Hypermobility 105: Posture and Joint Protection

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Slide handouts and recording available at: https://webspace.clarkson.edu/~lrussek/hsd.html

Who Am I?

- Professor Emeritus, Physical Therapy Department, Clarkson University
- Staff PT, St. Lawrence Health System, Potsdam NY
  - Clinical specialties: hypermobility, fibromyalgia, headaches, temporomandibular disorders
- Frequent presenter to professional and patient groups at national conferences
- Author of multiple review and research articles on hypermobility
- Author of ”Chronic Pain” chapter in *Physical Rehabilitation* textbook for PT students
- Lrussek@Clarkson.edu
- https://webspace.clarkson.edu/~lrussek/

I do not have any conflicts of interest to report

Objectives

By the end of this presentations, participants should be able to

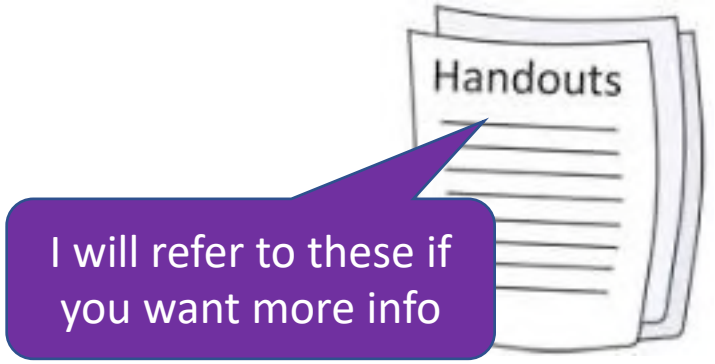
1. Explain why posture, body mechanics and joint protection are important in HSD.
2. Assess and correct their posture.
3. Describe principles of body mechanics and joint protection.
4. Explain how a variety of braces and splints can be helpful in HSD
5. Identify strategies for improving body mechanics and joint protection.

Hypermobility Lecture Series

- HSD 101: Basics of HSD/hEDS and self-care
- HSD 102: POTS and POTS self-care, basics of MCAS
- HSD 103: Pain management in HSD/hEDS
- HSD 104: Safe exercise selection and progression with HSD/hEDS
- **HSD 105: Posture and joint protection**
- HSD 106: Gut issues in HSD/hEDS, POTS, MCAS
- HSD 107: Fatigue in HSD/hEDS and POTS
- HSD 108: Headaches, migraines, and TMJ pain in HSD, POTS and MCAS
- HSD 109: Breathing dysfunctions in HSD
- HSD 110: Lumbar instability
- HSD 111: Cervical instability
- HSD 112: The Vagus Nerve
- HSD 113: The importance of fascia

I will refer to these if you want more info

Relevant Handouts Available



- https://webspace.clarkson.edu/~lrussek/research.html

- **Self-Care Strategies**
  - **Posture. Good posture decreases strain on muscles and joints, and can prevent many problems.**
  - **Joint Protection Strategies Learning to protect joints and muscles is the first step towards healthier and stronger joints.**
  - **Braces and Splints Braces and splints can help protect joints. Includes finger splints.**
  - **Sleep Hygiene and Positioning. Sleep posture and sleep hygiene strategies.**
  - **Sleep Checklist. Checklist of sleep promoting strategies can make sure you don't overlook any options**
- **Exercise**
  - Breathing. Breathing incorrectly can increase pain sensitivity, headaches, jaw pain, and more.
  - Starting to Exercise Ideas. Some ideas to help you get started on exercise: how to deal with fatigue, pain, and fear of movement.
  - Starting to Exercise Worksheet. This worksheet helps people identify and overcome roadblocks to being more active.
  - Augmented Reality Activities for Fitness. Staying stable and strong doesn't need to be boring. Use your phone for fitness games.
  - Ways to keep younger kids active while having fun.. Games and make-believe to keep younger kids moving.
- **Pain Management**
  - Pain self-care plan. Create a flare management plan so you can identify what helps you manage pain.
  - Pain flare management plan. Create a flare management plan so you know what works when you have a flare. PDF & Doc versions.

DISCLAIMER

The information in this presentation is for general purposes, only, and may or may not apply to your situation.
Check with your health care provider
before starting any new self-care program
to ensure that it is appropriate and safe for YOU.

There is little research about this content.
This lecture is based primarily upon expert opinion.

I will be displaying many devices that my patients have found helpful.
I do not have any financial interest in any of them.

Approach to Management of HSD

Assist patient in identifying and managing systemic comorbidities: education, treatment and/or referral

Decrease central, peripheral, and autonomic pain sensitization

Educate for correct posture and joint alignment, body mechanics, joint protection, appropriate use of splints and braces

Proprioceptive and motor control training, with training to relax muscles that are guarding

Stabilization, strengthening, muscle flexibility, aerobic conditioning

Integration of proper alignment & movement into function

Education about flare management

Why Are Posture & Joint Protection Important?

- To minimize ongoing damage and stress to joints: overuse injuries
- To decrease excessive stresses on muscles, decrease muscle spasm and strain
- To decrease pressure on arteries, nerves and the spinal cord
- To decrease likelihood of traumatic injury: sprains, subluxations, dislocations
- To improve quality of movement
- Improve function

Posture

- Sitting
  - At work/school
  - At rest
  - In the car
- Standing
  - From the ground up
- Sleeping
  - Body alignment
  - Pressure points

Sitting

- Posture
  - Forward head
  - Text neck
  - Slouched low back
- Common causes of pain from sitting posture
  - Common trigger points
  - Neck instability
  - *(Compression of nerves or neural tissues)*

Why Is Sitting Posture Important?

- Static positions can place a lot of stress on the joints and muscles
- Prolonged stretch can cause more damage than short term stretch
  - Tissue 'creep'
  - Compromised blood flow
- Poor sitting posture can cause:
  - Headaches, neck pain, upper and lower back pain
  - Decreased energy and mood
  - Poor breathing patterns
- (Szczygiel, 2017)

- https://www.usa.edu/blog/how-to-improve-posture/
- https://www.genesischiroclinic.com/blog/bad-sitting-posture-and-back-pain/

Posture as a Stack of Blocks

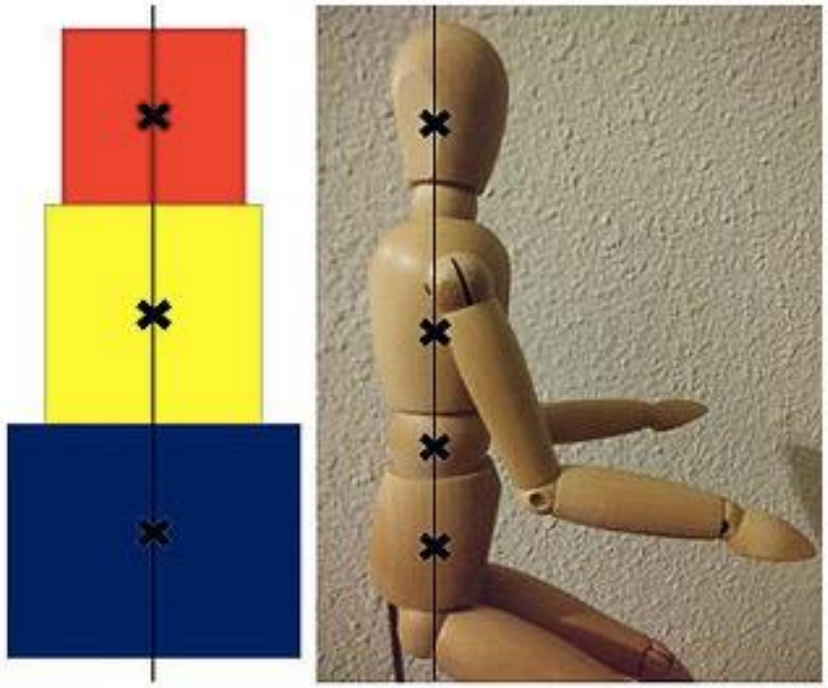


Figure 1. Stacked, aligned posture

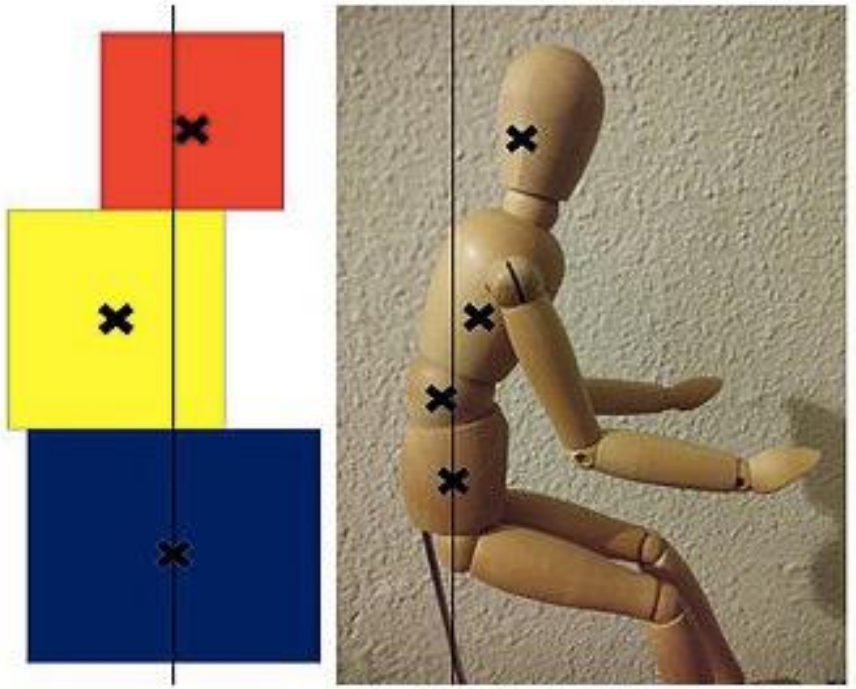
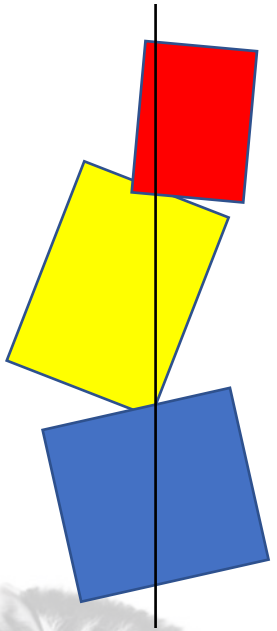


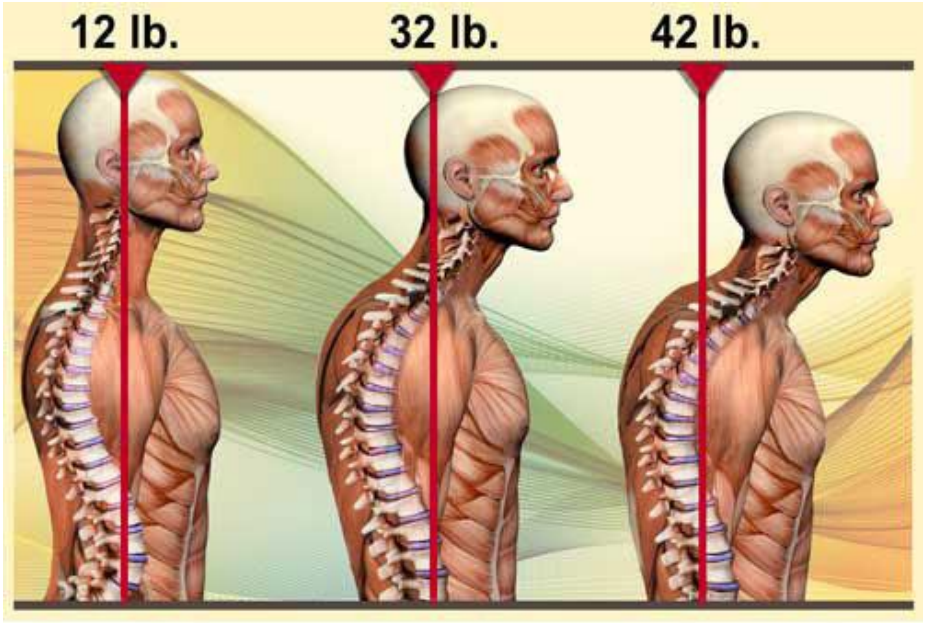
Figure 2. Postural misalignment

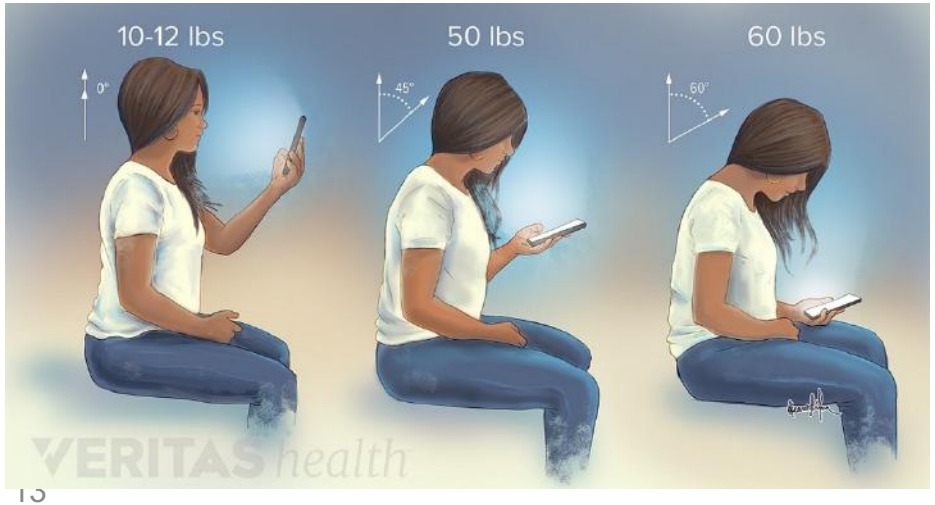


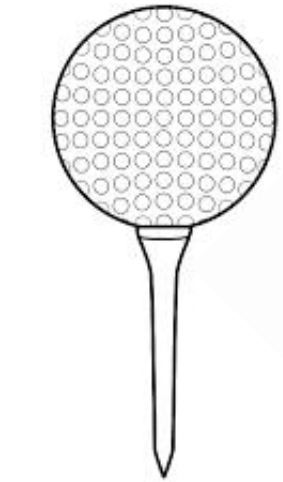
http://www.voxhumanajournal.com/huffington2018.html

Forward Head and Text Neck

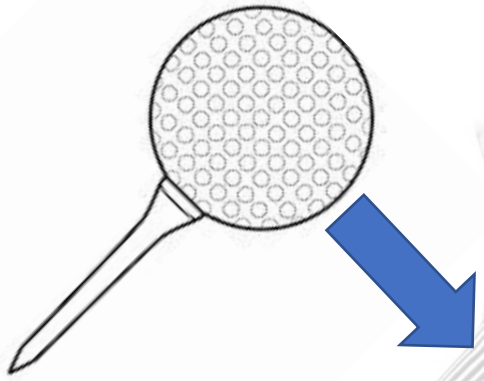
- Excessive forces on joints and muscles
- Muscle spasm & trigger points (TrP)
- Compression of nerves in the neck
- Cervical instability
- Compression of spinal cord structures







Good Posture



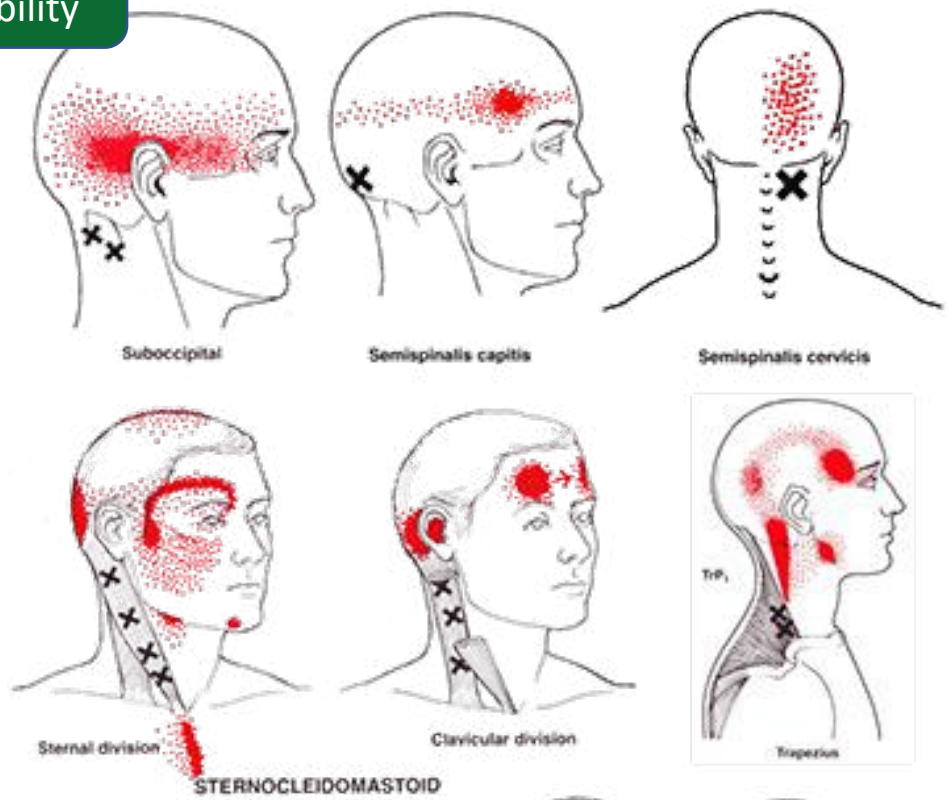
Bad Posture

Headache Trigger Points

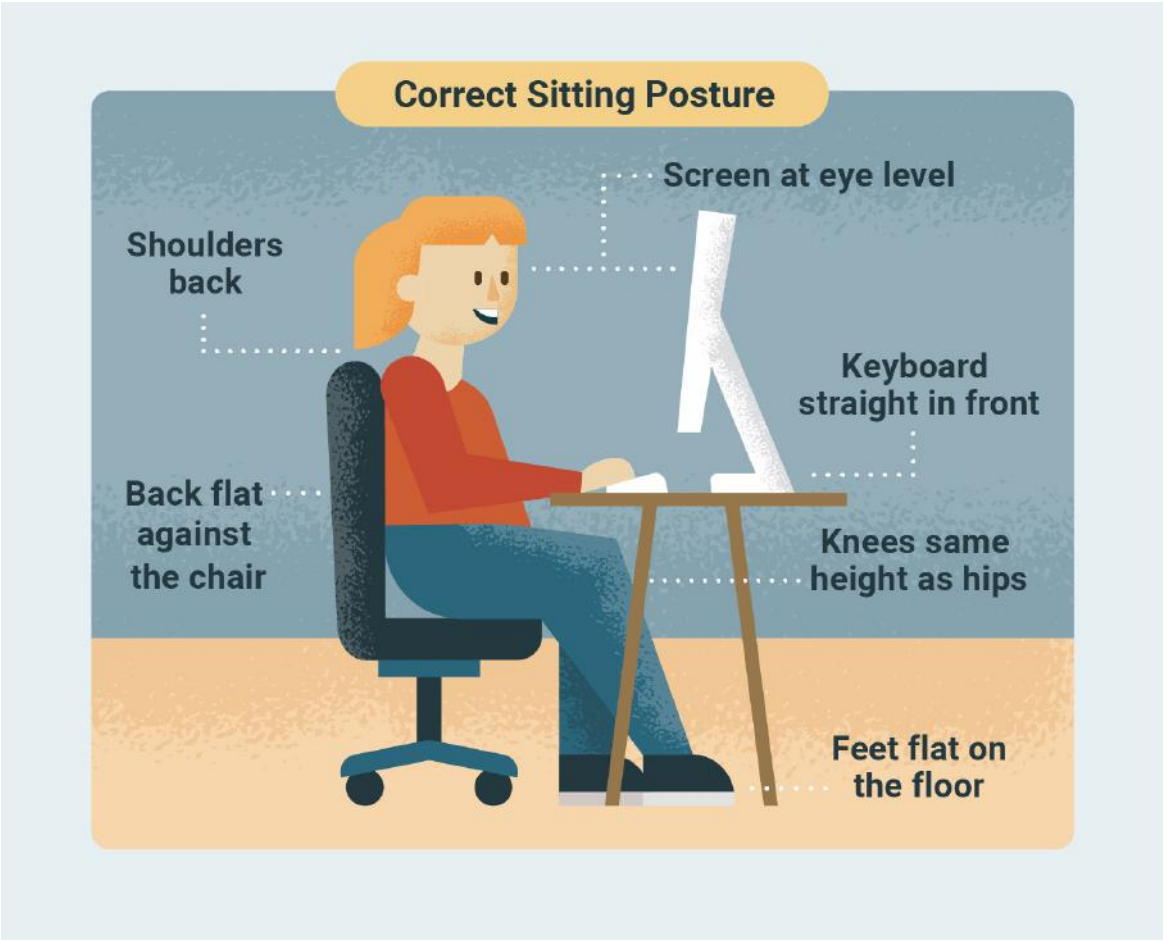
HSD108: Headaches
HSD111: Cervical Instability

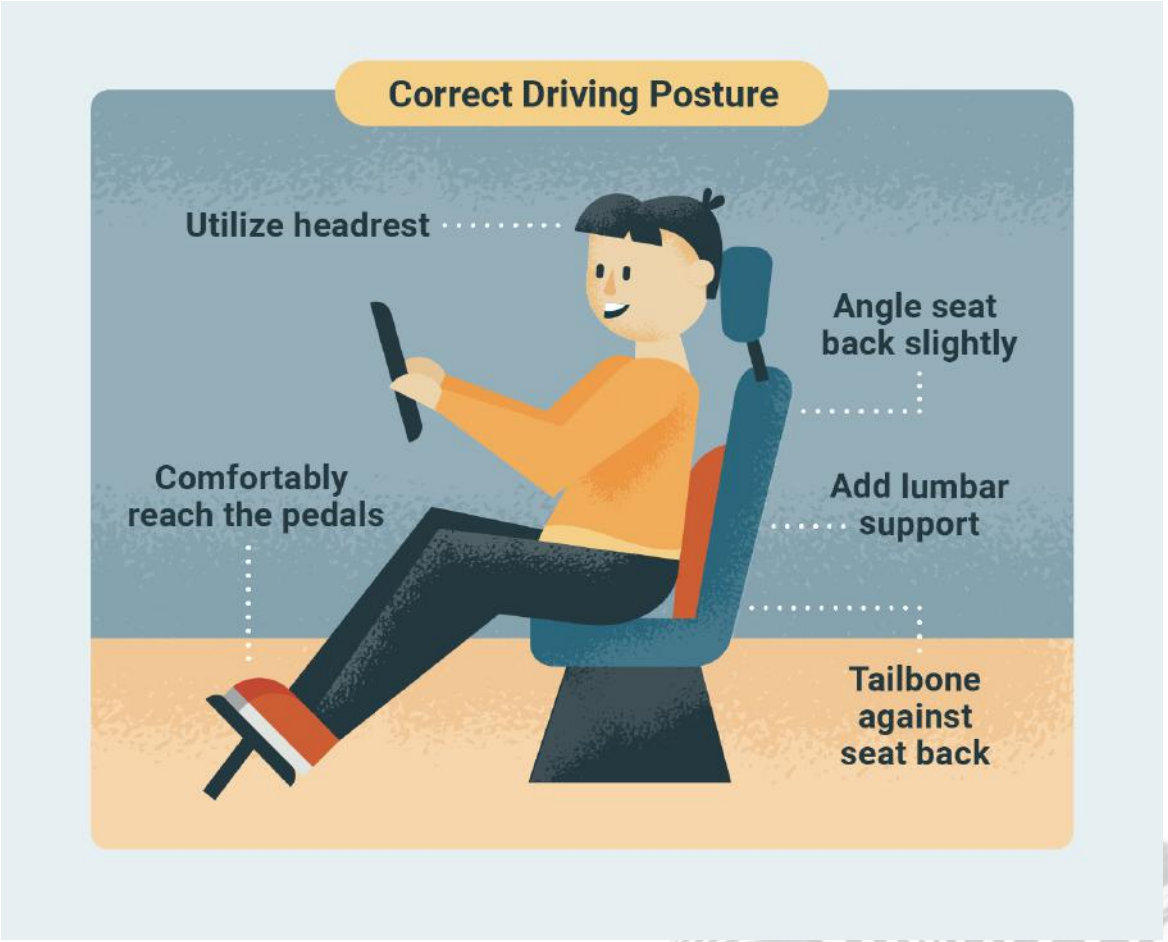
Neck Trigger Points

- Pain may be due to trigger points (TrP)
- TrP due to poor posture, tensing all the muscles, or emotional stress
- Poor posture due to weak stabilizing muscles
- Weak stabilizing muscles and overuse of superficial muscles due to poor motor control (coordination of muscles)
- Poor motor control due to decreased body awareness (proprioception)
- Resources:
  - http://www.triggerpoints.net
  - Valerie DeLaune, *Pain Relief with Trigger Point Self-Help* (2011)
  - Richard Finn, *Trigger Point Therapy Made Simple (2020)*



Good Sitting Posture





https://www.usa.edu/blog/how-to-improve-posture/

Posture Supports for Sitting

”Nada Chair”

“Air Pillow”

Kneeling chair

Alignmed
Posture Shirt

”Body Braid”
https://bodybraid.com

Shoulder Surgery Pillow,
Ergonomic Rotator Cuff Pillow

Posture Supports for Driving

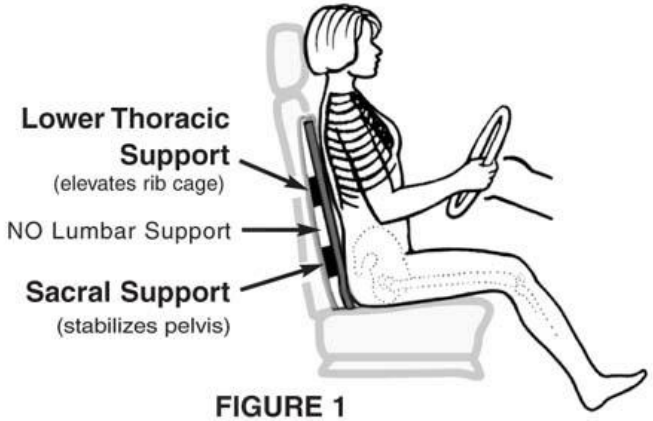


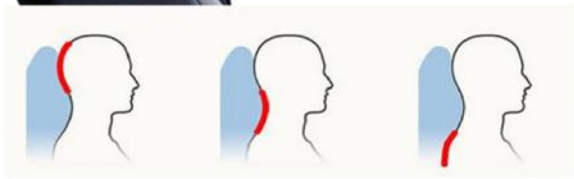
FIGURE 1
Optimal healthy driving posture with sacral and lower thoracic supports, but no lumbar support.

FIGURE 2
Typical slumped driving posture due to lowering of rib cage (A) without lower thoracic support.

https://www.yogaback.com/The_YogaBack_for_Driving/new-solution-to-drivers.html

(left) Arm support

(above) Car back support

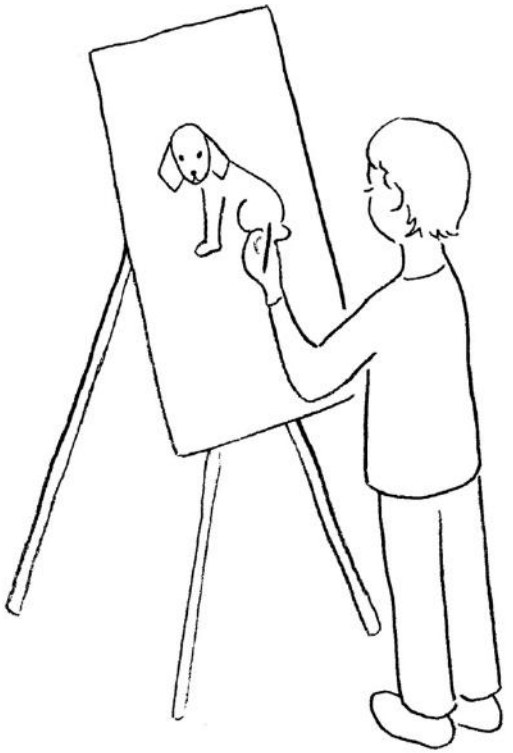


(above) Car Seat Headrest
https://bodwellbeing.com/collections/back-posture/products/car-seat-headrest-neck-rest-cushion-cushion-for-neck-pain?variant=32799655592018 or TravelMate Car Neck Pillow

Other Gadgets to Improve Posture

Mirror glasses

"Upright" posture biofeedback;
https://www.uprightpose.com



https://www.lowes.com/pd/Uncaged-Ergonomics-Adjustable-Height-Reading-Stand/

Questions?

Standing

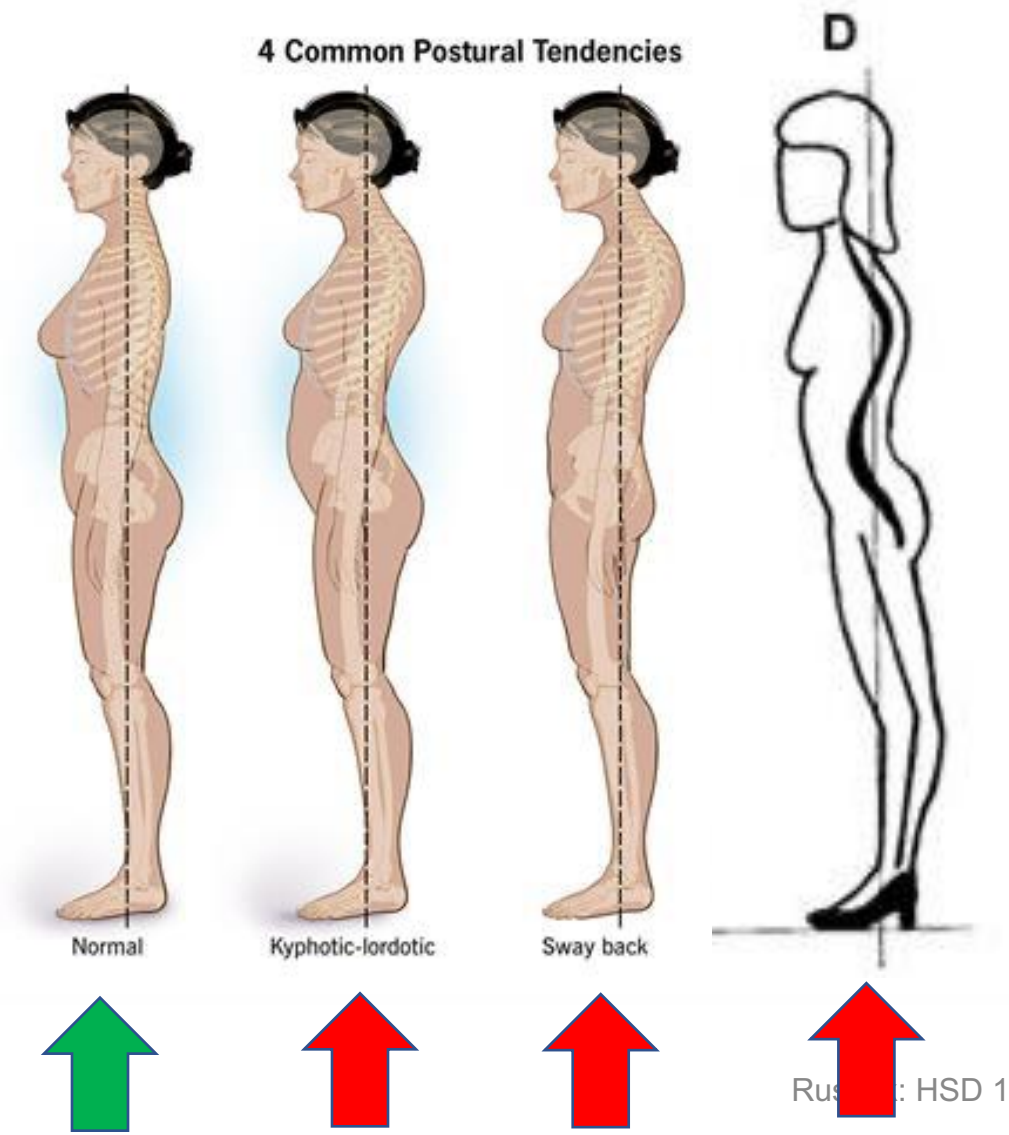
Posture Handout

Standing doesn't seem so hard – why does it hurt so much?

- Good standing posture
- Common problems caused by poor standing posture
- Factors leading to poor standing posture
  - Tight muscles
  - Poor motor control
  - Weakness
  - Flat feet up the kinetic chain

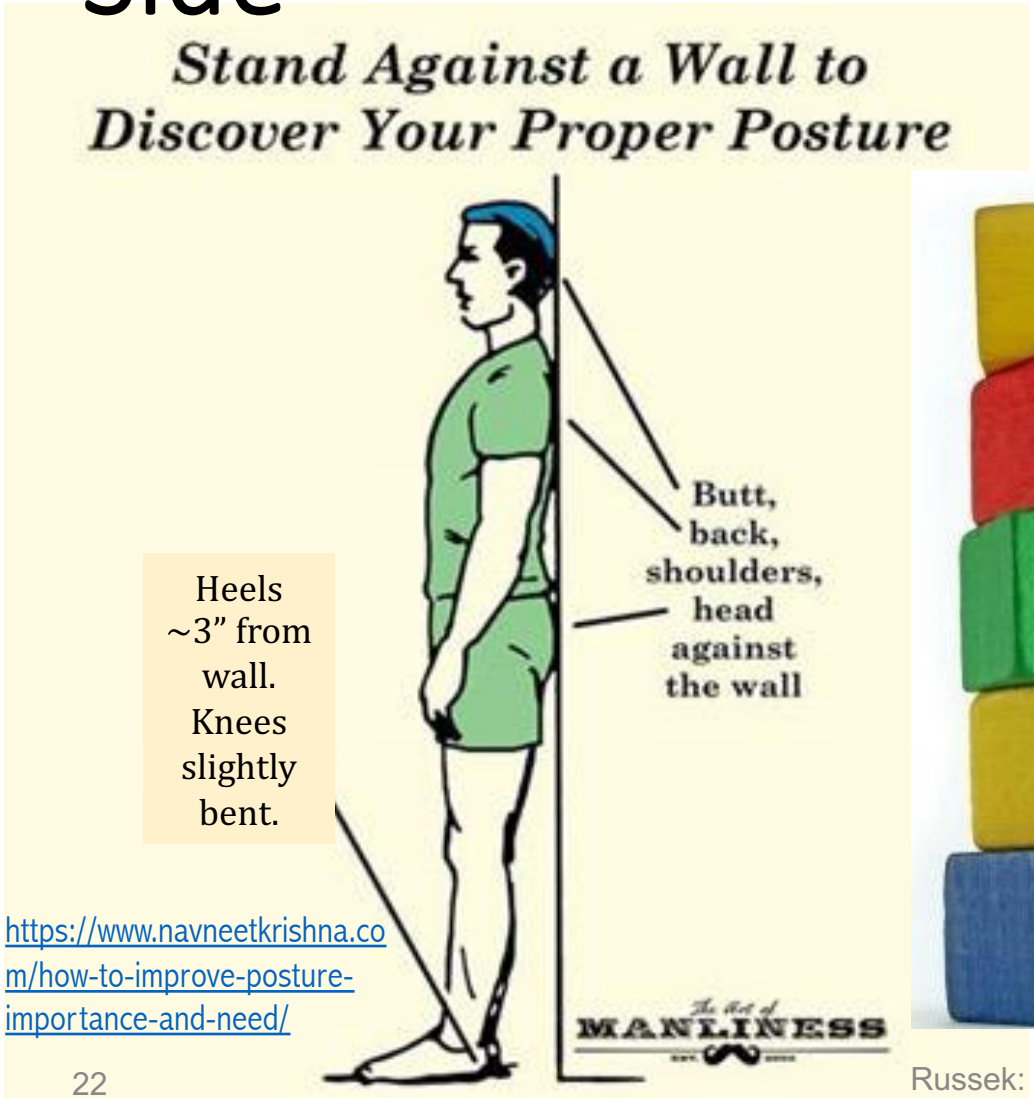
Posture

Standing Posture

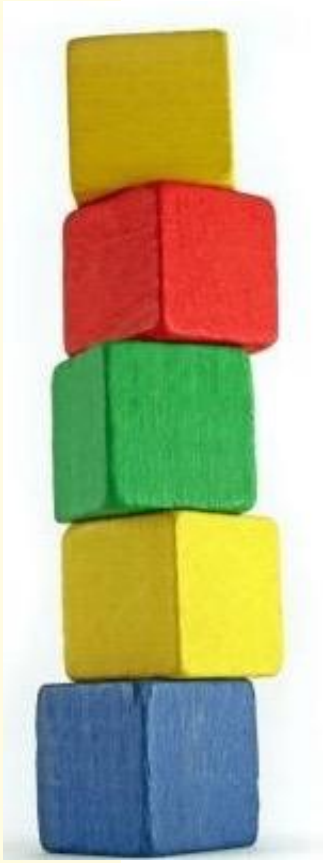


- Standing posture should have ankles, knees, hips, shoulders and ear aligned
- Gravity compresses the spine if muscles are not active
- It is ‘easiest’ to hang on our spine, hips and knees
  - But this overstretches ligaments and muscles
- Tight hip flexor or back muscles cause excessive arch in the back
- Slouching strains over-stretched muscles
- Slouching increases cervical instability

Assessing Your Standing Posture from the Side



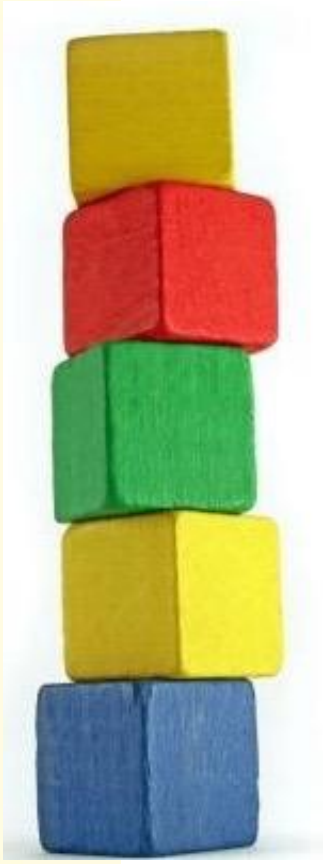
https://www.navneetkrishna.com/how-to-improve-posture-importance-and-need/



- Stand with heels ~3" from the wall, with buttock and shoulders touching the wall.
- Knees should be "soft" (slightly flexed, not hyperextended).
- Low back should be only ½-1" from the wall.
  - If it is further, drop your tailbone to flatten your back slightly; activate abs.
- The back of your head should touch the wall without tipping your head back.
  - If your head doesn't touch the wall, imagine a string lifting your head up, tucking chin in.
- This guide applies to MOST people, but not everyone – your body might be different.

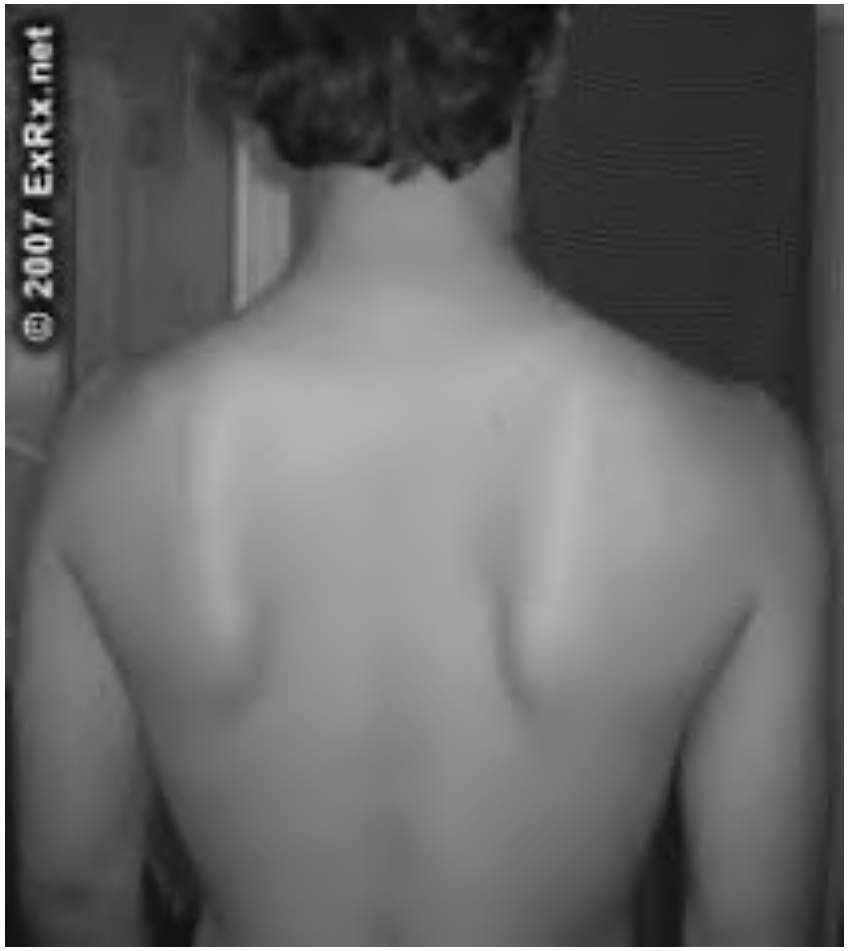
Stacking Practice (Optional)

https://www.navneetkrishna.com/how-to-improve-posture-importance-and-need/



- Stand with weight evenly distributed between your feet.
  - Feel all 4 'corners' of each foot stable on the ground
- Unlock the knees, flex slightly
  - Shift weight front/back so it is stable on your feet
- Imagine your pelvis is a bucket of water, try to level the top so water does not spill over the front or back
- Place your rib cage on top of your pelvis. Your back should not be overly arched or rounded.
  - Shoulders should hand from the rib cage
- Place your head on top of your shoulders, centered so it doesn't topple forward
- Inhale, exhale and try to relax. Standing in good posture should not require a lot of effort.
- This guide applies to MOST people, but not everyone – your body might be different. Don't do anything that feels wrong for your body.

Assessing Posture from Front/Back

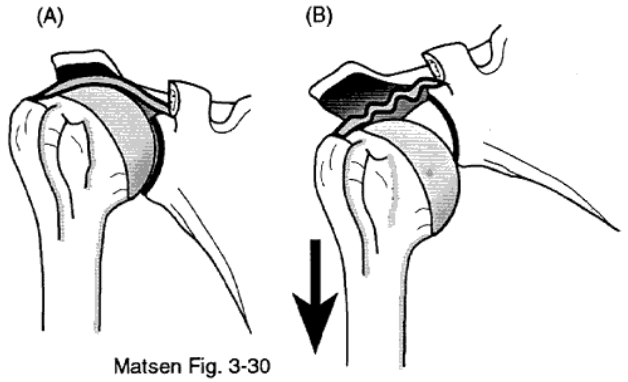


- The head and shoulders should be fairly symmetric.
  - OK for one shoulder to be slightly lower than the other.
- The top of the shoulder should slope *slightly* down to the arm.
  - This picture shows a normal L shoulder and a 'drooping' R shoulder.
- The shoulder blade should not poke out the back ('winging').
  - This picture shows winging of the shoulder blades.
- Drooping shoulders can cause:
  - Neck pain and headaches
  - Nerve pain in the arm
  - Shoulder instability

https://mskneurology.com/permanently-resolve-scapular-dyskinesis/

Sloped Shoulders

- Places stress on:
  - Upper trapezius muscle
    - Neck pain, headaches
  - Nerves going into the arm
    - Thoracic outlet, carpal tunnel, cubital tunnel
- Destabilizes the shoulder by tipping the shoulder blade down
  - Leads to shoulder instability
  - Leads to shoulder impingement because shoulder is subluxed

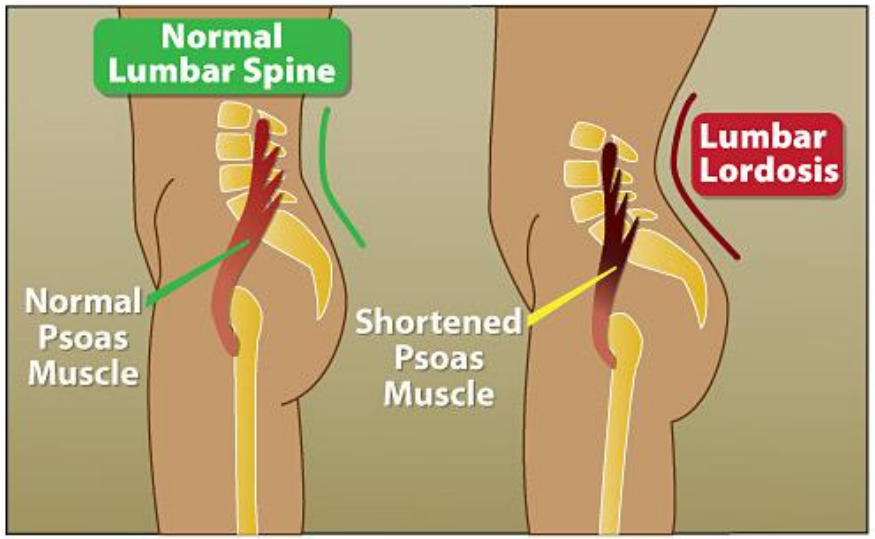


Matsen Fig. 3-30

HSD111: Lumbar Instability

Low Back Pain

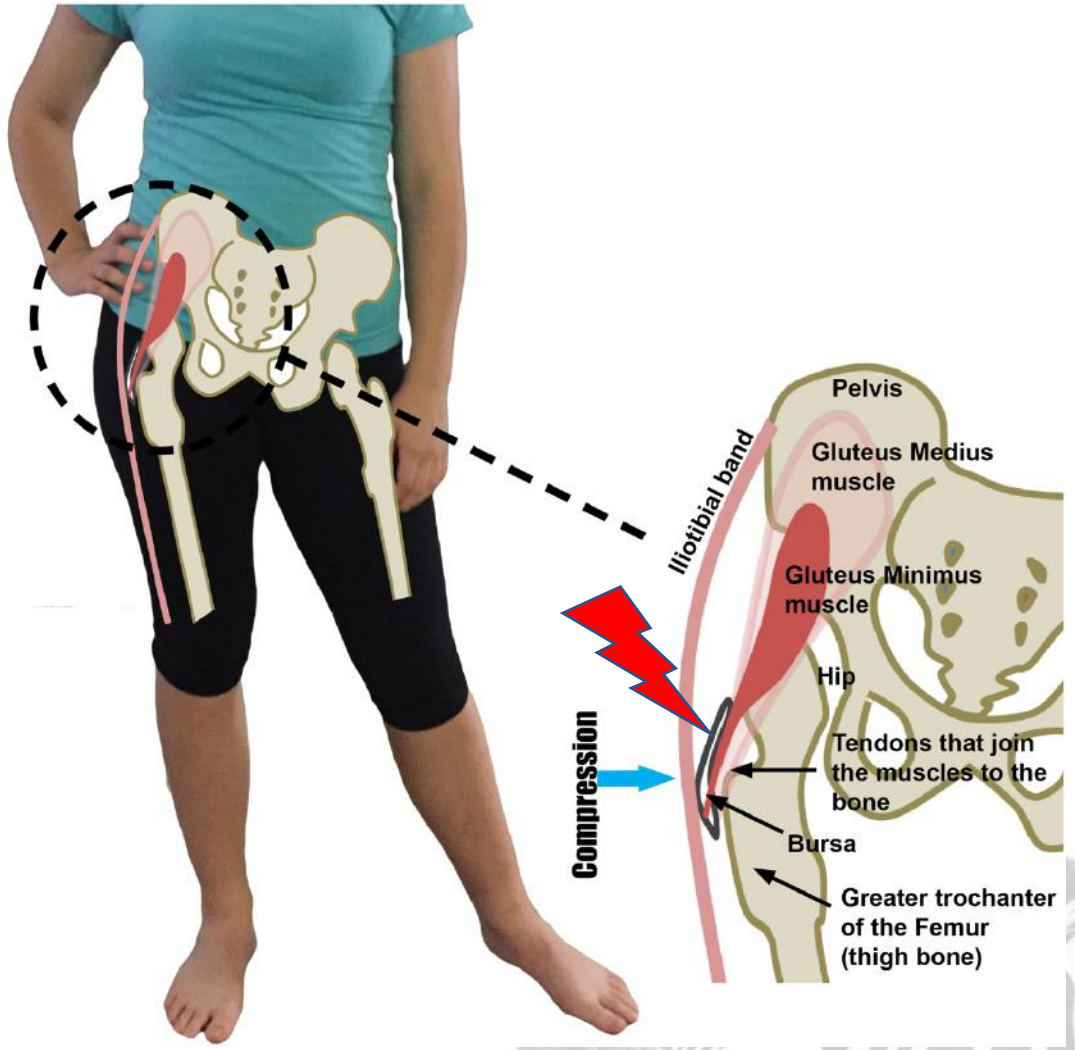
- Poor posture allows low back to arch too much, hang on ligaments and compress nerves
- Muscles tense to brace unstable spine
- Poor body awareness leads to using improper muscles or overusing proper muscles
- Not using the diaphragm to breathe increases muscle tension in the low back
- Tight hip muscles pull spine forward



Pictures from https://www.spineuniverse.com/conditions/back-pain/muscle-spasms-leading-cause-back-pain-not-primary-cause
https://blog.voltathletics.com/home/2015/3/25/psoas-talk-with-christye

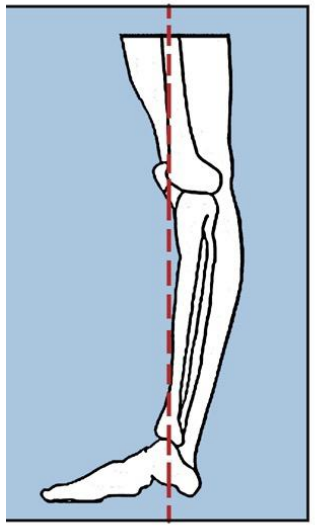
Hip: Trochanteric Pain

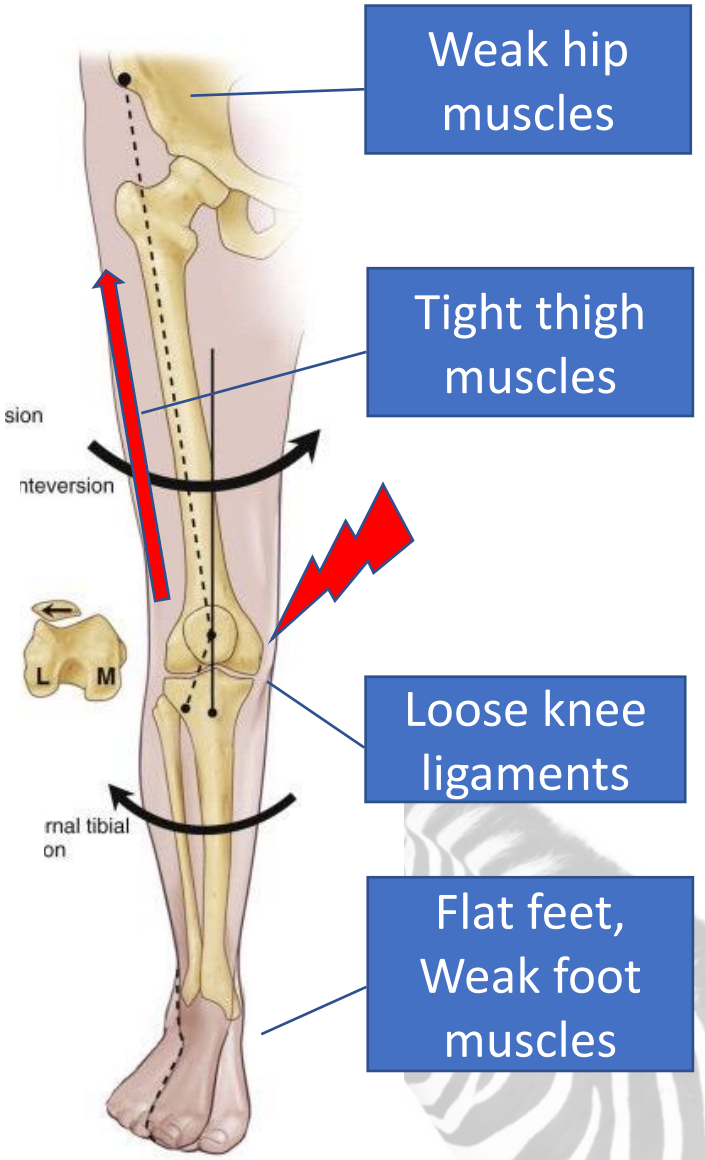
- Dropping pelvis while standing aggravates muscle & tendon
  - From muscle weakness
  - From poor body awareness
- Muscles/tendons are overstretched, bursa compressed
- Flat feet allow knees and hips to turn inward, pulling on hip muscles/tendons
  - May need orthotics for proper alignment of the legs



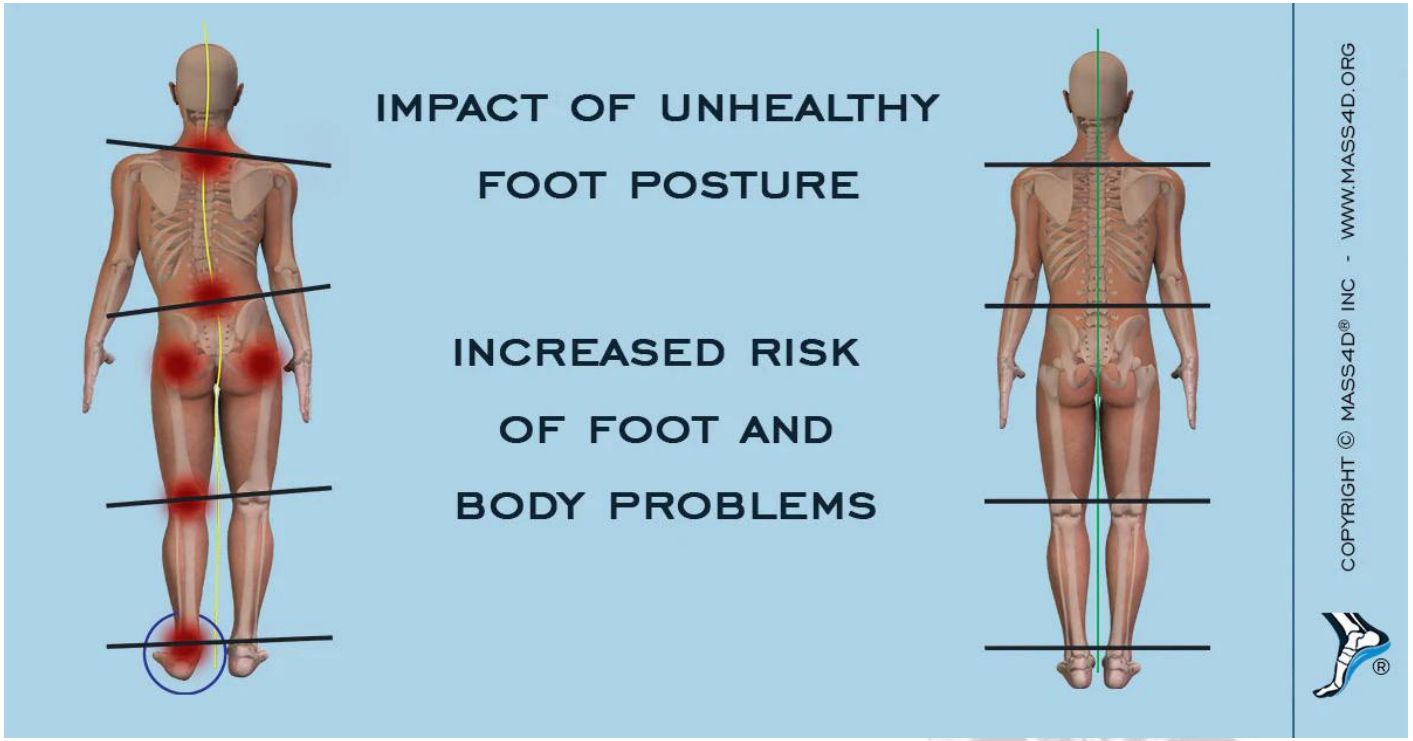
Knee: Patellofemoral Pain

- Loose ligaments allow too much motion of kneecap
- Standing with hyperextended knees allows kneecaps to float
- Tight thigh muscles pull kneecap outward
- Flat feet allow knee to turn inward
- Weak hip muscles allow leg to turn inward





Flat Feet Affect Everything!



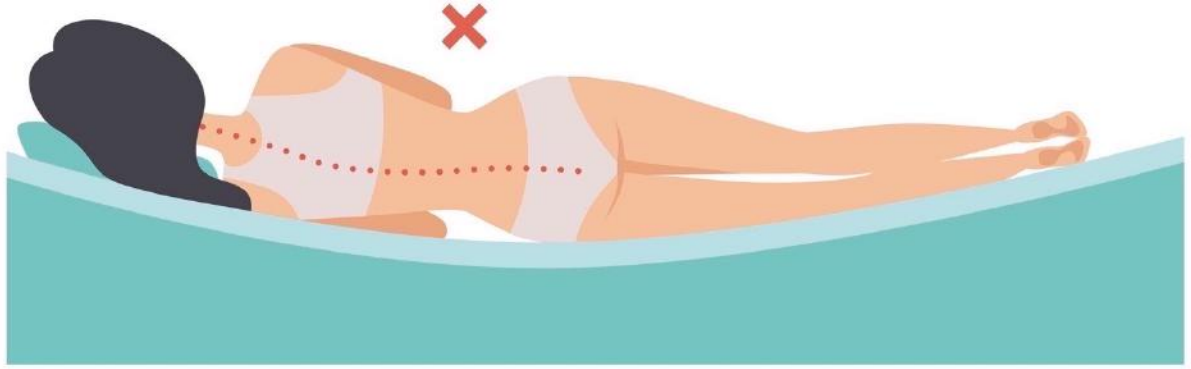
https://mass4d.com/blogs/articles/how-flat-feet-affect-body-posture

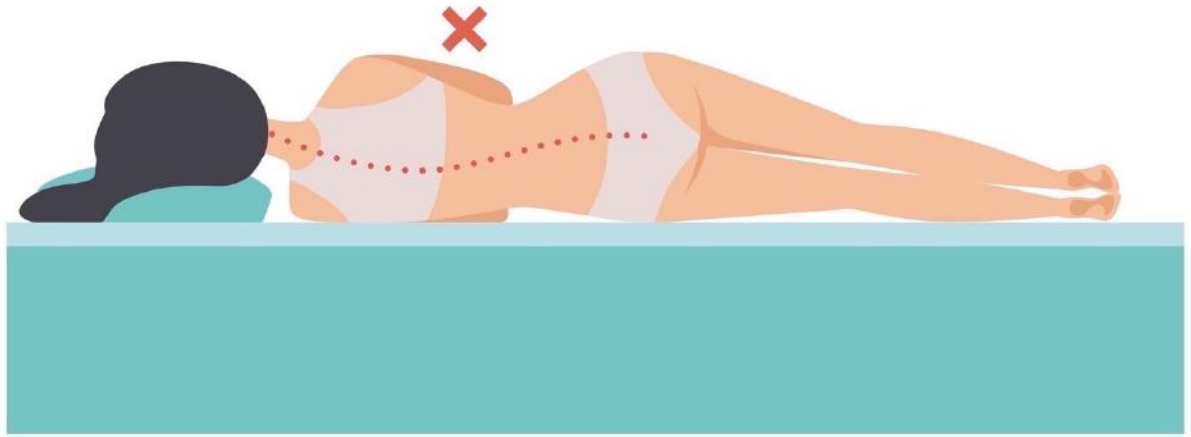
The “paper towel” test: place a dry paper towel over a damp paper towel and step on them.

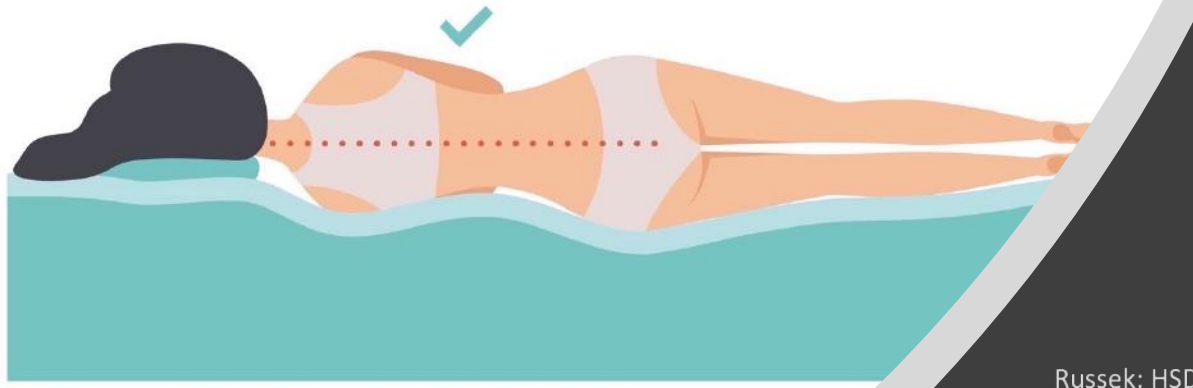
Resources for Sitting & Standing

- General info about posture:
  - https://www.usa.edu/blog/how-to-improve-posture/
- Sitting and standing posture suggestions:
  - https://www.nhs.uk/live-well/exercise/common-posture-mistakes-and-fixes/
  - https://brightside.me/inspiration-health/4-types-of-poor-posture-and-how-to-fix-each-of-them-798198/
- Variety of body support devices, company donates to EDS awareness:
  - https://www.bodysupportstore.com
- Malanga G. Sitting Disease and Its Impact on Your Spine:
  - https://www.spineuniverse.com/wellness/ergonomics/sitting-disease-its-impact-your-spine
- Trigger point identification and self-care:
  - http://www.triggerpoints.net
  - Valerie DeLaune, *Pain Relief with Trigger Point Self-Help* (2011)
  - Richard Finn, *Trigger Point Therapy Made Simple (2020)*

Questions?







Lying Down is a Posture, Too!

Russek: HSD 105: Posture & Joint Protection

Bad Position in Side Lying

Sleep Hygiene and Positioning, Sleep Checklist

illustration A

TOO SOFT (Hammock Effect)

- Sagging
- No proper back support
- Causes back pain

BAD!

illustration B

TOO HARD (Unnatural S-shape)

- Distorts your back
- Pressure concentrated on two areas: shoulders and pelvic area

- Bed too soft allows sagging → poor spinal alignment
- Bed too hard →
  - Too much pressure on shoulders and hips
  - Or spine bends to adapt to bed
  - Especially a problem for women with curvy figures
- Spine should be aligned (straight from the back)
- Pressure should be distributed across whole body

https://www.europeanbedding.sg/blogs/articles/the-influence-of-sleeping-on-a-hard-or-soft-bed-why-a-firm-mattress-won-t-relieve-you-from-back-pain

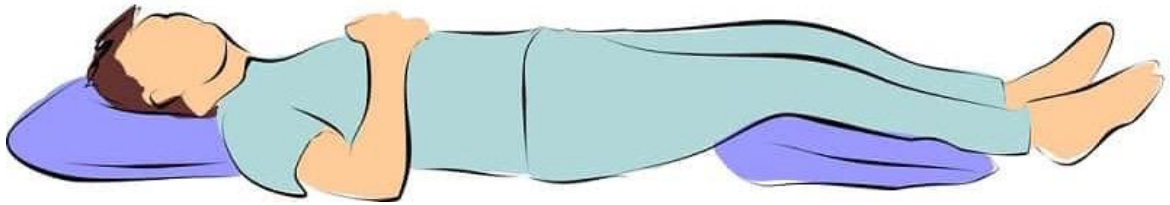
Ideal Bed Support in Side Lying

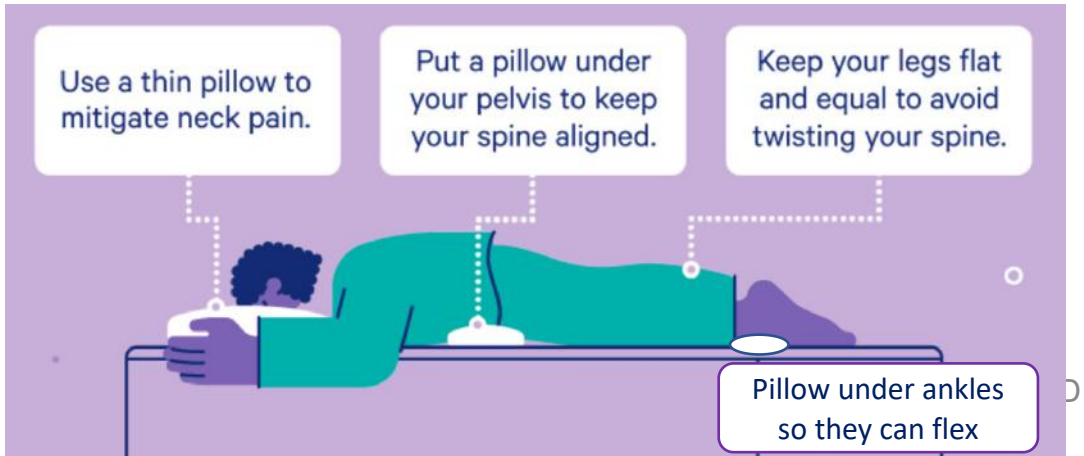
- Spine should be aligned: straight when viewed from the back
- Pressure should be distributed across whole body
- Mattress should adapt to the body

Pillows for Side Lying

- Shoulder-relief pillow decreases shoulder compression
- Pillows between the knees prevents hips from side-bending; decreases stress on top hip.
- A pillow under the waist prevents the back from bending and decreases pressure on shoulder and hip.
- Pregnancy pillow/body pillow allows you to lean on pillow; decreases pressure on shoulder and hip.

Sleeping on Your Back or Belly





- Spine should have normal curves when viewed from the side.
- Pressure should be distributed across whole body.
- Hips may be flexed slightly with a pillow under the knees.
- Belly sleeping is generally stressful to the body,
  - Using a body pillow or pregnancy pillow is better.
  - Or, place pillow under hips and ankles

If Your Bed Is Not Ideal…

- Consider a bed "topper" or pillows to provide necessary support
  - Bed toppers can distribute body weight more evenly
  - Options: memory foam, down, fleece, egg crate, etc.
- Best topper *for you* depends on:
  - Your sleep position(s)
  - Your body size/type
  - What your complaints are due to (e.g., excessive pressure or poor alignment)
- Reviews of toppers:
  - https://buyersguide.org/mattress-topper/t/best
  - https://www.sleepadvisor.org/best-mattress-topper-for-back-pain/

Neck Pillows

- Neck should be aligned:
  - Curved from the side
  - Straight from front/back

- There is no universal ‘best’ pillow for everyone
- The best pillow for you depends on:
  - Your body type and size
  - How you sleep
    - Back sleepers need soft/low pillow
    - Side sleepers need firmer/thicker pillow
    - Stomach sleepers should use a face pillow or body pillow

https://www.comfycentre.com/best-pillow-for-neck-pain/

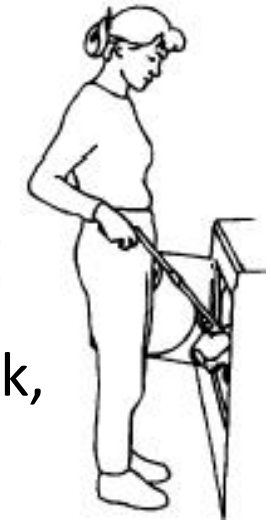
https://www.bodysupportstore.com/facedown-pillow

Questions?

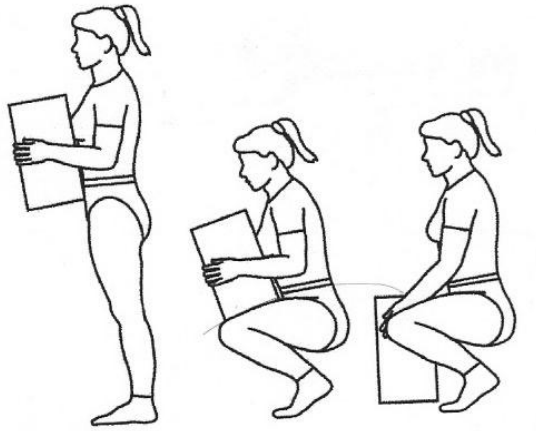
Joint Protection and Body Mechanics

Joint Protection

Body Mechanics



- For lifting:
  - Keep close to items you are lifting
  - Choose a lifting technique that suits your limitations, to protect back, neck, knees, hands, shoulders, etc.
- Stay upright, don't lean forward. Avoid prolonged bending over.
- Keep a broad base of support (feet apart).
- Use your body weight.
- Push rather than pull, when possible.
- Avoid twisting.
- Avoid reaching.

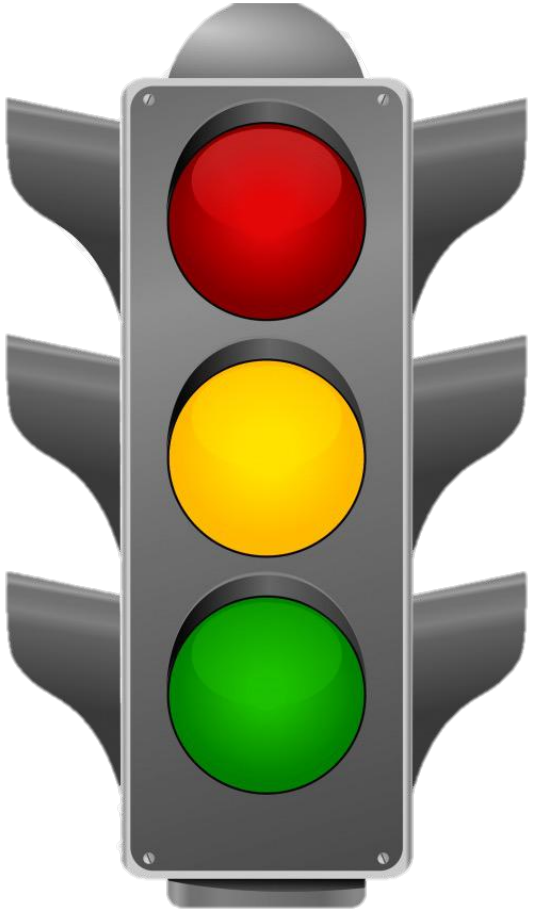


Principles of Joint Protection

Definition: using your body in ways that minimize stress to the joints and surrounding tissues

- Use larger, stronger joints when possible, use 2 hands when practical
- Minimize the forces acting on joints and/or minimize repetitive activity
- Avoid lifting or carrying heavy weights, especially in ways that stretch (distract) joints
- Try to keep joints in or near neutral (mid-range), keep spine aligned
- Use the proper tool for the job: use adaptive/assistive devices
- Keep muscles strong
- Avoid staying in one position for too long
- Use splints and braces if necessary

"Ready, Set, Go"



- Planning and preparation can protect your body
- "Ready": Correct your posture and alignment so you are ready to move.
- "Set": Activate your stabilizing muscles so they are set to stabilize joints.
- "Go": Now, go ahead and move!

Hinge Hip and Belly-Button Rule

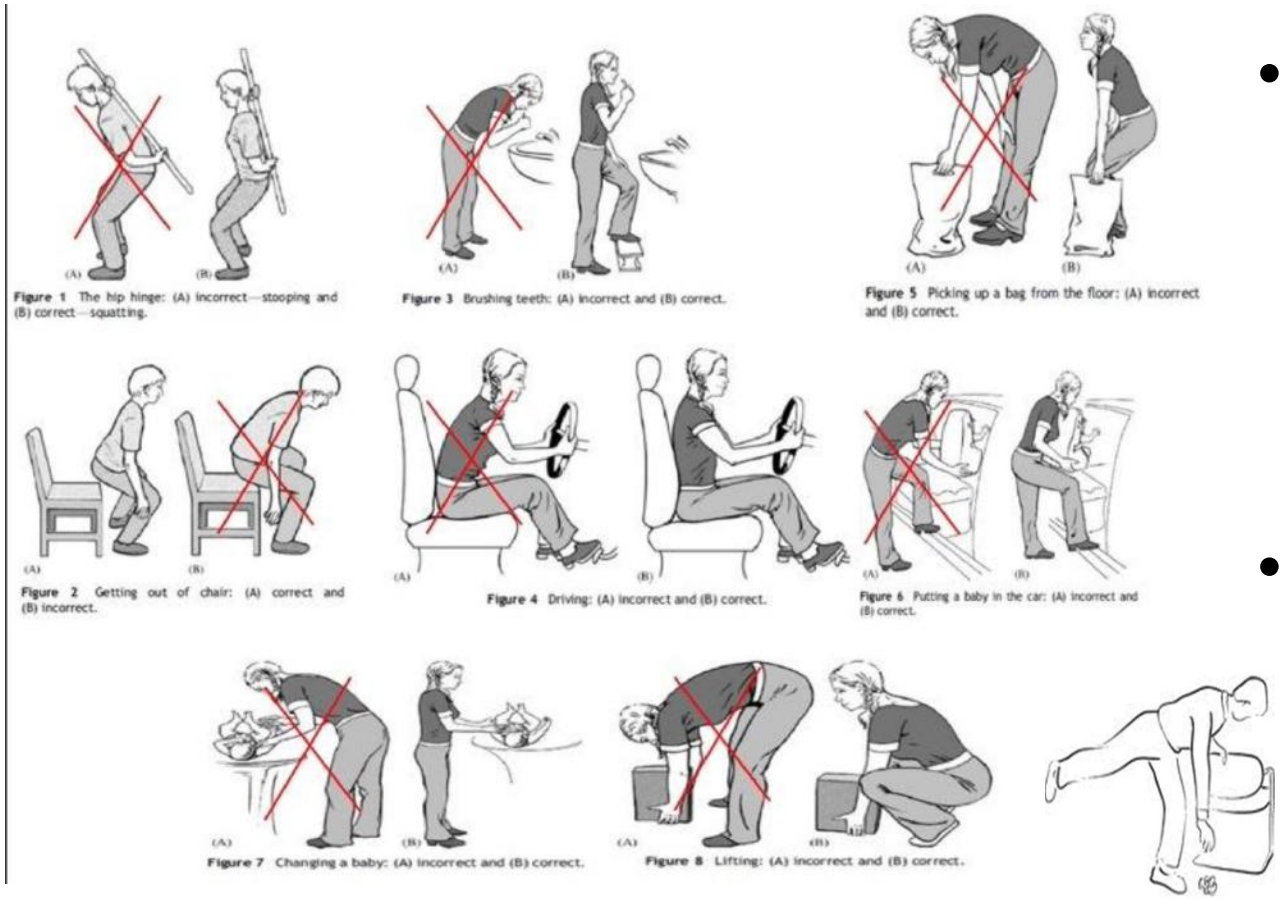


Figure 1 The hip hinge: (A) incorrect—stooping and (B) correct—squatting.

Figure 3 Brushing teeth: (A) incorrect and (B) correct.

Figure 5 Picking up a bag from the floor: (A) incorrect and (B) correct.

Figure 2 Getting out of chair: (A) correct and (B) incorrect.

Figure 4 Driving: (A) incorrect and (B) correct.

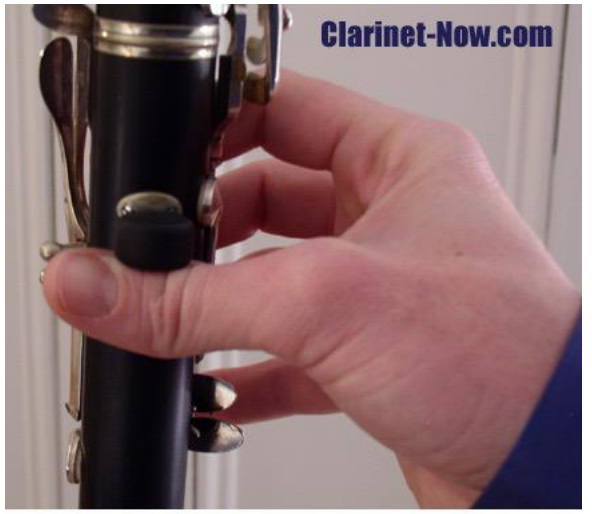
Figure 6 Putting a baby in the car: (A) incorrect and (B) correct.

Figure 7 Changing a baby: (A) incorrect and (B) correct.

Figure 8 Lifting: (A) incorrect and (B) correct.

- Hinge hip:
  - Keep the spine in neutral when bending forward
  - Avoid flexing the low back
  - Avoid flexing or extending the neck
- Belly-Button Rule
  - Keep your nose and belly button pointing the same direction to avoid twisting the spine

Hand and Finger Instability

- Loose ligaments allow too much movement and movement in wrong directions.
- Muscles cannot control some joint movements, so cannot prevent hypermobility in some directions.
  - Or, overworked muscles cause pain.
- Decreased proprioception (body awareness) leads to increased force to know where your body is.
- Pain can be from trauma or overuse.

CORRECT RIGHT THUMB POSITION: Place the thumb under the clarinet thumbrest just above the first knuckle of the thumb. Notice the backwards C of the right hand around the clarinet body.

Ring Splints for Fingers

Braces & Splints

Hyperextension

Flexion

Thumb MCP Problems

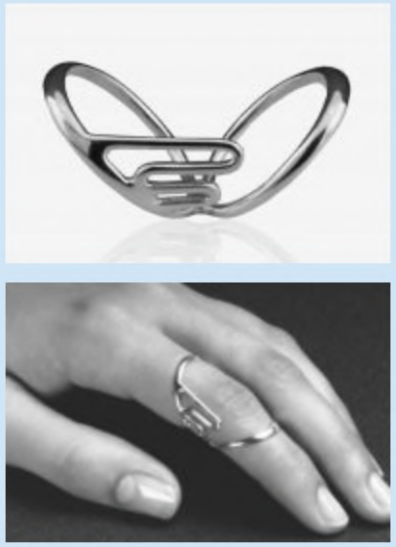
Lateral Instability

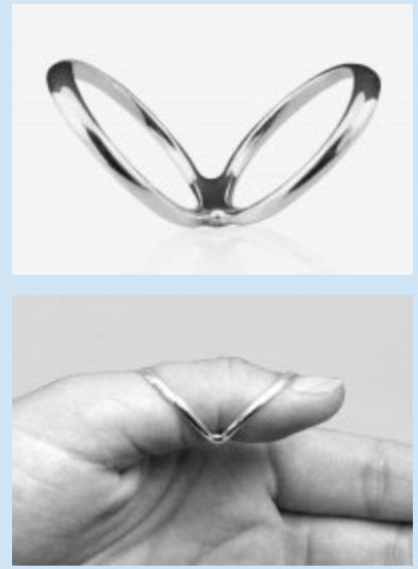
Thumb IP Problems

SilverRing™ Swan Neck Splint shown on the PIP joint

SilverRing™ Boutonniere Splint on the PIP joint

SilverRing™ Stable Thumb Splint





SilverRing™ Swan Neck Splint shown on the Thumb IP joint

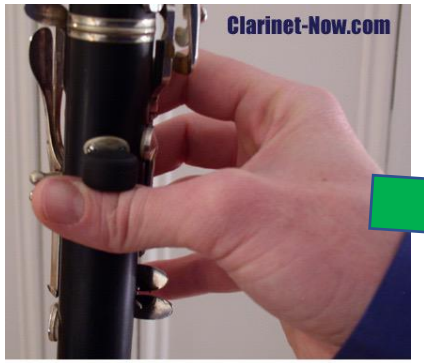
https://www.silverringsplint.com

Oval-8 or
BraceOn EZ Finger Splint

Adjustable size splints are convenient

Eva Belle
tion
https://www.evabellejewelry.com

Thumb and Wrist Braces

Splints & Assistive Devices for Hands

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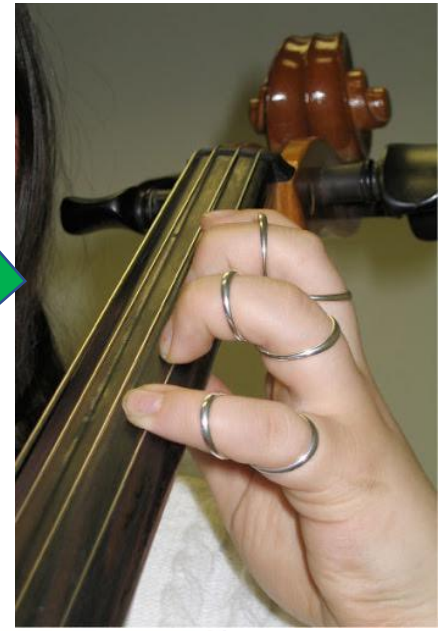
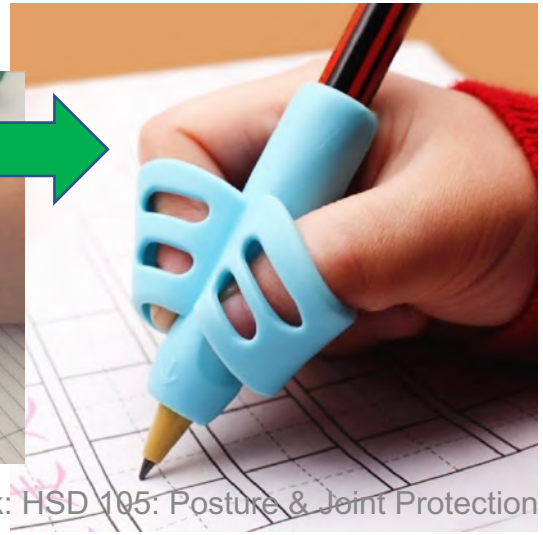
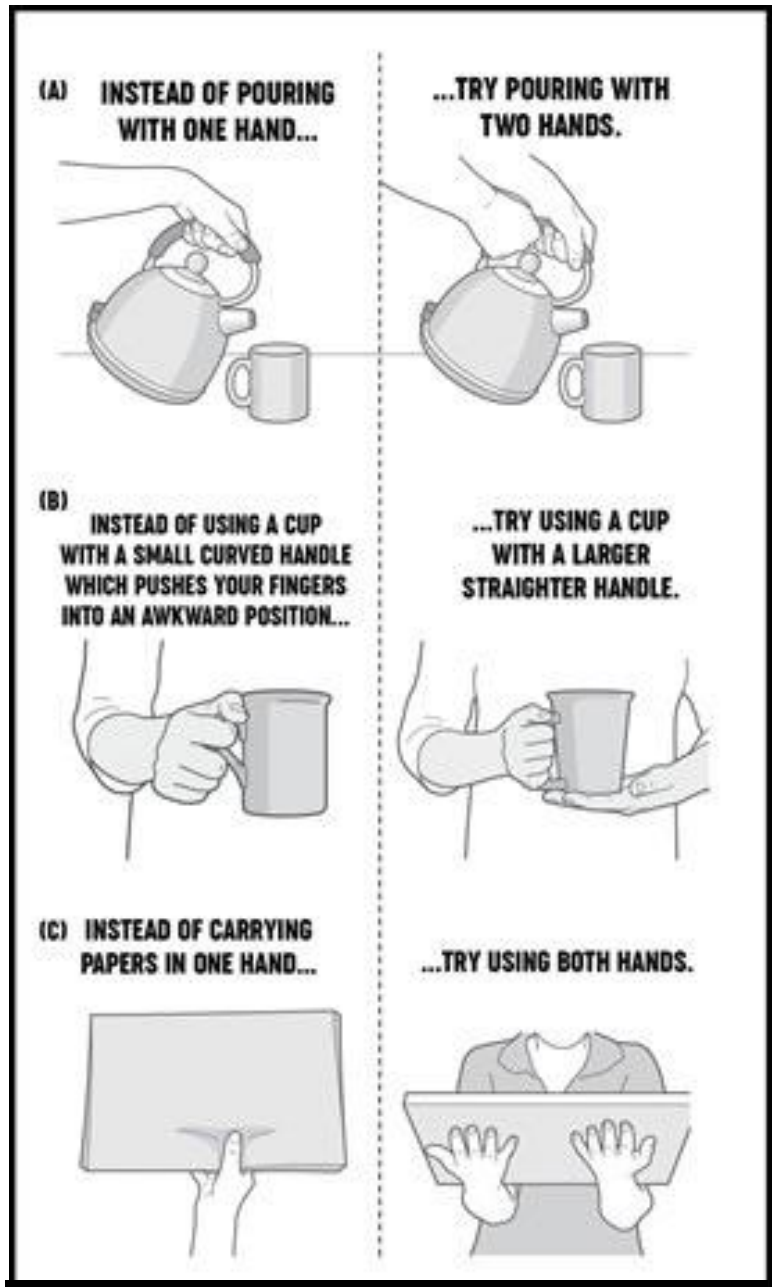


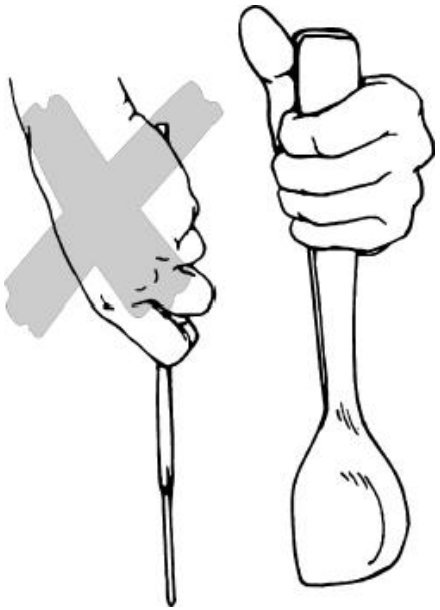
Research shows splinting can help:
Jensen, 2020





https://myra.org.au/article/living-arthritis-reduce-joint-wear/joint-care

How You Do Things Matters



- Use 2 hands to lift/hold
- Keep joints in mid-range
- Use big joints
- Use tools

Demonstrating grass trimming with long and short grass shears.

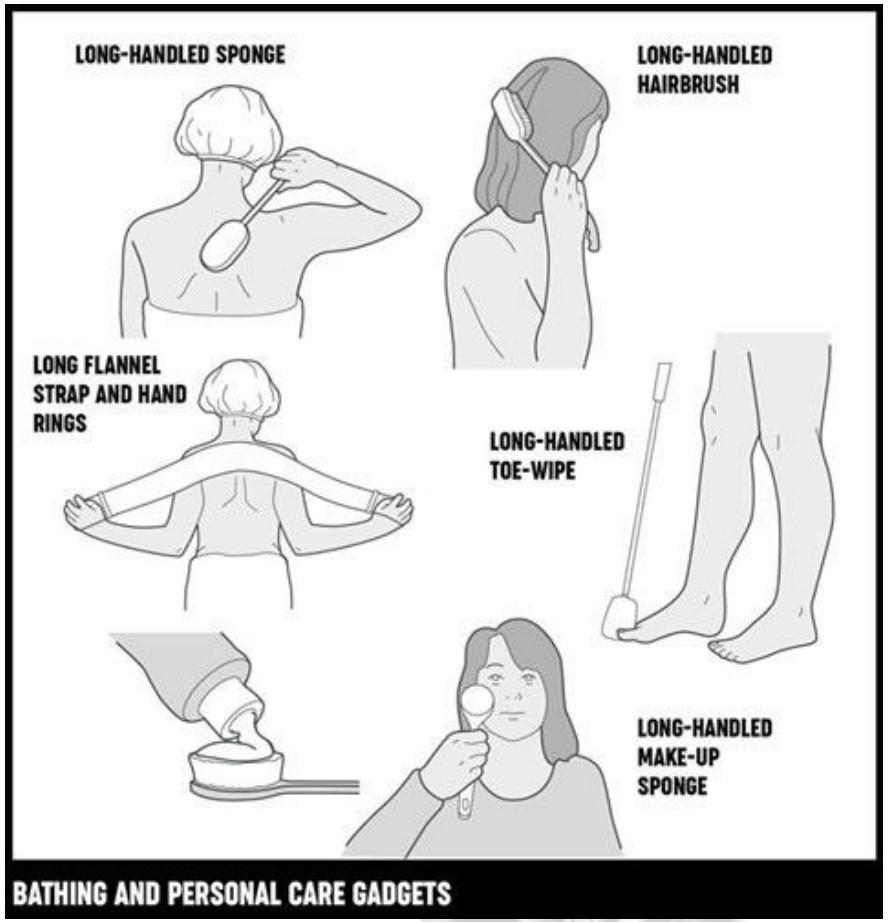
Purse or backpack over shoulders protects wrist/fingers

Rolling stool for gardening

Russek: HSD 105: Posture & Joint Protection

Gadgets & Devices

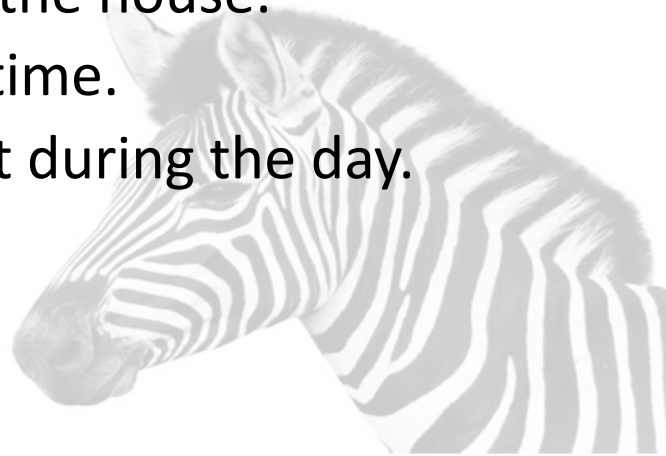
https://www.mayoclinic.org/diseases-conditions/arthritis/multimedia/joint-protection/sls-20076400?s=12



https://myra.org.au/article/living-arthritis-reduce-joint-wear/your-home

Braces, Splints & Orthotics

- Braces and splints can decrease stress on joints.
- Ideally, they should not prevent normal motion.
  - Immobilization braces may allow muscles to become weak.
- It is important that you do not allow muscles to become weak.
- You might need to always use them, or just when flared or to do certain activities. For example:
  - Wear an ankle brace when walking in the woods, but not in the house.
  - Use a wrist brace when the wrist hurts a lot, but not all the time.
  - Wear a wrist brace at night to manage carpal tunnel, but not during the day.
- Orthotics can improve alignment throughout the body



Exceptions to “Use Only When Necessary”

- It may be appropriate to use some braces/splints consistently:
  - Foot orthotics help align the legs and spine, are best used all the time.
  - Finger splints that allow proper motion, because there are no muscles that can prevent certain excessive motions.
  - Knee braces that prevent the knee from bending sideways (valgus) but allow normal bending.
  - Knee sleeves or taping to keep the kneecap from slipping out.
  - Compression sleeves can provide valuable proprioception
- Sometimes braces can decrease night-time subluxations

Braces & Splints

Braces & Splints

Bauerfeind braces are popular among people with EDS: https://www.bauerfeind.com/b2c/

Patellofemoral sleeve

Compression Garments for Proprioception

Start with 20 mmHg compression for proprioception and POTS

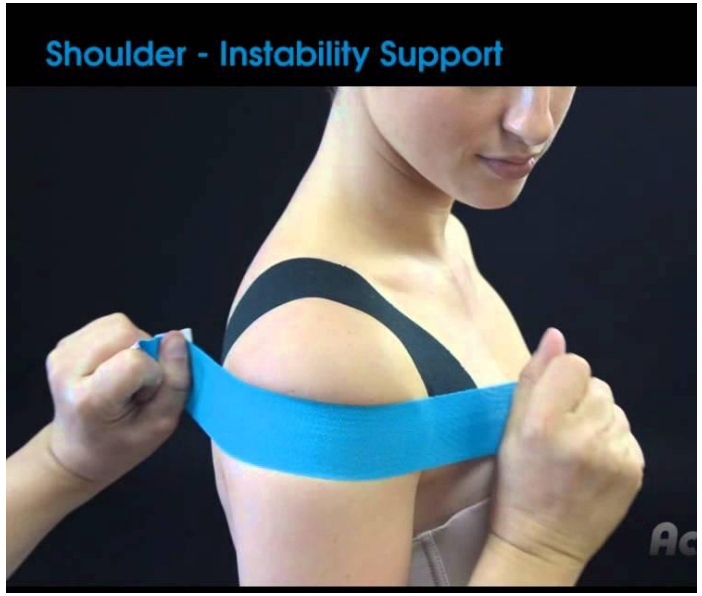
Many options available:

- Bauerfind makes many EDS-appropriate braces: https://www.bauerfeind.com/b2c/
- CWX makes sports compression garments with joint support: https://cw-x.com
- Www.Brightlifedirect.com or www.Foryourlegs.com or Old Navy brand

Body Braid: Joint Compression and Support

Taping

- Many options: KinesioTape, RockTape,
- Many Zebras like Thrive “Far Infrared” tape, hypoallergenic
- For skin sensitivity, pretreat with Pepto Bismol



- Taping can:
  - Improve proprioception/body awareness
  - Improve joint alignment
  - Improve quality of movement
  - Limit movement

Night-Time Subluxations

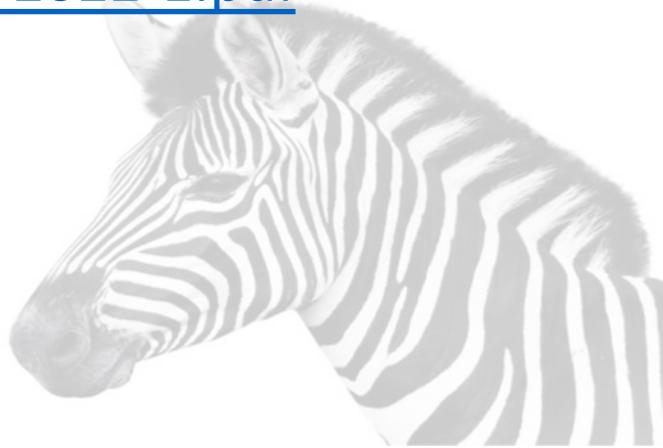
- It is possible for joints to slip out of place at night, when muscles relax
- Prevention before bed: strengthen stabilizing muscles, stretch tight muscles, improve posture
- Prevention in bed:
  - Use pillows to support limbs
  - Position joints in mid-range; don't stretch joints
  - Decrease the weight of blankets on joints
  - Consider sleeping with braces

Joint Protection Resources

- Principles of joint protection: Arthritis Australia:
  - https://myra.org.au/article/living-arthritis-reduce-joint-wear/joint-care
  - https://myra.org.au/article/living-arthritis-reduce-joint-wear/your-home
- https://www.bauerfeind-sports.com/us/sports-elbow-brace/ a range of braces that are particularly helpful for people with EDS.
- https://www.evabellejewelry.com for cost-effective and adjustable ring splints
- https://www.silverringsplint.com for 'medical grade' ring splints

Adaptive Technology Resources

- Adaptive devices can be purchased online from many companies:
  - https://www.thewrightstuff.com
  - Amazon has a lot of adaptive tech if you look for ”adaptive technology for disabled” or any specific device
  - Ability Magazine has great stories and info: https://abilitymagazine.com
  - Dysautonomia Support has a great booklet on assistive technology: https://www.dysautonomiasupport.org/wp-content/uploads/2022/02/Assistive-Technology-2nd-Edition-2022-1.pdf



Summary

- Poor posture adds up over time, stresses joints and muscles
  - Sleep is a posture, too!
- Body mechanics – how you use your body – makes a difference.
- Joint protection practices can minimize stress to fragile tissues.
- There are LOTS of gadgets, splints, braces or assistive devices that can help you protect your body.

Scientific References

- Booshanam DS, Cherian B, Joseph CP, Mathew J, Thomas R. Evaluation of posture and pain in persons with benign joint hypermobility syndrome. Rheumatol Int. 2011;31(12):1561-5.
- Jensen AM, Andersen JQ, Quisth L, Ramstrand N. Finger orthoses for management of joint hypermobility disorders: Relative effects on hand function and cognitive load. Prosthet Orthot Int. 2021;45(1):36-45.
- Levine D, Work B, McDonald S, Harty N, Mabe C, Powell A, et al. Occupational Therapy Interventions for Clients with Ehlers-Danlos Syndrome (EDS) in the Presence of Postural Orthostatic Tachycardia Syndrome (POTS). Occup Ther Health Care. 2022;36(3):253-70.

There is very little research regarding this content.

Questions?