#ideapti

Pelvic Bias-Key to Low Back Pain

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A few interesting facts:

- Low back pain is the single leading cause of disability worldwide, according to the Global Burden of Disease 2010.
- Back pain is one of the most common reasons for missed work. In fact, back pain is the second most common reason for visits to the doctor's office.
- One-half of all working Americans admit to having back pain symptoms each year.
- Experts estimate that as much as 80% of the population will experience a back problem at some time in their lives.
- Most cases of back pain are mechanical or non-organic—meaning they are not caused by serious conditions, such as inflammatory arthritis, infection, fracture or cancer.
- Americans spend at least $50 billion each year on back pain—and that's just for the more easily identified costs.

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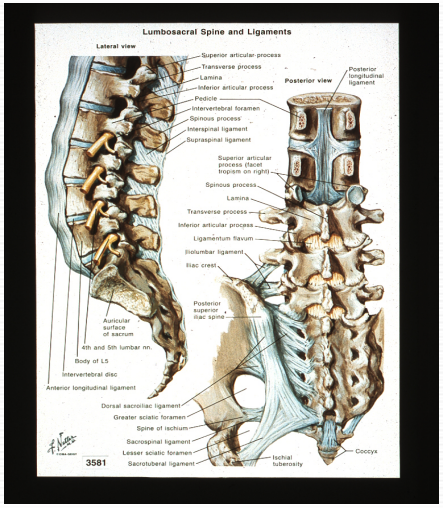
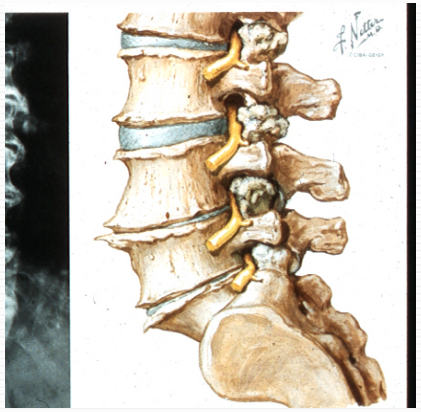
Anatomy of the Healthy Spine



- Disc
- Bodies of Vertebrae
- Transverse and Spinous Processes
- Intervertebral Foramen
- Ant. Longitudinal Ligament
- Post. Longitudinal Ligament
- SI Ligaments

Anatomy of the Aging Spine



- Discs
  - Equal Height?
- Vertebral Bodies
  - Square?
- IV Foramen
- Bone Spurs

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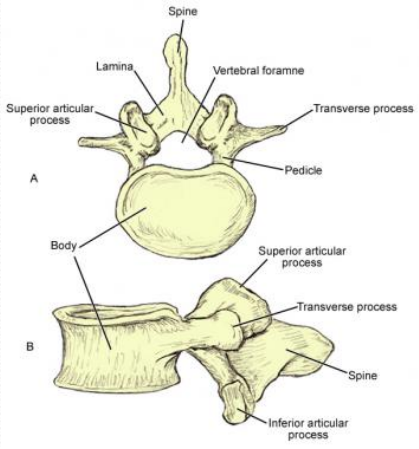
Anatomy of a Spinal Vertebrae



- Vertebral Foramen
- Body
- Transverse Process
- Spinous Process
- Lamina
- Pedicle
- Articular Processes

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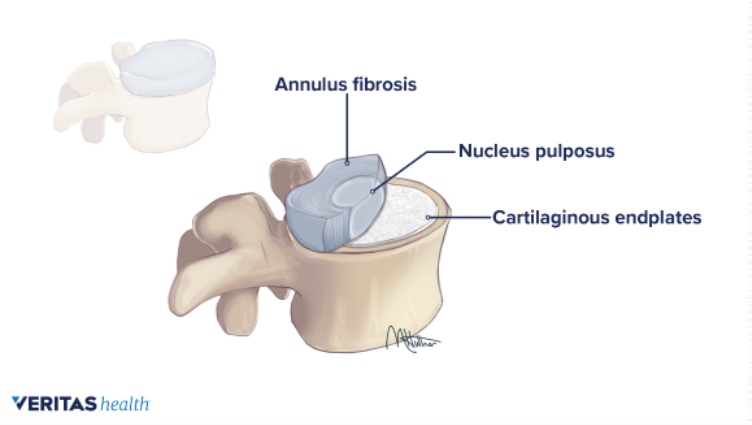
Anatomy of the Disc



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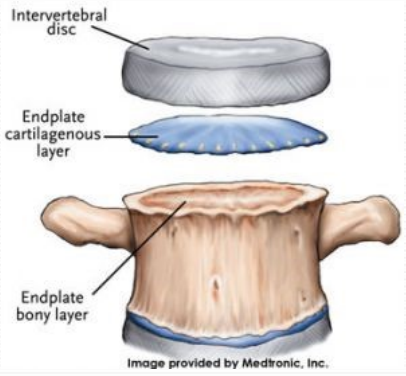
Anatomy of the Disc



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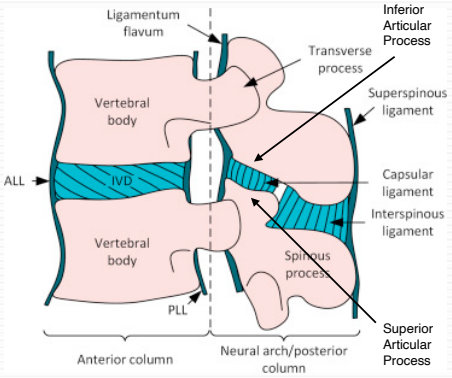
Spinal Motion Segment



- Vertebral Bodies
- End Plate
- Disc
- Spinous Process
- Transverse Process
- Articular Processes
- These Create IV Foramen

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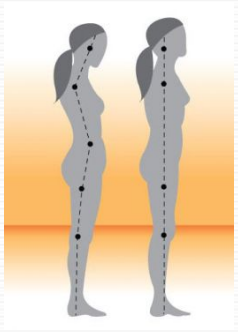
What is Proper Posture



- Keeps bones and joints in the correct alignment so that muscles are being used properly.
- Helps decrease the abnormal wearing of joint surfaces that could result in arthritis.
- Decreases the stress on the ligaments holding the joints of the spine together.
- Prevents the spine from becoming fixed in abnormal positions.
- Prevents pain, strain or overuse problems.
- Contributes to a good appearance.

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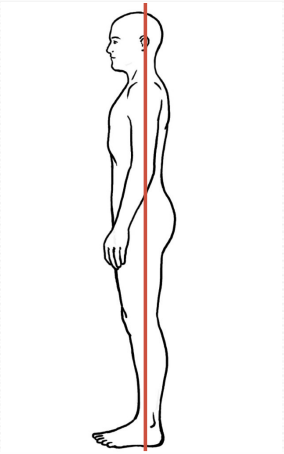
Definition courtesy of Cleveland Clinic

Measuring Proper Posture?



- Plumb line down the side of the body
  - Ant. to the lateral malleolus of ankle
  - Slightly ant. to midline of the knee
  - Through greater trochanter
  - Through the hip joint
  - Through the shoulder joint
  - Through the ear lobe

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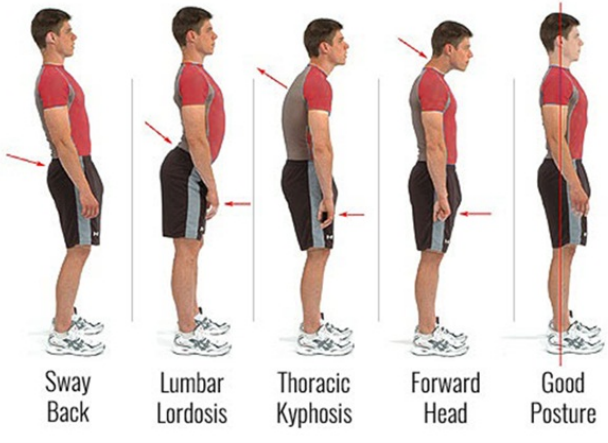
Common Postural Deviations



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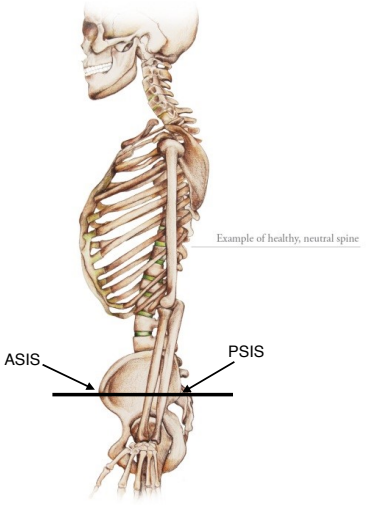
Neutral Spine



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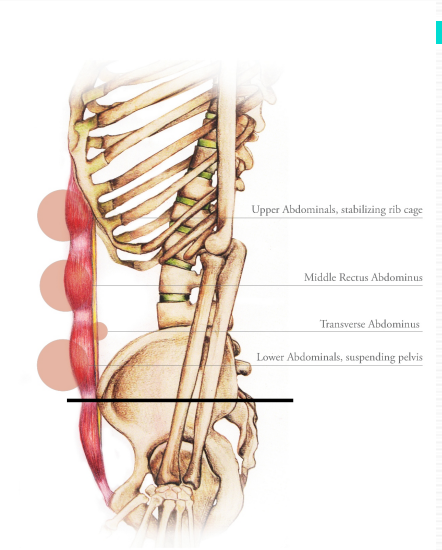
Neutral Spine



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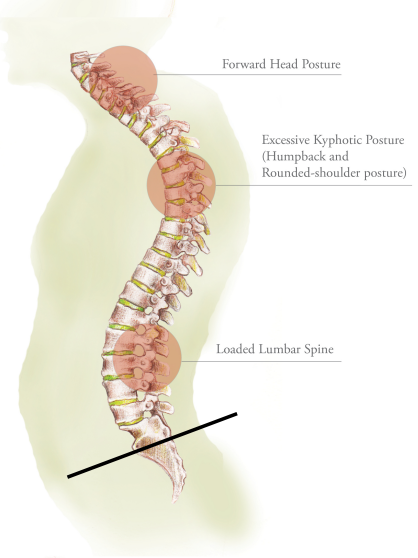
Neutral Spine



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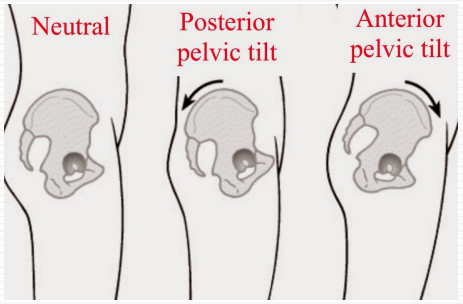
What is Pelvic Bias



- Pelvic Bias is the position in which your pelvis (and thus your lumbar spine) should be in during a given exercise.
- Pelvic Bias is determined by the specific medical condition they have.
- For people with specific medical conditions, their specific pelvic bias becomes their Neutral Spine

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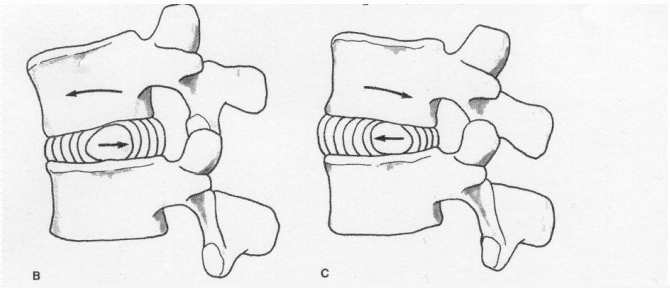
Pelvic Bias



- Flexion Bias
  - Disc compresses anterior
  - Nucleus thrusts posterior
- Extension Bias
  - Disc compresses posterior
  - Nucleus thrusts anterior

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Spinal Range of Motion

E Average ranges of motion in different spinal regions (degrees)

	Cervical spine			Tho-racic spine	Lum-bar spine	Cervical + thoracic + lumbar
	A-o joint	A-a joint	Entire cervical spine			
Flexion			65	35	50	150
Extension			40	25	35	100
Lateral flexion*			35	20	20	75
Rotation*			50	35	5	90

pp. 100-101

- Flexion: 50, Extension: 35
  Lateral Flexion: 20
- Rotation is 2 degrees or less per spinal segment.
- The entire lumbar spine rotates 5 degrees total.
- We do not rotate from the lumbar spine!!!
- Rotational mobility comes from our Lower Thoracic Spine and Hips.
- Disc herniations are most often caused from flexion with rotation

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Pathologies (Briefly)

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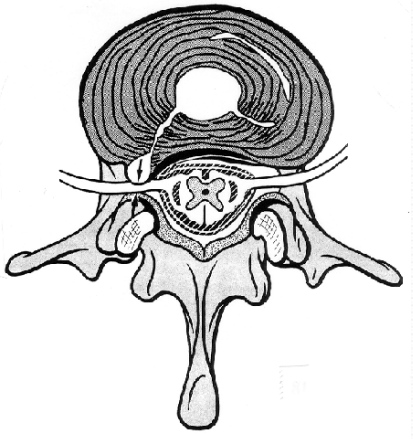
Disc Herniation



- Disc Herniation
  - Migration of the nucleus through the annulus fibrosis
  - Will usually have an effect on the nerve root
- Disc Bulge
  - Migration of the nucleus through a portion of the annulus fibrosis
  - May or may not affect the nerve root.

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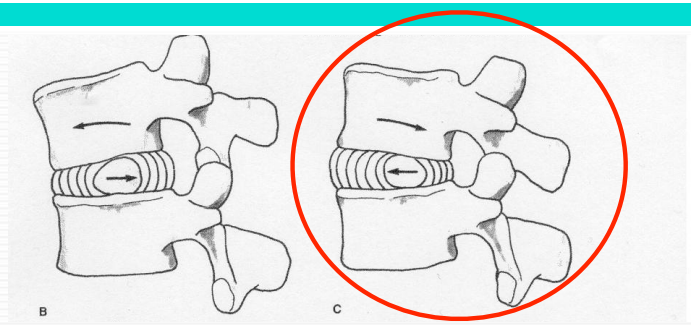
Pelvic Bias for Herniation



- For bulging discs or herniations we want to keep them in extension bias!
  - Trying to get the nucleus to shift forward away from the nerve root.

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Precautions

- At any time radiating pain, numbness/tingling or muscular weakness develop, the exercise should be discontinued and referred to their physician.
- All low back pain clients should avoid excessive uncontrolled trunk flexion with rotation.

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Exercise Objectives

- Focus all exercises in a Anterior Tilt
- Spinal Stability Exercises
  Level 1-3
- Strengthen Multifidus, QL, Erectors, Gluteal Max and Med, Abdominals/Obliques, Lower Extremity
- Stretch Hamstrings, Quads, Hip Flexors, Erectors, Piriformis and QL
- Stay in a PN Free ROM
- Limit Hamstring Stretching if Nerve PN
- Mckenzie Exercises

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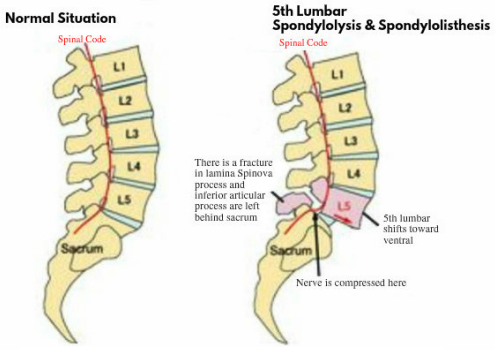
Spondylolisthesis



- Spondylolisthesis
- The anterior slippage of one vertebrae over another.
- Usually compressing the nerves
- Can occur by trauma (fracture), genetics, degeneration
- Can damage the spinal cord and nerve roots
- Symptoms include N/T/RPn

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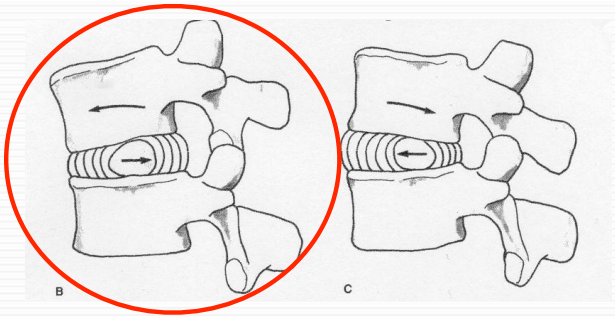
Pelvic Bias for Spondylolisthesis



- For Spondylolisthesis you MUST keep them in a Flexion Bias!!!
  - We are trying to take pressure off the nerve and assist in the vertebrae sitting back into position.

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Precautions

- Avoid excessive standing or postures of extension
- Avoid overhead activities
- Limit strengthening spinal extensors

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Exercise Objectives

- Focus all exercises in a Posterior Tilt!!!
- Absolutely NO extension their lumbar spine!!!
- Spinal Stability Exercises with a Flat Back
- Strengthen Abdominals, Mutifidus, Gluteus Max and Min, Lower Extremity and Obliques
- Stay in a PN Free ROM
- Do not focus on stretching Abs or Psoas. And while hamstrings may be tight do not overstretch
- Strengthening of the erectors and QL is fine, provided movement <10 degrees of extension.

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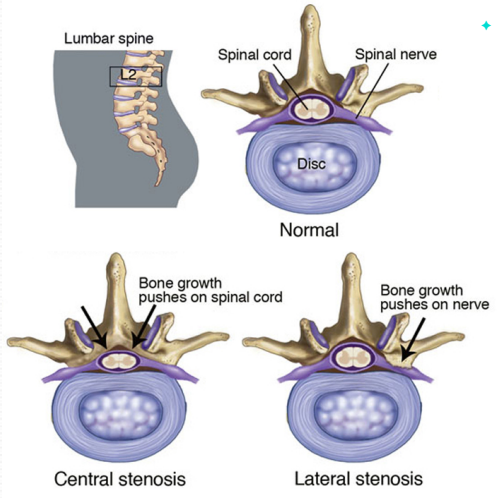
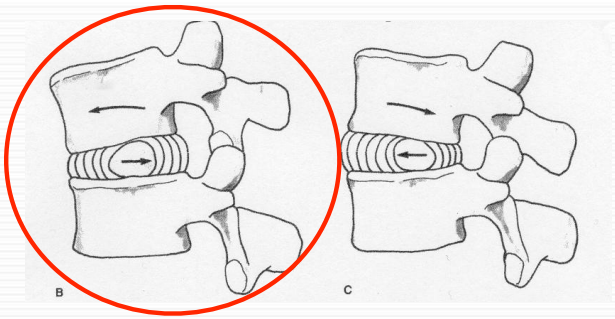
Stenosis



- Stenosis
  - Narrowing of the IV foramen, causing compression of spinal nerves
  - Central or Lateral Stenosis
  - Often caused by degeneration (aging) or bone spurs
  - Often seen with DJD
  - Symptoms include N/T/RPn

Pelvic Bias for Stenosis



- Overall you want a PN free neutral spine with slight flexion. For Central Stenosis, it may be slightly more flexed. Focus on PN free neutral to flexed!

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Precautions

- At any time radiating pain, numbness/tingling or muscular weakness develop, the exercise should be discontinued and referred to their physician.

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Exercise Objectives

- PN Free Neutral Spine (maybe slight flexion)
- Spinal Stability Exercises
- Strengthen Abdominals/Obliques, Multifidus, Erectors, QL, Glutes, Lower Extremities
- Stretch Hamstrings, Piriformis, Erectors, QL and Quads
- Focus on getting them into functional activities
- Cardiovascular capacity (Central = Recumbent Bike)

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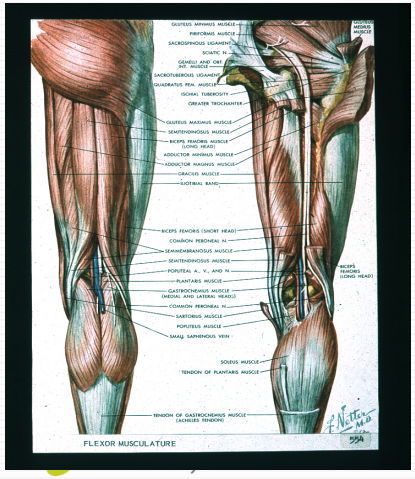
Sciatica

Sciatic Nerve Pain (Sciaticosis)



- Not a true Diagnosis; it is a symptom
  - "Garbage Diagnosis"
- Impingement somewhere between the spine and the leg.
- Find out the cause, don't settle for the symptom
- Causes: Herniation, Disc Bulge, Facet Syndrome, Vertebral Subluxation, SI Jt Impingement, Piriformis Syndrome, Stenosis, DJD

Spinal Stability

- Maintain Pelvic Bias for Lumbar Spine
- Progression: Full Support to No Support
- Always Monitor Pain
- If there is any NumbnessTingling or Radiating Pain-Discontinue Exercise Immediately

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Spinal Stability Progressions

- Find and Maintain **Their** Neutral
- Determine Functional ROM without losing Neutral
- Maintain Neutral in Static Positions
- Maintain Neutral with Dynamic Movements
- Full Support to No Support

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Spinal Stability Levels

- Fully Supported
- Partially Supported
- Non Supported
- Dynamic

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Fully Supported Exercises

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Bent Knee Fall out

- Eyes on ASIS
- No rotation in the pelvis

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Heel Slides

- Watch for Ant/Post movement in the pelvis. Should remain in neutral

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Marching

- No rotation of the pelvis
- Make sure they DO NOT push down with the opposite leg

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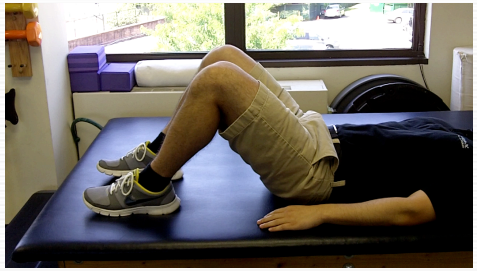
Leg Lowers



- No rotation of the pelvis
- Tap one leg down, return.
- Then do other side.
- Scissor legs only when their hips are completely stable.

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Kickouts

- No rotation of the pelvis
- Start in tabletop.
- Kick one leg out at 45°.
- Scissor legs only when their hips are completely stable.

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Pelvic Press Hip Extension

- Lying Prone, Hands under pelvis [Heel of hand under ASIS, finger tips at pubic bone]
- Press Pelvis into hands and hold.
- Lift one leg at a time.
- Do not let the pressure between your hips and hands change during the rep.

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Clamshell

- Sidelying, hips slightly rolled forward
- Externally rotate your top leg
- DO NOT let your hips roll backward

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Partially Supported Exercises

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SPINEFITTER stability work

- March
- Opposite Arm and Leg Raise
- Knee over navel
- Bridge
- Curl ups

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Pregnant Cat (TVA)

- Quadruped, Neutral spine. Pull belly off the floor and hold. Release and repeat.
- Add perturbation to the body.

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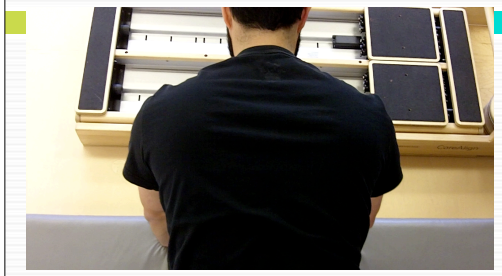
Quad 1 arm lifts



- In quadruped, keeping neutral spine
- Do not allow spine to move!

Opposite Arm and Leg lift

- Maintain Neutral Spine, no movement of the pelvis
- Move from the glute, not from the spine

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Seated Statue

- Maintain Neutral Spine
- “Don’t let me move you”
- Work on speed, not force

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Non-Supported Exercises

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Forward Lean (Multifudi)

- With fingers in the grove between the erectors and spinous processes, feel your multifudi.
- As you lean forward, do they fire evenly? Same force?
- If not, the one that is firing late, place that leg behind the other and repeat. Keep adjusting leg position until they are even or the lagging one is now in firing first.
- 10 reps, then bring feet slightly closer together and repeat keeping them firing as close together as possible,
- Repeat until feet are together

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Standing Statue

- Work on Speed not Force
- Don't let me move you"
- Change foot position

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Hip Extension over the Ball

- Maintain neutral spine throughout
- Move from the glute
- Hold 10 sec then tap down and repeat.

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Birddog over the Ball

- Maintain neutral spine throughout
- Move from the glute first, then the arm

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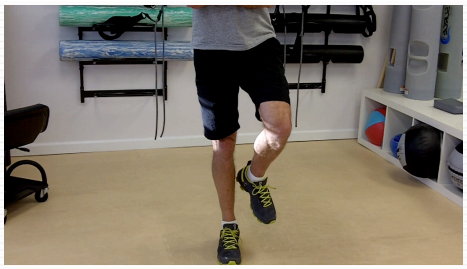
Gluteal Pivot



- Standing on 1 foot
- Without moving your spine, externally rotate your hips.

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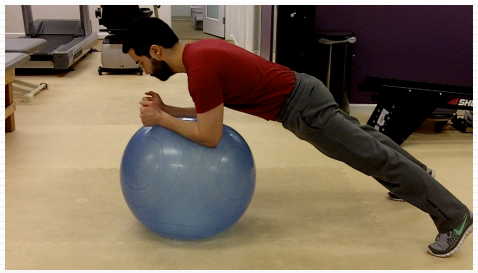
Alphabet Planks



- Plank on the ball
- Moving from your shoulders, draw the alphabet
- Start with small movements and then increase as you become more proficient

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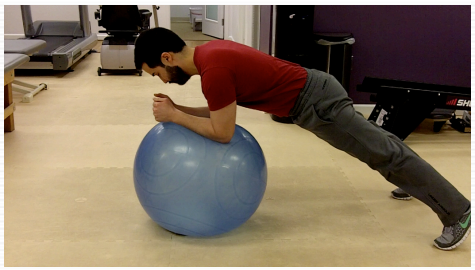
Stir the Pot Planks



- Plank on the ball
- Moving from your shoulders, draw circles
- Start with small movements and then increase as you become more proficient

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Dynamic Exercises

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Clock Lunges/Steps

- Keeping neutral spine, move through the hips as you rotate
- 12-3 oclock
- Go lower into the lunge as you become more comfortable.

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Unilateral Press (Manual Shown)

- Keeping neutral spine, Press forward
- Keep weight on the front leg
- Allow slight shoulder rotation as you become more comfortable.

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Unilateral Row

- Keeping neutral spine, row toward you
- Keep weight balanced between legs
- Allow slight shoulder rotation as you become more comfortable.

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Review

- Determine their Pelvic Bias
- Find and Maintain **Their** Neutral based on bias
- Determine Functional ROM without losing Neutral
- Maintain Neutral in Static Positions
- Maintain Neutral with Dynamic Movements
- Full Support to No Support

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Additional Information

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