

# Demystifying Treatment of the Pregnant Patient

Polly Holcomb, DPT  
Susan Palmer, MSPT

October 2, 2010

---

---

---

---

---

---

---

## Course Objectives

- Identify key components of the physical examination for the pregnant patient with spinal/pelvic pain
- Describe effective manual therapy techniques and modifications for the pregnant patient
- Describe considerations for exercise in the pregnant population
- Demonstrate appropriate body mechanics for ADLs, labor positions, and early childcare

---

---

---

---

---

---

---

## Course Schedule/Outline

- Introduction
  - Prevalence, Terminology, Risk Factors, and Etiology
- Physiology of pregnancy
- Lumbar anatomy and physiology review
- Evidence-informed treatment of chronic LBP
  - Manual therapy, exercise, modalities, education
- Evidence-informed treatment of LBP in pregnancy
  - Manual therapy, exercise, modalities, support belts
- History taking and evaluation, special considerations
- What we do
  - Manual therapy, exercise, education/body mechanics
- Case studies

---

---

---

---

---

---

---

### Prevalence of Back Pain

- Lifetime incidence of lower back pain (LBP) for all people 60-90%.
- Most studies show LBP to be more common in women than men.
- 15-24% of women attribute the onset of their LBP to pregnancy (Alexander & McCormick)
- Discal pathology is common in women of childbearing age (Alexander & McCormick)

---

---

---

---

---

---

---

---

### Prevalence of Back Pain in Pregnancy

- Reports vary from 45-82%
- Pain is severe enough to interfere with everyday activities in up to 30% of cases (Nakhostin Ansari)
- Pelvic floor dysfunction is seen in 52% of cases (Pool-Goudzwaard).
- Often seen as a “normal” part of pregnancy – and women are told it will resolve following delivery

---

---

---

---

---

---

---

---

### Mousavi, et al. 2007 cont'd

Results: 161 of the 325 reported lumbopelvic pain at the time of the examination

91/161 (28%) PGP  
43/161 (13.2%) LBP  
27 (8.3%) combined pain

39% of those with lumbopelvic pain reported the onset to be at the first 2 mos. of pregnancy.

---

---

---

---

---

---

---

---

## Evidence: Prevalence

Mousavi, et al. 2007

Cross-sectional study to differentiate between pregnancy related pelvic girdle pain and low back pain in Iranian women and investigate the prevalence of each syndrome.

N=325

Methods: Interviewed using a questionnaire, PTs performed provocation tests on all women with lumbopelvic pain

---

---

---

---

---

---

---

---

### **Do symptoms always resolve following delivery?**

- Regression of symptoms can be slow and incomplete.
- 16-20% persist with symptoms even 3 years post (Gutke, et al)
- Women with both LBP and pelvic girdle pain (PGP) recover to a lower degree (33%), compared to 66% with PGP, and 72% with LBP (Gutke, et al)

---

---

---

---

---

---

---

---

## Evidence: Prediction factors for incidence of lumbopelvic pain

Gutke, et al. 2008

Cohort study

N=308

Methods: Women were classified into LBP subgroups by mechanical assessment of the lumbar spine, pelvic pain provocation tests, standard history and pain drawings. Trunk muscle endurance, hip muscle strength and gait speed were evaluated.

---

---

---

---

---

---

---

---

### Gutke, et al. cont'd

Results: 272 women were included in the follow up analysis (3 mos post partum)

89/272 experienced LBP (33%)

Of these: 46 had PGP, 29 had LBP, and 14 had combined pain.

Women with combined pain recovered to a lower degree (33%) than those with PGP (66%) or lumbar pain (72%).

---

---

---

---

---

---

---

---

### Gutke, et al. cont'd

Conclusions: Predictors for persistent PGP and combined pain were work dissatisfaction, combined pain in early pregnancy, older age and low endurance of back flexors.

1 of 5 women with PGP or combined pain persisted, whereas 1 of 29 women with LBP.

---

---

---

---

---

---

---

---

### Pregnancy Related Lower Back Pain

- Pain is generally perceived in the low back and often radiates into the buttocks and posterior thighs.
- Generally exacerbated by activities such as walking, sitting, forward bending, and lifting.
- Variety of terms are used in the literature and clinic: pelvic girdle relaxation, pelvic joint instability, posterior pelvic pain, sacroiliac joint inflammation, round ligament pain, etc.

---

---

---

---

---

---

---

---

### Terminology

- Pelvic Girdle Pain (PGP): pain occurs between the posterior iliac crest and the gluteal fold, commonly near the SI joints (European guidelines)
- Pain can occur separately or in conjunction with LBP
- Lower back pain (LBP): pain occurs between the 12<sup>th</sup> rib and the gluteal fold

---

---

---

---

---

---

---

---

### PGP vs. LBP

- LBP
- Centralization/peripheralization phenomena with repeated movements
- Fewer than 2 positive pelvic provocation tests
  
- PGP
- Absence of centralization/peripheralization phenomena with repeated movements
- Positive Pelvic Provocation Tests

---

---

---

---

---

---

---

---

### Pelvic Provocation Tests

- Disputed effectiveness of these tests (Alexander & McCormick)
- “Objective methods of defining pelvic pain do not exist” (Endersen)
- Standing flexion, prone knee flexion, supine long sitting test and sitting PSIS test: reliability is too low for clinical use (Vleeming, et al)

---

---

---

---

---

---

---

---

### Pelvic Provocation Tests

- Highest sensitivity and specificity for the SI joint were the P4, Patrick's Faber Test, and Menell's Test (Vleeming, et al.)
- Neurologic Exam to rule out lumbar origin
- Active SLR

---

---

---

---

---

---

---

### Risk Factors

- Published studies are frequently in conflict
- Reasons for variation: prospective vs. retrospective studies, diagnostic criteria variable, lack of consistency in defining the location of pain.
- Most probable factors: history of previous lbp &/or previous trauma to the pelvis, and having a demanding occupation.

---

---

---

---

---

---

---

### Evidence: Prevalence, Aggravating & Relieving Factors

Mohsei-Bandpei, et al. 2009

Cross sectional Study

N=1100

Purpose: Determine the prevalence & risk factors of LBP during pregnancy

Methods: Data were collected using a questionnaire distributed at their health care clinic. (96.5% response rate)

---

---

---

---

---

---

---

### Mohsei-Bandpei, et al. Cont'd

Point prevalence of LBP: 40.2%  
Pain in the last mo: 55.9%  
Pain in the last 6 mo: 59.4%  
Pain in the last year: 76.2%  
Lifetime incidence: 84.1%

Mean Pain on VAS: 51/100  
Previous LBP reported by 48.9%  
Pain during a prior pregnancy: 44.1%

---

---

---

---

---

---

---

---

### Mohsei-Bandpei, et al. Cont'd

Significant risk factors: previous history of LBP, back pain during a previous pregnancy, younger women. Parity was not a risk factor.  
Women who were not doing regular exercise were more likely to experience LBP (though not statistically significant)  
Women living in urban areas were more likely to experience LBP  
Those women with help in their home were less likely to report LBP.  
Self rated as healthy less likely to experience LBP

---

---

---

---

---

---

---

---

### Evidence: Risk Factors

Levangie, 1999  
Purpose: Investigate the magnitude of association between LBP and self-reported factors thought to increase the risk of LBP  
N=150  
Questionnaires were completed by 150 patients receiving physical therapy for LBP. 138 patients being seen for other reasons served as the control group.

---

---

---

---

---

---

---

---

Levangie, cont'd.

Results: LBP was positively associated with:

- smoking status
- pregnancy
- industrial vibration exposure
- time spent in a car (1 hour or more)

---

---

---

---

---

---

---

---

Levangie, cont.d

• Weak positive association with:

- Daily lifting
- BMI
- Activity level
- Time sitting or standing
  
- 1 or more full-term vaginal deliveries increases the odds of LBP with increasing age

---

---

---

---

---

---

---

---

Evidence: Back pain in pregnancy

Ostgaard, et al. 1997

Prospective RCT

N=465

Purpose: to describe the long-term development of back pain in relation to pregnancy and to identify the effects of a physiotherapy and patient education program attended during pregnancy

---

---

---

---

---

---

---

---

### Ostgaard, et al. Cont'd

Group A: Control, received usual prenatal care  
 Group B: received education in posture, anatomy, vocational ergonomics, muscle exercises and relaxation. Presented the information in two 45 min. classes and issued a written summary.  
 Group C: : received education in posture, anatomy, vocational ergonomics, muscle exercises and relaxation. Classes were presented in five 30 min sessions at 4 week intervals and issued on cassette.

---

---

---

---

---

---

---

---

### Ostgaard, et al. Cont'd

First phase completed by 362 women  
 3mos post-partum by 351  
 6 years post-partum by 303 women  
  
 Back pain 18% incidence before pregnancy, 71% during, and back to 16% at 6 years post.  
  
 Pain intensity was highest in week 36

---

---

---

---

---

---

---

---

### Ostgaard, et al. cont'd

- Results: Frequency of back pain attacks during pregnancy correlates strongly with pain 6 years postpartum.
- Women with back pain earlier in life had back pain more often during an after pregnancy.
- Individualized treatment was shown to be more effective.
- Conclusion: Pregnant women should be included in the PT and education program as soon as back pain or pelvic pain appears.

---

---

---

---

---

---

---

---

### Possible Factors

- History of previous LBP
- Previous Trauma to the Pelvis
- Smoking
- Multiparity
- Physically Strenuous Work
- Maternal age
- LBP with Menstruation
- Decreased time between pregnancies

---

---

---

---

---

---

---

---

### The Jury is Out: Conflicting Evidence

- Maternal height and weight
- Physical Fitness
- Occupation
- Obesity
- Weight Gain in Pregnancy
- Fetal Weight

---

---

---

---

---

---

---

---

### Risk Factors for Persisting Pain

- Low Endurance of the spinal extensors
- Low Endurance of the spinal flexors
- Older age
- Pain in Early Pregnancy (between 12-18 wks)
- Work dissatisfaction
- Hypomobility
- High pain score during pregnancy

---

---

---

---

---

---

---

---

## Etiology

---

---

---

---

---

---

---

## Etiology

- Mechanical Overload
- SI dysfunction
- Night pain
- Local effects on the pelvic structures
- Movement dysfunction
- Bulging or herniated disc
- Hormonal changes

---

---

---

---

---

---

---

## Mechanical Overload

- Abdominals are stretched beyond an effective length for contraction for stabilization.
- Center of gravity is shifted forward progressively throughout the pregnancy
- Hyperlordosis of the TL spine and shortening of the paraspinal muscles
- Muscle strain results in pain.

---

---

---

---

---

---

---

### SI dysfunction

- Sacrum impinges on the ilia due to abdominal weight gain, anterior displacement of the pelvis, & ligament laxity.
- Inferior and anterior displacement of the sacrum stretches the ligamentous capsule – causes pain & separation of the pubic symphysis and pain.

---

---

---

---

---

---

---

### SI dysfunction???

- Several studies have shown that there is no linear relationship between pain and the increase range of motion in the pelvic joints (Vleeming, et al.)
- Some women can tolerate this increase in range of motion, while others can not

---

---

---

---

---

---

---

### Local Effects

Direct pressure of the fetus and uterus on the lumbosacral nerve root

- Stimulates the pelvic nociceptors
- Refers pain to the lumbar and sacral segments

---

---

---

---

---

---

---

### Movement Dysfunction

- Pregnancy related changes (TL hyperlordosis, weight gain, etc. )

---

---

---

---

---

---

---

---

### Night Pain

- Inferior vena cava is compressed by the uterus
- Paravertebral venous plexus becomes congested
- Increase in intravascular volume in the recumbant position
- Overdistention and stasis of vertebral venous channels with resultant hypoxia and metabolic disturbances at the nerve root – produces pain
- Symptoms are relieved with position changes

---

---

---

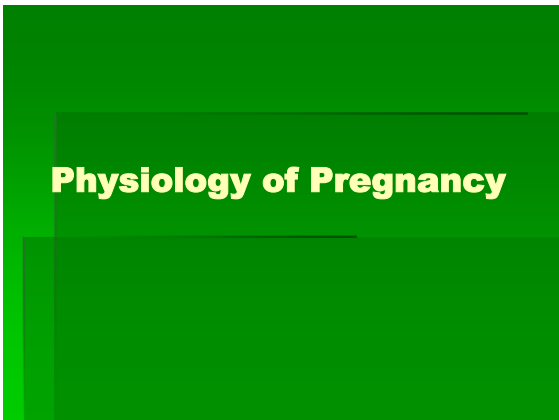
---

---

---

---

---



---

---

---

---

---

---

---

---

## Pulmonary System Changes

- Respiratory Rate and Vital Capacity are essentially unchanged
- Increase tidal volume: increase oxygen uptake and air exchange
- Dyspnea at rest is common in last trimester

---

---

---

---

---

---

---

---

## Cardiovascular Changes in Pregnancy

- Increased blood volume by 35-50 % (RBC volume increase less than total plasma volume increase resulting in physiological anemia)
- Resting heart rate increased 15-20 bpm (mostly in the last trimester)
- Slight decrease in BP 1<sup>st</sup> ½ of pregnancy then gradually returns to pre-pregnancy level
- Blood pressure stabilizes secondary to decreased vascular resistance
- Increased blood flow to organs (50 ml non-pregnant to 600 ml to uterus at term)

---

---

---

---

---

---

---

---

## Supine Hypotension

- Supine hypotension- decreased placental blood flow due to the weight of uterus on inferior vena cava thus causing a decrease in cardiac output
- Effects 3-11% of women
- Symptoms- light headedness, dizziness in supine
- Avoid supine after 5<sup>th</sup> month of pregnancy
- ACOG Guideline-avoid supine position for more than 10 minutes at a time
- Alternate positions- sidelying ( Left preferred), ¼ turn, propped sitting

---

---

---

---

---

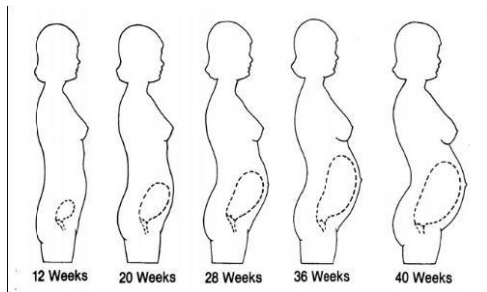
---

---

---

## Common Postural Changes

- Increased cervical, thoracic or lumbar curves (however, often lordosis increase is limited to upper segments or at the T/L junction leaving the majority of the lumbar spine in a flat position)
- Rounded shoulders
- Hyperextension of knees with internal rotation at the hips
- Pronated feet
- Widened base of support



[http://www.brooksidepress.org/Products/Obstetric\\_and\\_Newborn\\_Care\\_11\\_images/Figure\\_5\\_3\\_Postural\\_changes\\_during\\_pregnancy\\_500.jpg](http://www.brooksidepress.org/Products/Obstetric_and_Newborn_Care_11_images/Figure_5_3_Postural_changes_during_pregnancy_500.jpg)

## Hormones

Major player in pregnancy-related LBP?





How does information on hormones affect clinical practice for pregnant patients with LBP?

- Patients with complaints of LBP early in pregnancy—most likely not relaxin/ligament related
- In the case of pelvic laxity, check for hypomobility centrally
  - GET YOUR HANDS ON THEM

---

---

---

---

---

---

---

# ANATOMY & PHYSIOLOGY

---

---

---

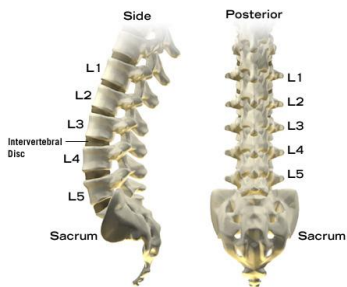
---

---

---

---

## LUMBAR ANATOMY



---

---

---

---

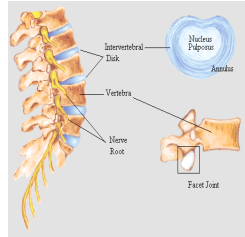
---

---

---

## LUMBAR ANATOMY

- Each disc comprises of an inner nucleus pulposus, an outer annulus fibrosus
- The nucleus tends to be primarily water
- Must have mobility to maintain nutrition to the disc




---

---

---

---

---

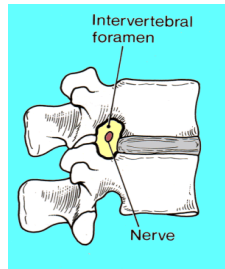
---

---

---

## LUMBAR ANATOMY

As the spinal nerves pass through the intervertebral foramina, they lie directly behind the disc.




---

---

---

---

---

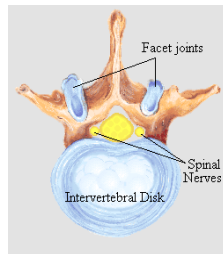
---

---

---

## LUMBAR ANATOMY

- The disc is flexible and can move in all directions
- The disc acts like a shock absorber




---

---

---

---

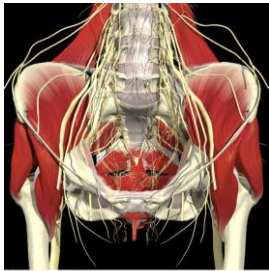
---

---

---

---

## PELVIC FLOOR ANATOMY



© 2003 Primal Pictures Ltd.

---

---

---

---

---

---

---

---

## PATHOPHYSIOLOGY

---

---

---

---

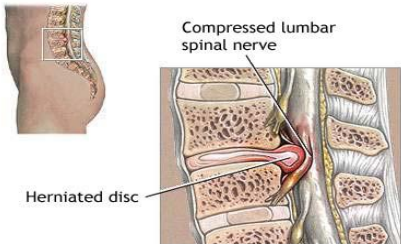
---

---

---

---

## LUMBAR DISC DYSFUNCTION



ADAM.

---

---

---

---

---

---

---

---

### LUMBAR DISC DYSFUNCTION

- Spinal flexion results in posterior bulging of discs
- Spinal extension decreases posterior bulging
- Analogy of dinner plates and water balloon

---

---

---

---

---

---

---

### LUMBAR DISC DYSFUNCTION

- Posterior bulging of the disc may compress the spinal cord as well as individual nerve roots
- Posterior bulging, or herniation, can be the annulus or nucleus

---

---

---

---

---

---

---

### LUMBAR DISC DYSFUNCTION

In the lumbar spine, disc herniation or protrusion is most common in the L4-L5 and L5-S1 discs and is rarely seen above those levels (less than 5%)

---

---

---

---

---

---

---

## LUMBAR DISC DYSFUNCTION

**EXCESSIVE SPINAL FLEXION WITH ADLs COMBINED WITH VERY LITTLE SPINAL EXTENSION IS A MAJOR CONTRIBUTING FACTOR OF DISC DYSFUNCTION (i.e. protrusion or herniation)**

---

---

---

---

---

---

---

---

## NERVE ROOT INFLAMMATION & PERIPHERAL NERVE DYSFUNCTION

- When the disc protrudes postero-laterally, it can impinge upon a nerve root, producing nerve root irritation/inflammation (NRI).
- The disc itself can also be the source of inflammation caused by biochemical factors.

---

---

---

---

---

---

---

---

**Evidence-Informed Treatment of Chronic Low Back Pain (CLBP)**

---

---

---

---

---

---

---

---

## Evidence-Informed Treatment of LBP

- The Spine Journal
- January/February 2008, Volume 8, Number 1
- Evidence Informed vs. Evidence Based Medicine (EBM)
  - EBM: Literature search, critically appraise literature, synthesize key research findings by level of evidence and adopt treatments with strong supporting evidence, discard treatments with insufficient supporting evidence
  - Evidence-Informed: Based on review articles by experts with the goal of making clinicians aware of the best available evidence for the available treatments for CLBP

---

---

---

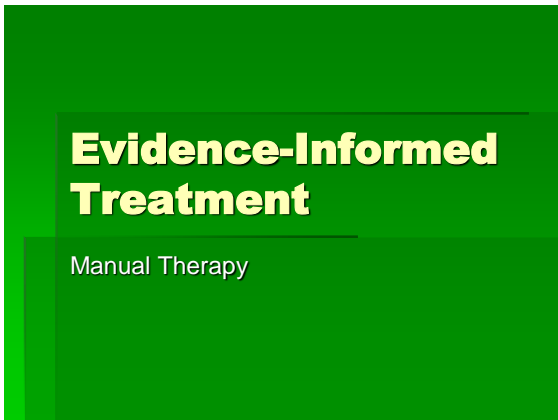
---

---

---

---

---



---

---

---

---

---

---

---

---

## Spinal Manipulation and Mobilization

- Spinal Manipulative Therapy (SMT)
  - Application of high-velocity, low-amplitude thrust(s) slightly beyond the passive range of joint motion
- Spinal Mobilization (MOB)
  - Application of manual pressure to spinal joints within the passive range of joint motion (does not involve a thrust)

---

---

---

---

---

---

---

---

### Contraindications to SMT/MOB

- SMT
  - Fever, unremitting night pain or pain at rest, pain combined with weakness or numbness distal to the knee, loss of bowel/bladder control, direct trauma, unexplained weight loss, history of cancer, progressive neurological deficit
- SMT or MOB
  - Fracture, severe osteoporosis, tissue disruption due to trauma

---

---

---

---

---

---

---

---

### Systematic Review

- Clinical Practice Guidelines (6): 3 (countries) recommended SMT, 3 were inconclusive
- Systematic reviews (6): 4 supported SMT for chronic LBP, 1 inconclusive, 1 did not support SMT for chronic LBP
- RCT's (22)
  - 9 were mixed subacute/chronic, 13 chronic

---

---

---

---

---

---

---

---

### Summary of Results

- In general, SMT has positive results in improving pain and decreasing disability in patients with chronic LBP
- Chronic LBP
  - Moderate evidence that results of SMT are similar to results achieved with other treatment methods including NSAID's, exercise, and physical rehabilitation
- Mixed LBP (acute/chronic)
  - Strong evidence that SMT is similar in effect to exercise instruction combined with medical care

---

---

---

---

---

---

---

---

## Harms

- “The preponderance of the evidence for efficacy, including recent high-quality trials, and the estimated very low-risk of serious AEs [adverse events] support SMT and MOB as viable options for the treatment of CLBP
- Rare adverse events (including SMT performed under anesthesia):
  - 1 cauda equina syndrome per 4-128 million SMT
  - 1 lumbar disc herniation per 8 million SMT

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

## Evidence-informed management of LBP

- Lumbar extensor strengthening
- Lumbar stabilization
- McKenzie Method

---

---

---

---

---

---

---

---

## Lumbar Extensor Strengthening

- Definition: supervised progression resistance exercise (PRE) with isolation of the lumbar extensors.
- Based on exercise prescription guidelines for PREs:
  - Up to 25 reps/set
  - 1-3 sets/session
  - 1-3 sessions/wk
  - Full, pain free ROM extension resistance

---

---

---

---

---

---

---

---

## Proposed Mechanism

- Isolated PREs improve structural integrity of affected region
- Dynamic exercise enhances metabolic exchange of the lumbar disc
- Improves fear of movement and locus of control

---

---

---

---

---

---

---

---

## Indications

- Non-specific mechanical chronic LBP
- No red flags or contraindications to resistance exercise
- Patient who:
  - is willing to take responsibility for his/her own self-care through active exercise
  - Recognizes the long-term benefit, despite the possibility of short-term discomfort.

---

---

---

---

---

---

---

---

### Available evidence

- Included RCTs 11
- Excluded RCTs (none )
- Systematic reviews: None

---

---

---

---

---

---

---

---

### Summary

- Short term: Extensor strengthening alone or with co-interventions is more effective than no treatment, and passive physical modalities
- There is no clear benefit of extensor strengthening compared with other exercises.
- Long term: some of the relative benefit is lost.

---

---

---

---

---

---

---

---

### Summary

- Improvements in lumbar muscle strength and endurance:
  - Extensor strengthening exercise alone or with co-interventions is more effective than no treatment and passive modalities
  - No clear benefit compared with other exercises
  - High intensity exercise appears to be superior to low intensity exercise

---

---

---

---

---

---

---

---

### Summary

- Improvements in the lumbar muscle cross-sectional area:
  - Extensor strengthening alone or with co-interventions is more effective than stabilization and home exercise.

---

---

---

---

---

---

---

---

### Harms

Temporary side effects in 3/11 RCTs

Increased LBP

Dizziness

No reported serious adverse events in reviewed RCTs

Possible side effects and adverse events:

delayed onset of muscle soreness, fracture, lumbar disc herniation, muscle strain, cardiovascular event

---

---

---

---

---

---

---

---

### Summary

- Lumbar Strengthening exercise appears to be effective in improving pain, disability, and physical function in patients with LBP
- In the absence of contraindications, a course of treatment including lumbar strengthening exercise with or without co-interventions is a reasonable option
- Best use of lumbar strengthening exercise (vs. other exercises) may depend on patient preference

---

---

---

---

---

---

---

---

### Lumbar Stabilization exercises

- Description: Therapeutic exercise aimed at improving neuromuscular control, strength, and endurance of muscles in order to maintain dynamic spinal stability
- Targets specific intrinsic core muscles
- Isometric or small ROM near neutral position
- Low Intensity

---

---

---

---

---

---

---

---

### Proposed Mechanism

- Training co-contraction of the deep lower trunk muscles (transverse abdominis, multifidus, quadratus lumborum) enhances spinal stability
- Facilitating motor control of the deep lower trunk muscles improves firing patterns during functional activities.

---

---

---

---

---

---

---

---

### Indications

- Chronic LBP with or without anatomic considerations
- No red flags
- Reproducible, mechanical pattern of lumbopelvic pain that follows a specific plane or movement or functional test

---

---

---

---

---

---

---

---

### Available evidence

- Included studies
- 0 CPGs
- 0 SRs
- 3 RCTs
  - 2 high quality/clinically relevant
  - 1 low quality/not clinically relevant

---

---

---

---

---

---

---

---

### Summary

- Strong evidence:
  - Stabilization exercise is no more effective than a less specific general exercise program
- Moderate evidence
  - Stabilization exercise is effective in improving pain and function
  - Stabilization exercise is no more effective than manual therapy

---

---

---

---

---

---

---

---

### Harms

- No serious harmful outcomes reported in 3 RCTs
- Possible harms:
  - Similar to other sub-maximal physical activities and exercises
  - additional fall risk when using therapy ball

---

---

---

---

---

---

---

---

### Core Stabilization Summary

- Core Stabilization exercise appears to be effective in improving pain, disability, and physical function in patients with LBP
- Core stabilization exercise may be considered a useful tool in the management of chronic LBP
- No evidence to suggest that core stabilization exercise is better than other forms of exercise

---

---

---

---

---

---

---

---

### McKenzie Method

- Description: A medical history and physical examination are completed in which responses to repeated lumbar movements are noted to enable the clinician to make a provisional classification of the patient's condition.
- The classification is then used to plan treatment (derangement, dysfunction, and postural syndrome)

---

---

---

---

---

---

---

---

### Proposed Mechanism

- Exercises are used to strengthen muscles, increase soft tissue stability, restore range of movement, cardiovascular conditioning, increase proprioception, and reduce the fear of movement.

---

---

---

---

---

---

---

---

### Indications

- At least 6 studies have reported on the excellent prognosis for patients who were categorized as centralizers – provided the directional preference of the patient is followed.
- Recurrent LBP – these patients are also typically found to have a directional preference and centralize symptoms with repeated reps.

---

---

---

---

---

---

---

---

### McKenzie Method Efficacy Summary

- McKenzie Classification method consistently demonstrates more reliability than any other alternative examination procedures.
- McKenzie method produces better short-term outcomes than non-specific guidelines based care.
- McKenzie method in hands of an experienced clinician is a very powerful tool to determine who will respond in a straightforward manner

---

---

---

---

---

---

---

---

### Harms

- There are no documented side effects or adverse events related to this intervention.
- Failure to alter symptom distribution is a strong predictor of negative outcomes.

---

---

---

---

---

---

---

---

## Brief Education as Treatment

- When provided in a clinical setting, there is strong evidence that brief education (provided as a stand-alone intervention) is not more effective than usual care for decreased pain, but it is more effective than usual care for returning to work
- There is conflicting evidence that brief education is more effective than usual care for disability reduction

---

---

---

---

---

---

---

---

## Modalities

### Evidence Based Practice for CLBP

- Spine Journal review
  - IFC: no eligible studies to base recommendations for IFC
  - EMS: no eligible studies to base recommendations for EMS
  - Ultrasound: no eligible studies to base recommendations for Ultrasound
  - MHP/CP: no eligible studies to base recommendations for IFC
- Although modalities commonly used, “few studies were found to support their use” for CLBP

---

---

---

---

---

---

---

---

## Treatment of LBP in Summary

- Routine use of diagnostic testing prior to initiating interventions is questionable
- Choice of intervention can be guided by specific indicators when they are known
- Current level of evidence is not strong for many interventions routinely used today
- Possibility of harms are not always discussed when weighing the options

---

---

---

---

---

---

---

---

## Treatment of LBP in Summary

Evidence informed approach would include:

- Exercise (strengthening or stabilization)
- Education
- Occasional use of therapies offering short-term pain relief that permit return to ADLs & exercise.
  - NSAIDS
  - Simple analgesics
  - SMT/Mob
  - Needle acupuncture
  - TENS

---

---

---

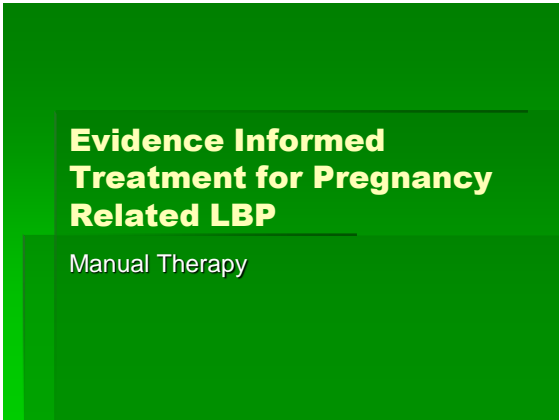
---

---

---

---

---



---

---

---

---

---

---

---

---

## Manual Therapy in Pregnancy-Related LBP

- Research
  - Limited
  - Techniques generally not well-described

---

---

---

---

---

---

---

---

## Osteopathic Manipulative Treatment (OMT)

- Licciardone JC
- RCT
- N=177
- Group 1: usual obstetric care, OMT (mobilization and manipulation)
- Group 2: usual obstetric care, sham ultrasound
- Group 3 usual obstetric care
- Results:
  - Back-specific functioning deteriorated significantly less in OMT group
  - LBP decreased in OMT group
  - LBP remained unchanged in group 2
  - LBP increased in obstetric care only group

---

---

---

---

---

---

---

---

## European Guidelines for Diagnosis and Treatment of Pelvic Girdle Pain (PGP)

- Vleeming A
- Review article for various treatments
- Difficult to distinguish PGP from LBP
- Evidence levels as defined by Cochrane
- Massage (Evidence level C) Recommendation: no evidence as a stand-alone treatment for PGP
- Manipulation and Joint Mobilization (Evidence level D) Recommendation: may be used to test for symptomatic relief

---

---

---

---

---

---

---

---

## Systematic Review of Chiropractic Treatment

- Stuber K
- 6 studies
- Treatment: manipulation, mobilization, myofascial release, exercise, education
- Results: all studies reported improved outcome in pregnancy-related LBP
- Limitations: poor to moderate quality studies (no RCT's, no studies in "good" category)
- Conclusion: chiropractic care may be helpful in treatment of pregnancy-related LBP; Unable to formulate any definitive conclusions secondary to weakness of literature
- NOTE: adverse events
  - 1 study reported no adverse events; other studies did not report

---

---

---

---

---

---

---

---



Evidence Informed treatment for Pregnant Patients

Dumas, et al. 1995

NRCT

N = 65

Evaluating the effectiveness of fitness classes for women on posture and back pain

Treatment group: TIW exercise class (started no earlier than 12<sup>th</sup> wk of pregnancy to term)

Control group: sedentary

No effect of exercise on posture was detected

---

---

---

---

---

---

---

---

Dumas, et al. cont'd

- Results:
- This particular program did not prevent or reduce back pain
- Sedentary group- more pain second half of pregnancy & only decreased slightly after delivery
- Treatment group – pain increased throughout the pregnancy, decreased significantly postpartum

---

---

---

---

---

---

---

---

Evidence Informed Treatment for Pregnant Patients

Fast, et al. 1990

NRCT

N=334

Correlating changes in abdominal muscle strength with LBP during pregnancy

Group A: 164 pregnant women

Group B: 164 non-pregnant women

---

---

---

---

---

---

---

---

### Fast, et al. (cont'd)

- 10% of pregnant women developed LBP
- 49% of non-pregnant women complained of LBP
- 16.6% of pregnant women could not perform a single sit up
- All non-pregnant women could perform a sit up
- There was statistically no significant correlation between the sit up performance and LBP

---

---

---

---

---

---

---

---

### Evidence Informed treatment for Pregnant Patients

- Garshabi & Faghieh, 2005
- RCT
- N=266
- Treatment group 1: TIW x 12wks, 15 movements in 60 min (5 min walk, 5 min extension, 10 min gen warm up, 15 anaerobic, 20 specific exercise (abs, hams) 5 min cool down) 140 bpm max
- Control: no exercise intervention offered

---

---

---

---

---

---

---

---

### Garshabi & Faghieh, cont'd.

- Evaluating the effectiveness of special exercise during pregnancy in preventing or reducing LBP
- Initial questionnaire revealed 68% of treatment group and 70.5% of control group were experiencing LBP
- "After" questionnaire: Intensity of pain in the exercise group was significantly decreased, Control group was increased

---

---

---

---

---

---

---

---

### Garshabi & Faghih, cont'd

- Flexibility between the two groups was not significantly different at the start of the study
- "After" flexibility was decreased for both groups, but there was significant difference between the two groups
- Exercise during the 2<sup>nd</sup> & 3<sup>rd</sup> trimester can reduce the intensity of pain, and increase flexibility of the spine

---

---

---

---

---

---

---

---

### Evidence Informed Treatment for Pregnant Patients

Granath, et al. 2006

RCT

N=390

Comparing the effect of a land-based physical exercise program versus water aerobics on low back or pelvic pain and sick leave during pregnancy

Women were in their 19<sup>th</sup> week on average and exercised once a week throughout pregnancy.

---

---

---

---

---

---

---

---

### Granath, et al. cont'd

Treatment group 1: Land based physical exercise consisting of 45 min of activity followed by 15 min of relaxation.

Treatment group 2: Water aerobics exercise also consisted of 45 min of activity followed by 15 min of relaxation.

Results: Women in group 2 had less pregnancy related low back pain compared to the women in the land-based aerobics groups.

---

---

---

---

---

---

---

---

### Granath, et al. cont'd

Results: No one in the water aerobics group was on sick leave due to low back pain compared to women in the land based group.

No other differences were seen between the two groups.

Conclusion: Water aerobics can be recommended for the treatment of low back pain during pregnancy.

---

---

---

---

---

---

---

---

### Evidence Informed Treatment for Pregnant Patients

Kashanian, et al. 2009

RCT

N=30

Evaluating the effect of exercise on back pain during pregnancy

Treatment group: 30 min of exercise, TIW (4.5 min preparation, followed by walking, stretching, and strengthening exercises for 21 minutes, then relaxation for 4.5 min)

Control group: routine care, no exercise

---

---

---

---

---

---

---

---

### Kashanian, et al.

Conclusions:

No significant differences between the groups in terms of age, weight, BMI, lumbar lordosis angle, or severity of pain and the beginning of the study.

The lordosis angle increased after 2 mos. In both groups, but the increase was greater for the control group.

Severity of pain increased in the control group, but decreased in the study group.

---

---

---

---

---

---

---

---

### Evidence Informed treatment for Pregnant Patients

Morkved et al, 2007

RCT

N=301

Purpose: to see if a training program would help in prevention of urinary incontinence and lumbopelvic pain.

---

---

---

---

---

---

---

---

### Morkved et al, 2007 cont'd

Treatment group: Trained in groups with 10-15 women per group for 60 minutes 1x/wk for 12 weeks. Low impact aerobic activity 15-20 min, strength ex 20-25 min, 5-10 min light stretching, body awareness and breathing/relaxation exercise.

Control group: Not discouraged from exercising on their own, but did not participate in any supervised program

---

---

---

---

---

---

---

---

### Morkved et al, 2007 cont'd

Conclusions: At 36 weeks gestation women in the training group were significantly less likely to report lumbopelvic pain (43% vs 56.2%)

3 months postpartum: 26.3% from the training group vs. 36.6% from the control group had persisting symptoms

Self reported sick leave less for training group (20.9% vs. 24.8%)

Functional status higher for the training group

---

---

---

---

---

---

---

---

Evidence Informed Treatment for Pregnant Patients

Noren, et al. 1997

Cohort Study – Prospective

N=135

Purpose: to identify patients with pain early in pregnancy, and by means of individual educational information and differentiated physiotherapy, reduce sick leave during pregnancy

---

---

---

---

---

---

---

Noren, et al. 1997

Treatment group: women were taught anatomy, posture, vocational ergonomics, pelvic mm training, and relaxation training. An individual exercise program is given for pain type and intensity. Ave # of visits: 3.4 visits for a total of 4 hrs.

Control group: No information on back pain was given.

---

---

---

---

---

---

---

Noren, et al. 1997

Results: 33 women from the intervention group were on sick leave for an average of 30 days

45 women from the control group were on sick leave for an average of 54 days.

The reduction in sick leave reduced insurance costs by approximately \$53,000 US Dollars

---

---

---

---

---

---

---

### Evidence Informed treatment of pregnant patients

- Sihvonen, et al. 1998
  - Prospective
- N=28  
Control group (21): Free of LBP  
All examined during 20 & 36 weeks of pregnancy

---

---

---

---

---

---

---

---

### Sihvonen, et al. cont'd

Results: 79% reported LBP at initial, 71% had pain at delivery.  
Pain scores correlated with maternal body weight (higher weight, more pain)  
Back muscle activity at first tri correlated with pain in the 3<sup>rd</sup> tri. (less activity, more pain)

---

---

---

---

---

---

---

---

### Cochrane Review

Pennick & Young, 2008  
RCT  
8 studies (1305 participants)  
No studies specifically dealing with prevention of back or pelvic pain  
Review of studies examining the effects of adding various pregnancy specific exercises, PT, acupuncture and pillows to usual prenatal care

---

---

---

---

---

---

---

---

### Cochrane Review

Overall, the methodological quality of the studies was poor, raising concerns for potential bias in the results.

All studies reviewed had moderate to high potential for bias, so results should be viewed with caution.

---

---

---

---

---

---

---

### Cochrane Review

Implications: Pregnant specific exercise programs, physiotherapy, and acupuncture added to usual prenatal care appears to reduce back and pelvic pain more than usual prenatal care.

There is a high incidence of pain during pregnancy, and there are factors that place women at risk for symptoms persisting beyond the pregnancy. More and better research is needed on intervention and prevention.

---

---

---

---

---

---

---

## Evidence Informed Treatment for Pregnancy Related LBP

Modalities

---

---

---

---

---

---

---

## Modalities

- Contraindications in pregnancy
  - TENS, e-stim
  - Whole body hydrotherapy (core not to exceed 100.8 °)
  - Ultrasound over trunk
  - Mechanical traction (manual is OK)

---

---

---

---

---

---

---

---

## Evidence Informed Treatment for Pregnancy Related LBP

### Support Belts

---

---

---

---

---

---

---

---

## Support Belts Evidence

- Depledge J 2005 "Management of symphysis pubis dysfunction during pregnancy using exercise and pelvic support belts
- RTC, n=87
- Pedro score 6/10
- Group 1: exercise (core strengthening) only
- Group 2 exercise + non-rigid neoprene support belt
- Group 3 exercise + rigid support belt
- Results: Significant improvement of outcome measures in all groups, but addition of either non-rigid or rigid support belt did not add to effect of strengthening exercise program
  - Use of core mm for stability have possible improved long-term benefit than external support device

---

---

---

---

---

---

---

---

### Support Belts Evidence

- Carr CA 2003 “Use of a maternity support binder for relief of pregnancy-related back pain”
- Clinical trial, non-random, n=40
- Group 1: Loving Comfort back support
- Group 2: control (no treatment)
- Results: ↓ LBP in Rx group, concluded that belts “warrant further study”
- Limitations: lack of randomization and subject blinding, small sample size, possible placebo effect in Rx group
- No Pedro score

---

---

---

---

---

---

---

---

### Support Belts Evidence

- European Spine Journal, Vleeming A 2008
- Recommendation:
  - No evidence to recommend a pelvic stabilization belt as a stand-alone treatment for pelvic girdle pain
  - May be used to test for symptomatic relief, but only used for short time periods

---

---

---

---

---

---

---

---

### Maternity Back Brace



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

### History

---

---

---

---

---

---

---

---

### History Taking

- Typical history of onset, quality and occurrence of symptoms
- Previous treatment/outcome
- Gynecological/obstetrical history
- LBP during previous pregnancy
- Prior pelvic or back surgeries
- Low back/hip pain

---

---

---

---

---

---

---

---

### History taking-continued

- Bowel function
- Bladder function
- Medical history-diabetes, stroke, MS, cardiac/arterial disease, abdominal surgeries
- Activity level
- Quality of life/impact
- Functional/Life Demands – other children, care for aging parents, etc.

---

---

---

---

---

---

---

---

### Evaluation

---

---

---

---

---

---

---

---

### Musculoskeletal Evaluation

- Posture
- Pelvic girdle alignment including sacrum
- Lumbar/Thoracic spine-ROM, areas of restriction with close attention to the transition zone between thoracic/lumbar spine and the more caudal region of lumbo/sacral spine
- Nerve root inflammation, neural tension, sensation
- Hip- ROM, capsular restrictions, strength
- Soft Tissue- trigger points, paraspinal muscle tone, etc.
- Trunk strength- spinal extensors, abdominals

---

---

---

---

---

---

---

---

### Musculoskeletal Evaluation

- Posture
- Pelvic girdle alignment including sacrum
- Lumbar/Thoracic spine-ROM, areas of restriction with close attention to the transition zone between thoracic/lumbar spine and the more caudal region of lumbo/sacral spine
- Nerve root inflammation, neural tension, sensation
- Hip- ROM, capsular restrictions, strength
- Soft Tissue- trigger points, paraspinal muscle tone, etc.
- Trunk strength- spinal extensors, abdominals

---

---

---

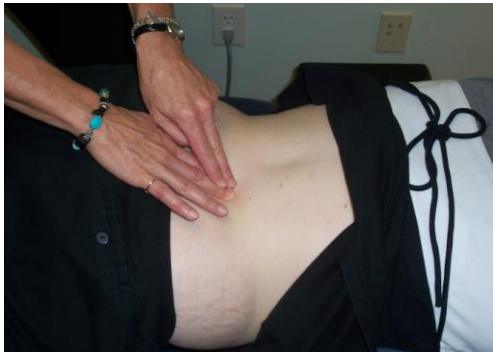
---

---

---

---

---



---

---

---

---

---

---

---

---

### Special Considerations for the Pregnant Patient

---

---

---

---

---

---

---

---

### Pregnancy Risk Factors

- History of preterm labor (PTL)
- Incompetent Cervix
- Gestational Diabetes
- Hypertensive Disorders
- Multiple pregnancy
- Maternal age (advanced and adolescent)
- Prolonged bed rest- may lead to impaired CV function, calcium loss with transient osteoporosis, decreased mm mass, depression

---

---

---

---

---

---

---

---

### ACOG- Contraindications to Exercise

- Pregnancy induced hypertension
- Premature rupture of membranes
- Preterm labor
- Incompetent cervix
- Persistent second/third trimester bleeding
- Intrauterine growth retardation
- Multiple gestation-not automatic restriction but important to clarify
- Avoid certain activities- scuba diving, contact sports, high impact activity, etc

---

---

---

---

---

---

---

---

### Exercise Considerations for High Risk Conditions

- Allows clarify specific restrictions with Dr.
- Monitor relevant systems
- Women with preterm labor must avoid exercises that stress abdominals- no kegels, no abdominal and possibly limited hip and LE exercises
- Incompetent cervix-avoid squatting position
- Gestational diabetes-walking, stationary bike or water aerobics; RPE-fairly light to somewhat hard; HR usually at 50-60% HR Max for age

---

---

---

---

---

---

---

---

## What We Do

- Manual Therapy
- Exercise
- Patient Education

---

---

---

---

---

---

---

---

## PPTW Chart Review Results

- Look at # with NRI
- Presentation of sx
- Treatment
- #of visits
- Functional outcome snapshot

---

---

---

---

---

---

---

---

## What We Do

- Manual Therapy

---

---

---

---

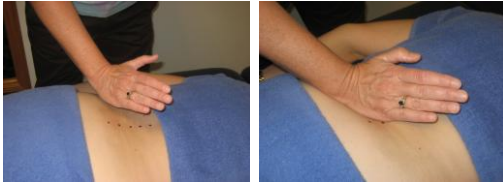
---

---

---

---

JOINT MOBILIZATION: RIGHT  
ROTATION



---

---

---

---

---

---

---

---

JOINT MOBILIZATION: RIGHT SB WITH  
LEFT ROTATION



---

---

---

---

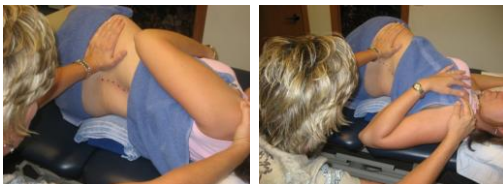
---

---

---

---

JOINT MOBILIZATION: RIGHT SB WITH  
LEFT ROTATION



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

---

## What We Do

Exercise

---

---

---

---

---

---

---

---



### Body Mechanics

- The most important component of your treatment plan
- Imperative that the patients understand the connection between their movement patterns and the cumulative effects associated with back pain
- Must practice everyday tasks- full and partial forward bending associated with laundry/housekeeping , picking up children, ADL's, work task, driving, etc.
- Don't assume they will be able to transfer the information to different tasks
- Educate about environmental changes to minimize re-injury

---

---

---

---

---

---

---

---

### TREATMENT

DISCUSS/PRACTICE BODY MECHANICS WITH:

1. Childcare: diapering, picking up child from crib, playing on floor, breastfeeding, bathing, etc.
2. Brushing teeth
3. Making beds
4. Unloading dishwasher
5. Laundry
6. Working at counter top/sink/cooking
7. House cleaning/vacuum
8. Yard work

---

---

---

---

---

---

---

---

### POOR FULL BEND




---

---

---

---

---

---

---

---



### Labor and Delivery Issues

- Minimize the positions or factors that can increase trauma to low back
  - Excessive flexion
  - Breath-holding
- Discuss position options with physician
  - Test positions for comfort prior to anesthesia
- Have tools available- towel rolls or pillows for lumbar support; ice

---

---

---

---

---

---

---

---

### Sleeping Tips During Pregnancy

- Try pillows between in the knees in side lying
  - Reducing pressures on pelvic/hip asymmetry
- Promote quarter turn forward and backward
  - Take pressures off of the greater trochanter to alleviate numbness and pain at the lateral hip (use pillows)
- Towel or small pillow at waistline and/or under abdomen
  - Decreases back pain and /or ligamentous stretching

---

---

---

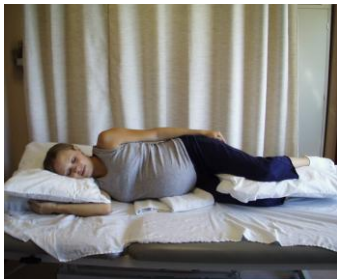
---

---

---

---

---



---

---

---

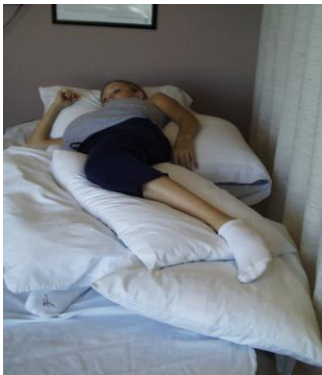
---

---

---

---

---



**Educate, Educate, Educate !**

- Exercises and proper stretches
- Posture and proper body mechanics w/ work station, childcare activities, etc.
- Infant care considerations-diapering, feeding, bathing, etc.
- Proper use of ice
- Activity modifications and importance of rest
- Sleeping positions
- General conditioning; proper footwear and attire
- Discussion of options for labor and delivery positions with physician

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

# Case Studies

---

---

---

---

---

---

---

---

## Case Study Subjective

- 27 yo Female
- 29 weeks pregnant with 3<sup>rd</sup> child (2 other children <5 yrs)
- Homemaker
- Dx of possible round ligament pain and diffuse musculoskeletal pain
- Hx of sciatica, worse in pregnancies
- No other complications with current or past pregnancies
- Onset of recent episode 4 weeks ago, insidious, no known injury

---

---

---

---

---

---

---

---

## Case Study Chief Complaint

- 1. Sharp pain B LQ which radiates to UQ, R>L, 7-8/10 severity, "severity of contractions", intermittent ranging from several times daily to 1x week
  - This pain brought her to PT; is unable to care for other children when it comes on
- 2. Constant ache to low back, 1-5/10 severity
- 3. Intermittent posterior L LE pain, daily frequency

---

---

---

---

---

---

---

---

### Case Study Objective

- Posture: ↓ lumbar lordosis
- Pelvic girdle: ↑ L iliac crest in standing, R LE long supine and long-sit (inconsistent possibly 2° pain/guarding)
- Lumbar AROM: L SB 20% ↓, R SB 25% ↓\*, flexion WNL\*, ext 50% ↓ low lumbar\* (\*L LBP)
- Hip PROM (ER, IR, Flexion): \*
- SLR (+) B for L LBP at 20-30°
- NRI palpation: L L5-S1, L L4-5, palp to L upper lumbar radiates low lumbar
- Functional mobility: unable to tolerate supine, painful bed mobility
- Joint mobility (lumbar): NT 2 ° irritability

---

---

---

---

---

---

---

---

---

---

### Case Study Treatment (2x wk)

- Visit 1:
  - STM to lumbar paraspinals
  - CP
  - Education: sitting and bending
  - HEP: standing lumbar extension
- Visit 2:
  - Joint mobilization (GR I-II)
  - HEP: L sidelying R lumbar rotation stretch
- Visit 3:
  - Subjective: LBP no longer constant
  - Did have 2 hr episode of R abdominal pain
  - (-) SLR; hamstring length R 45 °, L 40 ° with SLR
- Visit 4:
  - Subjective: LBP "better than it ever has been"
  - HEP: added L lumbar rolls, Hamstring stretch

---

---

---

---

---

---

---

---

---

---

### Case Study

- Only 2 more episodes of abdominal pain in 4 weeks (only 30 min duration)
- 2 more visits over 2 weeks (no LQ pain)
- Significant improvement in function: housekeeping, childcare
- NOTE: pelvic alignment reassessment: L LLD (L LE long), but NOT cause of dysfunction

---

---

---

---

---

---

---

---

---

---

Take Aways/Summary

---

---

---

---

---

---

---

---

Questions

- Thank you for coming!

---

---

---

---

---

---

---

---