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PREGNANCY: MANAGING LOW BACK PAIN

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The WSCC Care Pathways provide a standardized context for clinical decision making as well as a variety of possible interventions. These pathways are not intended to replace the clinical judgment of the individual practitioner. A practitioner may vary from these guidelines, if in his or her judgment, variance is warranted to meet the health care needs of the patient and the variance remains within generally accepted standards of practice.

WSCC pathways are intended for use within our clinic system. They may be useful as a seed for regional guidelines or guidelines with wider application, but caution must be exercised. The following limitations would have to be addressed: 1) The literature searches employed would need to be more exhaustive; 2) inclusion criteria for published studies would need to be more stringent; 3) a wider pool of subject-matter experts would need to be tapped; and 4) the participants of the consensus panel would need to be drawn from a broader cross-section of the profession and of perhaps other health care providers as well. Although individual procedures and decision-making points within this care pathway may have established validity or reliability, the pathway as a whole is untested.

IMPORTANT NOTE

THE SCOPE OF THIS CARE PATHWAY INCLUDES TREATMENT OF WOMEN DURING AND AFTER PREGNANCY. MANY OF THE MANAGEMENT OPTIONS IN THIS DOCUMENT ARE APPLICABLE TO NON-PREGNANT PATIENTS AS WELL, ESPECIALLY THE INTRAPELVIC, SACROILIAC, PUBIC SYMPHYSIS, AND COCCYGEAL PROCEDURES.

SEARCH STRATEGY

The following databases were searched using terms such as “low back pain and pregnancy, exercise and pregnancy”: MEDLINE, CINHAL, and MANTIS. Additional citations were discovered in the reference sections of papers obtained from the initial searches. Other papers were found in the general literature on low back pain, particularly related to the sacroiliac joint.

On using this document…

Unlike the other care pathways, this contains management strategies only. This review gives a variety of both active and passive interventions to manage low back pain in pregnancy.

The sections on manipulation are not intended to be exhaustive. Many commonly used methods are not addressed. Those selected for emphasis in this pathway were chosen either because panel members found them particularly useful or because they differed somewhat from routine adjustments. A comparison videotape is available demonstrating many of the treatment procedures in more detail.

Throughout the document, italicized initials are cited after specific forms of treatment, indicating the panel participant(s) who proposed them for inclusion.

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NOTES

MANAGEMENT

THERAPEUTIC GOALS

- Relieve pain
- Maintain activities of daily living
- Promote stability
- Increase endurance
- Improve physical fitness
- Promote self-care and responsibility
- Provide an expectation for a return to normal activities postpartum

Relief of pain and other discomforts as well as maintenance of activities of daily living should be primary objectives of treatment for the pregnant patient (Sandler 1996). Depending on the patient's interest, number of weeks of the pregnancy and symptomatology, the physician may focus only on symptomatic management (Cohen 1997) or may include rehabilitation and/or training programs. Understanding the cause of low back pain for each patient is the most important aspect of management (Hainline 1994, Sandler 1996). Treatment should be individualized to the patient's particular presentation and circumstances in order to facilitate her adaptation to the increasing and changing demands of pregnancy, childbirth and the postpartum period on her musculoskeletal system. Minimizing musculoskeletal and related complaints is best achieved through the promotion of optimal biomechanical function (Cohen 1997) and physical fitness, by improving strength, endurance and stability. This, in turn, can minimize the need for potentially harmful analgesic, narcotic or muscle relaxant medications. (Sandler 1996) Anecdotally, women undergoing chiropractic care suggest that it aids in the ease of delivery.

TREATMENT STRATEGY

The onset of low back pain can occur at any time during pregnancy, but the sooner the pregnant patient is treated, the better the opportunity for successful management (Bookhout 1988, Perkins 1998). For those patients contemplating pregnancy, pre-pregnancy evaluation and treatment may offer the best outcomes (Hitchcock 1976). This is particularly important for women who have low back pain or have had low back pain with previous pregnancies, since this increases the risk of low back pain in future pregnancies (Berg 1988, Ostgaard 1991).

A diagnosis must be made and any complications taken into consideration before treatment begins. In some cases the patient may present with both sacroiliac and lumbar pain. In these situations it is best to manage the condition with the strategies used for sacroiliac pain, particularly since it requires more activity and exercise restrictions (Ostgaard 1996). Posterior pelvic pain occurs four times as often as lumbar pain during pregnancy (Cohen 1997, Ostgaard 1994) and sacroiliac joint dysfunction is a frequent finding (Berg 1988, Cohen 1997, Daly 1991, Golightly 1982, McIntyre 1996, Sandler 1996, Sands 1959).

Other problematic areas in the spine identified by the consensus group were

- the transitional areas of the spine, (e.g., C0-2, C6-T2, thoraco-lumbar, lumbosacral),
- weight bearing joints (e.g., SI, hips, feet),
- joints under stress due to breast enlargement (e.g., T6-8, shoulder girdle),
- the lower ribs (rib 10-12).

In addition, old spinal injuries and complaints may again become symptomatic during pregnancy.

Problems in the feet may contribute to low back pain. The feet should be evaluated, adjusted and supported as needed. Good shoe support (arch support, good cushioning for shock absorption) may be beneficial to help reduce symptoms in the low back. Later in pregnancy, changes in foot size relative to swelling, as well as alteration of the arches due to ligamentous laxity, may mean that foot orthotics made at this time may not be appropriate after pregnancy.

A careful review of the intended diagnostic or treatment procedures and sensitive communication with the pregnant patient is important since she is likely to be protective of her body and to have a heightened concern about any potential harmful effects for herself and, especially, her fetus (Perkins 1998).

MANIPULATION / MOBILIZATION

Joint dysfunction is commonly found on examination of the pregnant low back pain patient (Bookhout 1988, Cohen 1997, Daly 1991, Golightly 1982, Sandler 1996). Although no well-controlled research has been published on manipulative therapy for low back pain in pregnancy, several papers report good results with manipulation or mobilization (Diakow 1991, Epstein 1959, Parsons 1994) and specifically, manipulation of the sacroiliac joints (Berg 1988, Daikow 1991, Golightly 1982, Sandler 1996, Sands 1959). Taking any complications and the special considerations discussed below into account, manipulation of the low back in pregnancy is a very low-risk procedure (Daikow 1991, Hitchcock 1976, Phillips 1995, Sandler 1996).

General Considerations

The practitioner must choose an appropriate manual therapy, take care in setting up and positioning the patient, and modulate the amount of force required for therapeutic effect. Some women's joints become lax enough that only light-force, mobilization or stretching techniques are needed to successfully correct joint dysfunction (Bookhout 1988, Esch 1991, Fligg 1986, Parons$_a$ 1994).

Therefore, care needs to be taken to use only the amount of force necessary to be effective and avoid excessive torque and stretching. Be aware that pain might be secondary to excessive motion in the hypermobile joint or to soft tissue alterations. The practitioner should identify and address primary structural abnormalities.

Choosing a Manual Therapy

Side lying thrust manipulations are effective for correcting lumbar or sacroiliac joint dysfunction (Cohen 1997, Daly 1991, Esch 1991, Fallon 1994, Fligg 1986, Golightly 1982, O'Connor 1990, Penna 1989, Sandler 1996, Sands 1959). Use short levers as much as possible due to potential joint laxity. Some practitioners prefer side posture distraction adjustments as opposed to push moves because the patient may better tolerate joint distraction. There is also less need for rotation with these moves because it is easier to get the patient to tension.

As patients become larger, particularly after 20 weeks, some will not tolerate standard side-lying adjustments. To improve patient comfort, consider prone, supine or sitting adjusting techniques.

Other manual therapy options include drop table, knee chest table, blocking, distraction and a variety of muscle energy techniques.

Positioning the Patient

Always get feedback regarding patient comfort. Patient preferences often change during pregnancy. Perform the adjustments in a timely manner as certain positions may be uncomfortable if held for long periods. The more relaxed she is, the less force will be needed to successfully manipulate, which in turn reduces the chance for discomfort.

Side posture

When utilizing side-lying techniques, position the patient away from the edge of the table to better support her abdomen.

A wedge-shaped cushion or folded towel placed between the abdomen and the table can be used to support the weight of the fetus (Esch 1991).

Since pregnant women often experience stretching and pressure in the groin, abdomen or ribs, feedback is important for achieving the most comfortable set-up. Consider whether there is too much rotation, torsion or hip flexion (Fligg 1986).

If a patient is very flexible, it may be difficult to reach pre-adjustive tension with the patient sidelying for a lumbar adjustment. If this is the case, it may be helpful to have the patient effect a strong contraction of both the shoulder girdle and trunk muscles while the thrust is applied.

This can be accomplished as follows: ask the patient to provide a strong forward rotational force against the practitioner's stabilizing hand (on the patient's shoulder). This de-rotates and stabilizes the patient's trunk and lumbar spine and seems to allow the thrust to have a more direct effect on the spinal/pelvic joints rather than being absorbed by the flexible muscles and joints.

Prone

Prone positioning can also be used for adjusting the pregnant patient. On a table with the appropriate type of articulating sections, the abdominal/thoracic section can be dropped away and the lumbar/ pelvic section raised to allow her to lie prone and reduce pressure on the abdomen.

On a flat bench, cushions or pillows can be used to accommodate the prone position.

As an alternative, SOT-type blocks in combination with blankets and towels can be used to increase the patient's comfort.

There are also specially designed cushions that can be used, which include cutouts to minimize pressure on the enlarging and often tender breasts.

A pillow may be placed above and below the breasts to offer support. (Note: posture cushions will add 2-3 inches of height to the table and so a lower table or doctor platform may be necessary.)

Despite these precautions, some women may still be uncomfortable lying prone during the eighth and ninth month.

Supine

The supine patient may be more comfortable with pillows under her knees and her head/ shoulders elevated. Alternatively, raise the head and shoulder piece on a Leander or similar table.

After the first trimester the length of time the patient is supine may need to be limited. The supine position may cause compression of the aorta and/or inferior vena cava, which could diminish circulation to the fetus or reduce the mother's cardiac output. Warning signs of this circulatory compromise would be shortness of breath and increased breathing or pulse rate.

Sacroiliac Joints

There is a variety of methods to treat the sacroiliac joints. These include manipulation procedures, muscle energy techniques, mobilization and blocking.

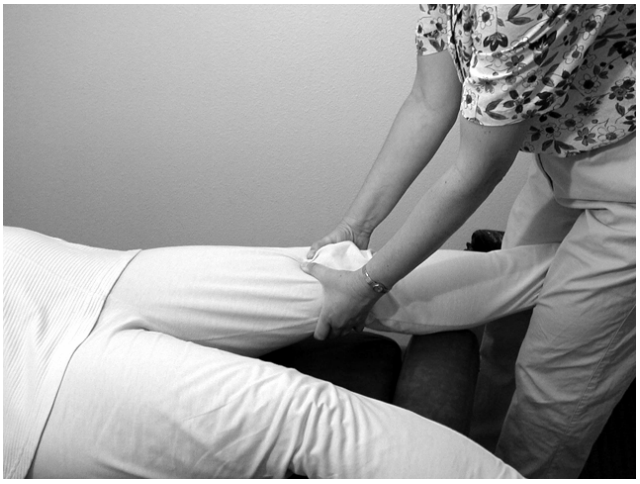
Manipulation of the pelvis

Manipulation of the pelvis can be performed with the patient side lying, prone, supine and sitting. These techniques can be modified as noted above to manipulate or mobilize the sacroiliac joints. Standard side-lying set-ups with contacts on the innominate or sacrum are the most frequently cited (Cohen 1997, Epstein 1959, Esch 1991, Fallon 1994, Fligg 1986, McIntyre 1996, O'Connor 1990, Sandler 1996, Sands 1959).

Side posture "anterior sacral base" adjustment. The sacral base is malpositioned anteriorly. Use an apex contact to counter-nutate the sacrum and flex the lumbosacral joint).

Posterior ilium prone extension adustment. The indifferent hand holds the anterior thigh or knee, lifting the hip and leg into extension. Thrust with the contact hand on the PSIS.

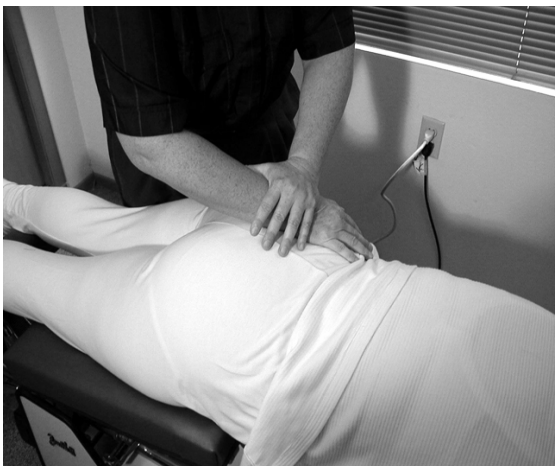
Long axis distraction. The patient lies supine and the practitioner initiates long-axis distraction of the lower extremity with the hip flexed and abducted. The hands grasp the distal thigh and proximal leg and a strong quick pull is given (Golightly 1982). This general maneuver can affect the hip, symphis pubis, SI, and lower lumbar spine.

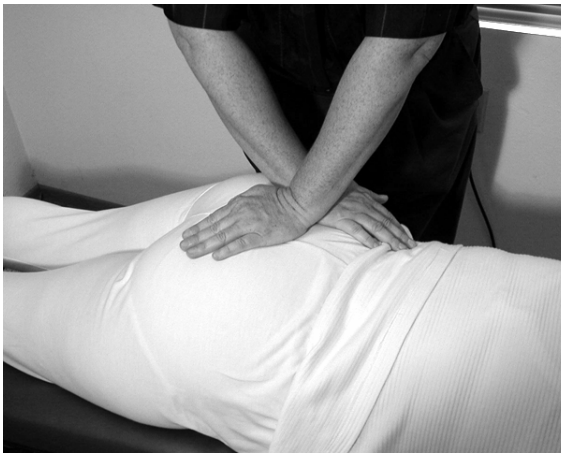


Anterior innominate supine adjustment. An anterior innominate can be corrected with the patient supine and the thigh flexed. The ASIS is thrust posteriorly (see below).

A variation on the adjustment (not depicted above) is to thrust the ASIS posteriorly with one hand while pulling the ischial tuberosity upward and forward with the other hand (O'Connor 1990).

Drop table adjustments. A table with a pelvic drop section can be used with the patient prone or supine, depending on the type of correction indicated (Cohen 1997, Esch 1991, Fallon 1994).





For example, a supine drop adjustment (light force 1-4 times) for a posterior-inferior or anterior-superior innominate malposition (PI/AS) listing or anterior femoral head can be useful. The contact is just inferior and lateral to the ASIS.

Drop table adjustments can also be made with the patient lying on blocks, but because there is greater potential shear force, a lighter thrust is called for.

Muscle Energy Technique (MET)

Muscle energy techniques can be used to reduce joint restrictions. For example, a “lever” technique for PI and AS listings is done as a side posture set up. The patient contracts the hip flexors of the upper leg and the hip extensors of the lower leg, attempting to open the legs as if they were the blades of scissors. The practitioner resists this motion creating an isometric contraction.

Mobilization/Distraction of the Pelvis

Prone. Distraction procedures can be performed with the patient prone and the pelvis raised with cushions or by adjusting the treatment table sections. Manual cephalad to caudad pumping of the sacrum can be applied to flex it with the heel of the hand at the mid-sacrum (Cohen 1997, Penna 1989). This treatment can also be done on a flexion distraction table or a mortorized table (such as a Leander table) with the abdominal piece dropped.

Prone sacral rocking. The practitioner places a palm on the sacral base with fingers pointing toward the coccyx, rhythmically distracting and relaxing pressure at the lumbosacral joint. This mobilization can be timed with breathing (distract with inhalation, relax with exhalation) or held in a sustained position (flexion or extension) based on patient response.

Side posture mobilization. The sacroiliac joints are mobilized by placing the patient in side posture and rhythmically "pumping" the sacrum (causing counter-nutation).

Supine mobilization. The sacroiliac joints can also be mobilized with the patient lying supine, knees and hips bent, feet firmly flat on the table. The practitioner contacts the thighs just above the knees and alternately pulls each knee in a pumping action. The femurs are rhythmically distracted from the pelvis (creating sheer across the SI).

Supine mobilization.
Sacral distraction can be done with the patient supine, knees and hips bent in a 90/90 configuration. The practitioner reaches underneath the patient and contacts the sacral base.

The practitioner then rhythmically flexes and distracts the sacrum.

Blocking
Pelvic blocking with SOT-type blocks can also be utilized (Cohen 1997, Penna 1989). The patient can be treated in a prone or a supine position.

The placement of the blocks is based on pelvic and leg length indicators. When blocking the patient, the practitioner should check the pelvic and leg length indicators to determine where to place the blocks and then re-check once the blocks are in position. If the indicators worsen, remove the blocks immediately. Blocking is done for 2-3 minutes and the patient should be rechecked periodically.

Symphysis Pubis

Unleveling of the symphysis pubis can be associated with local as well as sacroiliac pain. The pelvis is a ring structure and any such change in pubic alignment will often affect the sacroiliac joints (Berg 1988, Bookhout 1988, Hainline 1994).

Direct thrust manipulation. The symphysis pubis can be manipulated with the patient supine on a table with a pelvic drop piece or with two pillows under the buttocks to raise her up. A contact is made on the superiorly displaced pubis. A gentle thrust or toggle thrust is directed cephalad to caudad and anterior to posterior. The pubis may be very tender, and the thrust may temporarily aggravate the symptoms.

Comfort may be increased if the patient places her hand over the contact and the doctor's hand is placed over hers (Fallon 1994). Patient feedback is important when pillows are used to raise her buttocks and her abdomen is elevated above the level of her head because she may experience gastric reflux.

Indirect thrust manipulation (using the adductors). The pubic symphysis may be too irritated or inflamed to tolerate a direct thrust. Alternatively, the supine patient is positioned with hips and knees flexed and adducted. Contact is made on the medial aspect of the knees and the patient is instructed to contract the hip adductors and resist an abrupt, short-arc separation of the knees by the doctor (Parsons$_a$ 1994).

One clinician reported no side effects from this adjustment. Another clinician had noted an increase in pubic pain and adductor spasm as an adverse effect.

Muscle energy technique. (Bookhout 1988) The supine patient sustains the adductor contraction in the position described above for approx-imately 5 to 10 seconds while the doctor provides enough resistance to create an isometric contraction, but without any forced separation. This can be repeated several times, separating the knees a little further apart for each starting point. This may also be performed with the patient eccentrically contracting her adductors while allowing the doctor to gradually and gently abduct her thighs against resistance. ***Caution:*** *Too great an eccentric force or rapid movement could strain the muscles.*

Lumbar Spine

Lumbar joint dysfunction can be manipulated in the prone, side-lying or sitting position. Routine adjusting techniques are employed. Additional approaches include the following options.

Mobilization on a distraction table. The lumbar spine can be mobilized by fixing the vertebrae with a hand contact and then using the moveable caudal section to induce

movement of segments of the spine in the desired direction. For example, lateral flexion mobilization can be done with the patient prone on a flexion-distraction table while oscillating the caudal section from side to side.

Transverse-ilio lift. The lumbar spine and lower ribs can be treated in the prone patient by lifting and rotating the pelvis off the table (ASIS contact) while stabilizing the lumbar spine (as if performing a modified Farfan torsion test). This maneuver can be done as a stretch, graded mobilization or thrust.

Other options. A difficult thoracolumbar joint dysfunction can sometimes be addressed using the knee chest table, a seated adjustment, or side posture with a drop piece.

Lumbar Distraction

***Prone on stationary table*.** Distraction procedures can be performed with the patient prone and the pelvis supported by posture cushions or by elevating the treatment table sections.

One palm "hooks" underneath a lumbar spinous process with fingers pointed up the patient's spine and the other cups the sacral base with fingers oriented toward the coccyx. A gentle sustained or repetitive distractive force can be applied.

Distraction on a flexion-distraction table. The practitioner applies flexion distraction with the patient supported by a posture cushion and the abdominal piece dropped. Initially less depth should be used when flexing the caudal section of the table until the therapeutic response can be ascertained.

If the patient is not comfortable prone, she can also be treated in side posture using the lateral flexion component of the table to induce distraction.

Thoracic Spine

***Supine*.** As the pregnancy progresses, adjusting the thoracic spine in some women may be difficult to do prone because the posture cushion is soft and breast tenderness may be present. Supine adjustments may be a useful alternative.

The practitioner should be careful with A-P adjustments because breasts are tender (and may express fluid). A rolled towel/ sternal roll/pillow held between the breasts will make the treatment more comfortable. The contact can also be modified to minimize force through the breasts.

For anterior thoracic adjustments, roll the patient to the side, make contact with the vertebrae and roll back over the indifferent hand. The thrust should go through the patient's arms, carefully avoiding pressure on the abdomen.

In cases where the practitioner sits the patient up and has her lie back down onto the indifferent hand, this procedure should be done smoothly and without unnecessary delays.

A-P adjustments of the thoracic spine may be enhanced by having patients actively "squeeze" with their arms while they hug themselves to increase tension. This may allow the practitioner to more easily reach the elastic barrier in the pre-adjustment set up.

***Seated adjustments*.** Adjustments are often more comfortable for women if done sitting. Be sure that if a chair is used that it is very stable. Sitting thoracic extension mobilization/ manip-ulation may be useful as thoracic postural strain is common due to increased breast size.

The joints move easily so seated thoracic, rib, and cervical adjusting can be very effective.

Seated mobilization (4-8 repetitions) especially in extension or MET are other viable options.

SOFT TISSUE THERAPY

As a result of the changes in posture and weight distribution during pregnancy, strains, myofascial trigger points, shortening, weakness and imbalance of the muscles in the lumbar spine, pelvis,hips and abdomen are common findings (Bookhout 1988, Cohen 1997, Esch 1991, O'Connor 1990). Manual procedures such as ischemic compression, effleurage, cross friction, stretching, and muscle relaxation techniques such as post-isometric relaxation can be employed (Bookhout 1988, O'Connor 1990).

Special attention needs to be given to

- the paraspinals
- gluteals
- piriformis
- iliopsoas
- tensor fascia lata
- quadriceps femoris
- hamstring muscles
- adductors
- abdominals
- shoulder girdle muscles (Bookhout 1988, Cohen 1997, Esch 1991, Hitchcock 1976, Penna 1989)

Some clinicians like to do soft tissue work first (especially to the quadratus lumborum,

shoulder, and hip rotators such as the piriformis, gluteus, and TFL) prior to manipulation.

Comments on specific muscles

Iliopsoas. The psoas may be reached by positioning the patient in side posture and working through the abdomen. In late pregnancy, the iliopsoas is unable to be contacted through the abdomen. The tonicity may be reduced by applying a brief rapid thrust (such as a thumb toggle) at the insertion near the lesser trochanter. In addition, the iliopsoas often needs to be stretched.

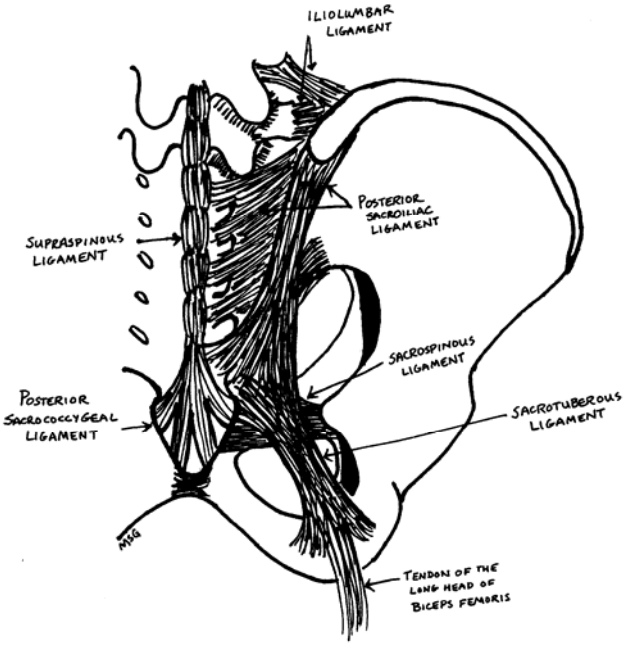
Abdominal muscles. In the third trimester, it may be beneficial to treat any myofacial trigger points in the lower abdominal muscles, especially in the rectus near the pubic symphysis.

Adductors. Treating the adductor muscles can be very useful, especially in patients with pubic symptoms. Some practitioners advise caution in stimulating the adductors with massage in patients who have a history of premature deliveries or who have been given certain activity restrictions by their perinatal provider because she has been judged to be at increased risk. Although there is no clinical evidence that massaging the adductors does induce pre-mature labor contractions, there is a tradition in the mid- wifery profession to massage this area to help promote labor. (Esch 1991) The adductor muscles can also be stretched with the patient lying on her side.

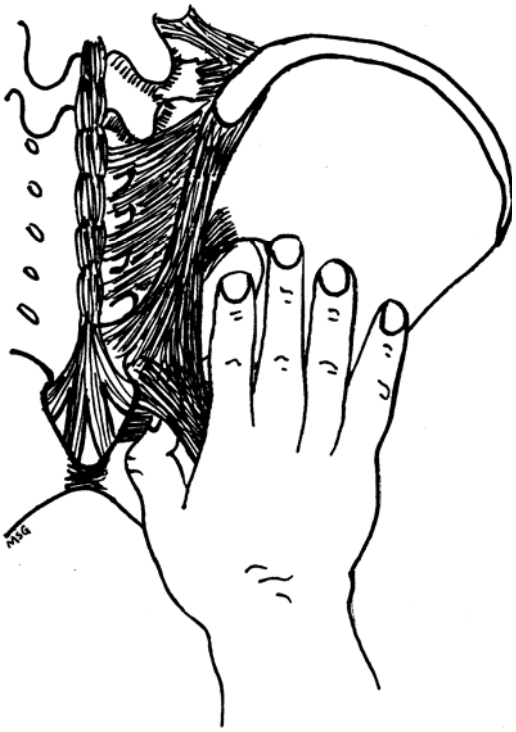
Pelvic Structures

Sacrotuberous ligaments

The sacrotuberous ligament can be used as a contact to manipulate the sacrum and coccyx, and may also reflexively affect the paraspinal muscles in the lumbar region. The ligament can be treated by direct pressure, working the length of the ligament and altering vectors of pressure. It is important that the procedure be first clearly explained to the patient and the practitioner be given permission to proceed before continuing.



In one approach, the patient lies prone and the practitioner, sitting on the opposite side, places a hand palm down on the inferior, medial aspect of the buttock. The ligament, which runs from the sacral apex to the ischial tuberosity, can be found by bisecting a line between these two landmarks and palpating superiorward the width of a thumb and then medial the width of a thumb. Confirmation can be made by asking the patient to cough gently. The tip of the thumb makes a light contact through the patient's gown on the inferior aspect of the ligament. A steady light pressure is exerted, creating a lifting motion (toward the ceiling) combined with a vector aimed at the ASIS. Local tissue response and tension in the pelvic muscles (e.g., gluteals) and even lumbar muscles (e.g., lumbar extensors) can be monitored. The vector of light force can be progressively re-directed, moving through different angles until the thumb is aiming at the patient's shoulder. Treatment continues until the practitioner senses the tissues relax and lose resistance (20 seconds up to a maximum of 7 minutes).



If this method proves ineffective, the practitioner may choose a perianal approach to this ligament. A PARQ conference will be charted and a written informed consent will be secured from the patient who will be given the option to have the treatment performed at that visit or a subsequent visit if they would like to think about this treatment option.

The practitioner gloves (after asking if the patient is allergic to latex) and asks an assistant to be present. In some cases, it will be advantageous to raise the pelvis a little higher by further adjusting the table or using pillows. This time the thumb contact is more medial (very near the anus) and more anterior. Light pressure is exerted, creating a lifting motion (toward the ceiling) combined with a vector aimed at the ASIS. The rest of the procedure is the same as described above. The gloves are then disposed in a biohazard bag and the hands washed.

If this perianal approach also proves ineffective, the practitioner may choose an internal rectal approach to treat the sacrotuberous ligament as well as the sacrospinous and sacrococcygeal ligaments. This treatment approach is included in the section on intrarectal treatment (see below). There are additional precautions and procedures for obtaining consent that are required for intrarectal treatment. They are discussed on this page under "Informed Consent for Evaluation."

Intrarectal Treatment

Women may also experience pain or discomfort from trigger points in portions of the myofascial layers of the pelvic sidewall (piriformis, internal obturator and sacrotuberous ligament), pelvic floor (sphincter ani, superficial transverse perinei, coccygeus, iliococcygeus, and levator ani) or pericoccygeal region (gluteus maximus, sacrospinous ligament and sacrococcygeal ligaments) that can be reached through the rectum. (Simons 1983, Sinaki 1977, Thiele 1963, Travell 1992) Coccyx manipulation/ mobilization can also be performed intrarectally.

Indications

Indications for evaluating these structures include chronic, significant pain or discomfort (such as pressure), or chronic or recurring pelvic subluxation that has not responded adequately to external treatment. (Baker 1993, Ryder 1996, Travell 1992) Typical pain patterns include the areas of the lower lumbar spine, sacrum, pelvis (anterior including the low abdomen or posterior including sacroiliac joints and coccyx), hip, thigh, sciatic distribution, and perineum. (Baker 1993, Ryder 1996, Simons 1983, Sinaki 1977, Thiele 1963, Travell 1992) Although several studies describe the effectiveness of this treatment, none have been reported on pregnant women. (Simons 1983, Sinaki 1977, Thiele 1963)

Informed Consent for Evaluation

Before assessing these muscles, their location and the evaluation procedures should be discussed with the patient. The patient's history should be reviewed to evaluate risk factors for the procedure (see "Contraindications" on P. 18). The patient should be asked in a gentle, sensitive manner questions about any physical or emotional trauma to this area, about prior pregnancy/delivery crises, and about current fears for the pregnancy. A PARQ conference for the procedure must be performed and the patient should sign a specific consent form that includes the risks of the procedure including those associated with pregnancy. A copy of the PARQ form should be sent home with the patient.

The supervising clinician should be present for these discussions. If the patient wishes to proceed, a rectal examination is scheduled. *Intrarectal examination or treatment typically will not be performed on the same day as the PARQ conference.* However, exceptions to this policy include extenuating circumstances, such as patients who are suffering from extremely severe symptoms, are already familiar with the treatment, or are unable to return in a timely manner.

Evaluation

Rectal evaluation is performed before a course of treatment is determined. ***It is clinic policy that rectal or genital areas of the patient never be exposed without having a witness present, either a second intern or a supervising clinician.***

It is important to establish that the patient is in control of the examination and any subsequent treatment. It is best to choose a specific word, such as "stop," which the patient can use to halt the examination or treatment.
Examination is typically performed in either the dorsal lithotomy position (if the patient is essentially supine, monitor tolerance of this position … see "Positioning the Patient" P. 7), side lying (typically left lateral Sims), or knee chest, but other positions may be used according to patient comfort or clinical need. The patient is positioned with appropriate draping, the examiner washes and gloves, and water soluble lubricating jelly is used for patient comfort, strictly adhering to universal precautions. Use vinyl gloves if there is any issue regarding latex allergies. Finger cots should not be used as they provide an inadequate area of protection. If the patient is in the lithotomy position, the examiner's right hand evaluates the right side of the patient's pelvis and the examiner's left hand is used to evaluate the left pelvis. If the patient is in the side-lying or knee chest position, the examiner's right hand evaluates the left pelvis and the examiner's left hand evaluates the right pelvis. The first or middle finger is used to examine or treat the patient's least painful side first. The examiner evaluates the more painful side next, again insuring that appropriate gloving, use of lubricating jelly and universal precautions are utilized. Higher structures can be reached if the examiner remembers to keep his/her shoulder and elbow on the side of the examining hand depressed.

The examination should begin with palpation for pathology. Benign anal/rectal conditions such as sphincter spasm, hemorrhoids or fissures do not interfere with examination or treatment unless they are too painful for easy patient tolerance. The presence of these conditions does increase the likelihood that pathology is present, and the supervising clinician should insure that adequate evaluation has been performed.

The examiner then assesses the quality of the myofascial tissues and attempts to elicit pain or symptom referral by pressing on any tissues with altered tone. Evaluation of the coccyx may be performed utilizing pressure over the ventral surface or by motion palpation using the internal finger and external thumb.

Pain on palpation that mimics the patient's complaints indicates that the tissue is most likely the cause of the patient's symptoms. However, palpatory stimuli rarely reproduces the patient's exact symptoms. Typically, palpating the involved tissues refers pain or sensations to the same location as the patient's complaints, *but with a different quality*. If there is no palpatory pain, the tissues are extremely unlikely to be involved in the patient's complaints. If there is only local palpatory pain (i.e., just beneath the fingertips), the area is unlikely to be the symptom generator.

Contraindications

Risk factors must be assessed. This procedure would usually not be performed if the patient:

- has established risk factors for pre-term labor,
- is experiencing symptoms consistent with pre-term labor (see P. 25 "Monitoring the Patient"),
- has or reports a history of bladder distention,
- has a history of multiple, recent or a current urinary tract infection(s),
- has a fever,
- has pain with the procedure beyond easy patient tolerance, or
- has a strong emotional or physical response to the discussion of treatment, to the rectal evaluation, or to the treatment itself. This response may occur up to 72 hours afterwards.

NOTE: *Latex allergy must also be addressed.*

ROF / PARQ

After the examination there is a meeting with the patient to discuss whether the suspected pain generating tissues are best treated intrarectally. If this course of treatment is selected, then a treatment plan is discussed. The supervising clinician should be present for the report of findings, the informed consent discussion, and treatment plan presentation.

Treatment plan discussion should include the following:

- patient positioning and gowning that will be used
- the people who will be present for the procedure
- frequency and duration of the trial of treatment
- possible side effects (see P. 19)
- specific outcome markers used to assess treatment efficacy (e.g. pain intensity, symptom frequency, centralization, ability to perform specific activities of daily living, Oswestry questionnaire)
- treatment charges

Treatment schedule

Treatments are usually scheduled once per week. Patients with more severe symptomatology may require treatment twice per week or even daily.

Usually 4-6 treatments are performed after

which the outcome markers and changes in tissue quality are evaluated.

If there has been significant improvement (greater than 30% reduction of symptoms overall), but symptoms continue, then a second treatment period may be tried. This cycle may be repeated as long as substantial improvement occurs with each treatment period.

Once maximal response to treatment is obtained, treatment is withdrawn. Periodic supportive treatment may be required to maintain the patient at maximal level of response.

Treatment Application

Options for positioning for treatment are the same as those for the examination (see "Evaluation" section, P. 17). Treatment consists of pressure applied to the identified tissues to patient's comfortable tolerance. Extra caution should be used in the vicinity of the anterior coccyx because of the presence of the coccygeal plexus. Pressure may be steady, applied as cross friction or stripping along the tissue fibers, or may be applied combined with passive hip movement. (During treatment the practitioner may contact the patient's thigh and flex or rotate the hip to move the intrapelvic tissues under the provider's fingers.)

To treat the coccyx, gentle pressure may be placed upon the anterior aspect of the coccyx, following the patient's breathing rhythm until a release or relaxation of the tissue is detected (1-3 minutes).

Alternatively, to treat the coccyx an available assistant can passively flex and extend the superior hip with the patient side-lying, as the practitioner maintains steady pressure on the coccyx. To treat the attached ligaments and muscles, gentle sweeping effleurage is applied laterally from the borders of the coccyx, or steady pressure may be applied to identified myofascial trigger points or areas of altered texture. A type of assisted contract-relax-stretch technique can be used by having the patient contract the pelvic floor muscles around the practitioner's internal finger, hold the contraction, and then when the patient releases the contraction the practitioner gently presses the coccyx into extension.

External treatment of related problems, such as manipulation of subluxations and treatment of myofascial areas of the lumbar spine, pelvis, hip or abdomen is typically performed at the same visit.

Postural retraining, especially with pelvic sitting position, lumbar stabilization exercises, Kegel exercises, pelvic clocking, proprioception and/or breathing exercises should be prescribed if indicated.

Side Effects

For non-pregnant patients the only reported side effects are emotional reactions, short-term pain or cramping following treatment, or short-term aggravation of pre-existing conditions such as hemorrhoids, fissures, etc. There are a few unpublished reports of long lasting irritation to the coccygeal plexus occurring with vigorous treatment to the coccygeal region.

Additional side effects during pregnancy include the theoretical possibilities of stimulating pre-term labor or of irritating the urethra or bladder leading to bladder infection or distention. If improper technique is utilized vaginal infection, from rectal contamination, could occur.

If cramping occurs during examination or treatment, the patient should lie quietly for 10 minutes in a comfortable, supported position *with the hips flexed*.

Any physical discomfort over the 24 hours following a treatment should be reported and assessed. Any emotional distress throughout the treatment period should be discussed and referral for counseling should be considered.

Coccyx

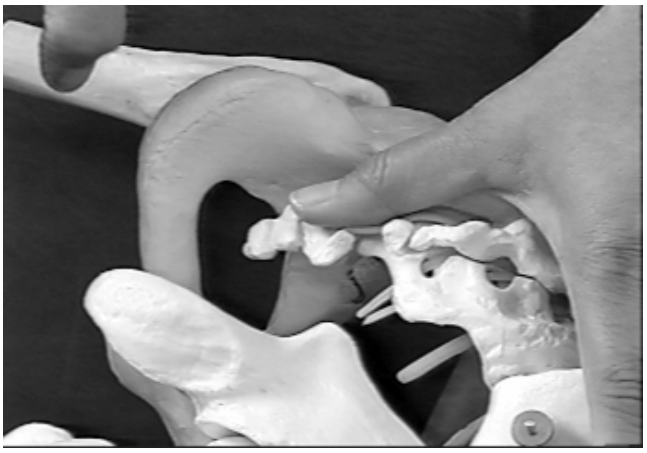
Indications for treating the coccyx include a pain pattern on or around the coccyx which may be aggravated by sitting, tenderness with external palpation, and history of fall on the buttocks.

Typically, external treatment is utilized first. Patients who do not respond to an external approach or patients who do not respond to the usual care for pain in the pelvic, lumbosacral, hip, posterior thigh, or sciatic regions may require internal treatment of the coccyx and/or related soft tissues. (See Intrarectal treatment on P. 16).

Techniques

Distraction technique. An adjustment for sacrococcygeal pain can be made by placing the patient prone on a flexion-distraction table and contacting the sacral apex. The apex is then used as a fulcrum as the lower part of the table is raised into extension to induce traction and perhaps extension at the sacrococcygeal joint. This maneuver is repeated rhythmically.

Drop technique. For an anterior (flexed) sacrococcygeal adjustment the patient lies prone. The practitioner places a thumb over the coccyx base, reinforces it with the pisiform of the indifferent hand, distracts with a tissue pull cephalad, then delivers a P-A thrust, using the drop piece.



Hold relax technique. The coccyx is indirectly affected by relaxing the lower gluteus maximus. The patient lies prone with her feet off the end of the table. The lowest ⅓ of each cheek of the buttock is cupped with the practitioner's thumbs pointed toward the gluteal crease. The patient is instructed to squeeze her buttocks and attempt to press the practitioner's thumbs together. Contract with about 20% of a maximum voluntary con-traction (MVC) for 5-7 seconds. When the patient relaxes, the practitioner gently lifts and spreads the cheeks until the elastic barrier is felt and the treatment is repeated.

The technique is pictured below on a male patient.

The treatment can be further enhanced by asking the patient to contract the pelvic floor muscles at the same time that she contracts the gluteal muscles (i.e., a Kegel exercise).

Internal adjustment. An internal coccyx adjustment may be performed intrarectally. (*See P. 17 regarding issues of informed consent, risk factors, timing of treatment, etc.*)

PHYSIOTHERAPY

A variety of physical therapy modalities may be used for symptom relief.

Although often suggested for use during labor (Bortoluzzi 1989, Grim 1985, Weisberg 1994), the use of TENS and other electrical stimulation during pregnancy is controversial. Some authors recommend its use for pain relief (Epstein 1959, Hainline 1994, Hill 1990, Kahn 1988) while others advise against it, primarily because its effects on the fetus have not been studied (LaBan 1996, Weisberg 1994). Extra caution needs to be taken during the first trimester when organogenesis takes place and there is an increased risk of teratogenesis. There are no reports in the literature of adverse effects of electrical stimulation when used during pregnancy. These interventions may offer a safer alternative when analgesic and muscle relaxant medications are being considered. However, it is advisable to discuss this with the patient and obtain her consent, as well as consult with her obstetric provider before initiation of this therapy.

- Local moist heat is cited in the literature as being useful for relaxing tight muscles and can be applied before treatment to enhance soft tissue, mobilization and manipulation procedures (Cohen 1997, Kahn 1988, O'Connor 1990). Some members of the consensus panel, however, were hesitant to recommend heat application because of the gravid uterus.

- Cryotherapy in the form of cold packs or ice massage is helpful in reducing pain and inflammation (Cohen 1997, LaBan 1996).

- Deep thermotherapies such as diathermy and ultrasound are contraindicated during pregnancy for treating low back pain (Kahn 1988, LaBan 1996, O'Connor 1990). Diathermy should not be used at all.

- Therapeutic ultrasound should not be applied to any part of the torso that may expose the gravid uterus.

SUPPORTIVE DEVICES

According to several authors, a trochanteric-type belt may relieve sacroiliac pain (Berg 1988, Bookhout 1988, Epstein 1959, Golightly 1982, Hainline 1994, Mens 1996, Ostgaard 1994, Penna 1989, Spankus 1965, Vleeming 1992). This may stabilize lax sacroiliac joints and symphysis pubis.

One screening option is to have the patient perform an active straight leg raise. If this increases low back pain, belt the patient and have her try again. If this provides symptomatic relief, prescribe the belt. Another option is to have the patient try wearing the belt for about 15 minutes in the office and see how she responds. The belt may be more effective to manage SI pain after pregnancy. The exact position of the belt must be adjusted for each patient. (Vleeming 1992) In one study the use of a pelvic belt relieved pain in about 52% of the pregnant patients and about 67% of the patients after pregnancy. (Mens 1996)

Although less comfortable, a broader maternity support for the spine and abdomen may help lumbar pain (Epstein 1959, Hainline 1994, LaBan 1996, Perkins 1998, Spankus 1965). These types of supports have an adjustable front panel or separate straps which go above and below the abdomen to minimize compression and more evenly distribute pressure. Even if a support did not help during pregnancy, a standard lumbar support may be more effective postpartum, particularly during functional activities. Supportive bras may also reduce postural strain.

A lumbar seat back support or small cushion to maintain the lumbar curve has been shown to relieve low back pain (Mantle 1977, Nwuga 1982). Sitting on a wedge-shaped seat cushion (with the thicker side in the back) reduces hip flexion and shortening of the hamstring muscles, which may also be helpful (Perkins 1998).

In a cross-over study in Australia, using a regular or wedge-shaped pillow to support the abdomen in the side-lying position at night was shown to help reduce nocturnal back pain, but use of the wedge-shaped pillow was significantly more effective (Thomas 1989). Because the uterus tends to be dextrorotated this may be particularly helpful when she is lying on her left side. *(See also "Sleep behavior" on P. 24.)*

EXERCISE

Exercise has both therapeutic and preventive value and can be started at any time before or during normal pregnancy. Women who continued a regular pre-pregnancy aerobic exercise program (three or more times a week, for at least 30 minutes) had fewer physical complaints while pregnant and recovered more rapidly from the birthing process (Clapp 1996). A prospective survey from the US found that vigorous maternal exercise appeared to reduce, rather than increase the risk of preterm birth, and at term, heavy exercisers delivered faster than non-exercisers (Hatch 1998). Another study found that women with lumbar pain who had engaged in physical fitness exercise for at least 45 minutes a week prior to pregnancy had less lumbar pain and fewer days of sick leave, but there was no such benefit from pre-pregnancy exercise for women with posterior pelvic pain (Berg 1988, Ostgaard 1994).

Women with sacroiliac pain should only engage in low-impact exercises such as walking or swimming (O'Connor 1990). Exercise recommendations should be individualized, taking into account physical and psychological factors. In a study from Sweden, pregnant women who received individualized training in proper posture, ergonomics, exercise and relaxation techniques had half the number of days of sick leave than those pregnant women who did not (Noren 1997). Other studies, where

the training was done in groups and not individually designed, suggest that there is much less or no positive effect (Dumas 1995, Mantle 1977, Ostgaard 1994).

The goals of an exercise program are to improve aerobic capacity, limit fear avoidance behavior, and enhance coping skills. This can be accomplished by strengthening and increasing flexibility of the muscles, joints and other supporting structures and facilitating proper posture (Bookhout 1988, Perkins 1998), which should reduce back pain and enhance the birth and delivery process. When developing an exercise program, consideration should be given to the woman's health and exercise history. In high risk or complicated cases consider consulting with her obstetrical provider. She should be advised to listen to her body and to modify, stop or switch if certain exercises cause discomfort, pain, dizziness or vaginal bleeding. She should avoid any type of activity which has the potential for mild abdominal trauma, exercises or positions that strain the abdominal or pelvic floor muscles and abdominal compression or breath-holding during exercise (O'Connor 1990).

The American College of Obstetricians and Gynecologists recommends that the supine position be avoided during exercise after the first trimester since it is associated with reduced cardiac output in most pregnant women (Anonymous 1994). An anaerobic pace should be avoided (Lee 1988) and she should stop when fatigued and not exercise until exhaustion (Anonymous 1994).

Lumbopelvic stabilization exercises may be particularly beneficial for pregnant women with sacroiliac pain to help stabilize the sacroiliac joints (Pool-Goudzwaard 1998). This involves a three phase program to strengthen the transversus abdominis and multifidus muscles. First, these muscles are contracted without any movement of the extremities or trunk, via abdominal hollowing and pelvic tilting (neutral pelvis, clocking exercises). Second, these muscles are contracted to maintain that position during movements of the extremities. In the third phase these muscles are active during trunk movements (Pool-Goudzwaard 1998).

Additional key muscle groups that may need to be strengthened are the erector spinae, which can be achieved by extension of the trunk, and the oblique abdominal, gluteus maximus and latissimus dorsi, which can be strengthened by trunk rotation (Pool-Goudzwaard 1998). In some women strengthening the long head of the biceps femoris may also help stabilize the SI joint (Vleeming 1992). "Essential Exercises for the Childbearing Year" (Noble 1988) and "Pregnancy Stretches" and "Getting Back into Shape after Childbirth" from the "Chiropractic Patient Resource Manual" (Di Lima 1994) are excellent resources.

Home exercises may include Kegels to strengthen the internal pelvic floor muscles, adductor isometrics and stretches, pelvic tilts and pelvic rocking, supine hip circumduction (if tolerated), wall squats and a walking program.

ERGONOMICS AND ACTIVITY MODIFICATION

Proper biomechanics and activity modification are other important self-care measures for prevention and treatment of low back pain in pregnancy and become even more important in the postpartum period when ligamentous laxity persists and the mother now has the increased demands of a newborn, and perhaps, other children.

Postural/movement strategies

Postural stabilization can be aided by teaching the woman the neutral pelvis posture, which avoids hyperlordosis and flexion of the lumbar spine. By using this neutral pelvis posture during all activities, postural strain is minimized (Hainline 1994) and the sacroiliac joints are better stabilized (Pool-Goudzwaard 1998).

Postures or activities that promote sustained or repetitive end range loading of joints and ligaments should be avoided. For this reason, pregnant women should not wear high-heeled shoes, as this will increase the lumbar lordosis and shearing stress (Hainline 1994). When sitting or standing for long periods, alternately resting one foot on a foot stool will relax the iliopsoas and reduce the strain on the lumbar spine, but may not be as helpful for women who have sacroiliac pain (Perkins 1998).

Correct lifting technique is essential for minimizing end range flexion loads at any time, but particularly during pregnancy. The patient should be taught to bend at the knees and hold the object close to her body (Hainline 1994).

Appropriate sitting posture can be critical to resolving low back and pelvic pain, especially if the intrapelvic muscles or coccyx are involved. (Baker 1993, Travell 1992) The patient needs to be taught to sit on her ischial tuberosities with the coccyx and its supporting structures suspended in a neutral or slightly extended position. To accomplish this, the patient can momentarily lift up from the seated position and slide her palms underneath her buttocks. She then can manually pull her buttocks posterior ward, shifting her weight forward onto her ischium. This results in a more stable sitting posture. The patient may also feel a slight spreading and relaxation of the pelvic floor muscles. If the patient can be convinced to perform this maneuver whenever she sits, over time she will be able to assume the appropriate sitting posture without using her hands. The patient's seated posture is important enough that it should be observed at every office visit and feedback given on how well she is utilizing the correct posture. "Donut" pillows are usually not required. If they are used in lieu of proper posture, they may actually worsen coccyx-related pain.

Sacroiliac pain

Women with sacroiliac pain should avoid strong contraction of the iliopsoas muscle (Pool-Goudzwaard 1998) and unilateral loading of the pelvis. They should minimize stair climbing and try to divide loads they carry into a bag for each hand to avoid asymmetric stress (Perkins 1998). Changing positions and activities between walking, standing, sitting and lying down is often helpful (Hainline 1994). Round ligament pain is a normal consequence of stress or stretching of the ligament and can be relieved by changing position and avoiding sudden movements. Appropriate periods of lighter activity or rest are important to reduce fatigability of muscles which predisposes to strain. However, she should be counseled that too much rest can cause loss of muscle strength, coordination, and stability as well as decreased muscular and physical endurance and is likely to increase symptoms (Pool-Goudzwaard 1998).

Sleep behavior

Pregnant women who experience back pain should try sleeping on their side. Placing a pillow between the knees to keep the thighs parallel and a wedge-shaped cushion under the abdomen help to reduce torque on the hip and low back while at sleep. *(See also "Supportive devices" on P. 21.)* Squeezing the knees together when rolling over in bed may also assist in stabilizing the pelvis (Perkins 1998). She should be taught how to keep her hips and shoulders in line when rolling over and/or sitting up. Using the same strategies to get out of bed, she should turn on her side, lower her legs over the side, tighten her abdominal muscles and push herself up with her arms. Sleeping supine seems to be associated with an increase in night back pain and disturbed sleep during late pregnancy (Fast 1992).

MONITORING THE PATIENT

Treating the pregnant patient's musculoskeletal complaints should not be construed as obstetrical care. For example, laboratory tests should be ordered only on rare occasions *when it is truly unrelated to the pregnancy*. If any abnormal values are found, they need to be reported, with the patient's permission, to her obstetric provider. Any questions the patient has directly related to the pregnancy (bleeding, cramping, due dates, etc.) should be referred to her obstetrical provider. This should be done immediately in cases where preterm labor or other complications are suspected (see warning signs below).

There is a clinical need to assess the risk to the pregnancy from any procedures performed such as manipulation, traction, physiotherapy, and exercise (for specific concerns see the pertinent sections of this document).

Chart the name of the obstetric provider. "Pregnancy, due date _____" must be recorded on a Therapeutic Alert to be placed in the chart. If the patient indicates that her pregnancy is at high risk for any reason, "high risk" should also be noted on the Therapeutic Alert as well as the reasons.

Examples include problems with previous pregnancies (e.g., miscarriage, ectopic pregnancy, preterm labor, pre-eclampsia, thrombophlebitis, vaginal bleeding after 20 weeks, still born or neonatal death) or current problems (e.g., hypertension, diabetes, multiple pregnancies such as twins, small or large for dates, risks for pre-term labor, substance abuse, eclampsia or pre-eclampsia, congenital *anomaly*, or any other medical condition complicating pregnancy such as cardiac or renal disease, seizure disorder, systemic infection).

It is recommended that at each visit the patient is asked how her pregnancy is progressing and whether there have been any changes. In addition, other specific questions can be asked and charted periodically throughout the course of the pregnancy.

- Is the baby growing/moving?
- When was your last prenatal visit? Was there any problem/concern? How was your blood pressure? When is your next appointment?
- Are you having any cramping, contractions, or episodes of increased (sometimes painless) "tightness" of the abdomen?
- Have you noticed any leaking of fluid or any bleeding?
- Are you having pain in the legs (if there are signs of swelling, inflammation, severe pain, redness, etc., consider thrombophlebitis)?
- Are you having UTI symptoms; flank pain, dysuria, sudden change in frequency/urgency, fever over 101ºF?

Pre-term labor

(greater than 2 weeks prior to due date)

The most important warning signs are as follows:

- Uterine contractions or episodes of (sometimes painless) "tightness" that happen every 10 minutes or more often, with or without any other warning sign.
- Increase or change in vaginal discharge. More vaginal discharge than usual, or change into a mucousy, watery or light bloody discharge.

The following may also be warning symptoms, depending on the overall clinical picture:

- Menstrual-like cramps felt in the lower abdomen. They may come and go or be constant.
- Low dull backache felt below the waistline. This may come and go or be constant.
- Pelvic pressure feels like the baby is pushing down. The pressure comes and

goes.
- Abdominal cramping with or without diarrhea.
- Febrile illness (e.g., fever above 101ºF with or without chills)

If the practitioner thinks pre-term labor may be occurring, the obstetrical provider, clinic, or hospital should be contacted immediately for further directions. If contact cannot be made, a family member, taxi, or in the case of an emergency, an ambulance can be called. Clinical staff are not to attempt to transport the patient themselves.

In cases where there is a delay in reaching the obstetrical provider, the mother-to-be is low risk, and it is unclear whether the symptoms are likely to be associated with preterm labor the following should be done:

1) Have the patient lie down on her left side.
2) Check and time her "contractions" for up to an hour if necessary.
3) Continue to try to contact the obstetrical provider.

If symptoms subside before the provider can be reached and there is no spotting or leaking of vaginal fluid consistent with possible rupture of membranes, the patient can be advised that she can leave the clinic. She should contact her provider if her status changes once again. On the other hand, contractions occurring every 10 minutes or less suggest that labor has begun.

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