Solving Your Tough Cases: Essential Musculoskeletal Assessment for Physicians, Nurses and Physician Assistants.

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DukeHealth

Disclosure

- We have no actual or potential conflict of interest in relation to this program/presentation.

- We have no relevant financial relationships to disclose.

Vision

- Improve communication between practitioners
- Provide the attendee with MSK assessment skills that can be taken back to clinic and used immediately
- Assist in understanding the MSK mystery- Connections!
- Improve patient care by strengthening the interdisciplinary care model.
- Learn from each other

Implications of Ignoring MSK

- Assessment of MSK dysfunction not routinely performed, delayed treatment (Lamvu et al 2018)
- Only 20 % of MD perform a pelvic MSK assessment (Berghmans 2018)
- MSK commonly underdiagnosed due to lack of understanding (Berghmans 2018)

Scope of the Problem

- MSK is not explored /end organ assumed ..not just pain but LUTS and other pelvic conditions (Meister et al 2018)
- There is a 85 % prevalence of MSK in CPP (Montenagro 2008)
- PP patients often attend numerous visits prior to being properly diagnosed (Pastore 2012)
- Difficult to diagnose secondary to multiple comorbidities (Faubion 2012)
- How do assess, understand and communicate?.....

We hope to demonstrate that accurate communication and assessments are worth while.....

Pelvic Girdle Anatomy

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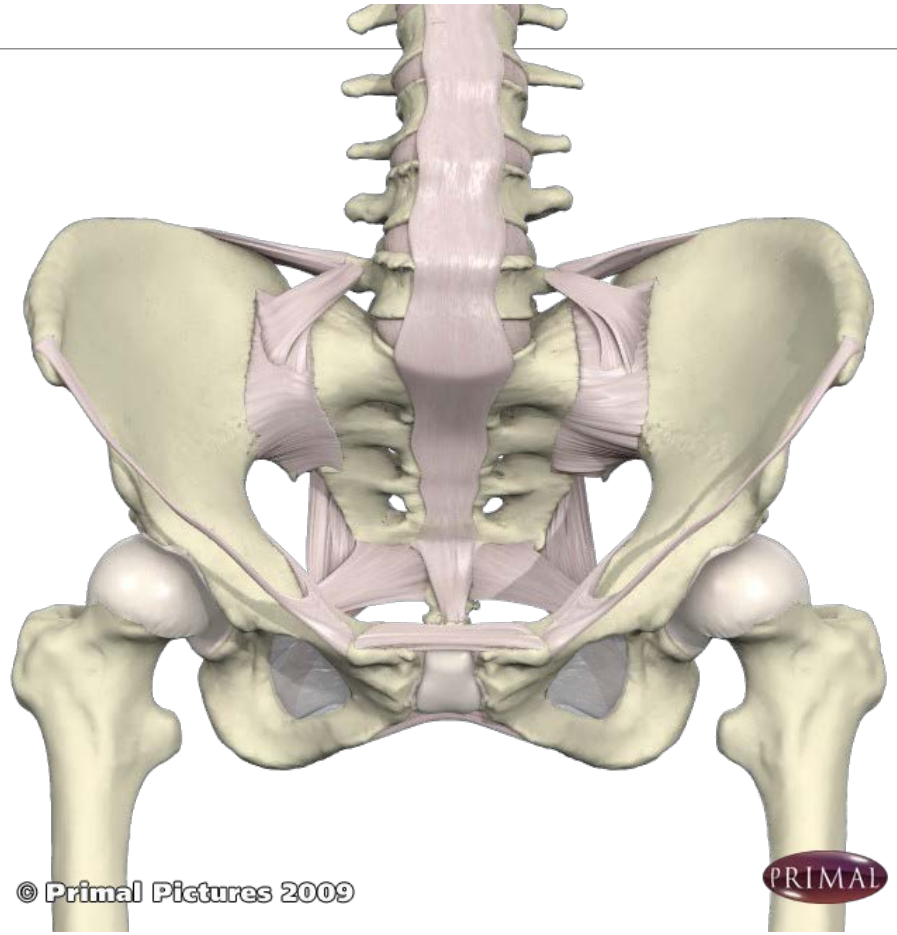
Pelvic Anatomy

- Bony structures and land marks
- Ligamentous structures
- Individual muscle groups
- Core
- Relationships
- Stability
- Research important to core stability and motor control

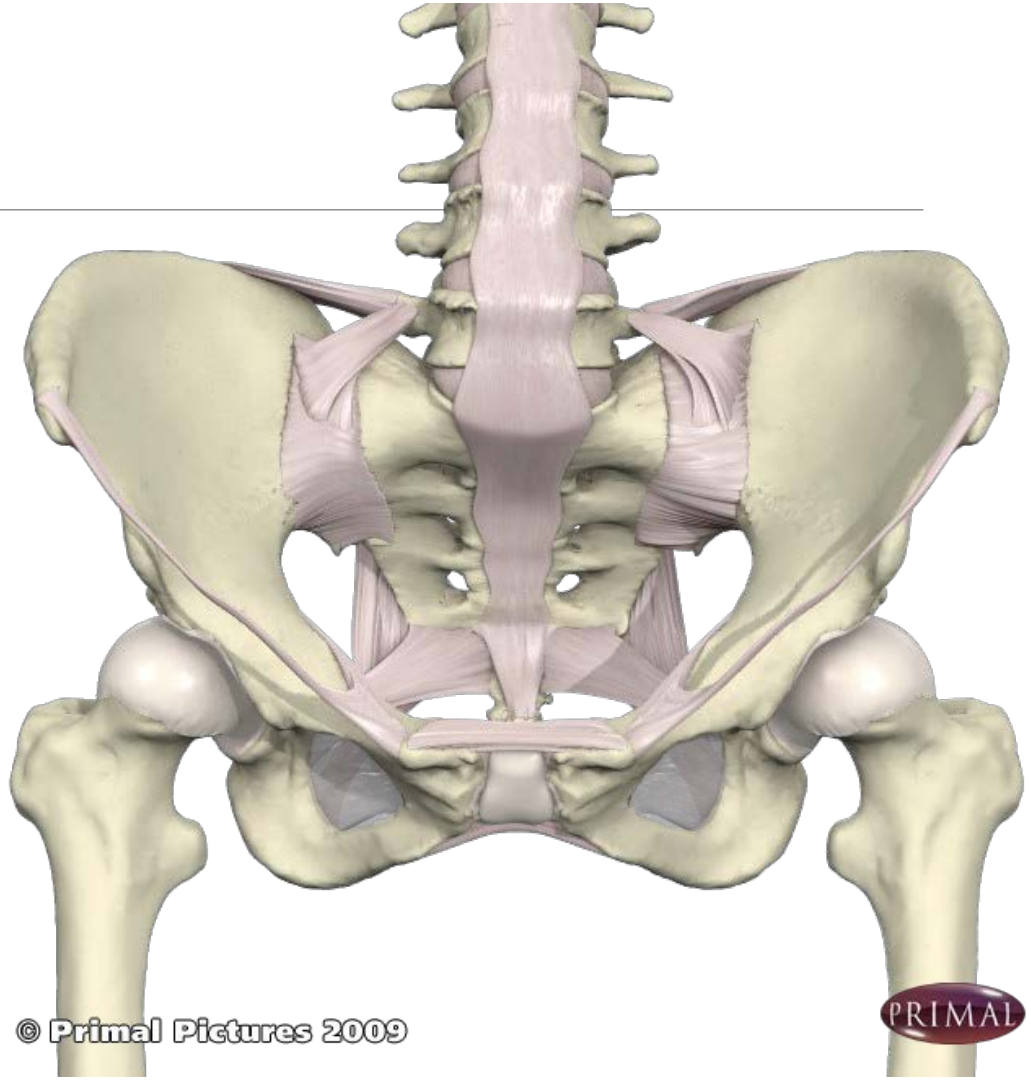
Bony Landmarks

- Anterior Superior Iliac Spine (ASIS)
- Posterior Superior Iliac Spine (PSIS)
- Iliac Crest (IC)
- Ischial Tuberosity (IT)
- Pubic Ramus



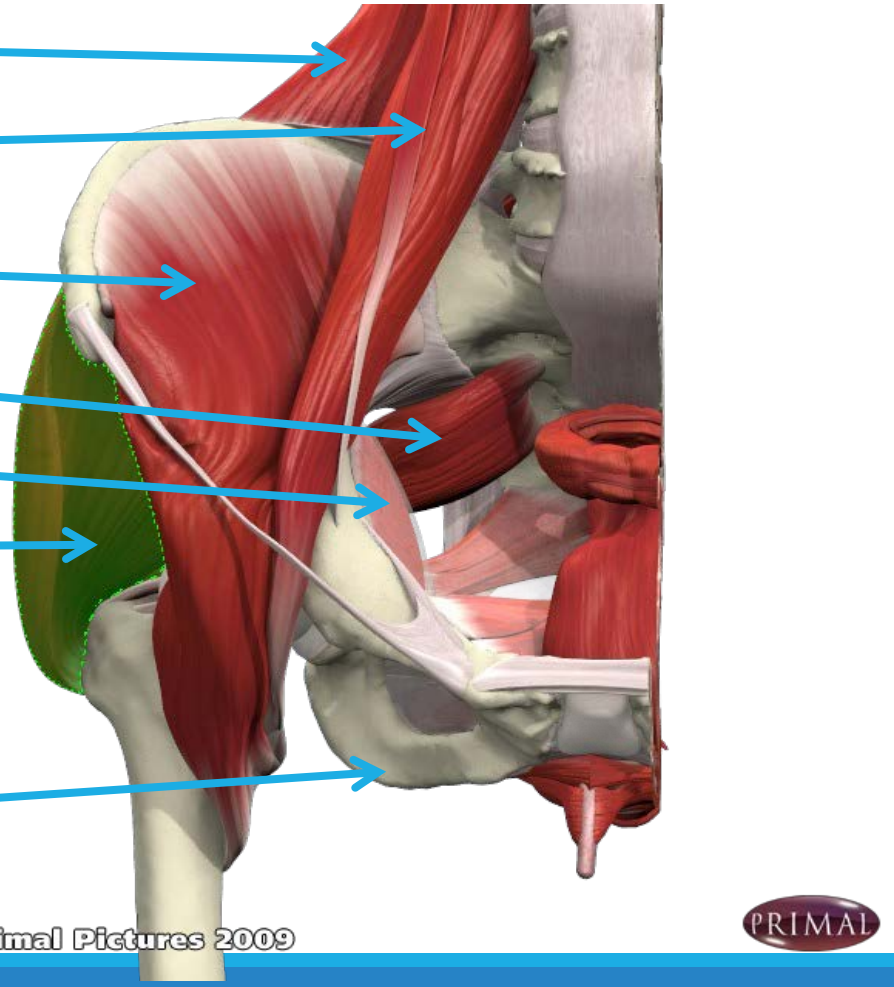
Pelvic Structure

- Ligaments create support structure
- Works in harmony with muscles to provide stability and mobility
- Fascia provides additional support
- Disruption of any of these creates weakness and imbalance
- 5 + joints



Pelvic Muscles

- Quadratus lumborum
- Psoas
- Iliacus
- Piriformis
- Obturator internus
- Gluteus medius
- Abdominals (transverse)
- Adductors



Piriformis, Iliopsoas, Gluteus Medius

- Piriformis
  - Origin: Sacrum- **anterior surface of S2 to S4.**
  - Insertion Femur: greater trochanter
  - Most easily palpated between sacrum and greater trochanter
  - *Sciatic nerve irritation*
- Iliopsoas
  - *Origin: Vertebrae **T12 to L5**:* bodies and intervening intervertebral discs, *Vertebrae **L1 to L5**: transverse processes*
  - Insertion: Femur- lesser trochanter.(conjoined tendon)
  - Most easily palpated at femoral triangle or just medial to ASIS
- Gluteus medius
  - Origin Hip bone: **ilium** (outer surface).
  - Insertion: Femur - **greater trochanter**.
  - Most easily palpated lateral buttock, below iliac crest

Obturator Internus, QL and Transverse Abdominis

- Transverse Abdominis
  - **Origin-inner surface of cartilages of lower 6 ribs, interdigitating with diaphragm**, anterior internal lip of IC, **thoracodorsal fascia**
  - Insertion- linea alba pubic crest.
  - Palpation – just medial to ASIS
- Obturator internus
  - Origin- **internal surface of the obturator membrane** and margin of the obturator foramen (fascia connected to capsule of hip)
  - Insertion- Medial surface of the **greater trochanter of femur**
  - Palpation- internally –laterally, externally medial to ischial tuberosity
- Quadratus Lumborum:
  - Origin- **Iliolumbar ligament, iliac crest** (lower lumbar transverse Processes.
  - Insertion- Inferior border of last rib and TP of upper **4 lumbar vertebrae.**
  - Palpation- just above IC, lateral trunk

The Impact of hip/pelvic musculature and fascia

- Pelvic/Hip muscles are directly and indirectly connected to the pelvic floor (origins/insertions)
- Pain/weakness/tightness/restrictions at pelvic floor create issues other pelvic muscles/fascia
- Mimic pain/symptoms of other conditions
- The “Core”-not what you think
- Gorniak and Conrad, “An anatomical and Functional Perspective of the Pelvic Floor and Urogenital Organ Support System”, JOWHPT, 2015
  - A thorough understanding of the anatomy, functions and regional interactions of the PF muscles, pelvic fascia and visceral support system should aid in the proper diagnosis, treatment and prevention of pelvic dysfunction and pain.

Hip Dysfunction

- Limitation at hip joint
  - Pain/avoidance of intercourse
  - Piriformis, iliopsoas, adductors, obturator internus, gluteals
  - Hip capsule tightness
  - Fascial fibers from obturator internus and obturator canal connected directly to hip capsule
  - Surgical consideration
  - Functional consideration-limitation in ADL-toileting

Hips Influence on Intercourse

- Tension/tightness at the obturator internus can create deep penetration pain with intercourse
  - Direct contact with the obturator internus and/or pelvic floor tightness secondary to the obturator's direct connection to the levator ani
  - Pain/avoidance of intercourse

The “Core”

- Unifies the pelvic structure
- Assess the patient as a whole
- 4 Basic structures
  - Back/buttock- gluteals, multifidus, iliopsoas, quadratus lumborum
  - Diaphragm – muscle fibers insert into lumbar spine, Posture stability, parapsympathetic
  - Abdominals- Transverse abdominis, guarding
  - Pelvic Floor: foundation
- Dynamic and fluid
  - Moving house
  - Assess in vertical (Peper et al 2015)

Alignment/Asymmetry

- Disruption in pelvic and sacral alignment: muscle/fascial/ligamentous imbalances
  - Consider ropes /pulley systems
- Asymmetry at the pelvis or pelvic floor can create overactive or underactive musculature
- Fascial disruption-chronic patterns
- Alignment issues can create stressors on our ligamentous structures – pain and/or entrapment of nerves
  - Pudendal nerve

Anatomy and Function: Putting it Together

- Various components of pelvic muscles functioned differently during respiration.
  - **ENTIRE CORE FUNCTIONS AS A UNIT** (Park et al, 2012)

- Findings suggest that the CNS differentially activates individual regions within complex spine muscles to control the three-dimensional forces applied to the spine.
  - **USING THE RIGHT MUSCLES AT THE RIGHT TIME** (Park, et al, 2014)

Pelvic/Motor Control Patterns: The Relationship

- Reports of **SUI were higher in women reporting CBP** than those without CBP. (Bush et al 2013)

- An association of **PGP and UI and UI and PFM weakness** (Fitzgerald et al 2012)

Coordinated Muscle Action

- Improvement in symptoms and QOL greatest with TA and PF combination treatment (Ptak et al 2017)

- Stability exercises with focus on Pelvic Floor Muscles improve both SUI and LBP (Gharderi 2016)

Importance of “The Whole”

- MSK disorders of pelvis may develop from disorders of spine, pelvic girdle and hip
- Clinicians consider and assess more than a single structure (Prather et al 2014)
- Disorders causing pain in the pelvic floor can be result of visceral and/or somatic sources (Prather et al 2009)
- In a sizable portion of pelvic pain patients, pain is caused by a MSK dysfunction (Lamvu et al 2018)

Pelvic Girdle Evaluation and Assessment Tools

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Components of a an exam

- Why is understanding this so important?
  - Communication, understanding of MSK, quick assessments to utilize in practice
- Subjective
  - Ask correct questions for MSK understanding
  - Past history- medical and condition specific
  - Functional limitations
- **MSK Assessment**

Subjective

- Thorough history
  - Development of condition/changes due to activities, movements and ADL
- Pain history-Injury and how did it occur.
  - What makes it worse, better
  - Pain levels , type of pain, location of pain
  - MSK origin
  - What can pt. do (or not do)?
- Comorbidities
  - Correlation with IBS, PBS, allergies, migraines (Wyman, et al, 2008)

Subjective continued

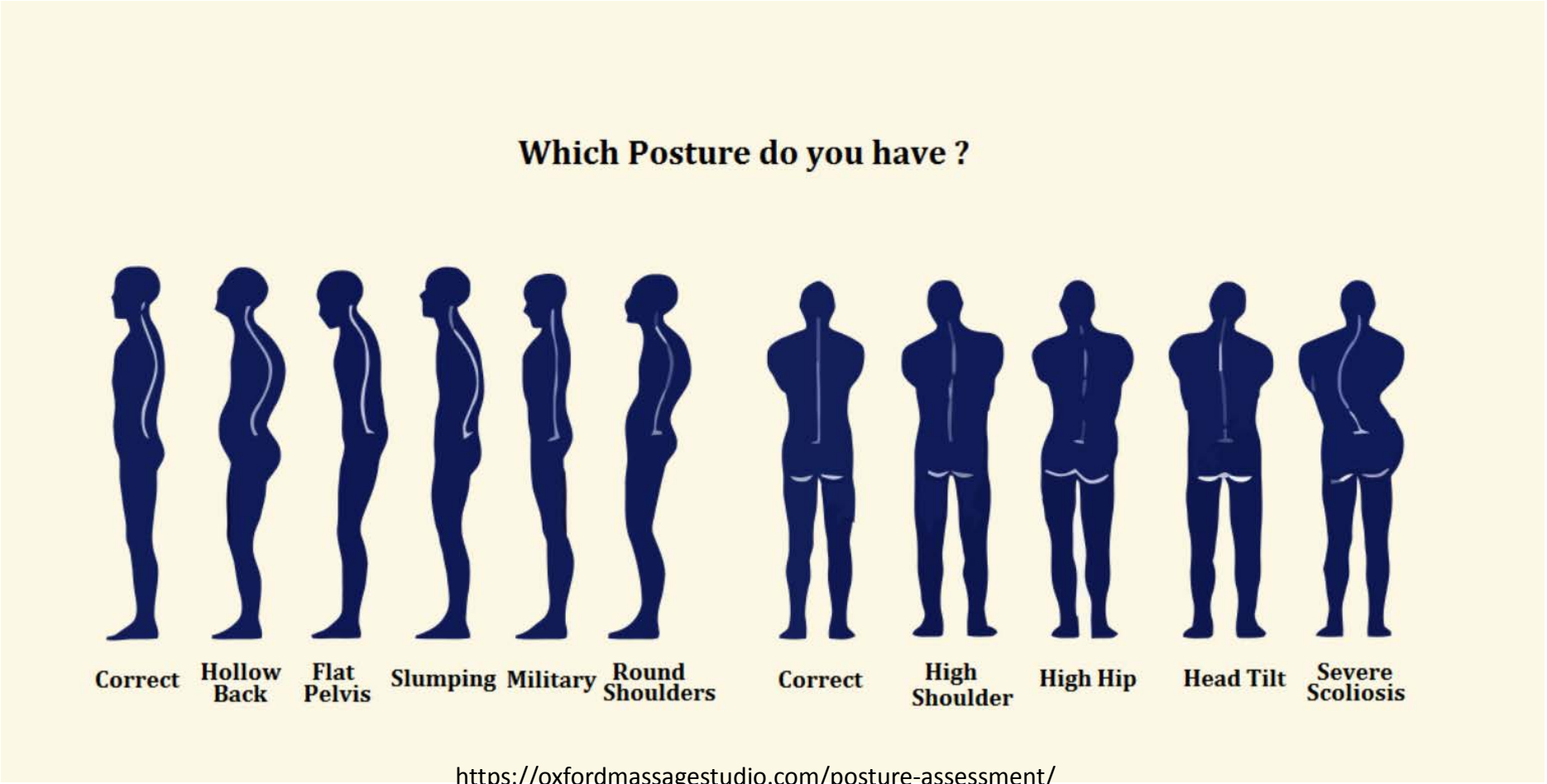
- Bladder conditions-regardless of whether bladder is primary
- Bowel conditions-regardless of whether bowel is primary
- Hormonal influence
- Sexual /physical abuse past or present
- Patient goals!! (Wyman, et al, 2008)

Basic external MSK Assessment

- Posture*
- Alignment*
- Gait*
- Lumbar and hip ROM*
- Sensation and reflexes (if needed)
- Breathing techniques
- Special tests for SI and/or hip*
- Palpation of lumbar, hips, core for:
  - Trigger points*
  - Fascial tension*
- Strength test* (Stacey et al 2012, Coady et al 2015)

*Will be discussed in more detail in the next session

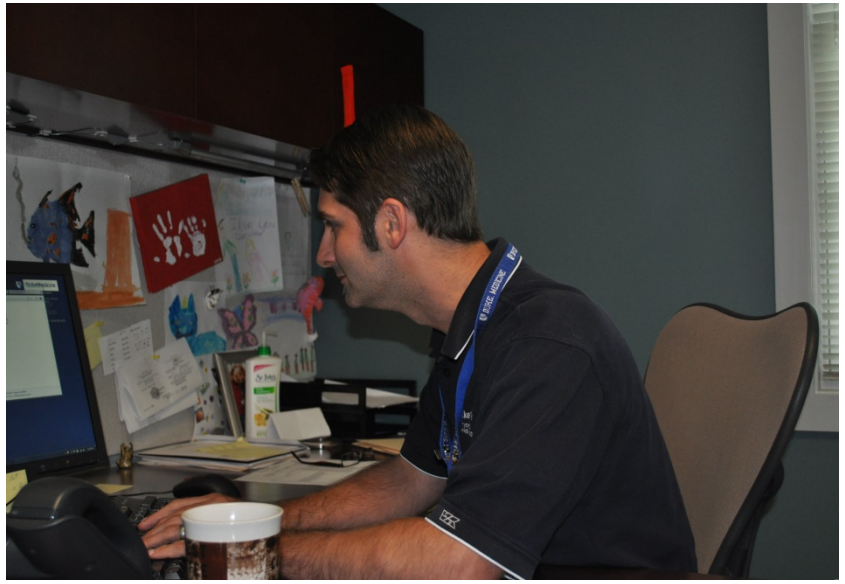
Postural assessment

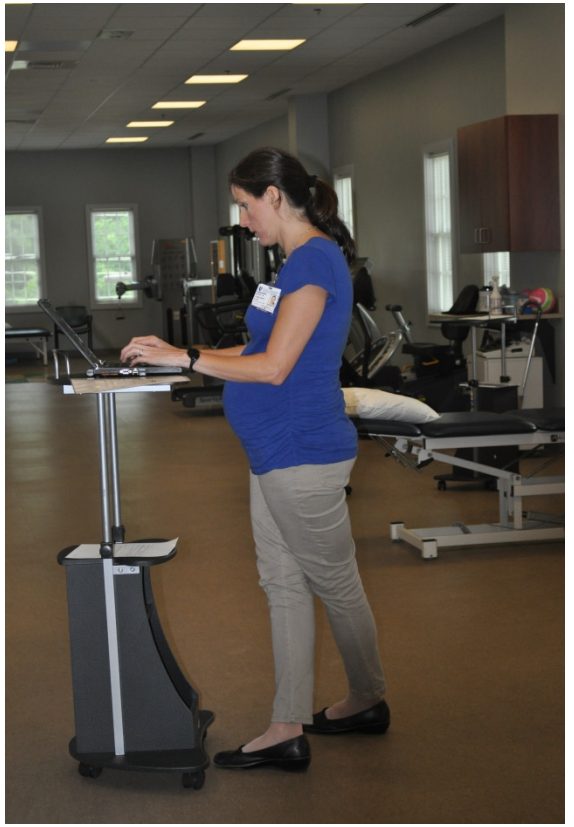


https://oxfordmassagestudio.com/posture-assessment/

Work related postures

Question: What do you do all day?

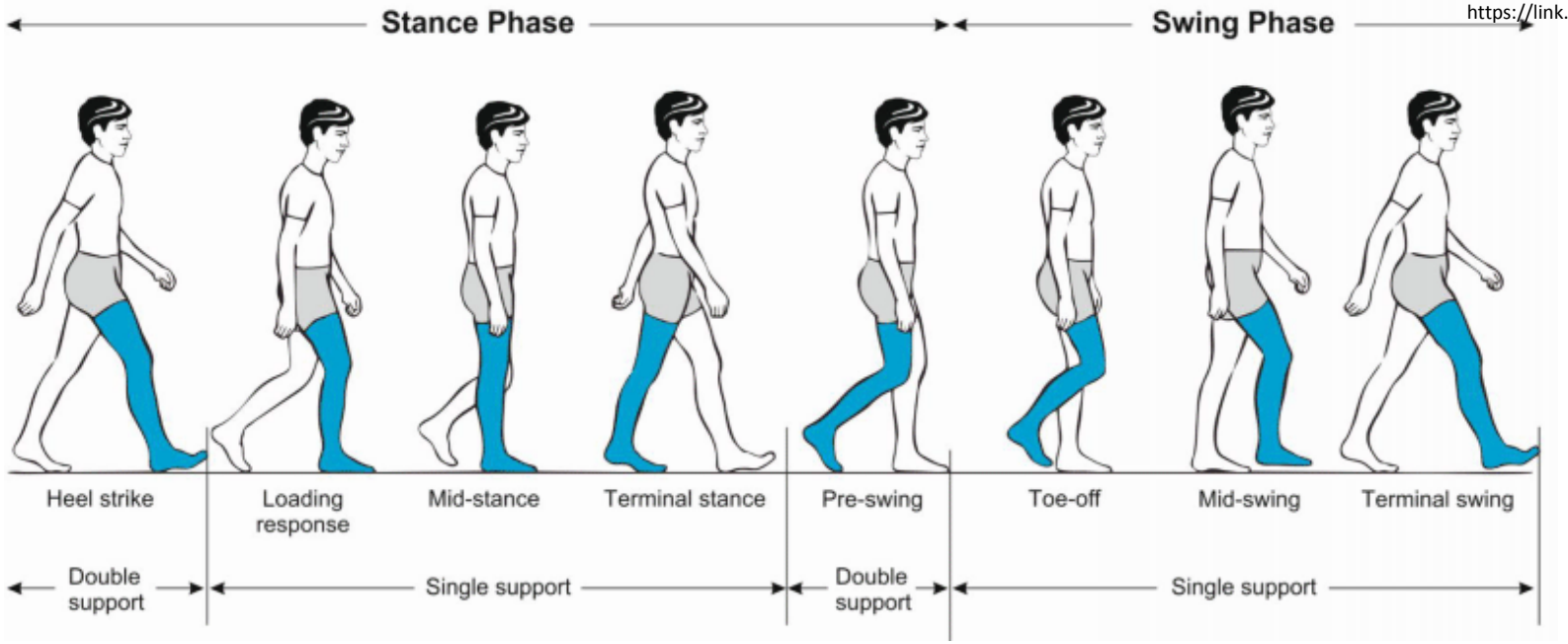




Alignment- what is the impact?

- Asymmetry from one side of the pelvis to the other creates imbalances in muscle length and strength
  - Shortened side cannot produce power that it needs, can get tight/fibrotic, which can become painful
  - Lengthened side cannot contract effectively, hyper stretched, weak, ineffective, which can become painful
- The cycle of pain and weakness continues without correction; can lead to chronic pain
- This can create symptoms at the PF and/or throughout the pelvis (Tu et al 2008)

Gait

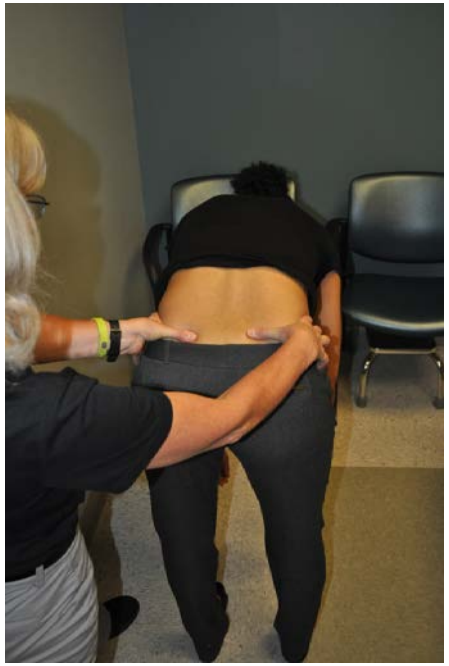


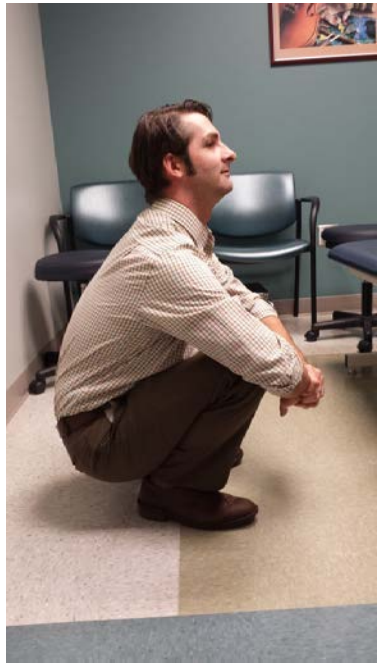
https://link.springer.com/article/10.1007/s00508-016-1096-4

- Deviations can include:
  - Decreased stance time
  - Decreased trunk rotation
  - Increased trunk lean
  - Increased or decreased lordosis
  - Knee hyperextension
  - Decreased knee &/or hip flexion
  - Hip &/or tibia rotation (toe in or out)
  - Hip and/or knee adduction
  - Decreased push off
  - Decreased dorsiflexion

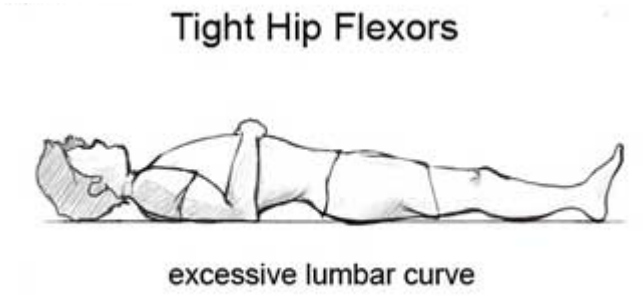
Lumbar ROM

- Implications: back pain, coccyx pain, Urinary incontinence, overall health
- Squatting –overall indicator of flexibility and health



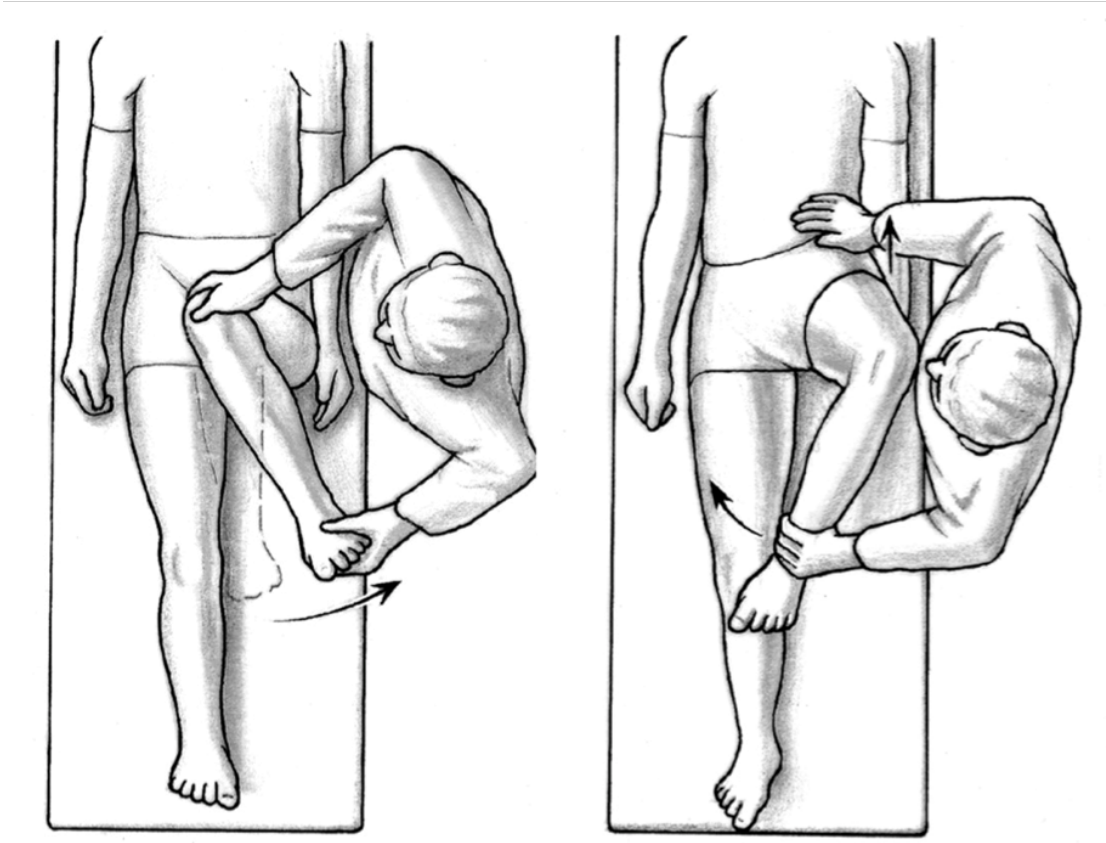


Hip ROM



https://lowbackpainprogram.com/tight-hip-flexors-and-back-pain/

https://www.pinterest.com/pin/247698048233518774/?lp=true



https://www.theptdc.com/planks-the-magic-sauce-to-fix-hip-tightness-increase-mobility

Breathing

- Normal breathing pattern
  - Exhalation -> the abdominal wall contracts / Inhalation -> the abdominal wall relaxes
    - This pattern is often absent in many clients who tend to lift their chest when they inhale and do not expand their abdomen or minimal movement in abdomen. (Peper 2016)
- Breathing pattern disorders automatically increase levels of anxiety and apprehension, which may be sufficient to alter motor control and to markedly influence balance control. (Leon 2004)
- Valsalva maneuver reflects an expiratory pattern with diaphragm and pelvic floor elevation (Talasz 2012)

Special tests

- Important to rule out impairments in surrounding joints – hip and SI
- Hip Special test for intra-articular impairments
  - FADIR
  - FABIR
  - SCOUR
- SI special test cluster (Laslett 2008)
  - Distraction
  - Compression
  - Thigh Thrust
  - Sacral Thrust
  - Gaenslen's

3 out of 5 tests must be positive in order to consider the SI joint as being the primary pain generator. Sensitivity 91% and Specificity 78%

Palpation - What are we looking for?

- Muscle tightness, trigger points, tension, restriction, pain, hypersensitivity
- External can be performed as a first line of assessment if the patient is unable or unwilling to undergo a pelvic floor assessment
- Trigger points and fascial restriction can refer pain and symptoms to viscera
- “Fight versus Flight” responses- upregulated/sympathetic system activated (Weiss 2003, Levine 1997, Gorniak 2016)

The Tricky Trigger Point

- Hyperirritable locus within a taut band of muscle
- TP can complicate assessments and diagnosis because they are so varied and occur far from the pain regions
- TP and muscle tension are often not noted on diagnostic testing
- Be careful of assuming that an issue does not exist if diagnostic testing doesn't demonstrate an issue
- Integrated system: diaphragmatic breathing (Peper, 2015)
  - ↑ Parasym ↓ Symp -reduced TP

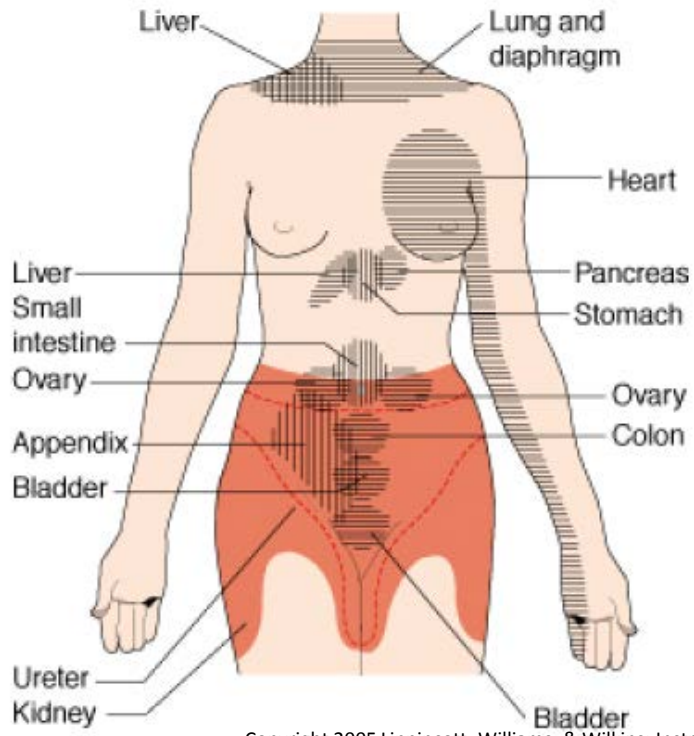
Examples of Trigger Point Referral Regions

- Iliopsoas- anterior hip, anterior thigh, LB, lower abdominal quadrant **"ovary pain"**
- Piriformis-buttock and posterior thigh
- Adductors- pain/irritation to bladder and groin

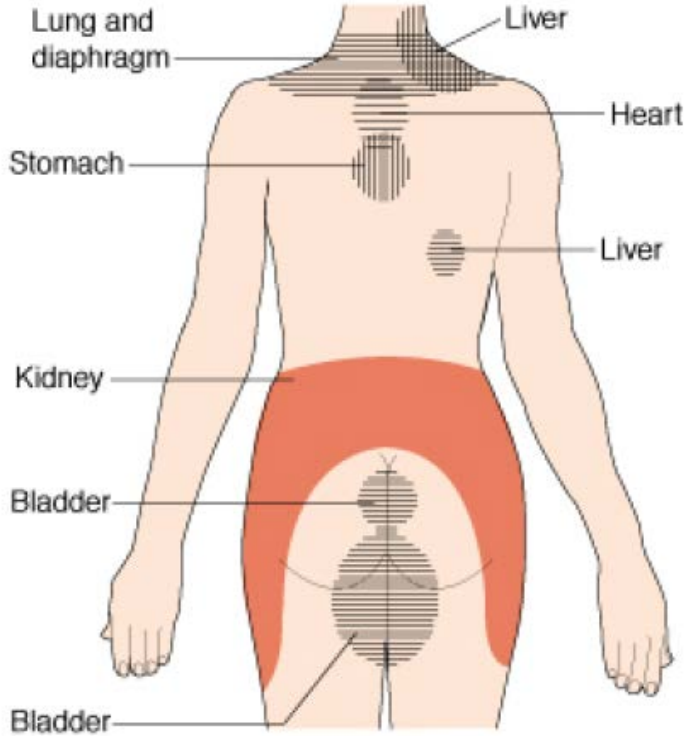
Simons and Travell 1999 and Weiss 2011

Visceral Convergence

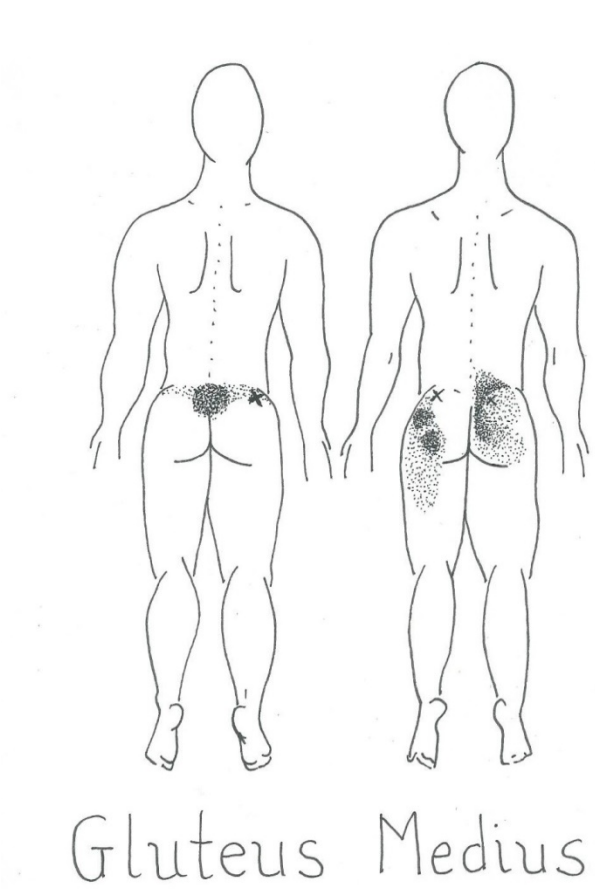
OVERACTIVE BLADDER RECEPTORS



UNEXPECTED SYMPTOMS



Trigger Points



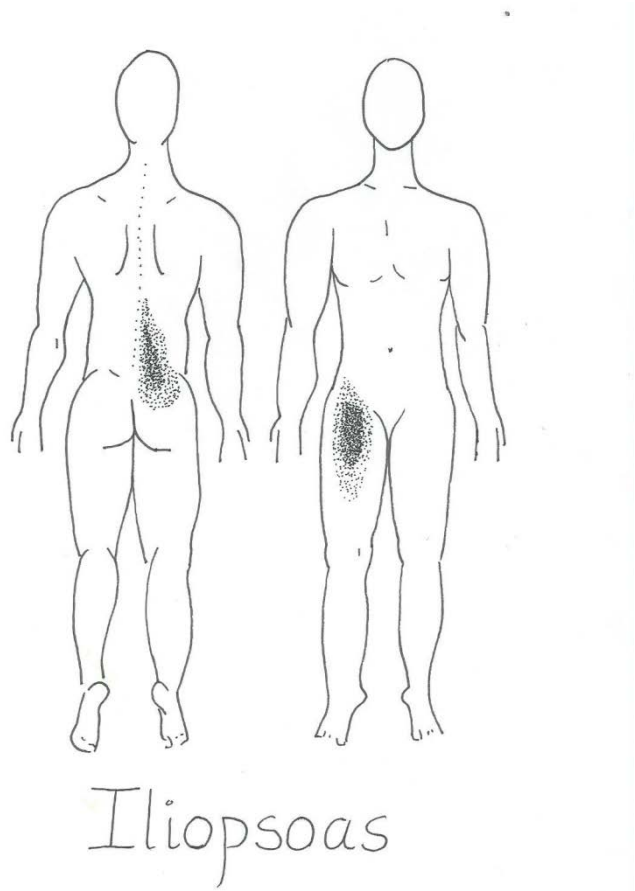
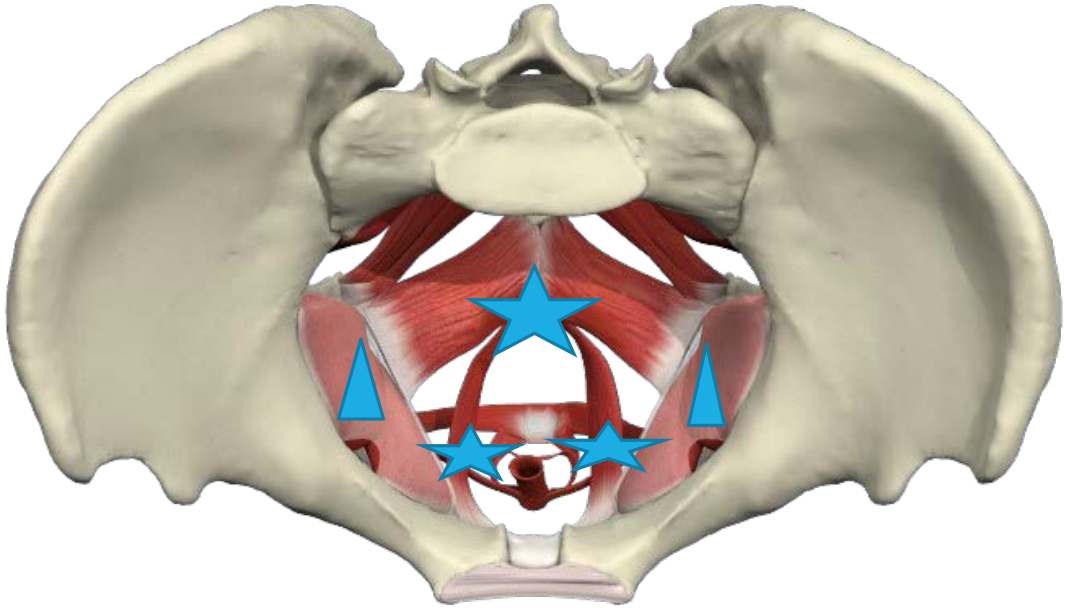


Illustration: Ingrid Harm-Ernandes

Reproduction symptoms

- Trigger points can reproduce symptoms
  - Puborectalis ★
    - Urgency/bladder pain
  - Obturator internus ▲
    - Pain during intercourse



PRIMAL

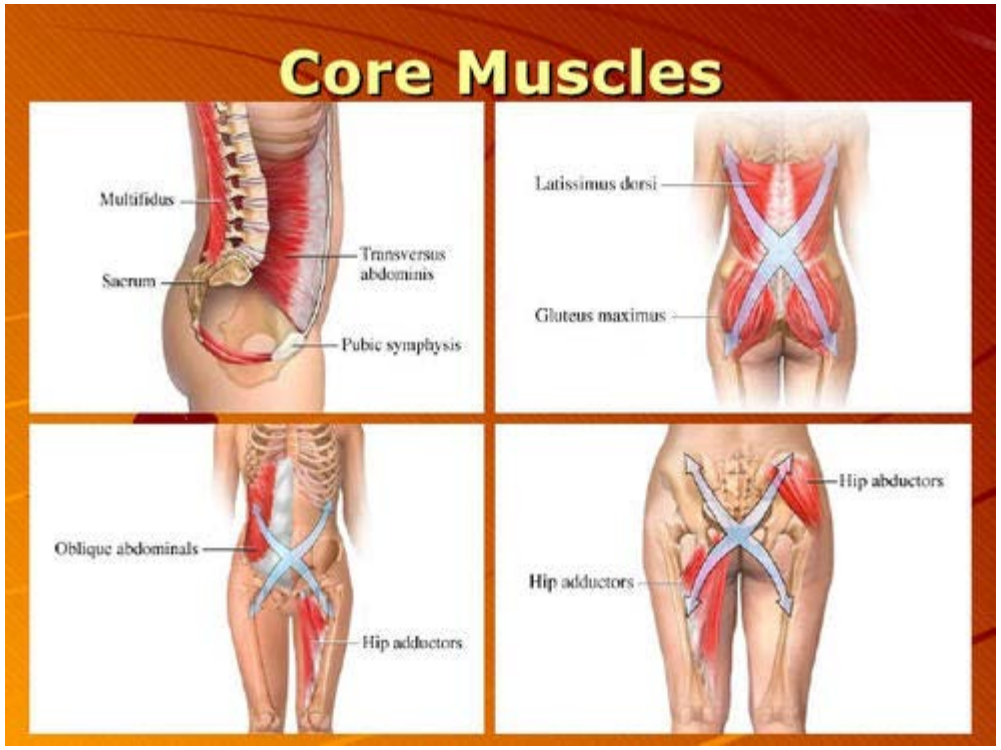
Fascial Tension

URACHUS LIGAMENT

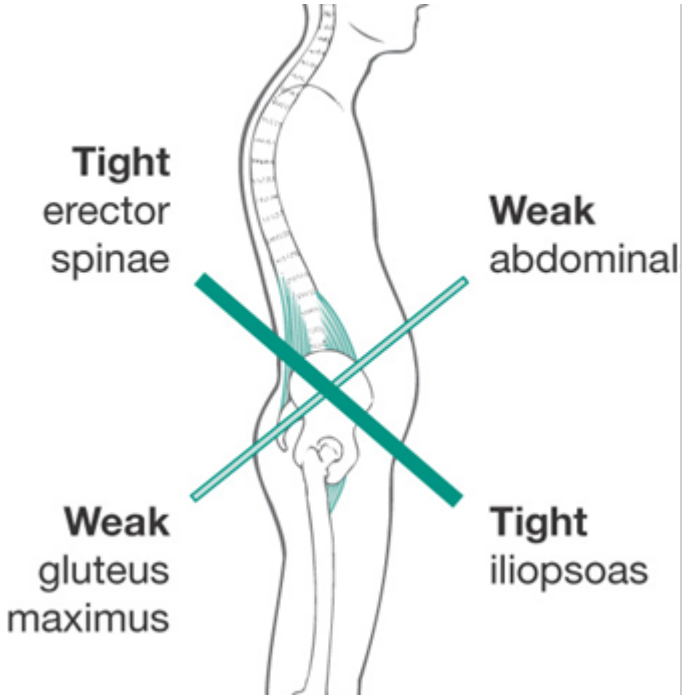
BLADDER FASCIA

Strength testing

- Core related
- Transverse Abdominis-isolation, quality
- Gluteus Medius
- Multifidus
- Diastasis Recti presence
- Motor control (Lee 2011, Irion 2010)
  - Functional ability
  - Coordinating muscle action
  - Instruction in coordination of muscle action
  - Improvement in alignment allows improved muscle function



How it is all connected…



https://www.runtothefinish.com/exercises-to-correct-tight-hip-flexors/

Developing Plan of Care

- Based on many factors
  - Pelvic floor and/or pelvic girdle driven (reason for referral)
  - Patient tolerance
  - Abuse history
  - May start with internal and address pelvic girdle during next visit
  - Functional movement patterns
  - Patient goals
  - Reassessment on regular bases
  - Treatment and goals altered with progression

Live Model Pelvic Girdle Exam

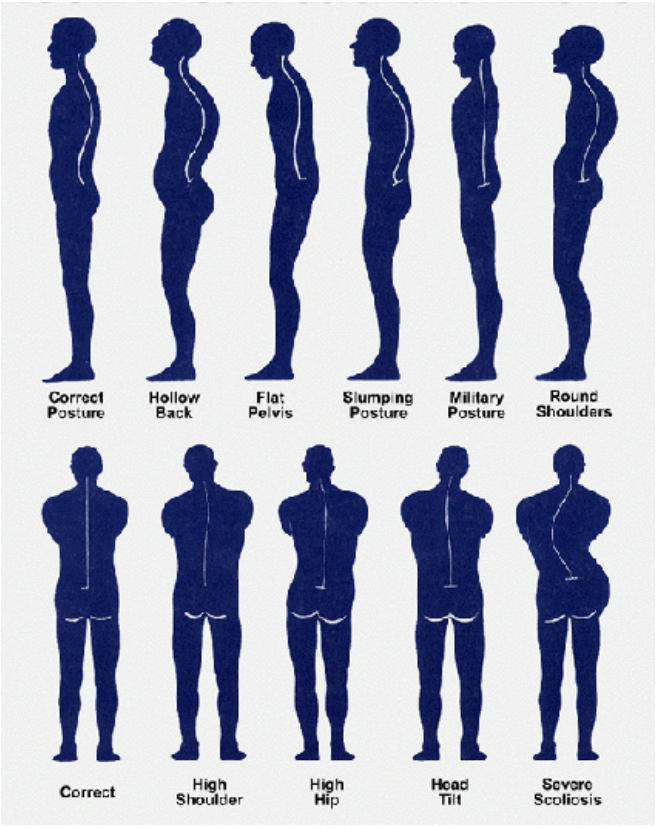
VALERIE BOYLE, PT, DPT, OCS

Basic Assessment Skills

- Posture/alignment
- Gait
- Hip ROM
- SI joint tests
- Trigger points
- Fascial tension
- Strength test

Postural assessment

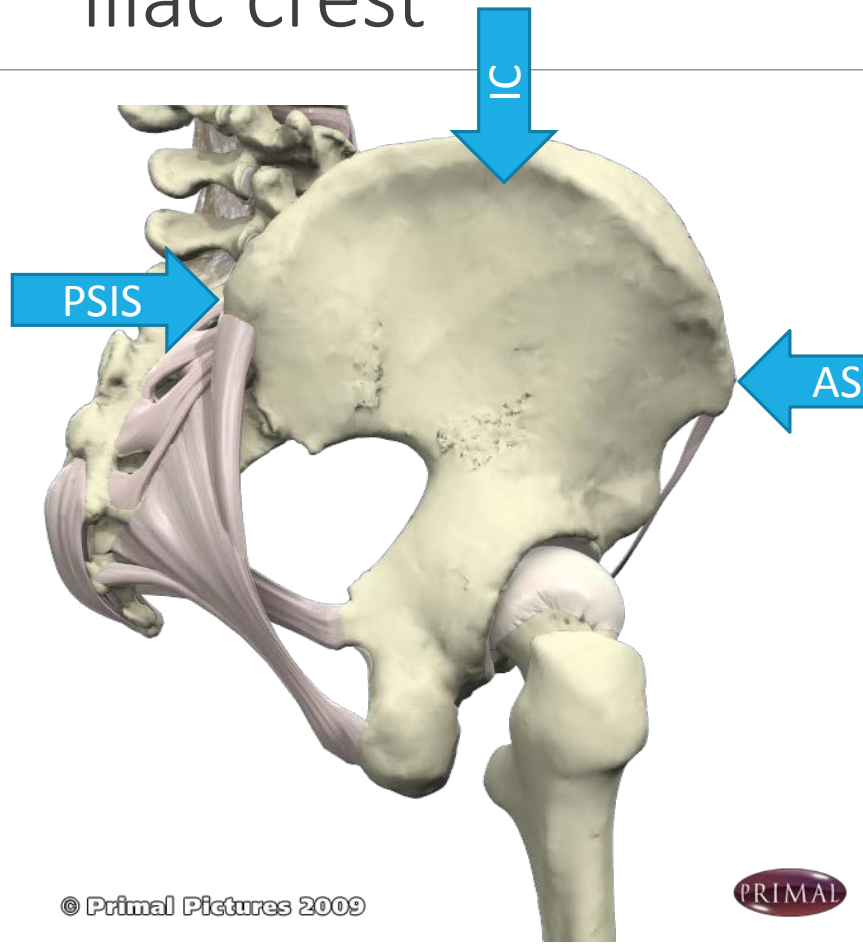
- Anterior view
  - Iliac crest level
  - Shoulder height (dominant should be slightly lower than non-dominant)
  - Pain posture
- Side view
  - Abdominals, supportive or restricted
  - Flattened or increased lumbar curve
  - Forward head
  - Rounded shoulders
- Posterior view
  - Iliac crest level
  - Scoliotic curve



https://www.massagetherapyreference.com/postural-assessment/

Alignment: locating landmarks

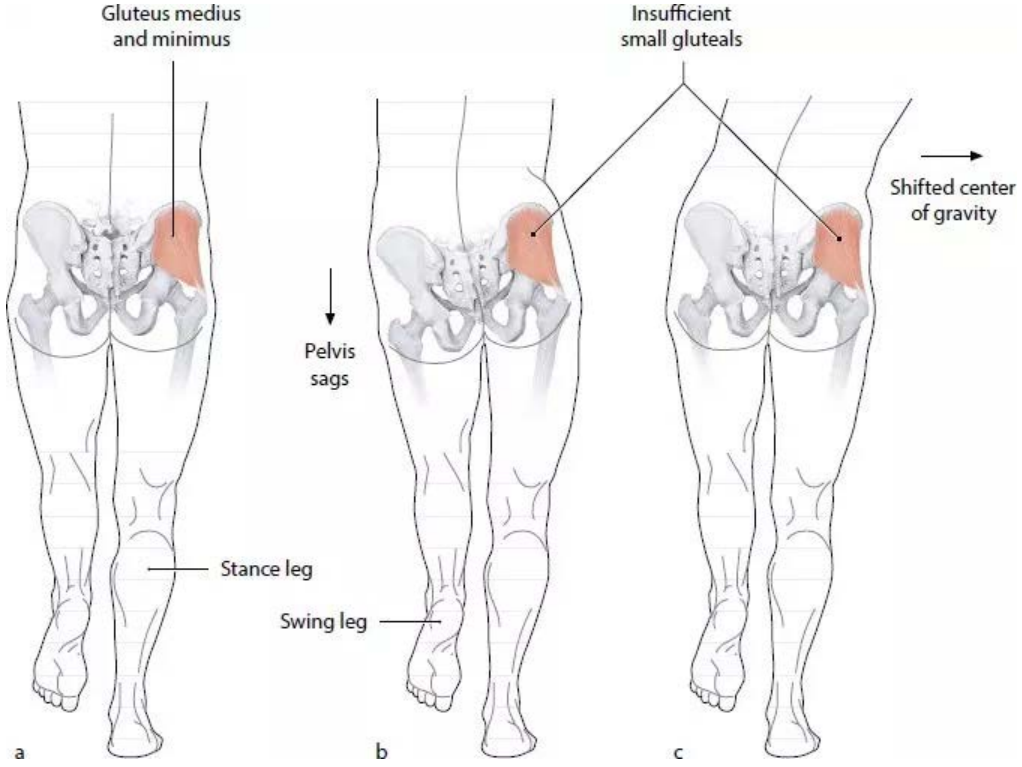
iliac crest



- Iliac Crest (IC) - high point of ilium
- Posterior superior iliac spine (PSIS) - around the dimple area
- Anterior superior iliac spine (ASIS) - prominent bony landmark anteriorly
- Always compare Right to left

Gait

- Observe the patient when walking in or out if possible
- Deviations to look for:
  - Antalgic gait
  - Foot rotation inward or outward
  - Hip weakness – Trendelenburg that can be compensated or uncompensated.

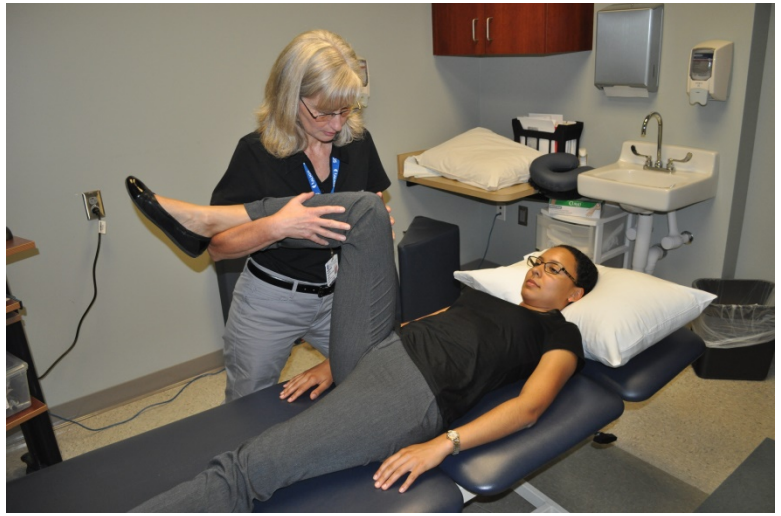


https://musculoskeletalkey.com/amputations-and-rehabilitation/

Hip ROM

Internal Rotation

(Obturator internus)

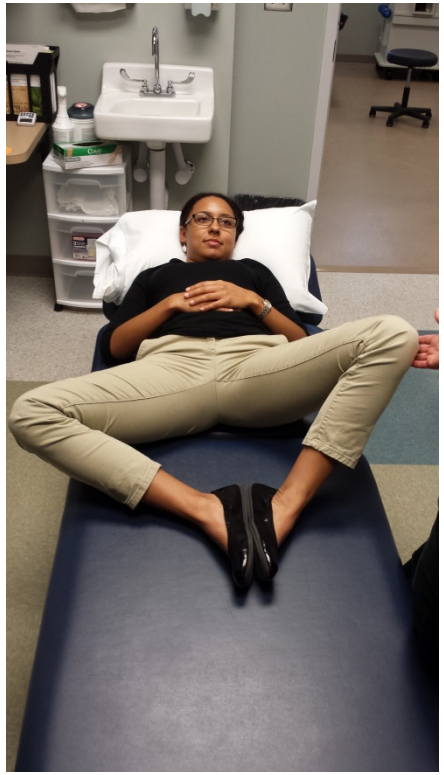


External Rotation

Hip ROM

Hip Flexion

Hip Abduction/External Rotation



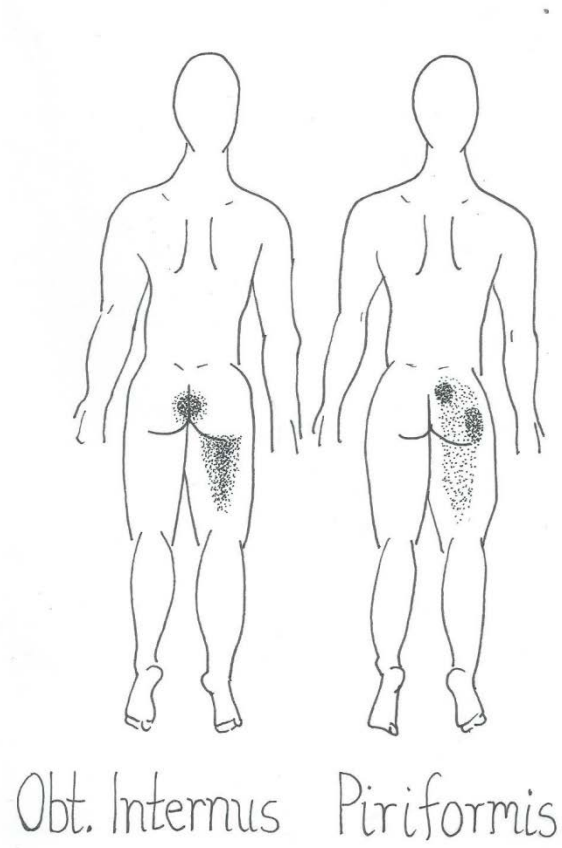
Hip Special Tests

Test	Description
FABER	Pt supine, the leg is placed in a figure-4 position (hip flexed and abducted with the lateral ankle resting on the contralateral thigh proximal to the knee. While stabilizing the opposite side of the pelvis at the anterior superior iliac spine, an external rotation, abduction and posterior force is then lightly applied to the ipsilateral knee until the end range of motion is achieved.
FADIR	Pt supine, examiner raises one leg with hip flexed to 90 degrees and knee flexed to 90 degrees Examiner adducts and internally rotates the hip (foot and ankle rotated away from midline), then straightens the leg.
Scour	Pt supine, the therapist stands on the side of the leg to be tested. The affected limb is placed in adduction and a compression force is applied and maintained through the femur through a range of 70-140 degrees of hip flexion. The test is repeated in abduction.

SI Special Tests

Test	Description
Distraction	Pt supine, examiner applies posterolateral directed pressure to bilateral ASIS.
Compression	Pt sidelying, examiner compresses pelvis with pressure applied over the iliac crest directed at the opposite iliac crest.
Thigh Thrust	Pt supine, examiner places hip in 90 deg flexion and adduction. Examiner then applies posteriorly directed force through the femur at varying angles of abduction/adduction.
Sacral Thrust	Pt prone, examiner delivers an anteriorly directed thrust over the sacrum.
Gaenslen's	Pt supine with both legs extended. The test leg is passively brought into full knee flexion, while the opposite hip remains in extension. Overpressure is then applied to the flexed extremity.
Active Straight Leg Raise test	Pt supine with both legs extended. Ask the patient to lift one leg up 20 cm, can also apply compression and distraction.

Trigger Points



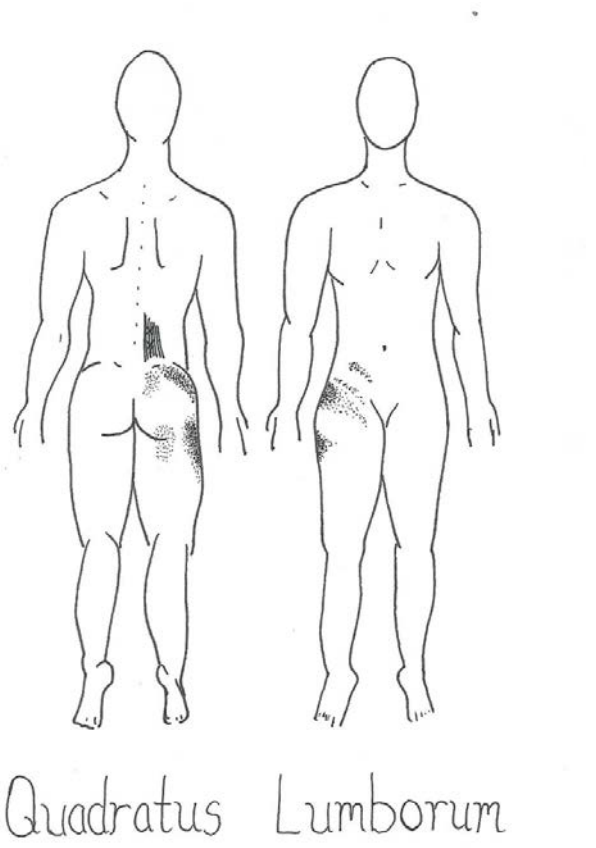
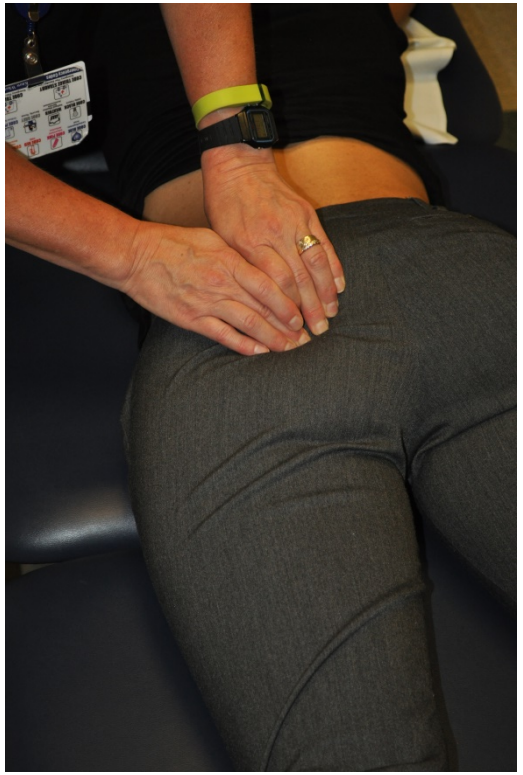


Illustration: Ingrid Harm-Ernandes

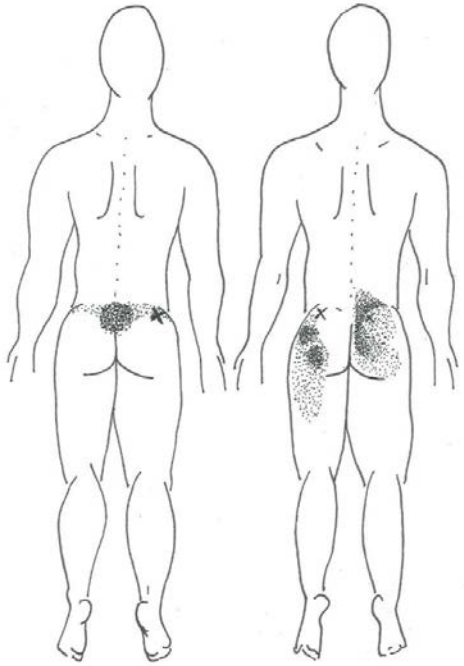
Palpation of QL and Piriformis

Piriformis

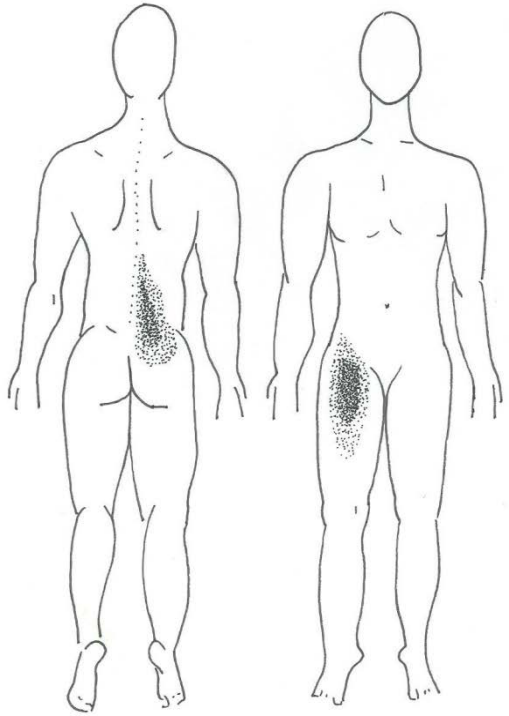


Quadratus Lumborum

Trigger Points



Gluteus Medius

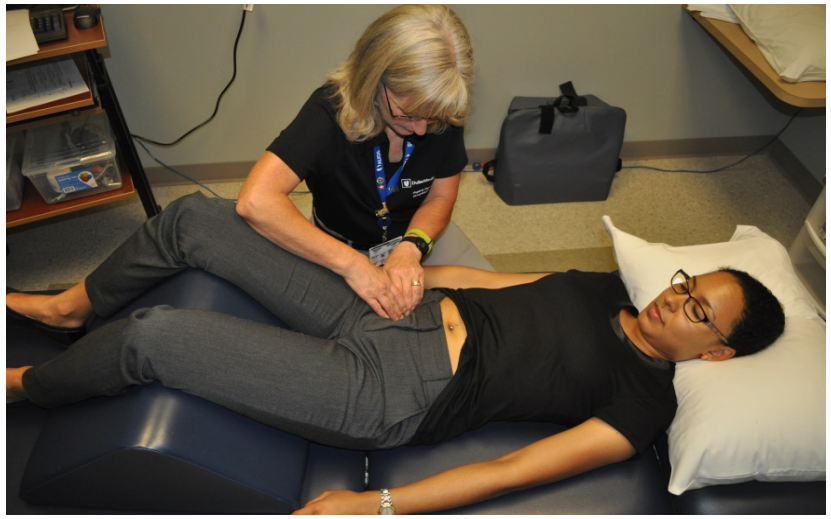


Iliopsoas

Illustration: Ingrid Harm-Ernandes

Palpation of Iliopsoas

Iliacus

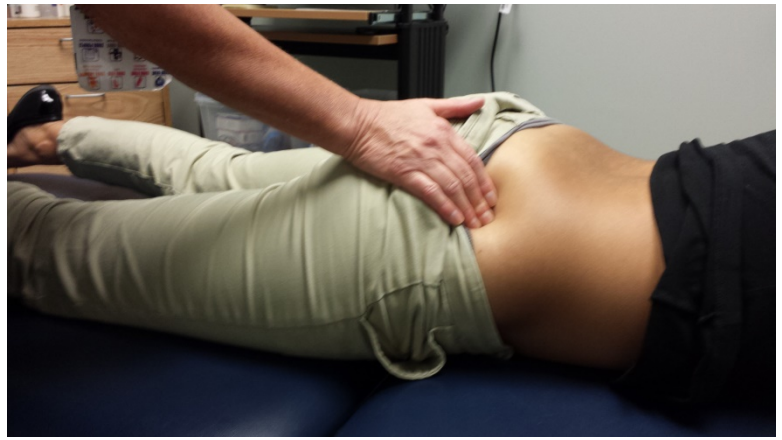


Iliopsoas tendon

Palpation of Gluteus

Mid- muscle belly

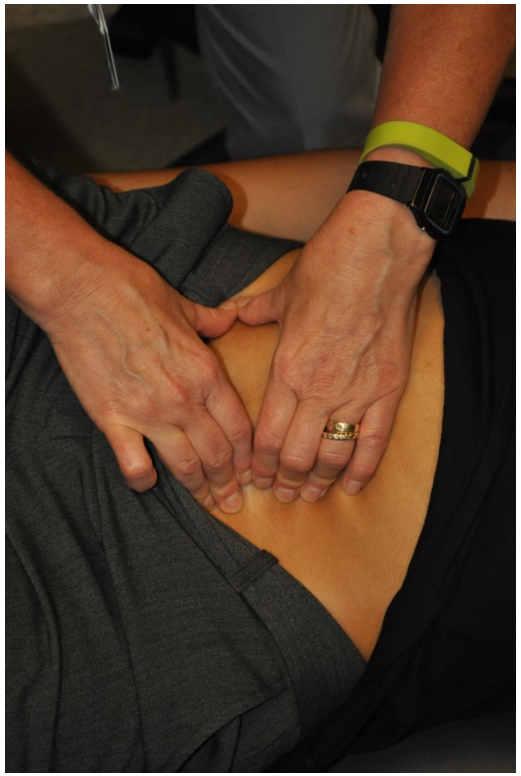
Lateral – musculotendinous junction



Fascial tension abdominally

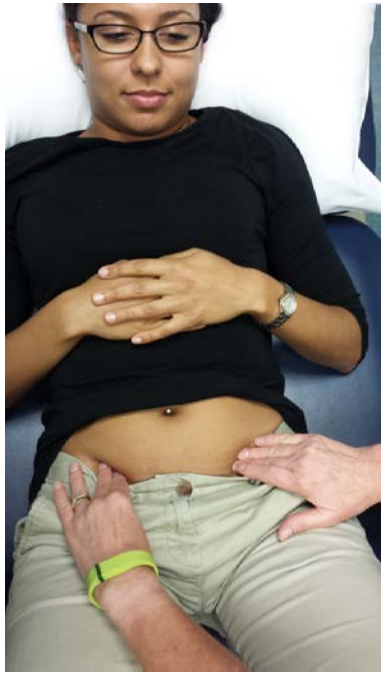
Urachus tension

Abdominal/Bladder fascial tension



Strength/function tests

Transverse abdominis



Engage deep core muscle without movement and normal breathing

Gluteus medius

Sidelying with top leg lifted into abduction and extension

Evaluation skills for Internal Vaginal Assessment

INGRID HARM- ERNANDES, PT, WCS, BCB-PMD

Pelvic Physical Therapy Assessment

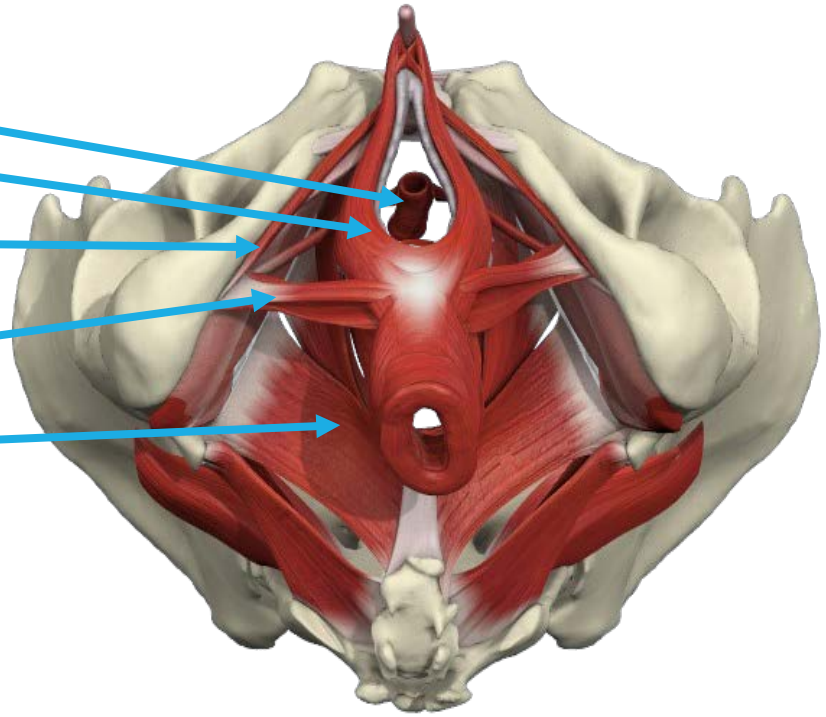
- Anatomy of pelvic floor
- PT Evaluation
- Internal exam – PT and for all practitioners
- Terminology and Communication

3 Muscular Layers of Pelvic Floor

- **First layer- Superficial Perineal layer**
  - “Guardian of the vaginal opening”
  - Lichen groups, vulvodynia, intercourse
- **Second layer- urogenital diaphragm**
  - Voiding dysfunction- intercourse
- **Third layer- Pelvic diaphragm**
  - Supportive-prolapse
  - Intercourse
  - 70 % of slow twitch fiber/ 30 % quick twitch

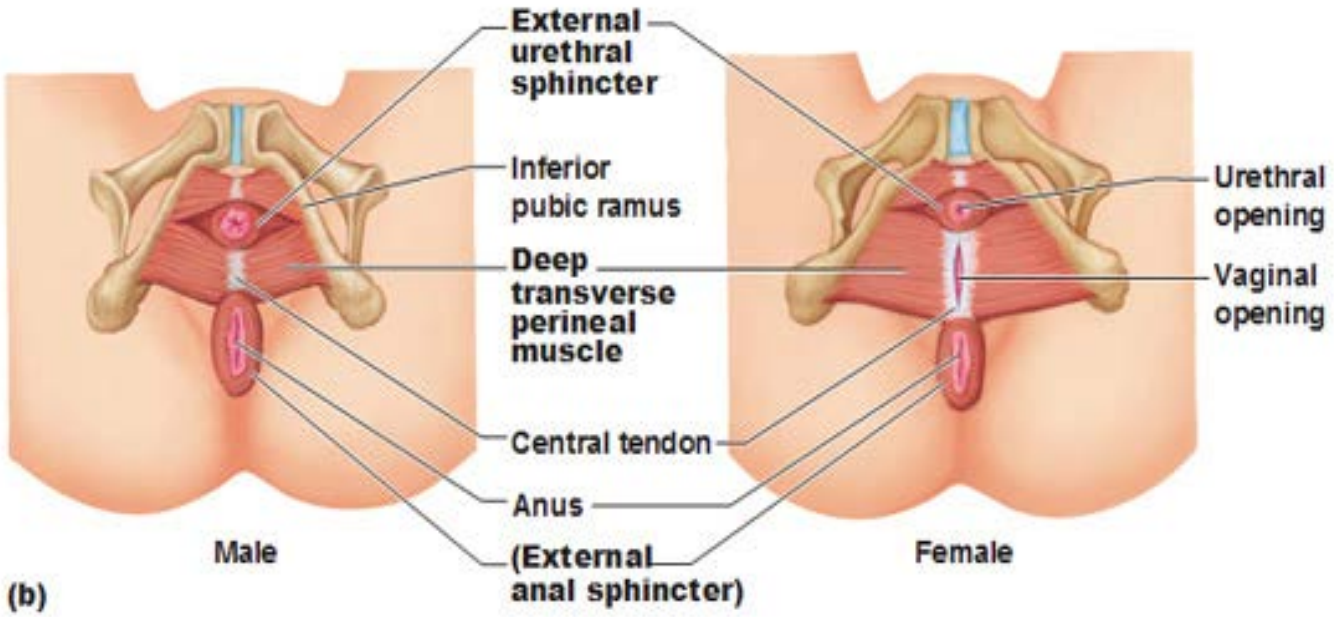
External Pelvic Floor View- Superficial Layer: 1st layer

- Introitus
- Bulbospongiosus
- Ischiocavernosus
- Superficial Transverse perineal
- Levator ani



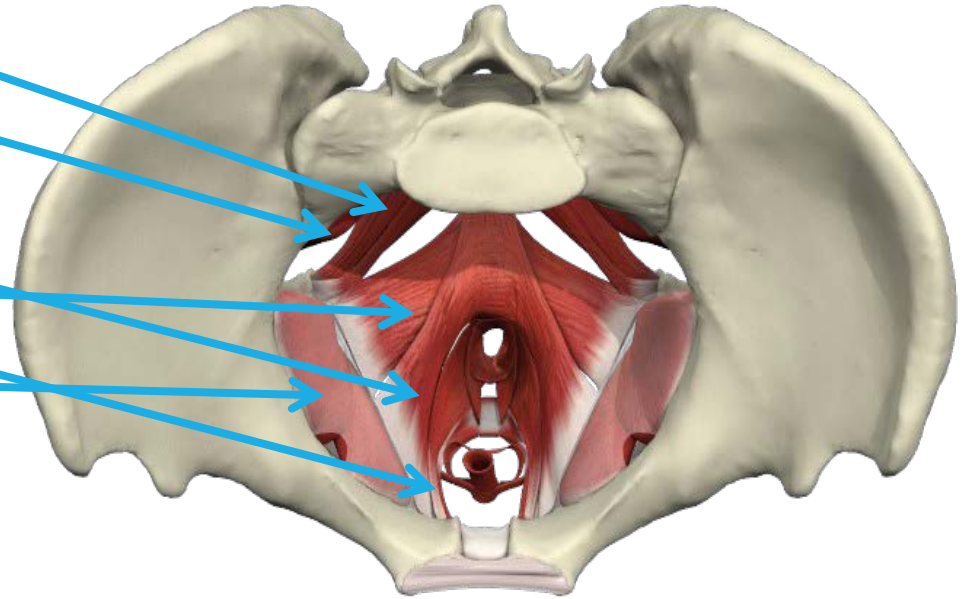
Second Layer

The Urogenital Diaphragm = the middle muscle layer



Internal Pelvic Floor View Third Layer

- Coccygeus
- Piriformis*
- Levator ani
  - Pubococcygeus
  - Puborectalis
  - Iliococcygeus
- Obturator internus (fascia)*
- Patient visual: ”sling or bowl”
- Model in clinic

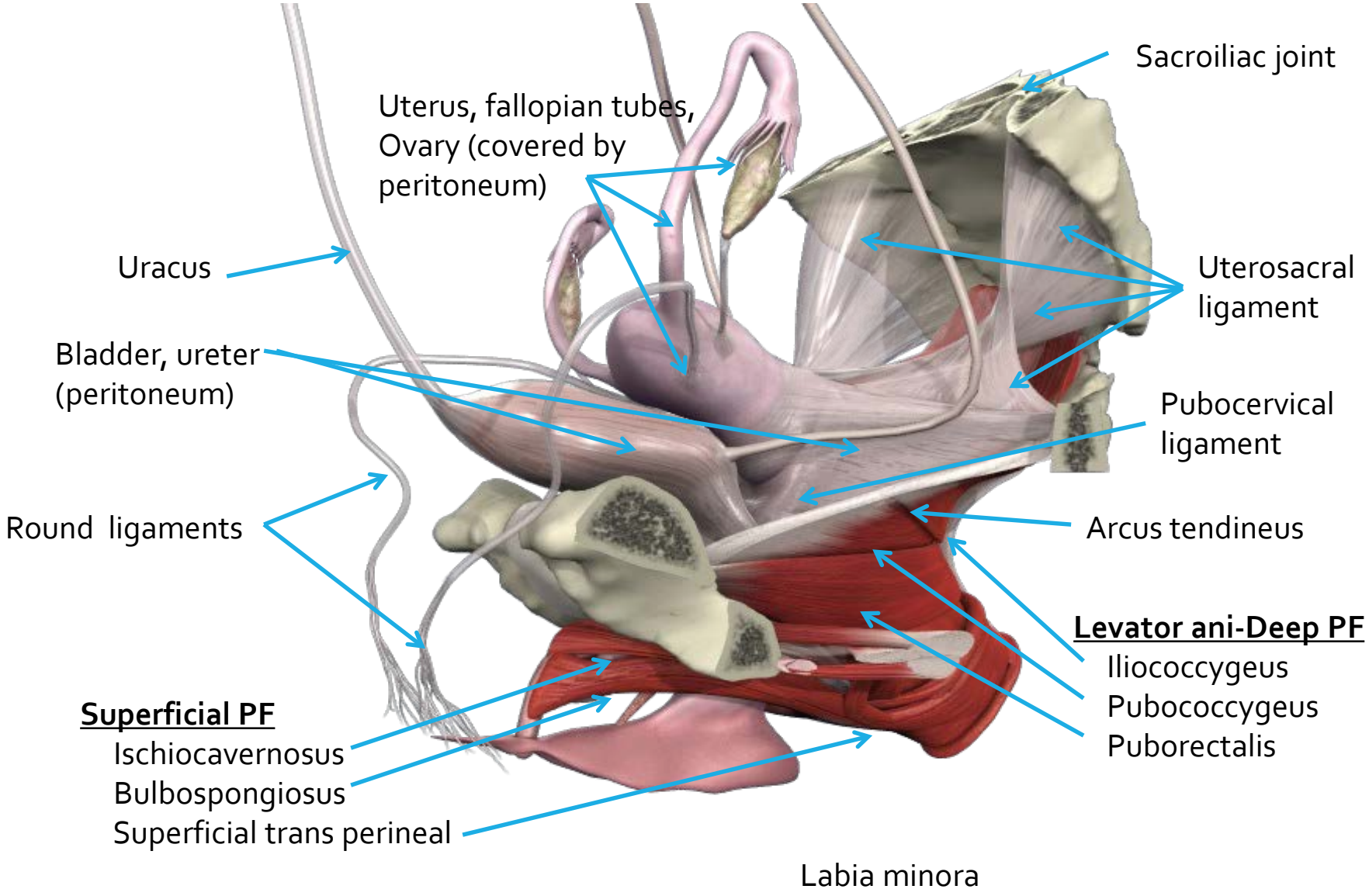


Myofascial System

- An appearance similar to a spider's web
- One continues structure
- All structures throughout the body
  - Ligaments
  - Organs
  - Nerves
  - Muscles
- Entrapment of structures in fascial tissues
- Contractile properties
- Does not show up on common diagnostic tests
- Trauma, inflammatory responses, and/or surgical procedures create Myofascial restrictions
  - www.myofascialrelease.com

Emotions- Neuro Input

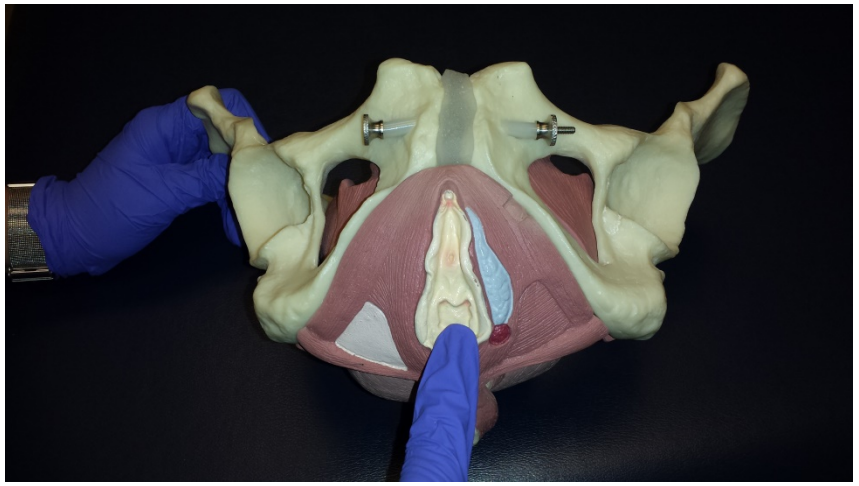
- Body not separate from the brain
- Convergence of afferent signals, crosstalk (Gorniak et al, 2016)
- Emotional experience
  - Pasts experience
  - Beliefs
  - Fear
  - Attitude
- **Physical Therapist:**
  - Look at the person as a whole
  - Assess brain/organ/MSK- combined impact
  - Function is key

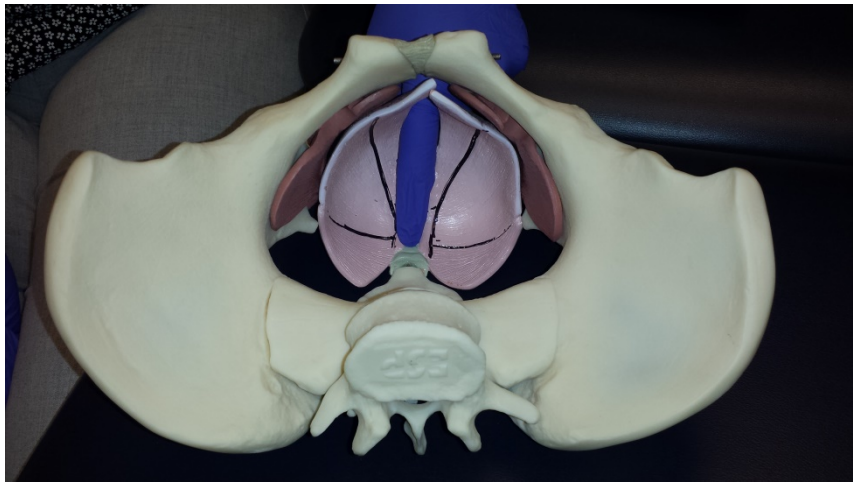


Pelvic Floor Evaluation (what can I tell my patient)

- Educate pt regarding PF anatomy with 3D model
- Proceed with one (or two) gloved finger
- We do not use speculums
- Assess skin integrity
- External trigger points
- Internal Trigger points
- Muscle strength/endurance and ability to relax
- PERFECT Scale
- Accurate PF exercise prescription

Pelvic Floor 3 D Model
Describe condition/symptoms/exam



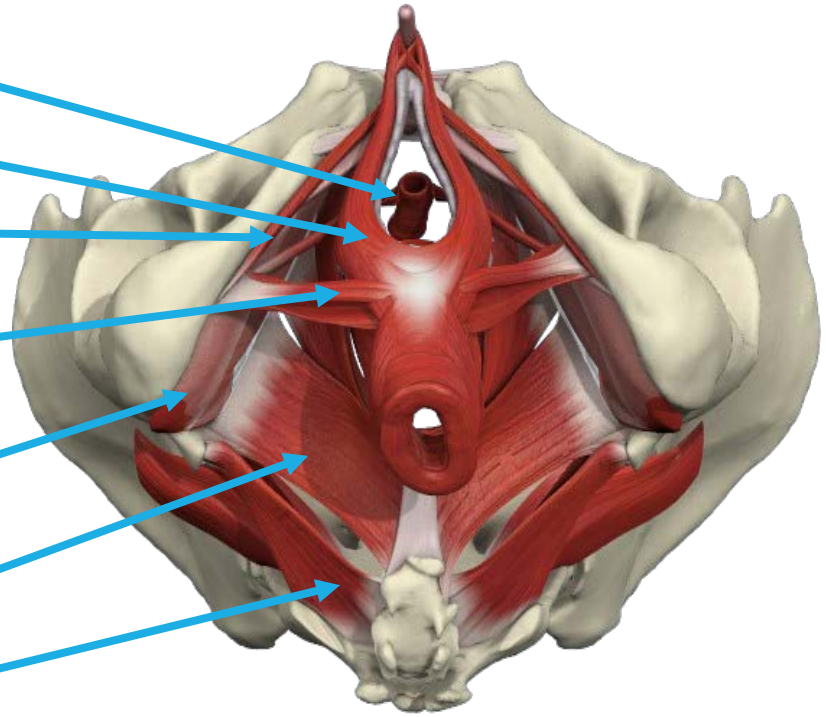


Clock Method

- Method for locating and documenting and describing areas of concern
- Can be utilized to instruct patient in self help techniques
- 12 o’clock - anteriorly at the pubic symphysis and 6 o’clock at the coccyx
- 3 and 9 o’clock STP
- Detailed description in “Palpation and Assessment of the Pelvic Floor Muscles Using Depth and Positional Measurements” Beth Shelly and Ann Dunbar, Journal Section of WH, April 2004

External Pelvic Floor View- What is the relationship to symptoms?

- Introitus tenderness
- Bulbospongiosus- guardian
- Ischiocavernosus- intercourse
- Superficial Transverse perineal
- Obturator internus - hip pain
- Levator ani-supportive
- Coccygeus-stress



PRIMAL

What Occurs in a PT PF Exam

- Pelvic floor assessment
  - Gentle pressure at introitus (tissue/muscle)-why?
  - Strength, endurance, repetition, quick response
  - Ability to relax
  - Palpation for trigger points/pain/restriction
- Fascial assessment
  - Restrictions, pain generators
- Relate symptoms to functional limitations
- Decide upon further MSK assessment

Pelvic Floor Assessment

- PERFECT is an acronym with
  - P = power (0-5)
  - E = endurance
  - R = repetitions
  - F = fast contractions
  - ECT = every contraction timed
- Assesses strength, endurance and quick response
- Not included-relaxation
- Slow Twitch /Quick Twitch fibers
- Rectal exam can be performed- control of IAS and EAS
- Specific prescription for PF exercises!

Pelvic Floor Assessment Continued

- Trigger points
  - A “knot” in taught band of muscle that produces local or referred pain. (Moldwin et al, 2013)
  - Palpation gentle and direct to each muscle group
    - EX: Puborectalis -urgency and pain
    - EX: Obturator internus-intercourse pain or hip pain
- Fascial restriction
  - Palpation gentle and over regions of fascia
    - EX: Periurethral - reproduces urgency and pain in the urethral, lower abdominal and pelvic floor regions
    - EX: Obturator canal- pain to lower abdominal region , hip, groin regions

Examples of Internal Trigger Point Referral Regions

- Levator Ani - vaginal, vulvar, and **buttock** regions
- Obturator internus- **rectal, “golf ball”, posterior thigh and hips**
- Puborectalis- **urgency symptoms**, bladder and suprapubic regions
- Coccygeus- coccyx, buttock, **LB pain**

Referral Patterns for Internal Muscles

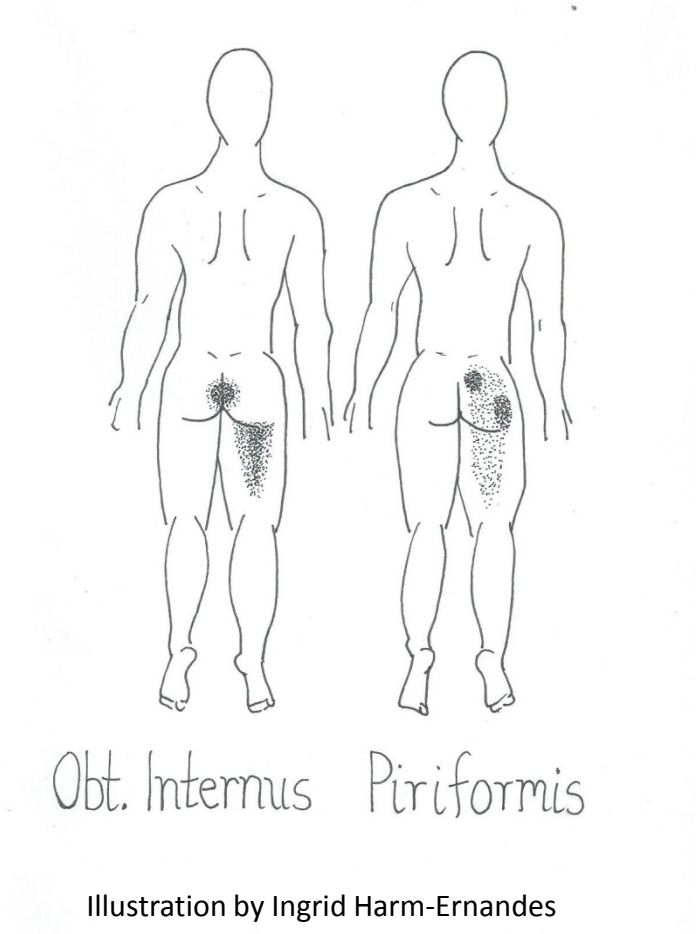


Illustration by Ingrid Harm-Ernandes

Terminology

- Underactive Pelvic Floor
  - AKA: low tone, hypotonic, relaxed…..
  - Typically UI, FI, prolapse……but can be pain/pressure
- Overactive Pelvic Floor
  - AKA: hypertonic, tight, increased tone….
  - Typically pain patients, constipation……but UI, FI as well
  - PF pain/trigger points referred outward
  - Not just pain ……..weakness
  - Consider the entire core and more

Overactive/Hypertonic Pelvic Floor (What is it?)

- May involve persistent contraction of pelvic floor muscles
- Central sensitization -Pain impulses amplified (Pelletier et al 2015)
- Hypertonic musculature can be the primary issue or can arise from other insults (Montenegro 2008)
- Hypertonic pelvic floor musculature often presents with more than one co-morbidity (IBS, PBS, CPP) (Fall et al 2009)
- Can have UI/FI too! Majority of pt. with urgency/freq. have tight PF (Adams et al 2015)

How does this present?

- Complaints of pelvic, pelvic floor, abdominal, back, buttock pain
- Chronic pain cycles
- Co-morbidities: migraines, fibromyalgia, allergies, IBS, dyspareunia, UI
- LBP, SIJ pain – little or no improvement in symptoms with PT
- History of birthing issues, surgeries , abdominal/pelvic adhesions
- History of sexual/physical abuse
- UI/FI

Underactive/Hypotonic Floor (What is it?)

- Visual assessment- PF can lie at IT or below
- Palpation- decreased muscle bulk but trigger points can occur
- PF strength assessment- lower strength test, lower endurance and coordination
- Difficulty “finding pelvic floor”- proprioceptive difficulty
- Sarcomeres

How does this present?

- Complaints of UI/FI
- Complaints of prolapse- pressure /bulging
- Core weakness
- Diffuse or generalized LBP
- SIJ pain
- Knows where every bathroom is located

After the Assessment

- Decision- PF alone or Pelvic MSK, or both?
- Discuss potential issues with patient
- Referral to PT (Eval and treat!)
- Referral to specialist (Urogyn, Derm, etc)
- Email, call , My Chart PT if needed

Live Model Internal Vaginal Exam

INGRID HARM- ERNANDES, PT, WCS, BCB-PMD

Ground Rules

- Slow and Gentle
- Take your time
- Let models guide your progress
- This should not be painful
- Models and patients will appreciate it and you will gain more information!
- GOAL: GENTLE, EFFICIENT and EFFECTIVE ASSESMENT

Gentle is the key!

- Less is more!
- Pain is what patient have been experiencing
- Previous painful experience = reflexive protection response!
- Explain what you are doing-brief
- Stop if needed
- Building trust can give you more information
- Use flat pad of finger- Do NOT poke

Positioning

- Patient in supine
- Knees flexed (no stirrups)
- Draped with sheet
- Use gel
- One gloved finger

Basic Components

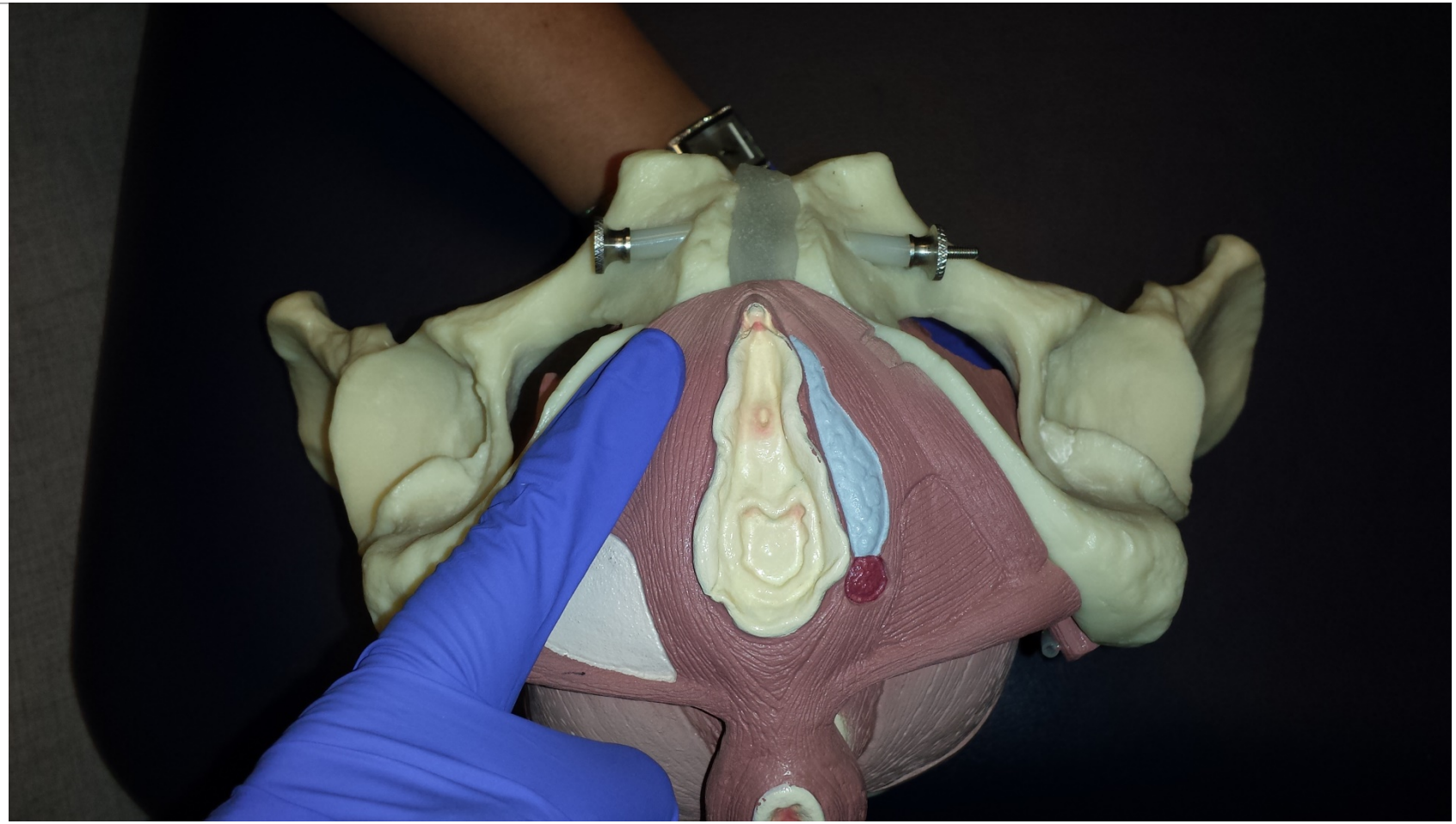
- Superficial - 1st layer
- Middle (urethral) - 2nd layer – 1st knuckle
- Deep - 3rd layer – 2nd knuckle
- Fascial
- PERFECT

Palpation

- Before you start- Diaphragmatic breath
- Each point multiple answers
  - Trigger points
  - Referral of pain
  - Tension
  - Local Pain
  - Reproduction of symptoms

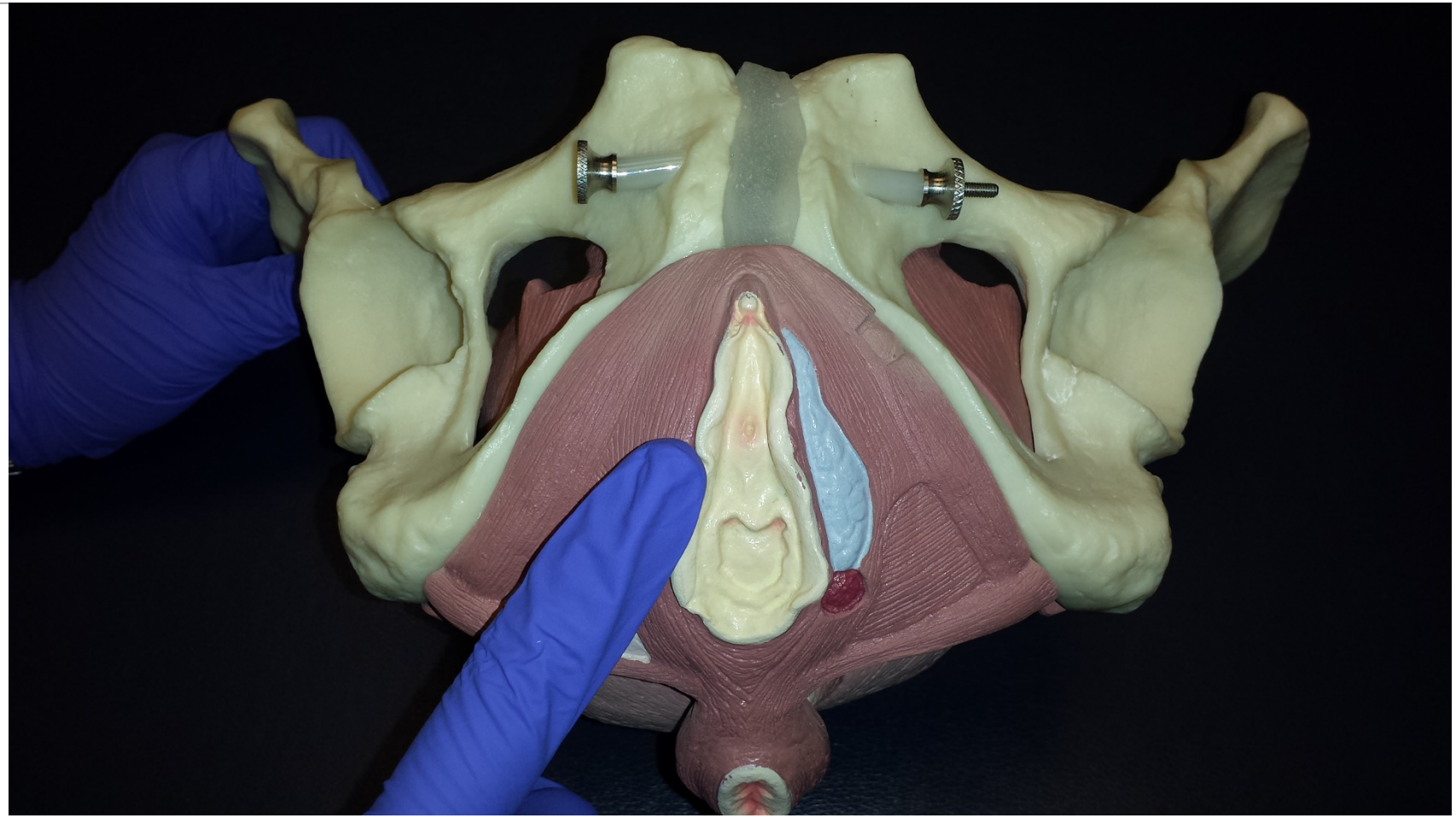
Ischiocavernosus

- Smaller area than you think
- Dyspareunia, vulvar pain



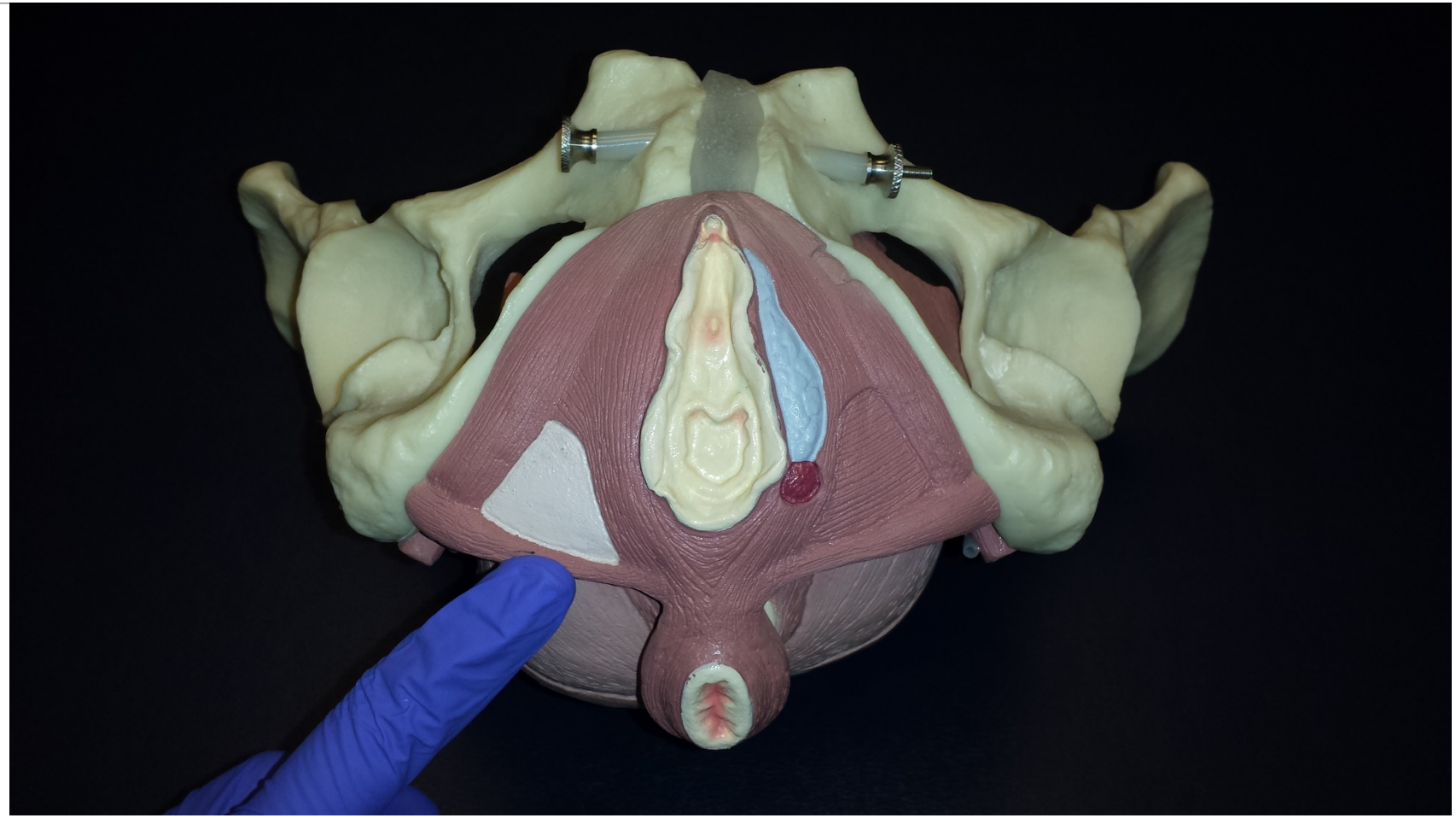
Bulbospongiosus

- Roll finger slightly inwards along pubic bone
- Guardian of the Vaginal Canal- Dyspareunia, vulvodynia, CPP)



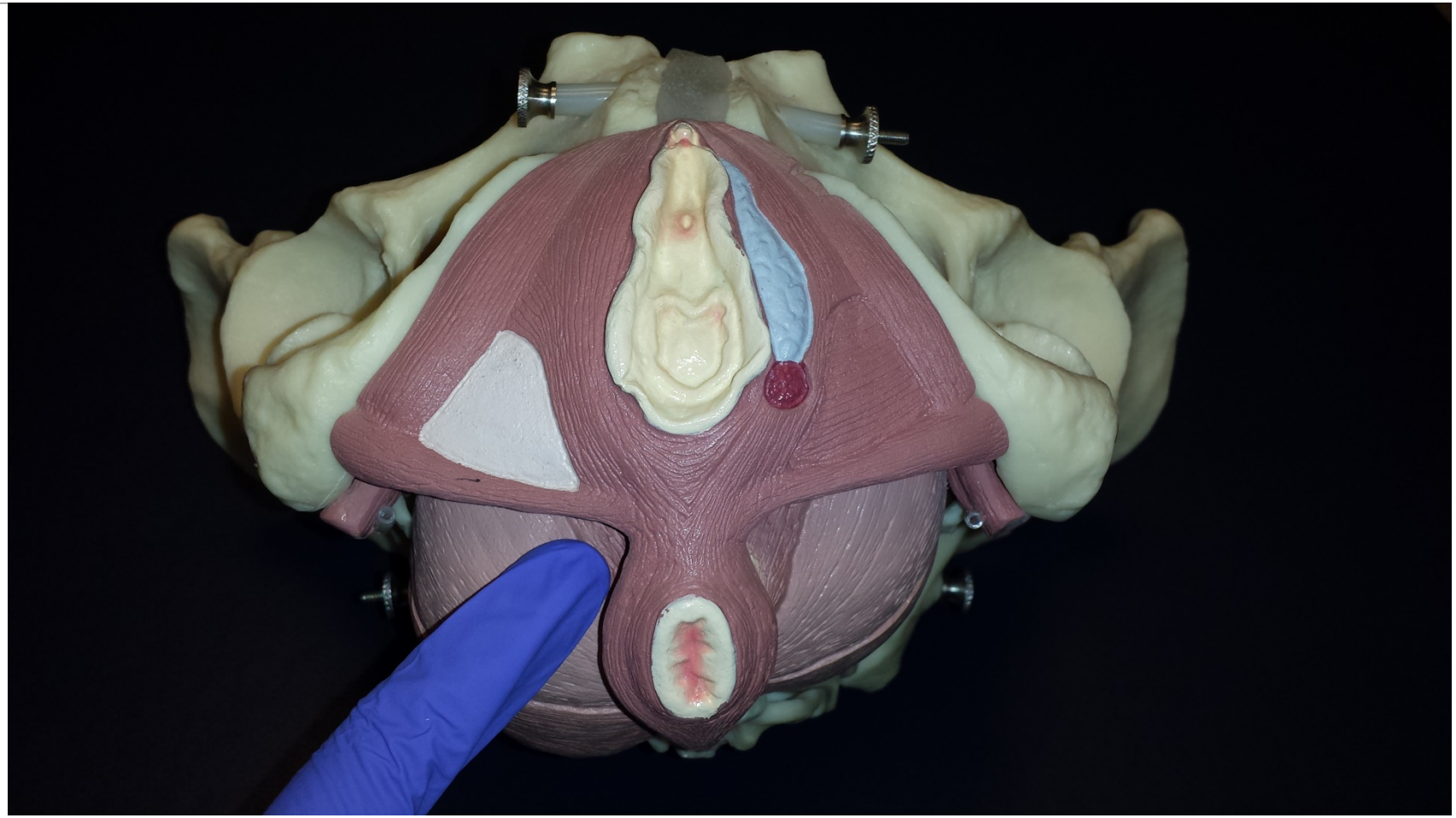
Superficial Transverse Peroneal

- I –beam, supportive for prolapse



Levator Ani Externally

- CPP
- Prolapse
- IT pain
- Pudendal nerve pain

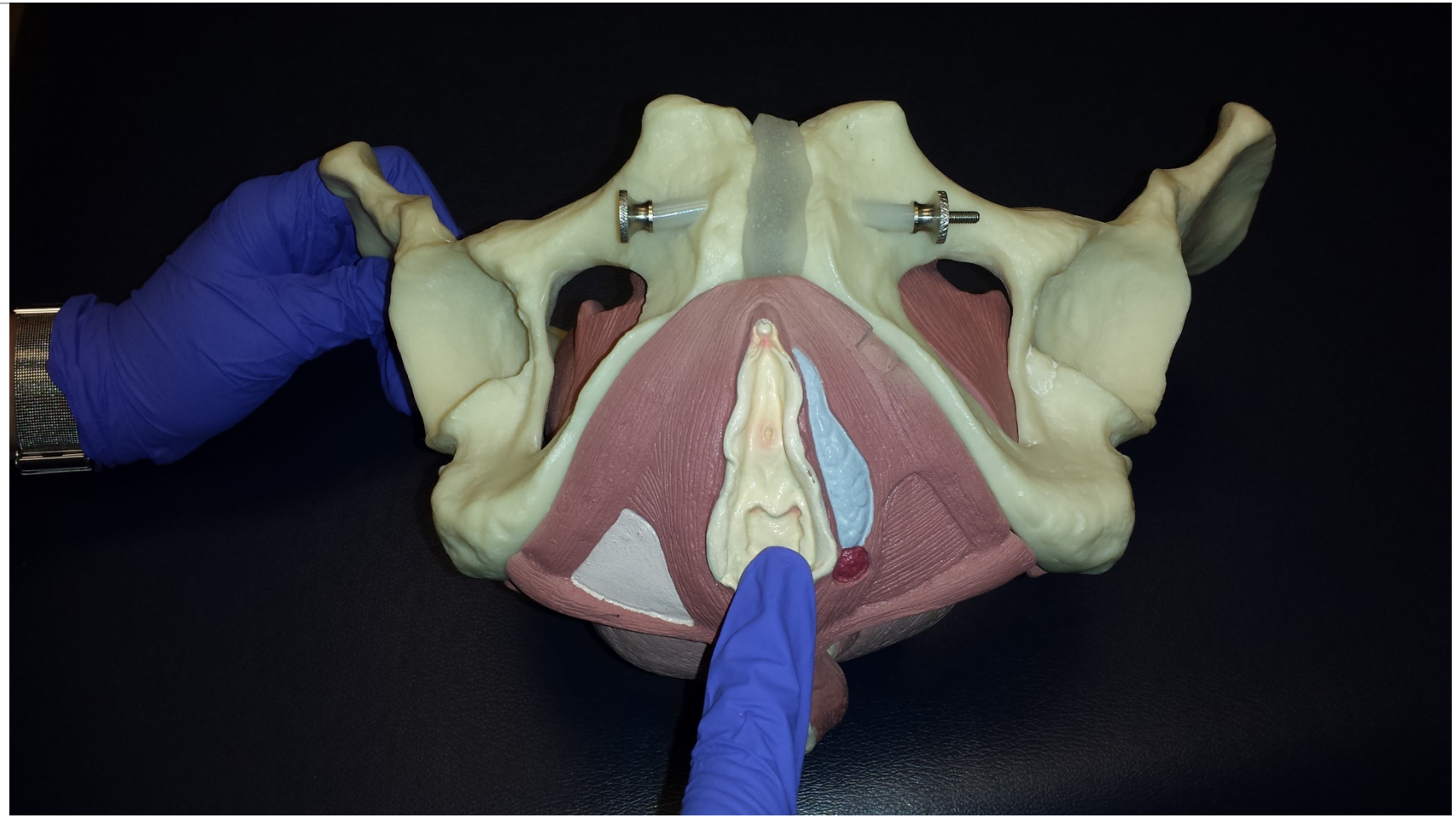


Transition - Superficial to Deep

- Observe Contract/Relax
- Are they able to relax
- Tone of pelvic floor
- Protective response
- Allow for pelvic floor relaxation prior to continuing

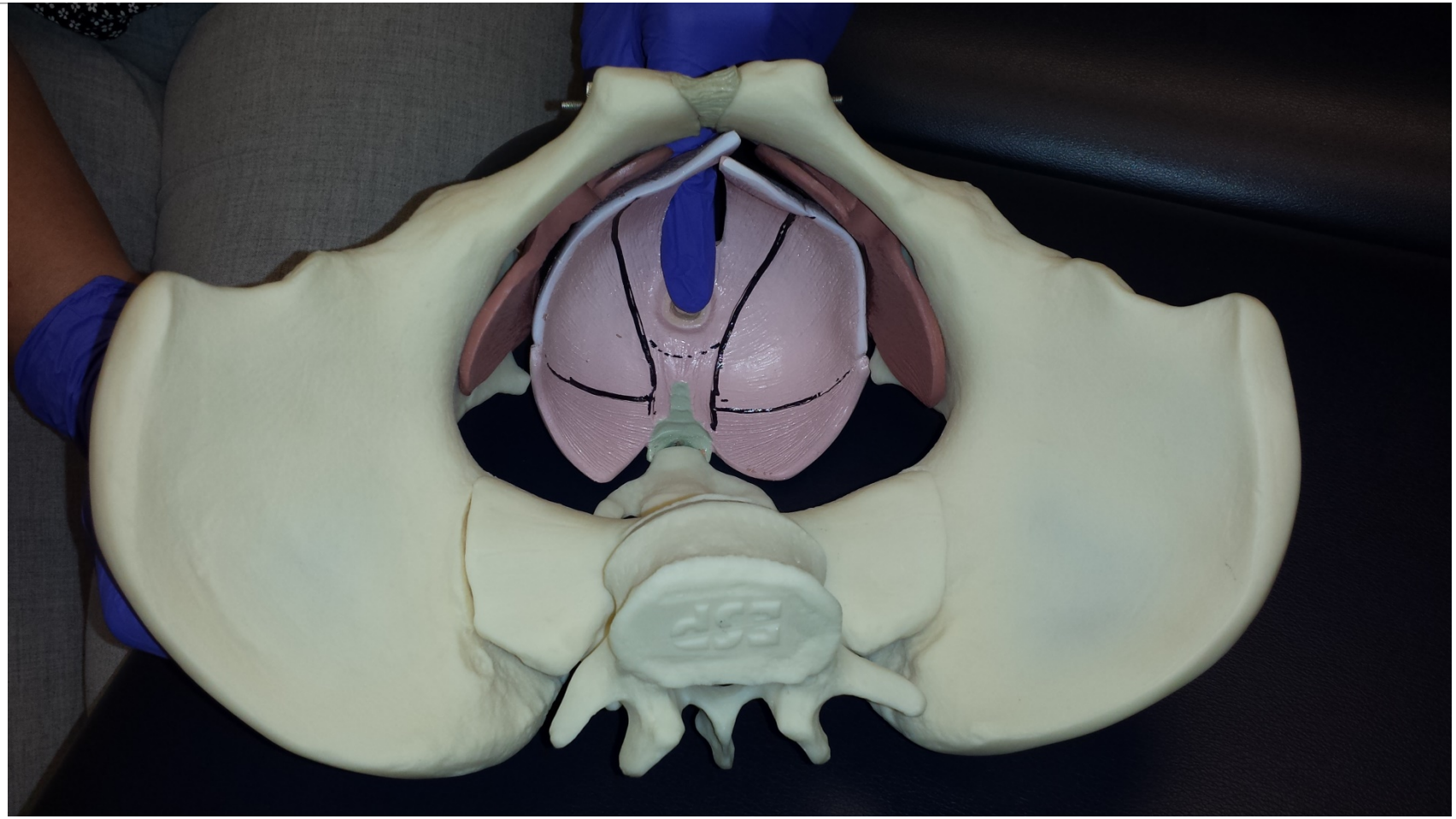
Introitus

- Dyspareunia
- Vulvar conditions



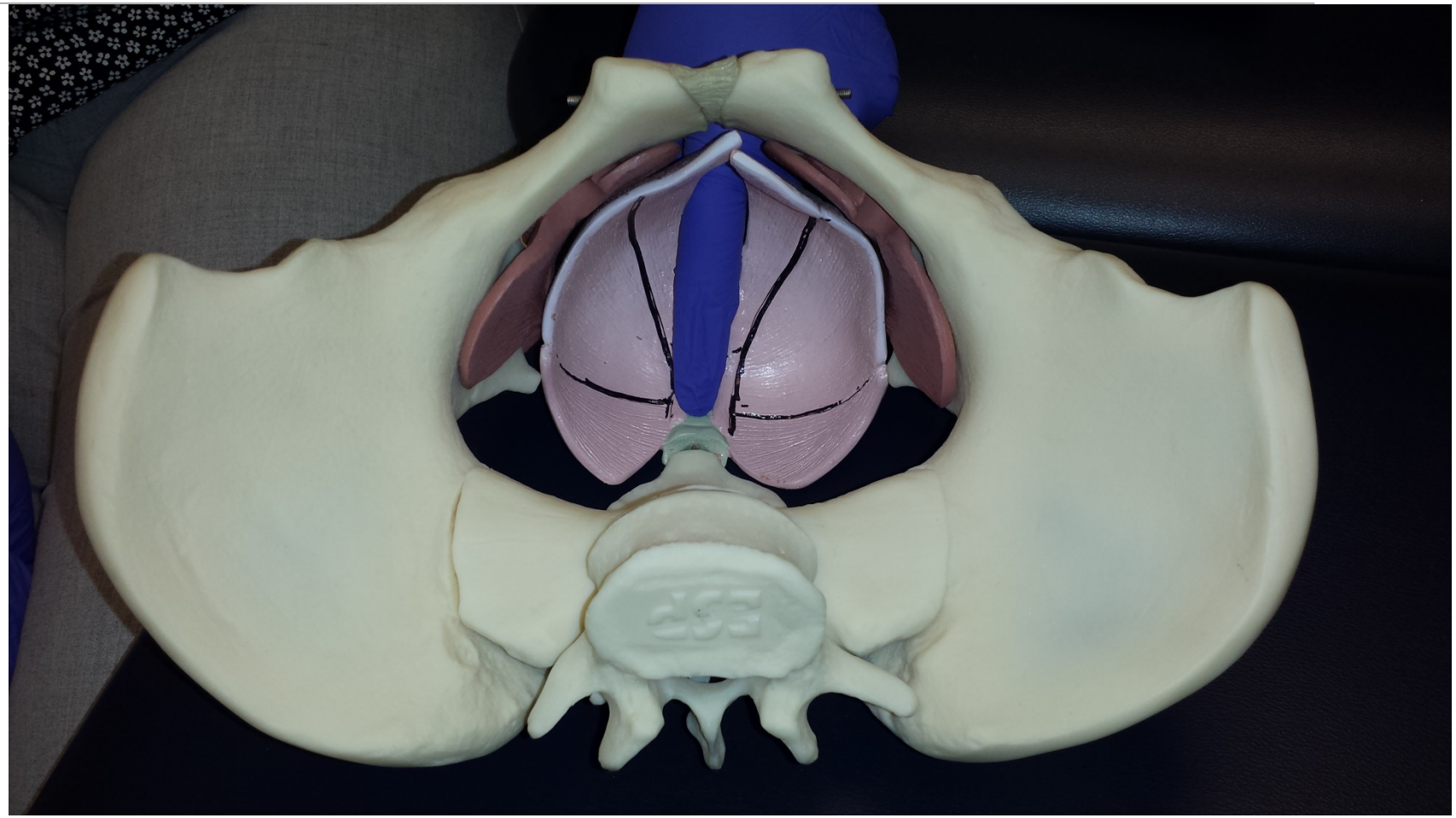
Rectal Fascia

- Constipation
- FI
- Back pain
- Rectocele



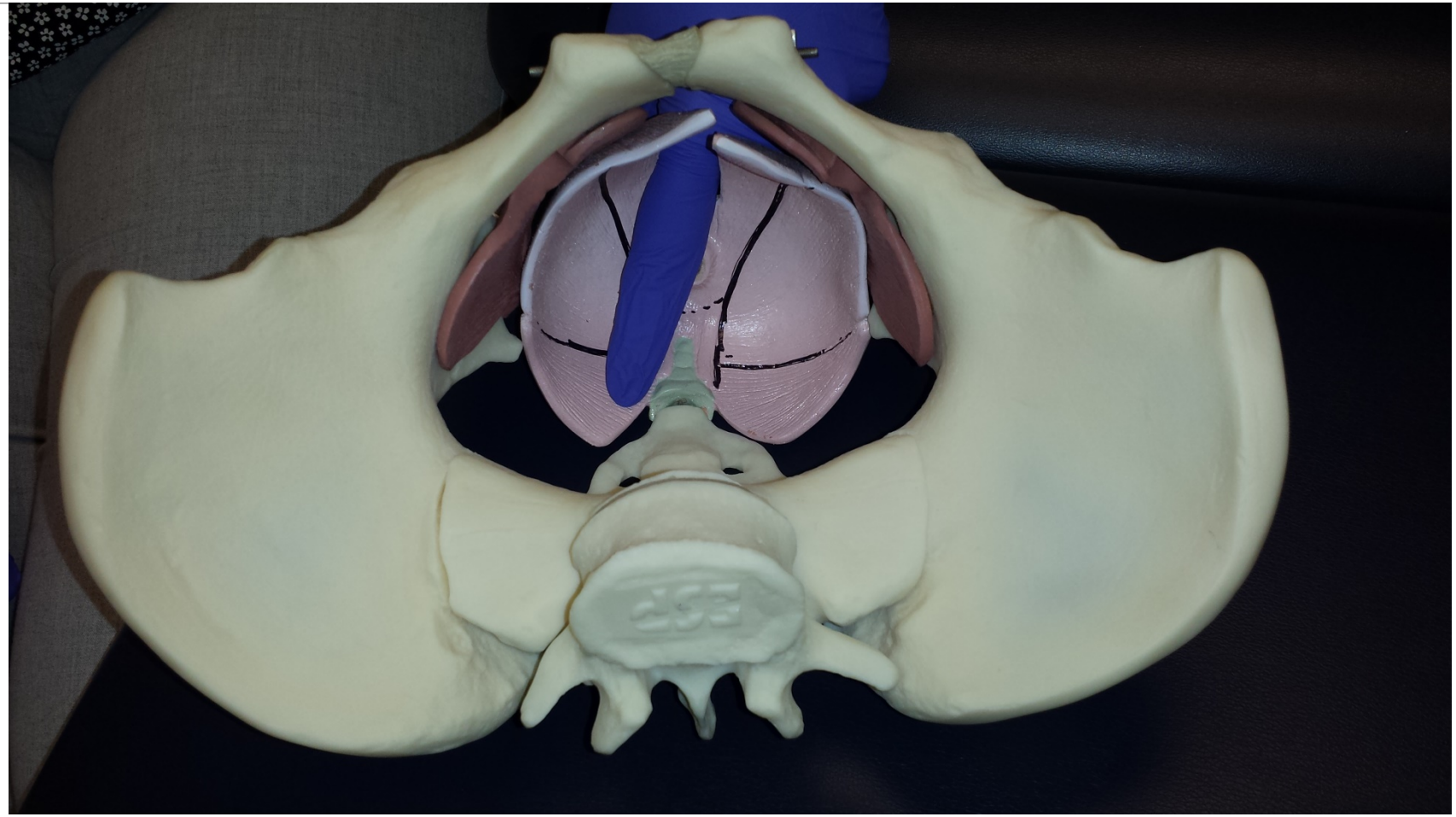
Coccyx

- LBP
- SIJ pain
- Proctalgia fugax



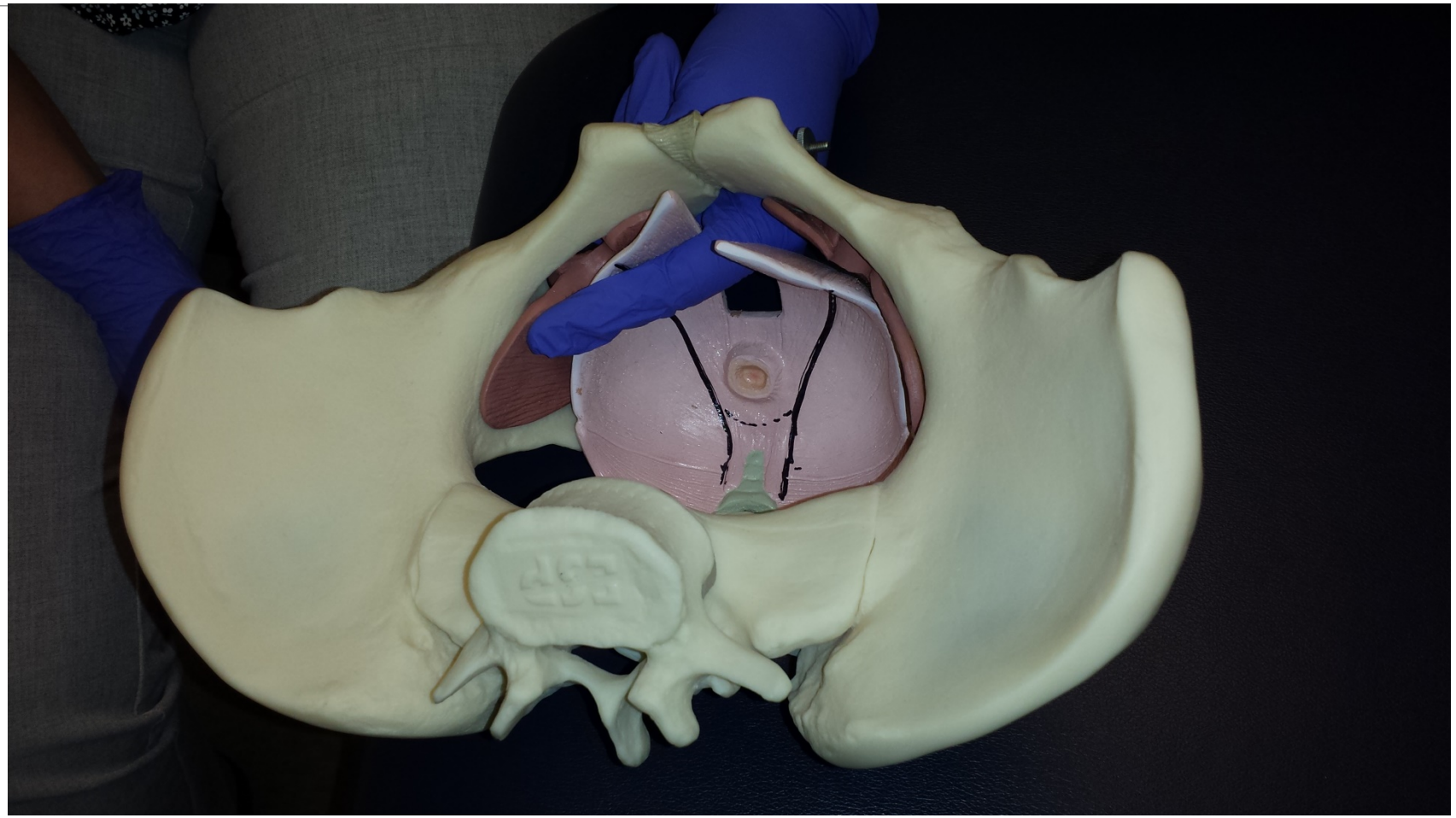
Coccygeus

- Bilaterally, sweep laterally
- Type A personality
- Buttock, coccyx, LB pain



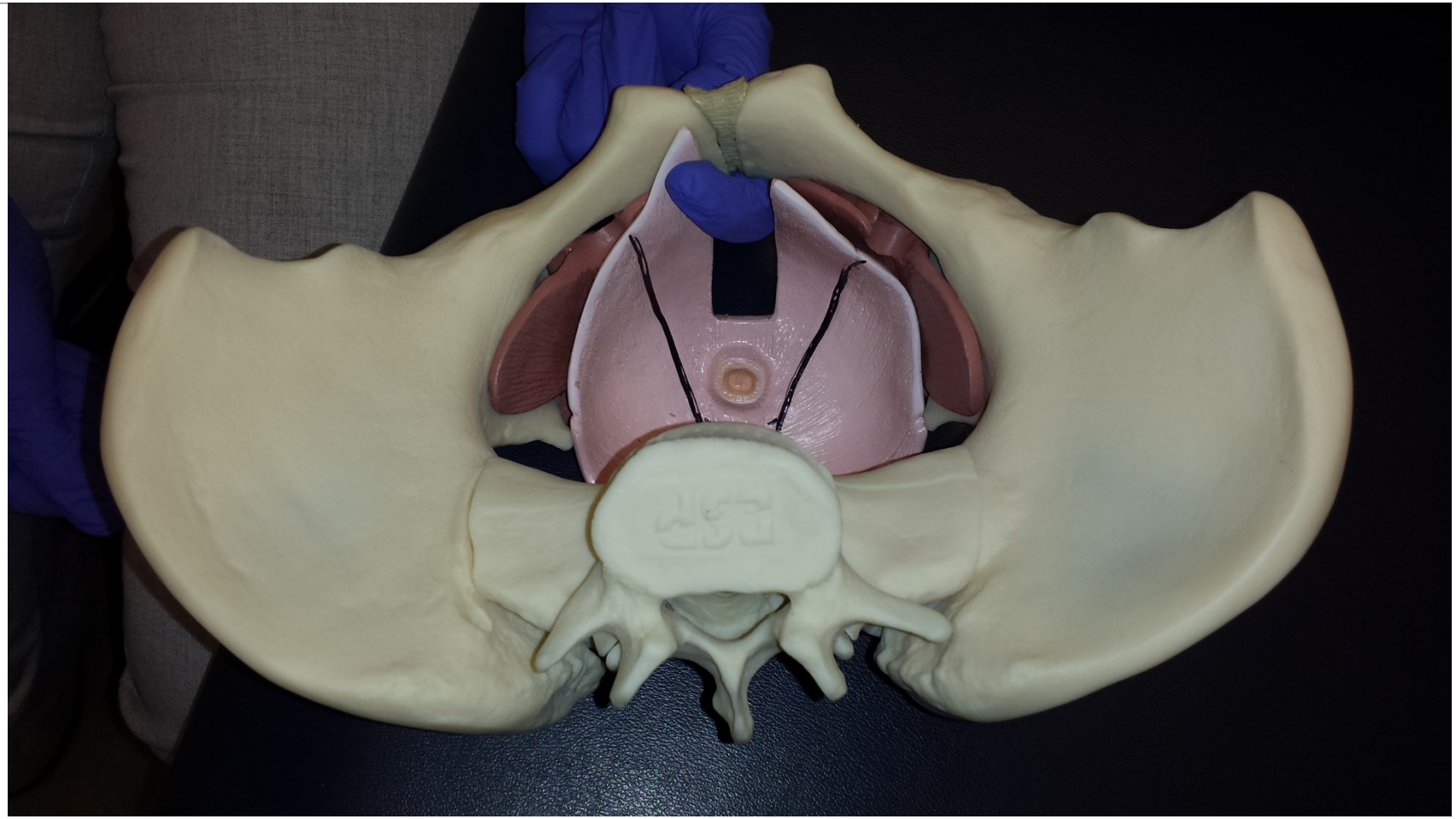
Obturator Internus

- Hip abduction
- Hip bursitis
- Buttock pain, “golf ball in rectum”



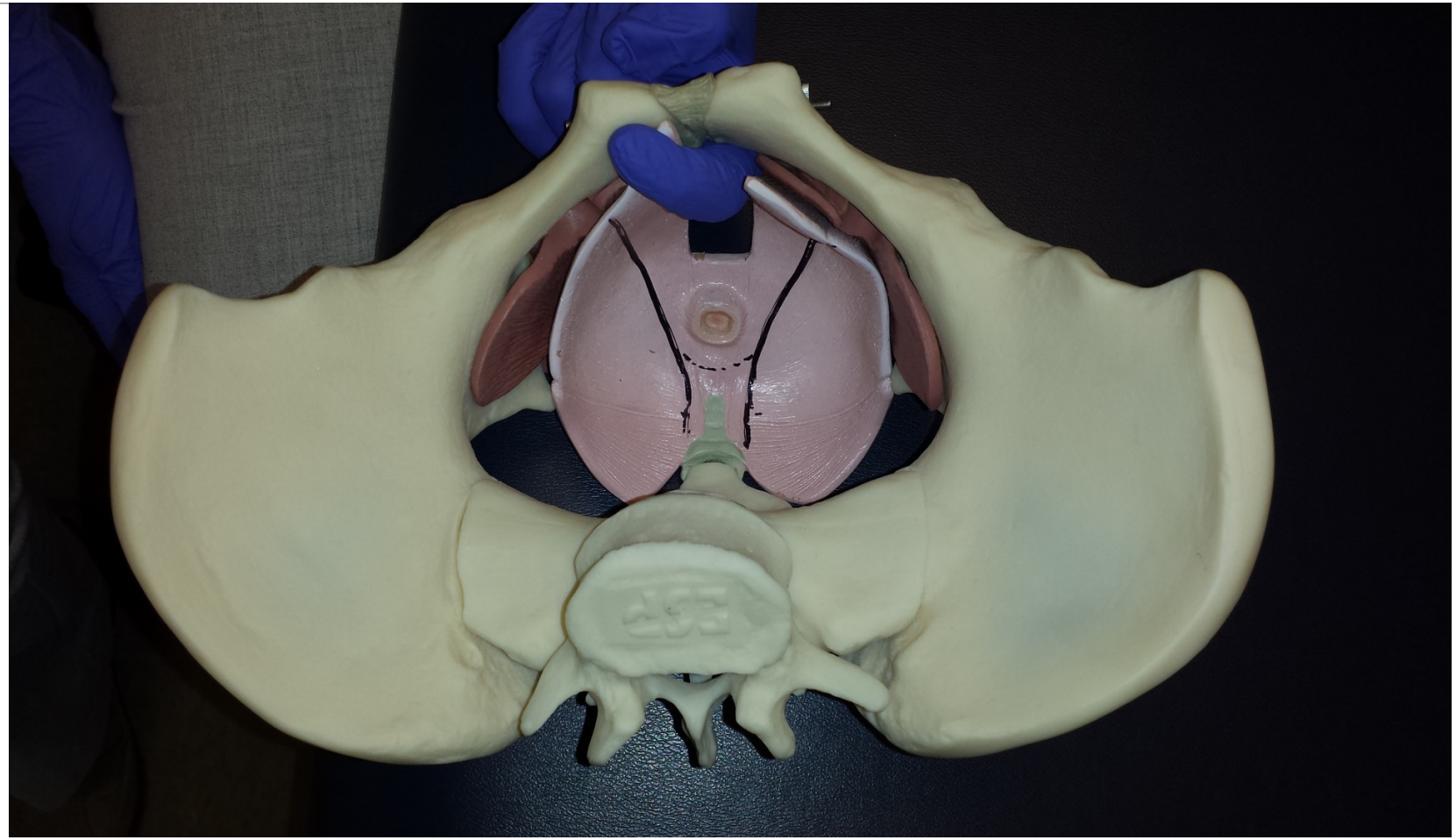
Puborectalis

- Pubic bone
- Urgency
- Suprapubic pain
- IC/PBS, constipation



Periurethral Tissues

- Bladder symptoms
- Abdominal pain



Pelvic Floor Assessment

- PERFECT is an acronym with
  - P = power (0-5)
  - E = endurance
  - R = repetitions
  - F = fast contractions
  - ECT = every contraction timed
- Assesses strength, endurance and quick response
- Not included-relaxation

One or All Components

- If you have time-> perform full assessment
- Can use one component if time constraint or specific condition
- UI- use PERFECT
- Pelvic pain- Muscular palpation
- Urgency – periurethral region
- Severe pain- external palpation

Time for discussion

- Answer questions
- Connect symptoms with assessment
- Share notes with PT
- Briefly discuss PT treatment
- Tip of the Iceberg – PT will take it from there

Pelvic Health Physical Therapy Interventions

VALERIE BOYLE, PT, DPT, OCS

Treatment Considerations

- Diagnosis and comorbidities
- Chronicity of symptoms
- Past medical and surgical history
- Past sexual abuse or trauma
- Negative feelings associated with self, diagnosis, treatment
- Willingness of patient to participate

Treatment Considerations

- Physical therapy interventions are part of a comprehensive plan of care based on:
  - Diagnosis
  - Function and impairments
  - External and internal assessment

- Treatments are very specific and individualized per patient based on exam

Treatment Methods

- **Behavioral Modifications**
- Therapeutic Exercise
- Manual Therapy – internal and external
- Biofeedback – internal and external
- Modalities

Behavioral Modifications and Self-Management

- Dietary changes
  - Decrease irritants (Bryant et al 2002, Dalosso et al 2003, Wyman 2009)
- Weight loss
  - Higher BMI associated with increased forces on the PFM (Subak et al 2002, Dalosso et al 2003, Kapoor et al 2004, Pomian 2016)
- Smoking Cessation
  - current smokers were at higher risk for both SUI and OAB compared with those who had never smoked (Bump 1992)
- Timed voiding
- Urgency drill

http://neuros.net/en/normal_pressure_hydrocephalus/

Behavioral Modifications and Self-Management

- Increase fiber (Dukas 2003, Satish 2007)
- Avoid straining (Chiarelli et al 2000, Lubowski et al 1988, Snooks et al 1985)
- Colon massage (Sinclair 2011)
- Toileting positioning (Rad 2002)

www.squattypotty.com

Treatment Methods

- Behavioral Modifications
- **Therapeutic Exercise**
- Manual Therapy – internal and external
- Biofeedback – internal and external
- Modalities

Therapeutic Exercise

- Pelvic Floor Muscle Training (PFMT)
  - Needs to be patient specific and isolated if able
  - Relaxation of PFM is just as important as the contraction
  - Evidence supports the use of PFMT as part of a first-line conservative management program for UI (Wallace 2004, Neumann 2006, Choi 2007, Hay-Smith 2009, Dumoulin 2010, Greer 2012, Pereira 2012, Dumoulin 2018.)

https://www.pinterest.com/pin/355221489331451088/

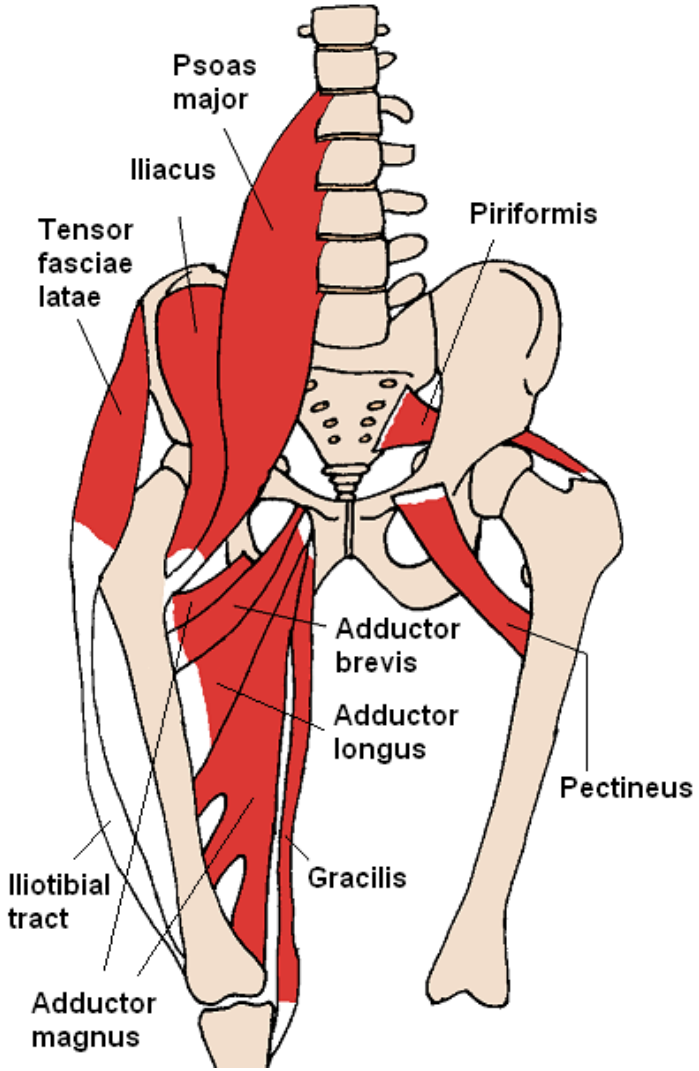
Therapeutic Exercise

- Any type of dysfunction along the kinetic chain encompassing lower extremities, hips, abdomen, pelvis, and spine, may cause dysfunction at other parts of the kinetic chain and associated muscles (Akuthota et al 2004, Tu et al 2008)

- PFMT in combination with physical exercise, including stretching and strengthening, improves the QoL and amount of leakage in all types of UI (Stenzelius et al 2015)

Therapeutic Exercise

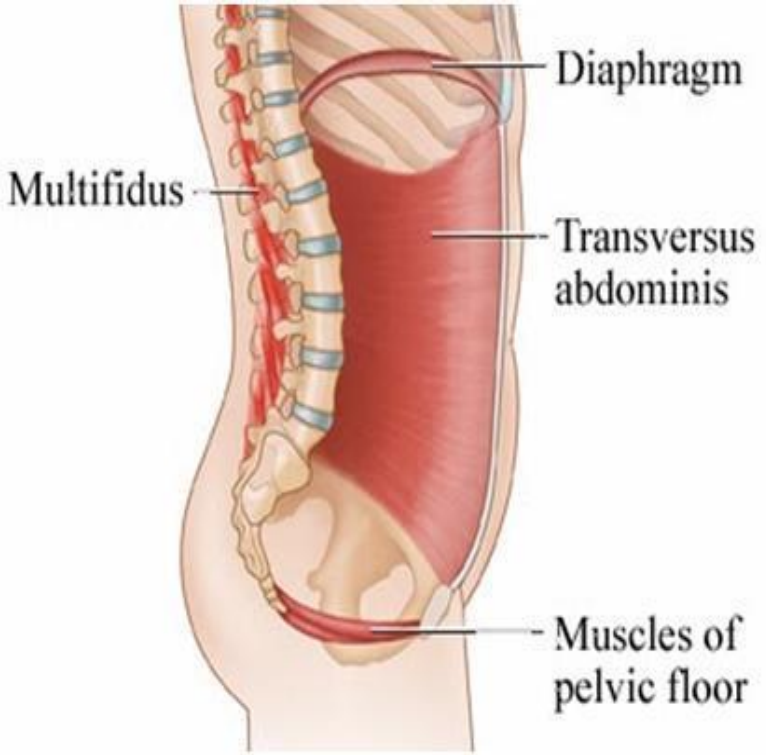
- Flexibility
  - Flexibility needed to help ensure equilibrium of the pelvis
  - Most common muscle groups implicated with pelvic floor dysfunction: iliopsoas, piriformis, quadratus lumborum, adductors, gluteals



https://en.wikipedia.org/wiki/Snapping_hip_syndrome

Therapeutic Exercise

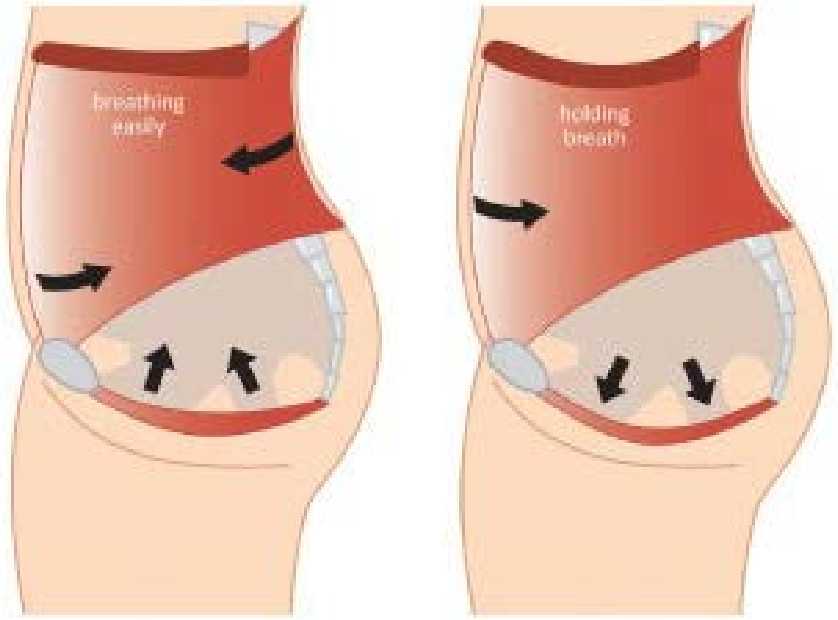
- Stabilization/Strengthening:
  - The entire core needs to be addressed:
    - Abdominals (transversus abdominus)
    - Back muscles (multifidi and paraspinals), gluteals
    - PFM
    - Diaphragm



https://www.jmmhealthsolutions.com/2018/03/15/the-deep-core/

Therapeutic Exercise

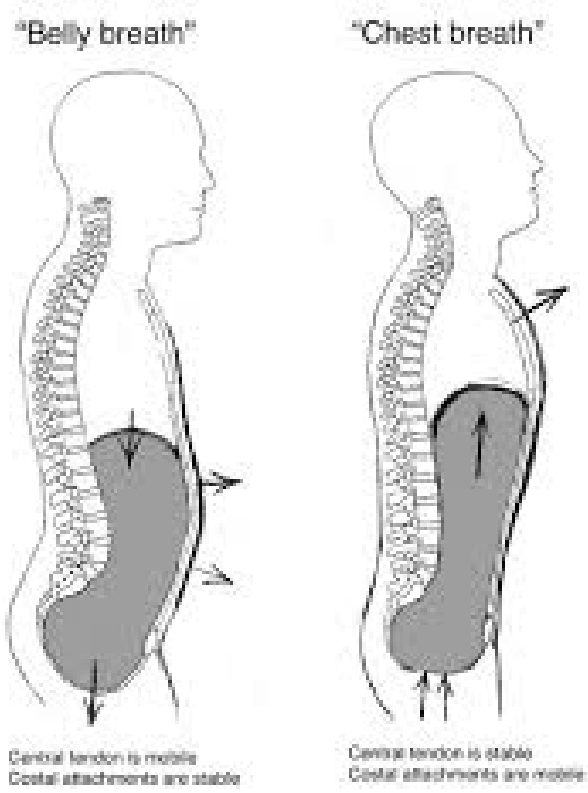
- Stabilization
  - The PFM co-contracts with transversus abdominus and is associated with diaphragmatic movement (Sapsford 2000, O'Sullivan et al 2002)
  - Important to increase stabilization for bowel and bladder dysfunction, pelvic pain, and in postpartum state (Stuge et al 2006, Sapsford 2000, Ferreira et al 2006)



https://www.foundationalconcepts.com/the-pelvic-chronicles-blog/pelvic-floor-core-musculature/

Diaphragmatic Breathing

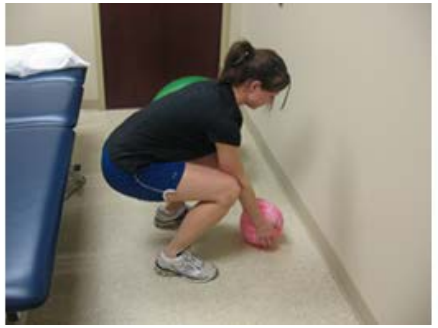
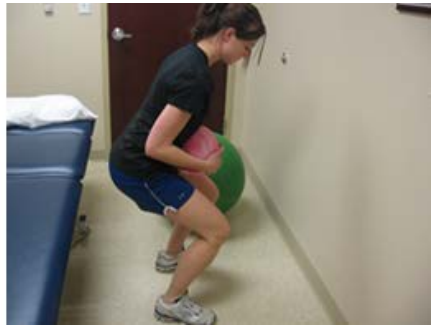
- Diaphragmatic motion and contraction of the PFM correlate with breathing (Park 2015)



https://okanaganpeakperformance.com/are-you-blowing-it

Therapeutic Exercise

- Postural training and body mechanics
  - Protects the pelvis, PFM, and back
  - Increases the ability to perform ADL comfortably
  - Decrease stress on body
  - Fear and anxiety decreases with increased activity
  - Prevent future injuries

Treatment Methods

- Behavioral Modifications
- Therapeutic Exercise
- **Manual Therapy** – internal and external
- Biofeedback – internal and external
- Modalities

Manual Therapy

- Joint mobilization
- Soft tissue mobilization (STM)
  - Strain Counterstrain
  - Trigger point release
  - Myofascial release (including Graston/ASTYM)
  - Scar massage
- Dry needling
- Muscle energy technique (MET)

Joint Mobilization

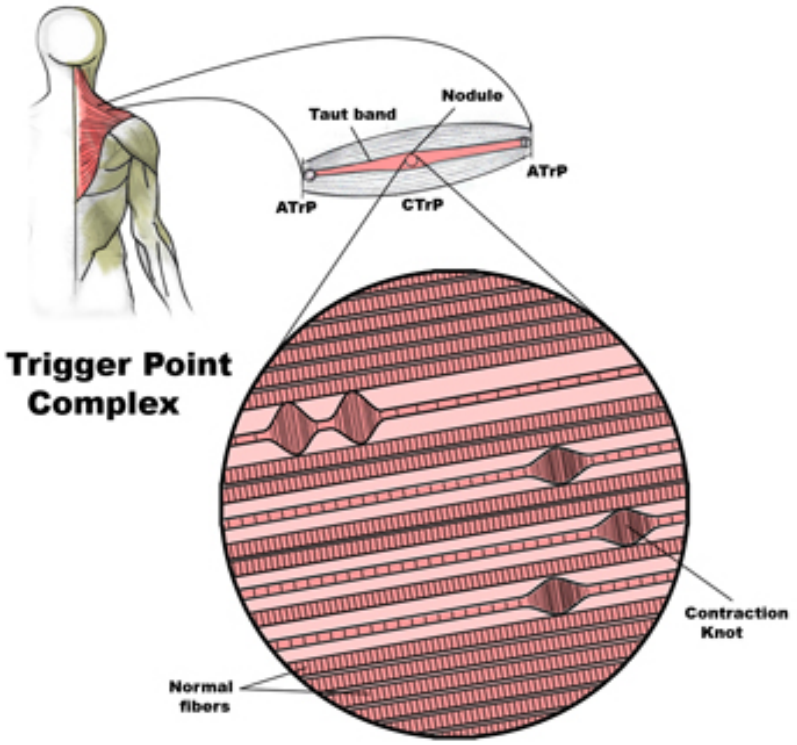
- Passive movements of a joint to improve mobility and pain, with benefits sustained at 1 year (Abbott et al 2013)
  - Spine
  - Hips
  - Coccyx (internal or external)

Soft Tissue Mobilization (STM): Strain Counterstrain

- Gentle, non-aggressive method to help reduce muscle tightness and spasm
- Passive positional release to decrease muscle tightness and spasm
- Decreases pain when used alone or with therapeutic exercises (Wong et al 2012, Wong 2013, Wong 2014)

STM: Trigger Point Release

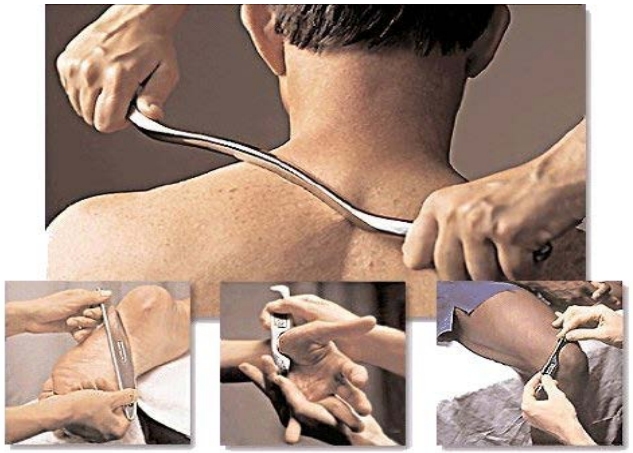
- Focused pressure on a hyperirritable locus within a taut band of muscle
- The pressure on these trigger points can be still, circular, or strumming
- Evidence supports the use of trigger point release for patients with pain, urgency, and OAB (Thiele 1963, Weiss 2001, Holzberg et al 2001, Gunter 2003, Oyama et al 2004)



http://www.renewacupuncturecare.com/

STM: Myofascial Release and Scar Massage

- Slow lengthening of fascial tissues surrounding muscles, tendons, ligaments, and organs to a normal length
- Myofascial release can improve range of motion, decrease pain, and improve urinary symptoms
  (Heyer et al 2012, Adams et al 2015)
- Scar massage



http://www.betterbodiesrichmond.com/services/grastontechnique/

http://www.rocktape.com

Dry Needling

- Solid filament needle is inserted into the skin and muscle directly at the myofascial trigger point
(Kalichman et al 2010)

- Different from acupuncture!

https://www.foundationalconcepts.com/the-pelvic-chronicles-blog/dry-needling/

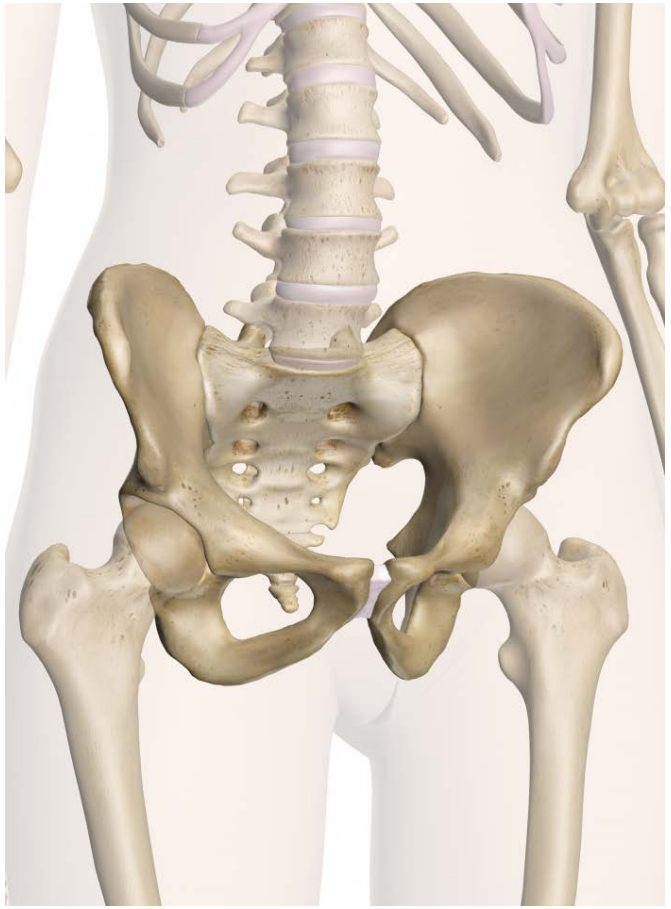
Dry Needling

- Can produce a significant reduction in mean pain intensity and increase ROM immediately following treatment (Tsai et al 2009)

- Trigger point injections are not therapeutically superior to dry needling (Cummings et al 2001)

Muscle Energy Technique (MET)

- Gentle muscle contractions of the patient to relax and lengthen muscles and normalize joint motion.
- Patient is taught how to perform independently at home
  - Promotes self management and not reliant on therapist for treatment



http://www.innerbody.com/anatomy/skeletal/lower-torso/pelvis

Treatment Methods

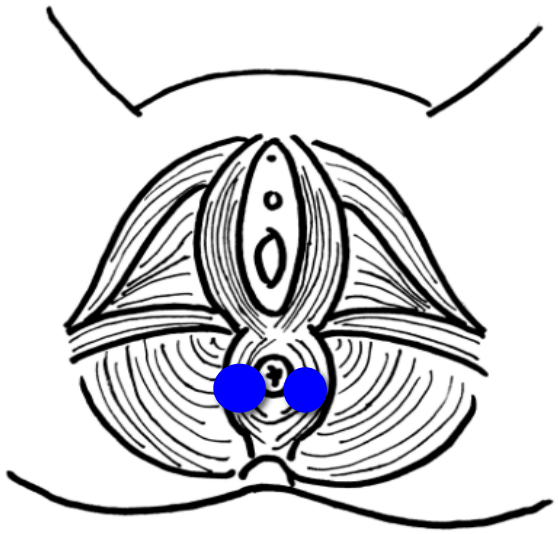
- Behavioral Modifications
- Therapeutic Exercise
- Manual Therapy – internal and external
- **Biofeedback** – internal and external
- Modalities

Biofeedback

- Biofeedback is a method in which the patient is made immediately aware of the physiological state of target muscles (Irion)
  - Visual, auditory, tactile
- Electromyography (EMG) biofeedback measures the electrical activity of muscles and can be used as an adjunct to both examination and treatment
- Can be beneficial for UI, OAB, FI, constipation, pelvic pain, vulvodynia, vaginismis, and interstitial cystitits (Glazer HI1995, Fynes et al 1995, Bergeron S et al 2001, Clemens 2001, Edwards L 2003, Wang 2004, Dannecker et al 2005, Herderschee 2011)

Biofeedback: External

- External electrode pads placed on the skin
- Can be used in various functional positions
- Noise from accessory muscle contractions may alter readings



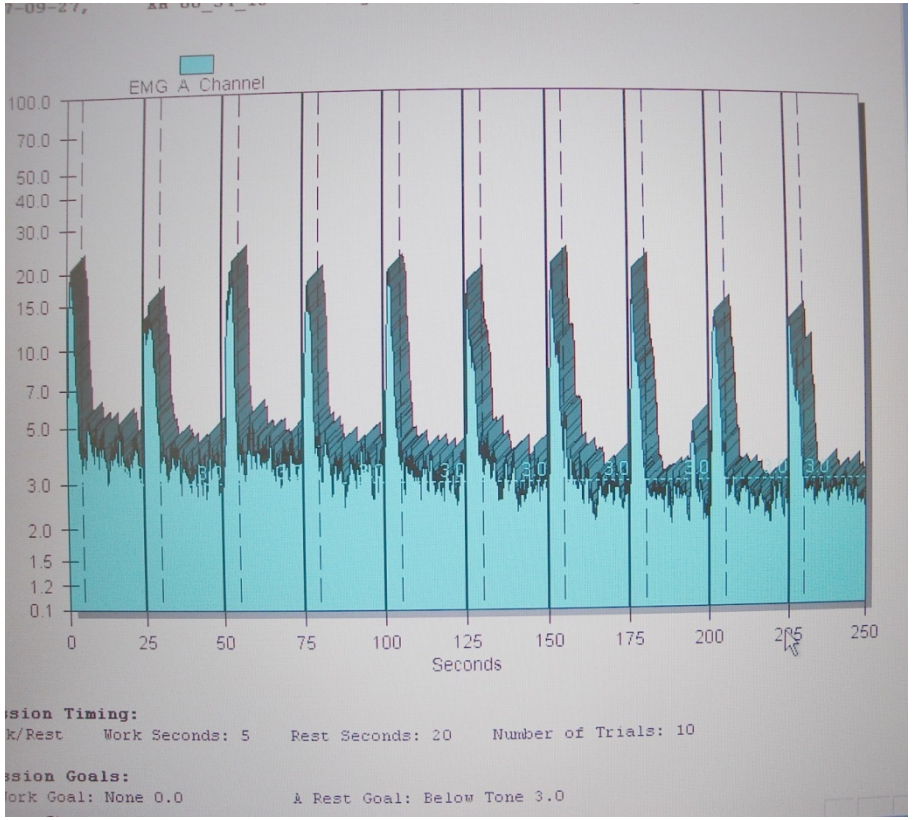
Biofeedback: Internal

- Rectal or vaginal sensor
- Direct contract on the target muscles
- Limited positions for assessment and treatment

http://www.pattersonmedical.com/app.aspx?cmd=getItemDetail&id=081014000

Biofeedback

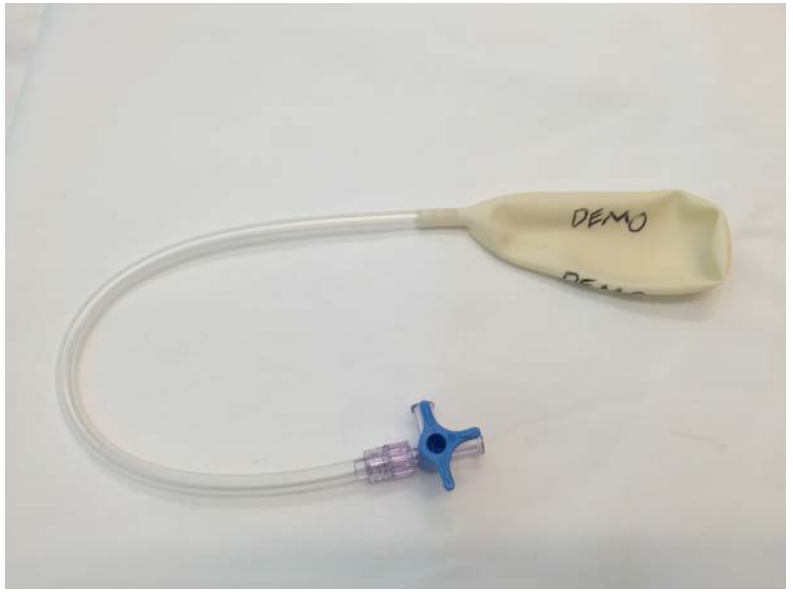
- Protocols
  - **“Down training”**
    - Relax overactive PFM
  - **“Up training”**
    - Strengthen weak PFM



Biofeedback: Rectal Balloon Training

- Can improve rectal sensitivity by training the responsiveness of the sphincter muscles to balloon distension, which facilitates discrimination of smaller rectal volumes or suppressing urgency with larger rectal volumes

(Wald 2007, Norton 2008, Bols et al 2012)



Treatment Methods

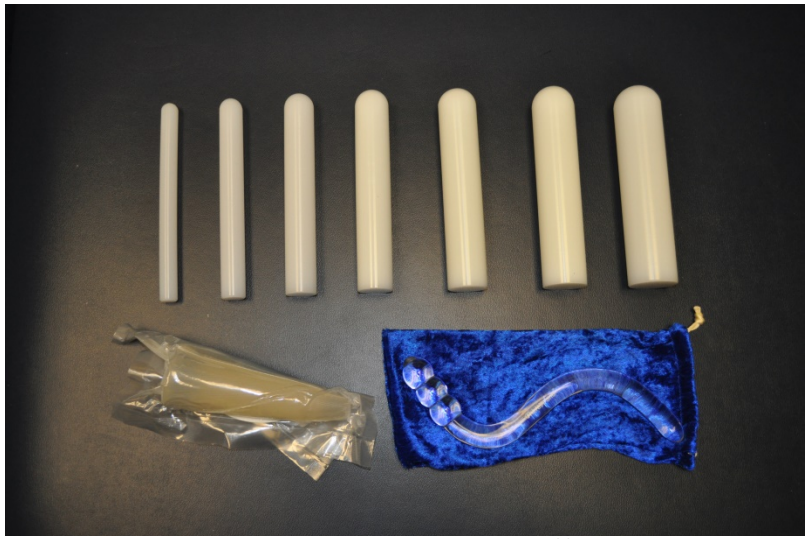
- Behavioral Modifications
- Therapeutic Exercise
- Manual Therapy – internal and external
- Biofeedback – internal and external
- **Modalities**

Modalities

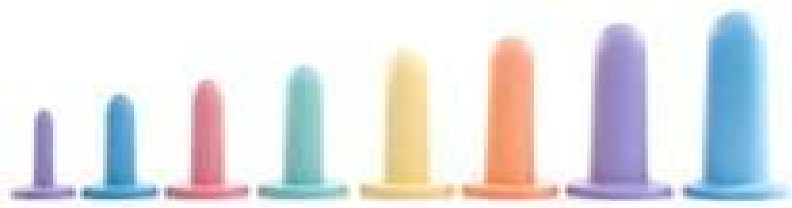
- Dilators
- Electrical modalities
  - NMES, TENS

Modalities: Dilators

- Used to
  - Stretch introitus
  - Mobilize soft tissues
  - Desensitize tissues



http://www.cmtmedical.com



https://www.soulsource.com

Modalities: Electrical

- Neuromuscular Electrical Stimulation (NMES)
  - Main parameters for: urgency, strength, and pain
  - Can be performed externally or internally
  - Can restore continence by: strengthening support of urethra and bladder neck, strengthening the PFM, inhibiting reflex bladder contractions (Plevnic et al 1991, Sand et al 1995, Berghmans et al 2002, Fall et al 1994)

Modalities: Electrical

- Transcutaneous Electrical Nerve Stimulation (TENS)
  - Used for treating pelvic pain, OAB (Bø 2014, Mira 2015, Murina 2008)
  - External pads placed at sacral nerve roots or over the area of pain (ie: abdomen for endometriosis, perianal for vestibulodynia)

http://www.heroldspharmacy.com/products/tens-unit/tens-unit-s2000/

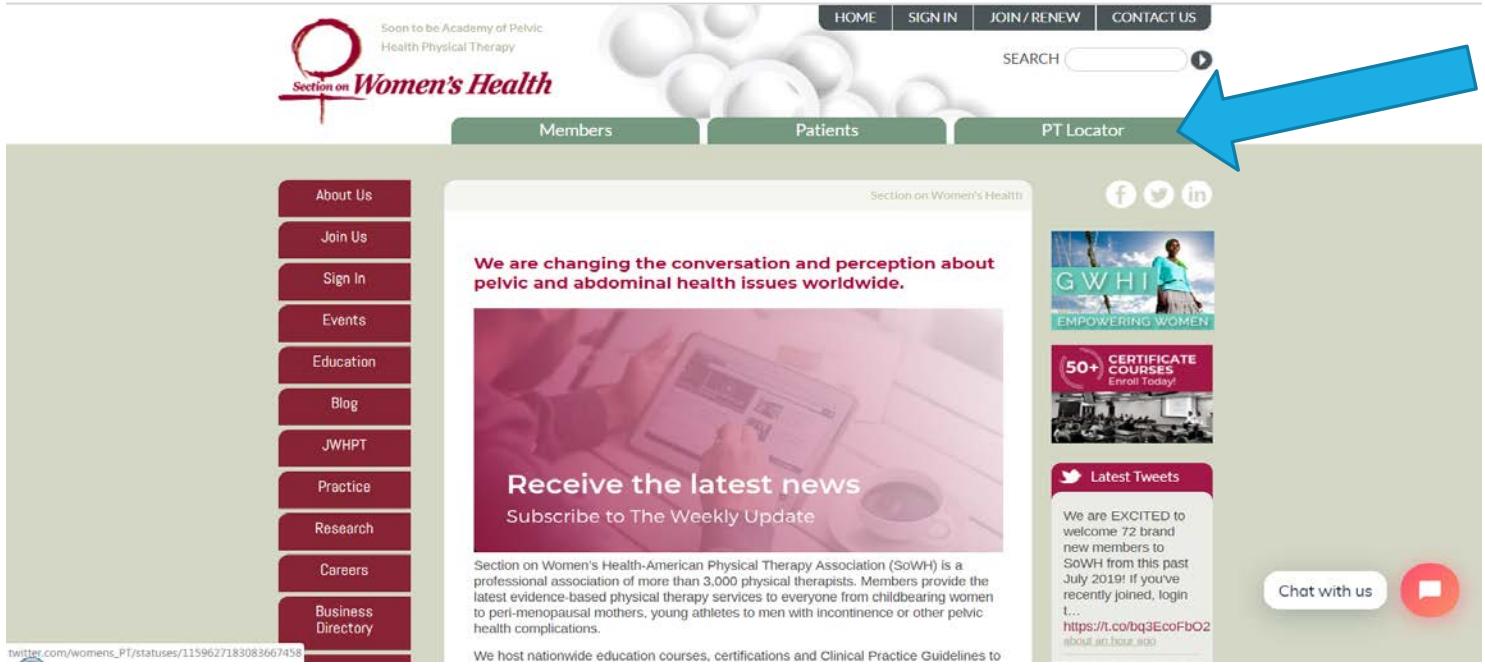
Bottom line about physical therapy

- High-level evidence supporting the use of conservative PT interventions continues to grow

- Many national and international organizations list conservative interventions including physical therapy as the first-line treatment for pelvic floor dysfunction – ***refer to your local pelvic PT!***

How to find a Pelvic Floor Therapist

- PT locator on APTA Section on Women's Health website



- Research local PT offices but be sure to ask if the therapist is trained in internal exam

Pearls of Wisdom

- MSK can play a strong but hidden role
  - PT is perfect fit for these conditions
- Entire core is often involved
- TPs can often mimic other conditions and pain patterns
  - Don’t assume there are no issues if diagnostic tests aren’t positive
  - Muscular issues often do not show up on these tests
- Ask questions
  - Patients have difficulty discussing pelvic issues
  - Consider questionnaires
  - “Read between the lines”
- Connect with other practitioners for tough pelvic cases

**References available upon request