

# PRECAUTIONS AND CONTRAINDICATIONS FOR BODYWORK DURING PREGNANCY

## LEARNING OBJECTIVES

After reading this chapter, you should be able to:

- Discern when the use of a medical release prior to massage is indicated and when to refer a client to her prenatal care provider based on symptoms that might indicate pregnancy-related problems.
- Describe the most common bodywork-technique precautions for pregnancy and be able to determine in which situations they would apply.
- Describe the difference between sedating and potentially stimulating type bodywork and the precautions or contraindications associated with each.
- Describe high-risk obstetric conditions and their relevant bodywork precautions.
- Develop health intake and medical release forms that address specific bodywork concerns related to pregnant clients.
- Identify specific acupressure points that are contraindicated for use during pregnancy.
- Ask discerning questions to help identify pain as possibly a concerning condition of pregnancy or as purely musculoskeletal.
- Understand the importance of a thorough health intake at an initial visit and update at each subsequent visit.
- Describe three potential consequences of improper client positioning during pregnancy massage.
- Name the three most important safety concerns for a therapist working with a pregnant woman.

Most pregnant women in the United States will have a normal perinatal period without looming dangers to the safety and health of herself or her baby, and without need for medical interventions.<sup>1,2</sup> The majority of pregnant women who come for massage and bodywork sessions will also be healthy and will need few bodywork restrictions. However, while appreciating pregnancy as a normal physiological passage in many women's lives, all pregnancies do have associated risks, and some will become classified as "high risk." A bodyworker must be aware of precautions, contraindications, and various bodywork guidelines that are important to observe not only for the client with a normal pregnancy, but for those with minor or more serious risk factors. The massage therapist needs to be educated about what conditions are normal and what symptoms or conditions indicate that a client should be referred to her prenatal care provider (PCP) or perhaps to a more experienced pregnancy massage therapist. (See Box 4.1 for a list of these symptoms.)

This chapter begins by clarifying bodywork terminology that is used hereafter in the text, specifically what is meant by "Type I" and "Type II" touch. Then, information on health intake and assessment questions specifically relevant to working with pregnant clients is presented, including an explanation of obtaining a medical release. Next, we consider precautions that are needed for specific types of bodywork. General conditions considered by the American College of Obstetrics and Gynecology to increase risk during pregnancy, and which have a few particular

## BOX 4.1 | Symptoms Requiring Referral to the Primary Care Provider

Refer a client to her primary care provider for the following symptoms:

- Abdominal Discomfort
  - Tender or painful abdomen or unexplained pain in abdomen
  - Right upper quadrant abdominal pain
- Leg pain
  - Pain or aching in the leg
  - Unidentified leg pain
  - Swelling, heat, tenderness in leg
- Uterine Cramping
  - Intermittent or regular uterine cramping before 36 weeks
- More than four preterm contractions an hour for 2 hours
- Malaise
  - Increasing malaise, dizziness, visual changes, right-sided upper abdominal pain, and/or nausea
- Bleeding or leaking fluid
  - Unexplained vaginal bleeding
  - Sudden gush or slow leak of liquid from vagina (amniotic fluid should be clear, but could also be greenish, or port wine color)
- Pain
  - Any unexplained pain or discomfort that is severe, sudden, nagging, or worrisome

considerations for bodywork, are then defined. The intention of these descriptions is to help the therapist understand *why* the situation is considered an obstetrical risk, and how massage can be adapted to the particular situation.

Finally, high-risk obstetrical complications that the prenatal massage therapist may encounter are explored.

## PRIMARY CONSIDERATIONS FOR PREGNANCY MASSAGE

Most of the massage students' and therapists' fears about working with pregnant women are not actual dangers. The three most significant real concerns for a pregnancy massage therapist are listed as follows:

1. **Proper positioning:** Improper positioning of a client during pregnancy can be a danger for both mother and baby by interfering with uterine blood flow and resulting in maternal hypotension, nausea, syncope (fainting) and ultimately shock, along with consequent effects on a baby. Ligament strain, sacro-iliac pain and misalignment, leg cramps, and brachial plexus compression can all be aggravated by inadequate support and improper positioning on the massage table. Methods of positioning will be discussed in detail in Chapter 5.
2. **Blood Clots:** During pregnancy, the *risk* for developing a blood clot or *thrombus* is greatly

increased (see the section "Circulatory System" in Chapter 2). Because massage may have the capacity to stimulate circulation through the blood vessels and increase the risk for dislodging a clot, only gentle touch should be used on the legs of pregnant and postpartum clients, and at times, no touch at all. Massage is always contraindicated to legs with thrombophlebitis or deep vein thrombosis (DVT). Thankfully, despite the increased risk, the actual incidence of a clot becoming an embolism during pregnancy is low. This issue is discussed in greater depth later in this chapter.

3. **High-Risk Pregnancies:** Pregnancies that become categorized as high-risk hold the potential for serious complications to a mother and/or baby. In these situations, there are usually restrictions to the type or quality of bodywork given and a medical release is necessary before offering bodywork. When a mother has a high-risk condition, excessively stimulating or deep, full-body or abdominal massage could possibly increase risks in some situations. This is also discussed later in this chapter.

Consideration of these issues is of primary importance during each perinatal massage. Throughout this chapter, and throughout the book, these three topics are addressed where relevant, and recommendations for the massage therapist are provided. In addition to these areas of precaution, it is also important to remember that any standard massage contraindications and

**Table 4.1 Review of Standard Massage Precautions for All Clients**

Local Contraindications	Precautions for All Type I Bodywork (A medical release is required and possibly only Type II techniques may be permitted.)
Acute skin injuries/burns Acute arthritis Acute bursitis Communicable skin conditions, irritation, or discharge Varicose veins Vertebral disk problem	Cancer Severe hypertension Circulatory and cardiac conditions Convulsive disorder  Type I diabetes Infectious disease Pitting edema due to heart/kidney problems Kidney disease or kidney stones Thrombophlebitis or blood clot

precautions—such as avoidance of inflamed or infected skin—that are applicable to nonpregnant clients, still apply in pregnancy. The massage therapist is responsible to know these standard massage precautions (see Table 4.1 for a list of these precautions).

As you read this chapter, keep in mind that it is most important to understand *why* particular precautions and contraindications exist. With that knowledge, you can make skilled and sound decisions about what kind of bodywork is appropriate in each individual case.

*Note:* Many massage therapists will never encounter a pregnant client with a dangerous high-risk complication. Once trained, others will intentionally choose to offer massage to a higher-risk population. This chapter is meant to be a useful resource for all practitioners. Refer here for information regarding conditions of which you are uncertain about the appropriateness of bodywork. Rather than immediately refusing to work on a client who says she has a “risk” condition, turn to this chapter to see if you can determine if the condition actually poses a *bodywork* risk or not. By reading this chapter you may learn standard types of precautions that can then be applied to other situations not listed here. Keep in mind, however, that safety is always primary, so *when in doubt, give a shout: ask for advice from someone more knowledgeable to ensure safety!* Always obtain advanced training in perinatal massage before working with high-risk pregnancies.

## CLARIFICATION OF BODYWORK TERMINOLOGY: TYPE I, TYPE II

There are numerous schools of bodywork and modalities of touch. For purposes of clarification and simplification, this book divides bodywork into two

categories: stimulating touch and gentle or subtle energy touch. When listing contraindications to massage, it can be too limiting and ill-defined to simply state that “massage is contraindicated.” When touch is gentle and nurturing, it can be used in nearly every situation. When it is vigorous or deep tissue, it will have some limitations. The differentiation between these two types of touch is made by referring to Type I and Type II styles of touch.

### Type I: Stimulating

Type I massage and touch is generally more intensive and may be stimulating to the circulatory and/or musculoskeletal system, with a tendency to increase the release of cellular waste products. In this category are at least some of the techniques from the following modalities: vigorous Swedish, Rolfing, deep tissue, trigger point, sports massage, lomi lomi, and Shiatsu. This is not a comprehensive list. In the text, I may refer to this Type I work, as “deep,” “stimulating,” or “circulatory” bodywork. While Type I full-body Swedish massage may be contraindicated, this does not necessarily contraindicate all touch. Often, localized work on the extremities—hands, feet, neck, shoulders, head—or Type II full-body touch will still be appropriate.

### Type II: Gentle

The second type of touch is physically gentle, non-forceful or nonintrusive, and does not stimulate the physical body in the same way as the above techniques. It is therefore appropriate in nearly every situation, even if Type I work is contraindicated. Type II techniques include, but are not limited to, the following: Swedish massage to the extremities or in

localized areas, as well as light-touch, full-body Swedish massage, indirect myofascial release, gentle acupressure such as Jin Shin Jytsu, and subtle energy work such as Reiki, craniosacral therapy, or polarity therapy. I refer to these Type II bodywork modalities in the text as “gentle” or “energy-work.” Except in the case of a communicable, contagious disease process, when contact with the infected person is contraindicated, *there is rarely a reason for Type II touch to be contraindicated.*

## HEALTH INTAKE, ASSESSMENT QUESTIONS, AND MEDICAL RELEASE

Many massage practitioners use a standard health intake form with new clients. These forms generally do not address the specifics of pregnancy. Because a woman’s pregnancy is constantly changing, with the possibility of developing risk conditions as the pregnancy progresses, it is important to have an intake form that addresses these special concerns of pregnancy. It is equally important to update your information *at each visit*, as a client may return with a new health condition that may indicate new precautions with bodywork. Obtaining and reviewing this information will not only give you perspective on the physical concerns your client may have, but can also enlighten you to emotional issues that she may be contending with and which may arise during bodywork sessions.

On review of the information received, you may, on rare occasions, need to cancel the session or resort to only Type II bodywork for the current session, asking her to return next time with a medical release indicating whether it is appropriate for her to have Type I bodywork. This will generally occur only if her symptoms have just recently developed and she has not yet been seen by her prenatal care provider. Some questions may be asked over the phone when an appointment is made to determine if a medical release seems appropriate prior to bodywork.

Figure 4.1 is an example of an acceptable health history intake form, which is devoted to pregnancy questions. The intake should include questions about how far along the client is in her pregnancy, what number pregnancy this is, and should identify potential risks or current complications. The form benefits the client as well as the therapist, as it indicates to her that you are aware of conditions of pregnancy. It also gives her a chance to review the health of her pregnancy relative to massage, and will bring to her mind the type of conditions that she should inform you of in the future, should her condition change. If the

health intake is not done in writing, the therapist should at least ask the following questions:

1. *What number pregnancy is this? How many births has she had?*

These are two different questions. A woman could have been pregnant five times but not have a child. She may have had miscarriages, abortions, or had a child die before or after birth. Her response to these questions will give you information to help evaluate risks during this pregnancy. If she has had three or more consecutive miscarriages, she will be considered higher risk for another miscarriage.<sup>3</sup> A woman who has had more than three full-term pregnancies, or has had two or more pregnancies following within a year of each other, will be more likely to experience varicose veins, diastasis recti, low back pain, and other back complaints. This information is useful to the massage therapist with regard to what type of bodywork precautions may be necessary, as well as to having an idea of the client’s emotional state.

2. *How many weeks pregnant is she, which trimester is she in, or what is her due date?*

Obtaining this information when an appointment is made will help you to determine ahead of time how to set up your massage table for her optimum comfort and safety and help you evaluate trimester-dependent precautions. It will also inform you if she is close to delivery time, which would allow you to use labor preparation techniques and prepare you for the possibility of her having early labor contractions during a session.

3. *Does she have a history of complications with this or other pregnancies?*

Depending on what the previous complication or condition was, having formerly had a high-risk pregnancy may increase a woman’s risk with this one, even if she is currently having no problems. This would be particularly true with a history of preterm birth, placental abruption, or deep vein thrombosis, all of which have a risk of recurrence in a subsequent pregnancy.

4. *Is she currently having any high-risk conditions, complications, or physical concerns?*

If she describes any conditions which indicate bodywork precautions, you will have to investigate further as to whether bodywork is appropriate at this visit, or whether you should obtain a medical release or have a discussion with her PCP before continuing.

**CONFIDENTIAL HEALTH INTAKE FORM FOR PREGNANCY**

Name \_\_\_\_\_ Date \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Emergency contact: Name \_\_\_\_\_ Phone \_\_\_\_\_

Prenatal Care Provider: Name \_\_\_\_\_ Phone \_\_\_\_\_

My due date is: \_\_\_\_\_

This is my \_\_\_\_\_ (1<sup>st</sup>, 2<sup>nd</sup>, etc) pregnancy and will be my \_\_\_\_\_ (1<sup>st</sup>, 2<sup>nd</sup>, etc) birth. I am \_\_\_\_\_ (number) weeks pregnant in my \_\_\_\_\_ (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> trimester).

In order to provide you with the best care possible during your pregnancy, it helps me to know of any complications or conditions that may require particular bodywork precautions. Please inform me, at each of our visits, of any changes in your pregnancy.

Please check ( ) current problems; mark with (+) if you have had one of these problems in the past.

_____ Sciatica	_____ Bladder infection*
_____ Nausea	_____ Uterine bleeding*
_____ Anemia	_____ Chronic hypertension*
_____ Edema/swelling	_____ Blood clot or phlebitis*
_____ Headaches	_____ High blood pressure*
_____ Low back pain	_____ Problems with placenta*
_____ Leg cramps	_____ Preterm labor*
_____ Insomnia	_____ Abdominal cramping*
_____ Carpal tunnel syndrome	_____ Preeclampsia*
_____ Skin disorders/athlete's foot	_____ More than 2 consecutive miscarriages*
_____ Separation of the symphysis pubis	
_____ Diabetes (gestational or Type I)	
_____ Separation of the abdominal muscles	
_____ Any other problems in current or past pregnancy (provide details): _____	

I, \_\_\_\_\_, verify that I am experiencing a low risk / high risk (circle one) pregnancy according to my prenatal care provider. If I am currently having or develop complications (any conditions/symptoms listed above with \*), I will discuss the condition with my massage therapist and will have a medical release for bodywork signed by my prenatal care provider before continuing bodywork.

Signature \_\_\_\_\_

**FIGURE 4.1 Health history intake form.**

A health history should be obtained at the first prenatal massage visit, and updated at each subsequent visit.

**5. How is she feeling about this pregnancy?**

This can be a casual question. It need not be direct, and may be assessed based on how she has expressed herself during the health

intake. Do not assume that all women are enthusiastic about their pregnancy. Some are ambivalent about their situation and need time to adjust to this new reality. Some did



not plan to be or want to be pregnant. Other women have tried unsuccessfully for years to become pregnant or to maintain a pregnancy, and have finally resorted to vitro fertilization or other new technologies for becoming pregnant. Assess her relationship to her pregnancy to avoid making assumptions or an embarrassing faux pas with a casual comment. Your role as massage therapist is to offer a safe environment for her to receive nurturing touch and support for however she happens to be feeling at that point.

6. *Is she doing any exercise during her pregnancy?* This may give you an indication of her general health and orientation toward exercise and desire for referrals to others in your community should she have particular muscular aches that may benefit from prenatal yoga, swimming, or another exercise program recommended by her PCP. It will also give you a clue about her interest in self-care strengthening or stretching instruction.

### Assessing Symptoms of Discomfort

Before beginning work with any client, it is important to collect the above health information that may affect your work. If a client presents at your office with a *new*

condition, or in the rare case of symptoms arising *during* a massage, a few discerning questions can help determine appropriate action and possibly identify whether symptoms indicate a problem of pregnancy. For instance, a symptom of mild abdominal pain could be a musculoskeletal concern, such as a tight or spasming psoas or uterine ligament, or could indicate a condition that needs medical attention, such as preterm contractions or urinary tract infection. Box 4.2 highlights common symptoms that may reflect both musculoskeletal and pregnancy-related conditions.

The client herself will often be aware of symptoms that should be assessed by her PCP, but the massage therapist should also be able to recognize a situation that requires bodywork precautions or is contraindicated for massage. As a massage therapist, you will never diagnose a condition of pregnancy, but do not hesitate to refer a client to her PCP for *any discomfort that has an unclear etiology, or which you or the client are concerned about*. If you encounter a concerning symptom, such as recent headaches and pitting edema (which will be explained later in the chapter) in the third trimester, first determine if the symptoms have been assessed recently by the client's PCP. If they have and it has been determined that the client is in no danger, your own worries can be alleviated. Avoid contemplating out loud all the possible ramifications of the symptoms. While at times they might indicate a

#### MESSAGE THERAPIST TIP

#### Addressing Client Health Information With Sensitivity

Pregnant women in the United States have plenty of concerns on their minds. They are often consumed with thoughts about maintaining optimum fetal health, examining how their life will change with a new family member, or anxious about how they will fare through labor. Women come to their massage therapist to find renewal, relaxation, and recovery from their stresses and strains of daily life. It is the last place they expect to find more things to worry about or to feel judged for their choices. If, as a massage practitioner, you begin doing automatic assessment tests for deep vein thrombosis on every client, (as some students are taught to do), or requiring a medical release even when she has a low-risk pregnancy (as some spas require), or questioning every complaint with a fearful discussion of all the possible risks it could indicate, you could add to her stress, not relieve it. Simple, discerning questions, as discussed in this chapter, can indicate if a client should contact her PCP without overly increasing anxiety.

Care and respect in your responses is also needed when reviewing the personal information you receive during a health intake or while massaging your client. Everyone has personal opinions about sexuality, pregnancy, and birth choices. Common "hot" topics that may come up during a massage or intake process include abortion, in vitro fertilization, single parenting by choice, homosexual parenting, or birth control choices. Practice cultivating a safe environment by keeping your opinions to yourself, and letting your hands share their caring touch.

In accordance with creating a safe, nurturing space for your clients, remember that all your health-intake information and whatever your client discusses during her sessions is confidential and must remain within your office walls between the two of you. Letting your client know this ahead of time helps create that safe space.

## BOX 4.2 | Common Symptoms That Could Indicate Problems of Pregnancy

Massage therapists may encounter pregnant clients asking for relief of the following symptoms. Some of these common complaints may indicate a more serious problem. Most musculoskeletal problems will get at least some relief from massage, whereas a medical problem will not improve with massage.

### Mid to High Back Pain

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Kidney stones or infection</li> <li>2. Musculoskeletal</li> </ol> | <ul style="list-style-type: none"> <li>• Assess whether pain is sharp, shooting, or localized in kidney area, and unrelieved by massage.</li> <li>• Kidney pain usually has more sudden onset.</li> <li>• Musculoskeletal pain is likely relieved by massage.</li> </ul> |
|---|--|

### Low Back Pain

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. Preterm labor.</li> <li>2. Urinary Tract Infection (UTI)</li> <li>3. Contractions</li> <li>4. Musculoskeletal</li> </ol> | <ul style="list-style-type: none"> <li>• Musculoskeletal low back pain is common during pregnancy.</li> <li>• Preterm labor may feel like backache, groin pressure, low abdominal ache, without sensation of contractions. May be irregular or constant.</li> <li>• UTI symptoms include any or none of the following: low back pain, burning or frequent urination, low-grade fever, low abdominal pain. May be irregular or constant.</li> <li>• Full-term contractions may be experienced in the low back, rather than abdomen.</li> </ul> |
|--|---|

### Groin Pain and Pressure

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Preterm labor</li> <li>2. Urinary tract infection</li> <li>3. Contractions</li> <li>4. Separated symphysis pubis</li> <li>5. Pulled round ligament</li> </ol> | <ul style="list-style-type: none"> <li>• Preterm labor may be experienced as groin pressure. May be irregular or constant.</li> <li>• UTI may be experienced as low abdominal pain or pressure.</li> <li>• Separated symphysis pubis is often painful with walking, and with abduction of hips. May feel tender to the touch in pubic area.</li> <li>• Round ligament pain may feel like low abdominal or groin pain; often sharp and sudden like muscle cramp. May be relieved with flexion of hip.</li> </ul> |
|---|---|

### Headache/Heartburn/ Edema/ Severe Persistent Back Pain/Nausea

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Preeclampsia, gestational hypertension, HELLP syndrome</li> <li>2. Normal aches and pains of pregnancy</li> </ol> | <ul style="list-style-type: none"> <li>• Headaches, heartburn, edema, back pain, and nausea are all common and nonpathological complaints during pregnancy, but above symptoms also can indicate preeclampsia.</li> <li>• Client should see health provider if above symptoms have not been assessed and are experienced as a new group of symptoms, or if headache is unrelieved by Tylenol or massage, if client is seeing spots or visual changes, or has pitting edema.</li> </ul> |
|---|--|

### Pain in Leg or Calf

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. Possible blood clot</li> <li>2. Leg cramps common in pregnancy,</li> </ol> | <ul style="list-style-type: none"> <li>• Sharp pain or aching pain in calf or leg should be assessed for recent musculoskeletal injury or activity, new shoes, poor posture.</li> <li>• Assess for redness, swelling, streaking, or inflammation in area indicating especially at night possible clot.</li> <li>• Refer client to care provider for unexplained leg or calf pain.</li> </ul> |
|--|--|

problem, they can also be very normal conditions of pregnancy, with no concern for the mother's or the baby's safety.

If symptoms are new and the client is concerned enough about them to want to call her PCP, she should be immediately supported to do so. *Always listen to intuitive or "gut" feelings if they are urging caution.* Even if all other signs indicate there is not a problem, our intuitive mind often picks up on cues that we miss with our rational mind.

If the symptoms have not been assessed by the PCP, ask further appropriate, discerning questions that define the discomfort as specifically as possible, as discussed below. If you are uncertain about the condition, suggest that she call her PCP to verify if she should be seen right away, or if there are any restrictions for bodywork in relation to this condition. By asking questions, the massage practitioner may avoid assuming that all sensations are dangerous and pregnancy-related, or that all sensations are musculoskeletal-based.

1. *Has this been assessed by her primary care provider recently? Has the discomfort increased since that visit?* If symptoms have increased and she was told to report changes, she should call her PCP before beginning bodywork.
2. *Where exactly does she feel it?* To help clarify, have her point to the area of discomfort. Some describe a "belly ache" and point to the pubic bone, while others will point to the liver area. Knowing where it is located can help define it. Any sensations in the abdomen that are not easily identifiable, or sensations elsewhere that are not clearly musculoskeletal should be referred to the PCP for further assessment. Keep in mind that uterine sensations, such as contractions, may be felt in the legs, pelvis, and groin, as well as the abdomen.
3. *What is the quality of the discomfort?* Massage therapists generally learn to assess nerve, ligament, and muscular pain, such as sharp, shooting, and burning sensations that are often related to nerve pain or ligament spasm. Dullness and aching may be related to muscle soreness, uterine cramping, or possibly organ dysfunction of some sort.
4. *Is the sensation intermittent or is it constant? Does it refer elsewhere in the body?* Contractions are typically intermittent. Muscular spasms may be intermittent sharp pain that can radiate and may include a constant, localized aching. Constant unchanging or increasing pain in the abdomen may reflect developing problems with the uterus, placenta, or baby,

or a condition such as a urinary tract or kidney infection, and the client should call her PCP right away.

*A note about contractions:* Most women experience mild, intermittent tightening of the uterus in the latter part of pregnancy (or sooner for women who have had more than one birth). These have been commonly called Braxton-Hicks contractions, or "practice" contractions. They are irregular, nonrhythmic, sensations of the uterus that do not increase in amplitude and do not change the cervix. It is important not to ignore the potential for preterm labor by *assuming* that any mild uterine sensations are merely these types of normal tightenings. However, it is equally important not to be nervous each time a woman's uterus tightens. One contraction does not mean labor or preterm labor has begun. A general guideline is that if a woman is having *regular* or frequent tightenings of her uterus (more than four per hour for a period of 2 hours) her PCP should be called.

5. *Does repositioning or touch help relieve the pain? Does she know what relieves it and what makes it worse?* Generally musculoskeletal pain will increase with movement, and lessen with positional or postural changes that alleviate muscle tension or spasm. Massage will often help relieve muscular pain.
6. *Is it tender if palpated? Is it inflamed with redness, swelling, or heat?* Tenderness upon palpation might give more indication of muscular discomfort if you can touch a specific muscle where it hurts. Inflammation should be reported to the PCP.

A tender abdomen is not normal and the client should be referred immediately to her PCP if she feels pain on touching her abdomen. Sharp or aching pain in the leg, or unidentified leg pain, especially with redness, edema of the extremity, or localized swelling or heat associated with it, should also be referred to the PCP for evaluation of a possible blood clot.

Having the client describe the discomfort will give you some information to start with. You also might explore more about the discomfort in relation to her pregnancy. These questions would include the following:

1. *How long has she had the pain?* If it just started when she got on the table, perhaps she pulled a ligament or muscle while positioning herself. If she has had the discomfort for weeks,



she may have visited her PCP already and been given some idea of what is causing the discomfort. If her discomfort has increased since her last prenatal visit, she should call her PCP.

2. *When is her next appointment with her prenatal care provider?* If she has experienced the pain for days, but has not seen her provider recently, find out when her next visit is. She may want to call her PCP to determine if she needs to be seen sooner.
3. *What does she think is the cause of the discomfort? Has she experienced it before?* Many women will know or have a sense of what has caused the discomfort or it may feel familiar from a previous pregnancy.
4. *How far along in her pregnancy is she?* This should already have been discussed in your general intake process and be in your mind as you review her symptoms. Headache and nausea during the first trimester can be normal and would more likely be related to hormonal issues or dehydration, while in the third trimester, complications of pregnancy such as preeclampsia or HELLP syndrome might be considered. This will be discussed later in this chapter.

### Medical Release

A written **medical release** is a form signed by your client's prenatal care provider which indicates approval, from an obstetrical viewpoint, for massage at this point during her pregnancy, and which can indicate restrictions or concerns applicable to massage. When working with women with a high-risk condition, obtaining a release may be valuable for several reasons:

- **Clarification of limits and risks:** While the client will normally have been told what types of restrictions her condition requires, a release from the PCP can clarify limitations, restrictions, or risks of which you must be aware of with bodywork. After obtaining this information you can decide whether you are comfortable working with a client with this condition. Your nurturing touch will never adversely affect the pregnancy, but if you have insecurities for any reason, your uncertain energy will be transmitted to the client through your tactile and verbal contact, and will not provide her with optimum comfort. The medical release may help to alleviate your worries.
- **Liability:** Some hope that a medical release form could reduce legal liabilities should a

lawsuit regarding the woman and baby's care arise. This is a concern that is especially pertinent in the litigious-prone United States, where 76% of obstetricians have reported to the American College of Obstetrics and Gynecology that they have been sued at least once, with an average of 2.6 times in their careers.<sup>4</sup>

- **Building a referral base:** Obtaining a medical release could help you to establish a relationship with the midwife or doctor by making the provider aware that the client is receiving or wants to receive massage. It will help you to become familiar with local medical providers and give you an opportunity to share with them the benefits of touch for pregnancy and ensure that you are included, at least peripherally, as part of a circle of support working to help a woman have the best pregnancy and birth experience possible. By sharing in this process, medical providers may also come to view you as a resource and may refer clients to you or allow you to display our business cards in their office.

Some practitioners choose to obtain a medical release before working with any pregnant client. This is due to perceptions of pregnancy as a dangerous condition, or concerns that the pregnant woman will not inform the therapist of relevant risk factors. If it is your policy to have a medical release for all your clients, then obtaining one for your pregnant clients would be consistent. However, *a release for massage is not necessary for clients with a normal, low-risk pregnancy*, unless the client (or therapist) would feel more at ease having a form signed by her PCP confirming in writing that massage is safe for her.

The most appropriate time to use a medical release form is if a new client presents to you with a high-risk condition or if a current client develops a condition of which you are uncertain about bodywork restrictions. See Box 4.3 for a list of conditions for which a medical release is most highly indicated and recommended. If you choose not to use a release, but have questions about a particular condition, do research, or call her PCP's office and ask what kinds of risks are associated with that condition. You will not be given information specific to your client, due to privacy issues, but you may be able to obtain general risk information or resources for obtaining more information about the type of condition she has.

You can develop your own release form that suits your practice and clientele. The form should include a list of contraindications, and/or of acceptable bodywork techniques that the PCP can check if pertinent to

### BOX 4.3 | Conditions for Which to Obtain a Medical Release for Bodywork

- Hypertensive disorders including:
  - Preeclampsia
  - HELLP syndrome (Type II as well as Type I bodywork may be contraindicated, depending on the severity of the client's condition.)
  - Severe chronic hypertension
  - Moderate to severe gestational hypertension
- Placental dysfunctions including
  - Placenta previa
  - History of partial placenta abruption in this pregnancy
  - History of placenta abruption in former pregnancy
  - Symptoms of bleeding
- Miscarriage or premature labor or birth
  - Preterm labor in this pregnancy
  - History of more than one preterm birth
  - High risk for repeat miscarriage, such as three or more consecutive miscarriages prior to this pregnancy
- Polyhydramnios
- Blood clots: Thrombophlebitis, DVT, history of DVT or embolism
- Any client restricted to bed rest or modified activity
- Any client with a condition being managed in the hospital
- Any time the client requests to have a release from her doctor or midwife

this client. Your client can bring the form to her PCP, along with information or a brochure about the type of bodywork you do. Once the provider signs the form, the client brings or mails it back to you for review. Many times doctors or midwives do not know what concerns a massage practitioner could have, therefore it is still your responsibility to know prenatal bodywork contraindications and follow those guidelines, even if a doctor signs a form approving all massage with no restriction. For instance, if you know that a client has large varicose veins, has a history of clots, or is on bedrest and at higher risk for deep vein clots, you would still not massage her legs, despite the doctor's lack of written restriction. A sample medical release form is provided in Figure 4.2. The release may need to be updated or revised as the pregnancy progresses and the client's condition changes.

## BODYWORK PRACTICES REQUIRING PRECAUTIONS IN PREGNANCY

Certain types of bodywork require special precautions when performed on pregnant clients. Below are some considerations to take into account when using specific methodologies, techniques, or tools with your client.

### Abdominal Bodywork

Abdominal bodywork is contraindicated in a few situations. Because the majority of miscarriages occur during the first trimester,<sup>3,5</sup> avoid *deep* abdominal massage at this time. The primary reason for this

recommendation is to prevent any questioning or association of massage with miscarriage in your own mind and in the mind of the client, should this pregnancy result in miscarriage.

*Note:* Be aware that Type II, slow effleurage or energy techniques on the abdomen will not cause harm, and some advanced practitioners may still choose to use these techniques on the abdomen at this time, with the client's informed consent or request.

Along with first trimester contraindications, Type I abdominal massage is also contraindicated at any time during pregnancy that there are concerns or risks with the health of the uterus or placenta, as well as when the mother is having preterm labor risks, or if the baby is demonstrating signs of stress, as indicated by irregularities of the heartbeat. These are situations for which the client would be medically managed. You might see her in a hospital or at home with restricted activity or on bed rest. In this situation, it is highly recommended to obtain a release from your client's PCP that assures you and your client that gentle touch to the belly poses no risks to her condition.

Understanding *why* abdominal work is avoided can help you make the appropriate choices and communicate effectively with your client about touching her abdomen.

In the second trimester, once the pregnant belly has grown larger, abdominal bodywork can be offered if five other criteria are met first:

1. The client is not experiencing abdominal or pelvic pain, cramping, or bleeding.
2. The client is not considered at high risk for preterm labor.

### RELEASE FOR THERAPEUTIC BODYWORK DURING PREGNANCY

Dear \_\_\_\_\_

Date \_\_\_\_\_

Your patient is interested in receiving therapeutic massage, which has numerous benefits, and few, if any risks during pregnancy.

The following describes the types of bodywork I may use, some of which may be contraindicated with certain types of conditions:

- **Nurturing therapeutic massage** uses long strokes, squeezing, kneading, and pressure on tight muscles, and is generally beneficial and appropriate for all pregnant clients.
- **Abdominal massage** can at times stimulate a few *Braxton-Hicks contractions* and is contraindicated with *placenta previa*, *risk of abruption*, *severe hypertension*, or *preterm labor*.
- **Deep tissue and circulatory stimulating work** can trigger a release of cellular waste into the circulatory system. Occasionally, some clients may experience mildly achy muscles for 24 hours after a session. This work may be contraindicated with clients who have a high risk of preterm labor or uterine irritability.
- **Deep leg massage** might stimulate circulation through the legs and may increase the risk of *dislodging a blood clot*. If your client is at high risk for blood clots and thrombophlebitis, leg massage, or possibly even full body circulatory massage, may be contraindicated depending on the severity of her risk and condition.
- **Range of Motion** and **Resisted Stretching** are not recommended when a client has an extreme *hypermobility of the joints*. As well, it is contraindicated to do hip mobilizations with *diastasis symphysis pubis*.

Please help me to work safely with your client by indicating what types of bodywork restrictions might be necessary.

This signed release confirms that I,           (Doctor or midwife name)          , verify that my pregnant patient,           (patient name)          , would benefit from massage therapy during her pregnancy. I consider her pregnancy at this time to be *(circle one)*:

Low Risk / Moderate Risk / High Risk

*The following checked techniques ARE appropriate for my client at this time of her pregnancy:*

- General relaxing massage (rare need for restrictions)
- Abdominal massage/belly rub (on occasion, mild Braxton-Hicks contractions may be stimulated)
- Stimulating or deep tissue massage (may stimulate blood circulation, causing the release of cellular waste products)
- Leg massage (not appropriate if client has problems with blood clots/phlebitis)
- Range of Motion, resisted stretching (not appropriate with extreme joint laxity and hypermobility)
- Client may only be positioned on left side
- Client is restricted to full bed rest and may not get out of bed onto massage table.  
(Session can be done with client on the bed)

Specific precautions and activity restrictions are as follows:

\_\_\_\_\_

\_\_\_\_\_

Contact my office for clarification or review of these precautions for massage at the following number: \_\_\_\_\_.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Printed Name \_\_\_\_\_

**FIGURE 4.2** Sample medical release form.

Sample of the type of information you might ask on a medical release for pregnancy massage. Use this as an example, but create your own that applies to your own type of bodywork — *acupressure, lomi lomi, cranial sacral, etc.* — and its risks if different from those that appear here. Enclose with your release a brochure or fill in a description on your release that informs the PCP of the type of work you do.

**MESSAGE  
THERAPIST  
TIP**
**Is a Medical Release Necessary?**

Unless it is your policy to obtain a medical release for all clients, a release is generally not necessary for a low-risk normal pregnancy. Some women, however, who have concerns about what kind of activities are appropriate during their normal pregnancy, may feel safer if they bring a release to their prenatal health provider.

Once familiar with the providers in your area, you may find that some doctors and midwives state that massage is beneficial in all situations, as long as the pregnant woman wants massage, and nothing vigorous or stimulating to the abdomen is done. They may feel that when a massage therapist requires a medical release, it heightens fears for women who are likely already carrying various anxieties about the health of their pregnancy. If she did not need a medical release *before* she was pregnant, why should she need one now? Pregnancy is a normal, healthy condition of a woman's life, and generally is not dangerous.

For high-risk pregnancies, many bodywork practitioners determine that a medical release will help them offer

the safest and most appropriate care to their clientele. Others will choose not to use medical release forms even for high-risk pregnant clients because they are familiar with local providers, are very knowledgeable about the conditions and contraindications of pregnancy, and are confident in their work with pregnant women. By using a medical release for a high-risk pregnancy, however, you assure and inform both the client and the PCP that you understand that this particular situation has more concerns than normal, that you will be observing any necessary special precautions, and that you are seeking the PCP's advice as to further precautions based on this woman's condition.

Considering the benefits of using a medical release, many practitioners will find its use logical and practical for high-risk pregnancies. In the context of this book, I will elucidate the times when a release is highly recommended.

3. You have asked permission first before touching the client's belly.
4. You always ask your client for feedback regarding your use of pressure and her comfort level.
5. You use firm (but not forceful) effleurage as opposed to very light touch on the pregnant abdomen, which can feel ticklish and uncomfortable, unless the client directs you otherwise.

### Acupressure

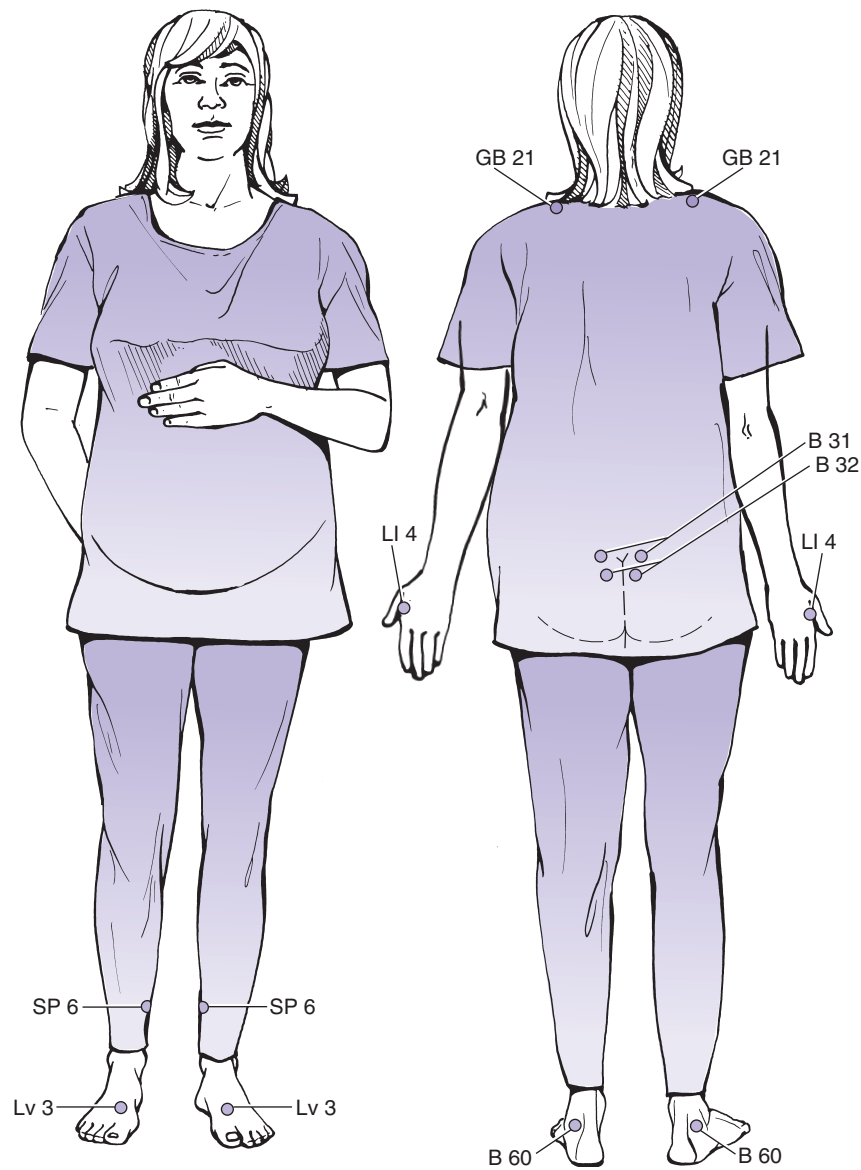
The use of a few specific acupressure points is contraindicated during pregnancy. These points are based on the "forbidden" points of *acupuncture*. Not all of the prohibited *acupuncture* points are prohibited for *acupressure*; however, many of the points are contraindicated for applying needles only, not for using finger pressure.

Since many massage therapists study a basic course of acupressure, or at least hear about acupressure points that are contraindicated in pregnancy, they are included here for reference and clarification. Be aware that contraindications for acupressure are sometimes misconstrued into contraindications for

massage in general. These are different techniques that do not affect the body similarly; therefore, contraindicated acupressure points are *only* contraindicated for acupressure treatment. This is lucky for women, for if it were true that the regions of contraindicated acupuncture or acupressure points could not be massaged, then the shoulders, hands, abdomen, inner calves, and ankles would all have to be avoided for massage as well.

Generally, acupressure applied to points that specifically stimulate the uterus, ovaries, and downward flow of energy should be avoided or limited, as these points, used in combination with other practices, can be used to help initiate contractions when labor is imminent and desirable. This means that focused and sustained pressure and attention to these exact points, with the intention of inducing energy flow is contraindicated. It *does not* mean that you cannot touch that area of the body at all.

The two primary prohibited acupoints until 38 weeks' gestation are Spleen 6 (SP 6), located on the lower medial leg, and Large Intestine 4 (LI 4), located in the webbing between the thumb and first finger on each hand (Figure 4.3). These are two of the most effective points for helping to stimulate effective uterine contractions.<sup>6-12</sup>



**FIGURE 4.3** Locations of prohibited acupressure points.

Until the last 2 weeks of pregnancy, stimulation with acupressure of acupoints Large Intestine 4 (LI 4) and Spleen 6 (Sp 6) are contraindicated. Bladder 60 (B 60) and Liver 3 (Lv 3) are contraindicated by some sources, but others use those points during pregnancy. In the first trimester, use caution and avoid deep stimulation to Gall Bladder 21 (GB 21) and Bladder (B) 31, 32, in the sacral foramen.

Other points to consider (seen in Figure 4.3) are Gall Bladder 21 (GB 21), Bladder 31 (B31), Bladder 32 (B32), and Bladder 60 (B 60): During the first trimester, some sources suggest using caution and avoiding deep stimulation to GB 21 on top of the shoulder.<sup>6,13</sup> Some sources also mention B 31 and B 32 in the sacral foramen, as potentially stimulating to the uterus when used in conjunction with other points.<sup>6</sup> B 60, lateral to the malleolus,<sup>12</sup> and Liver 3 on the dorsum of the foot are also sometimes contraindicated, mostly when used in combination with other points,<sup>9</sup> (D. Betts, Personal

Communication, December 2006), though other sources do not mention them as contraindicated.<sup>6,14,15</sup>

One perinatal massage book warns against other points on the leg and feet, including Kidney 5, Bladder 61, Spleen 10, and Kidney 1,<sup>16</sup> but these points are not prohibited for finger pressure in most Traditional Chinese Medicine resources or prenatal acupressure books, nor by acupuncturists and acupressurists consulted for this text.

Be aware that there are not hard and fast rules, even within the practices of acupuncture and



acupressure, about what points should definitively be avoided.<sup>6,17,18</sup> The most important rules to adhere to when doing acupressure with any client is to work gently with care and respect. The *method* of application of pressure, more than the acupressure point itself, is of primary importance. For instance, some contraindicated points can be used with special tonifying contact, whereas they would remain contraindicated when touched with a sedating type energy (K Ethier, L Ac, personal communication, May 20, 2007). Hence, we can list standard “forbidden” points, but there are times when the skilled and experienced practitioner may find their use appropriate. That is beyond the scope of this book. If you deepen your studies of a particular form of acupressure, you will learn which points are contraindicated for your type of practice.

See Figure 4.3 for location and a list of commonly prohibited points, and read the box, “Dispelling Myths: Massage of the Ankles,” for more details about stimulating points around the ankles.

### Aromatherapy

Many practitioners use scents in their office or add essential oils to their massage oils. A pregnant woman is likely to be more sensitive to aromas, especially in the first trimester when nausea or vomiting is common. Before using strong scents, have your client do a “sniff-test” to see if she responds agreeably to the odor. Avoid burning incense, which can permeate a room and be uncomfortable for some. Always have unscented oil or lotion available for use.

Many essential oils are contraindicated for use during pregnancy and postpartum. Until you have studied a full course in aromatherapy, it is advisable to assume all essential oils to be contraindicated in the *first trimester*, unless you have specific instruction for their use. In the second and third trimesters, some scents can be quite useful, while others are still contraindicated until labor begins. As a warning, the following essential oils have specific dilutions or restrictions for use in pregnancy, yet are commonly found in scented massage oils: lavender, rose, rosemary, geranium, chamomile. There are numerous useful aromatherapy resources written specifically about pregnancy. Refer to these if you plan to incorporate aromatherapy in your practice. See Suggested Readings in Appendix B for further information.

### Breast Massage

Breast massage can be appropriate during a normal, low-risk pregnancy to help relieve aching of enlarging breasts; however, it is contraindicated in any high-risk

pregnancy or preterm labor situation due to possible uterine-stimulating effects. Nipple stimulation promotes the release of the labor-inducing hormone, oxytocin, and is sometimes used by clients to help support or initiate labor. While the nipples are not touched during professional breast massage, there could be a minor risk of hormonal release due to generalized tactile stimulation of the breasts. Avoiding breast massage during a high-risk pregnancy eliminates this risk.

### Massage to the Adductors and Inner Thigh

Varicose veins in the legs often emerge for the first time during pregnancy (Figure 4.5). Adhere to standard massage contraindications and avoid massaging over varicosities, and on legs with known phlebitis, and blood clots. Severe varicosities can indicate that clots are present in deeper veins. Obtain a medical release before beginning any bodywork for clients who are currently being treated for a blood clot.

Not all clots are obvious and symptomatic. Small ones often go unnoticed and eventually are broken down by the body. You will know when your client has a *symptomatic* clot, as she will be medically treated. Severe pain and swelling in the leg are likely to have come on suddenly, with an 80% to 90% chance that it occurred in her left leg or in the left iliofemoral vein.<sup>19-21</sup> If a woman has been medically managed for her clot, all massage to the legs will be contraindicated to avoid possibly dislodging the clot into the circulation.

You will not know if your client has a nonsymptomatic, but potentially dangerous clot, however; therefore, always practice safety. Because massage does have the capacity to release a clot with serious consequences,<sup>22</sup> a general recommendation during pregnancy and postpartum, is to use only gentle touch to the legs, especially in the hip adductor region. Discussions with several midwives, obstetrical doctors, and pregnancy massage specialists have indicated that the risk from nonsymptomatic clots is so low that there need not be this type of restriction on bodywork, however, a nonsymptomatic clot can still dislodge and become a pulmonary embolism. Therefore, some therapists choose to adhere to the following standard: throughout pregnancy and for at least 6 weeks postpartum, avoid tapotement, deep vibration, cross-fiber friction, petrissage, deep effleurage, and pressure in the hip adductor region of the leg between the knee and groin, and any work that involves tissue compression which can slow or block the blood flow momentarily, including firm acupressure. (This precaution could be for longer if she has not yet been released, for medical reasons,

## DISPELLING MYTHS:

### Massage of the Ankles

Many massage students learn: "Don't massage a pregnant woman's ankles." However, the idea that it is dangerous to massage a healthy pregnant client's feet or ankles is simply not true. The term "massage" is not specifically defined in that generic statement, but one would assume it refers to effleurage or other types of stroking or "Swedish" massage manipulations. There is no evidence that gentle stroking to the ankles is dangerous, and initiating effective uterine contractions during pregnancy is not that simple. As several obstetricians and midwives have stated in personal interviews, if labor could be started merely by massaging a woman's ankles, the use of medical interventions to induce labor would be stopped! *Effleurage to the feet and ankle area does not stimulate labor.*

The reasoning behind the prohibition of ankle massage during pregnancy has developed for two reasons. Under the medial and lateral malleolus are reflexology areas related to the uterus and ovaries (Figure 4.4). In a similar region are several acupressure points that can be used to support labor (Bladder 60 and Kidney 3). While reflexology and acupressure are different touch techniques from massage, some people still have had concerns that by massaging near these areas, they might stimulate miscarriage or preterm labor. I have found no documented evidence of this ever happening, and interviews with midwives, obstetricians, massage therapists, acupressurists, and reflexologists, have confirmed that there is no reason to avoid massaging the ankles.

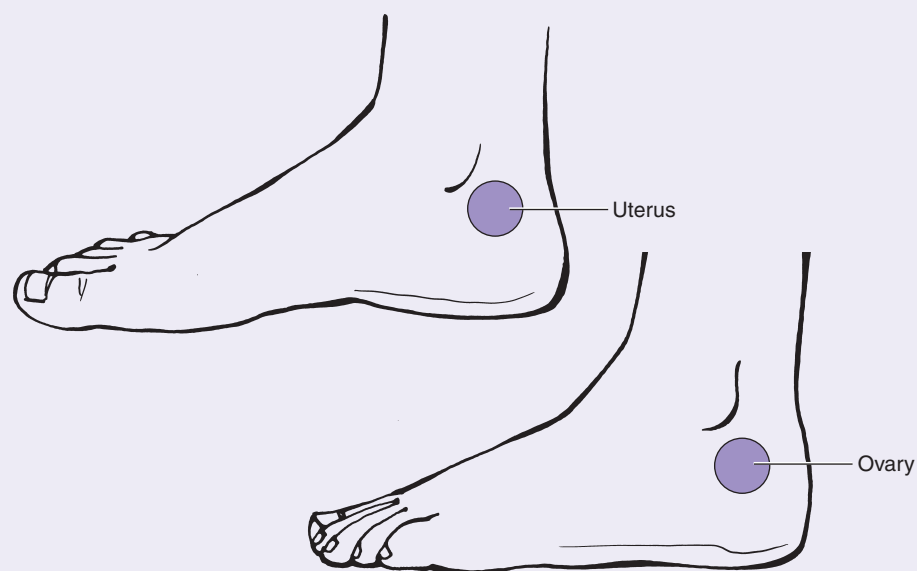
Effleurage and general massage are very different techniques from reflexology. The uterus and ovary

reflexology zones are very specific spots which massage does not stimulate in the same way. Additionally, reflexology itself, when applied to these spots, does not trigger miscarriage or contractions (D. Byers, Director of International Institute of Reflexology, personal communication, Dec 2006). According to Christopher Shirley, Director of the Pacific Institute of Reflexology, the beneficial results of reflexology to the ankles may actually help *reduce* the occurrence of miscarriage as it helps nurture a healthy maternal environment to support the developing fetus (C. Shirley, personal communication, January 2007).

As for stimulating acupressure points with massage, gentle effleurage in the ankle region with intention of relief of discomfort will not affect those acupoints in a negative way or induce contractions. To influence acupressure points, strong and continuous pressure, repeated over a period of hours or days, is necessary to have any hope of possibly stimulating a uterine contraction. Gentle *massage* can therefore be done without fear in the areas of points prohibited for acupressure.

Suzanne Yates, bodyworker, antenatal educator and author of *Shiatsu for Midwives*, states that she often gently massages around the ankles with light pressure as she connects with the mother's womb. "I have done this kind of work for 18 years now and not had any problems. Indeed I feel it is of benefit. In the first trimester it is calming and supporting the flow of the Jing, an important energy which nurtures the baby" (S. Yates, personal communication, December 2006).

The outcome is that a massage therapist can feel assured that gentle nurturing touch will not harm a pregnant client, and accidentally stimulating the acupressure points around the ankle with massage will not cause uterine contractions to suddenly begin.



**FIGURE 4.4** Reflexology zones of uterus and ovaries.

*Small specific zones are stimulated with Reflexology to support and nourish the uterus and ovaries and do not stimulate contractions during pregnancy.*



**FIGURE 4.5 Varicose veins.**

*Varicose veins often develop during pregnancy and can be prominent and visibly bulging. Legs with numerous varicose veins have a slightly increased risk of developing DVT.*

from her PCP's care.) This is especially true for women with a history of deep vein thrombosis, those on restricted bed rest due to a high-risk condition, and those who have had recent major surgery—such as a cesarean section, as their risk for developing clots is increased even more with their lack of mobility.<sup>20,23</sup>

See Box 4.4 and read more about blood clots in the next section.

**Note:** Direct pressure on the boney adductor attachments, which avoids compression of the blood vessels, can be used when there are no known clots.

### Electromagnetic Fields: Electric Blankets and Heating Pads

There have been studies indicating negative effects from extended exposure to electromagnetic fields or EMF's<sup>24-27</sup>—the electrical force which surrounds electrical devices or wires. While the verdict is not final on the effects of EMF during pregnancy, electromagnetic radiation could theoretically have the capacity to affect the well-being of the fetus in subtle ways, including increasing risk for miscarriage.<sup>25,28</sup> Since there is no confirmed assurance of what level of EMF exposure is totally safe, it may be prudent to avoid the use of electric blankets and heating pads with pregnant clients. Instead, use moist, nonelectric warmth at 101°F or less if desiring the therapeutic benefits of heat on muscle tissue.

### Passive Range of Motion

For women who have been experiencing nausea during pregnancy, the rocking or rotations of range of motion stretches, or Trager bodywork, could increase nausea, especially in the first trimester when morning sickness is more common. Avoid these techniques if a client has complaints of nausea.

Do not do hip mobilizations if there is a separation of the symphysis pubis (see Chapter 2). Avoid overstretching joints that are already hypermobile due to the effects of relaxin by maintaining active communication and feedback with the client when stretching. Generally, when facilitating isometric stretches with a patient, it is safer to suggest that your

## BOX 4.4 | Risk Factors for Blood Clots and Symptoms

### Risk Factors for Blood Clots

- Cesarean section or other recent hip, pelvic, or knee surgery
- Bedrest and immobility
- Leg injury
- History of previous deep vein thrombosis
- Smoking
- Age greater than 40 years
- Obesity
- Family history

### Symptoms of Blood Clot

- Pain in area of clot
- Swelling
- Redness
- Heat in area of clot
- Decreased circulation to extremity
- Tender to palpation
- No symptoms—Not all blood clots are symptomatic

### Case Study 4.1: BLOOD CLOTS DURING PREGNANCY I

When Mary, a 25-year-old woman with her first pregnancy, came for her first massage, she marked on her health intake form that she had a blood clot. The massage therapist queried Mary further and learned that she had recently experienced pain, swelling, and heat in her left inner thigh and edema of her lower leg, and had been told she had a blood clot. She was placed on anticoagulants to prevent further clotting potential. Mary did not have a history of circulatory problems but had been told this was a condition that sometimes occurs in pregnancy. She did not express worry or concern over her condition but did state that she was having a lot of discomfort in her legs and hoped that the therapist could do deep work to her legs to help relieve it.

The therapist was alarmed at the request and at the client's apparent lack of knowledge about the risks involved with a blood clot, namely the potential for the clot to be dislodged with potentially life-threatening consequences. The therapist informed her client that she was unable to work on her legs at any time during the pregnancy because of this clot. She also told the client that until she had a medical release from the client's doctor approving Type I massage for the rest of her body, the therapist would only use Type II, non-pressure, energetic techniques during today's massage, along with deeper work to her shoulders, neck, arms.

The client stated that everything was fine, since she was on anti-coagulants and the doctor had not specified that she should avoid massage. She did not understand the therapist's concerns and was perturbed that she would not do deep work during the session. Mary did not reschedule a massage.

client position her muscle in the stretch, rather than you positioning for her.

### Foot Massage and Reflexology

There are two considerations regarding foot massage during pregnancy. The first is that many pregnant women experience calf cramps. These are due to a variety of possible causes, such as overactivity, underactivity, changes in posture, and other influences. Plantar flexion of the foot during a foot massage, (pointing the toes), can stimulate calf cramps. Avoid

this action and ensure that the foot is well supported when the client is in the sidelying position to avoid drooping of the foot in a plantar-type flexion.

The second issue concerns safe touch when working with edema, a common development in the feet and hands during the latter part of pregnancy. Normal nonpitting edema, as well as sometimes **pitting edema** of the extremities can be normal. Pitting edema is evaluated by pressing a finger pad into the skin for 5 seconds and then lifting the finger up. If an indentation is formed by the finger pressure and remains for more than a brief moment, it is considered to be pitting. It can vary from mild to extreme (Figure 4.6).

Deep work on pitting edema can cause tissue damage, and so Type I deep techniques should be avoided. Only light touch, such as lymphatic and energy work should be used directly on pitting edema.



**CAUTION:** Pitting edema can be normal, but it is also associated with pregnancy complications like preeclampsia, which will be discussed later in this chapter. If pitting edema has just developed since the last prenatal visit and has not been evaluated yet, the client should be instructed to call her PCP to determine if she needs to be seen sooner than planned.

### Supine Positioning

Avoid supine positioning after about 22 weeks' gestation or any time a woman's pregnant belly is visibly obvious and she is uncomfortable lying supine for more than a few moments. When the client is supine, the weight of the baby and other uterine contents can press directly onto the large blood vessels (the aorta and inferior vena cava) along the mother's back (Figure 4.7). If it does, the blood flow will decrease, affecting both the mother and the baby. The baby's heart rate will decelerate, its oxygen saturation levels will drop,<sup>29</sup> and the mother may feel dizzy, nauseated, or generally uncomfortable or uneasy. If this should happen, the optimal treatment is to have her turn immediately onto her left side to relieve the pressure on the blood vessels and resume full blood flow. Encourage her to breathe deeply to increase oxygenation.

Despite this restriction of supine positioning, some women are comfortable lying supine. This is because of the baby's ever-changing position. If the baby is positioned such that its weight will not compress onto the mother's spine when supine, short periods of bodywork (3 to 7 minutes) may be allowable in this position. Sometimes this is convenient for





**FIGURE 4.6 Pitting edema assessment.**

*Pitting edema can be normal in pregnancy, and can also be associated with preeclampsia. Assessment is done by pressing finger into swelling for 5 seconds, and looking for indentation after removing finger. Deep tissue work should not be done on pitting edema. (From Bickley LS and Szilagy P. Bates' Guide to Physical Examination and History Taking, 8th Ed. Philadelphia: Lippincott Williams & Wilkins, 2003.)*

a final neck traction or massage of the shoulders and face. Certain assisted stretches are also done with the client in the supine position. In either of these situations, it is imperative to maintain good verbal communication with the client about how she is feeling, and instruct her to roll over to her side if she feels the least bit uncomfortable.

**CAUTION:** Any woman in the supine position who complains of nausea, dizziness, or uneasy feelings, however mild, should be repositioned immediately to her left side, which typically provides the most optimum blood perfusion to the baby and mother.<sup>29-33</sup>

As a general rule, when the position of baby is not definitive, always position your second or third trimester client in the sidelying or semi-reclining position for extended bodywork. An optional position is to place a foam wedge under the client's right hip; this tilts and displaces the weight of the uterus to the left,

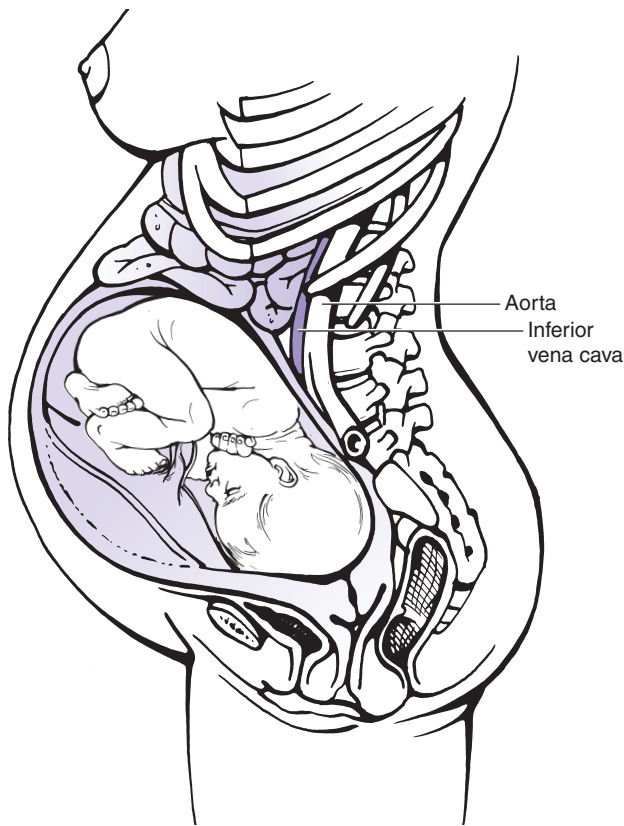
preventing compression of the large blood vessels situated to the right of the spine.

### Saunas and Hot Tubs

Practitioners who work in spas or other settings where saunas and hot tubs are available should take special care to ensure that temperatures are kept at a safe level for their clients. Hot tub water temperatures are best kept to 101°F or less, and immersions into heat kept to 5 to 10 minutes. Immersions in hotter water can be done as long as it is for less than 10 minutes, which avoids the risk of raising core body temperatures over 102°F.<sup>34</sup> Core body temperatures over 102.6°F in the first trimester may be associated with some neurological birth defects and may possibly increase risk of miscarriage, although study results are conflicting about this.<sup>34-36</sup> The issues of neural tube defects decline after the first trimester, since this primary development occurs very early in the fetal life.

Later in pregnancy, mothers tend to become dizzy or unable to tolerate heat for more than short periods





**FIGURE 4.7** Supine positioning and pressure on inferior vena cava and aorta.

*When the pregnant mother is positioned supine, risk exists for the weight of the gravid uterus to press onto the large blood vessels running along the spine. This compression will decrease oxygen flow to both the mother and child.*

of time, thus self-regulating with regard to heat immersion. Interspersing short dips in hot water with immersion in cold can help prevent the development of hyperthermia.

## HEALTH FACTORS THAT INCREASE RISK DURING PREGNANCY

Some pregnancies begin with or develop risk factors indicating minor or major concerns for the mother and/or the baby. These risks may lead to serious complications. Pre-existing risk factors include maternal age, obesity, history of repeat miscarriage, or asthma, while risks that can develop during pregnancy itself include conditions such as preterm labor and gestational hypertension. If the client has a condition that increases her risk for complications, massage restrictions are not always necessary unless

### Complementary Modalities:

#### Applications of Heat During Pregnancy

Most pregnant clients in their second and third trimesters will feel warmer than when they are not pregnant. This is due to hormonal effects and increased blood volume. While some may enjoy short immersions in hot water, your client in advanced pregnancy may not appreciate a heating pad or blanket on your massage table.

If she is experiencing muscle tension in a particular area, however, and you feel that the application of heat will enhance your work and the ability of her muscles to relax, use localized nonelectric warm packs. Hydroculator packs; heated flax seed bags; hot water bottles; or moist, hot towels, can be used to warm an area of tension. Avoid heat applications greater than 101°F for more than 10 minutes directly over the abdomen or low back where the heat may affect the developing fetus, particularly in the first trimester.

problems actually develop during the current pregnancy. Some of these conditions are discussed below, beginning with those that have a few extra bodywork considerations.

This is followed by a discussion of complications that can develop during pregnancy and that pose serious risk to the life and health of the mother and/or the infant. These conditions contraindicate Type I massage or require increased precautions for bodywork. Remember, however, as you read the following section that the majority of women you see will be having a normal, healthy pregnancy and can be supported fully with your nurturing touch.

## Conditions Requiring Special Bodywork Precautions

The following conditions classify a woman's pregnancy as having some potential for problems. They are explained here to give you an understanding of why they are considered risks and to help inform you if you encounter or hear about the condition. Bodywork considerations are dependent on the history of the problem and the current level of severity, and they generally emphasize observance of precautions related to positioning, abdominal work, or use of Type I bodywork.


### Traditional Birth Practices:

#### Keeping the Mother and Baby Safe

Cultural practices to keep both the mother and baby safe during pregnancy often include taboos against activities or foods that could cause baby to “stick” inside, bring on illness or weakness, cause problems to the placenta, or cause labor to not progress effectively. Traditional Yup’ik Eskimo practices from Western Alaska have included turning their pillows over prior to sleeping to encourage the baby to stay mobile, rather than stuck, inside the womb, and walking quickly through door ways to encourage a quick delivery. Women were sometimes instructed not to sleep on their backs to prevent baby from rising up in the womb, and to lean forward for several minutes each day to keep baby smaller and thus have an easy delivery. It was encouraged that eating only freshly made foods could help prevent fetal deformities, while no burnt food should be eaten, as this could cause the placenta to become stuck and not release after birth. Many practices around the world, including some of our own, involve maintaining positive thoughts and avoiding emotionally stressful situations, such as funerals.


#### Maternal Asthma

When a pregnant woman has severe asthma, her fetus is at risk due to the mother’s use of medications and the decreased oxygen availability to the fetus during asthma attacks.

 **BODYWORK PRECAUTIONS:** Ask whether the client’s asthma is affected by certain scents, and avoid the use of essential oils, scented oils, candles, and other scents that you or she suspects may trigger an attack.

#### Obesity


Obesity is defined as having greater than 20% of the expected weight for a woman’s size and age. Beginning pregnancy with obesity increases the risks for gestational diabetes, a large baby, and hypertension.

 **BODYWORK PRECAUTIONS:** It is worthwhile to consider using the sidelying or semi-reclining position during the first trimester if it is more comfortable for your client. The supine and

prone positions can increase breathing difficulties for extremely obese people. Semi-reclining position may be more comfortable than sidelying for some women as pregnancy progresses.


#### Tobacco/Drug/Alcohol Use

With any type of maternal addiction to drugs, alcohol, and tobacco, risks increase for fetal complications, lower fetal birth weight, preterm delivery, deep vein thrombosis, labor complications, placental abruption and previa, and miscarriage.

 **BODYWORK PRECAUTIONS:** For clientele for whom drug, tobacco, and alcohol use is common, the recommendation of a medical release is based on the severity of the client’s drug use, the likelihood of her developing any of the above risks, your uncertainty of the client’s veracity, or, if working in a clinic or environment with clientele for whom drug use is not uncommon, the clinic’s standard protocol.

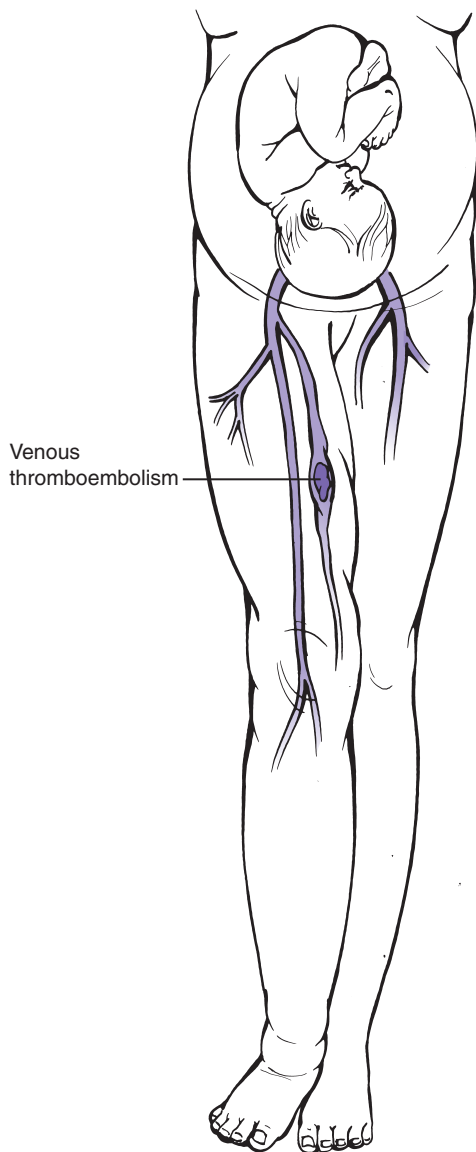
#### Chronic Hypertension

High blood pressure that develops before pregnancy and has been treated medically over a period of time, is considered to be chronic, as opposed to hypertension which develops during pregnancy and is called gestational hypertension. Chronic hypertension can lead to increased risks for preterm labor, placental abruption, and decreased fetal growth.<sup>37-39</sup>

 **BODYWORK PRECAUTIONS:** For a client with severe hypertension, a medical release is recommended to determine the level of risk your client’s PCP considers her to be, and to determine if Type I full body techniques are appropriate. Abdominal massage is contraindicated with severe hypertension.

#### Thromboembolic Disorders

By the third trimester, many women have at least small, asymptomatic clots in their legs, most commonly in the deep vessels of the inner thighs in the area of the saphenous, iliac, and femoral veins. The development of blood clots that partially or totally block a leg vein is called **deep vein thrombosis (DVT)** (see Figure 4.8). It occurs, as its name implies, in the deep blood vessels of the legs, most commonly in the left iliofemoral vein. **Superficial thrombophlebitis**—a condition of venous inflammation in



**FIGURE 4.8 Deep vein thrombosis.**

*Risk for the development of clots increases during pregnancy due to impeded circulation to the legs and increased clotting factors in the blood, and during postpartum if postcesarean and having decreased mobility.*

the superficial veins caused by a clot—occurs more often in the calf.<sup>19</sup>

The concern surrounding a blood clot is the possibility that it could become dislodged into the circulation, as an **embolus**, and become lodged in the lungs, causing difficulty breathing, chest pain, and possibly death. This is known as a **pulmonary embolism**. DVTs have a higher likelihood of causing a pulmonary embolism than superficial clots.<sup>19</sup>

During pregnancy, the risk of developing a clot increases by five or six times, as compared to

nonpregnant women.<sup>19,40</sup> The higher risk for clots occurs because of changes in the perinatal circulatory system, including expanded blood volume, increased clotting factors in the blood, and impeded blood flow to the extremities (see Chapter 3). Risk factors include smoking, being over age 35, being overweight, having had a previous DVT or embolism or having varicose veins, high blood pressure, preeclampsia, or being on bed rest or very inactive.<sup>41</sup>

DVT occurs in an average of one out of every 1000 to 1800 pregnancies<sup>19,20,23,42,43</sup> and can develop in any trimester of pregnancy.<sup>20,21,44,45</sup> During the postpartum period or after a cesarean section the occurrence of DVT may increase to about 1 in 700 women,<sup>23</sup> though the incidence of embolism is low. Out of 268,525 deliveries reviewed in one study, 165 women developed known clots in their veins, and 38 of those experienced a pulmonary embolism.<sup>20</sup>



**BODYWORK PRECAUTIONS:** *Standard protocol is as follows:* If the client is complaining of leg pain that is unexplained by new activity or strain, or if you notice redness, swelling, and heat in an area of the leg, instruct her to call her PCP immediately for further assessment.

Follow standard clot precautions on the legs of all pregnant and postpartum clients.

Some perinatal massage sources recommend that a practitioner assess a client before each massage for signs of DVT.<sup>16</sup> The assessment recommended is the Homan's test, which involves abruptly dorsiflexing the client's foot and assumes that if the client feels sharp pain in the popliteal area or calf, the test is positive. However, the more accurate positive sign is a resistance of movement to the dorsiflexion action.<sup>46</sup>

I do not recommend this test for several reasons:

1. The use of the Homan's sign is generally no longer recommended as a diagnostic tool.<sup>47,48</sup> Ultrasound and venography along with visual assessments, such as localized swelling, heat, and redness are the primary diagnostic tools used by medical professionals.
2. The Homan's test has been demonstrated to be inaccurate, and is not useful for determining the presence of a clot.<sup>49-51</sup> Even when done correctly, its accuracy can be as low as 8%.<sup>49</sup> Whether the result is positive or negative, there is no assurance regarding the absence or presence of a clot.
3. Other physical issues can cause a positive result, including leg cramps, edema, cellulitis, and a change in shoes from high heels to low heels.<sup>46</sup>

A massage therapist who regularly tests for a positive Homan's sign can stimulate client anxiety about her safety. A pregnant woman has plenty of worries to occupy her mind. When she comes for a massage, she does not need to add to these by thinking about the remote chance that she may have a problematic blood clot. Instead, make it standard to practice gentle touch to the legs, and always visually assess for redness, pain, swelling, and inflammation, referring to the PCP if found.

### Multiple Gestation (Twins or More)

While it can be exciting for the mother to be having more than one baby at a time, risks increase for the development of preterm labor. All other common complaints of pregnancy are further exacerbated due to the increased size and weight gain and hormonal influences (Figure 4.9).



**FIGURE 4.9 Large abdomen: mother of twins.**

*When a mother has a particularly large abdomen, as with multiple pregnancy, obesity, or extra large baby with smaller mother, extra care is needed to ensure adequate body mechanics instruction is given for getting on and off massage table and for repositioning. Extra abdominal support may be needed on the table as well.*



**BODYWORK PRECAUTIONS:** In the third trimester, if the abdomen is exceptionally large, extra care in teaching the client proper methods of sitting up from sidelying, as well as possibly using a foam wedge or rolled towel on the table to support under the belly is important. (See "Positioning" in Chapter 5.) The client with a large belly has an increased risk for diastasis recti, and for straining of the uterine ligaments. Help her to rest comfortably and well-supported on the table, and minimize her need for repositioning. Use only gentle abdominal massage for short durations to avoid stimulating contractions. Avoid excessively stimulating Type I work throughout the pregnancy until the last weeks. A medical release is recommended if premature labor has occurred with this pregnancy.

### History of Repeat Miscarriage

**Miscarriage** is birth that occurs before 20 weeks' gestation. Miscarriage occurs in about 15% of pregnancies each year,<sup>3,52</sup> with the vast majority occurring in the first trimester before 12 to 13 weeks' gestation. According to the Centers for Disease Control and Prevention, of the 6.28 million pregnancies reported in the U.S. in 1999, miscarriage occurred in 1 million of those.<sup>53</sup> Since so many miscarriages happen too early to have even been reported as a pregnancy, we can conclude that there are many more than this that occur each year.<sup>54</sup>

The vast majority of miscarriages result from a healthy response to the early abnormal development of an embryo, but other known associations with miscarriage include maternal issues, such as problems with the cervix or uterus or conditions such as diabetes, infection, or virus. Miscarriage is also associated with increased *paternal age*<sup>55,56</sup> as well as maternal drug use, including tobacco.<sup>57-59</sup>

Women who have three consecutive miscarriages in the first trimester have a 35% chance of having another miscarriage.<sup>60</sup> Women with this experience will often have a significant level of anxiety during consequent pregnancies if the fear of losing the baby again overrides their ability to relax and enjoy the current pregnancy. Massage can be very helpful, by encouraging relaxation and self-care.



**BODYWORK PRECAUTIONS:** If a client has had two or more consecutive miscarriages, avoid abdominal massage until 1 to 2 months past the date of the previous miscarriages, unless the client asks for belly massage and feels that this



touch will help to allay anxieties. The contraindication is simply to avoid association between your touch and another miscarriage, should that unfortunately occur. With this in mind, if the client has a history of multiple miscarriages, has a high level of anxiety related to it, has had preterm contractions in this pregnancy, or is, for additional reasons, at higher risk for repeat miscarriage, avoid any stimulating touch, such as vigorous Type I bodywork that could alarm a client who already has concerns about receiving massage. A medical release is recommended for clients with three or more consecutive miscarriages to help ascertain risks and precautions.

### Previous Premature Birth

A **premature birth** is one that occurs between gestational weeks 20 and 37. Each time a woman has a premature delivery, her risks increase for having another.

If her first and only pregnancy resulted in the delivery of a baby less than 3 pounds, her chances of it occurring in the next pregnancy are 50%.<sup>60</sup>



**BODYWORK PRECAUTIONS:** practice caution with clients who have a history of a premature delivery in their last pregnancy and for those who have a current condition that was associated with the first preterm birth. Wait to offer abdominal massage until 1 to 2 months past the time of the previous premature labor, or until the mother's anxiety has diminished about preterm labor occurring again. Avoid Type I techniques until the mother has been told her risk for preterm labor in this pregnancy has decreased. A medical release is suggested prior to commencing work if she has had more than one pregnancy with issues of preterm birth or preterm labor, to help determine what level of risk she is at currently.

## DISPELLING MYTHS: Massage and Miscarriage

One of the greatest fears bodyworkers have about working with a pregnant woman is unintentionally doing something that could cause her to miscarry or experience preterm labor. Miscarriages occur in hundreds of thousands of pregnancies each year due to causes utterly unrelated to massage. The fears abound however, and if a miscarriage should occur after a massage, both client and therapist may harbor fears that the massage caused it to happen. This is a common misconception about prenatal massage. Other fears are also expressed about the potential dangers of prenatal massage. Here are some examples of erroneous beliefs collected from general public and from students in pregnancy massage classes:

- “Massage releases toxins that poison and kill the baby, or cause a miscarriage.”
- “Overstimulation to the abdomen may shrink the uterus and negatively affect the baby, or even cause miscarriage.”
- “Avoid prenatal massages until the late second trimester. The massage moves fluid which the baby can feel is an attack, and it can cause miscarriage. Using the wrong pressure points with reflexology can also cause miscarriage.”
- “Don't press hard on the left side of the low back or sacrum, as that is where the baby attaches and you might hurt it.”

None of the above statements are true. *Therapeutic massage does not cause miscarriage.* There are, however, two caveats to identify:

1. If one has a strong intention toward *causing* a miscarriage and does very deep, intensive, and invasive manipulations to the abdomen, especially in the first trimester, there is a possibility that problems could occur. Healing bodywork is not of that intensity, however, nor does it have nor should it have, that intention.
2. If someone is at high risk for miscarriage and is already on the verge of one, then circulatory and vigorous Type I full body massage or abdominal massage might possibly support and encourage the body to do what it was already beginning to do. This can actually be helpful during what is often a difficult experience for women and often their partners. While massage and bodywork can be supportive during a miscarriage that is already underway, nurturing touch will not cause a healthy pregnancy to miscarry. The general precaution during the first trimester, when most miscarriages occur, is to use respectful, gentle, and superficial touch to the belly or avoid the abdomen altogether. This way, if a miscarriage occurs soon after a massage, both the mother and massage therapist can avoid harboring any concerns that the massage was somehow the cause of this miscarriage. This is the primary reason for abdominal bodywork precautions in the first trimester of pregnancy—to simply avoid an association between bodywork and a potential miscarriage, for which any woman is initially at risk.




*Note:* If the client with a history of preterm labor in previous births has not been having preterm contractions with *this* pregnancy, gentle touch to the abdomen can be done for the client who requests it and feels it will help her cope better emotionally with her pregnancy.

### **Fetal Genetic Disorders, Intrauterine Growth Restriction, Oligohydramnios**

Nowadays, with numerous blood tests, ultrasounds, amniocentesis, and chorionic villi sampling, women know a great deal about the health of their unborn baby. Knowing ahead that her baby may have abnormalities can cause increased emotional stress for the mother.

**Intrauterine growth restriction** means the fetus is small for its estimated gestational age, as indicated by measurements and ultrasound. This condition may indicate it has fetal anomalies or other problems.

In **oligohydramnios**, too little amniotic fluid is produced. It is associated with placental dysfunctions, fetal anomalies, or fetal death.

 **BODYWORK PRECAUTIONS:** Precautions are dependent on the history of the problem and the current level of severity. A woman may have increased fears or anxieties about her pregnancy. Abdominal massage may be contraindicated to avoid association of massage with potential problems with the baby. This contraindication will be based on the woman's anxiety level and her desire to receive or avoid abdominal massage. Some women may want gentle touch and energy work to the abdomen to ease anxiety and help them to deepen their connection with the baby. The massage itself will not affect the condition of the baby, but in some instances, a woman's uterus may be more irritable and contractile, increasing the risk for preterm labor or premature rupture of the membranes or amniotic sac and making abdominal massage, and sometimes Type I massage, a contraindication.

### **Fifth or Subsequent Pregnancy**


With each pregnancy, a woman's musculoskeletal system is again stressed. Risks increase for diastasis recti, varicose veins, ineffective uterine contractions in labor, and postpartum hemorrhage.

 **BODYWORK PRECAUTIONS:** A woman in her fifth or subsequent pregnancy will tend to have

more low back pain and need extra abdominal support. She should be encouraged to do abdominal strengthening from the start of her pregnancy (or sooner) and should be assessed for diastasis recti as a cause of low back pain. Abdominal support binders can be helpful as well. (See Appendix B, Resources for the Practitioner.)


### **Prolonged Infertility or Hormone Treatment**

Any woman who has had difficulty becoming pregnant will have increased emotional concerns and anxiety over the health of her pregnancy. If she has taken fertility hormones, she is at a much higher risk for multiple conception and has increased risks in general.

 **BODYWORK PRECAUTIONS:** In this situation, a woman's need for comfort and reassurance will be high. Abdominal massage and vigorous Type I massage may be contraindicated throughout pregnancy until the last few weeks before delivery, depending on the history of attempted pregnancy or miscarriages and the client's anxiety level. Discuss her expectations of bodywork so your work can support her needs. A medical release may be recommended if the client has a history of repeat miscarriage or if she has a great deal of anxiety about this current pregnancy and would feel more relaxed having a medical release.

### **Gestational Diabetes**

**Gestational diabetes (GD)** occurs in about 4% of all pregnancies.<sup>62</sup> It is different from the common Type I or Type II diabetes, as it only occurs during pregnancy, and is a condition that usually resolves after delivery. Excess maternal blood sugar will cause the baby to grow larger, thereby causing size-related difficulties at delivery. To prevent this, many women with GD are induced into labor with **Pitocin**—a synthetic form of the hormone oxytocin—earlier than their due date, before the baby has grown too large. A woman also has a greater chance of developing infection, preterm labor, gestational hypertension, or fetal abnormalities when she has GD.<sup>61</sup>

 **BODYWORK PRECAUTIONS:** A woman with GD may have an extra-large abdomen and be especially prone to low back pain, leg pain, and pelvic congestion. Proper abdominal support under the belly on the massage table is, as

always, essential (see Figure 5.1). An abdominal support binder may be recommended.

### Urinary Tract Infection

A **urinary tract infection** (UTI) increases the risks of preterm labor, kidney infection, and premature rupture of the membranes. Symptoms of a UTI may be mild, in which case the client may not perceive many discomforts, or the symptoms may be moderate with urinary urgency and frequency, low back pain, uterine contractions, pelvic pain, and fever.



**BODYWORK PRECAUTIONS:** If your client has a UTI, ensure that she has been treated for this condition and is not having acute symptoms of pain, fever or chills, or preterm contractions during massage. It would be unlikely for you to see a client in this condition, unless the symptoms have only just begun to increase prior to the massage session. Avoid massage to the abdomen until a UTI is fully resolved.

### High-Risk Complications of Pregnancy

Five percent of pregnancies develop complications that have the potential to seriously endanger the mother and/or baby during pregnancy, birth, or postpartum.<sup>62</sup> These complications occur only during pregnancy. They may contraindicate Type I massage or require specific and particular precautions. In most cases, a woman with these complications will be on a modified rest regimen, which might involve partial or total bed rest and the therapist will be making a house call. These conditions must be assessed for their severity to determine the type of precautions to be implemented. A medical release that describes necessary precautions or discussion with the client's PCP is important and strongly recommended before working with clients with high-risk conditions.

- Uterine and placental abnormalities
- Polyhydramnios
- Moderate to severe gestational hypertension
- Preeclampsia or HELLP syndrome
- Preterm labor

Women with these conditions should only be treated by massage therapists who have had significant practice in massage in the sidelying positioning and have confidence working with pregnant women. The risks of each condition should be fully understood and massage done in compliance with any medically indicated restrictions as described by the PCP.

### Placental Abruption (Marginal or Partial)

**Placental abruption** is a condition in which the placenta begins to separate from the wall of the uterus before the delivery of the baby. It occurs in an average of 1 out of 150 to 200 pregnancies.<sup>63</sup> The placenta may separate partially, or there may be a complete abruption, in which case the placenta detaches entirely, leaving the maternal blood vessels open and bleeding at the site of placental attachment. Symptoms may include light or heavy bleeding, a hard, rigid abdomen with abdominal pain, or massive hemorrhage. Chronic high blood pressure is a primary risk factor for abruption, along with tobacco or cocaine use, premature rupture of membranes, and having had an abruption in a previous pregnancy.<sup>33, 63-65</sup> A full abruption is a medical emergency in which an immediate cesarean delivery is necessary.

With a partial or marginal abruption without heavy bleeding (determined by ultrasound), the mother may be restricted to bed rest until the bleeding resolves.

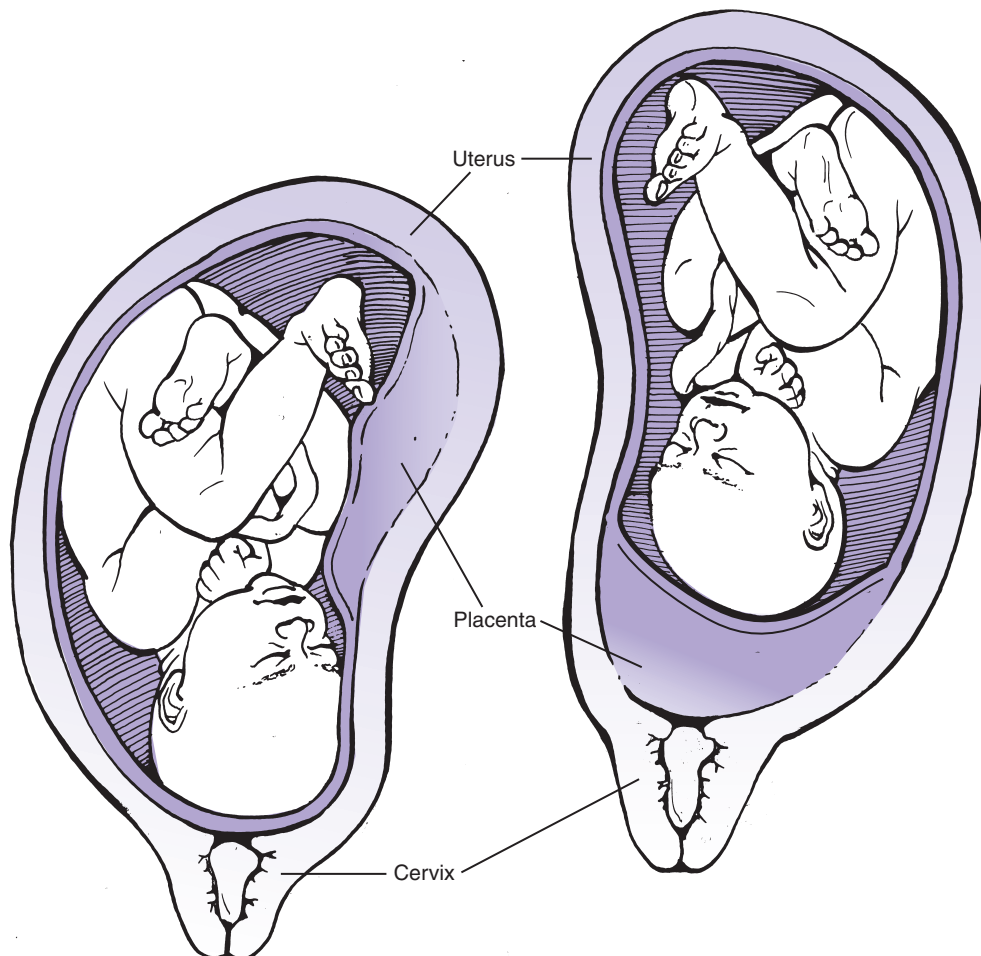


#### BODYWORK PRECAUTIONS:

- *After recovery* from a partial abruption, once the mother is able to resume some of her daily activities (although they will likely be quite modified), massage can be done with gentle Type II work. *Avoid all abdominal massage and Type I stimulating massage.* Obtain a medical release prior to beginning bodywork to be certain the PCP approves of massage, and to alleviate concerns for the mother and yourself, as well as to ascertain other risks.
- Call 911 emergency services immediately if your client should develop symptoms of severe abdominal pain or sudden heavy vaginal bleeding during a session, as this could indicate another abruption.

### Placenta Previa

When the placenta has implanted itself partially or completely over the opening of the cervix, it is called a **placenta previa** (Figure 4.10). This happens more frequently in women who have uterine fibroids or scarring from previous surgeries, as well as in smokers, women over 35 years old, and those who have had multiple pregnancies.<sup>33</sup> If the placenta is positioned low early in the pregnancy, it may still migrate upward and out of danger as the pregnancy progresses. If it does not, a cesarean section will be necessary at delivery, as the placenta will impede the vaginal delivery of the baby. There may be no symptoms



**FIGURE 4.10 Placenta previa and normal placenta.**

Normally the placenta is positioned in the upper area of the uterus. With a previa the placenta is positioned over or very near the os, or opening, of the cervix. There is increased risk of bleeding with this condition and delivery must be by cesarean section. (LifeART image copyright 2009 Lippincott Williams & Wilkins. All rights reserved.)

manifested with a previa, and it may only be found by ultrasound. In other situations, there may be a small or large amount of bleeding as the uterus enlarges and pulls on the placental attachments. The danger of hemorrhage is extreme if the cervix dilates, pulling away from the placenta.

With a known complete previa, a woman is usually instructed to avoid heavy lifting, aerobic activity, and sexual stimulation and intercourse, which can stimulate the abdomen, cervix, and uterus.


**! BODYWORK PRECAUTIONS:** Gentle massage can be done, and will benefit a woman, but avoid abdominal massage. All Type I full-body stimulating massage is also contraindicated if the client has had any bleeding. A medical

release is highly recommended to be certain the PCP approves of massage, alleviate concerns for the mother and massage therapist, and to ascertain other risks.

### **Polyhydramnios**

**Polyhydramnios** is a condition in which excessive amniotic fluid is produced in the uterus. It is associated with maternal shortness of breath, diabetes, preterm labor, and fetal anomalies.<sup>38</sup> With the increased fluid, there is an increased intrauterine pressure and impaired perfusion of blood between the uterus and placenta. This can lead to dangerous effects, such as sudden rupture of the uterus or placental abruption, irritable uterine contractions,


preterm labor, or premature rupture of the amniotic sac. A woman may be treated with modified activity or restriction to lateral bed rest. Type II bodywork is beneficial.

 **BODYWORK PRECAUTIONS:** Precautions for this condition depend on the history of the problem and the current level of severity. Obtain a medical release to determine the need to restrict Type I massage or additional necessary bodywork restrictions. No abdominal massage should be performed.

### Preterm Labor

**Preterm labor**, also known as premature labor, is defined as the onset of contractions *with changes to the cervix* (dilation, shortening, and effacing) before 37 weeks' gestation and with risk of the baby being born early. Preterm contractions do not always lead to preterm labor. A woman may have contractions that do not cause cervical change. She may also have cervical change without being aware of any contractions. Early contractions can be caused by simple things, such as dehydration or urinary tract infection—either of which can be easily treated. More serious preterm labor can be caused by other problems, such as issues with the health of the baby, a shift in hormones, rupture of the amniotic sac, or infection. Most often, the cause is unknown.

A woman with this condition may be restricted to lateral bed rest and may take medications to help prevent or decrease preterm contractions.

 **BODYWORK PRECAUTIONS:** Full body Type I massage is contraindicated for a client relegated to bed rest or restricted activity due to preterm labor, but localized Type I or general Type II massage can still be done. Obtain a medical release prior to beginning bodywork. Offer her a drink of water and encourage her to drink more than normal after receiving massage to minimize the effects of a massage-stimulated release of cellular waste into the circulatory system, which could potentially further irritate an already irritable uterus.

### Gestational Hypertension, Preeclampsia, and HELLP Syndrome


**Gestational Hypertension (GH)** refers to high blood pressure that develops during pregnancy, usually beginning sometime between 20 weeks' gestation

and 1 week postpartum. Mild gestational hypertension is not necessarily dangerous, but up to 50% of women with GH are likely to progress into a condition called **preeclampsia**,<sup>66</sup> in which changes begin to develop in the organ systems, blood chemistry is altered, and blood pressure continues to rise. A woman might be relegated to bed rest to reduce stress and blood pressure, but as long as her blood pressure stays consistently below 140/90, there may be no restrictions, other than to have her blood pressure monitored weekly throughout the rest of her pregnancy.

The etiology of preeclampsia is unclear, but it occurs in 3% to 7% of pregnancies and occurs most commonly in first time pregnancies.<sup>60,65,67</sup> As it progresses, it can lead to premature births and increased risk of placental abruption. In 25% of pregnancies, preeclampsia first becomes evident in the postpartum period and her blood pressure can stay elevated for up to 6 weeks postpartum.<sup>60</sup>

Symptoms of preeclampsia may include sudden rapid weight gain, visual disturbances, such as spots before the eyes, epigastric pain similar to heartburn, increased blood pressure, nausea and vomiting, unremitting headache, pitting edema of the extremities and face, along with abnormal lab tests. A woman with severe preeclampsia will be in the hospital on bed rest.

**HELLP** is an acronym for Hemolysis, Elevated Liver enzymes, and Low Platelets. It is insidious and considered by some to be a variation of advanced preeclampsia. It is characterized by pain in the epigastric area or right upper quadrant of the abdomen, often accompanied by general malaise, nausea, vomiting, and headache.<sup>65</sup> Though rare, occurring in less than 1% of pregnancies,<sup>68</sup> it is easily confused with other conditions that cause malaise, and yet HELLP can be extremely dangerous. It more typically develops in the third trimester of pregnancy, but can occur in the second as well.<sup>68</sup>

 **BODYWORK PRECAUTIONS:** If your client has GH or preeclampsia with no activity restrictions, then no bodywork restrictions may be necessary. If the client has progressed into preeclampsia with modified activity, Type I techniques should be limited and a medical release is highly recommended. Many women are restricted to the left-sidelying position, which can provide increased blood and oxygen perfusion to the fetus and uterus. This must continue during a massage, with sessions performed with the client solely in the left lateral position.



Women with HELLP will be in the hospital for medical management of the condition. Type II bodywork may be supportive, but all Type I bodywork will be contraindicated.

**CAUTIONS:** Be aware of insidious symptoms of HELLP, which can develop relatively quickly. If your client in the late second or third trimester has not been seen yet by her PCP for a recent development of headache, nausea, right upper abdominal pain, or general malaise, have her call her PCP before deciding to continue with a massage.

### Eclampsia

If left untreated, GH and preeclampsia are precursors to a more serious condition that develops when preeclampsia is not controlled, called **eclampsia**. This can lead to convulsions and even death. Preeclampsia and eclampsia are the third leading cause of pregnancy-related deaths in the United States.<sup>69,71</sup>

**BODYWORK PRECAUTIONS:** Eclampsia and HELLP are life-threatening conditions and the woman will be in the hospital. In this case, all Type I bodywork is contraindicated. Type II

### Case Study 4.2:

#### BLOOD CLOTS DURING PREGNANCY, II

Joan was a 34-year-old client at 35 weeks' gestation who came for a massage complaining of a mild headache, along with pain and cramping in her left calf that developed earlier that day. Joan also stated she was experiencing an increase in bilateral swelling of her feet and ankles since her last massage 2 weeks ago. The pain was moderate and increased when the left foot was dorsi-flexed with walking. It did not refer elsewhere. The therapist assessed the leg and found no signs of swelling, heat, or redness in the area of discomfort, but did note the edema of the foot. There was no obvious bruising, but the calf was painful with moderate palpation of the gastrocnemius. Joan had not done any recent physical exertion, nor changed to new shoes recently, but she had been having an increase in leg cramps at night.

The therapist asked about Joan's headache. Joan stated it had been low-grade, but constant, and that she had last seen her doctor 8 days ago, though her next appointment was scheduled in 2 days.

The massage therapist had several concerns. Noting the increase in edema, though minor and nonpitting, and the complaint of persistent headache, the therapist considered the possibility of early preeclampsia. Joan stated that her blood pressure had been normal until her last prenatal visit, when it had been slightly elevated, though her doctor had stated that there was nothing to worry about. The massage therapist was also concerned about the calf pain and swelling and the potential for blood clot, since she was unable to discern clearly whether the client's pain was only musculoskeletal. Because it was *bilateral* swelling,

she thought it was unlikely to be a clot, but she had enough uncertainty that she felt it important that Joan be evaluated by her PCP.

Due to this uncertainty, the therapist informed Joan that she would be unable to do her standard massage at this visit but suggested that she call her prenatal clinic from the massage office and query whether she should be seen right away. Joan did this, and made an appointment for later that afternoon. Knowing Joan would be seen soon, the therapist then offered to do a Type II energy session with a head and neck massage to help her relax, if it did not interfere with the timing of Joan's appointment. She also gave Joan a medical release form to bring to her PCP to be signed before her next massage, after her condition was evaluated.

Joan returned to the massage therapist the following week with the medical release and explanation that no clot was found in her leg. The doctor had suggested that her discomfort might be residual from her frequent leg cramps, of which she had several the night before her last massage visit. Her headaches resolved with Tylenol, and she was told she would be monitored twice weekly for blood pressure changes, since her pressure had increased slightly again, yet was still not of significant concern requiring activity restrictions.

The therapist then felt comfortable massaging Joan's legs to help relieve tension from muscle cramping. Each subsequent visit she asked for an update on her client's blood pressure and any other medical concerns so that she would know if she would need to enact any restrictions to general massage.



**MESSAGE  
THERAPIST  
TIP**
**Working Within Your Scope of Comfort, Knowledge, and Skill**

**B**eginning massage therapists and those who have little experience working with pregnant clients, or who have nervousness or uncertainty about positioning, precautions, and symptoms indicating problems, should steer clear of working with clients with high-risk complications, referring them to more experienced pregnancy massage therapists. This is simply to alleviate fears for either the therapist or the mother about the safety of the treatment. As you become more comfortable with your work and more knowledgeable about conditions of pregnancy, you may choose to expand your work to women who have high-risk conditions.

If you have any uncertainty about precautions or lack confidence, do not hesitate to refer a client to a more experienced prenatal massage therapist, or to contact her prenatal office for more information about her type of condition.

Use your knowledge, reason, common sense, and intuition and only work within the scope of your comfort and skill level. If your client has a condition with which you are unfamiliar or for which you are uncertain of the risks and benefits of touch, discuss it with your client, research it, read about it, talk with a doctor or midwife about it, and speak with other bodyworkers who are skilled in the field of childbirth about it.

Having said this, remember that gentle Type II touch will never cause harm, but instead, often reduces anxiety and decreases the production of stress hormones which contribute to problems in pregnancy. In almost all situations, energy work and gentle, soothing touch can be appropriate even when other forms of bodywork, such as vigorous Swedish or deep tissue work is contraindicated.

bodywork for women with severe conditions requires a medical release.

### Client Restricted to Bed Rest

For women with high-risk pregnancies, confinement to bed may be one of her prescribed treatments. Her prescription may vary from total bed rest, with use of a bedpan or bedside commode, to bed rest with 2- to 4-hour breaks during which she may be upright and move about the house minimally. These types of restrictions can lead to numerous complaints, including general muscle stiffness, aches, weakness, and atrophy; structural and postural changes that cause back pain; increased constipation due to immobility; emotional stress due to boredom, guilt, or anxiety about her condition; increased heartburn from horizontal positioning; and an increased risk of blood clots. Massage can be a life saver. If she works on a laptop computer in bed, she may have further problems related to poor posture and positioning, such as carpal tunnel syndrome and brachial plexus syndrome.

#### Bodywork Precautions

Working with bed-bound women necessitates communication with her PCP. Obtain a medical release for massage prior to beginning your work with your client. Requesting enough information about her condition to feel secure about what type of bodywork is appropriate. For most conditions, Type I work is

contraindicated for the full body, though it is useful in local areas such as the shoulders, neck, and arms. Your client is in bed to avoid excessive stimulation that might cause her either to lose her baby—such as in cases of preterm labor—or increase her risk of bleeding—such as with placenta previa or partial abruption. Therefore, abdominal massage will often be totally contraindicated. She may also be on bed rest to avoid increasing severe high blood pressure.

If uncertain what is appropriate, always err on the side of gentle, calming energy work, and decreasing stimulation. Incorporate calming visualizations and breathing practices in your work. Typically there are no restrictions to working on the head, neck, shoulders, arms, and upper back. You can have a huge effect merely by offering emotional support and gentle hands-on holding, if that is all you are able to do.



**CAUTIONS:** A woman's risk for blood clots increases greatly when her activity level has been restricted. Maintain all precautions for blood clots with your client on bedrest, as described under "Massage to Adductors and Inner Thigh" earlier in the chapter.

#### Health Intake for Client on Bed Rest

A thorough health intake is mandatory for clients relegated to bed rest. In addition to the standard health questionnaire and intake, ask the following questions

## *Self Care Tips* FOR MOTHERS:

### Stress Relief for the Client Restricted to Bed Rest

For the client who is on bed rest, simple stretches and activities are recommended by PCPs to maintain muscular tone and blood and lymphatic circulation, reduce the risk of blood clots, improve mood and energy level, decrease muscular aches, relieve boredom, give a woman a way to engage in her care, and stimulate inspiration and respiration. Some of these stress-relieving methods are included here. The massage therapist might remind the client of these tools to diminish tension between massages.

Conscious breathing is a known stress reliever and can help minimize anxiety that develops for women on restricted activity.<sup>72-74</sup> When engaging in the following activities, attention to the inhalations and exhalations will help increase a woman's relaxation response. Breath-holding should be avoided, as it increases pressure and strain to the abdomen. If you or the client has any uncertainty about the appropriateness of these activities for her condition, she should contact her PCP. Practices 1 to 6 can be done with the client in any position. The others are best done in the semi-reclining position.

1. Deep abdominal breathing: Slowly allow the abdomen to expand as the breath slips in through the nostrils. After the belly fills, let the chest continue to fill, expanding the ribs out laterally. Pause for a moment before exhaling slowly through the mouth, allowing all the breath to be released. Pause between the exhalations and inhalations.
2. Arm stretch: Reach each arm out to the side, and over the head as far as possible, while inhaling deeply with each stretch. Exhale returning the arms to the side.
3. Shoulder shrugging and shoulder rolls: Inhale as the shoulders are shrugged up to the ears. Exhale as the shoulders relax. Raise the shoulders to the ears with an inhale and rotate them backwards and down on an exhale. Repeat, rotating the shoulders forward.
4. Hand stretches: Alternate between making fists and stretching open fingers. One hand can pull back on the fingers of the other hand to increase stretching.
5. Foot circles: Stretch the toes back and rotate the feet in circles in either direction.
6. Kegel exercises: On an exhalation, squeeze the perineal muscles. On an inhalation, relax them. (See "Kegel Exercises" in Chapter 3.)
7. Neck rolls: Allow the chin to fall to the chest on an exhale. Lift the head and allow it to fall back with an inhale. Roll the head from one side to the other.
8. Chest opener: Place hands behind the head, retract the scapula, pulling the elbows posteriorly on the inhale. Exhale and return the elbows to neutral or forward.
9. Leg press: On an inhalation, plantar flex the feet, pulling the toes back, tighten the buttocks, perineum and lengthen the back of the legs, pressing the knees toward the bed. Exhale and relax the legs.
10. Leg Roll: Roll the legs in and out, bringing the knees together and apart.

of your bed-bound client or her care provider before beginning bodywork. The information gathered will help you offer the type of touch most appropriate for each individual.

1. What is her diagnosis and what are her risks?
2. Has she had this experience with previous pregnancies or earlier in this pregnancy? What was the outcome?
3. What are her limitations with regard to positioning and being up out of bed? Can she get out of bed and onto a massage table?
4. Has she had any bodywork while on bed rest?
5. What limitations would the care provider recommend with regards to bodywork?

## CHAPTER SUMMARY

Most women who receive massage will have a healthy, low-risk pregnancy. However, occasionally complications develop. The massage therapist who is educated about these conditions will be able to offer with confidence, the safest bodywork for her or his clientele. Most bodywork precautions for women with a risk condition during pregnancy involve using safe and proper positioning, avoiding excessive full body stimulation or abdominal massage, using gentle touch to the legs and avoiding all work on legs with multiple, severe varicose veins or known blood clots. By being aware of the necessary precautions, and

empowered with the ability to ask appropriate and discerning questions, the therapist can determine when extra caution may be appropriate, and when a medical release or discussion directly with a client's PCP or office nurse is highly recommended. To enhance your understanding of particular pregnancy conditions, you may be able to access support and information through doctors' or midwives' offices, by attending midwifery conferences, using research libraries, or by contacting other pregnancy massage specialists. As you become more educated, your confidence will increase, and your clients will be able to relax more in the security of your hands.

## CHAPTER REVIEW QUESTIONS

1. Name three dangers of improper positioning during pregnancy massage.
2. Describe the difference between Type I and Type II forms of bodywork according to this text, and in what situations their use would be inappropriate.
3. Name three health-related questions specific to pregnancy that should be included on a health intake.
4. What concerns would you have with a client at 14 weeks' gestation, who states that she has had three consecutive miscarriages just prior to this pregnancy? What kind of adjustments might you make to your bodywork with her, if any?
5. Name three bodywork techniques or modalities that are contraindicated during pregnancy and explain why they are contraindicated.
6. Give two reasons why the use of certain essential oils or scents would be contraindicated during pregnancy.
7. Explain why pregnant and postpartum women have a higher risk for DVTs than nonpregnant women.
8. Name two health-related circumstances where a medical release would be highly recommended before working with a pregnant client.
9. Describe two situations that demonstrate why a thorough health intake is important.
10. Name a triad of common symptoms that could indicate a dangerous condition that only occurs during pregnancy.

## REFERENCES

1. Jones W. Safe Motherhood: Promoting Health for Women Before, During and After Pregnancy — At a Glance 2007. National Center for Chronic Disease Prevention and Health Promotion At a Glance Health Pamphlet. Centers for Disease Control and Prevention.
2. Ventolini G, Heard M. Keys to minimizing liability in obstetrics. *Contemp Ob Gyn* 2003;48:81–96.
3. Beers MH, ed. *The Merck Manual of Medical Information—Second Home Edition Online Version*. Whitehouse Station, NJ: Merck & Co, 2004–2005.
4. Dickerson VM. Statement Regarding Medical Liability Reform. March 15, 2005. ACOG News Press Release, Office of Communications. Found at [http://www.acog.org/from\\_home/publications/press\\_releases/nr03-15-05.cfm](http://www.acog.org/from_home/publications/press_releases/nr03-15-05.cfm).
5. Mayo Clinic Staff. Tools for Healthier Lives. Education pamphlet. 2006. Available online at <http://www.mayoclinic.com/health/miscarriage/PR00097>.
6. West Z. *Acupuncture in Pregnancy and Childbirth*. Edinburgh: Churchill Livingstone, 2001.
7. Johnson E. Shiatsu. In: Tiran D, Mack S, eds. *Complementary Therapies for Pregnancy and Childbirth*. 2nd Ed. Edinburgh: Harcourt Publishers Limited, 2000.
8. Budd S. Acupuncture. In: Tiran D, Mack S, eds. *Complementary Therapies for Pregnancy and Childbirth*. 2nd Ed. Edinburgh: Harcourt Publishers Limited, 2000.
9. Yates S. *Shiatsu for Midwives*. Oxford: Elsevier Science, 2003.
10. Wang B, Liu JY, Han Y, et al. [Study on effect of electroacupuncture at Hegu (LI 4) on the uterotonic time in parturients of uterus inertia]. [Article in Chinese] *Zhongguo Zhen Jiu* 2006;26(12):843–846.
11. Rabl M, Ahner R, Bitschnau M, et al. Acupuncture for cervical ripening and induction of labour at term — a randomized controlled trial. *Wien Klin Wochenschr* 2001;113(23-24): 942–946.
12. Deadman P, Al-Khafaji M, Baker K. *A Manual of Acupuncture*. Seattle: Journal of Chinese Medicine Publications, Eastland Press, 2001.
13. Acupuncture Research and Resource website. <http://www.acuxo.com>.
14. Gach MR. *Acupressure's Potent Points: a guide to self-care for common ailments*. New York: Bantam Books, 1990.
15. Yin Yang House: Acupuncture for the World. <http://www.Yingyanghouse.com>.
16. Stillerman E. *Prenatal Massage: a textbook of pregnancy, labor, and postpartum bodywork*. Mosby, 2008.
17. Dale RA. The contraindicated (forbidden) points of acupuncture for needling, moxibustion and pregnancy. *Am J Acupunct* 1997;25(1):51–53.
18. Rempp C, Bigler A. Pregnancy and acupuncture from conception to postpartum. *Am J Acupunct* 1991;19(4): 305–315.
19. Zotz R, Gerhardt A, Scharf R. Prediction, prevention and treatment of venous thromboembolic disease in pregnancy. *Semin Thromb Hemost* 2003;29(2):143–153.
20. Gherman RB, Goodwin TM, Leung B, et al. Incidence, clinical characteristics, and timing of objectively diagnosed venous thrombo-embolism during pregnancy. *Obstet Gynecol* 1999;94:730–734.
21. Soomro RM, Bucur IJ, Noorani S. Cumulative incidence of venous thromboembolism during pregnancy and puerperium: a hospital-based study. *Angiology* 2002; 53(4):429–434.

22. Warren SE. Pulmonary embolus originating below knee. *Lancet* 1978;2(8083):272-273.
23. McKinney ES, Ashwill JW, Murray SS. *Maternal-Child Nursing*. Philadelphia: WB Saunders, 2000.
24. Cao YN, Zhang Y, Liu Y, et al. [Effects of exposure to extremely low frequency electromagnetic fields on reproduction of female mice and development of offspring][Article in Chinese] *Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi* 2006;24(8):468-470.
25. Li DK, Odouli R, Wi S, et al. A population-based prospective cohort study of personal exposure to magnetic fields during pregnancy and the risk of miscarriage. *Epidemiology* 2002;13(1):9-20.
26. Feychting M. Non-cancer EMF effects related to children. *Bioelectromagnetics* 2005;26(Suppl 7):S69-S74.
27. Ahlbom IC, Cardis E, Green A, et al. Review of the epidemiologic literature on EMF and health. *Environ Health Perspect* 2001;109(Suppl 6):911-933.
28. Lee GM, Neutra RR, Hristova L, et al. A nested case-control study of residential and personal magnetic field measures and miscarriages. *Epidemiology* 2002;13(1):21-31.
29. Kinsella SM, Lohmann G. Supine hypotensive syndrome. *Obstet Gynecol* 1994;83:774-788.
30. Carbonne B, Benachi A, Leveque ML, et al. Maternal position during labor: effects on fetal oxygen saturation measured by pulse oximetry. *Obstet Gynecol* 1996;88(5):797-800.
31. Jeffreys RM, Stepanchak W, Lopez B, et al. Uterine blood flow during supine rest and exercise after 28 weeks of gestation. *BJOG* 2006;113(11):1239-1247.
32. Brock-Utne JG, Buley RJ, Downing JW, et al. Advantages of left over right lateral tilt for caesarean section. *S Afr Med J* 1978;54(12):489-492.
33. Cunningham FG, Gant NF, Levene KJ, et al. *Williams Obstetrics*. 21st Ed. New York: McGraw Hill Medical Publishing, 2001.
34. Pergament E, Stein Schechtman A, Rochanayon A. Hyperthermia and pregnancy. *Illinois Teratogen Information Service Risk Newsletter*, June 1997;5(6). Last accessed May 2007 at <http://www.fetal-exposure.org/HYPERTH.html>.
35. Milunsky A, Ulcickas M, Rothman KJ, et al. Maternal heat exposure and neural tube defects. *AMA* 1992;268(7):882-885.
36. Li DK, Janevic T, Odouli R, et al. Hot tub use during pregnancy and the risk of miscarriage. *Am J Epidemiol* 2003;158(10):931-937.
37. Ananth CV, Savitz DA, Williams MA. Placental abruption and its association with hypertension and premature rupture of membranes: a methodological review and meta analysis. *Obstet Gynecol* 1996;88(2):309-318.
38. Mazor M, Ghezzi F, Maymon E, et al. Polyhydramnios is an independent risk factor for perinatal mortality and intrapartum morbidity in preterm delivery. *Eur J Obstet Gynecol Reprod Biol* 1996;70(1):41-47.
39. Ananth CV, Oyelese Y, Srinivas N, et al. Preterm premature rupture of membranes, intrauterine infection, and oligohydramnios: risk factors for placental abruption. *Obstet Gynecol* 2004;104: 71-77.
40. Richter ON, Rath W. [Thromboembolic diseases in pregnancy.] [Article in German] *Z Geburtshilfe Neonatol* 2007;211(1):1-7.
41. Ninet J. [The risk of maternal venous thromboembolism disease. Synopsis and definition of high-risk groups] [Article in French] *Ann Med Interne (Paris)* 2003;154(5-6):301-309.
42. Gates S, Brocklehurst P, Davis L. Prophylaxis for venous thromboembolic disease in pregnancy and the early postnatal period. *Cochrane Database Syst Rev* 2002;2.
43. Lindqvist P, Dahlback Ba, Marsal K. Thrombotic risk during pregnancy: a population study. *Obstet Gynecol* 1999;94:595-599.
44. James AH, Tapson VF, Goldhaber SZ. Thrombosis during pregnancy and the postpartum period. *Am J Obstet Gynecol* 2005;193(1):216-219.
45. *Thromboembolism in pregnancy*. ACOG Practice Bulletin, No. 19. Washington, (DC): American College of Obstetricians and Gynecologists, 2000 Aug: 10p.
46. Hill DR, Smith RB. Examination of the extremities: pulses, bruits, and phlebitis. In: Walker KH, Hall DW, Hurst JW. *Clinical Methods: The History, Physical and Laboratory Examination*. 3rd Ed. London: Butterworth-Heinemann, 1990.
47. Urbano FL. Homan's sign in the diagnosis of deep venous thrombosis. *Hosp Physician*, March 2001. Available at: <http://www.turner-white.com>.
48. Bulger C, Jacobs C, Patel N. Epidemiology of acute deep vein thrombosis. *Tech Vasc Interv Radiol* 2004;7(2):50-54.
49. Joshua AM, Celermajer DS, Stockler MR. Beauty is in the eye of the examiner: reaching agreement about physical signs and their value. *Intern Med J* 2005; 35(3):178-187.
50. Lefor AT, Bogdonoff D, Geehan D. *Critical Care On Call*. New York: McGraw Hill Medical, 2002.
51. Levi M, Hart W, Büller HR. *Ned Tijdschr Geneesk*. [Physical examination — the significance of Homan's sign] [Article in Dutch] 1999;143(37):1861-1863.
52. ACOG Education Pamphlet Item #AP090. *Early Pregnancy Loss: Miscarriage and Molar Pregnancy*. American College of Obstetricians and Gynecologists, 2002.
53. *U.S. Pregnancy Rate Down from Peak; Births and Abortions on the Decline*. Revised Pregnancy Rates, 1990-97, and New Rates for 1998-99: United States. *NVSR*;52(7), 15 pp. (PHS) 2004-1120. Last viewed on May 2007 at <http://www.cdc.gov/nchs/pressroom/03facts/pregbirths.htm>.
54. Wilcox AJ, Weinberg CR, O'Connor JF, et al. Early loss of pregnancy. *N Engl J Med* 1988;319(4):189-194.
55. Kleinhaus K, Perrin M, Friedlander Y, et al. Paternal age and spontaneous abortion. *Obstet Gynecol* 2006;108(2):369-377.
56. Slama R, Bouyer J, Windham G, et al. Influence of paternal age on the risk of spontaneous abortion. *Am J Epidemiol* 2005;161(9):816-823.
57. National Institute of Child Health and Human Development, NIH, DHHS. Division of Epidemiology,



- Statistics, and Prevention Research (DESPR), NICHD: Report to the NACHHD Council, 2001. Washington, DC: U.S. Government Printing Office. Last accessed on 9/08/07 at: [http://www.nichd.nih.gov/publications/pubs\\_details.cfm?from=&pubs\\_id=128](http://www.nichd.nih.gov/publications/pubs_details.cfm?from=&pubs_id=128).
58. Rasch V. Cigarette, alcohol, and caffeine consumption: risk factors for spontaneous abortion. *Acta Obstet Gynecol Scand* 2003;82(2):182-188.
  59. Tolstrup JS, Kjaer SK, Munk C, et al. Does caffeine and alcohol intake before pregnancy predict the occurrence of spontaneous abortion? *Hum Reprod* 2003;18(12):2704-2710.
  60. Beers MH, Berkow R, eds. *The Merck Manual of Diagnosis and Therapy*, 17th Ed. Section 18, Ch 250. Whitehouse Station, NJ: Merck & Co, 1999-2005.
  61. Gestational Diabetes Resource Guide. American Diabetes Association. <http://www.diabetes.org/gestational-diabetes.jsp>.
  62. Pernoll ML. Benson & Pernoll's Handbook of Obstetrics & Gynecology. Columbus, OH: McGraw-Hill Professional, 2001.
  63. Ananth CV, Smulian JC, Vintzileos AM. Incidence of placental abruption in relation to cigarette smoking and hypertensive disorders during pregnancy: A meta analysis of observational studies. *Obstet Gynecol* 1999; 93(4):622-628.
  64. Kramer MS, Usher RH, Pollack R, et al. Etiologic determinants of abruptio placentae. *Obstet Gynecol* 1997;89(2):221-226.
  65. Wolf JL. Liver disease in pregnancy. *Med Clin North Am* 1996;80:1167-1187.
  66. Management of Chronic Hypertension During Pregnancy. Summary, Evidence Report/Technology Assessment: Number 14. AHRQ Publication No. 00-E010, August 2000. Agency for Healthcare Research and Quality, Rockville, MD. Available at: <http://www.ahrq.gov/clinic/epcsums/pregsum.htm>.
  67. Goffon EN, Capewell V, Natale R, Gratton RJ. Obstetrical intervention rates and maternal and neonatal outcomes of women with gestational hypertension. *Am J Obstet Gynecol* 2001;185(4):798-803.
  68. Padden MO. HELLP Syndrome: Recognition and Perinatal Management. *Am Fam Physician* 1999;60(3). Online access: <http://www.aafp.org/afp/990901ap/829.html>.
  69. Douglas KA, Redman CW. Eclampsia in the United Kingdom. *Br Med J* 1994;309:1395-1400.
  70. Preeclampsia and eclampsia, while often preventable, are among top causes of pregnancy-related deaths. *Fam Plann Perspect* July/August 2001;33(4). Online at [www.guttmacher.org/pubs/journals/3318201.html](http://www.guttmacher.org/pubs/journals/3318201.html).
  71. MacKay AP, Berg CJ, Atrash HK. Pregnancy-related mortality from preeclampsia and eclampsia. *Obstet Gynecol* 2001;97(4):533-538.
  72. Kaushik RM, Kaushik R, Mahajan SK, Rajesh V. Effects of mental relaxation and slow breathing in essential hypertension. *Complement Ther Med* 2006;14(2):120-126.
  73. Joseph CN, Porta C, Casucci G, et al. Slow breathing improves arterial baroreflex sensitivity and decreases blood pressure in essential hypertension. *Hypertension* 2005;46(4):714-718.
  74. Mack S, Steele D. Complementary therapies for the relief of physical and emotional stress. In: Tiran D, Mack S, eds. *Complementary Therapies for Pregnancy and Childbirth*, 2nd Ed. Edinburgh: Harcourt Publishers, Ltd., 2000.