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The Role of Physical Therapy During the Childbearing Year

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Learning Outcomes

After this course, participants will be able to:

- List at least three potential red flags that might present in pregnant women with musculoskeletal pain.
- Discuss at least two corrective exercise choices to help women's bodies adapt to the changes they experience during pregnancy and the postpartum period.
- Describe at least three aspects, including physical therapy interventions to optimize recovery, for the musculoskeletal impact of a cesarean and vaginal delivery.

Pregnancy

CONTINUED

Pregnancy

- Pregnancy-a state of being with child
  - 40 weeks long; divided into 3 trimesters
  - The majority of women will experience some form of musculoskeletal pain during this period
- Many orthopedic and outpatient PTs do not feel comfortable treating this population
  - This is an easy population to treat if you understand a few basic principles!
- Remember: many traditional treatments are not an option for these women (medication, imaging, injections, etc.)

CONTINUED

Does Physical Therapy Help?

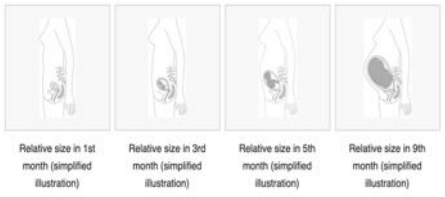
- No plethora of evidence for this patient population
- Identified research needs-classification system, identification of specific treatments
- 2013 Cochrane review
  - Exercise tailored to the individual significantly reduced pain (generic exercise program did not)
  - A multimodal intervention program seemed effective in relieving pain and improving function
- Other studies-physical therapy more effective in changing course of back pain vs medication, bracing, or manipulation

Normal Pregnancy Challenges

- First Trimester (ends at approximately week 14)
  - Nausea/morning sickness (vs HG)
  - Dizziness/lightheadedness
  - Fatigue
- Second Trimester (weeks 15-27)
  - Low blood pressure (watch out for orthostatic hypotension!)
  - Easily dehydrated
- Third Trimester (weeks 28-40)
  - Cramping/pain with uterine stretching
  - Fatigue
  - Dizziness/lightheadedness
  - Easily dehydrated
  - Braxton-Hicks contractions
  - Stress incontinence
  - Shortness of breath
  - Pain/swelling in the feet

Big Changes

- 25-35 pounds gained (on average)
- Force across the joints is increased up to 2-fold
- Release of hormones (primarily relaxin) triggers laxity in ligaments and increased mobility in the joints
- Position of uterus/weight distribution changes dramatically
- Dramatic increase in breast size



Red Flags

- DVT/Blood Clot (increased risk during pregnancy due to changes in blood flow)
- Blood glucose crisis
- Pre-eclampsia
- Fracture
  - Transient osteoporosis of pregnancy (rare)
- Preterm labor symptoms
  - Differentiate from Braxton-Hicks
  - Most hospitals have an OB triage unit where women can go for labor checks or to be evaluated for any issue during pregnancy

Exercise/Fitness

- Exercise/fitness-depends on prior level of fitness
  - Normal abdominal exercise can be done through 1st trimester
  - After this-switch to stabilization type exercise
  - Resistance training is fine-low weight, high repetitions
  - Cardiovascular is great-swimming, walking, biking, running
  - Stretching is especially important
  - Yoga and pilates can both be really great!
  - Avoid exercise in supine after mid second trimester
  - Encourage good hydration habits!

Evaluation of the Pregnant Woman

Precautions/Contraindications

- It is crucial to determine whether the patient has had an uncomplicated pregnancy thus far!
  - If there has been a complication, make sure you consult with the doctor or another resource to determine what level of intervention is acceptable
  - Example: If the patient has had episodes of early labor, exercise that gets the heart rate up may be contraindicated, manipulations/mobilizations are contraindicated, and massage is a precaution
  - Be sure you are monitoring blood pressure if pre-eclampsia is a concern

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Precautions During Pregnancy

- No prolonged supine positioning during the 3rd trimester*
- Most cannot tolerate prone positioning
- No heavy lifting
- No Valsalva/breath holding during exercise
- Monitor for lightheadedness and educate regarding eating prior to exercise to hold off potential hypoglycemic events
- No moist heat on the low back or abdomen (cold is fine)
  - Heat recommendation: don't increase core body temp by >1 deg F
- No electrical stimulation or therapeutic ultrasound on the abdomen
- Pelvic floor recommendations

CONTINUED

Evaluation

- How pregnant is the patient?
  - Planning for rehab is different for 12 weeks vs 37!
- How long have their symptoms been present?
  - 2 groups: those who had issues long before that are simply exacerbated by pregnancy and those whose issues are caused by pregnancy
- What is the behavior of your symptoms?
- What is the current level of fitness?
- Prior delivery history
- History of current pregnancy

Physical Evaluation

- Not very different from a "typical patient" other than paying attention to positioning (reclining tables help!)
- Neuro screen or modified neuro screen when appropriate (reflexes, dermatomes and myotomes)
- Gait analysis is very important!
  - Sometimes you won't be able to get patients into a position to test some muscle groups, so the gait analysis may give you your most vital information about functional strength
- Muscle length and tone evaluation
- It is never too early to educate about the correct way to sit up!!

Physical Evaluation-Joint Mobility

- Most joints can be examined as you normally would
- Hips: reclined or supine
- Spine:
  - Lumbar mobility-sidelying
  - Thoracic/rib mobility-seated and leaning forward
  - Cervical mobility-lower the table, stand behind them

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Findings During Pregnancy

Normal
- Laxity in joints
- Increased lumbar lordosis
- Slight "waddle" in gait (after about week 35)
- "gravid" appearance (enlargement of abdomen)
- Bilateral mild edema of both feet which worsens with dependent positioning and improves with elevation

Abnormal
- Pain with joint mobilization
- Increased thoracic kyphosis
- Trendelenberg or antalgic gait pattern
- High tone/"spasm" feeling in lower abdomen
- Inability to single leg stance
- Unilateral swelling with redness, warmth or that doesn't improve with elevation

Appropriate for PT?

- Absolutely appropriate:
  - Mechanical pain-low back pain, SI issues, rib pain, hip pain, pelvic floor problems, etc.
  - The vast majority of patients you see will have one of these
- Absolutely inappropriate:
  - Osteonecrosis of femoral head
  - Ongoing early labor symptoms, uncontrolled hypertension/pre-eclampsia
  - Suspicion of DVT
- Appropriate, but proceed with caution
  - History of early labor symptoms
  - History of spotting
  - Transient osteoporosis of the hip

Objective Exam

- Modify techniques to seated position
  - Thoracic and rib mobility
- Modify techniques to sidelying as needed
  - Lumbar spine mobility
  - Lumbar and thoracic musculature palpation
  - Sacral joint mobility and musculature
  - Pelvic floor
- Modify techniques to reclined position
  - Hip mobility assessment
  - Pubic symphisis mobility and palpation
  - Cervical mobility and musculature
  - Hip palpation/musculature
  - Round ligament, inguinal ligament
  - Pelvic floor

Common Musculoskeletal Complaints During Pregnancy

Complaints and Treatment!

Low Back/Pelvic Girdle Pain

- Occurs in up to half of all pregnant women (some estimate higher prevalence)
- Twice as common in women who had low back pain prior to pregnancy
- Cause: gravid uterus (posterior posture) causes weight of the uterus to be carried posterior to normal center of gravity. This creates a tremendous mechanical strain on the low back.
  - Additionally, relaxin causes ligamentous laxity in the spine and pelvic joints
  - Referral pattern from sacral ligaments
  - Neuromotor control/stability motor patterns
- May occur at any time during pregnancy; in some women, this is the first sign of pregnancy that is noticed!

Characteristics-Low Back/PGP

- Very exaggerated Trendelenburg gait (can be compensated or uncompensated)
- Incorrect motor patterns of pelvic floor, external pelvic girdle stabilizers, and/or abdominal musculature
- Dramatically increased joint mobility in the lumbar spine and SI region
- Often accompanied by muscle spasms
- Increased pain with single leg stance or active hip flexion
- Often point tender to palpation

Sciatica

- Severe leg pain may accompany low back pain or occur in isolation
- Can be severe enough to waken the mother at night
- Pregnant women do NOT have a higher incidence of disc herniation
- Causes:
  - Baby's position/pressure from baby's position
  - Change in posture/joint position can lead to increased pressure on the nerve
  - Can also be referral from the pelvic floor

Characteristics-Sciatica

- Common to see antalgic gait in addition to Trendelenberg
- Typically worsens with standing or walking and is relieved in hooklying (but not sitting)
- May present as pain only or be accompanied by weakness and/or numbness and tingling
- Can switch sides or be bilateral

Low Back Pain/Sciatica Treatment

- Maternity support belt-helps lift weight closer to the center of gravity and supports the joints
  - Belly wrapping
- Manual Therapy
  - Soft tissue mobilization
  - Lumbar mobilization/manipulation
  - Muscle energy techniques
    - Pelvic shotgun is particularly helpful for SIJ pain
  - Hip long axis distraction
  - Pelvic floor soft tissue mobilization

Low Back Pain/Sciatica Treatment

- Neuromotor retraining of the transverse abdominus and other spinal stabilizers (may need PF down training)
- Stretching and strengthening as needed (determined during initial evaluation)
- Pelvic mobilization exercises
  - Modified hand/heel rocks, hula hoop
- Education: flat shoes, adequate rest, KEEP MOVING!

Sidelying Sacral Distraction

- Patient in sidelying, may have pillow between knees
- Hip flexion to tolerance (the more "fetal position" the easier it is to feel the sacrum)
- Therapist "catches" top of sacrum with heel of hand, provides gentle distraction force

Seated Mobilization with Movement

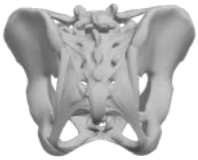
- Patient in a seated position, therapist "catches" top of sacrum with heel of hand
- Patient flexes forward, therapist's hand follows sacrum
- Patient sits back up, therapist follows sacrum and provides additional mobilization in desired direction

Long Axis Hip Distraction

- Patient in hooklying or reclined hooklying
- Therapist's hands around ankle or thigh
- Hip at 30 degrees each flx/abd/external rotation
- Therapist provides distraction force-can hold, oscillate, or manipulate from here

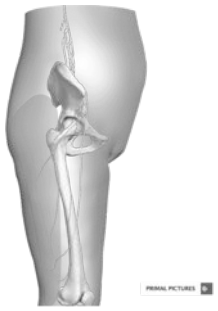
Posterior Pelvic Soft Tissue Mobilization

- Patient in sidelying
- Moderate pressure
- Can combine with other sidelying techniques/joint mobilizations



Meralgia Paresthetica

- Also called lateral femoral cutaneous neuropathy
- Can be unilateral or bilateral
- Typically presents as a burning pain along the skin innervated by the lateral femoral cutaneous nerves
- Caused by compression of the lateral femoral cutaneous nerves
- Usually resolves spontaneously with delivery



Characteristics-Meralgia Paresthetica

- Weak hip flexors and gluts
- Weak hip abductors
- Tight ITB, piriformis, and hamstrings
- Antalgic and/or Trendelenberg gait
- Pain is not usually position dependent

Meralgia Paresthetica-Treatment

- Worst case-surgical excision after delivery
- Exercise
  - Aerobic exercise-NuStep or recumbent bike
  - General hip strengthening
- Neuromotor re-education
  - Hip flexors, spinal stabilizers, gluts
- Manual therapy
  - Hip long axis distraction
  - MFR to ITB and hip flexor tendons
- Ice may be used (cold pack or ice massage) as a pain relief mechanism PRN
- A support belt is often helpful

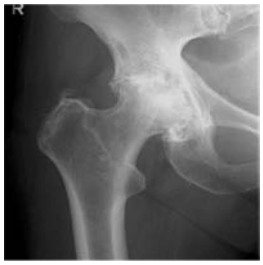
Double Crush Syndrome

- Dual entrapment of a nerve-usually one proximal and one distal site
- Most of the time during pregnancy one is a true entrapment (scar tissue from an old ankle injury, fibular head immobility from an old sprain, etc.) and the other is an irritation from excess movement of the sacrum and pelvis
- Characteristics
  - Extreme pain with radicular component
  - May or may not be positional in nature
  - Patients may be very debilitated (need walker for gait)
- Treatment
  - Relieve secondary site of compression, work on stability and position/alignment of sacrum/pelvis

Double Crush Syndrome Treatment

- Fibular head mobilization
- Sidelying sacral distraction
- Nerve glides

Hip Pain



- May accompany back pain or occur in isolation
- Most common cause-pelvic instability
- 2 rare, yet serious potential diagnoses
  - Transient osteoporosis of the hip
    - Occurs during the 3rd trimester
    - Pain and limitation of ROM of the hip accompanied by radiographic signs of unilateral or bilateral osteoporosis of the hip with preservation of joint space
    - Continued unprotected weight bearing can result in a fracture of the femoral neck
  - Osteonecrosis of the femoral head: exact mechanism unknown, but the rise in cortisone levels may be partly to blame
    - Symptoms usually begin in 3rd trimester
    - Deep pain the groin radiating to the knee, thigh, or back
    - Unlike most pathologies, this will not resolve upon delivery

Hip Pain

- Ruling out the serious threats
  - Pregnant women are not usually x-ray candidates
    - CT scan/MRI is a possibility but not necessarily ideal
  - Both of these have characteristics of:
    - Extreme waddling gait
    - Pain is deep in the groin
    - Pain is not position dependent
    - Extreme loss of AROM
- If you have treated someone with hip pain for several weeks with no improvement, you may want to notify the doctor that you suspect one of these pathologies

Hip Pain Treatment

- For normal hip pain:
  - Strengthen hip musculature
  - Manual therapy (soft tissue and joint mobilization) as needed for pain control
  - Retrain core musculature as needed
  - Heat or ice as needed
  - Sleep with a pillow between the knees

Pubic Symphysis Pain

- Often occurs in conjunction with low back or hip pain
- Cause: pelvic instability which can lead to displacement of pubic symphysis
- Symptoms: pain (0ften sharp/severe) directly over pubic symphysis, extreme Trendelenburg gait, difficulty initiating/controlling hamstrings and quads, may be relieved by position changes

Pubic Symphysis Pain Treatment

- Pelvic shotgun muscle energy technique
- Pubic symphysis mobilizations
- Manual therapy to sacrum/sacroiliac joints
  - Muscle energy techniques, sidelying sacral distraction, soft tissue mobilization
- Soft tissue mobilization-pelvic floor and abdomen
- Retrain transverse abdominus and pelvic floor musculature
- Other strengthening as needed

Pubic Symphysis Mobilization

- Gentle!
- Can do round ligament mobilization in this position

Pelvic Shotgun

- "Reset" pelvic floor and pelvis
- Patient in hooklying, have them abduct against you 3x8 sec hold, then adduct against fist or forearm, with or without bridge

Thoracic and/or Rib Pain

- Causes:
  - Dramatic increase in breast size can put relatively sudden increased strain on scapular stabilizers
  - Relaxin decreases the ligamentous stability in the thoracic spine and rib cage
  - As the baby grows it can place a strain the ribs and intercostals from the inside

Thoracic/Rib Pain Characteristics

- Rib pain often focal and localized
- Decreased thoracic and rib mobility
- Pain with deep inspiration or expiration
- Pain with coughing/sneezing/laughing
- May have pain with UE movement (sometimes incorrectly diagnosed as a shoulder pathology)
- Can be accompanied by symptoms of neural impingement
- May have incorrect breathing patterns

Thoracic/Rib Pain Treatment

- Strengthening of the scapular stabilizers
- Mobilization/METs for thoracic spine and ribs
- Spine mobility exercises
- Breathing exercises
- Soft tissue work as needed for pain control

Rib Mobilizations

- Sidelying (rotational)
- 1st rib
- Bent forward (P-A)
- Reclined (A-P)

Rib Muscle Energy Techniques

- Inhalation restriction
  - More common
  - Hand on posterior rib angle, pt with hand on opposite shoulder, patient presses forward into therapist's other hand while therapist places pressure on PA
- Exhalation restriction
  - Patient pulls elbow down toward floor

Breathing Retraining

- Purpose: facilitate rib movement and diaphragmatic excursion to "keep" the new motion you have given patients
- Generalized (wing arm)
- Inhalation restriction (arm overhead)
- Exhalation restriction (drop down to side)
- "Breathe into my hands"
- 360 expansion, belly, chest

Pelvic Floor Dysfunction

- PF can spasm to compensate for other muscles
- Patient may experience any PF symptom you can imagine
- Pain referral to hip, “sciatic pain”, SIJ, etc.
- Constipation is common in pregnancy
- Treat with manual therapy, downtraining, or uptraining as appropriate
- Teaching safe pushing motor pattern

Postpartum

Postpartum-the First 12 Weeks

- Hormone levels fluctuate wildly
  - Relaxin is still very high
- Muscles that were tight are now on slack and weakened
- Body composition and weight distribution has changed dramatically
- Uterus is undergoing a shrinking process
- Huge emotional changes as well-joy and terror at being a new parent, focus switches from “all about mom” to “all about baby”

Postpartum Red Flags

- Postpartum depression/anxiety/OCD
- Postpartum pre-eclampsia
- Postpartum thyroiditis
- DVT
- Postpartum hemorrhage/placental retention

Typical Postpartum Aches/Pains

- Vaginal/perineal soreness (can be present even with C section)-should resolve or greatly decrease by 7-10 days postpartum
- Pelvic (bone) soreness-can be mitigated with sacral mobilizations, should fade by 2 weeks postpartum
- Other muscular soreness from the labor process-should resolve within a few days
- C section soreness-should resolve or greatly decrease within 4-6 weeks
- May complain of a "falling out" feeling-should resolve within 2-3 weeks, use as a signal to take it slower/easier

Postpartum Ergonomics

Image by OpenClipart-Vectors from Pixabay

- Hugely important for any new mom
- Doing activities repeatedly 24/7 for the first time
- Lack of education about this in our system
- Education should include information about carrying baby, carrying car seat, changing baby, feeding positioning, stroller use, etc.

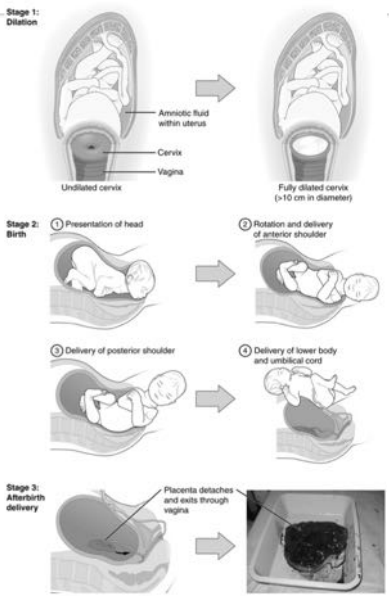
Postpartum Return to Exercise

- Limit high impact activities for the first 6 weeks (vaginal delivery) or until cleared by physician (C section or complicated delivery)
- No heavy lifting/Valsalva for the first 6-8 weeks to prevent damage to pelvic floor/abdominal adhesions
- Can return to gentle exercise as soon as feel ready (walking, yoga or other body weight resistant activities after uncomplicated vaginal delivery
- Kegels/pelvic floor strengthening is helpful-but only if done correctly
- Return to high impact should happen slowly

Common Musculoskeletal Complaints Following Vaginal Delivery

Vaginal Delivery

- Cervix opens and moves anterior
- Pelvic floor muscles are stretched to 2-3 times normal length
- Sacrum-top part widens and moves posterior during early labor-at end stage, bottom portion widens and coccyx moves posterior

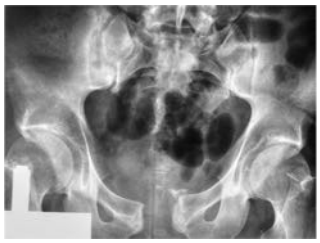


Vaginal Delivery Complications

- Baby or mom's positioning less than ideal for labor- leads to uneven pressures on sacrum and/or pubic symphysis
- Instrument assisted delivery
- Tearing
- Complications from epidural placement
- Shoulder dystocia
- Long OR short pushing stage

Symphysis Pubis Dysfunction or Separation

- 7% of SPDs present during pregnancy persist postpartum
  - No studies on whether physical therapy management changes this number
- Separation-dislocation of pubic symphysis (>9 mm separation)
  - Extreme pain anteriorly, may be unable to walk
  - May hear "clunk" during delivery or in the first 48 hours postpartum
  - Palpable separation



Symphysis Pubis Dysfunction

- Dysfunction
  - Core retraining
  - Gentle mobilization into as close of anatomical approximation as possible
- Separation
  - Acutely: education-bed mobility (no log roll), transfers, ambulation (may need assistive device), care for child, use of sacroiliac belt of tolerated, no active hip or core exercise, ice for pain at home
  - When cleared for therapy: core strengthening, hip strengthening

Coccydynia

- Joint dysfunction or soft tissue dysfunction
- Pain which increases with sitting, running, stepping up, or attempting to do a pelvic floor contraction-may have pain with bowel movements
- Gait is often antalgic
- Pain is often not central
- Palpable tilt
- Sometimes fractured
- Occurs most often with deliveries where mom was supine or sitting

Pelvic Organ Prolapse

- Extrusion of rectal tissue (rectocele), urinary system tissue (cystocele), or cervical tissue through the vagina
- Typically due to prolonged or too forceful of a pushing phase plus the weakened/stretched pelvic floor OR returning to high impact or heavy lifting exercises before pelvic floor was recovered adequately
- 4 stages-conservative care can help with all but the most severe stage

Common Musculoskeletal Complaints After Cesarean Section

Cesarean Section

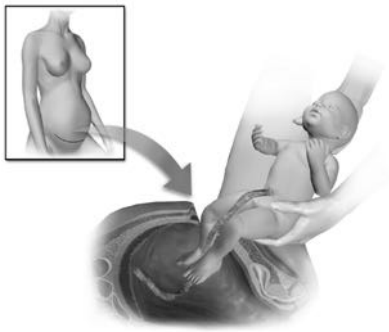
- Incision is made through abdominal musculature and uterus, then uterus is sewn up and skin is stapled together
  - This is a major abdominal surgery
  - Patients do not usually receive rehab (we are going to change this!)
- Surprisingly, rate of pelvic pain and incontinence are not lower in post-C section patients compared to SVD patients
  - Suggests it is pregnancy, not delivery, that causes pelvic floor issues

Cesarean Section

- People who labor for a while pre C section can have all the same MSK issues as people with SVD
- Planned C sections have a significantly higher correlation with postpartum low back pain compared to emergency C section or SVD
- Can have higher risk of postpartum depression

Core Retraining

- Remember-core musculature was completely disrupted-after being stretched!
- VERY important to incorporate coordination of muscles, not just strengthening
- Check pelvic floor function



Common Postpartum Challenges

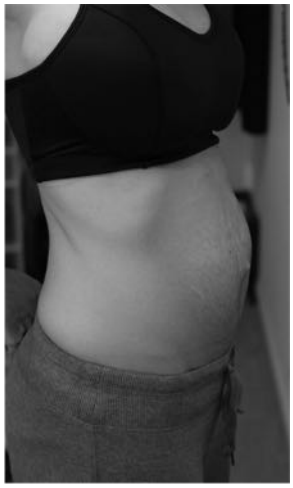
Regardless of delivery type

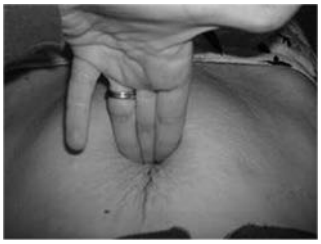
Diastasis rectus

- Separation of the rectus abdominus (over stretch vs split)
- Most common during the last half of pregnancy, but can also occur during labor
- If not treated, this can lead to pelvic instability and low back pain

Diastasis Rectus Testing

- Testing:
  - Patient in hooklying-ask to raise head and shoulders while reaching toward feet
  - The clinician measures with fingers/palpation
  - A separation of 1-1.5 fingers width is considered normal and will resolve spontaneously
  - If the separation is 2-2 ½ fingers-width or there is a bulge upwards that looks like a mound at midline, special precautions are warranted
- Depth is more important than width for prognosis





Diastasis Rectus Prognosis

- Depends on severity
- Worst cases may require surgical intervention due to herniation
- Most cases respond positively to conservative care
- Special precautions for severe DRA:
  - Avoid twisting/reaching activities, especially at midrange
  - No full sit ups or leg drops/leg lifts
  - Supine->sit transition via log roll method
  - Manually splint during coughing or sneezing

Diastasis Rectus-Treatment

- It is VITAL to retrain transverse abdominus first
- Retraining should begin within a few days for women who underwent a vaginal delivery; wait 4-6 weeks after a C-section
- Monitor for closure/depth shrinking (but goal is ability to pre tense fascia and control intra-abdominal pressure)
- As the muscle strength/position improves you can go on to more advanced stability retraining such as bird dog
- If you are having a hard time activating TrA, a lumbopelvic manipulation may help “reset” the musculature and allow for better contraction

Pelvic Floor Dysfunction

- Remember: dysfunction is equally likely regardless of delivery type
- Pelvic floor trauma/scar tissue
- Instrument assisted delivery
- Episiotomy
- Tearing
- Levator ani avulsion
- Pelvic organ prolapse

Cervical, Thoracic, Rib Pain

- Changes in posture with caring for child can lead to issues here
- If breastfeeding, breasts may have even increased in size from pregnancy size
- Patient education
  - Feeding position
  - Carrying child
  - Stretching, movement

Lower Back and Pelvic Girdle Pain

- Complications from epidural or spinal placement can cause short or long term issues here
- Same causes as prenatal issues in these areas
- This may show up years or even decades later
- Patient education
  - Carrying child
  - changing and lifting child
  - Stroller use

Nerve Compression Injury

- Typically from positioning in stirrups, usually the fibular nerve as it wraps around the fibular head
- Symptoms
  - Foot drop/weakness
  - Numbness
  - Tingling
  - Pain
- May resolve on its own, may require intervention (gait training, mobilization, strengthening)

Outpatient Postpartum Evaluation

- Functional movement assessment to look at motor patterns
- Evaluate/address any specific pain/dysfunction that is present
- Check for diastasis rectus
- Pelvic floor exam
  - Prolapse
  - Palpation
  - Muscle activation ability

Case Study

- 42 year old female with complaints of significant low back pain and leg pain with all positions and activities. Insidious onset, significant to the point where she is vomiting multiple times per day and can only tolerate flat/supine positioning. G2P1, her last pregnancy was 17 years ago, uncomplicated vaginal delivery.

Case Study

- What would you like to know?
- What tests might you like to do?
- What interventions might you plan?
- Likely prognosis? Any implications for labor?

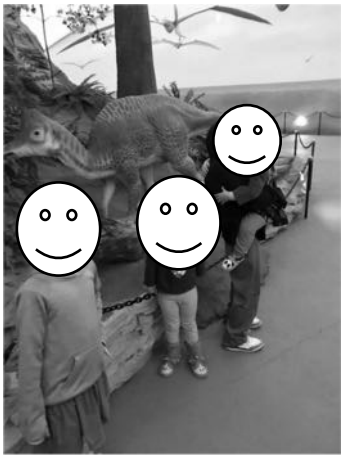
Case Study

- 31 year old female with complaint of right sided hip pain since her last delivery 8 months ago. It has been ongoing with no real easing factors, worse with increased activity. G3P3. Did not have hip pain during her pregnancy but noticed immediately upon delivery. She is breastfeeding.

Case Study

- What else do you want to know?
- What is your differential diagnosis?

Questions?



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