

Pelvic Mechanics and OMT in Pregnancy



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Disclaimer/Conflicts



☞ No conflict to report



Epidemiology



- ❧ Low back pain or pelvic pain reported during pregnancy: 50-75%
 - ❧ Increased incidence with subsequent pregnancies
 - ❧ Increased incidence with elevated BMI in nulliparous
- ❧ Severe/disabling pain: ~35%
- ❧ Continued low back pain after pregnancy:
 - ❧ 66% @ 1 year
 - ❧ 16% @ 6 years
- ❧ < 4 hours of sleep/night: 80%
- ❧ Offered management options: 15%
 - ❧ <10% (1.5% overall) satisfaction with treatment

Cost



- ❧ Sick leave
- ❧ Medication
- ❧ Devices
- ❧ Consultation

Impact



- ❧ 30% stop performing at least one daily activity d/t pain
- ❧ 10% take time off from work
 - ❧ m/c reason for sick leave in working pregnant women
- ❧ Increased likelihood for depression 6-7 months PP
- ❧ Decreased
 - ❧ Perception of health and quality of life
 - ❧ Sexual satisfaction
- ❧ Restraint from future pregnancy

Predictors

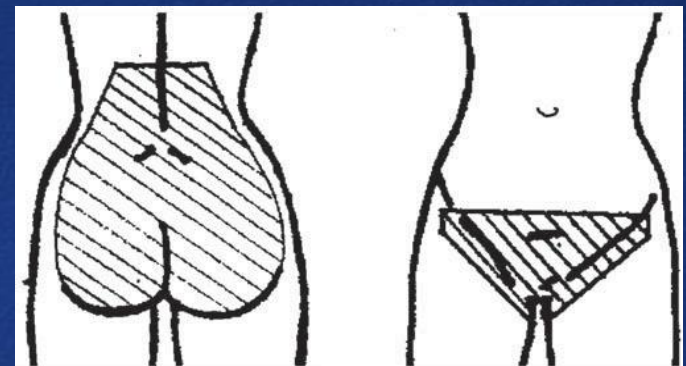
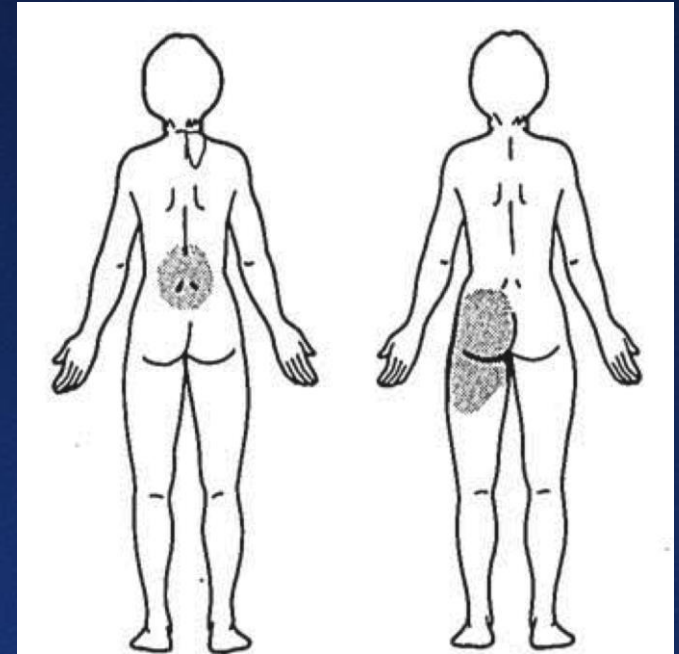


- ❧ Age
- ❧ LBP during menstruation
- ❧ Previous history of back pain
- ❧ Previous LBP during pregnancy

Presentation



- ❧ Varies significantly
 - ❧ Ignored as “normal”
- ❧ Location
 - ❧ Low Back
 - ❧ Sacroiliac/Posterior pelvic
 - ❧ Pubic Symphysis
- ❧ Temporality
 - ❧ May be present at any stage during pregnancy
 - ❧ m/c: 20-30 wks
 - ❧ More often at night



Etiology of LBP in Pregnancy



❧ Multifactorial

- ❧ Postural Changes
- ❧ Mechanical Load Changes
- ❧ Hormonal Changes
- ❧ Water Retention
- ❧ Vascular Changes
- ❧ Uterine Displacement

Postural Changes of Pregnancy



Postural Changes of Pregnancy



- ❧ **Center of gravity shifts forward**
 - ❧ Anterior Head Carriage
 - ❧ Cervical hypolordosis
 - ❧ Thoracic hyperkyphosis ($\sim 6^\circ$)
 - ❧ Lumbar hyper/hypolordosis ($\sim 7^\circ$)
 - ❧ Accentuation of anterior pelvic tilt
 - ❧ Sacroiliac joints resist forward rotation = **PAIN**

- ❧ Anterior Pelvic Tilt and Lumbar Lordosis changes exaggerate as the sacroiliac ligamentous laxity increases

Mechanical/Load Changes



- ❧ Weight Gain
 - ❧ 25-35 lbs
 - ❧ 20% weight gain → increase force on a joint by as much as 100%
- ❧ Intra-articular bleeding/synovial fluid effusion
- ❧ Decreased stability
- ❧ Standing/Gait changes
- ❧ Muscle fatigue

Mechanical/Load Changes



- ❧ *Low Back Pain*
 - ❧ “Spinal Shrinkage”
 - ❧ Axial Load → Disc compression
 - ❧ Poor recovery during pregnancy
- ❧ *Posterior Pelvic Pain*
 - ❧ SI joint strain/instability
- ❧ *Pubic Pain*
 - ❧ Pubic Symphiseal dysfunction/diastasis
 - ❧ Normal widening < 10 mm
 - ❧ Increased PSA
 - ❧ 10th to 12th week of pregnancy
 - ❧ Tenderness
 - ❧ Exacerbated by exercise

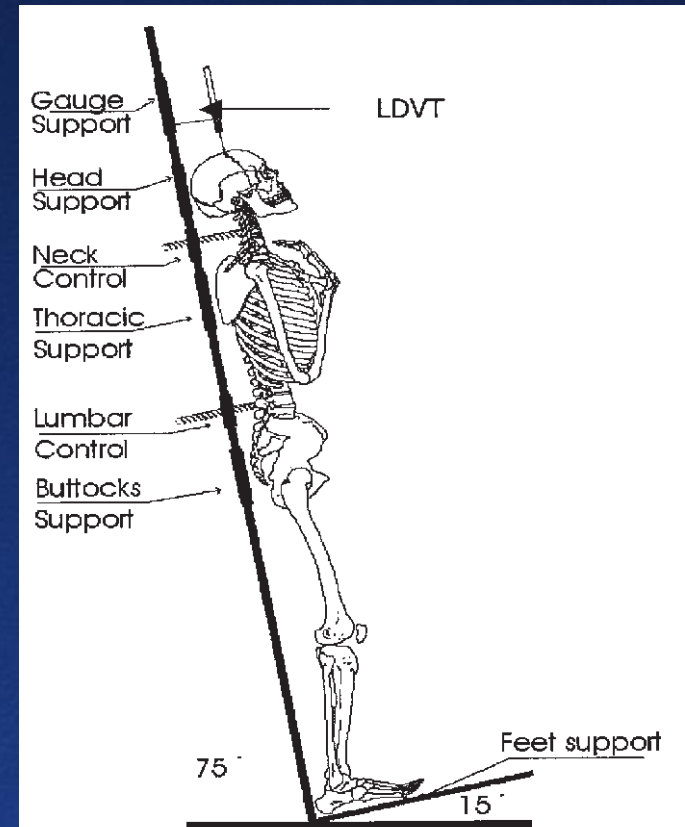


Fig 1. A schematic of the stadiometer used to assess changes in stature showing the location of the postural controls and linear vertical digital transducer.

Hormonal Changes



☞ Relaxin

- ☞ Corpus Luteum
- ☞ Late luteal phase and during the entirety of pregnancy
- ☞ Fluctuating Levels
 - ☞ Initial increase with peak value at the 12th week
 - ☞ Decline until the 17th week
 - ☞ Stable @ 50% of peak thereafter
- ☞ Inhibits collagen synthesis → amplifies the activity of collagenase
- ☞ Enhanced fluid retention

Hormonal Changes



- ❧ “Pelvic Girdle Relaxation”
 - ❧ Ligaments around pelvic joints and cervix
 - ❧ SI
 - ❧ PLL
 - ❧ Spinal ligaments

Problem: Correlation of levels to pain/instability

Water Retention

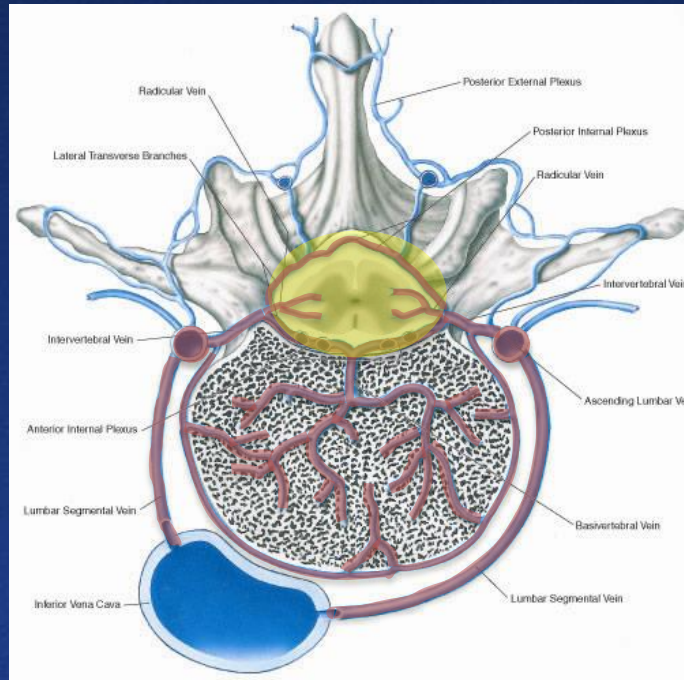
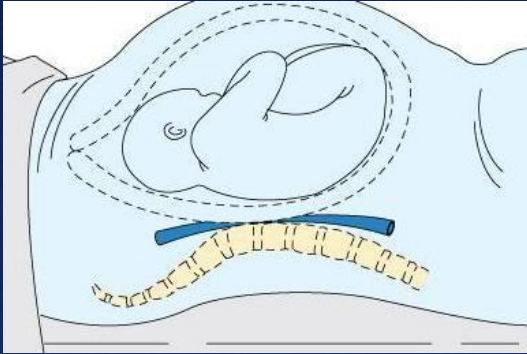


- ❧ ~ 6.5 liters
- ❧ Predisposition
 - ❧ Tenosynovial imbrication
 - ❧ Nerve entrapment



Vascular Changes

Vena caval obstruction



Increased
interosseous
pressure

Neural Edema

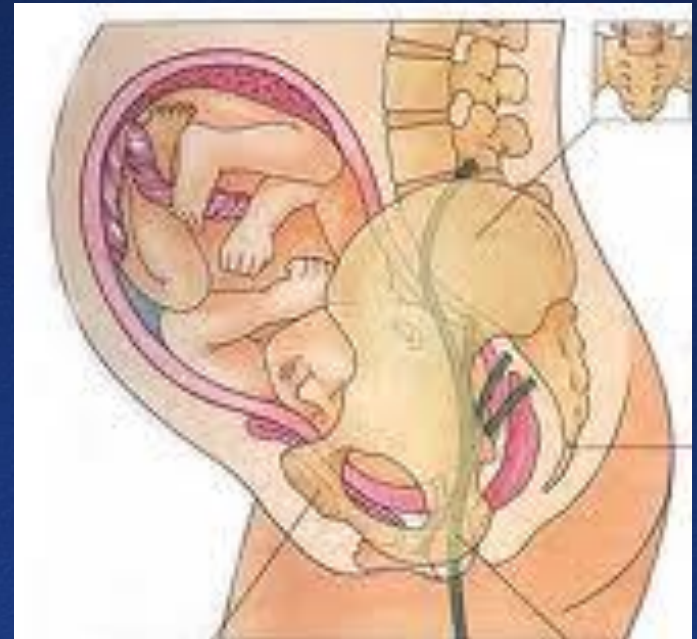
Hemostasis in
vasa nervorum

Uterine Displacement



- ❧ Posterior
 - ❧ Nerve compression
 - ❧ *Radiculopathy*

- ❧ Anterior
 - ❧ Muscle strain
 - ❧ *Muscle fatigue*



Treatment Options



Education

- Posture and body mechanics from first trimester
- Expectations for LBP

Exercise Programs

TABLE 1 Absolute contraindications to aerobic exercise during pregnancy*

Hemodynamically significant heart disease
Restrictive lung disease
Incompetent cervix/cerclage
Multiple gestation at risk for premature labor
Persistent second or third trimester bleeding
Placenta labor during the current pregnancy
Ruptured membranes
Preeclampsia/pregnancy-induced hypertension

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Treatment Options



Devices

- Decreased loading
- Reduce utilization
- Pelvic support/Trochanteric belt
- Pillow
- Taping



Cellacare Materna
(www.lohmann-rauscher.cz)



Materna (www.ergon.cz)



Treatment Options



☞ Analgesia

- ☞ Tylenol
- ☞ Narcotics
- ☞ Joint injection

☞ Physiotherapy

- ☞ Heat – risk of maternal hyperthermia
- ☞ TENS – avoid contact to fetus
- ☞ Therapeutic Ultrasound – contraindicated

Treatment Options



- ❧ Manual
 - ❧ Soft Tissue Massage
 - ❧ Chiropractic
 - ❧ SI joint pain
 - ❧ Length of Labor
 - ❧ Osteopathic



Evidence of Benefit from OMT



❧ Low back pain

- ❧ 49% reduction in narcotic use
- ❧ 84-91% improvement with OMT
 - ❧ No adverse events reported

❧ Viscerosomatic Link

Decreased probability of having meconium-stained amniotic fluid

Decreased use of forceps during delivery

Decreased likelihood of having a preterm delivery

Decreased duration of labor

Decreased blood pressure

Decreased fluid overload

Decreased sacroiliac dysfunction

Decreased low back pain

Decreased carpal tunnel symptoms

Evidence of Benefit from OMT



- ❧ Licciardone et al. January 2010
 - ❧ Randomized, placebo-controlled clinical trial
 - ❧ 3 arms: OMT (except HVLA), sham U/S, no care
 - ❧ OMT group
 - ❧ Decreased back pain
 - ❧ No deterioration of back-specific functioning

Contraindications to OMT in Pregnancy



- ❧ Undiagnosed vaginal bleeding
- ❧ Threatened abortion
- ❧ Ectopic pregnancy
- ❧ Placenta Previa
- ❧ Placenta abruption
- ❧ Premature rupture of membranes
- ❧ Preterm labor (relative contraindication)
- ❧ Prolapsed umbilical cord
- ❧ Eclampsia and sever pre-eclampsia
- ❧ Surgical or medical emergencies (other than those listed above)

Osteopathic Evaluation



- ❧ Palpation (TART)
 - ❧ Tenderness
 - ❧ Asymmetry
 - ❧ Restricted motion
 - ❧ Tissue texture change
- ❧ Identify the pain causing structure
- ❧ Identify the somatic dysfunction
 - ❧ Stork Test – “Overtake Phenomenon”
 - ❧ FADE Test
 - ❧ FABER Test



Figure 3. The Faber test uses the femur as a level to pull the ilium forward while the practitioner fixes the pelvis.

or Stork test. The level of the posterior, superior iliac spines (PSIS) are determined with the patient standing equally on both feet. When the hip is flexed to about 80° a fixed SIJ will see the PSIS rise upward on the ipsilateral side.

OMT Techniques for LBP in Pregnancy



- ❧ Muscle energy
- ❧ Myofascial release
- ❧ Ligamentous articular strain
- ❧ Balanced membrane tension
- ❧ High-velocity, low amplitude thrust
- ❧ Strain counter-strain
- ❧ Osteopathy in the cranial field

Gravid Abdomen Comfortable Positions



Pubic Symphysis MET/HVT “Shotgun Technique”



- ❧ If severe instability, surgical referral may be indicated
- ❧ Mild-Moderate instability can be resolved by restoring position and movement in the *opposite* direction(s) of the instability
- ❧ Maintained joint approximation for a period of time
 - ❧ Facilitate scar tissue development
 - ❧ Reduce reflexive muscular inhibition
 - ❧ Increase in muscle tone reflexively
 - ❧ Increases in ligament tone (through partial insertion or fascial expansions)
- ❧ Afferent barrage in the spinal cord
 - ❧ Decrease in pain due to “Gate Control” Theory

Pubic Symphysis MET/HVT “Shotgun Technique”



Sacral Rocking



- ❧ Physiology:
 - ❧ Sacral base moves around the S2 axis
 - ❧ posterior (counter nutation) with inspiration
 - ❧ anterior (nutation) with expiration
- ❧ Goal:
 - ❧ To help regulate parasympathetic outflow to the pelvis
- ❧ Technique:
 - ❧ Pt prone
 - ❧ Practitioner places hands on the sacrum
 - ❧ Pressure is applied to enhance respiratory motion of the sacrum



Sacral Rocking



Prevention



- ❧ Low back pain screening
 - ❧ Early antepartum
 - ❧ Prior h/o LBP
 - ❧ Multiparity
 - ❧ Smoking
 - ❧ Young age
 - ❧ Post partum

Questions?



Thank You

