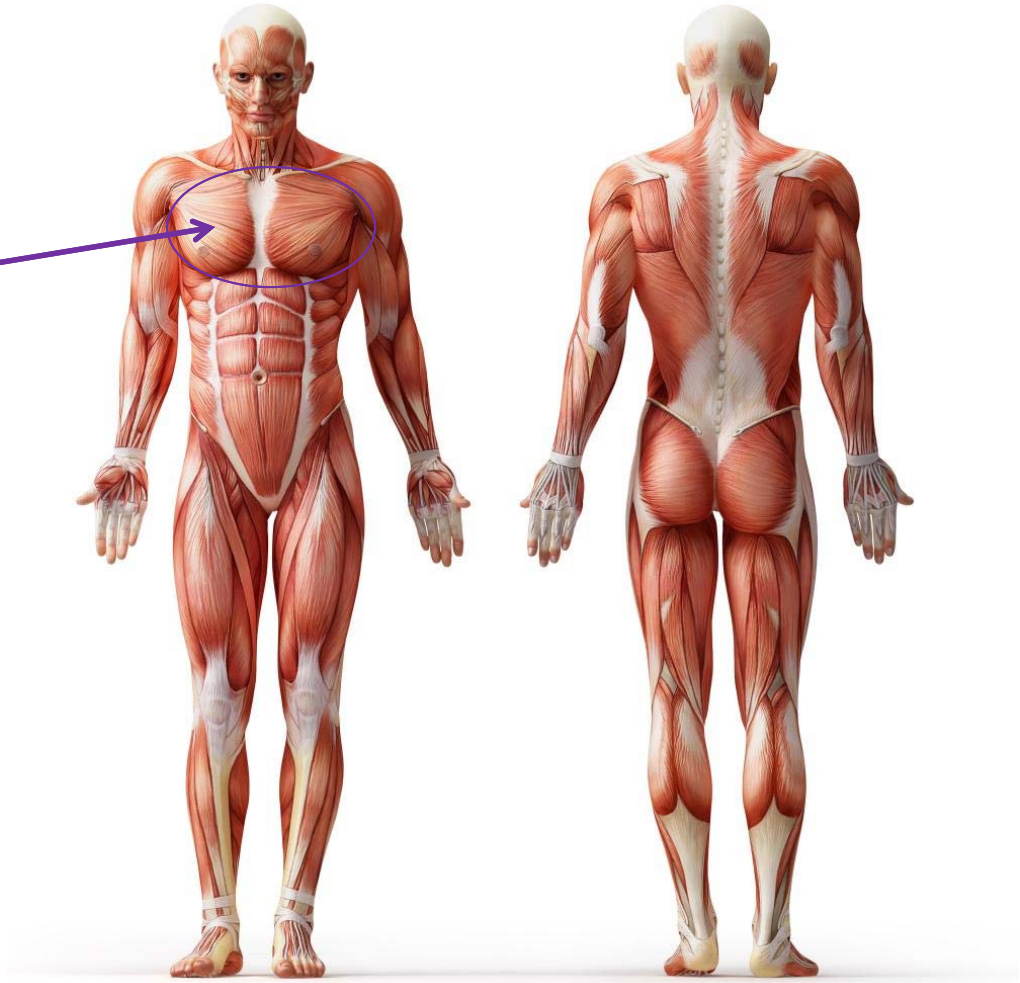

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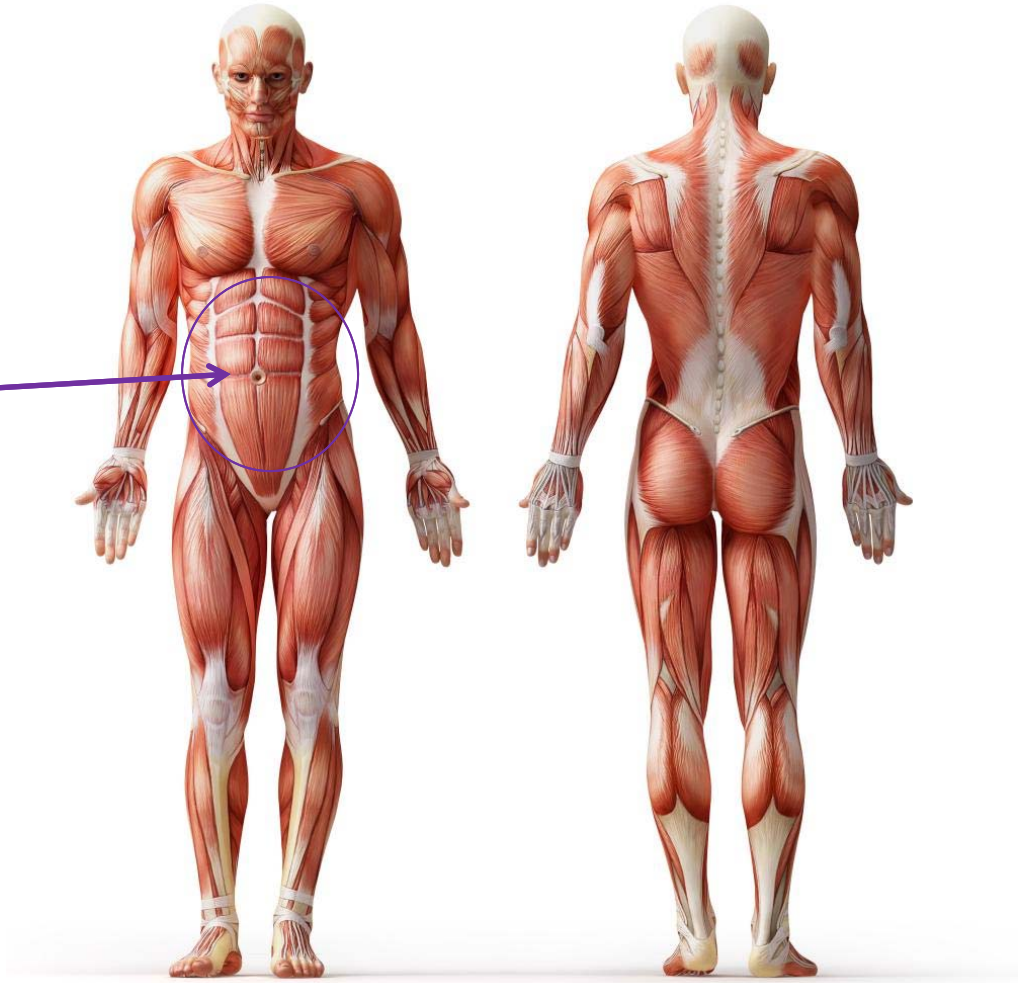

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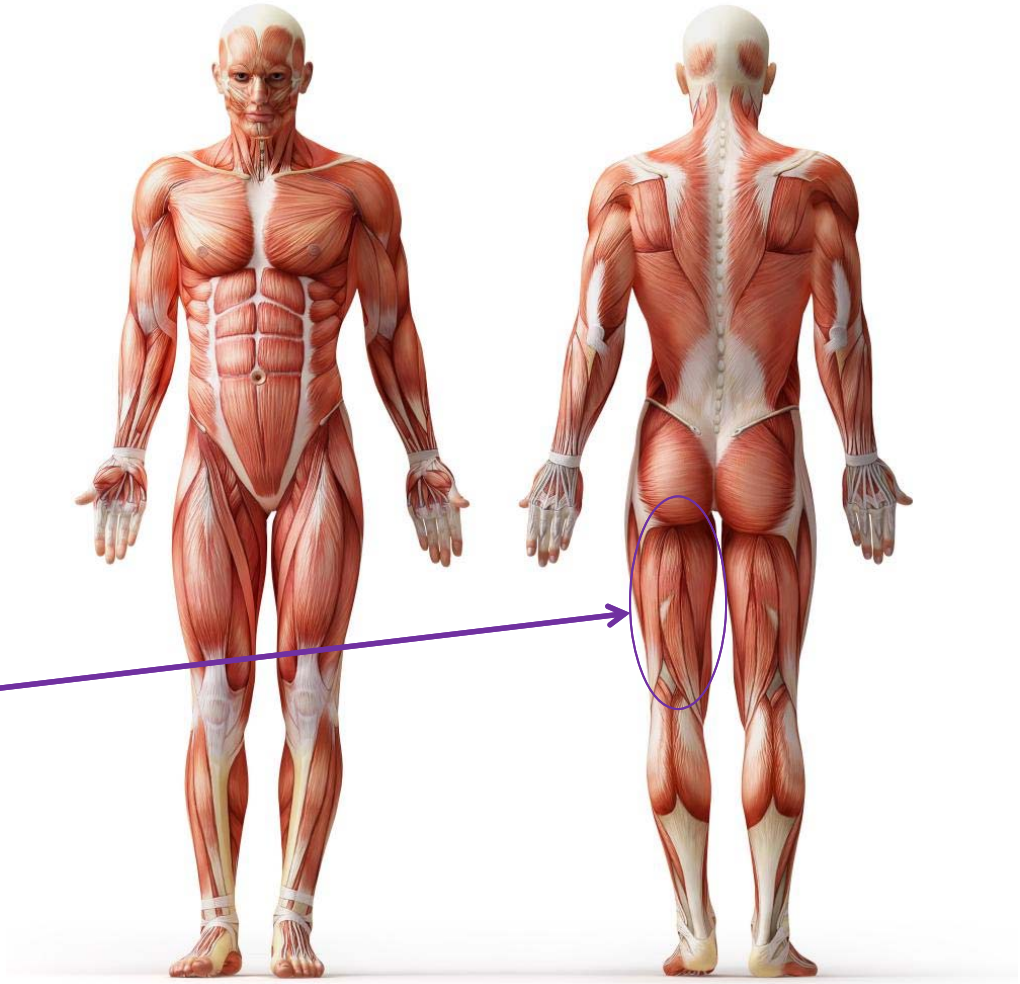

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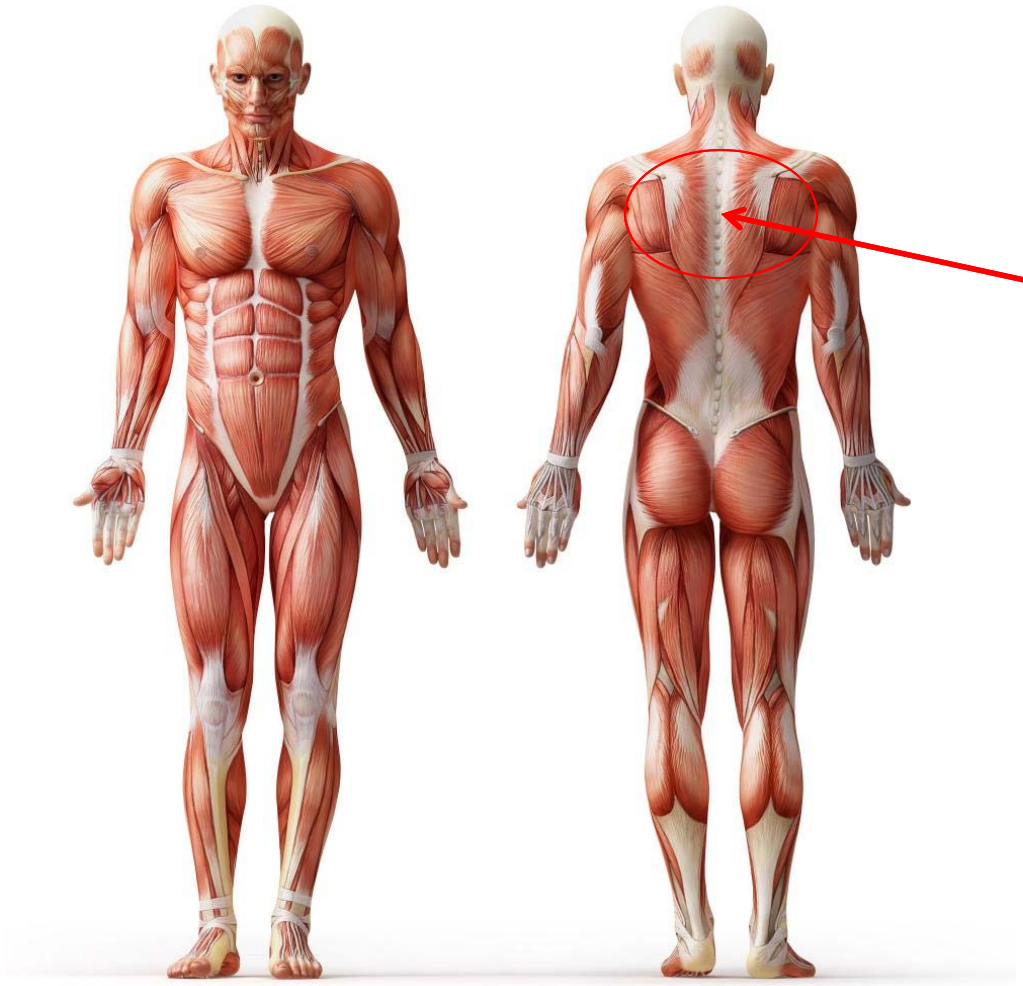

If you tend to extend when you spasm – stretch your back muscles

- Scapula/shoulder blades
- Low back
- Hands
- Quadraceps
- Calf

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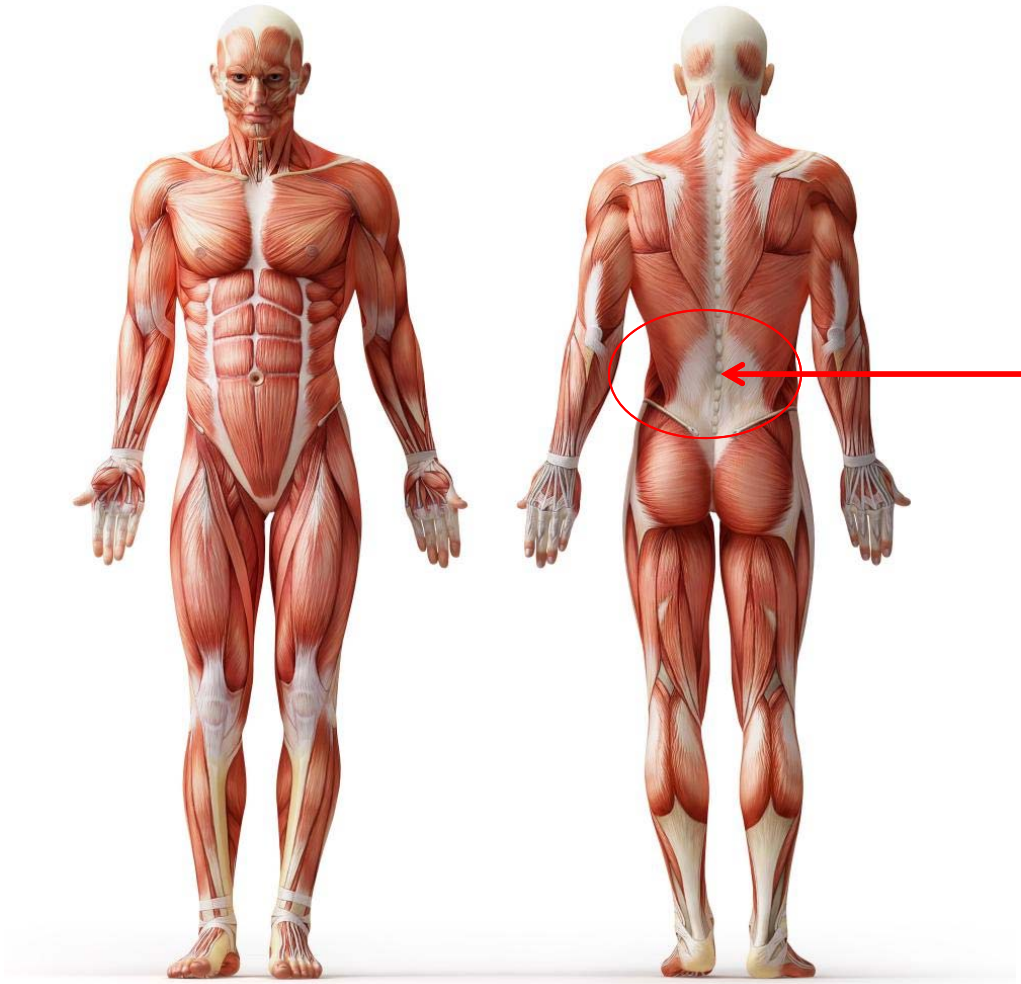

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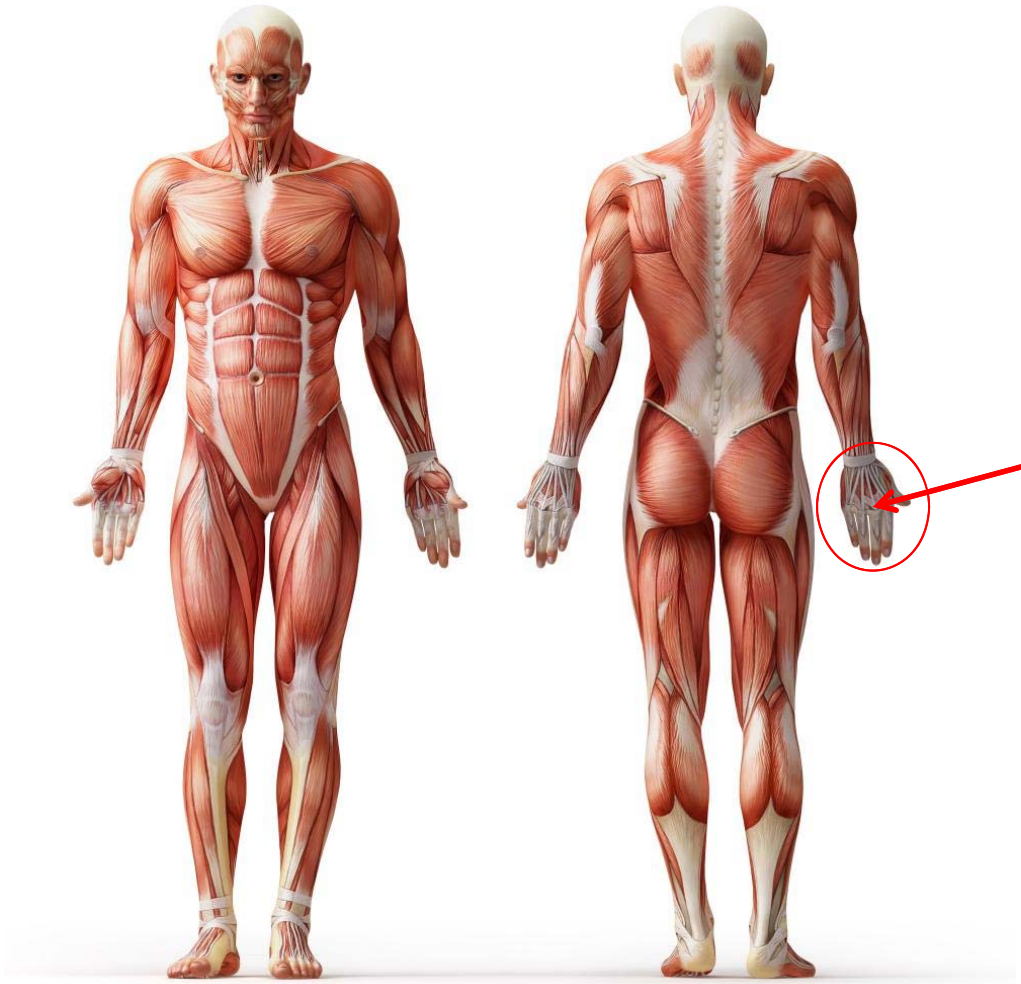

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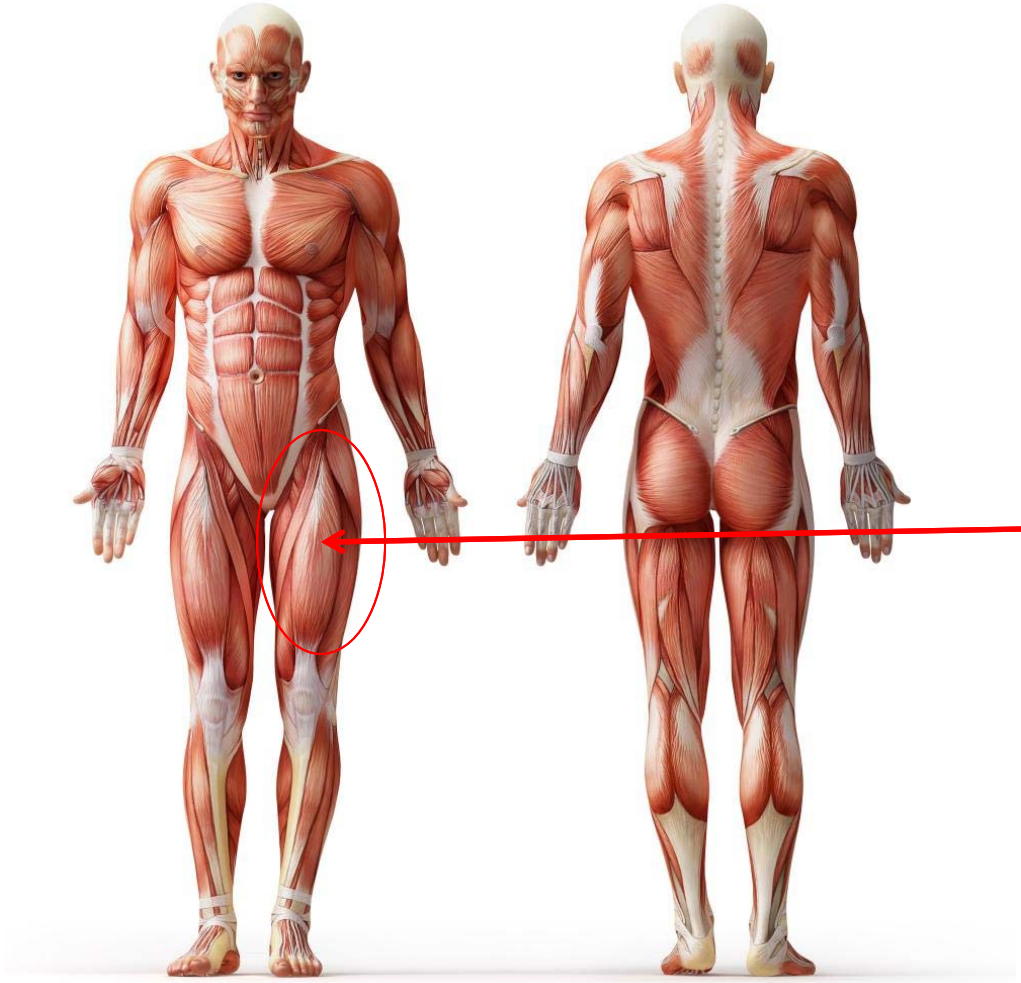

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STRETCHING - TYPES

- Passive versus active

- Low amplitude/longer duration
  versus
  higher amplitude/shorter duration

STRENGTHENING

Why it may work

- Exercising the opposing muscle will inhibit the spastic muscles
- Exercising the “spastic” muscle may actually decrease the excitability
- Most of the studies are from stroke and brain injury research

STRENGTHENING

American College of Sports Medicine Guidelines:

- 60-80% of 1 rep maximum
- 3 sets 12 reps maximum
- 3 times a week for a minimum of 6-12 weeks
- Incorporate functional positions

https://www.acsm.org/docs/brochures/spinal-cord-injury.pdf?sfvrsn=4

WEIGHTBEARING/STANDING

Why it may work

- Prolonged stretch to muscles that become tight primarily calf muscles, hip flexor muscles, and abdominal
- Possibly decreases the excitability of the over spastic muscles

May last until the next day – benefits are greater than stretching alone

STANDING EXAMPLES

http://www.electro-medical.com/standing-table/

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WHOLE BODY VIBRATION

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WHOLE BODY VIBRATION

Why it may work

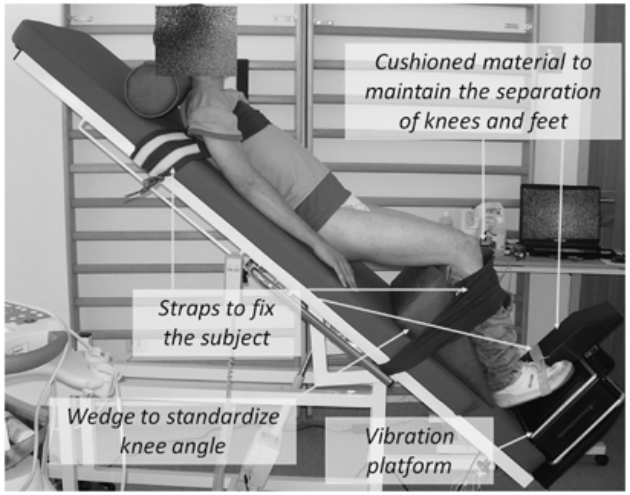
- "Vibration paradox" – inhibitory and excitatory qualities
- Last 6-8 days in people with incomplete spinal cords injuries

Dosing

- 3 days per week for 4 weeks
- 45 second bouts with a 1 minute rest break x 4 reps (studies range from 30-60 second bouts)
- Vibration frequency varies (20-100 Hz).
- It is unclear how much (frequency) and how long (duration) may be therapeutic.

WHOLE BODY VIBRATION

http://powerplate.com/



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SPLINTING

Why it may work

-provides prolonged muscle stretch

-allows joint position that does not elicit spasm

-prevent contracture

DYNAMIC SPLINTING

http://www.dynasplint.com/

http://www.bristolneurophysio.co.uk/services/saeboflex

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THERMAL MODALITIES

Why it may work

- Cold
  - Causes slowing of nerve conduction
  - Decrease muscle spindle activity
  - Decrease CNS excitability
  - Dose ~20 min, duration <1 hour
  - Protect skin

HEAT

Why it may work

-Heat

- Increases blood flow which can increase O2 and nutrients to muscle
- Dose 20 min
- Protect skin

-Examples

-hot packs, hot bath, paraffin

ELECTRICAL STIMULATION

Why it may work

- Stimulation to antagonist muscle
- Stimulate tetanic contraction to spastic muscle
- Alternating stimulation to agonist/antagonist

TENS

- Decrease excitatory impulse to spastic muscle

Leg and arm ergometry with electrical stimulation

EXAMPLES

http://www.bioness.com/Products/H200_for_Hand_Paralysis.php

http://www.nchpad.org/VirtualTour/MotomedDemo3.html

http://www.restorative-therapies.com/rt300-legarm

http://www.medi-stim.com/stims/nmes/comfystim.html

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THE “OTHER” INTERVENTIONS

Hydrotherapy
Repetitive TMS
Massage
Acupuncture
Hippotherapy
Taping
Lycra garments

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