

# Pelvic Realignment

## Day 1

- Review the relevant anatomy for the pelvis including bones and landmarks, and all muscles directly attaching to or crossing over pelvis
- Learn to assess basic types client pelvic misalignments
- Observe and practice treatment techniques for specific hard to reach muscles that affect pelvic alignment while client is in prone position

# Why Pelvic Alignment Matters

- **When properly aligned, the pelvis provides support for the upper body while allowing for free and fluid motion in the hips**
- **When the pelvis isn't balanced well in gravity, muscles are overburdened holding up the skeleton which restricts ROM in hips, and affects all other areas of the body negatively**
- **Over time, pelvic misalignment causes wear and tear issues on other joint structures including knees and hip sockets and can lead to spinal compression issues such as lumbar disc herniations, ruptured discs, nerve impingement and more**

# What is An Ideal Balance?

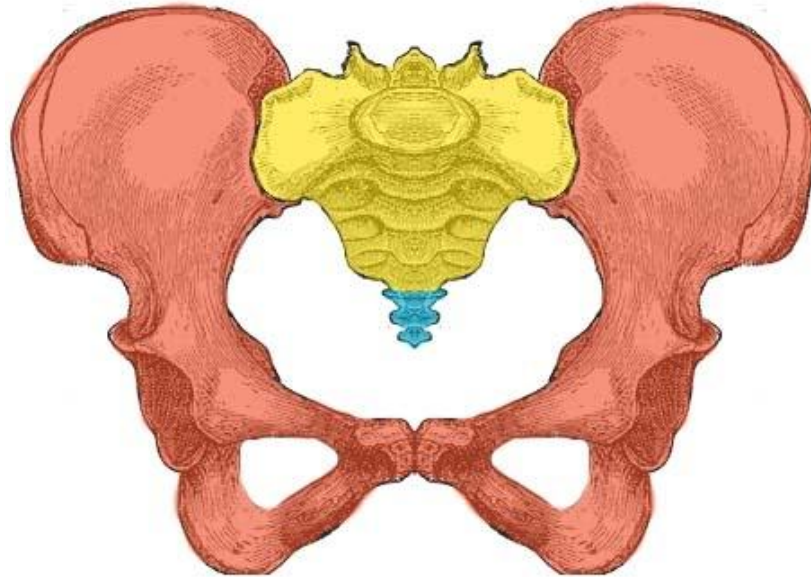
- **Ideally, the pelvis creates a center of gravity that allows both the front, back, and sides of the body to work equally when standing so that no one plane is working harder than the others**
- **Additionally, the pelvis acts like a “bowl” for the organs when aligned allowing the pelvic floor muscles to support the viscera and the “core” muscles to keep the viscera in place without the need to consciously fire these muscles**

# The Pelvis Bridges the Lower & Upper Body

- **Any shift of the pelvis away from an ideal balance causes the muscles above and below to have to fire or release to hold this position above and beyond their resting tone**
- **The pelvis also acts as a lever to connect front and back functional fascial lines from the centered placement on the upper body to a “split” placement through both legs**

# Anatomy Review: Major Bones of the Pelvis (Macro)

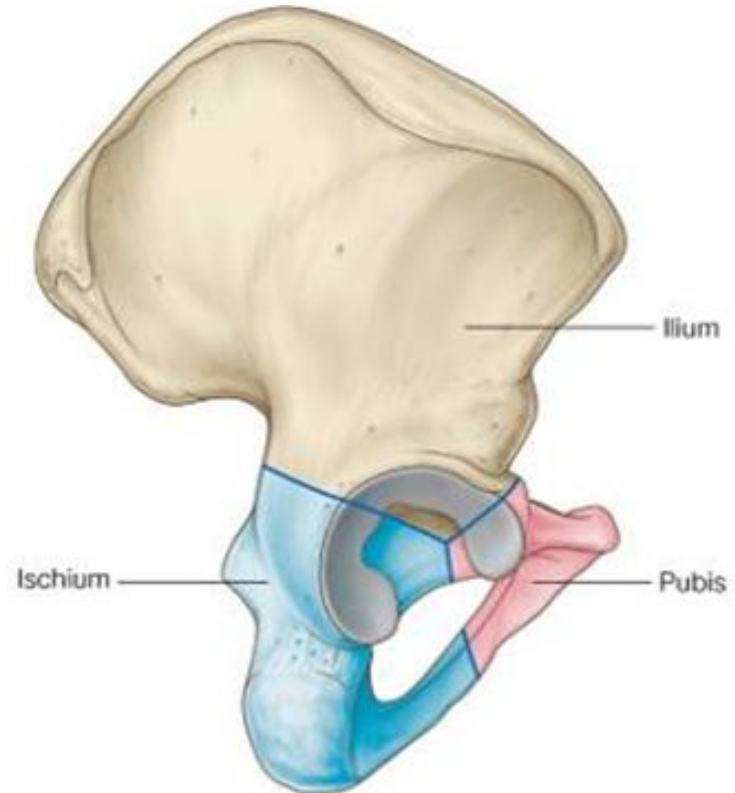
- Hip Bones
- Sacrum
- Coccyx
- Hip Bones are made up of 3 bones fused together (next slide)
- Hip Bones & Sacrum are attached by ligaments
- Sacrum starts as separate bones that begin fusing after birth and continue until they fully fuse together between 18-30 years of age



- Hip bones
- Sacrum
- Coccyx

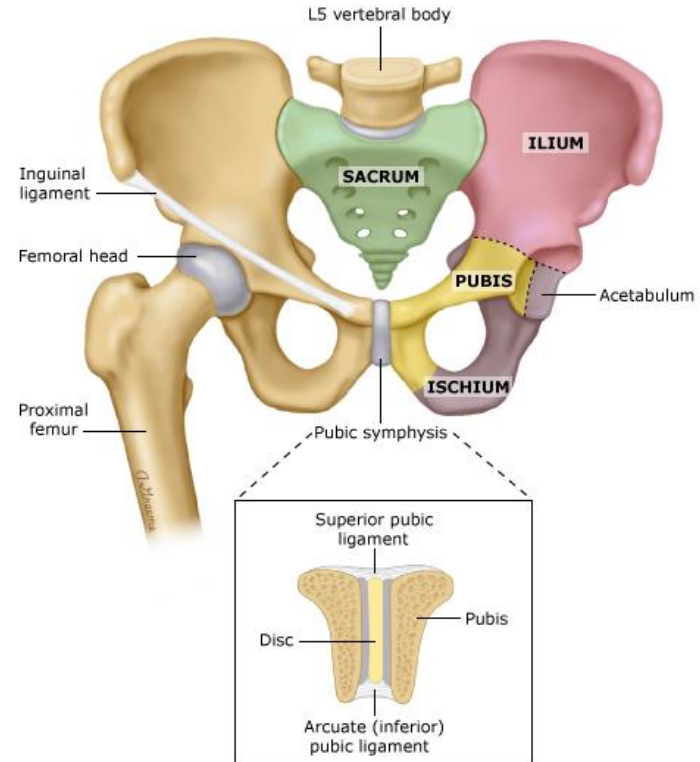
# Anatomy Review: 3 Bones & Cartilage of the Hip Bone

- Ilium
- Ischium
- Pubis
- Triradiate Cartilage (closes to fuse 3 bones together between 12-14 years of age)
- These 3 bones form each half of pelvis (iliac crest and ischial ramus twist to about 180 degrees from each other)

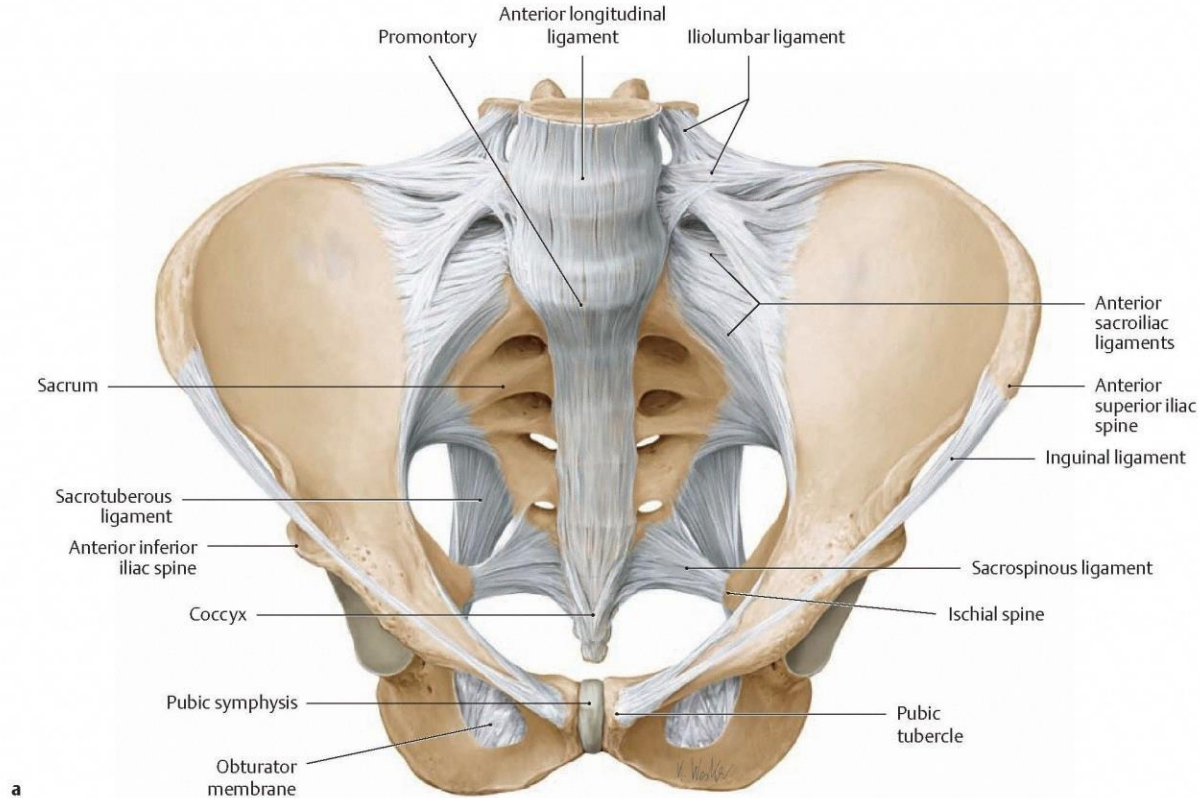


# Anatomy Review: Connection of Pelvis to Spine & Femur

- The 3 hip bones fuse on each side and create the acetabulum (hip socket)
- The femoral head or “ball” of the femur fits into the acetabulum
- The 2 hip bones are attached to each other and the spine through the sacrum in the back of the pelvis
- The 2 hip bones are attached to each other through the pubic symphysis in the front of the pelvis (the pubic symphysis greatly expands during pregnancy to allow room for birth which is triggered by the relaxin hormone)

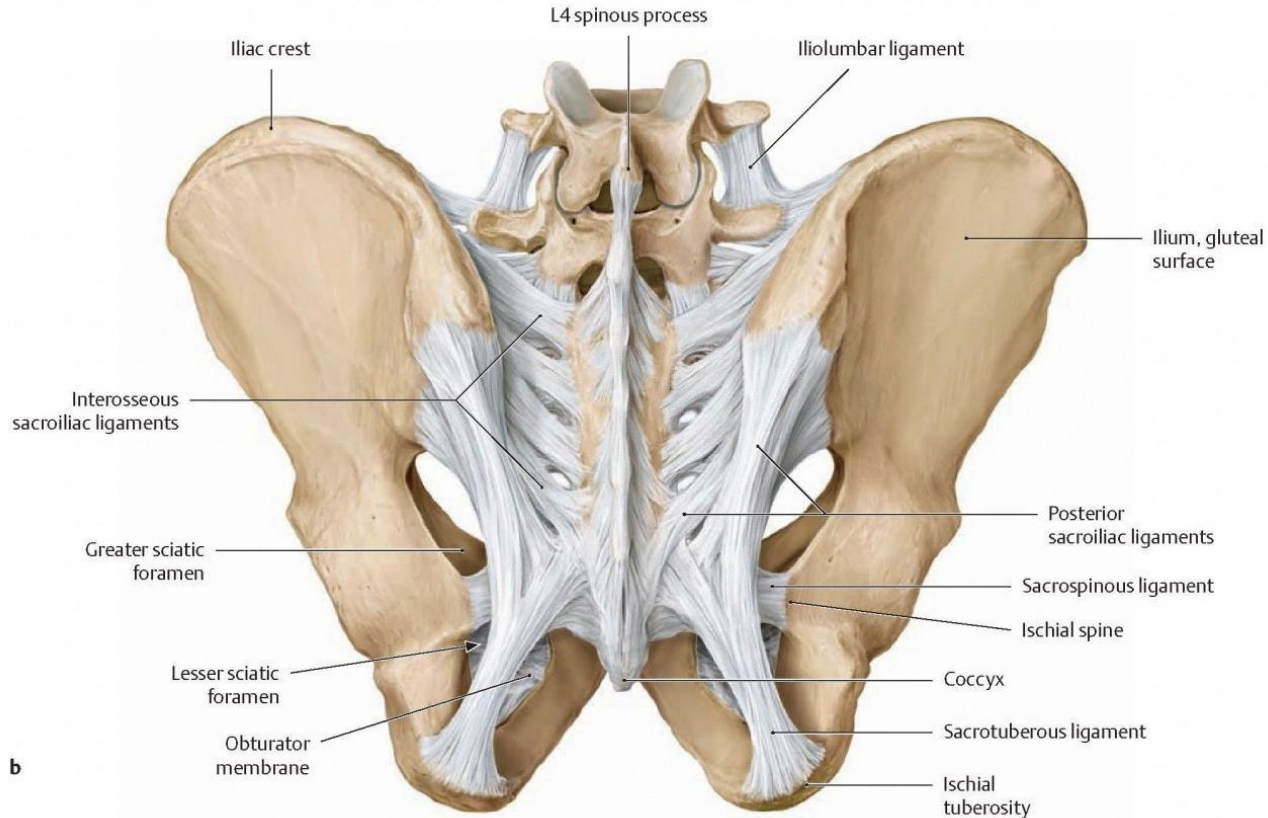


# Anatomy Review: Anterior Ligaments - Pelvis to Sacrum



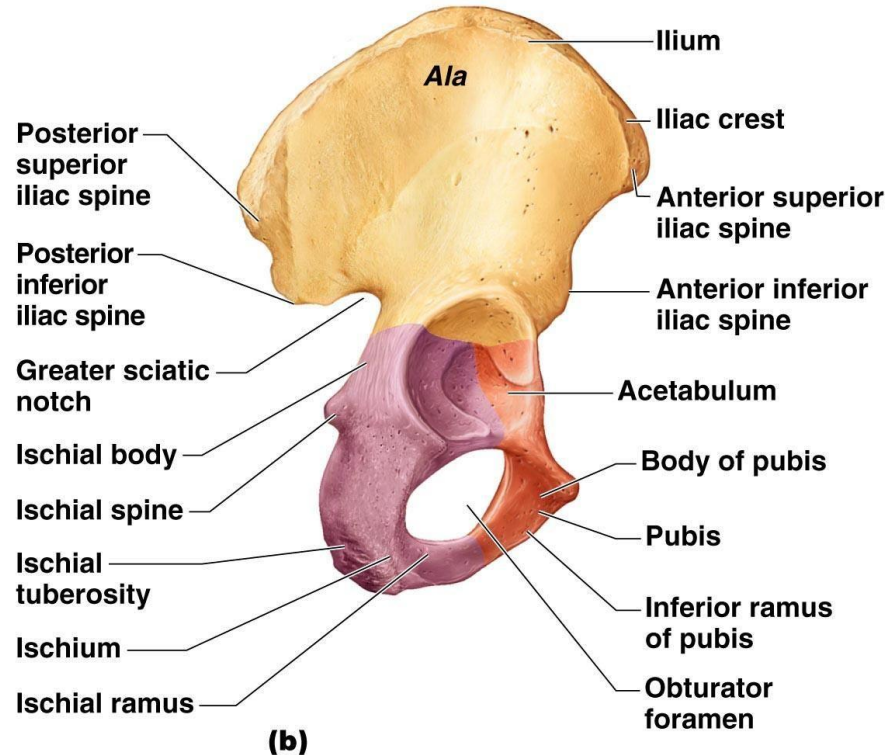


# Anatomy Review: Posterior Ligaments - Pelvis to Sacrum



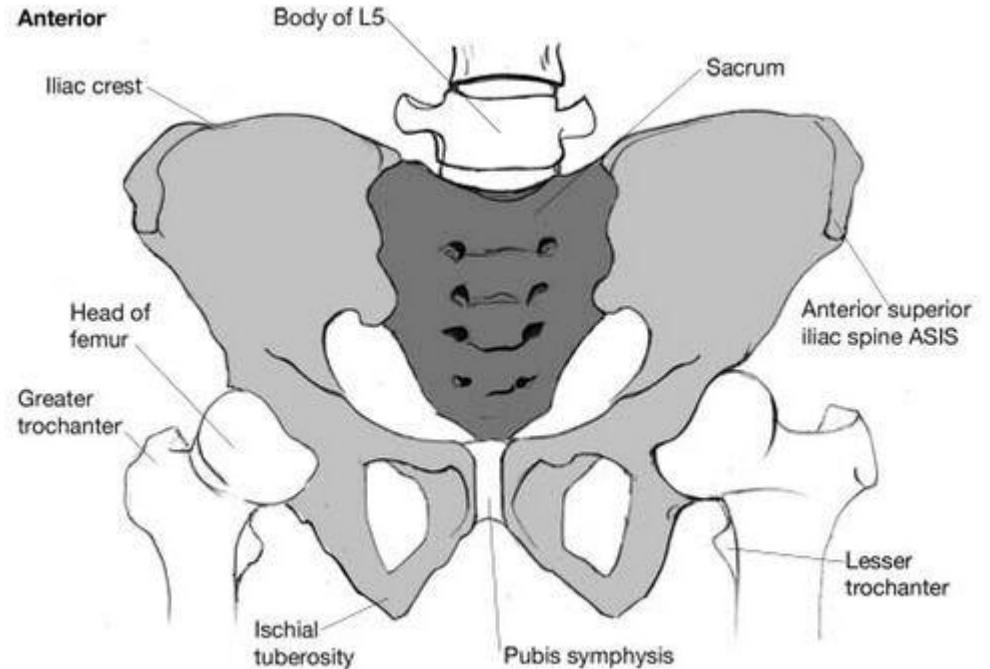
# Anatomy Review: Major Bony Landmarks Most Relevant to Manual Therapy of the Pelvis (Lateral View)

- Iliac Crest
- ASIS
- PSIS/PIIS
- Ischial Tuberosity
- Ischial Ramus
- Pubis
- Inferior Ramus of Pubis
- Obturator Foramen



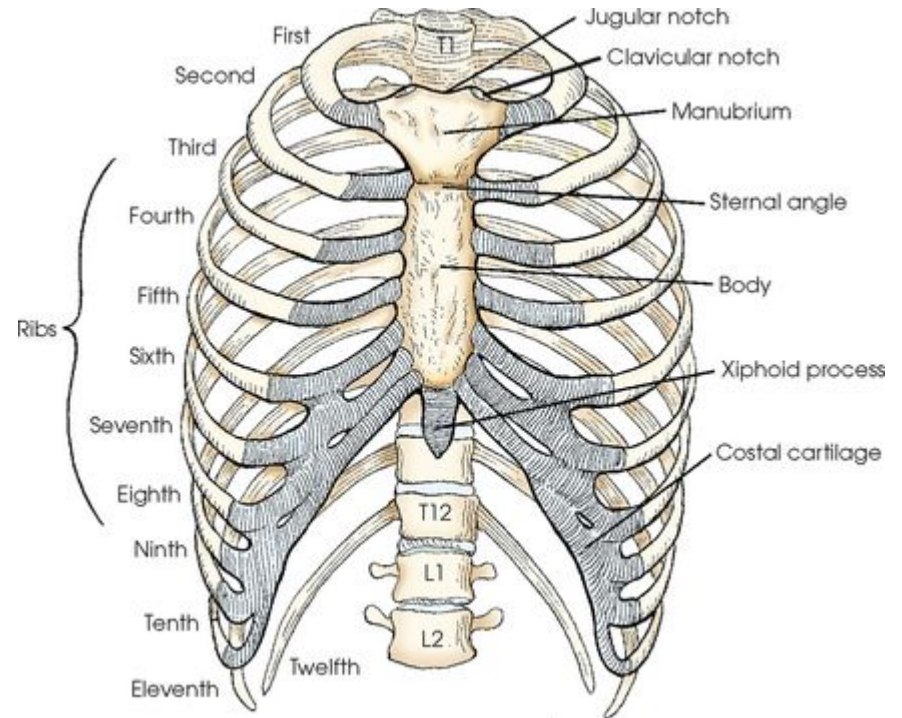
# Anatomy Review: Bony Landmarks Most Relevant to Manual Therapy of Bones Connected to Pelvis

- **Greater Trochanter**
- **Lesser Trochanter**
- **Posterior Sacrum**
- **Lateral Attachments on Coccyx**



# Anatomy Review: Bony Landmarks Most Relevant to Manual Therapy of Other Bones that Affect Pelvis

- **Transverse Processes of L1-L5**  
(attachments of psoas)
- **Floating Ribs (11 & 12)**
- **Ribs 7-10 Costal Cartilage**  
(attachments of abdominals)
- **Xiphoid Process**



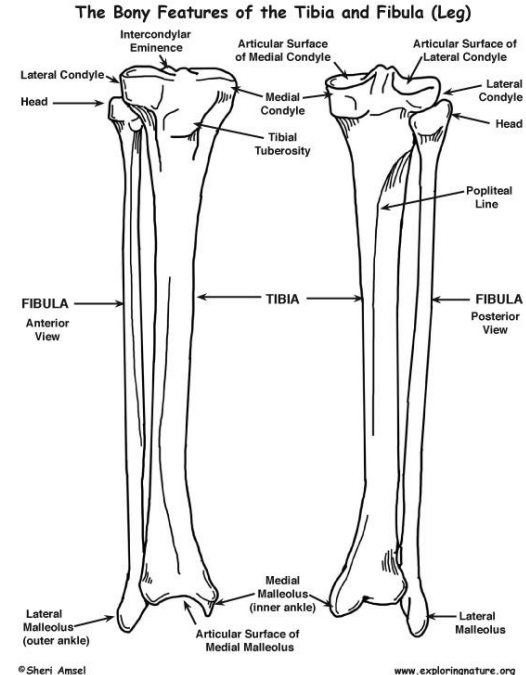
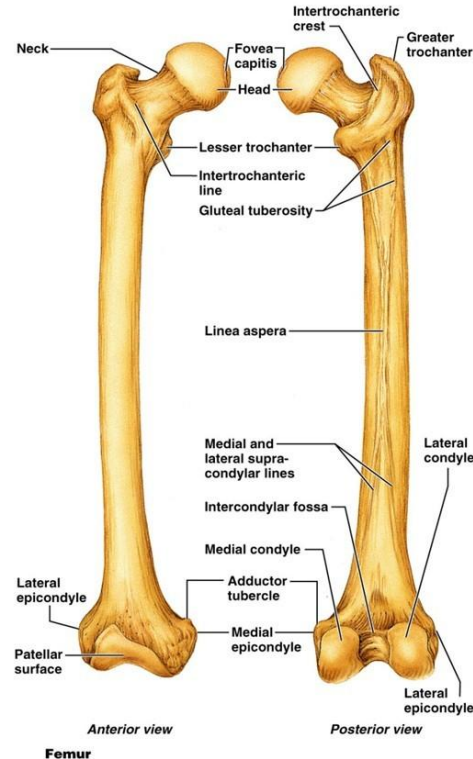
# Anatomy Review: Bony Landmarks Most Relevant to Manual Therapy of Other Bones that Affect Pelvis

## Femur

- Gluteal Tuberosity
- Linea Aspera
- Medial Epicondyle
- Lateral Epicondyle
- Adductor Tubercle

## Tibia & Fibula

- Tibial Tuberosity (& Pes Anserine)
- Head of the Fibula



# Anatomy Review: Major Muscle Groups Affecting the Pelvis & Hip

## Hip Wheel

- Hamstrings
- Quads
- Glutes
- Adductors
- Pes Anserine Group
- TFL
- Iliopsoas
- Deep 6 Rotators

## Pelvic Alignment to Spine & Ribcage

- Abdominals
- QL
- Lats

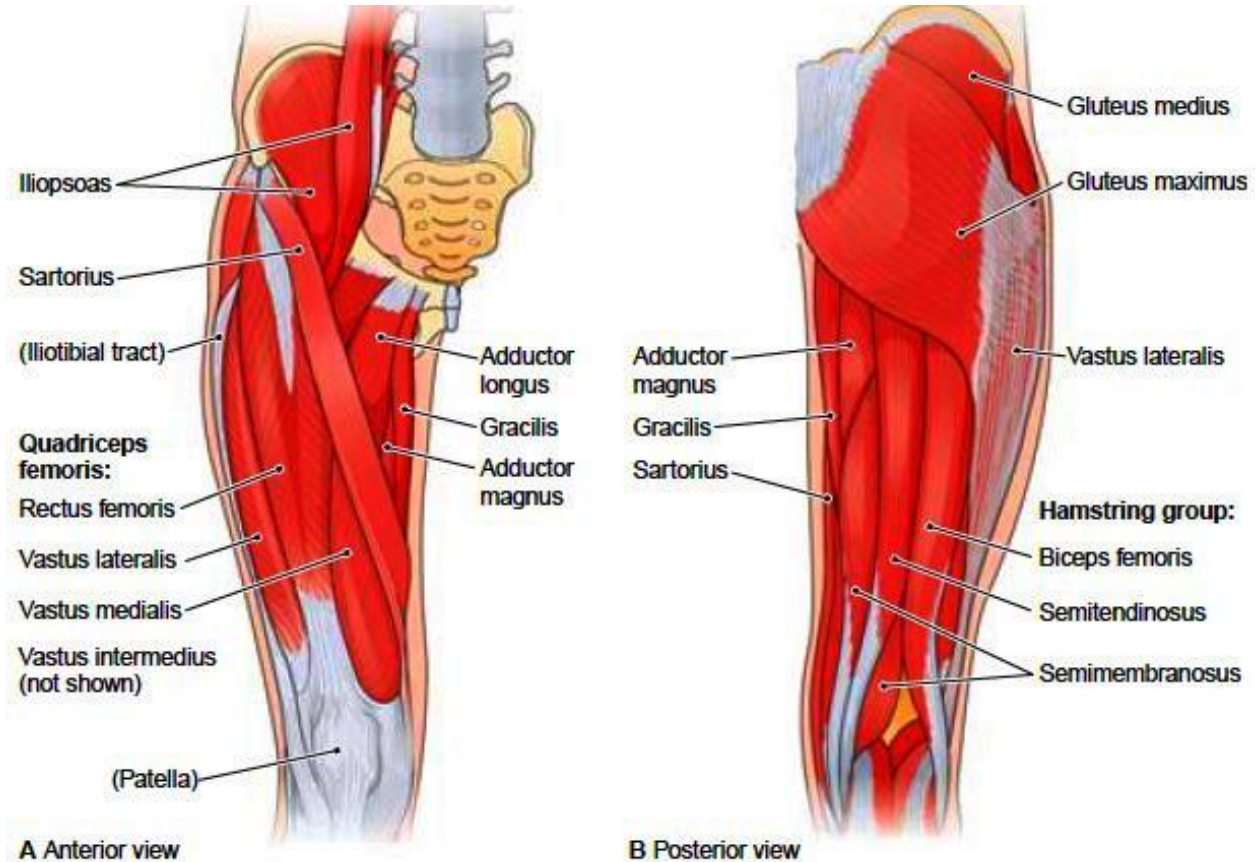
## Support for Viscera

- Pelvic Floor Muscles



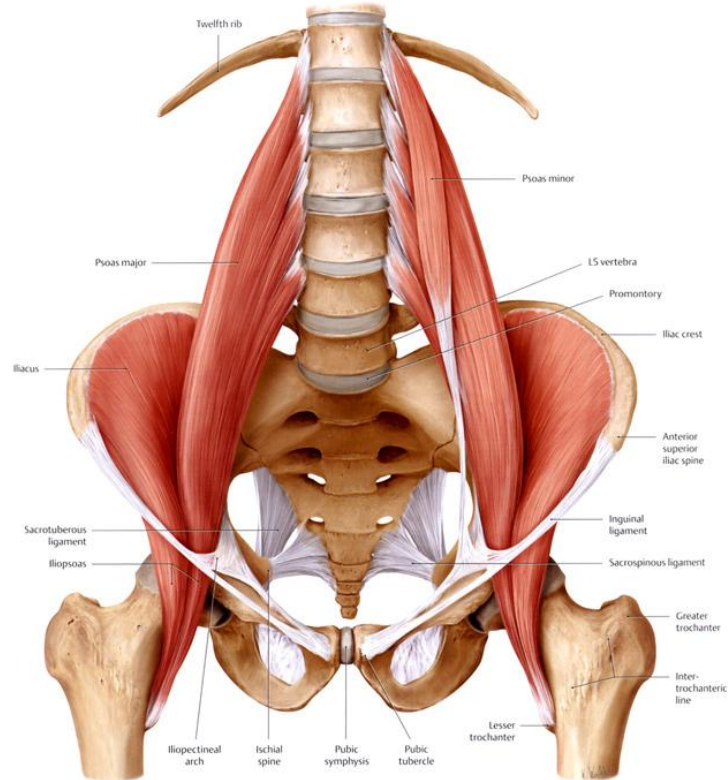
# Anatomy Review: Muscles Affecting the Hip Wheel

- Psoas
- Iliacus
- Pectineus (not shown)
- Sartorius
- TFL (not shown)
- Gracilis
- Rectus Femoris
- Gluteus Maximus
- Gluteus Medius
- Adductor Magnus
- Adductor Longus
- Adductor Brevis (not shown)
- Biceps Femoris
- Semitendinosus
- Semimembranosus



# Anatomy Review: Muscles Affecting the Hip Wheel (Detail)

- Psoas (Major & Minor)
- Iliacus

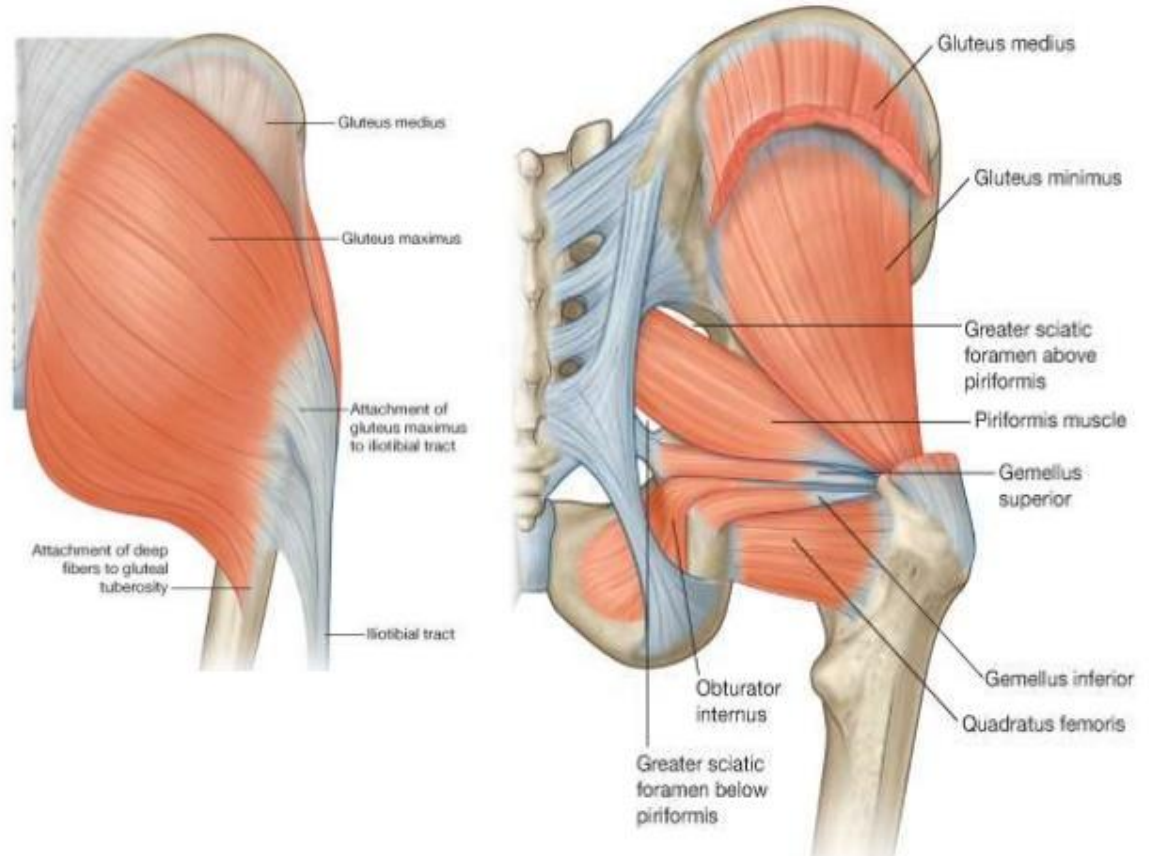




# Anatomy Review: Muscles Affecting the Hip Wheel

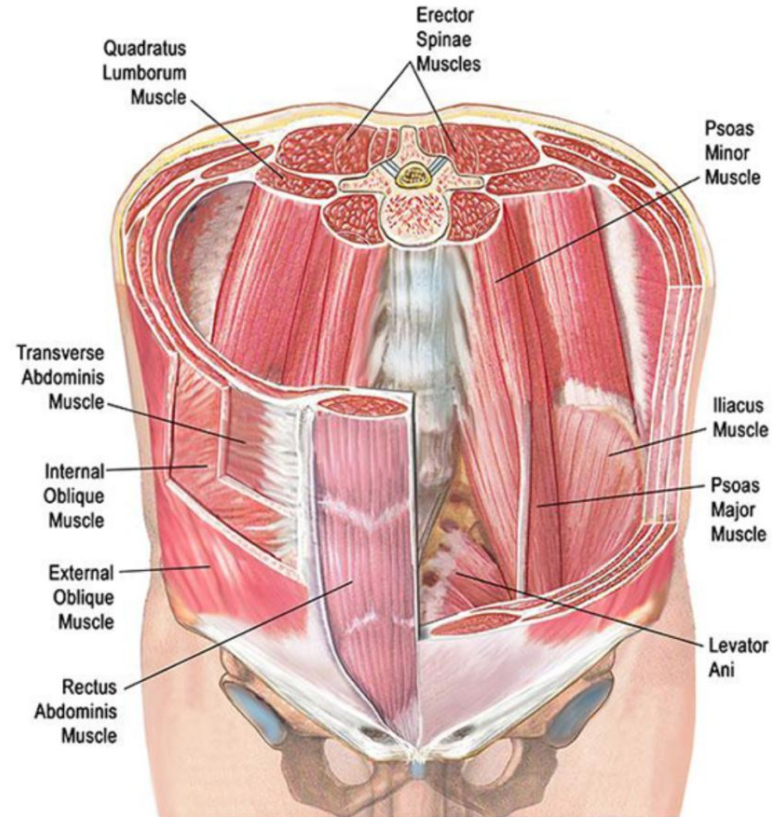
## Deep 6 Group

- Gluteus Minimus
- Piriformis
- Gemellus Superior
- Gemellus Inferior
- Obturator Internus
- Quadratus Femoris



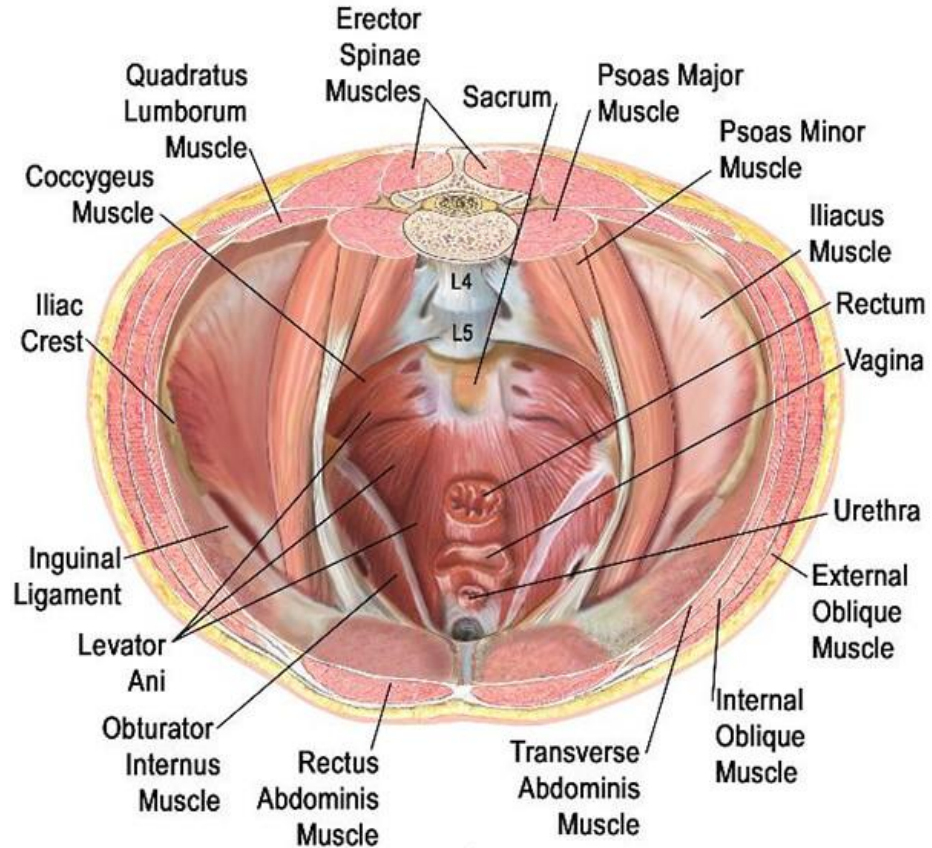
# Anatomy Review: Muscles Affecting Pelvic Alignment In Relation to Spine

- Quadratus Lumborum
- Rectus Abdominis
- External Obliques
- Internal Obliques
- Transverse Abdominis
- Lats (not shown, potential effect on pelvic alignment due to attachment at iliac crest and floating ribs)



# Anatomy Review: Pelvic Floor Muscles

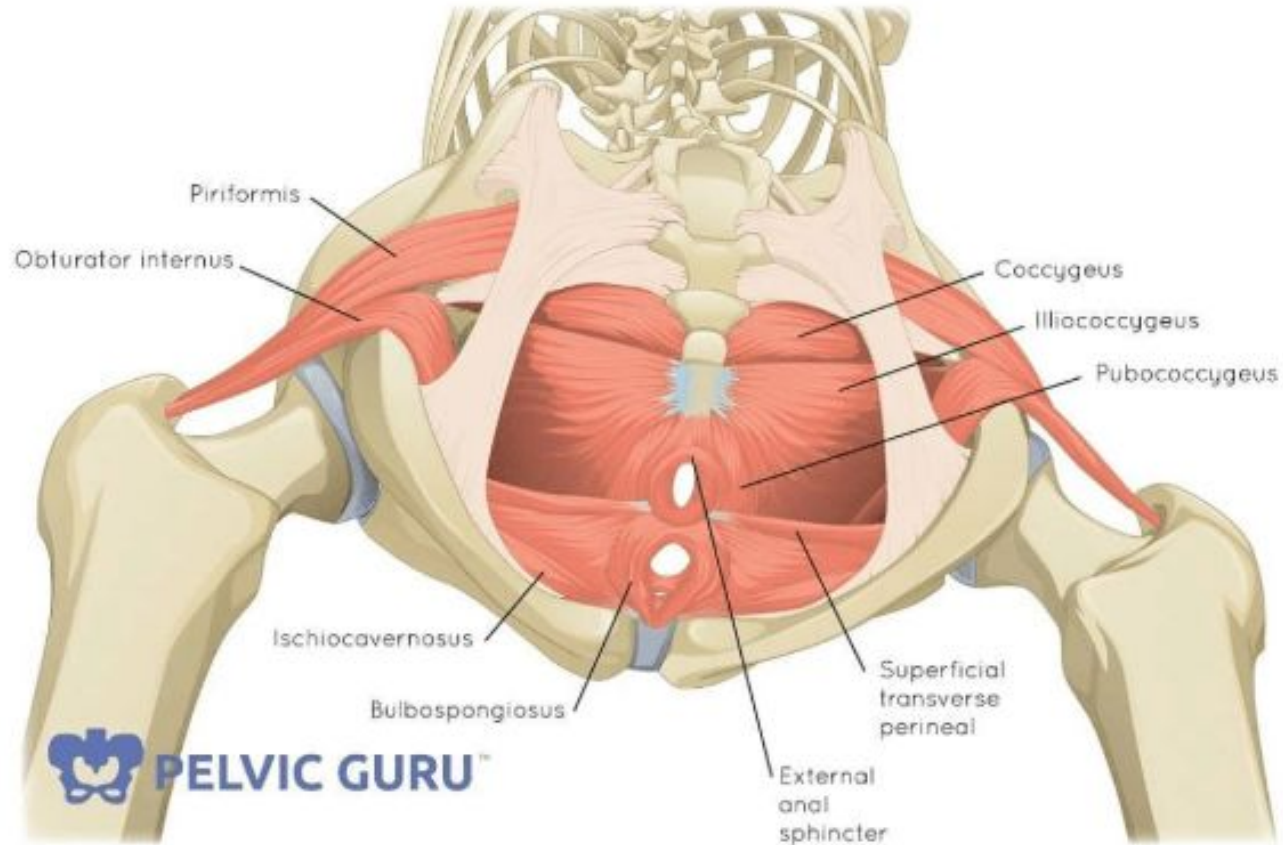
- Levator Ani
  - Iliococcygeus
  - Pubococcygeus
- Obturator Internus
- Coccygeus



# Anatomy Review: Pelvic Floor Muscles (From Below)

- Levator Ani
  - Iliococcygeus
  - Pubococcygeus
- Obturator Internus
- Coccygeus

(Manual therapy of the other pelvic floor muscles are beyond the scope of this class)



# Common Misalignment Patterns

## Sagittal Plane

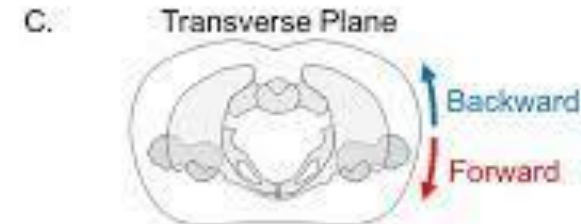
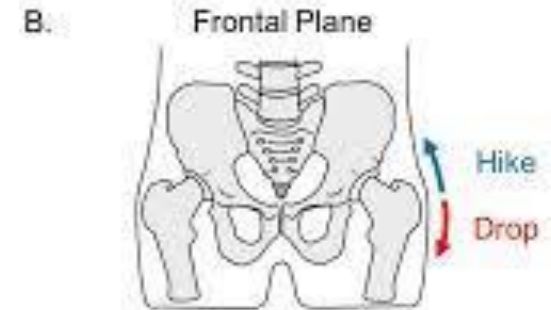
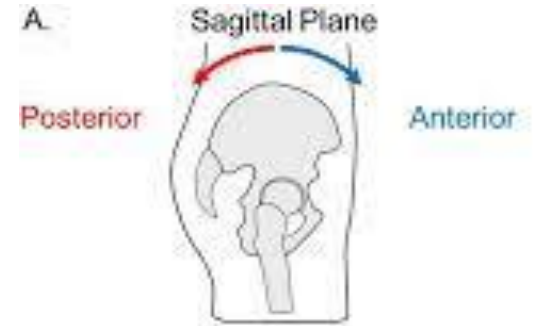
- Anterior or Posterior Pelvic Tilt

## Frontal Plane

- Left or Right Pelvic Hike

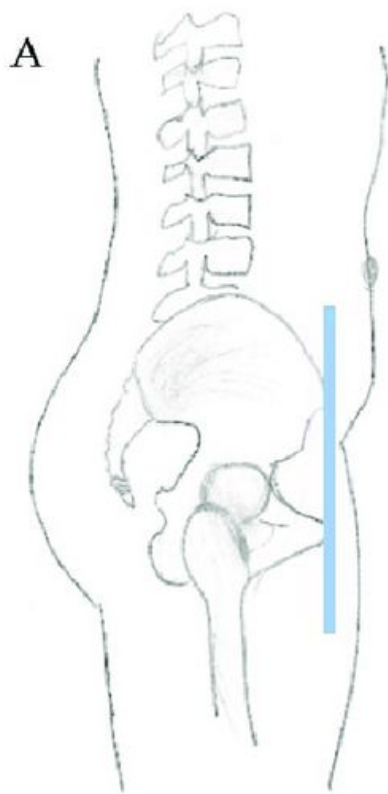
## Transverse Plane

- Left or Right Hip Forward Twist

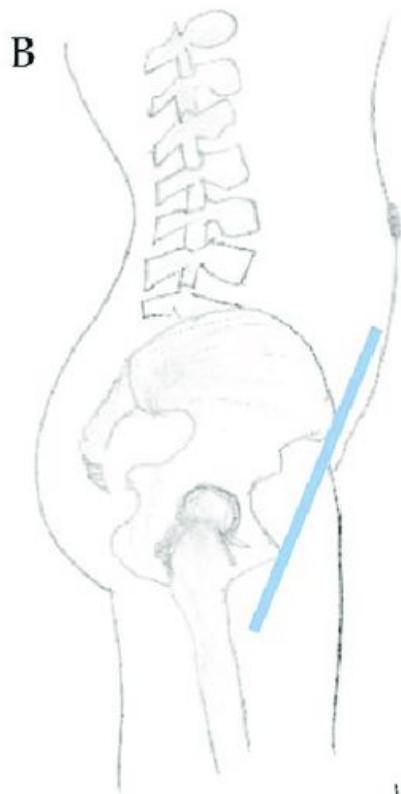




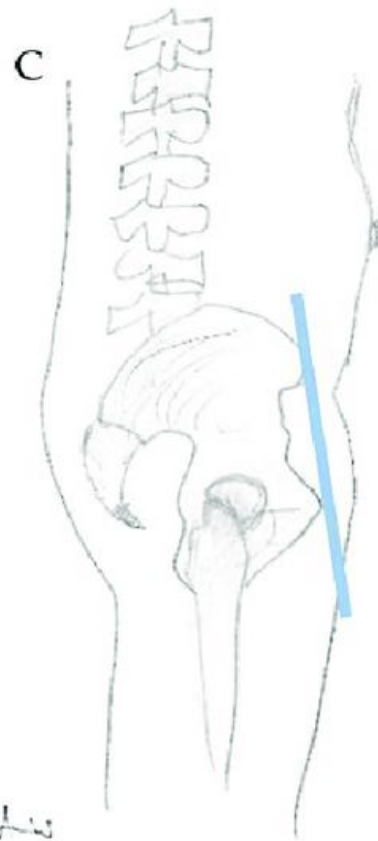
# Sagittal Plane



Neutral

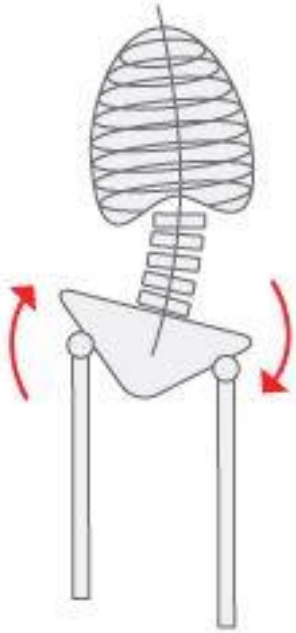


Anterior tilt



Posterior tilt

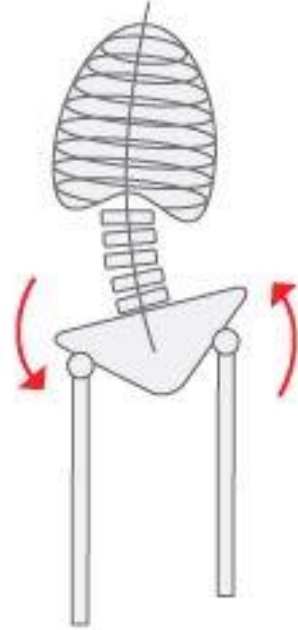
# Frontal Plane (Simplified)



Right Lateral Pelvic Tilt Posture



Neutral Spine Posture



Left Lateral Pelvic Tilt Posture

# Transverse Plane





# Less Common Patterns Due to Structural Bone Shapes Formed During Childhood & Adolescence

- **Scoliosis**
- **Leg Length Difference (often goes with a scoliosis or a growth plate injury to the femur or tibia in childhood)**
- **Ill-fitting ball and socket joint (ball either too big or too small)**
- **Partial L6 Vertebra (often goes with a scoliosis & leg length difference)**
- **Fully formed L6 Vertebra**
- **Valgus or Vargus Knees (look for curved Tibia/Fibula to determine if this is structural or functional)**

## Example #1 - Anterior Pelvic Tilt

- Generally pairs with a noticeable shift of upper chest to the posterior
- Often present with hyperextended knees
- Head angles forward to balance



## Example #2 - Left Hip Hike

- Ribcage shifts away from hiked hip
- Head shifts back toward hiked hip



## Example #3 - Rotated Hip

- Generally shows with one knee forward other knee hyperextended
- Often centerline of face does not line up with sternum but top of head does line up with sternum
- Eyes will have to look slightly left or right to focus



# Possible Symptoms Due to Pelvic Misalignments

## Early Stage Symptoms

- **Low Back Pain (achy)**
- **Hip Pain**
- **Knee Pain**

## Later Stage Symptoms

- **Sharper low back pain, hip pain, knee pain**
- **Weakening core muscles**

# Possible Symptoms Due to Pelvic Misalignments

## Late Stage Symptoms

- **Cervical disc herniations or stenosis causing nerve impingement locally and along sciatic nerve**
- **Labral tears of hip socket due to wear and tear**
- **Iliopsoas Bursa Inflammation**
- **Neuropathy in one or both legs/feet**
- **Degraded knee or hip joints that require surgical intervention or replacement**

## Some Rare Special Cases to Look Out For

- **Partially or Fully Formed L6 Vertebra (I've only seen a few partial and 1 fully formed in my career)**
- **Stress fractures to coccyx (will cause sharp pain when sitting)**
- **Pelvic pain due to refer all from enlarged gall or kidney stones**
- **Neuropathy of pelvic region due to testicular cancer radiotherapy (use deeper pressure very cautiously)**
- **Leg length difference (can only truly be confirmed with x-rays)**

# Notes on More Invasive Advanced Techniques

- **Working on the adductors, pelvic floor muscles, psoas, iliacus, and abdominals can be sensitive and can trigger reflexes and fear responses including muscle guarding in clients**
- **These muscles need very little pressure to create change in their tone**
- **Start out light until you gain experience and comfort with landmarking each set of muscles and get a better gauge for how much pressure the average clients find therapeutic**



# Proposed Treatment Sequence: Prone Position

## Surface level muscles

- Fascial release of spinae erectors down to QL
- QL and obliques fascial release
- Lats + floating ribs + illiocolistalis releases
- Gluteus maximus fascial release
- Gluteus medius fascial release
- Piriformis fascial release
- Fascial release of each hamstring

# Proposed Treatment Sequence: Prone Position

## Deeper level muscles

- **Coccygeus muscles release**
  - **Gently work cross fiber friction on sides of coccyx**
  - **Assess position of coccyx - does it seem shifted to the left or right?**
  - **Try a gentle mobilization by lightly rocking the coccyx side to side - see if one side is able to shift less or not at all (if so, repeat cross fiber friction technique on this side again)**

# Proposed Treatment Sequence: Prone Position

## Deeper level muscles

- **Quadratus Femoris release (possibility of Obturator Internus & Gemellus Inferior as well)**
  - **Bend client's knee and hold foot in lateral hand so that you have the ability to internally and externally rotate the femur using the foot and lower leg as a lever**
  - **Walk up Semitendinosus hamstring from knee towards pelvis so that client's nervous system can adjust to your working near the pelvis**
  - **As you get closer, slow down palpation to make sure you are still in a safe area**
  - **As you get to the medial gluteal fold, palpate for the lesser trochanter (make absolutely sure that all pressure is directed away from the midline to avoid accidental contact with genitals)**
  - **Once you are sure you have the lesser trochanter, apply pin and stretch technique by applying pressure to it while internally and externally rotating femur in the hip socket**

# Proposed Treatment Sequence: Prone Position

## Deeper level muscles

- **Quadratus Femoris release (continued)**
  - You'll know that you have gotten a release by noting that the rotation gets easier with larger ROM
  - Gently work up from lesser trochanter towards space between femur and ischium
  - Apply light pressure up and lateral to contact quadratus femoris - use pin and stretch technique while applying pressure to quadratus femoris
  - If the tissue allows, you may be able to change angle laterally and contact obturator internus and/or gemellus inferior
  - Contacting either (or both) of these will be extremely tender and won't take much pressure at all - again try contacting these and using pin and stretch technique
  - With these two releases the goal is to feel the hip socket open and for internal and external rotation to be much easier with larger ROM (they are so small you won't likely feel the tissue itself change)

# Pelvic Realignment

## Day 2

- Observe and practice treatment techniques for the QL, obliques, and glutes in side lying position
- Observe and practice treatment techniques for adductors, pelvic floor muscles, psoas, iliacus, and abdominals in supine position

# Notes on More Invasive Advanced Techniques

- **Working on the adductors, pelvic floor muscles, psoas, iliacus, and abdominals can be sensitive and can trigger reflexes and fear responses including muscle guarding in clients**
- **These muscles don't need a lot of pressure in order to create change in their tone**
- **Start out light until you gain experience and comfort with landmarking each set of muscles and get a better gauge for how much pressure the average clients find therapeutic**

# Notes on More Invasive Advanced Techniques

- **Avoid pressure directly downward on the femoral triangle as this can compress nerves and major vessels (it is okay to work across it parallel to its surface)**
- **When working on pelvic attachments make sure that all pressure is directed towards bone and away from the midline to avoid accidental contact with genitals**
- **It is a good practice to ask for consent to work on these areas, and to explain to the client the reasoning for working them**

# Notes on More Invasive Advanced Techniques

- In addition, it can be helpful to describe the musculature to the client so that they understand that you are working on muscles which can often alleviate worry and guarding on their part
- However, don't shy away from working on these muscles as releasing and rebalancing the smaller pelvic muscles, as well as deeper larger muscles such as psoas and iliacus can have profound positive impacts on a client's posture and ability to balance easily in gravity



# Proposed Treatment Sequence: Sidelying Release of Lats, QL, Small Glutes, TFL

- Fascially release side fascia from pelvic crest to and through lateral edge of scapula (repeat 2-4 times, changing angles)
- Iliocostalis release while holding lower ribs in front
- Fascially release obliques from floating rib down to pelvic crest while extending through the heel with both legs straight (and even with arm extending up)
- Stretch QL by asking client to let their hip drop “back and down” while tractioning the pelvis down towards feet with palm on pelvic crest
- Fascially release small glutes & TFL by finding tight areas in the triangle from greater trochanter to pelvic crest and using pin and stretch technique - use elbow to pin point and ask client to move femur towards ceiling (and/or nose) *without* changing pelvic position from neutral
- Repeat on several found “stuck” points until client is able to move femur without needing to recruit QL and obliques
- Repeat sequence on other side

# Proposed Treatment Sequence: Supine Release of Hip Wheel, Pelvic Floor, Abdominals, and Iliopsoas

- Fascially release ITB from hip to knee
- Fascially release septum between vastus lateralis and rectus femoris from hip to knee
- Fascially release rectus femoris from knee to AILS
- Drape around hip and abduct leg with bent knee, resting client's leg on yours while sitting on the table (use chair to balance your foot to make this easier)
- Fascially release adductor magnus from knee towards hip
- Fascially release adductor longus from knee towards hip

## Proposed Treatment Sequence: Supine Release of Hip Wheel, Pelvic Floor, Abdominals, and Iliopsoas

- **Lift lower leg up and rest on your shoulder while sitting in same position as adductor work**
- **Use elbow point to fascially release semitendinosus**
- **Use elbow point to fascially release membranousus**
- **Stand and use soft fist to fascially release biceps femoris**
- **Use elbow point to fascially release lower triangle of gluteus maximus**

# Proposed Treatment Sequence: Supine Release of Hip Wheel, Pelvic Floor, Abdominals, and Iliopsoas

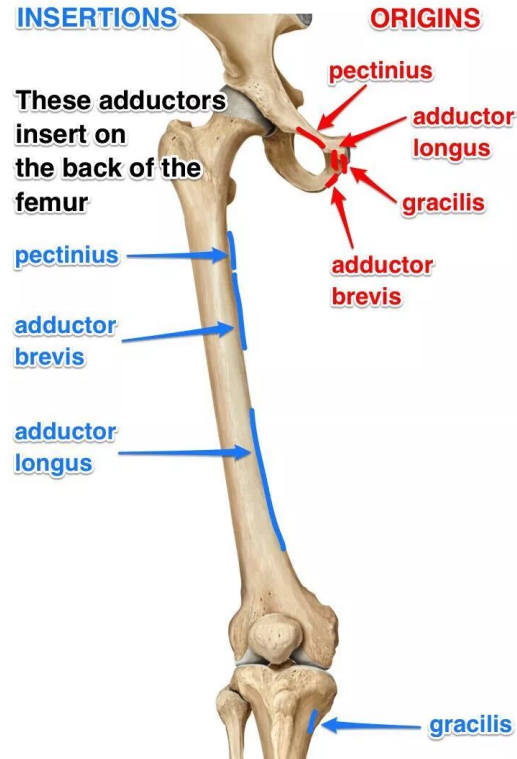
## Advanced Releases (Lesser Trochanter Attachments)

- **Palpate along semitendinosus towards hip socket**
- **About 1.5 inches away from the pelvis (towards you) is the lesser trochanter - try gentle cross fiber friction up and away from midline to palpate into and behind adductor brevis to find bony knob of lesser trochanter**
- **You'll know you have it when client has a big reaction to light pressure on the bone**
- **Use cross fiber friction on lesser trochanter to help release psoas and iliacus**

# Proposed Treatment Sequence: Supine Release of Hip Wheel, Pelvic Floor, Abdominals, and Iliopsoas

## Advanced Releases (Pubis Attachments)

- Use gentle palpation then cross fiber friction on attachments on pubis for pectineus, adductor longus, gracilis, and adductor brevis
- Be very careful that all pressure is on bone of pelvis
- A little goes a long way



# Proposed Treatment Sequence: Supine Release of Hip Wheel, Pelvic Floor, Abdominals, and Iliopsoas

## Advanced Releases (Ischial Attachments)

- Place foot on bolster on table with knee bent and pointing straight up and so that foot is in a stable place
- With one hand on knee to control internal and external rotation, use other hand to work under glutes to find the ischium - start with hand below lumbar and work down towards ischium to avoid shocking client
- The Ischium can easily be contacted about  $\frac{1}{2}$  way between midline and greater trochanter
- You can palpate attachments on ischium and use pin and stretch techniques by applying pressure to these attachments while lightly rocking knee away and towards you
- While in this position you can also use this technique on deep six group attachments on the greater trochanter

# Proposed Treatment Sequence: Supine Release of Hip Wheel, Pelvic Floor, Abdominals, and Iliopsoas

## Advanced Releases (Distinguishing Layer of the Abdominals)

- **Starting at belly button, shift just lateral to it and begin a fascial stroke up rectus abdominis towards xiphoid process**
- **Angle should be almost parallel to body**
- **Ask client to pull belly button towards spine on inhale and release on exhale to help fire transverse abs and obliques**
- **You can also apply a fascial release stroke along the iliac crest from back towards pubic bone to release obliques**

# Proposed Treatment Sequence: Supine Release of Hip Wheel, Pelvic Floor, Abdominals, and Iliopsoas

## Advanced Releases (Distinguishing Layer of the Abdominals Cont)

- Starting at belly button, shift just below it and very slow work a fascial stroke down towards pubic bone
- Be very careful not to apply downward pressure towards bladder and let client know that they should let you know if this causes them bladder discomfort (the need to pee)
- If they do experience discomfort discontinue the technique
- On men you may need to ask them to hold and move their genitals out of the way to avoid contact
- When done right you should be able to palpate the pubic bone at end of the stroke



# Proposed Treatment Sequence: Supine Release of Hip Wheel, Pelvic Floor, Abdominals, and Iliopsoas

## Advanced Releases (Psoas Release)

- Starting at belly button, shift away from midline about 1.5 inches to find edge of the rectus abdominis muscle
- Slightly more laterally there will be a “pocket” between the layers of the obliques and rectus abdominis
- Using straight fingers or a thumb, sink into the pocket at a slight angle towards the lumbar vertebrae
- Use other hand to gently rock leg internally and externally in the hip socket
- If you are correctly placed, you should feel psoas shifting back and forth under your fingers - use pin and stretch technique to release

# Proposed Treatment Sequence: Supine Release of Hip Wheel, Pelvic Floor, Abdominals, and Iliopsoas

## Advanced Releases (Iliacus Release)

- **Starting at ASIS, shift towards the midline just to the inside of the ASIS**
- **Using straight fingers or a thumb, sink down and laterally to contact edge of iliacus on the “bowl” of the front of the pelvis**
- **Use other hand to gently rock leg internally and externally in the hip socket**
- **If you are correctly placed, you should feel iliacus shifting back and forth under your fingers and/or you may see the femur flex in the hip socket to raise the knee slightly - use pin and stretch technique to release iliacus**