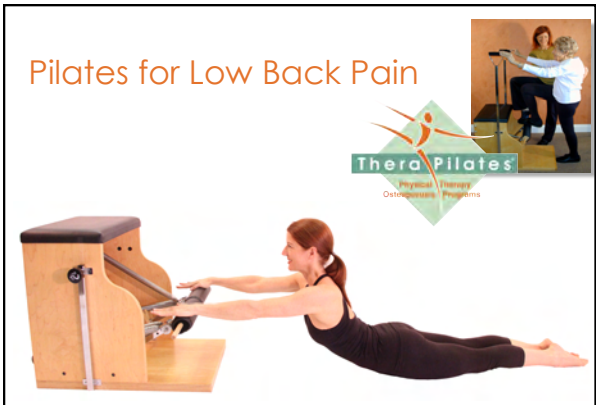
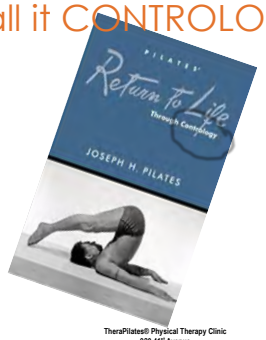
Pilates for Low Back Pain



with Dr. Sherri Betz, PT, DPT GCS, CEEAA, PMA®-CPT

Let's call it CONTROLOGY!!



TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Next to the common cold, Low Back Pain is the number one reason for physician visits!!

"I just need to stretch more…"

Main Causes for Low Back Pain:

- Declining activity level
- Prolonged Sitting
- Poor Postural Alignment/Asymmetry
- Muscular Imbalances
- Poor Core Muscle Strength
- Habitual Faulty Movement Patterns
- Genetic Predisposition
- Skeletal Anomalies

How can we walk, talk, breathe and be continent?

Paul Hodges

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

"The spine is inherently unstable. The body cannot be supported without the surrounding ligaments, discs and surrounding muscles."

Paul Hodges

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

What is STABILITY, anyway?
"Stable Ability"

Alastair Greetham, PT

Occurs when a substance is in a dynamic equilibrium with its environment (Chemical)

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Hodges….on Stability

"Stability is optimal when muscle activity is controlled with sufficient finesse to maintain controlled movement and postures in a manner that is matched to the demands of the task."

Paul Hodges

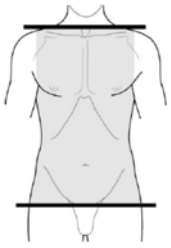
TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Don't use 25# of effort to lift a 10# object!

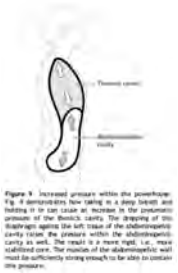
This increases compression of joints and tension in muscles…

www.TheraPilates.com 888-229-5334
©Copyright TheraPilates 2019
TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

What about the "Powerhouse"



Also "Box" coined by Bob Liekens



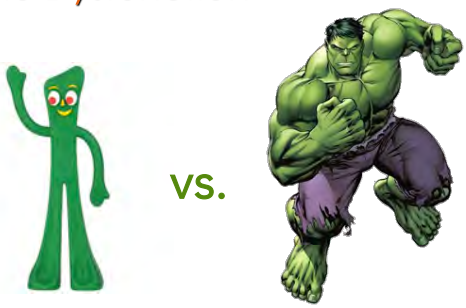
Muscolino JE, Cipriani S. Pilates and the "Powerhouse": I. *J Bodyw Mov Ther*. 2004;8:15-24.

3 Main Categories of Spine Dysfunction

- Stiff, tight (DJD, DDD)
- Hypermobility/Instability (Spondylolisthesis,Facet Syndrome)
- Pelvic Girdle Dysfunction (Sacroiliitis, Pelvic Asymmetry, Leg Length Discrepancy, Scoliosis)

www.TheraPilates.com 888-229-5334
©Copyright TheraPilates 2019
TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Categories of Spine Dysfunction



TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

1. Stiff/Tight Category

- Poor Lumbar Flexion
- Decreased curve reversal of lumbar
- Excessive thoracic flexion
- Likely tight hamstrings
- Likely has poor abdominal strength and excessive lumbar recruitment

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

2. Hypermobility/Instability

- High Beighton Score
- Increased lumbar lordosis and/or kyphosis
- Poor core control
- Likely tight hamstrings
- Likely has poor core control

Beighton Score for Hypermobility Syndrome

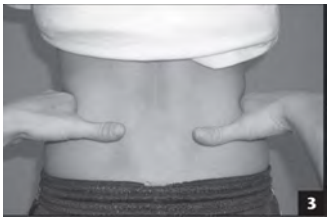
1. Passive dorsiflexion/hyperextension of the 5th MCP joint past 90°
2. Passive apposition of thumb to the flexor aspect of the forearm
3. Passive hyperextension of elbow past 10°
4. Passive hyperextension of knee beyond 10°
5. Active forward flexion of hips with knees straight and palms to floor

TOTAL ____ / 9

(0-3 = Normal, 4-9 = Ligamentous Laxity)

3. Pelvic Asymmetry

1. Ilium either posterior or anteriorly rotated
2. Sacral torsion
3. Muscle imbalance
4. Falls
5. Post-partum ligamentous laxity
6. Diastasis Recti
7. Pelvic Floor Weakness



TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Let's Practice!

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Finding Transversus Abdominus

- Palpation of Transversus Abdominus medial to ASIS in Supine
- Cough/Sneeze
- Forced Expiration
- Sidelying
- Pregnant Cat in Quadruped
- Prone Lift of Transversus Abdominus
- Rollup without Rectus Bulge (No Loaf of Bread!!)

Posterior Muscle Assessment

Prone Instability Test:

https://www.physio-pedia.com/Prone_Instability_Test

Posterior Muscle Assessment

Avoid cueing "neutral spine" in supine or prone. The client will often over arch and accentuate lumbar lordosis which will recruit superficial erector spinae muscles.

Posterior Muscle Assessment

Aberrant Movement:

- Rapid superficial contraction
- Global contraction with ES and OE
- Posterior Pelvic Tilt
- Subtle Anterior Pelvic Tilt

Let's Practice!

Pelvic Floor Assessment & Training

Cheap and Effective!

Good evidence for PF Training…

Is it tight or weak?

Neumann, et al 2006

Simple Screen for PF Problems:

Can you stop the flow of urine midstream?
(Avoid doing this regularly)
(Avoid doing first thing in the morning)
Do you have difficulty initiating micturition?
(May suggest hyperactivity or hypertonicity)
Does your stream stop and start?
Do you have pain or discomfort?
Do you hover?
Do you lose control when coughing or sneezing?

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

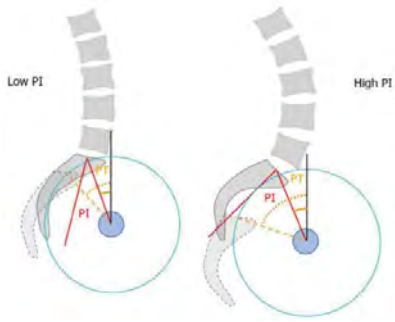
Posture (Bony Alignment)

Sitting is different than standing posture
Most people think that good posture is to extend everything!
Women have more lordosis than men in sitting.
Lumbar spine is generally flat in sitting

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Pelvic Incidence

Sacral slope and relationship to femoral heads predicts curves of spine



TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Postural Correction

Forward Head-Shuts off the abdominals. Correction is not just a straight retraction, it's a scoop and lift. When done correctly, the abdominals will fire.
Thoraco-lumbar junction extended: connect distance from bottom of sternum to belly button. Breathe into hands at TL junction
Bring rib cage over the back of the pelvis

**Corrections feel weird but comfortable*

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Axial Elongation

Axial Elongation helps to distribute and minimize shear forces at each vertebral segment, facet joints and sacroiliac joints.

Decreases dependence on inert or passive (ligamentous, bony, and capsular structures) for stability

Minimizes wear and tear of cartilaginous surfaces of joints

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Posture Work

- Encourage "release" into optimal curve… not forced.
- Shift weight forward and back on feet, feel abdominals fire.
- Rock pelvis forward and backward to dissociate pelvic from thoracic motion with weight over IT's
- Post Tilt: Weight behind each IT
- Ant Tilt: Weight in front of each IT

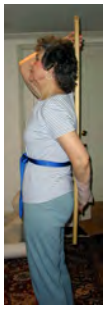
TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

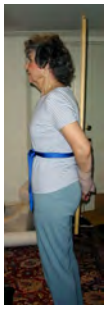
Posture Work

- Shift ribcage forward and backward to stack over pelvis-feel abdominals fire when correct
- Lift ribcage out of pelvis
- Draw throat back to correct forward head posture-feel abdominals fire when correct
- Lumbar muscles are relaxed when correct

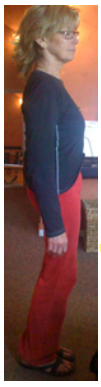
Neutral or Optimal Alignment


Relaxed Posture


Forced Correction

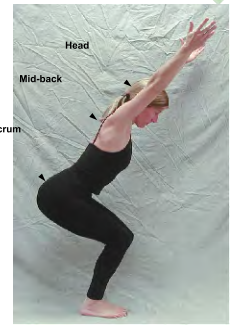

Best Correction

Postural Types



67 year old woman with 4 Vertebral compression fractures after doing Yoga Shoulder Stand with Osteoporosis. 1 month post-Vertebroplasty x 4. C/O Low Back Pain. Very flat and almost kyphotic Lumbar Spine.

Neutral Spine Training



Neutral Spine: Optimal Alignment

- Optimal spine & pelvic position
- Most stable posture-not natural! Position is slightly different for everyone
- General cervical lordosis, thoracic kyphosis and lumbar lordosis
- All segments: disc spaces, facet joints, foraminal openings, sacro-iliac joints and pubic symphysis bear an equal distribution of forces.

Lumbar Stabilization and Neutral Spine

- Everyone should learn to HIP HINGE !! Squat with Dowel on Head, Mid Back, Sacrum
- Chair Pose Hip Hinge with Dowel
- Quadruped with Dowel
- Transfer to and from Floor in Neutral

Concepts to think about…

Hollowing vs. Bracing

We teach people to activate muscles in isolation to provide a training stimulus to make the system modify.

Contraction of only TrAb: get pushing up of the diaphragm and descent of the PF

Lot of studies where people are asked just to contract the transversus….they have completely missed the point.

Paul Hodges

Hollowing vs. Bracing

With "bracing" you get descent of the pelvic floor. Can lead to incontinence or PF weakness.

Bracing limits diaphragmatic motion.

Hollowing is meant to be a "drawing in" of the lower abdominal wall.

Often makes people "suck in", close the epiglottis and lift the ribcage.

Pilates Teaching…

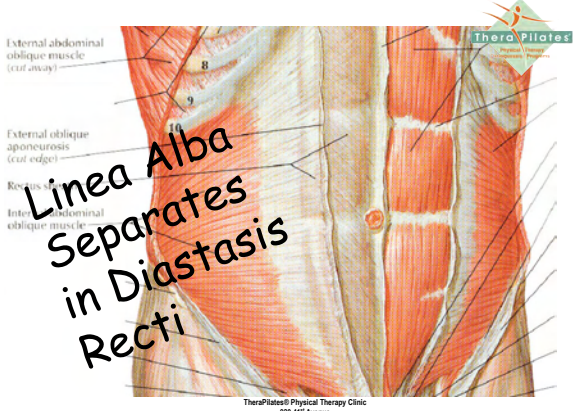
Be careful not to over recruit the TA, or abdominal wall.

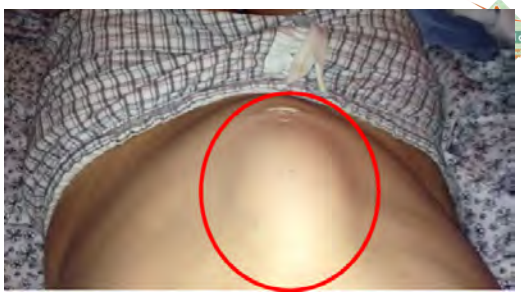
Check the outcome of your training techniques.

Avoid over recruitment of external obliques

Avoid excessive forced inspiration/ expiration-make the breathing match the movement demand.

Avoid forcing client into posterior tilt or flat back position even with long lever exercises.

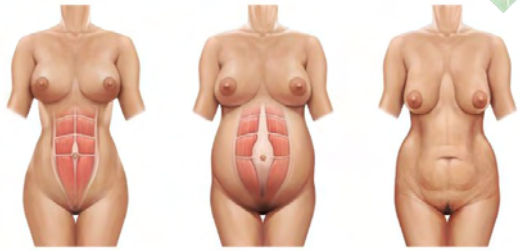




2 finger opening is normal. A bulge is not normal and indicates poor core (IAP) control.

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Diastasis Recti



50% 2nd Trimester 66% 3rd Trimester 53% Postpartum

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

Pilates Teaching…

- Ask the client what is in their mind when they try to attain good posture.
- You might be surprised at what they "think" you said!
- Always check in with them about the mental cues they give themselves.
- When pain occurs during an exercise, teach the client to have better control and see if that changes the pain

www.TheraPilates.com 888-229-5334
©Copyright TheraPilates 2019
TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062
46

Sequencing

- Categorize Pathologies: flexion or extension problem, stability vs. mobility
- Identify the lesion
- Consider the movement impairment
- Avoid provocative postures and movements
- Consider adjacent joints
- Correct movement faults

www.TheraPilates.com 888-229-5334
©Copyright TheraPilates 2019
TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062
47

General Assessment:

Standing Posture
Iliac Crest / ASIS / PSIS
Semi-Squat Parallel and ER
Single Leg Bend
Single Leg Bend with Hip Drop
Full Squat (Parallel Hip Width)
Marriage Proposal Lunge
Spine: (If appropriate) Flex, Ext, SB, Rot (looking for fulcrums, asymmetries and curve reversal)
Knees: Varus, Valgus, Recurvatum

www.TheraPilates.com 888-229-5334
©Copyright TheraPilates 2019
TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062
48

Assessment:

Tibial Torsion
Feet: Pronation, Supination, Bunions
Breathing: Diaphragmatic, Upper Lung, Costal
Leg Length
Relaxed Rotation of Hips
ASIS Position in Supine
Flexibility: Hamstrings, ITB, Adductors, Psoas, Hip Flex/IR/ER
Sciatic Nerve Tension Test: Straight Leg Raise provokes pain down leg or to foot. IF pain goes past the knee + test. Can be involved in Piriformis Syndrome

Trunk Assessment:

Rollup: View at patient's feet
0-Unable to attempt
1-Partial
2-Arms Straight, Hips Flex, Rectus Bulge
3-Arms Straight
4-Arms Crossed
5-Hands behind head

**Do not perform this test in clients with osteoporosis*

Trunk Assessment:

Obliques:
1-Partial Rollup with Rotation
2-Arms Straight, Hips Flex, Rectus Bulge, needs momentum
3-Arms Straight, elbow in line with opposite ASIS/Leg, unable to maintain rotation
4-Arms Straight, elbow in line with opposite ASIS/Leg, maintains rotation
5-Hands behind head, elbow in line with opposite ASIS/Leg, maintains rotation
**Do not perform this test in clients with osteoporosis*

Trunk Assessment:

Transversus Abdominus:
1-1 Foot on Mat, extend opposite leg, lower to mat, L-spine flat or neutral, no rectus bulge
2-90/90 Position, Hold TA in, L-Spine Flat or neutral, no rectus bulge
3-90/90 Position, Extend 1 Leg, Lower to floor, keep spine flat or neutral
4-"100" Position, Head Down, L-spine flat or neutral, Lower legs to 45° angle, keep knees straight
5-"100" Position, Head Down, L-spine flat or neutral, Lower legs to mat, keep knees straight

Trunk Assessment:

Bridging: Able to articulate equally through the spine, ASIS level; at top maintains alignment of shoulder, ribs, ASIS, knees
**Single Leg Bridging: able to lift one knee to ceiling and maintain alignment of pelvis
***Very important for Pelvic Girdle Dysfunction*

Sidelying: (Sidekick with Bent Knee): Able to bring hip into flexion and extension without losing neutral spine/pelvis

Trunk Assessment:

Sidelift: On elbow in Sidekick position, ankles, knees, hips, pelvis & spine in neutral, good scapular organization.
1-Unable to lift hips
2-Lifts hips but needs upper hand for support
3-Lifts hips 3" but cannot maintain neutral spine/pelvis
4-Lifts hips 3" with top arm extended up
5-Lifts hips 3" with top arm and leg lifted

Trunk Assessment:

PSIS: Check for asymmetries
Prone Unilateral Hip Extension: Able to lift one leg at least 10° in pelvic neutral without sacral rotation or lumbar rotation/ sidebending (often painful in SI joint)
Prone Bilateral Hip Extension: Able to lift both legs into hip extension at least 5° without losing pelvic/lumbar neutral
Quad Length: Heel to buttock without losing pelvic/lumbar neutral or leg abducting
Piriformis/External Rotation: Flex knees to 90. Allow tibias/feet to fall outwards, look for tightness or asymmetry. Should internally rotate at least 45°

Assessment:

Swan: Start with lowest ribs in contact with mat into full Swan position with straight elbows. Patient should have symmetrical articulation in C/T/L spine. No sagging in L-Spine. May also be painful.

Also see if client can maintain lowest ribs in contact with mat and extend thoracic spine without lumbar movement

Assessment: Special Tests for Licensed Healthcare Practitioners

- Flare Test w/without rotating discs
- Prone Deerfield Test: Distract Lower Extremities. Check Leg Length and medial malleolus in knee extension, check again in 90° knee flexion. Can indicate SI problem
- Vertebral Spring Tests: to rule out lumbar issues
- Pelvic Girdle/SIJTests: Gaenslen's, Thrust, Compression, Fig 4
- Pelvic Girdle Positions: Anterior/Posterior Rotation, Inflare, Outflare, Upslip, Downslip

Whoopee!
Let's Begin the Exercise Program

Core Control Routine
For all Lumbar Pathologies

Diaphragmatic Breathing in all positions (Supine, Sidelying, Prone, Quadruped, Supported Standing, Standing)
Eliminate Upper Lung Breathing
Progress to Costal Breathing in all positions (use straps around ribs, tactile cues)
Transversus facilitation in all positions. Have client palpate under lowest ribs with one hand and TA with other hand and eliminate use of external obliques with contractions
Multifidus facilitation in Supine and Prone
Teach Neutral Spine in all positions
Progress to Neutral spine control from standing to quadruped and return.

The Good News…

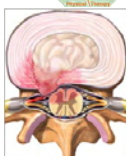
If you are not sure what is going on….you can always teach breathing, core control activation, neutral or optimal spine alignment!

If they are not better in a few sessions, refer out to your chosen healthcare practitioner.

You can't hurt anyone with those instructions! (Hopefully ☺)

Specific Pathologies:
Definitions, Symptoms, Precautions

Herniated Nucleus Pulposus (HNP)

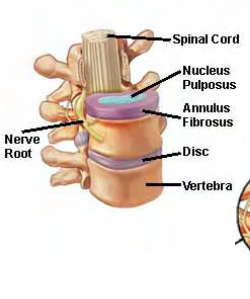


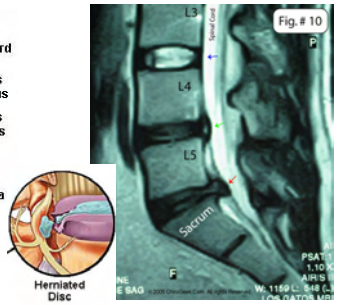
Definition: **Herniated Nucleus Pulposis – HNP (Herniated or Bulging Disc)**
Annular fibers weakened, nucleus loses volume and narrows

3 Stages:

1. Disc Bulge
   a. posterior annular fibers tear due to repeated loading in flexion and/or flexion and rotation
   b. nucleus may bulge sufficiently to cause pressure on the Posterior Longitudinal Ligament (PLL), causing pain
2. Prolapsed Disc (extruded nucleus): outer annulus and PLL fibers give way, allowing nucleus to bulge into spinal cord
3. Sequestration: nuclear material has separated from the nucleus allowing it to be free in the neural canal

HNP





HNP

Symptoms: peripheral pain or numbness/tingling in buttocks, thigh, calf or toe; may present with a lateral shift; in more severe stages may present with lower extremity weakness and/or loss of deep tendon reflexes.

Contraindications: In acute stage or when any of the above symptoms are present avoid all exercises that include spinal flexion or vertical loading (seated, standing or inverted positions) of the spine. Avoid any exercise that involves a straight leg raise or strong spinal rotation

HNP or Sciatica Treatment

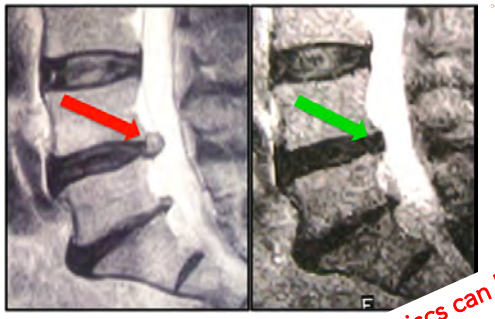
David Butler performing "Slump Test" and sciatic neural flossing

Have physical therapist identify places of entrapment and advise in proper exercises and contraindications.

HNP or Sciatica Treatment

Painful Side Up! Lumbar Gapping

HNP Healing

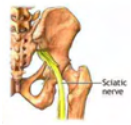


Discs can heal !!

Suggested Exercises: HNP

- Core Control Routine (In studio & HEP)
- Start with Stability: Arm Arcs, Heel Slides, Dip the Foot in the Pool, Bent Knee Fall Out, Sidelying (Modified Sidekick), Prone Hip Extension, Prone Shoulder Flexion, Prone Pelvic Lift (Single Leg Kick) Quadruped Variations, Push Up-Modified.
- Progress to Mobility of Spine: Prone Press Up (Pre-Swan), Pelvic Tilts, Pelvic Clocks, Bridging with Articulation, Side-to-Side, Sidelying Rotation, Book Openings
- When all of the above is done with good form and pain free begin Dynamic Stability Exercises in all positions and standing.
- Same as Osteoporosis Apparatus

Sciatica

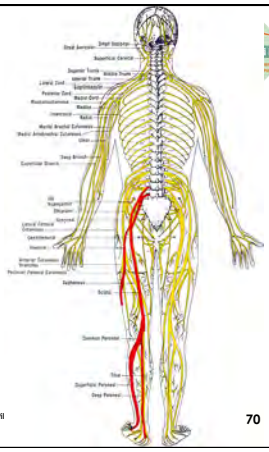


Definition: A set of *symptoms* including pain that may be caused by general compression and/or irritation of one of five nerve roots that give rise to the sciatic nerve, or by compression or irritation of the sciatic nerve itself.

The pain is generally felt in the lower back, buttock, and/or various parts of the leg and foot. In addition to pain, which is sometimes severe, there may be numbness, muscular weakness, and difficulty in moving or controlling the leg. Typically, the symptoms are only felt on one side of the body.

Sciatica

entrapment of the sciatic nerve somewhere along its pathway



Typical Cause of Sciatica

Piriformis Syndrome

©MMG 2005

Sciatica or HNP Treatment

Have physical therapist identify places of entrapment and advise in proper exercises and contraindications.

Sciatica: Suggested Exercises:

Core Control Routine (In studio & HEP)

Start with Stability: Arm Arcs, Heel Slides, Dip the Foot in the Pool, Bent Knee Fall Out, Sidelying (Modified Sidekick), Prone Hip Extension, Prone Shoulder Flexion, Prone Pelvic Lift (Single Leg Kick) Quadruped Variations, Push Up-Modified.

Progress to Mobility of Spine: Prone Press Up (Pre-Swan), Pelvic Tilts, Pelvic Clocks, Bridging with Articulation, Side-to-Side, Sidelying Rotation, Book Openings

When all of the above is done with good form and pain free begin Dynamic Stability Exercises in all positions and standing.

Same as Osteoporosis Apparatus

Sciatica: Precautions/Contra-indications:

Avoid Spine Flexion until pain free.

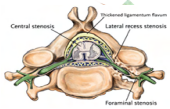
Avoid "Hamstring Stretches"

Avoid long sitting positions.

Use small (straps, balls) or large apparatus (tower bar, trapeze) to support limbs for long lever work.

When pain free begin to add flexion.

Spinal Stenosis

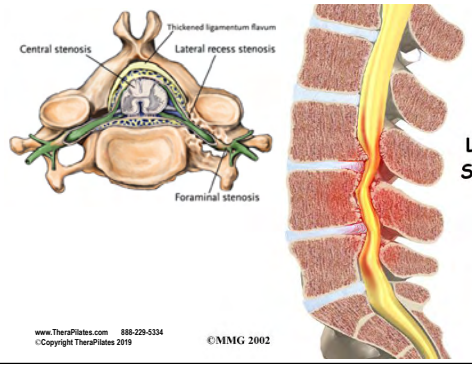


Definition: Narrowing of the spinal canal (central stenosis) or nerve root canals (lateral stenosis), compromising the spinal cord or nerve roots. Usually occurs in the lumbar spine but can also occur in the cervical and thoracic spine.

Symptoms: Symptoms typically aggravated by extension and include back pain, tingling, motor deficits (transient) and intermittent pain in one or both legs which is made worse by standing or walking (especially downhill).

Contraindications: Always avoid extension of the spine (or stenotic segment).

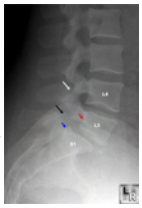
Spinal Stenosis



Spondylolisthesis

Spondylolisthesis

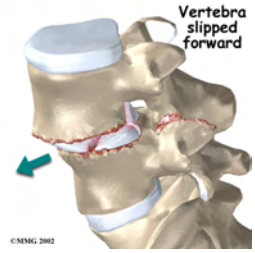
Definition: An instability most often at L5-S1 or L4-L5 due to a defect in the laminae causing anterior vertebral displacement.

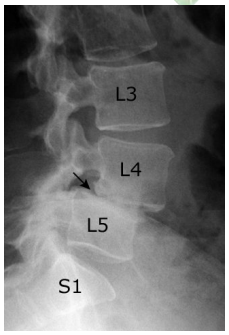


Symptoms: Typically aggravated by extension activity. Minor injury causes acute pain with diffuse radiation into buttocks. Major injuries cause fractures in the laminae and can also cause serious spinal cord injuries.

Contraindications: Avoid extension of the lumbar spine* (at the spondylytic segment)

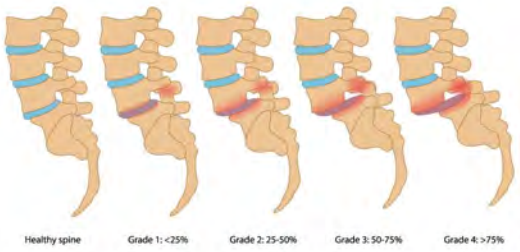
Spondylolisthesis





Spondylolisthesis: Meyerding's Scale

Amount of subluxation



Stenosis & Spondylolisthesis

They LOVE Pilates!

These people usually get pain relief with lumbar flexion.

Stenosis & Spondylolisthesis Suggested Exercises

Core Control Routine (In studio & HEP)

Start with Stability: Arm Arcs, Heel Slides, Dip the Foot in the Pool, Bent Knee Fall Out, Sidelying (Modified Sidekick), Prone Hip Extension, Prone Shoulder Flexion, Prone Pelvic Lift (Single Leg Kick) Quadruped Variations, Push Up-Modified.

Mobility: Posterior Pelvic Tilts, Pelvic Rotation, Bridging with Articulation, Chest Lift, Rollups (start on Trapeze Table), Side-to-Side with feet down, Sidelying Rotation (Book Openings) Prone Extension (Thoracic Spine ONLY-Palpate Lumbar spine to keep it still)

Emphasize Thoracic Extension without Lumbar Extension (Spine Corrector, Baby Arc, Ladder Barrel, Massage Ball or Foam Roller)

Emphasize Hip Disassociation (Hip Extension without pelvic or lumbar movement)

Facet Syndrome

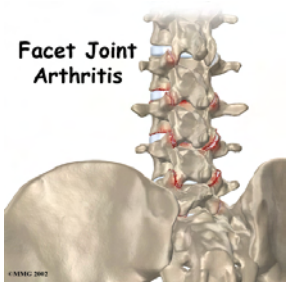
Facet Syndrome

Definition: Characterized by a segmental hypomobility (facet lock) causing secondary hypermobile segments with pain and pain referral.

Symptoms: Often occurs with or because of disc degeneration. Usually painful with extension especially combined with rotation and sidebending.

Contraindications: Avoid extension of the spine*. (at the affected facet)

Facet Syndrome



Facet Syndrome:
Suggested Exercises:

- Core Control Routine (In studio & HEP)
- Start with Stability: Arm Arcs, Heel Slides, Dip the Foot in the Pool, Bent Knee Fall Out, Sidelying (Modified Sidekick), Prone Hip Extension, Prone Shoulder Flexion, Prone Pelvic Lift (Single Leg Kick) Quadruped Variations, Push Up-Modified.
- Mobility: Posterior Pelvic Tilts, Bridging with Articulation, Chest Lift, Rollups (start with spring assistance on Trapeze Table), Side-to-Side with feet down, Sidelying Rotation with painful side up. Partial ROM if bilateral (Book Openings) Prone Extension (Thoracic Spine ONLY-Palpate Lumbar spine to keep it still)
- Emphasize Neutral control & Hip Disassociation (Hip Extension without pelvic or lumbar movement)

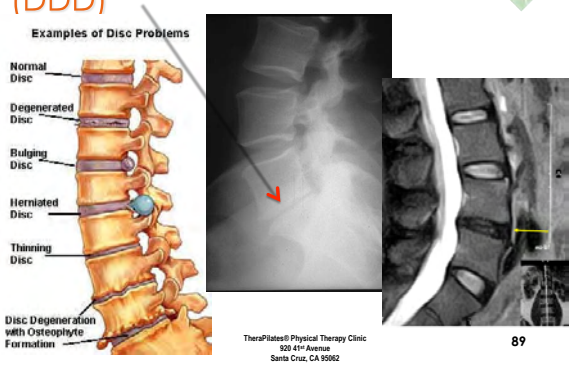
Facet Syndrome

- If pain source is the facet joint a typical treatment is with denervation of dorsal ramus (Bogduk)
- This also denervates the multifidus
- Works really well the first time
- Diminishing returns….and what about the multifidus for stability and core control?

Degenerative Disc Disease (DDD)

- Definition: The gradual degeneration of intervertebral discs caused by repetitive stress on the spinal tissues leading to a loss of flexibility, elasticity and shock-absorbing properties.
- Typical causes: wear and tear, aging, or trauma.
- Consequences may be: disc space narrowing, osteophyte formation, disc bulging, or herniation.

Degenerative Disc Disease (DDD)



Suggested Exercises: DDD

- Core Control Routine (In studio & HEP)
- Start with Stability: Arm Arcs, Heel Slides, Dip the Foot in the Pool, Bent Knee Fall Out, Sidelying (Modified Sidekick), Prone Hip Extension, Prone Shoulder Flexion, Quadruped Variations, Push Up-Modified.
- Mobility: Pelvic Tilts, Pelvic Clocks, Bridging with Articulation, Chest Lift, Rollups (start on Trapeze Table), Side-to-Side with feet down, Sidelying Rotation (Book Openings), Prone Extension
- Emphasize gentle spine mobility (arthritis mantra) and axial elongation

Sacroilitis or Pelvic Girdle Dysfunction

Sacroilitis: Inflammation of the SI joint. Usually caused by one of the connective tissue diseases (e.g. ankylosing spondylitis, psoriasis).

Symptoms: pain in low back, buttocks, thighs

Pelvic Girdle Dysfunction: Origin is thought to be a disruption in the normal movement of the sacroiliac joint (too much or too little movement in the joint) Often provokes pain on one side. Often caused by Leg Length Discrepancy.

Do NOT begin strengthening exercises in poor pelvic alignment, you will only stabilize the faulty alignment!

Sacroilitis or Pelvic Girdle Dysfunction: Suggested Exercises

Core Control Routine (In studio & HEP)

Start with Stability: Arm Arcs, Heel Slides, Dip the Foot in the Pool, Bent Knee Fall Out, Sidelying (Modified Sidekick), Prone Hip Extension, Prone Shoulder Flexion, Quadruped Variations, Push Up-Modified.

Stay with Stability work for a long time.

If not successful, refer out to HCP.

Might need support belt or manual therapy corrections on a regular basis at first.

Exercise Class Grouping

- Extension Bias Groups (HNP, Sciatica, Osteoporosis)
- Flexion Bias Groups (Facet Syndrome, Spondylolysthesis, Stenosis)
- Pelvic Girdle Syndrome- Neutral Not always easy to categorize

1. Start with Stability

Start with all exercises in Neutral Spine

Teach disassociation of spine from hip and spine from shoulder

Maintain Tr Abdominus contraction and Axial Elongation during all exercises

- Footwork
- Feet in Straps
- Arm Arcs
- Quadruped
- Leg Circles

2. Progress to Mobility

When all exercises are symptom free in neutral then begin to add mobilization exercises for the spine starting in supine in one plane such as:

Flexion/Extension-Sagittal (Bridging, Rolldowns)

Sidebending-Frontal (Sidebending on Barrel)

Rotation-Transverse then progress to more advanced combined movements (Side to Side/Pendulum Pelvic Clock then Spine Twist)

3. Advanced Dynamic Movements

When all stabilization and mobilization exercises are symptom free then begin to add Advanced Dynamic exercises in combined planes of movement like:

- ♦ Mermaid with Rotation
- ♦ Saw
- ♦ Reformer Short Box facing side (Pearl Diver), Snake and Twist

My favorite MAT Pre-Pilates Exercises:

- Arm Arcs
- Heel Slides
- Dip Foot in Pool
- Bent Knee Fall Out
- 90/90 Lower Abs
- Bridging w/or without articulation
- Bridge with Marching
- Sidelying
- Side Lift
- Single Leg Kick (modified) Prone Pelvis Lift
- Prone Hip Extension
- Quadruped-Neutral & Pregnant Cat Breathing'
- Quadruped-Shoulder Flex & Hip Ext
- Push Up- Modified on knees or hands on Table

MAT Standing Work:

- Pelvic Floor Plies in Neutral Pelvis
- Wall Squats
- Marriage Proposal Lunges
- Hip Extension & Calf Stretches
- Single Leg Standing
- Single Leg Knee Bends
- Sit to Stand off Desk Chair without lumbar movement

**Standing work needs to be in all Classes!*

Get the client back to the activities they love!

Additional Considerations:

Simulate functional or sports activities

Be sure to encourage cardiovascular activity 3x week

Encourage water intake

Encourage good nutrition (especially Calcium & Vitamin D)

Discourage smoking & excessive alcohol consumption (more than 1 drink per day)

Pilates Method Alliance

The Pilates community at large has joined together in an effort to identify and preserve the comprehensive work of Joseph and Clara Pilates.

The PMA believes that Pilates should evolve along with the advances in movement research and modern science.

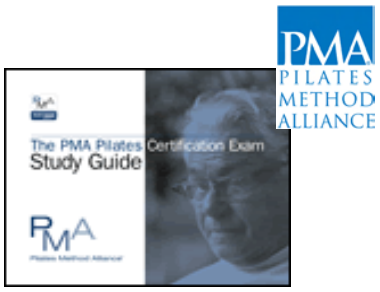
The PMA developed a 3rd party accredited certification program in 2005 to establish national entry-level standards in an effort to protect the public and ensure quality of instruction.

PMA PILATES METHOD ALLIANCE

A Not-for-Profit Organization

with Elizabeth Anderson, E.D.

Pilates Method Alliance Study Guide



REFERENCES:

Ferreira, ML., Ferreira, PH., & Hodges PW. (2007) Changes in postural activity of the trunk muscles following spinal manipulative therapy. *Manual Therapy,* 12(3):240-248.

Ferreira PH… & Hodges PW. (2004) Changes in the recruitment of the abdominal muscles in people with low back pain: ultrasound measurement of muscle activity. *Spine,* 29(22): 2560-2566.

Ferreira, ML, et al. (2007). "Comparison of general exercise, motor control exercise and spinal manipulative therapy for chronic low back pain: A randomized trial." Pain 131(1-2): 31-37.

Franklin, Eric. *Pelvic Power.* Princeton Book Co: 2003.

Germain, Blandine. *Anatomy of Movement*; Eastland Press: 1993.

Greig, AM., Bennell, KL., Briggs, AM., Wark, JD., & Hodges, PW. (2007) Balance impairment is related to vertebral fracture rather than thoracic kyphosis in individuals with osteoporosis, *Osteoporosis International*, 18(4):543-551.

Grimstone, SK, & Hodges, PW. (2003) Impaired postural compensation for respiration in people with recurrent low back pain. *Experimental Brain Research*, 151(2):218-224.

Hall, L., Tsao, H., MacDonald, D., Coppieters, M., & Hodges, PW. (2009) Immediate effects of co-contraction training on motor control of the trunk muscles in people with recurrent low back pain. *Journal of Electromyography and Kinesiology*, accepted 2007 Nov 21.

Hodges, PW, et al. (2006) Rapid atrophy of the lumbar multifidus follows experimental disc or nerve root injury. *Spine,* 31(25):2926-2933.

REFERENCES:

Hodges, PW., & Richardson, CA. (1996) Inefficient muscular stabilization of the lumbar spine associated with low back pain. A motor control evaluation of transversus abdominis. *Spine,* 21(22):2640-2650.

Hodges, PW., Gandevia, SC., & Richardson, CA. (1997) Contractions of specific abdominal muscles in postural tasks are affected by respiratory maneuvers, *Journal of Applied Physiology*, 83(3):753-760

Hodges, PW., & Richardson, CA. (1998) Delayed postural contraction of transversus abdominis in low back pain associated with movement of the lower limb. *Journal of Spinal Disorders*, 11(1):46-56.

Hodges, PW., Sapsford, R., & Pengel, LHM. (2007) Postural and respiratory functions of the pelvic floor muscles. *Neurourology and Urodynamics,* 26(3):362-71.

Hulme, Janet. *Pelvic Pain and Low Back Pain*; Missoula, Montana, Phoenix Publishing: 2002

Jackson, Richard "The Pelvic Girdle" Course Manual for Physical Therapists.

Jones, Lawrence & Kusenose, Randall et al. *Jones Strain Counterstrain*; Jones Strain Counterstrain, Inc.:1995.

Kofotolis, N., et al. (2016). "Effects of Pilates and trunk strengthening exercises on health-related quality of life in women with chronic low back pain." *J Back Musculoskelet Rehabil.*

Lee, Diane. *The Pelvic Girdle*; Churchill Livingstone, London: 2004.

Lessen, DL. PMA Pilates Certification Study Guide. 2005.

REFERENCES:

MacDonald, D., Moseley, GL., & Hodges, PW. (2009) Why do some patients keep hurting their back? Evidence of ongoing back muscle dysfunction during remission from recurrent back pain. *Pain,* accepted 2008 Jan 12.

Maher, CG., & Refshauge, KM. (2007) Comparison of general exercise, motor control exercise and spinal manipulative therapy for chronic low back pain: A randomized trial. *Pain*, 131(1-2):31-37.

Maher, CG., Latimer, J., Hodges, PW., Refshauge, KM., Moseley, GL. et al. (2005) The effect of motor control exercise versus placebo in patients with chronic low back pain. *BMC Musculoskeletal Disorders*, 6:54.

Mazloum, V., et al. (2018). "The effects of selective Pilates versus extension-based exercises on rehabilitation of low back pain." *Journal of Bodywork & Movement Therapies* 22(4): 999-1003.

McGill, Stuart. *Low Back Disorders: Evidence Based Treatment*. Human Kinetics, 2007.

Mok, NW., Brauer, SG., & Hodges, PW. (2007) Failure to use movement in postural strategies leads to increased spinal displacement in low back pain. *Spine,* 32(19):E537-543.

Moseley, GL., Hodges, PW., & Gandevia, SC. (2002) Deep and superficial fibers of the lumbar multifidus muscle are differentially active during voluntary arm movements. *Spine*. 27(2):E29-36.

Pâmela Maiara, M., et al. (2018). "Effectiveness of the Pilates method for individuals with nonspecific low back pain: clinical and electromyographic aspects." *Motriz: Revista de Educacao Fisica,* Vol 23, Iss 4 (2018)(4).

Pilates, Joseph. *Return to Life;* Miami, Pilates Method Alliance, 2003.

Richardson Carolyn, et. al. *Therapeutic Exercise for Spinal Segmental Stabilization in Low Back Pain*; Churchill-Livingstone, London, 2004.

REFERENCES:

Richardson, C. A., Jull, G. A., Hodges, P. W., & Hides, J. A. *Therapeutic exercise for spinal segmental stabilisation in low back pain: Scientific basis and clinical approach.* Churchill Livingstone, Edinburgh, UK, 1998.

Sapsford, RR., & Hodges, PW. (2001) Contraction of the pelvic floor muscles during abdominal maneuvers. *Archives of Physical Medicine and Rehabilitation*, 82(8): 1081-1088.

Sapsford, RR., Hodges, PW., Richardson, CA., Cooper, DH., Markwell, SJ., & Jull, GA. (2001) Co-activation of the abdominal and pelvic floor muscles during voluntary exercises. *Neurourology and Urodynamics*, 20(1):31-42.

Smith, MD., Russell, A., & Hodges, P.W. (2006) Disorders of breathing and continence have a stronger association with back pain than obesity and physical activity. *Australian Journal of Physiotherapy*. 52(1):11-16.

Stieglitz, D. D., et al. (2016). "Equipment-based Pilates reduces work-related chronic low back pain and disability: A pilot study." *J Bodyw Mov Ther* 20(1): 74-82.

Tsao, H., Hodges, PW. (2008) Persistence of improvements in postural strategies following motor control training in people with recurrent low back pain. *Journal of Electromyography and Kinesiology*, 18(4):559-567.

Tsao, H., Galea, MP., & Hodges, PW. (2008) Reorganization of the motor cortex is associated with postural control deficits in recurrent low back pain. *Brain,* 131(Pt8): 2161-2171.

Urquhart, DM. & Hodges, PW., Allen, TJ., & Story, IH. (2005) Abdominal muscle recruitment during a range of voluntary exercises. *Manual Therapy*, 10(2):144-153.

REFERENCES:

Valenza, M. C., et al. (2016). "Results of a Pilates exercise program in patients with chronic non-specific low back pain: A randomized controlled trial." *Clin Rehabil.*

Wells, C, et al. (2013). "Effectiveness of Pilates exercise in treating people with chronic low back pain: systematic review of systematic reviews." *BMC Med Res Methodol* 13: 7.

Thank You!

TheraPilates Physical Therapy Clinic
920-A 41st Avenue Santa Cruz, CA 95062
www.therapilates.com sherri@therapilates.com

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

109

The End

www.TheraPilates.com 888-229-5334

TheraPilates® Physical Therapy Clinic
920 41st Avenue
Santa Cruz, CA 95062

110