Hypermobility 110: Lumbar Instability

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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
- Retired PT, St. Lawrence Health System, Potsdam NY
  - Clinical specialties: hypermobility, fibromyalgia, headaches, temporomandibular disorders
- Member: Ehlers-Danlos Society Medical and Scientific Board
- Chair: The Allied Health Working Group of the International Consortium of Ehlers-Danlos Syndromes and Hypermobility Spectrum Disorders
- Frequent presenter to professional and patient groups at national and international conferences
- Author of multiple review and research articles on hypermobility
- Author: “Pain Mechanisms in HSD” in Di Bon, *The Integral Movement Method for Hypermobility Management*
- Author: “Chronic Pain” chapter in *Physical Rehabilitation* textbook for PT students
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I do not have any conflicts of interest to report

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Hypermobility Lecture Series Schedule

- 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 104 part 2: How to Modify Exercises for HSD & POTS – nuts and bolts.
- 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, & TMJ pain associated with HSD, POTS and MCAS
- HSD 109: Breathing disorders in HSD
- **HSD 110: Lumbar instability**
- HSD 111: Conservative Management of Cervical Instability
- HSD 112: The vagus nerve
- HSD 113: The role of fascia
- HSD 114: Surgical and hospital precautions for HSD, POTS, MCAS
- HSD 2015: Functional Neurological Disorder

I will refer to these if you want more info

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Relevant Handouts Available

I will refer to these if you want more info

- https://webspace.clarkson.edu/~lrussek/research.html
- **Self-Care Strategies**
  - Self-Care Toolbox. *NEW* A checklist to help you optimize your self-care toolbox.
  - Breathing. Breathing incorrectly can increase low back pain and instability, pain sensitivity, and more.
  - Posture. Good posture decreases strain on muscles and joints, and can prevent many problems.
  - Joint Protection Strategies Learning to protect your joints and muscles is critical to self-care.
  - Sleep Hygiene and Positioning. Sleep posture and sleep hygiene strategies.
  - Starting to Exercise Ideas. Ideas to help you start exercising: handling fatigue, pain, and fear of movement
  - Topicals for pain management. Topicals can be a helpful tool for managing flares.
- **Pain Management**
  - Pain self-care plan. Create a pain self-care plan to improve your pain management.
  - Pain flare management plan. Create a flare management plan so you know what works
  - Pain Sensitization. Cognitive behavioral approaches to pain management.
  - Free chronic pain management apps for teens. Similar information as Curable, but appropriate for teens.

DISCLAIMER

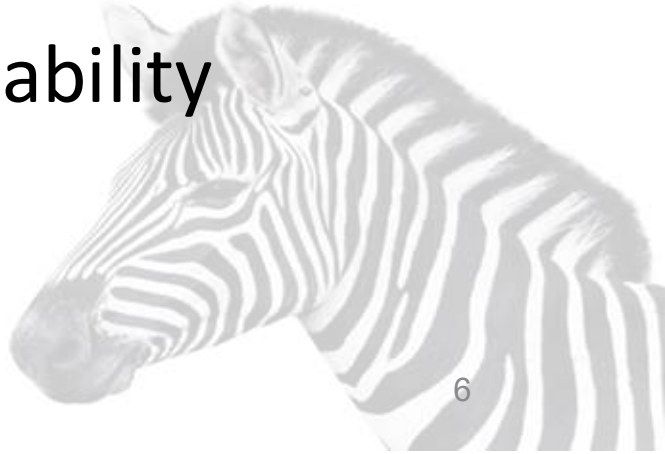
The information in this presentation is for general purposes, only, and may or may not apply to your situation.
Check with your health care provider
before starting any new exercises or self-care,
to ensure that they are appropriate and safe for YOU.

I cannot diagnose you or provide personal medical recommendations, and this lecture should not be used for those purposes.

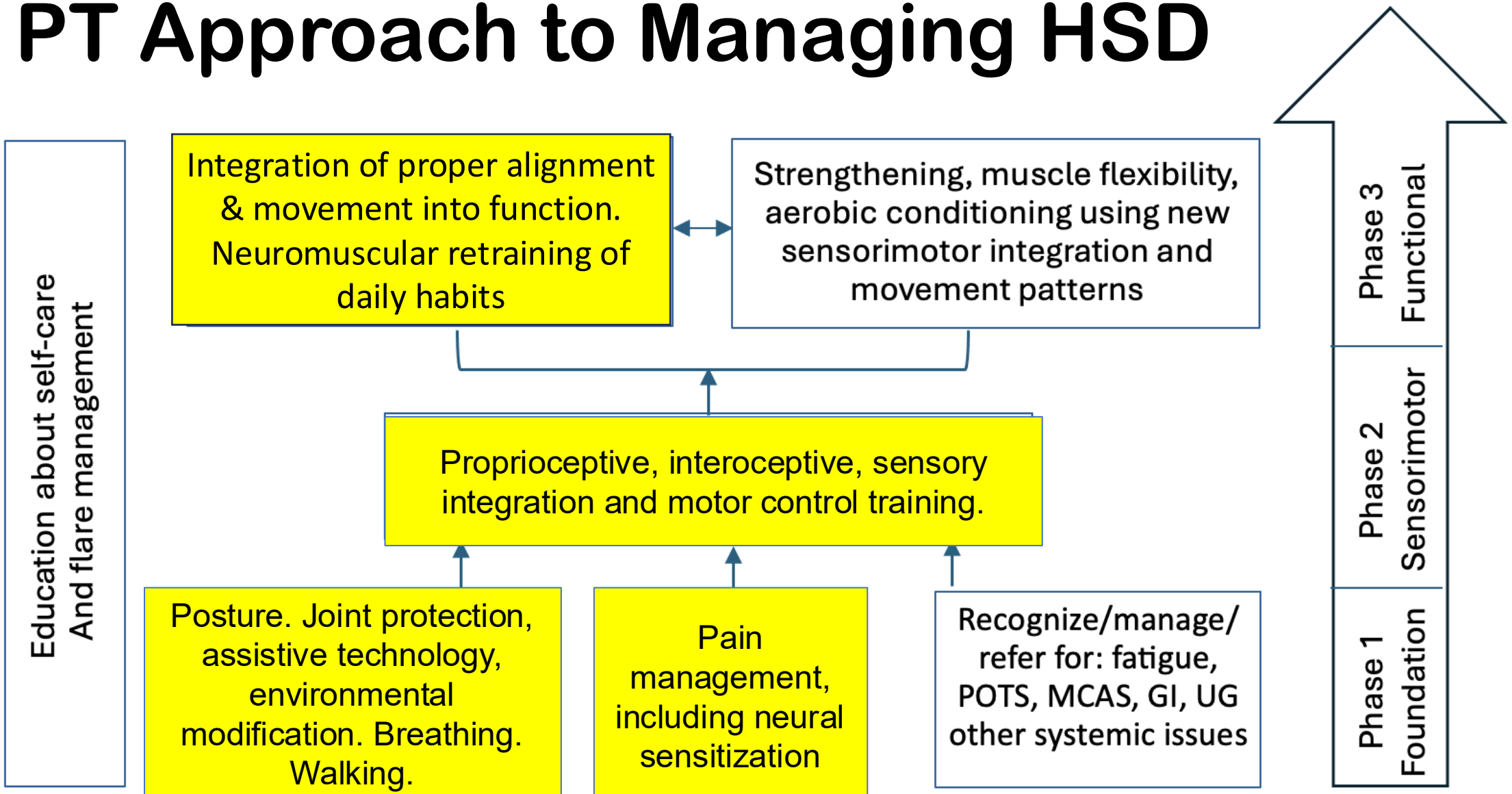
Objectives

At the end of this presentation, participants will be able to:

1. Identify key anatomical structures in the lumbar spine
2. Describe causes of lumbar instability pain
3. Recognize signs and symptoms of lumbar instability
4. Identify things you can do to avoid and manage lumbar instability
5. Understand that you CAN manage lumbar instability



PT Approach to Managing HSD



Understanding Your Back Pain

What Kind of Back Problem Is It?

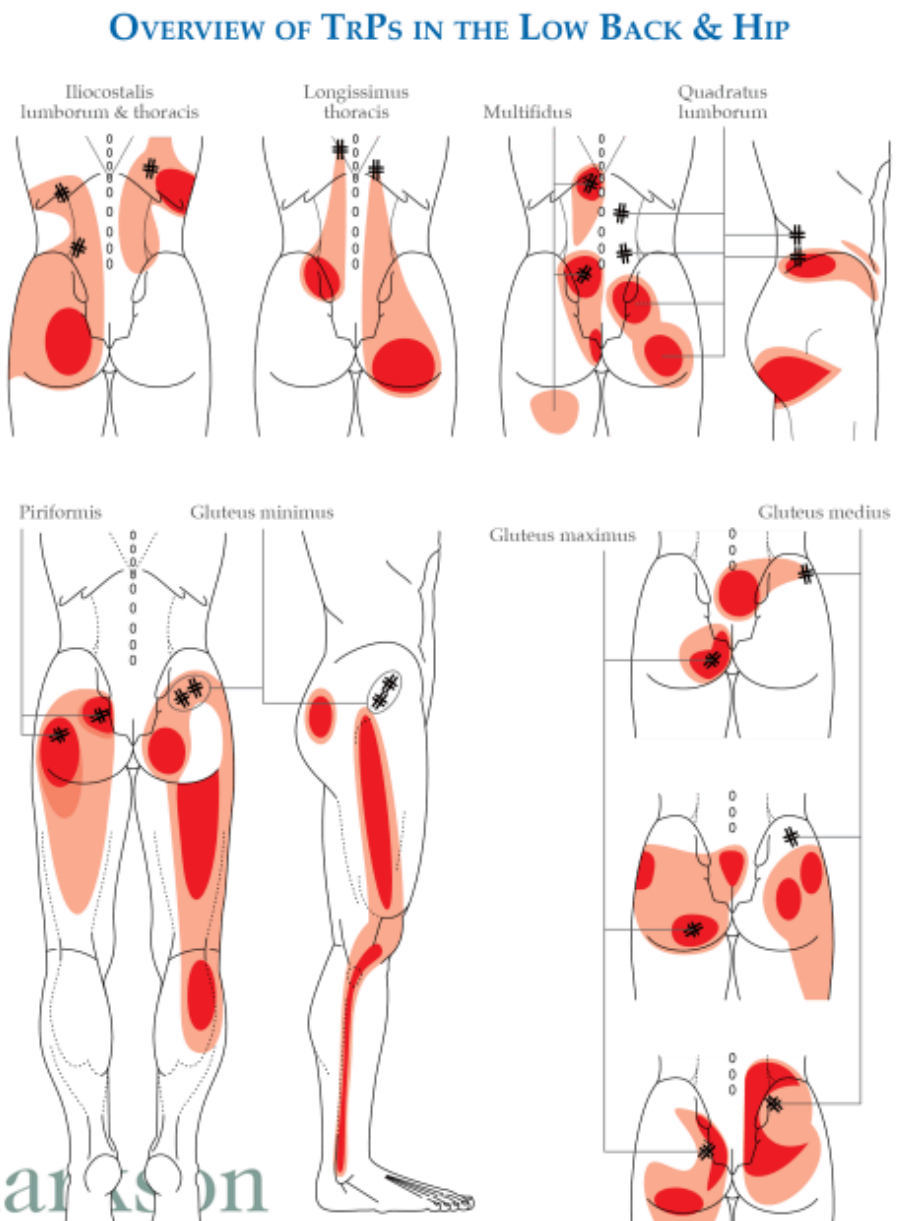
- Lumbar instability:
  - Intermittent pain, typically in the back/buttock, sometimes very intense
  - Provoked by minimal movements, sometimes better with activity
- Spondylolisthesis:
  - Vertebral malalignment on imaging, may be asymptomatic
- Muscle spasm or myofascial pain:
  - Localized pain and stiffness. May be secondary to instability
- Herniated disc (aka 'flexion syndrome'):
  - MUST have radiating pain into the leg that radiates with back flexion, centralizes with extension; may have one-sided neurological issues (numbness or weakness).
  - MRI results correlate poorly with symptoms – many pain free people have (+) MRI
- Lumbar stenosis:
  - Due to arthritic or bony compression on nerves or the spinal cord. Worse standing/walking.
- Tethered cord:
  - Bilateral neurological signs into the legs, such as weakness, numbness, tremor/spasm
  - Loss of bladder or bowel control (not incontinence due to hypermobility)

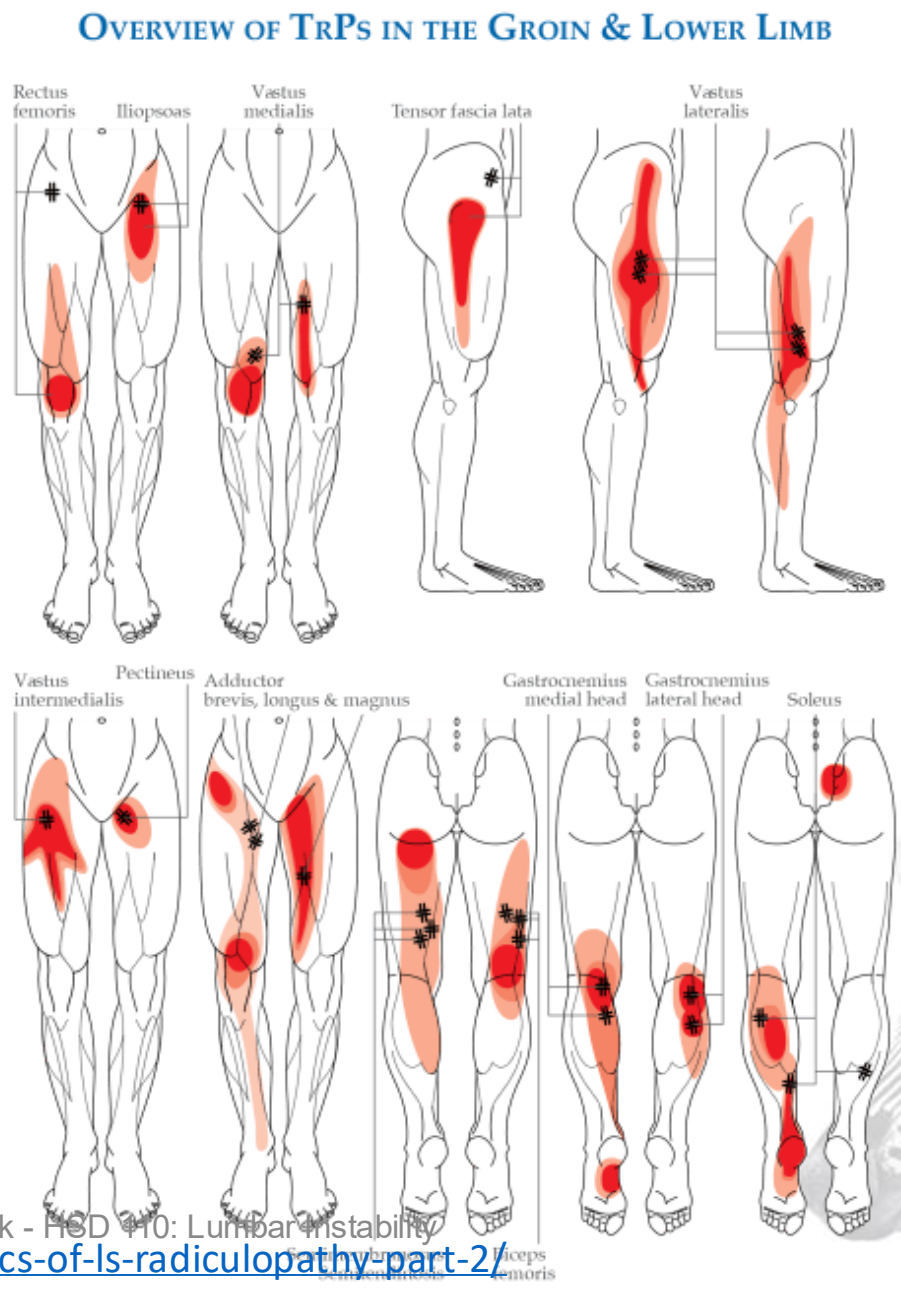
Low Back: Spasm and TrP

- Muscles tense to brace unstable spine
- Poor body awareness leads to using improper muscles or overusing proper muscles
- Using wrong muscles to breathe increases muscle tension
- Pain and fear of moving increases muscle spasm
- Fascia may become tight due to stress, restrict nutrient flow in tissues
- Trigger points (TrP) lead to myofascial pain – the source of a lot of HSD pain
- **TrP often co-exist with lumbar instability!**

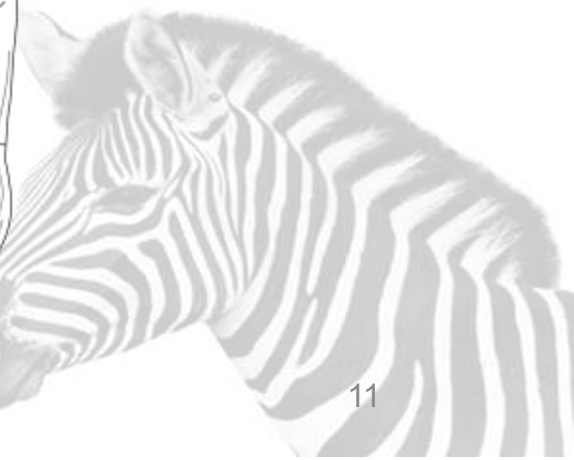
Picture from https://www.spineuniverse.com/conditions/back-

Trigger Point Referral Patterns

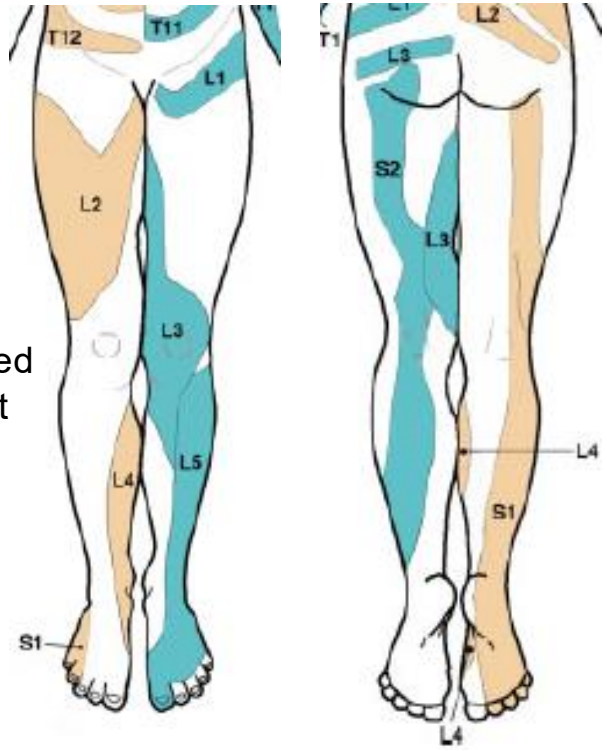




Due to muscles working too hard or too often trying to provide stability



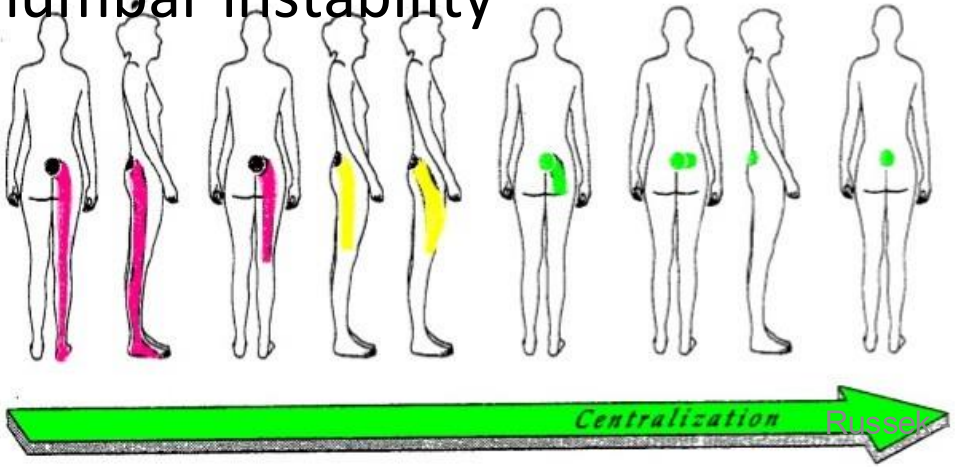
Lumbar Flexion Syndrome



Dermatomes are areas of skin served by each nerve root

Looks like:

- Pain in the back and radiating down the back of one leg: “sciatica”
- Radiating pain increased with forward bending and sitting
  - Pain typically ’centralizes’ with standing, walking, back extension
- May be present in people with lumbar instability

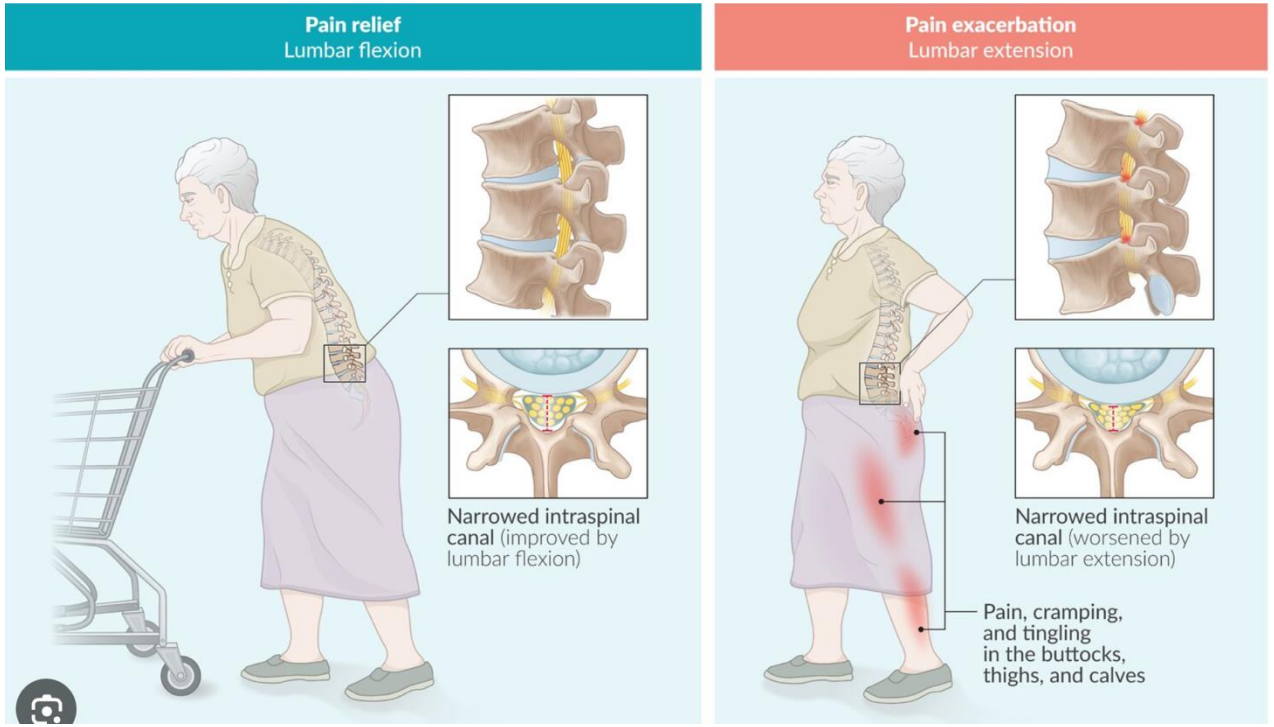


What to do:

- Avoid lumbar flexion until the pain has fully centralized.
- Lumbar extension exercises (arching backwards) may be helpful if they centralize the pain. But it may be more complicated.
- Once pain has centralized, you can gradually resume flexion exercises.

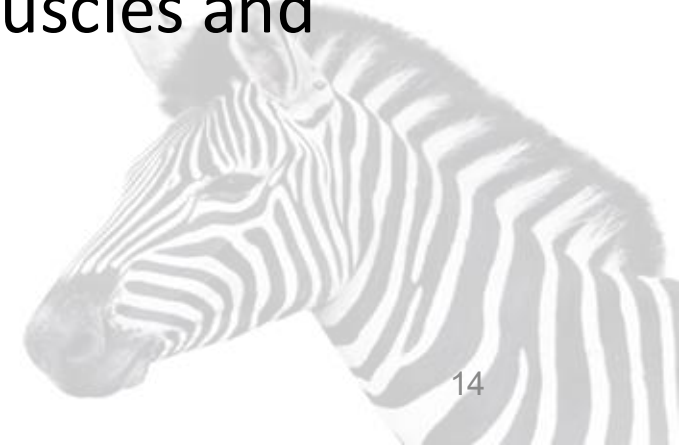
Lumbar Stenosis

- Often affects older people over 50 yrs, especially if they have arthritis.
- Symptoms:
  - Leg pain, cramping or heaviness (neurogenic claudication)
  - Numbness and tingling in the legs
  - Weakness in legs or foot drop
  - Low back pain and stiffness
- Symptoms are relieved by sitting or bending forward, and aggravated by standing or walking upright.



What Is Lumbar Instability?

- Inability to control spinal movement within the ‘neutral zone’
- Lumbar stability is normally a combination of:
  - Passive structures, such as the disc, facet joints and ligaments
  - Muscles acting on or affecting the spine
  - Neurological system (brain and nerves) that controls the muscles
- People with hypermobility have stretchy passive structures
- BUT, what makes the spine unstable is failure of the muscles and nervous system to provide control



Symptoms of Lumbar Instability

- Symptoms:
  - Sharp, intense pain, usually in the back, but maybe also buttocks or thighs
  - There may be ‘catching’ or ‘locking’ in the spine or you may feel like your spine ‘gives out’
- Onset
  - Might be initially triggered by a specific injury, but not necessarily
  - Often gets worse when you have been less active or stopped exercising
- Pattern
  - Pain (initially) occurs in bouts, where it comes and goes
  - These bouts of pain may become more frequent and longer over time
  - Specific bouts often triggered by small movements, especially quick or unexpected
  - May be aggravated by prolonged postures, such as sitting or standing

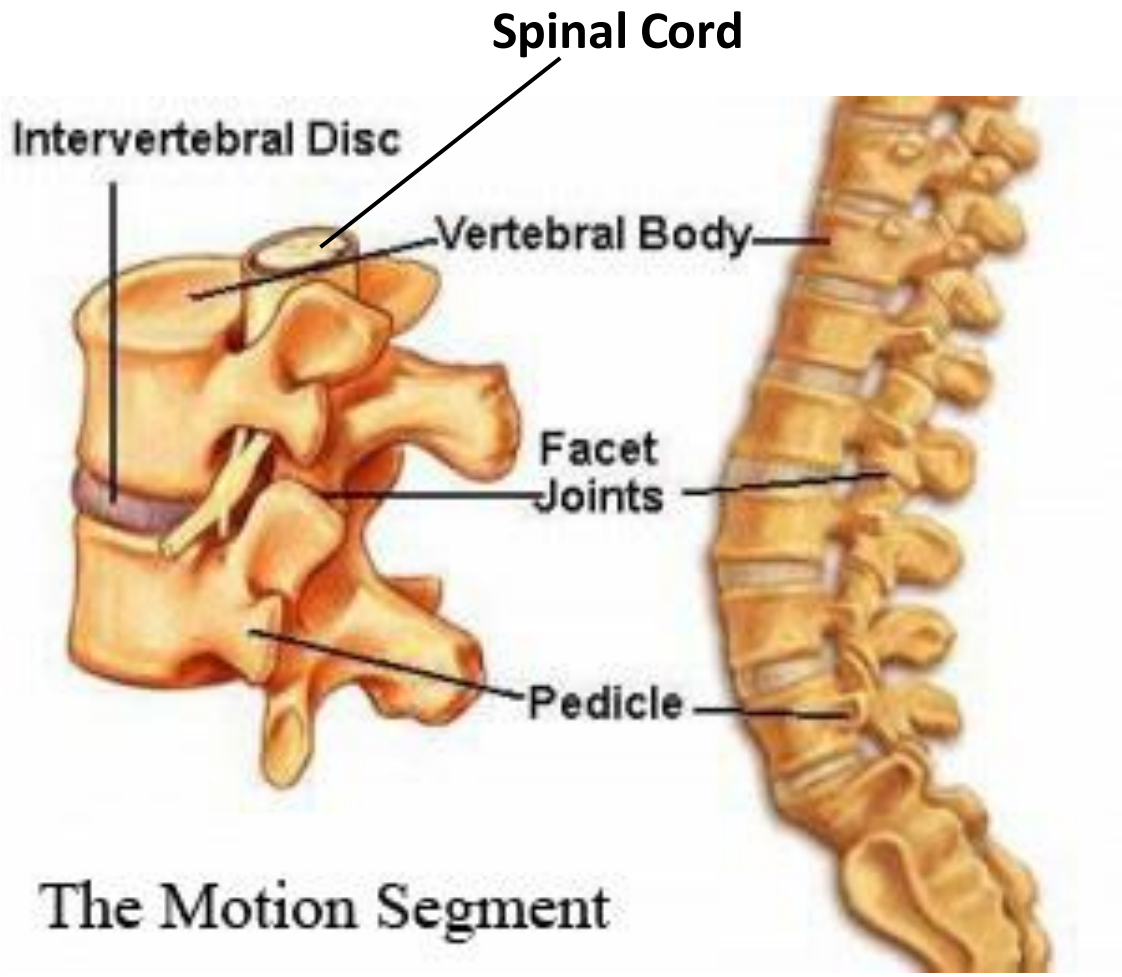
Saragiotto, 2018

IMPORTANT!

- Functional lumbar instability occurs when muscles (and the nervous system that controls the muscles) do not effectively control stability and motion
- Instability, therefore, can come and go based on things you CAN control

- There is another, similar but different problem resulting from lumbar instability, called spondylolisthesis

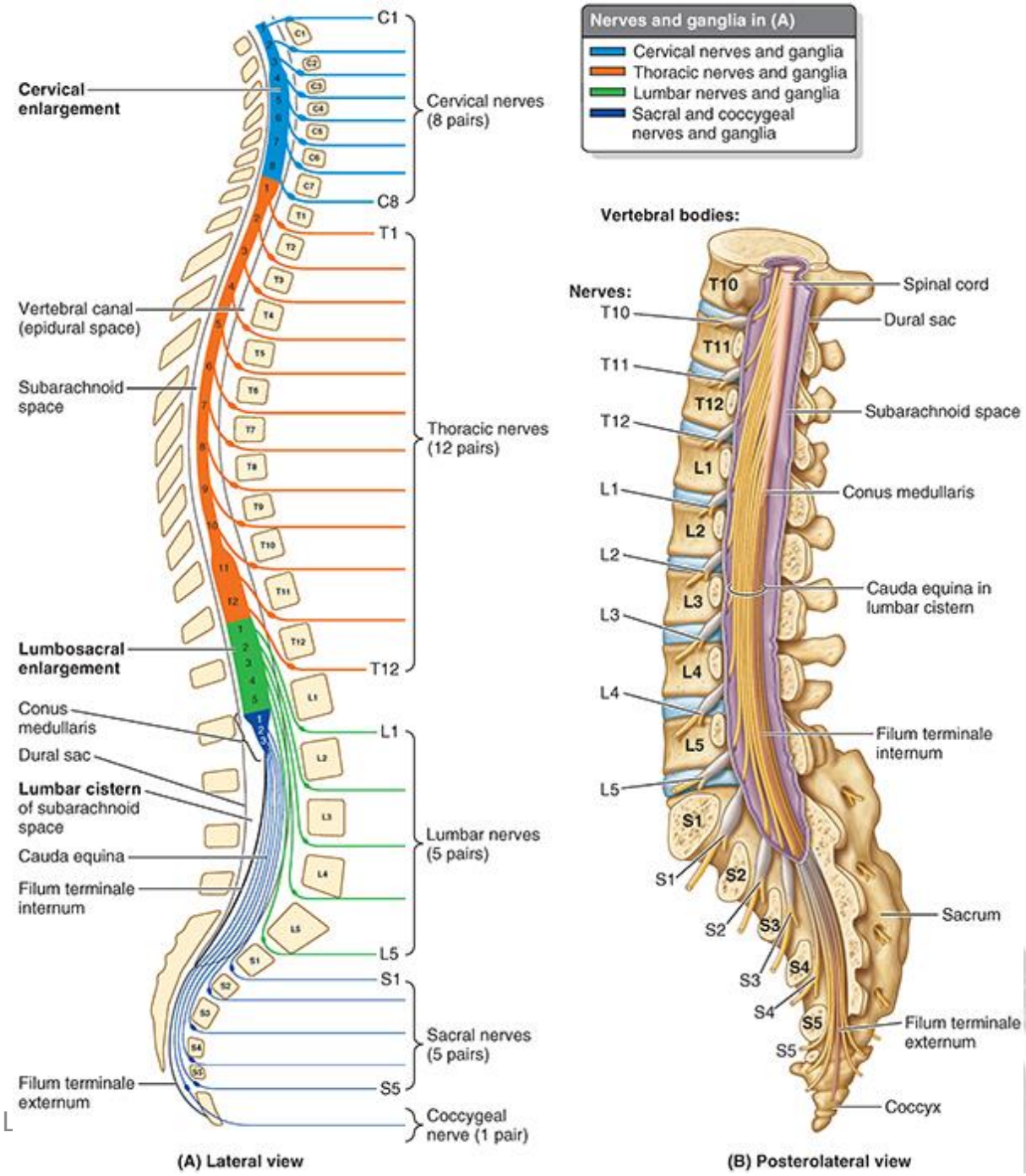
Spine Anatomy



- Vertebrae are separated by intervertebral discs
  - Discs allow movement between vertebrae
- Vertebrae connect at facet joints
  - Facet joints control direction of movement between vertebrae
- Ligaments limit vertebral motion
- Muscles control vertebral motion

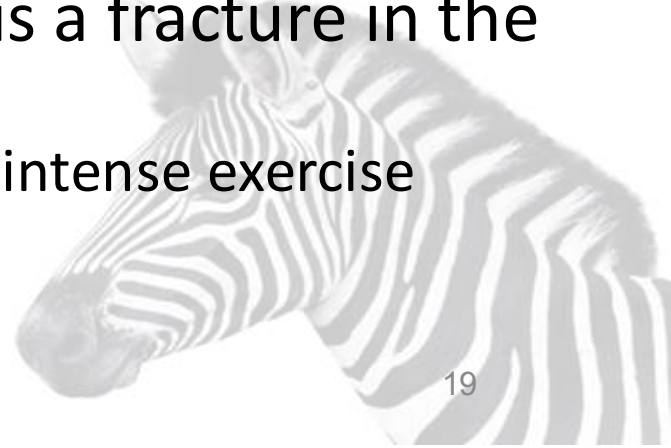
Spinal Cord

- The spinal cord has neuron cell bodies in it; cell bodies control nerve function
- The nerves have axons, which act like electrical cables to transmit signals
- The spinal cord ends at lumbar vertebra 2
- Below L2, nerves inside the spinal canal form the ‘cauda equina’ (horse’s tail)



What is Spondylolisthesis?

- Also called “a Spondy”
- One vertebra slips forward on another
- Most spondy’s do NOT cause pain or symptoms
- Typically occurs in the low back
- Degenerative spondy occurs when the disc is weak or damaged
  - Typically older people, probably also zebras
- ‘Isthmic’ spondy occurs if there is a fracture in the vertebra
  - Typically in younger people, from intense exercise



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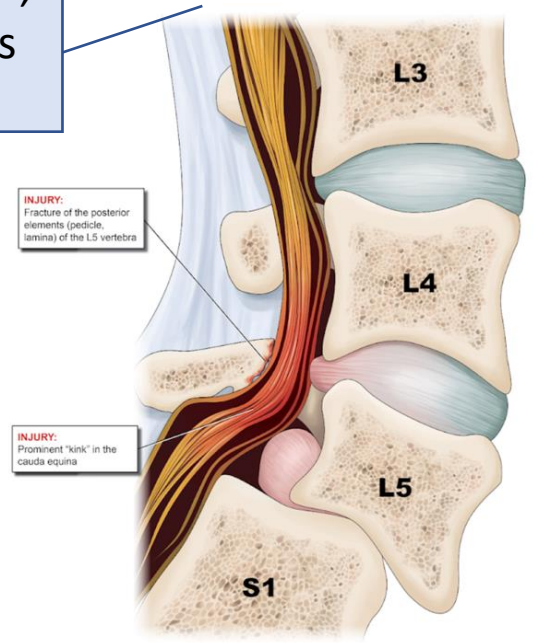
Spondylolisthesis

Spinal cord ends at L2, cauda equina nerves are below



Colorized Interpretation of L5-S1 Spondylolisthesis Injury

http://www.annenamocatcat.com/2019/01/post-accident-injuries-of-lumbar-spine.html

- X-ray findings are poorly correlated to pain
- The spinal canal in the lumbar spine has space
- Spinal cord has ended and only nerve roots here
- Symptoms, when present, include:
  - Buttock and posterior thigh pain
  - Back muscle spasm
  - Radiculopathy: compression of nerve root
    - Typically worse with standing upright, walking, lumbar extension
  - Cauda equina syndrome: buttock numbness, bowel/bladder, acute pain
    - If you have neurological weakness or abnormal reflexes, see a doctor

Nerve root

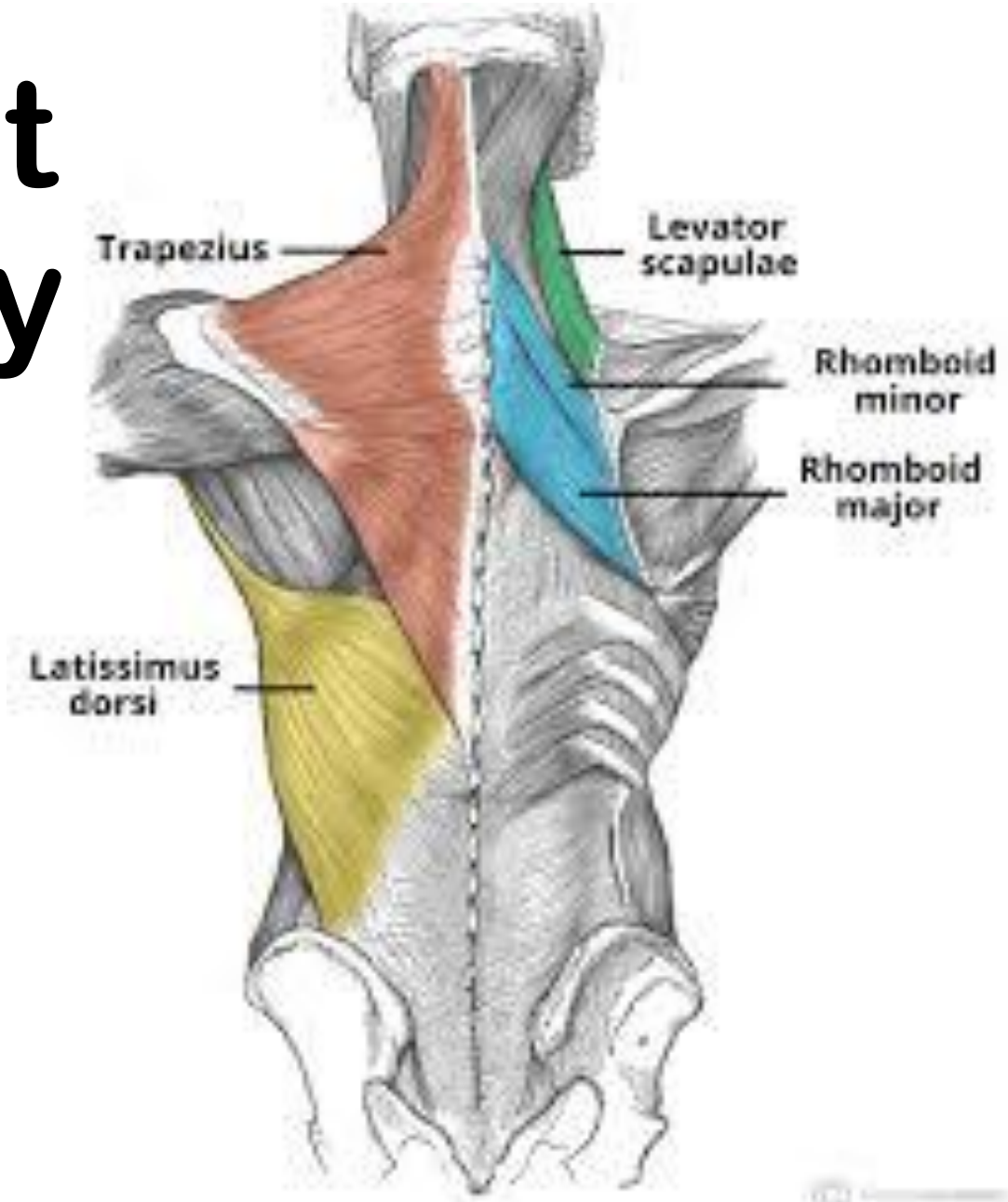
Vanti, 2021

IMPORTANT!

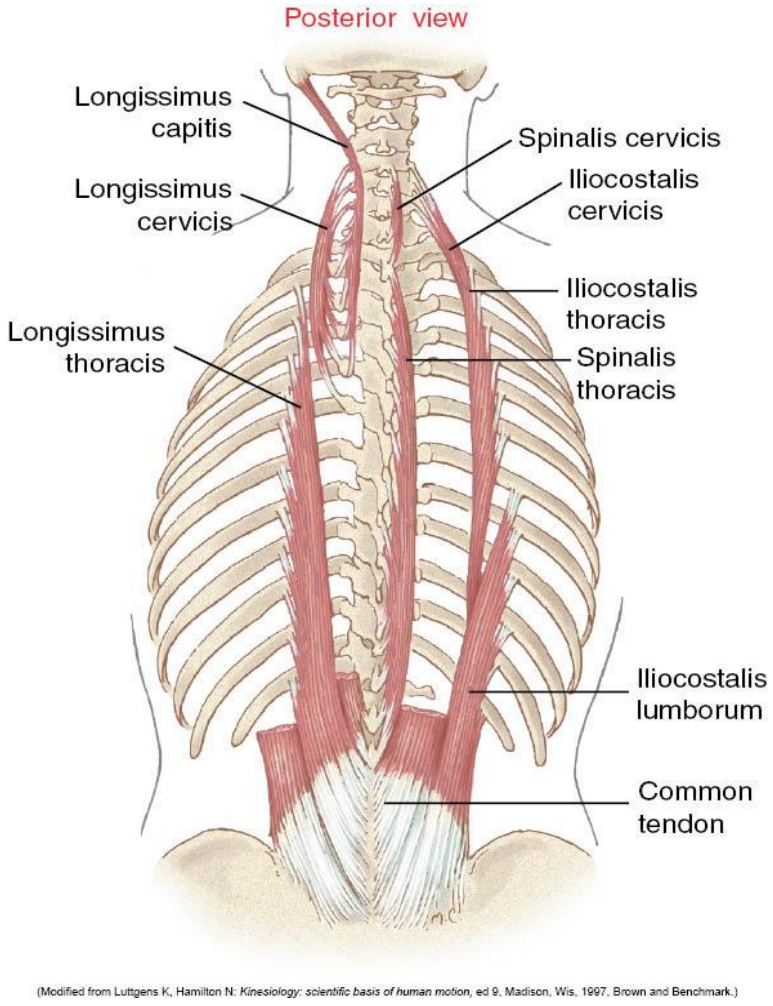
- If you have a spondylolisthesis, it might or might not be causing your pain – most spondy's do NOT cause symptoms!
- Although the vertebra is not in the correct place, you are not 'broken'
- Many people with spondy's have pain due to functional instability
- Everything in this presentation would apply…
- You CAN learn to control functional instability

Questions?

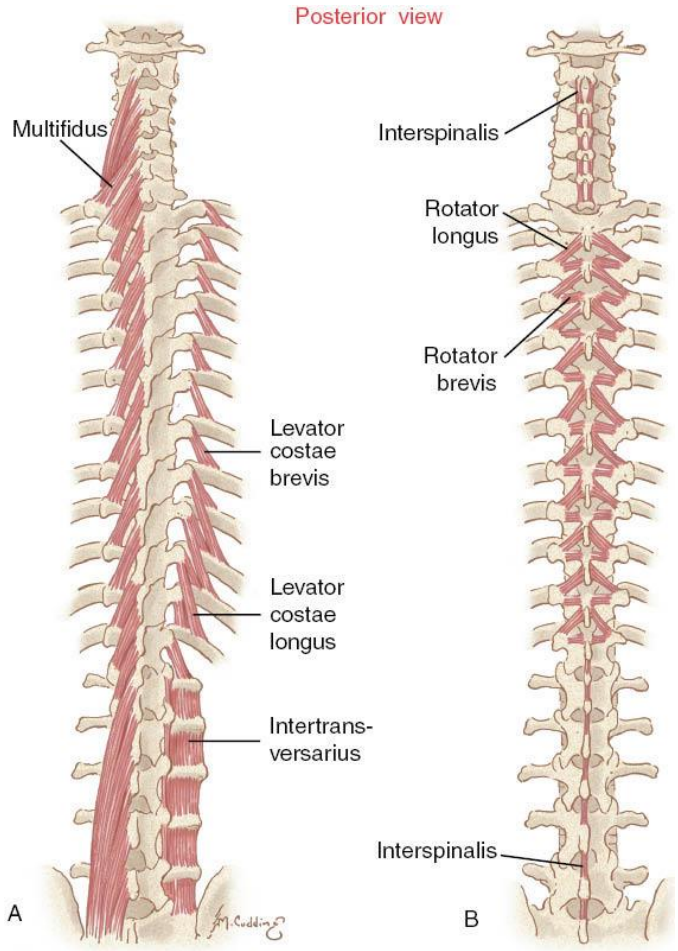
Relevant Anatomy



Mobilizer vs. Stabilizer Spinal Muscles



(Modified from Luttgens K, Hamilton N: *Kinesiology: scientific basis of human motion*, ed 9, Madison, Wis, 1997, Brown and Benchmark.)



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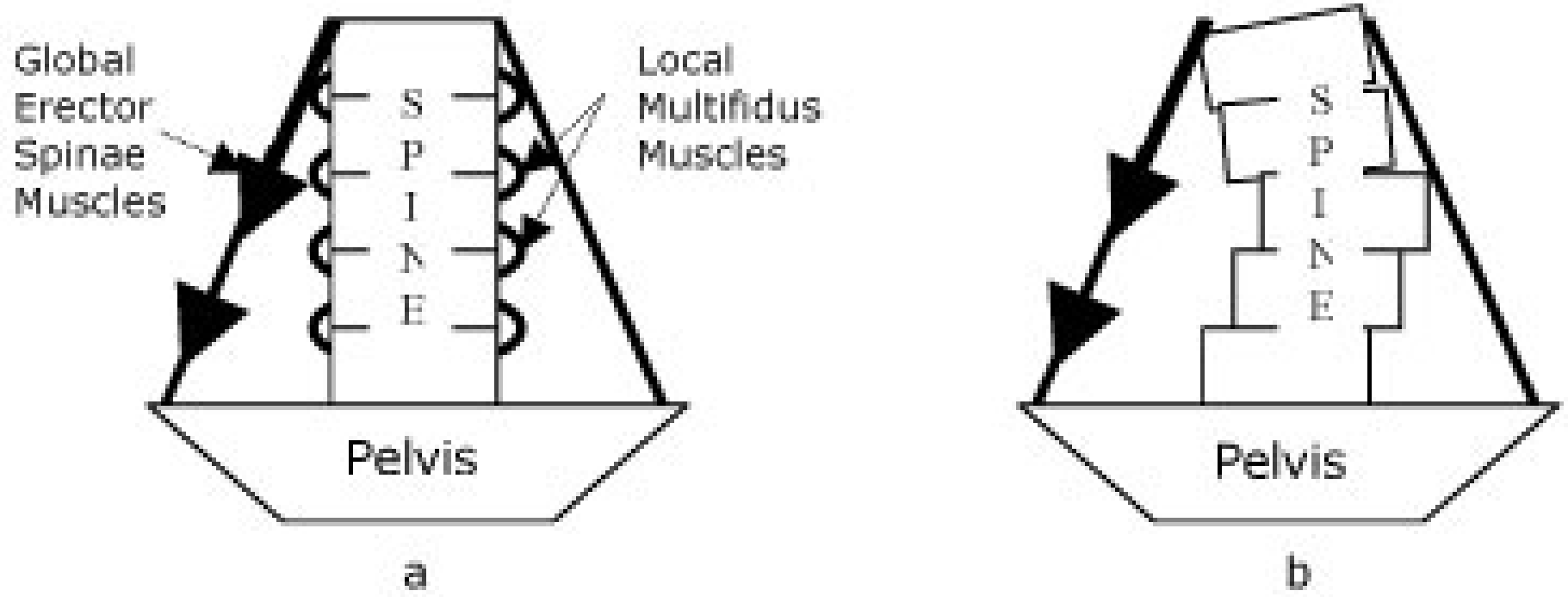
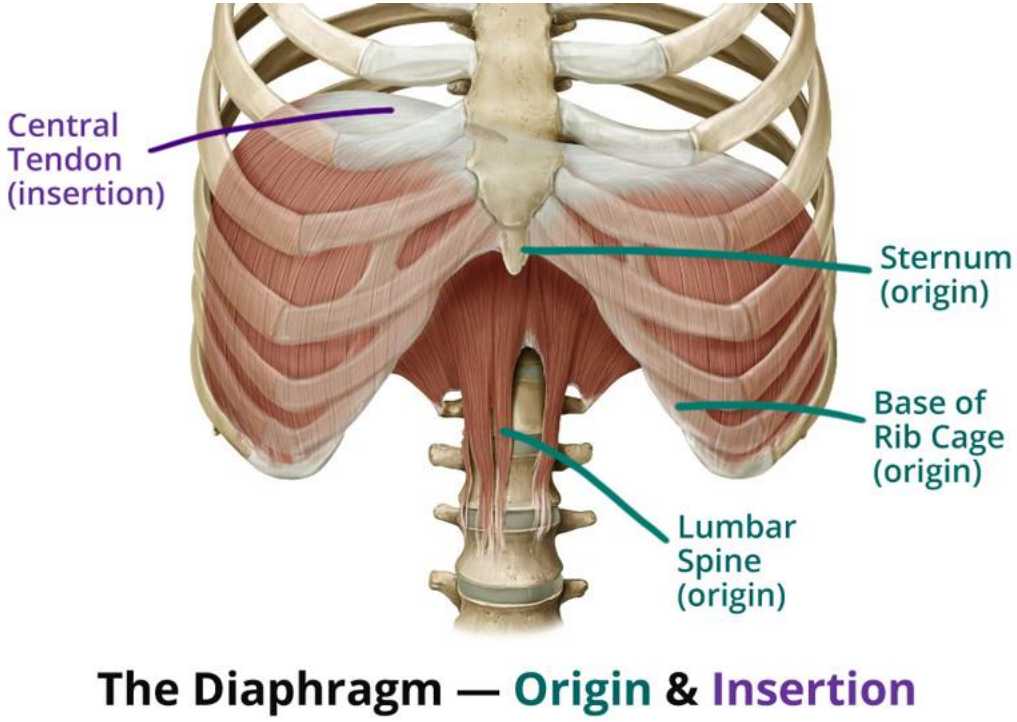
Core Stabilization Concept



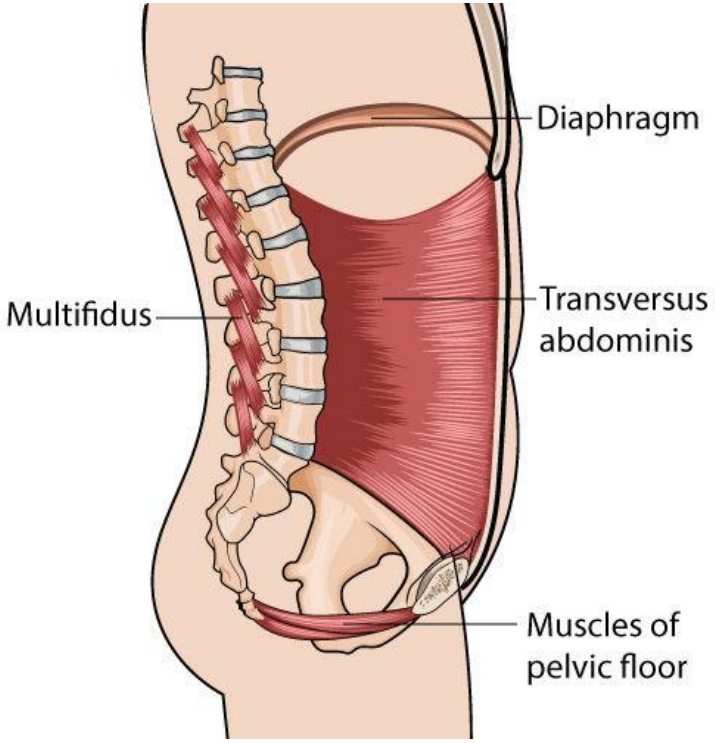
- Instability occurs when the short, deep, stabilizing muscles are not effective
- The long, superficial muscles try to help, but make instability worse
  - And cause pain by going into spasm
- Gentle muscle engagement (e.g., 1-2/10 effort) preferentially activates stabilizing muscles

(picture from https://www.physio-pedia.com/images/d/dd/Ms_systems.jpg)

Other Stabilizing Muscles

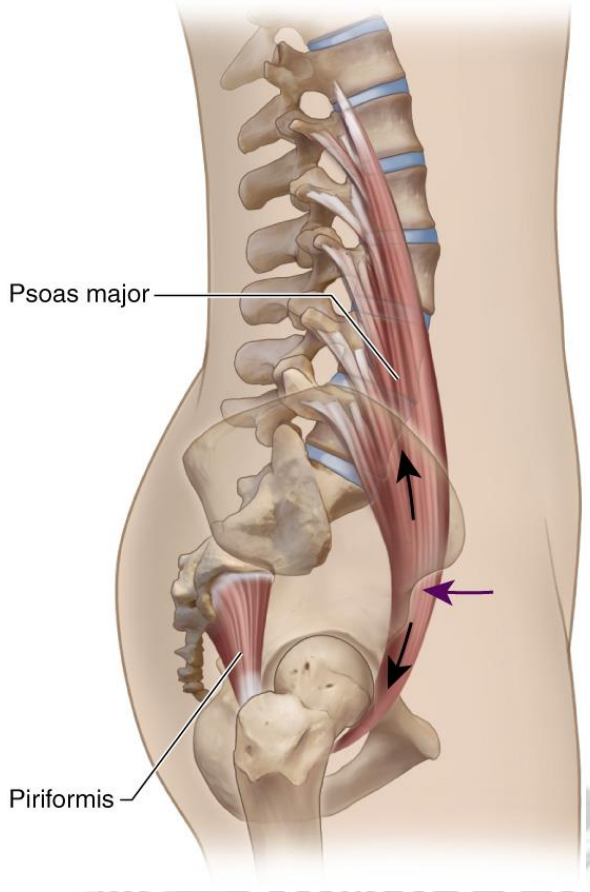


The Diaphragm — Origin & Insertion

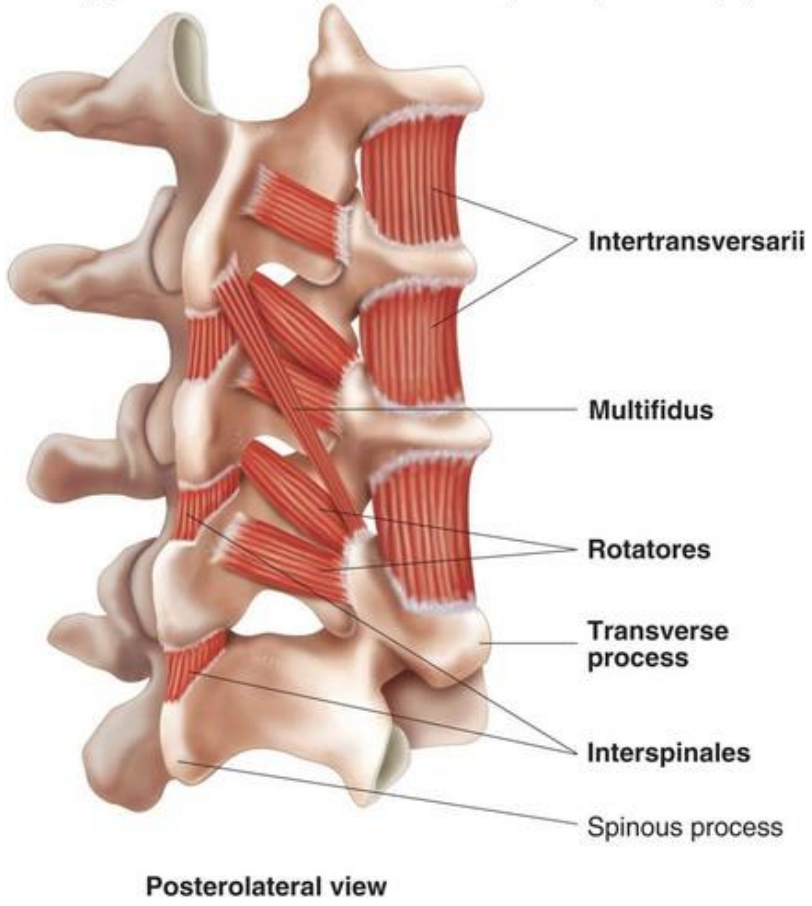


The Pelvic Floor

The Psoas



Body Awareness Role of Spine Muscles



Posterolateral view

- Deep stabilizing muscles provide position and movement awareness in the spine
  - Rotatores muscles have 3x the number of position sensing nerves as other muscles!
- People with HSD/hEDS often have poor body awareness
- Treatment often needs to start with restoring this body awareness
  - Russo, 2018

https://brentbrookbush.com/articles/anatomy-articles/muscular-anatomy/rotatores-interspinales-and-intertransversarii/

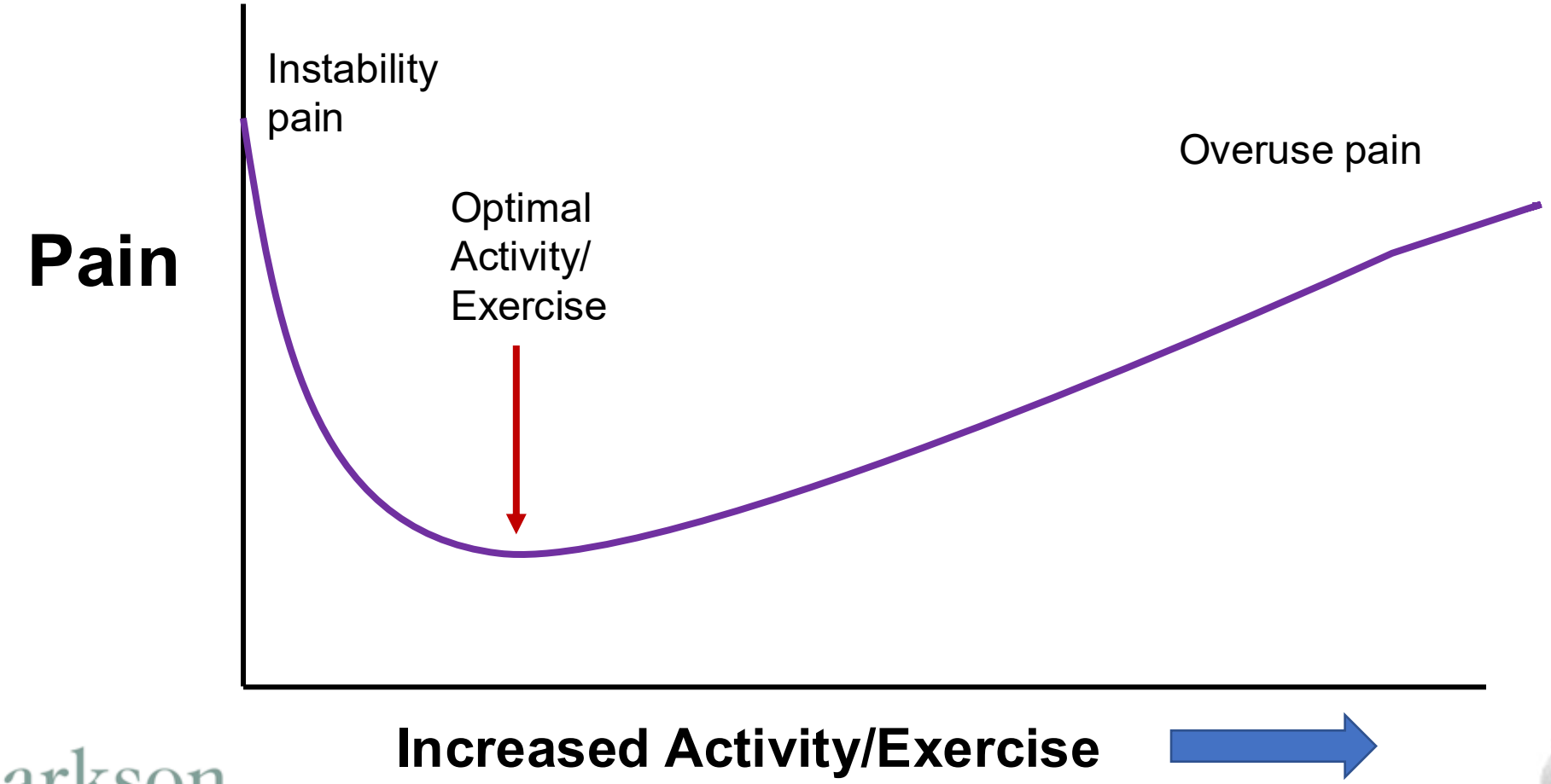
When Muscles Don't Work Right…

- Local stabilizer dysfunction
  - (e.g., multifidi, transversus abdominus, psoas)
  - Are inhibited by pain
  - Leads to instability and poor segmental control
- Global stabilizer
  - (e.g., internal/external obliques, spinalis, gluteus medius)
  - Difficulty controlling movement
  - Often become weak and long
- Global mobilizer
  - (e.g., rectus abdominus, iliocostalis, piriformis)
  - Responds to pain by going into spasm
  - Tightness in these muscles causes imbalances elsewhere

(Gibbons, 2001)

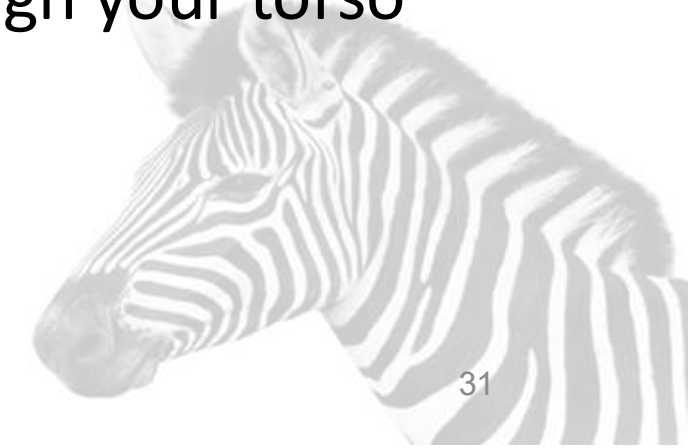
Managing Lumbar Instability

Proposed Exercise/Pain Relationship



Steps to Managing Lumbar Instability

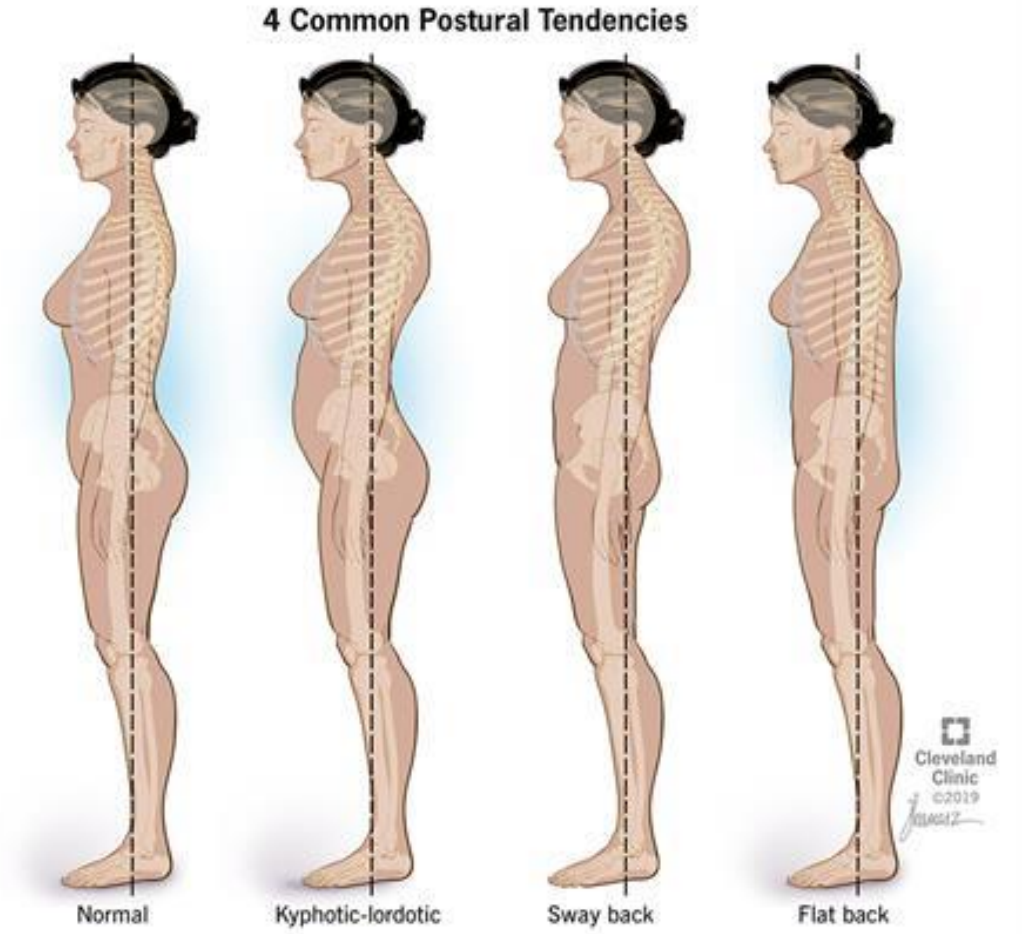
1. Learn and use good posture and body mechanics, from the feet up
2. Breathe correctly, using your diaphragm muscle
3. Calm your central nervous system if it is in overdrive
4. Train your body awareness (proprioception), especially in the spine
5. Learn to activate the correct muscles and not overuse the incorrect muscles (i.e., isolate the stabilizing muscles)
6. Make sure you remain stable from the feet up through your torso
7. Strengthen core muscles safely
8. Use the correct muscles to stabilize during function



Posture

HSD105: Posture & Body Mechanics

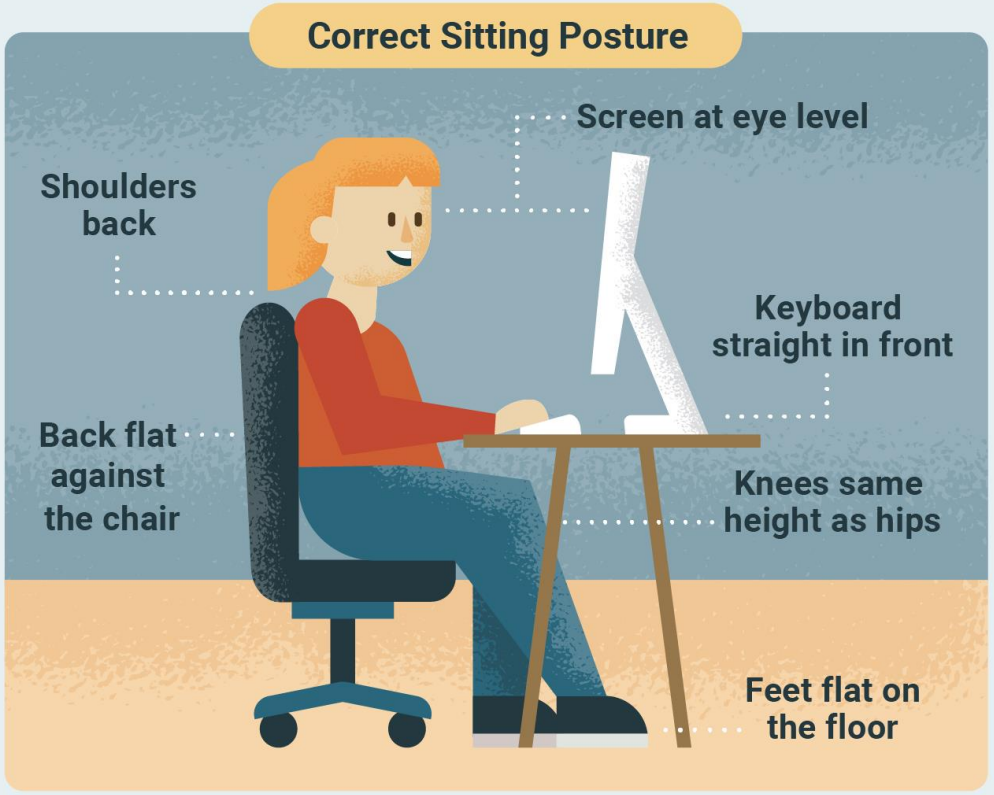
Posture

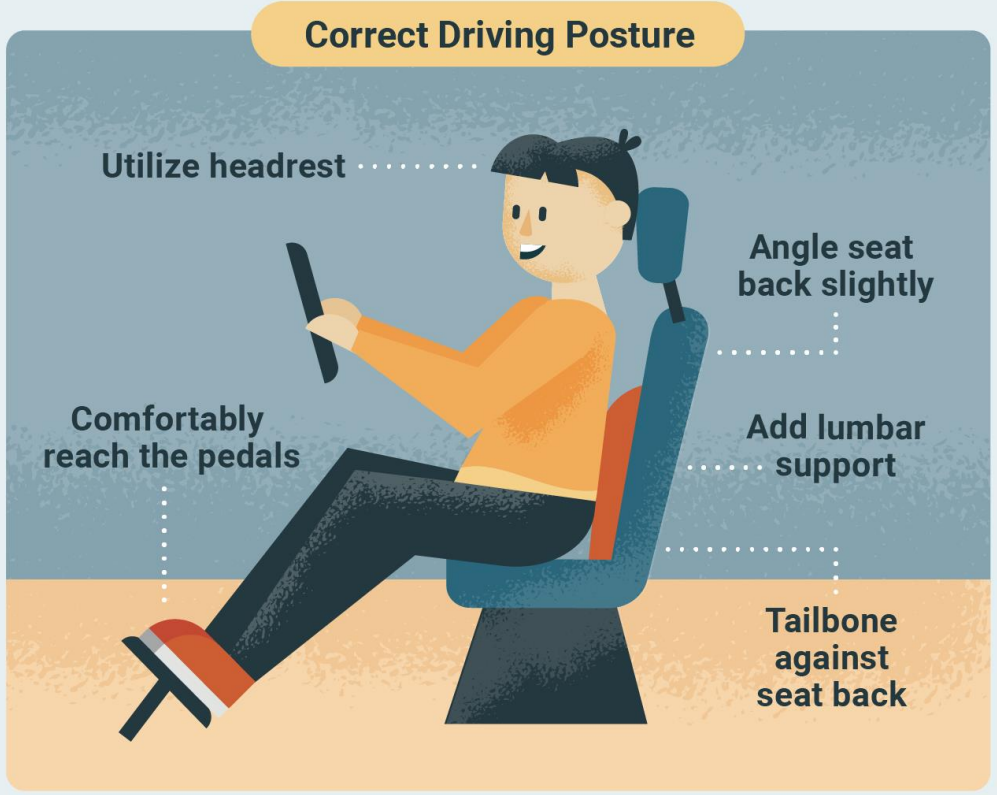


- Standing posture should have ankles, knees, hips, shoulders and ear aligned
- Your pelvis should be in 'neutral'
- Poor posture is often due to hanging on your ligaments
- This overstretches already stretchy ligaments
- It allows core muscles to become long and weak
- Increased arch in the low back increases lumbar instability
- Consider your feet, knees, hips and pelvis – these provide the foundation for the spine

Good Sitting Posture

HSD105: Posture





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

VEHICLE ERGONOMIC EDUCATION

DRIVER SEAT SETUP – 8 STEPS

1. SEAT HEIGHT:
Raise the seat as high as is comfortable to improve your vision of the road

2. PEDALS:
Move the seat forwards until you can easily fully depress the clutch pedal and the accelerator pedal. Fine tune the seat height again if required

3. BACK SUPPORT:
Adjust the lumbar support to give even and comfortable pressure along the length of the backrest

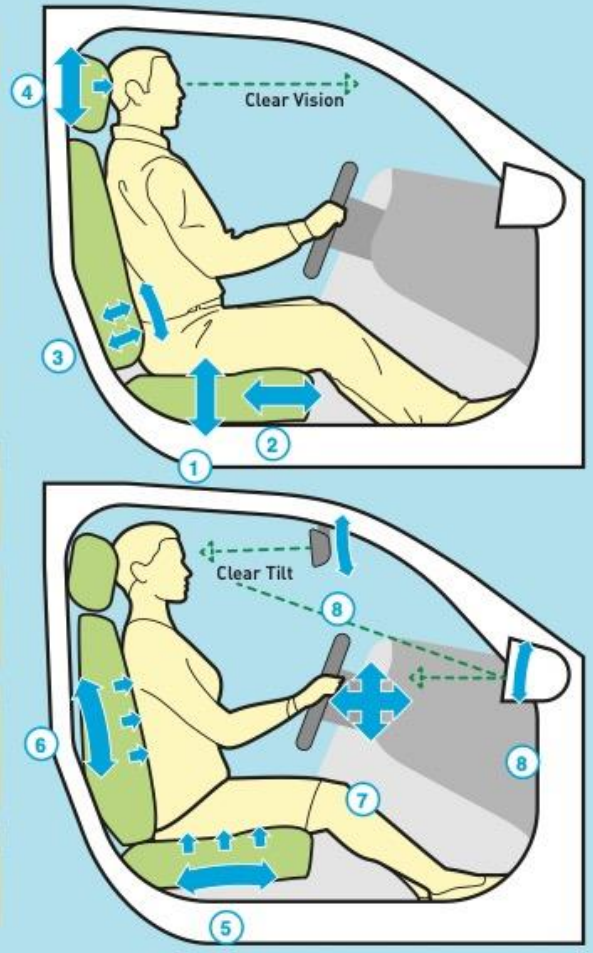
4. HEAD RESTRAINT:
Adjust the head restraint to ensure the risk of injury is reduced in the event of a car accident

5. SEAT BASE:
Adjust base tilt angle so that the thighs are supported along the length of the cushion (avoid pressure behind the knee)

6. SEAT BACKREST:
Adjust the backrest so it provides continuous support along the length of the back and is in contact up to shoulder height

7. STEERING WHEEL:
Adjust the steering wheel rearwards and downwards for easy reach (check for clearance with thighs and knees when using pedals and ensure display panel is in full view and not obstructed)

8. MIRRORS:
Adjust the rear view and side mirrors ensuring that they can be used without excessive straining of the neck or upper body



REPEAT 1-8 AND FINE TUNE AS NECESSARY

NOTE: NOT ALL VEHICLES WILL HAVE ALL OF THESE ADJUSTABLE FEATURES. PLEASE ADJUST IN THE ORDER RECOMMENDED HERE FOR THOSE FEATURES THAT YOU HAVE IN YOUR VEHICLE.

ENTERING AND EXITING THE VEHICLE

STORAGE TIPS FOR BEST PRACTICE

- Be mindful of getting your body into an awkward posture when entering and exiting the vehicle. This includes awkward bending of your neck, spine or lower body.
- Some individuals find squatting down onto the seat and then slowly turning trying to move the legs and trunk at the same time helps with the ease of getting into the vehicle.
- When exiting, try to turn the legs and trunk at the same time to avoid twisting through the spine

STORAGE SOLUTIONS

STORAGE TIPS FOR BEST PRACTICE

- Store items in the boot
- Avoid rear seat or passenger seat

TAKING BREAKS

REST BREAK RECOMMENDATIONS

- Research is mostly focused on accident prevention
- Rest when tired
- Schedule breaks
- NIOSH advice for sedentary workers
  - rest 15 mins every 2 hours, QLD Transport
  - a break every 2 hours, NHVR
  - 2 x 15min breaks in an 8 hour driving shift

PRACTICAL SOLUTIONS

- Schedule pre planned rest breaks
- Enable workers to decide when they take breaks (autonomy)
- Frequent short rest breaks rather than longer less frequent rest breaks
- Promote movement within the work day

WORKING WITHIN A VEHICLE

TIPS FOR BEST PRACTICE

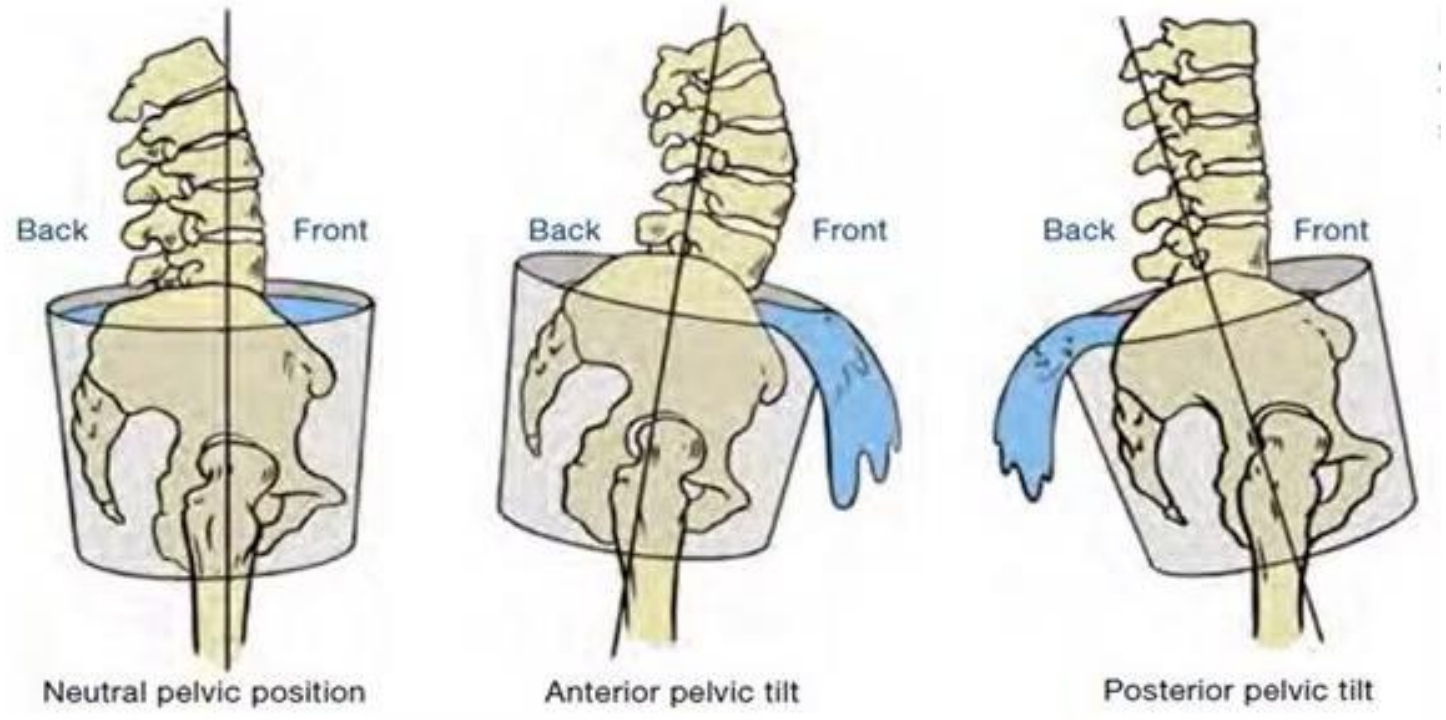
- Where possible - try and get outside of the vehicle for work
- If required to work within the vehicle, go to the passenger seat and push the seat back as far as possible.

Good Car Ergonomics

Car ergonomics

HSD105: Posture

Finding Pelvic Neutral



- Some people have too much anterior tilt, causing excess arch in the back.
- Some people struggle to activate abdominal muscles to do a posterior pelvic tilt

- To find pelvic neutral ("level bucket"), you need go into anterior (forward) and posterior (backward) pelvic tilts, then find the level spot in the middle.

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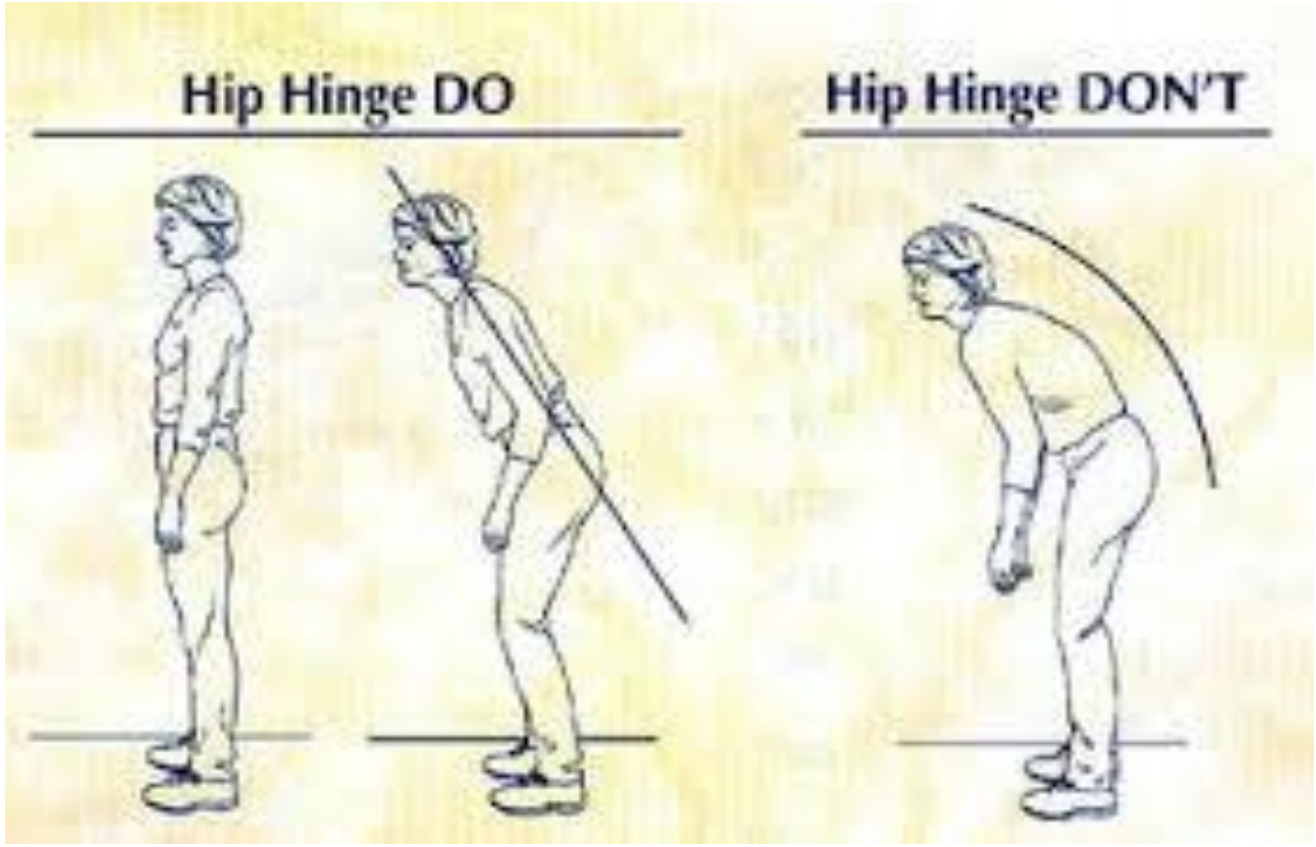
What You Can Do About Posture

Learn correct lumbar posture:

- Stand with your back to the wall, feet a few inches from the wall, knees very slightly flexed (not locked in extension)
- You should have just a finger's width of space between you and the wall.
- If you have too much space behind your back, drop your tailbone, and bring your back towards the wall.
- You should have a little arch for good posture
- https://www.mayoclinic.org/healthy-lifestyle/adult-health/multimedia/back-pain/sls-20076817?s=4

Use Good Body Mechanics



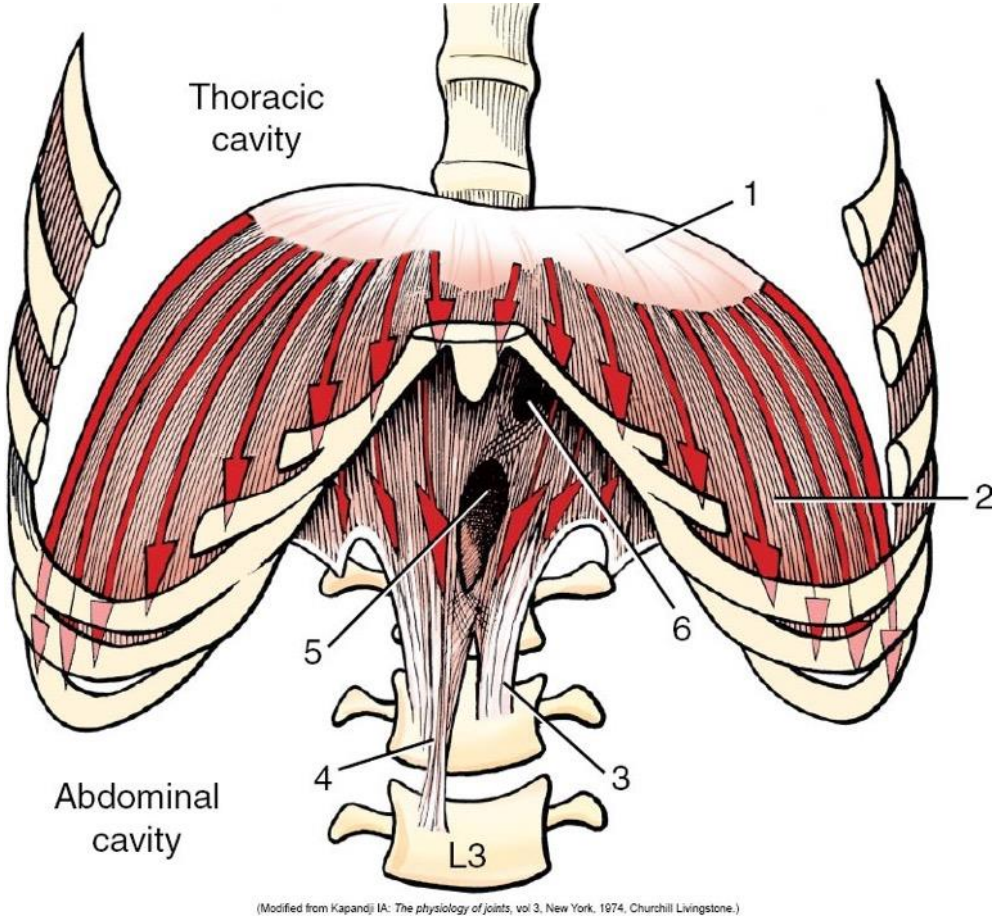
https://physicaltherapyprescott.com/hip-hinge-a-natural-solution-for-low-back-pain/

- For example…
- Use a ‘hinge hip’ movement when bending forward
- Keep hips, spine and head aligned
- Flex/hinge from the hip
- Do not round your back

Diaphragmatic Breathing

Breathing handout

HSD 109: Breathing

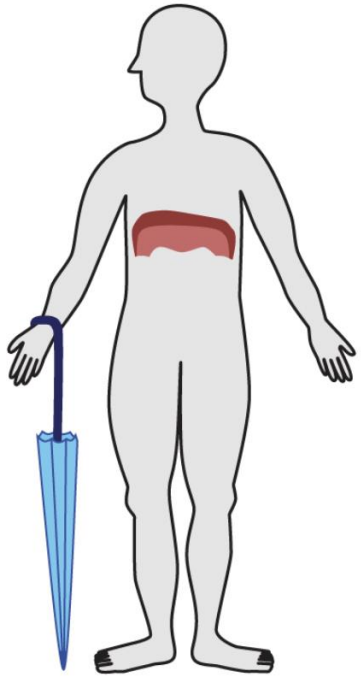


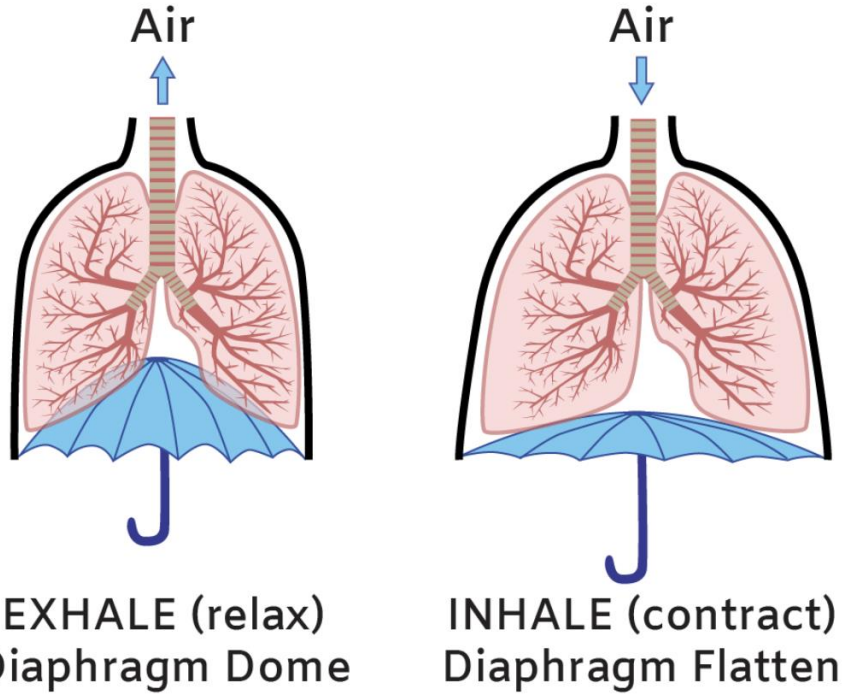
(Modified from Kapandji IA: *The physiology of joints*, vol 3, New York, 1974, Churchill Livingstone.)

- The diaphragm is the primary muscle for relaxed breathing
- The diaphragm coordinates with abdominal and pelvic floor muscles
- Together, these muscles stabilizes the lumbar spine
- Breathing exercises help strengthen abdominal and lumbar stabilizing muscles

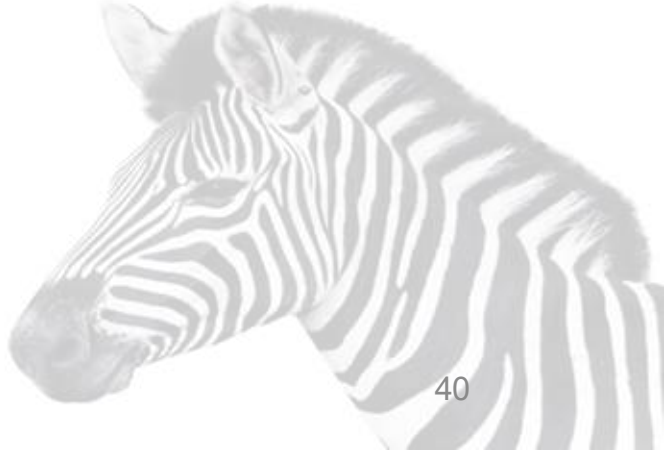
(Fortin, 2021; Finta, 2014; Kocjan, 2017)

"Umbrella" Breathing: New View





- Place hands on lower ribs
- Expand your belly and lower ribs in all directions as you inhale, like opening an umbrella
- Upper chest should not rise when at rest
- Diaphragmatic "umbrella" breathing improves lumbar stabilization



Pain Sensitization

HSD 103: Pain

Central Sensitization

- The central nervous system (CNS) can become oversensitive
  - It is like “turning the volume up” on pain
  - It is abnormal function of the central nervous system (spinal cord or brain) resulting in increased pain experience
  - The nervous system can get ”stuck” here through neuroplasticity
- Often aggravated by psychological and social factors such as stress, anxiety, etc. but it is NOT psychosomatic!
- You can decrease central sensitization

Clarkson UNIVERSITY

Strategies to Manage Sensitization

HSD103: Pain
HSD109: Breathing
HSD112: Vagus nerve

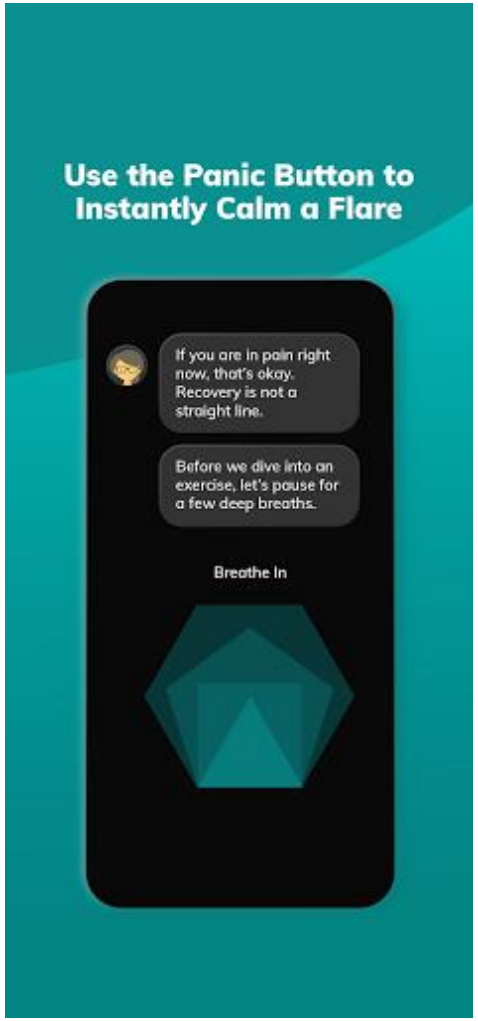
Pain Self-Care Plan

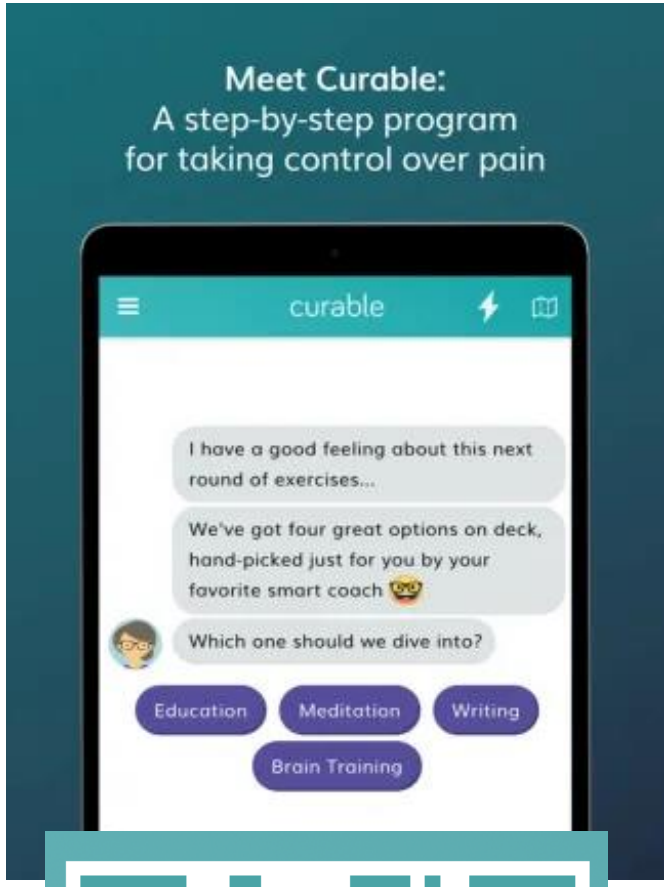
- Learn about ‘pain neuroscience’ to help you understand pain sensitization
- Identify what might be putting your nerves in overdrive – stress, poor sleep, anxiety, MCAS, etc.
- Do exercises that can calm your nervous system – e.g., diaphragmatic or slow breathing, yoga, Tai Chi, etc.
- Use other strategies to calm your nervous system: meditation, chanting, binaural music, vagus nerve calming
- TENS machine at low frequency (‘acupuncture-like’) settings

Curable™

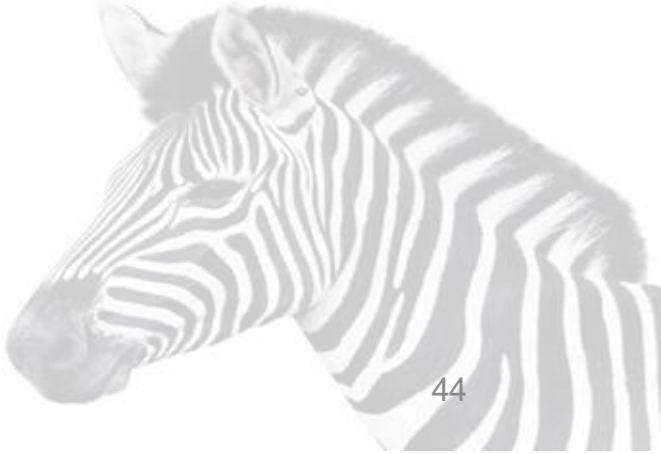
Pain Sensitization

- Curable app is a self-directed, cognitive behavioral therapy (CBT) based pain self-management program: www.curablehealth.com
- You can get a 6-week free trial of Curable. Scan code at right.
- Even though you have ”issues with your tissues,” volume control can calm pain enough to let you do exercises.





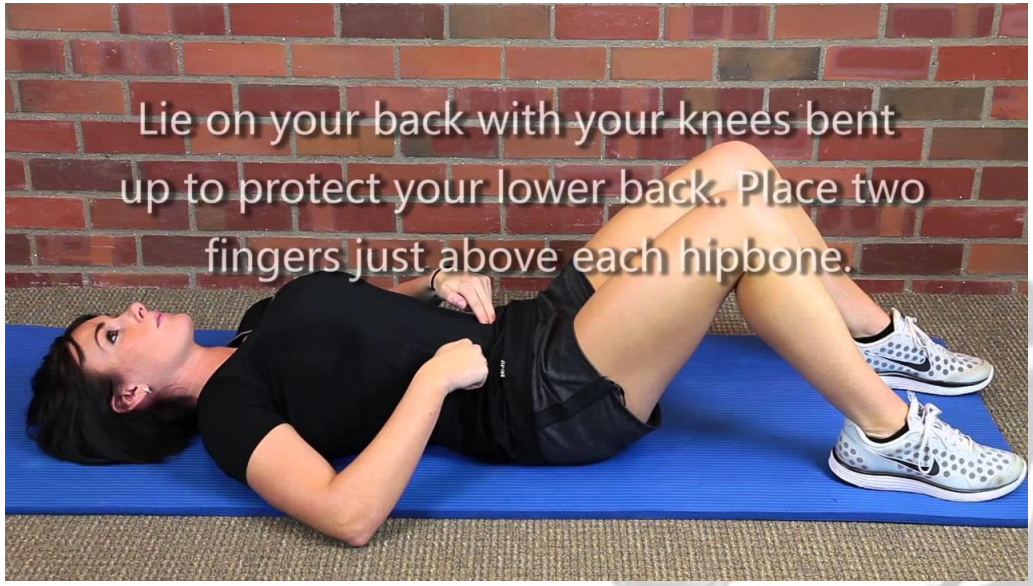
Questions?



Body Awareness (Proprioception)

- People with hypermobility typically have poor body awareness due to sensory nerves in the joints not providing good information.
- If you don't know where your spine is, you cannot control it.
- You can train body awareness by using feedback – either a pressure feedback device, PT feedback, your fingertips, a mirror, etc.
- **Other strategies to improve proprioception:**
  - **Slow movement can train the proprioceptive nerves in the stabilizer muscles.**
  - **Compression clothing can enhance sensory input from the skin.**

Proprioception Training Options



https://youtu.be/fLtNIQyZXiU

https://youtu.be/_ay-3arH5qg

Example of Proprioception Exercise

Stability ball exercises

- Sit tall on the ball, feet wide apart
- Increase challenge by:
  - Placing feet closer together
  - Closing your eyes
  - Moving your arms
- More challenging exercises with professional guidance

Motor Control Before Strengthening

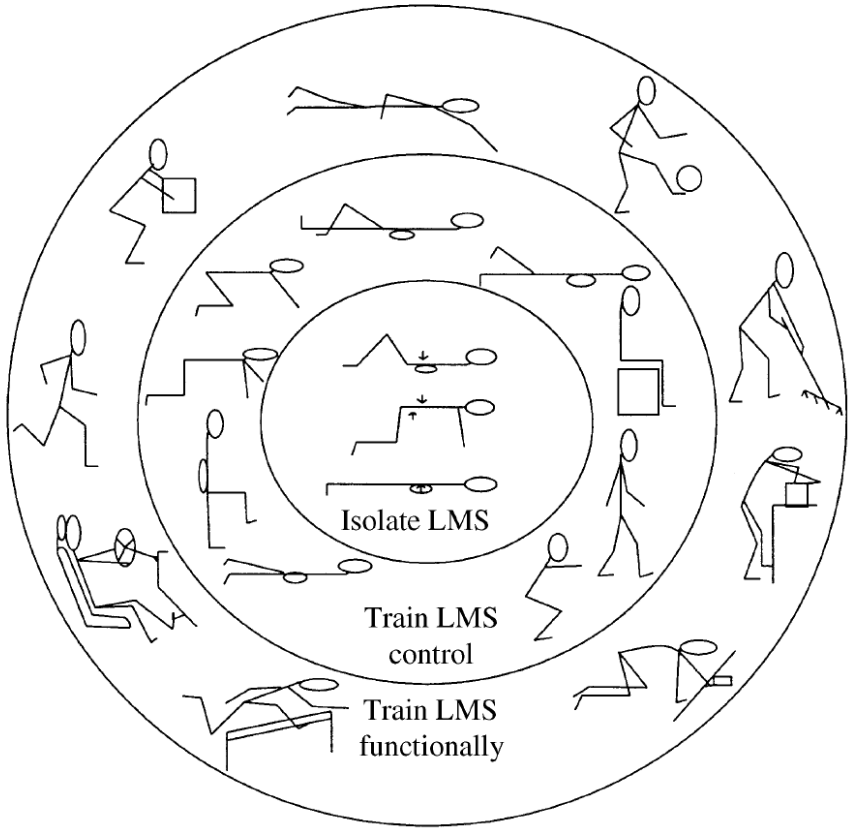


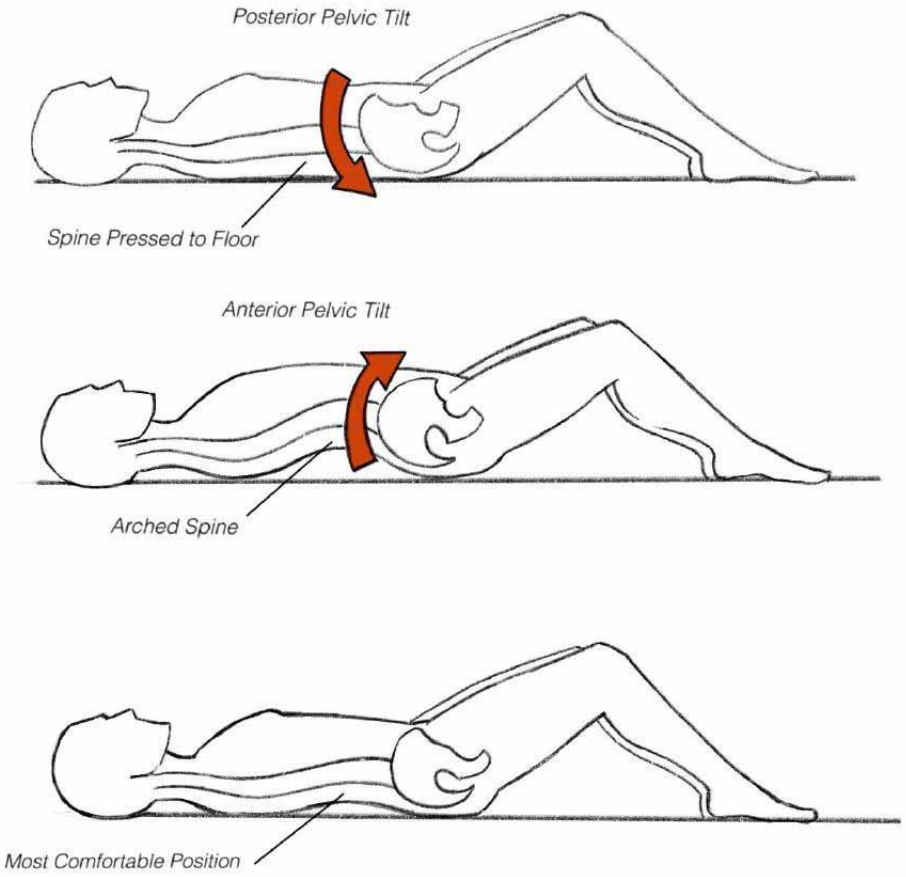
Fig. 12—Stages of rehabilitation based on a motor learning model (LMS – local muscle system). (Reproduced by kind permission of W.B. Saunders.)

- Motor control is about using the correct muscle, at the correct time, and the correct intensity
- Stabilizing muscles often 'shut down' when there is pain, and they often don't come back
- Start by isolating stabilizing muscles
- Then teach them to control movement
- Finally integrate into function

O'Sullivan, 2000

Finding Pelvic Neutral

- Find Neutral Pelvis: the middle between arched and flat back
- If using Biofeedback Stabilizer, set this to 40 mmHg using the Stabilizer™ or CoreCoach™ or use fingertips on pelvic bones to monitor to make sure pelvic doesn't move during the exercise



Example: Knee Fall-Out

- Start in pelvic neutral, 5-point alignment check
- Drop one knee out over 5 sec., starting with 2” movement
- Hold and perform 5-point alignment check,
- Return to neutral in 5 sec. while maintaining 40mmHg.
- Repeat x5 right, x5 left, x5 alternate, starting and stopping in neutral.

5 POINT ALIGNMENT CHECK

To be performed during each of the **5 second holds**

1. Feet balanced equal weight distribution
2. Knees – hip width apart
3. Belly rise and fall (breathing)
4. Chest still
5. Shoulders out of ears

For a Change of Pace…

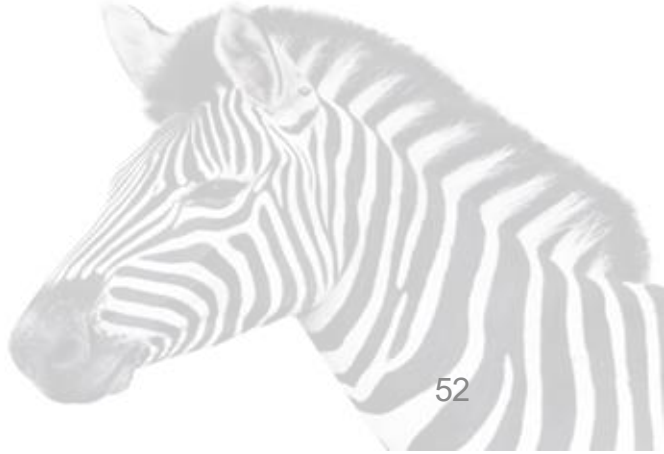
Augmented Reality

- We think of stabilization exercises as being static
- However, moving the limbs on a stable core is also lumbar stabilization
- Augmented reality games like this (Whack-A-Mole, from Active Arcade™) encourages lumbar stability in a game format.
- Active Arcade™ is a free app.

Joint Protection

"Ready, Set, Go"

- Instability events often occur when we are relaxed
  - E.g., rolling over in bed, standing from a chair, turning…
- It can help to pre-activate the stabilizing muscles
  - **"Ready":** be mindful that you plan to move
  - "**Set":** pre-activate the stabilizing muscles (gently)
  - **"Go":** move slowly and mindfully



“Pull Yourself Together”

- People with HSD are like these push toys with the tension released (bottom picture)
- We need to “Pull ourselves together” so the joints are held in better alignment (top picture)
- This creates a slight, healthy stiffness in the joints (not rigid tension)

Progress Exercises Carefully!

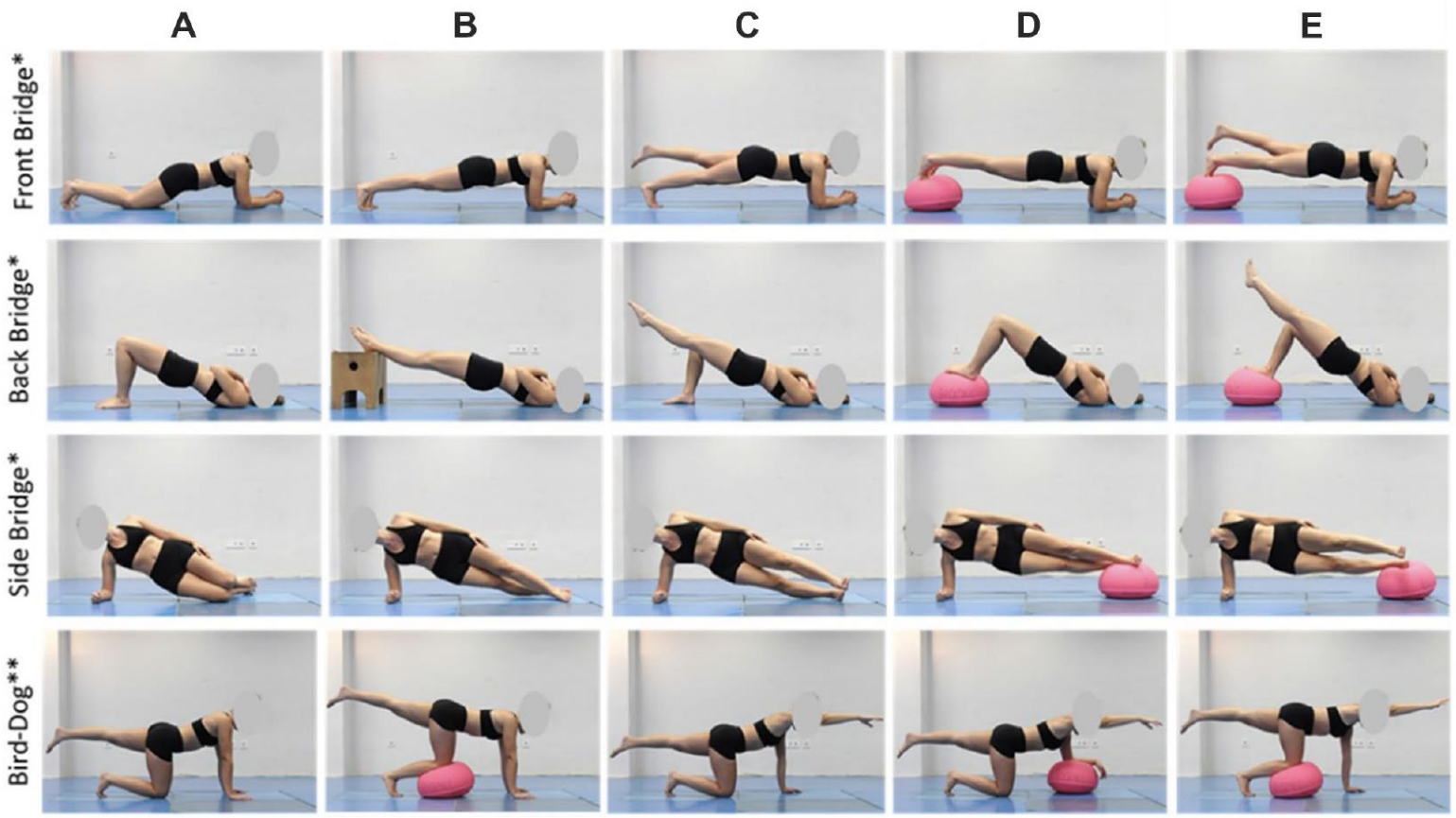


Fig. 1 Core stabilization exercises on two force platforms. *Variations of the front, back and side bridge exercises: A: short bridges; B: long bridges; C: bridging with single leg support; D: bridging with double leg support on a hemisphere ball; E: bridging with single leg support on a hemisphere ball. **Variations of the bird-dog exercise: A: three-point position with an elevated leg; B: three-point position with an elevated leg and the contralateral knee on a hemisphere ball; C: classic two-point bird-dog position with elevated contralateral leg and arm; D: two-point bird-dog position with the forearm on a hemisphere ball; E: two-point bird-dog position with the knee on a hemisphere ball

- **These 'standard' core stabilization exercises are too difficult for many zebras**
- It may take you weeks to progress to the typical first exercise
- A PT can help you understand what exercises are safe for you

Vera-Garcia, 2020

Importance of Motor Control Training

- Poor lumbar motor control predicts back injury more than the presence of generalized hypermobility in dancers.

  Roussel, 2009

- Research shows that motor control exercises are more effective for people with lumbar instability than general fitness exercises.

  (Frizziero, 2021; Saner, 2016)

- This is true for people with HSD/hEDS, as well. (Toprak-Celenay, 2017)
  - However, Beighton ≥ 5/9 predicted poor response to lumbar stabilization program. (Lariviere, 2022)
- Not all 'core strengthening' exercises are motor control or stabilization exercises (e.g., 'crunches' can be harmful)

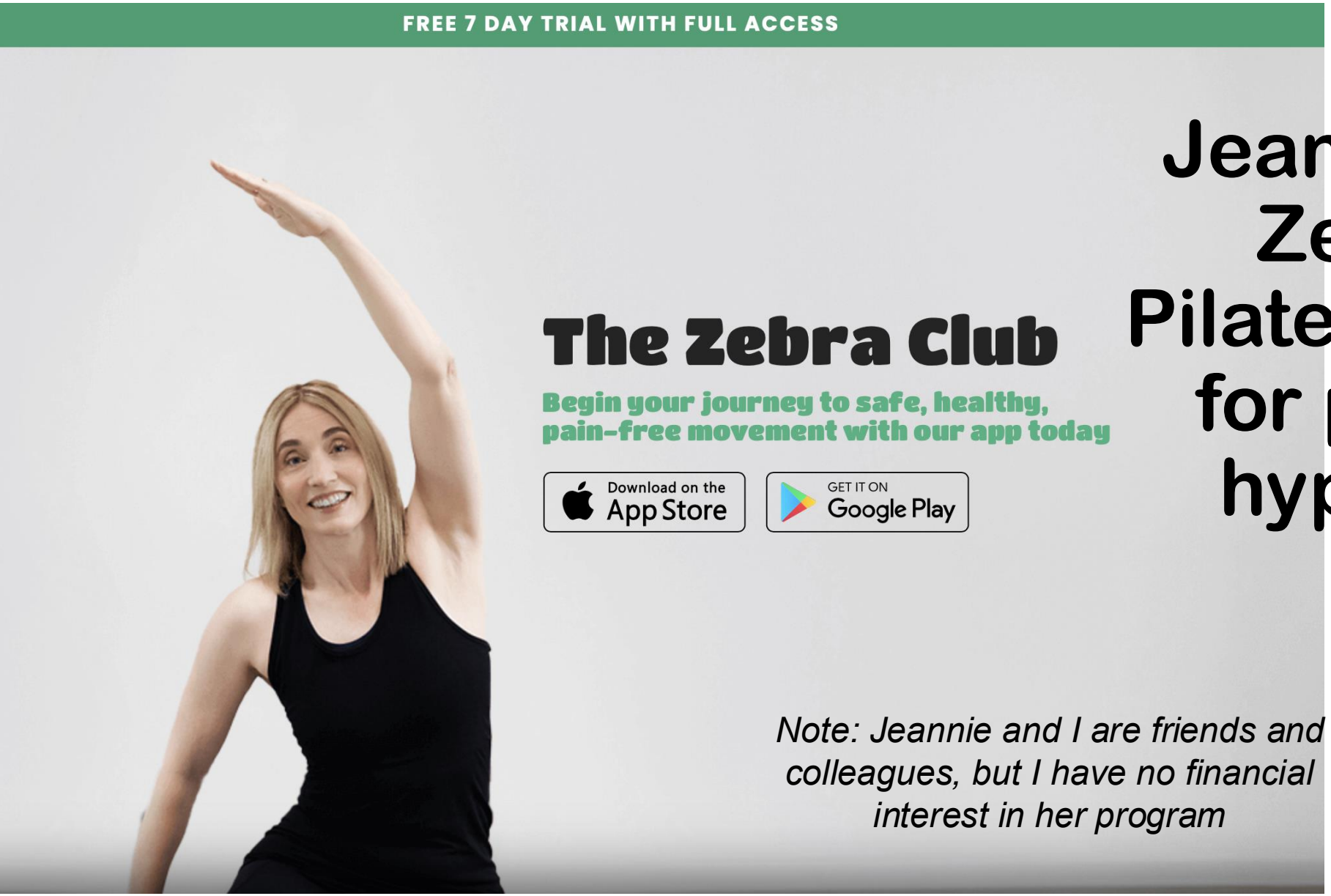
Evidence for Motor Control Training

- Pressure biofeedback can improve lumbar instability in patients with low back pain. (Crasto, 2019)
- Lumbar motor control training with pressure biofeedback improves effectiveness of neck motor control training, improves deep neck flexor endurance, decreases neck pain and disability in patients with chronic neck pain. (Khosrokiani, 2022)
- Pilates can be as beneficial as PT-led exercise (Frizziero, 2021)
  - Jeannie Di Bon's Strengthen Your Hypermobile Core Pilates program and Zebra Club are very popular among people with hypermobility: https://jeanniedibon.com

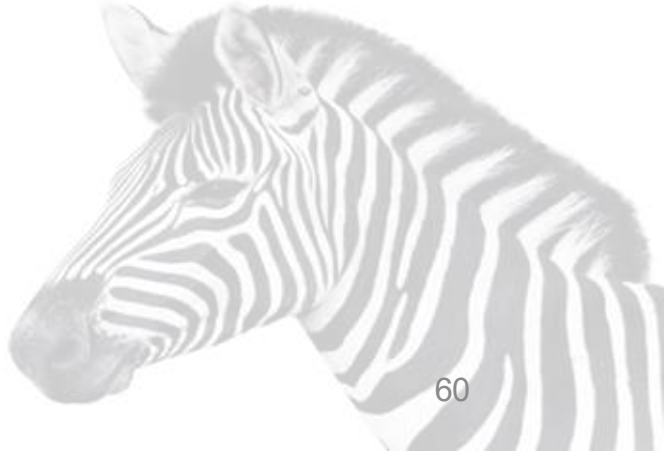
Neuroplasticity

- Neuroplasticity means retraining the nervous system to function better 24 hrs/day.
- What does this mean?
  - “Neurons that fire together wire together”
  - Learning and developing New Habits to replace or disconnect Old Bad Habits!
- Every time you “Catch Yourself and Make a Change” you are reinforcing new behaviors and over time your circuit or neurons wire apart and you discourage bad habits, and replace them with good habits.

Jeannie Di Bon's Zebra Club: Pilates specifically for people with hypermobility

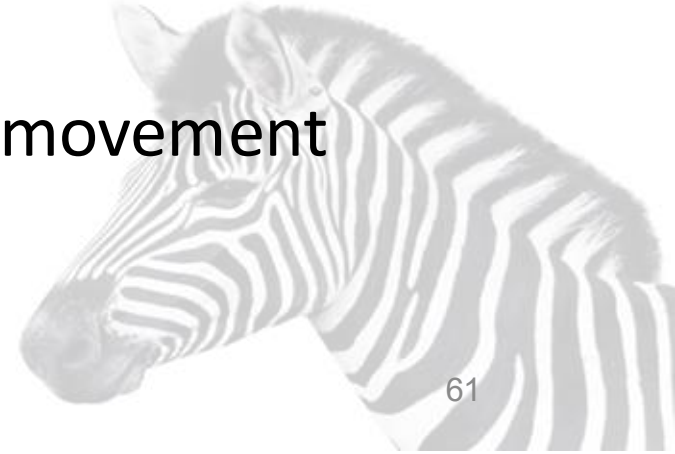


Note: Jeannie and I are friends and colleagues, but I have no financial interest in her program



In Summary…

- Lumbar instability is about muscle control, which you can change
  - Loose joints do not mean instability is inevitable!
- You can learn body awareness (proprioception)
  - But it often requires some type of external feedback
- You can learn to re-activate stabilizing muscles, but it is often difficult!
- It is very important that you do exercises correctly
  - The exercises need to be appropriate for you
  - You need to be activating the correct muscles
- It can really help to have an EDS-knowledgeable PT or movement specialist (e.g., Pilates instructor) on your team



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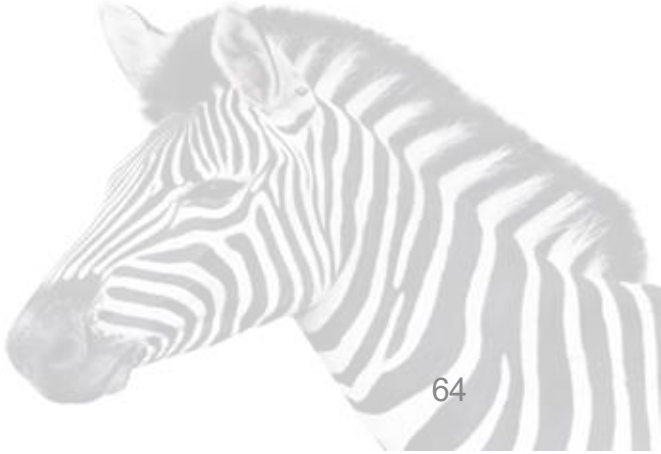
Thank You!



Questions?